Draft North Yukon Regional Land Use Plan

NICHIH GWANAŁ'IN • LOOKING FORWARD

SUSTAINABLE DEVELOPMENT | PRECAUTIONARY PRINCIPLE | CONSERVATION | ADAPTIVE MANAGEMENT

NORTH YUKON PLANNING COMMISSION

October 2007

NORTH YUKON
PLANNING COMMISSION
NICHIH GWANAŁ'IN • LOOKING FORWARD

About our Logo

The logo of the North Yukon Planning Commission depicts the significance of the Porcupine Caribou Herd to the people of North Yukon. The Mother and calf signifies the responsibility of parents and the older generation to their young and to the future. The circle shows how we are all inter-connected and dependant on a healthy environment. *Looking Forward -Nichih Gwanal'in* is a value inherent in the Vuntut Gwitchin culture; it is the responsibility of all to work towards a sustainable future for generations to come.

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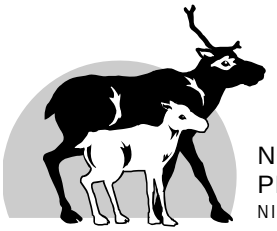
COVER PHOTO:
Porcupine Caribou cow and calf in the Richardson Mountains of northern Yukon © Peter Mather



NORTH YUKON
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October 31, 2007

Letter of Transmittal for Draft North Yukon Regional Land Use Plan

It is with great pleasure that the North Yukon Planning Commission (NYPC) announces the public release of the Draft North Yukon Regional Land Use Plan (the Plan). The Plan represents the culmination of four years of work by the NYPC, and builds on the earlier efforts of the Vuntut Planning Commission. The Plan was produced by the NYPC with the assistance of many partners, including Old Crow community members. The Plan applies to the traditional territory of the Vuntut Gwitchin, and represents part of the implementation of Chapter 11, Land Use Planning, of the Vuntut Gwitchin First Nation Final Agreement (VGFNFA).

The NYPC wishes to extend its gratitude to the citizens of Old Crow, the Yukon and Vuntut Gwitchin governments, the public, and other agencies and groups for their continued support and assistance in the production of Yukon's first regional land use plan under the mandate of a Yukon First Nation land claim agreement. The partnerships and collaboration between these groups and the Commission has made possible the public release of a land use plan that aims to reflect the vision, values and interests of the Vuntut Gwitchin, other affected First Nations and Yukoners as a whole. The Plan attempts to balance economic development with protection of Vuntut Gwitchin culture and traditional economy, and the environment upon which we all depend.

About this Document

This document is the full Draft Plan; it is a detailed and technical version of the Plan, primarily intended for resource managers. A non-technical Draft Plan Summary document highlighting major recommendations is also available. The Draft Plan Summary is suggested for a non-technical audience. Public comments on one or both of these documents are welcomed by the Commission. *Understanding the Plan*, a foreword to this document, assists readers in navigating and using the full Draft Plan.

We Need to Hear from You

The NYPC will be consulting on the Plan with the public, governments and other groups through a series of public forums and workshops in various communities between November 20 and December 15, 2007. Please check our website, watch for local ads or contact the Commission directly for more information on the consultation schedule.

Comments on the Plan will be accepted until **January 15, 2008**. During the consultation period, NYPC will be seeking input on all aspects of the Plan, including proposed land management concepts, land use designations and recommended protected areas. It is vital that everyone with an interest in northern Yukon participate in shaping a management vision for the region.

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What Happens Next?

Following the Plan consultation period, NYPC will consider the comments received and make revisions. A Recommended Land Use Plan will then be produced for consideration by the approval governments - Yukon and Vuntut Gwitchin - by March 31, 2008.

How to Provide Comments

Please review this Plan document, or request a copy of the Draft Plan Summary, and provide us with your questions or comments by **January 15, 2008**. Written comments may be submitted by mail, email or fax. NYPC contact information is listed below.

Where to Get the Draft Plan Summary

A separate Draft Plan Summary document provides a synopsis of this full Plan. This Plan, the Draft Plan Summary, a Resource Assessment report of the region, and Land Use Scenario supporting documents can be obtained online at: www.nypc.planyukon.ca.. Many informative resource maps used to prepare the Plan are also found here. Printed copies of the Draft Plan Summary document will be available for pickup at various locations around Whitehorse, and in the communities of Old Crow, Mayo, Dawson, Ft. McPherson and Aklavik. Please refer to the NYPC website, and check local ads for times and locations.

Where to Get More Information

Please contact the NYPC office for additional printed copies, information regarding community consultation schedules, supporting documents, or any other general inquiries:

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Thank you in advance for your participation in the Plan consultation. The NYPC looks forward to meeting with you and discussing our proposed Plan. Should you have any questions about the Plan, community consultations, or the review schedule, please do not hesitate to contact our office. Mahsi' Choo (Thank you).

Sincerely, on behalf of the North Yukon Planning Commission,

Shawn Francis, M.Sc., P.Biol.
Coordinator / Senior Land Use Planner

Executive Summary

The North Yukon Regional Land Use Plan (the Plan) is a collective statement about how to use and manage land and resources within the North Yukon Planning Region (Figure E1). The Plan was prepared under the mandate of Chapter 11, Land Use Planning, of the Vuntut Gwitchin First Nation Final Agreement (VGFNFA).

The Plan was produced by the North Yukon Planning Commission (NYPC), a public planning body nominated by Yukon and Vuntut Gwitchin governments. The Plan aims to balance economic development opportunities with the conservation of heritage resources, First Nations cultural landscapes and traditional economy, and the environment. The Plan is to reflect the vision, values and interests of the Vuntut Gwitchin and Yukoners as a whole.

1. Setting

The North Yukon Planning Region encompasses 55,568 km^2 of the Vuntut Gwtichin Traditional Territory. It also includes portions of the Tr'ondek Hwech'in, Tetlit Gwich'in and the Na-cho Nyak Dun First Nation Traditional Territories. The Inuvialuit Settlement Region, on the Yukon North Slope, is not included in the planning region.

The Plan applies to all Yukon Government public lands and all VGFN settlement lands, outside of Special Management Areas (SMAs) and the community of Old Crow.

Figure E1. Location of North Yukon Planning Region.

2. Guiding Principles

The Plan provides a **Sustainable Development** framework for land management in the North Yukon Planning Region.

The VGFNFA defines Sustainable Development as "*beneficial socio-economic change that does not undermine the ecological and social systems upon which communities and societies are dependent.*" Three other principles consistent with achieving Sustainable Development guided the production of the Plan: **Precautionary Principle**, **Conservation**, and **Adaptive Management**. The Plan proposes land management goals and objectives that relate to social, economic, and ecological issues and expectations—these are linked to the plan principles.

3. Key Issues

Two key issues were addressed in the development of plan goals and objectives: 1) potential oil and gas development in a significant portion of the annual range of the Porcupine Caribou Herd; and, 2) management of development impacts in wetlands outside of Protected Areas. Access to land and resources, transportation, and climate change were other major issues considered in setting goals and objectives.

The Plan also provides land use designation options for future consideration within the North Yukon Interim Land Withdrawal. The interim land withdrawal affects the northern portion of the region, and has been in place since 1978. The withdrawal order removes this area from mineral and oil and gas disposition, and prevents exploration activities.

4. Plan Concepts

The plan proposes four tools and approaches to guide land management decisions in the region: 1) **Landscape Management Units**, 2) a **Land Use Designation System**, 3) a **Results-based Management Framework,** and 4) **General Management Direction**. The approaches are complementary to each other and fit within the Sustainable Development framework advanced by the Plan. These tools and approaches have been applied in other jurisdictions to guide land management decisions.

4.1 Landscape Management Units

Landscape management units (LMUs) are distinct areas of the region determined by identifiable features. The boundaries of each unit are determined by existing SMAs and protected areas, or other features such as the Dempster Highway and major rivers. The Plan divides the region into 13 LMUs.

4.2 Land Use Designation System

A land use designation system is used to guide the management of land use activities within the different LMUs. It provides the broadest level of guidance for land and resource decision-making. A land use designation system consists of different land categories that describe either the type or intensity of land uses that are allowed or recommended for each specific LMU. Each LMU is assigned to a land category or zone.

The Plan proposes three general land use categories: **Integrated Management Area (IMA)**, **Protected Area (PA)**, and **Community Area (CA)**. The Integrated Management Area is the ‘working landscape’ where a variety of land uses may occur. The IMA is further described by four zones: **Zone I** (highest conservation focus), **Zone II** (high conservation focus), **Zone III** (moderate development focus) and **Zone IV** (highest development focus). Protected Areas are for the maintenance of ecological integrity, interpretation and enjoyment of special features, or recreation—resource exploration and development are prohibited. The Community Area applies to the area around Old Crow, where community development requirements are prioritized. The Plan does not address management issues within the Community Area.

4.3 Results-based Management Framework

The Plan proposes a results-based management framework to determine if plan goals and objectives are being met. An important application of the framework is monitoring and reporting the state of the environment within LMUs of the IMA. This is necessary to track the health of the land, water, and ecosystems within the 'working landscape'. In the absence of monitoring and reporting, a variety of exploration, development, and tourism/recreation related activities may cause unchecked and undesired cumulative impacts to valued cultural, ecological and economic resources.

Cumulative Effects Management

Large-scale activities such as oil and gas exploration and development have the potential to cause **cumulative effects** to wildlife and fish species and their habitats. Caribou populations may be negatively impacted through direct habitat disturbance, and the disturbances can lead to other indirect impacts to caribou from increased predation, hunting mortality, vehicle collisions, etc.

Based upon research and experiences in other regions, the Plan advocates the monitoring of **two indicators of ecological integrity** within each LMU of the IMA. This is required to assess the condition of valued ecological resources, with emphasis on tracking the general condition of caribou habitat.

The two proposed indicators are: 1) **Direct human-caused surface disturbance**, and 2) **Linear (access) density**. An important assumption for the indicators is that as the levels of disturbance increase, so does the risk of significant impacts to ecological (and cultural) resources. The plan proposes **thresholds** or '**limits of acceptable change'** for the amount of surface and linear disturbance allowed in each LMU.

4.4 General Management Direction

The Plan provides general management direction and recommendations for the region's land, water, cultural, and ecological resources. Most recommendations are aimed at minimizing or avoiding development impacts to cultural, heritage and/or ecological resources, within the IMA, in specific areas and at certain times of year.

5. Plan Recommendations

5.1 Landscape Management Units and Land Use Designation

Detailed maps and descriptions are provided for each of the 13 LMUs, including a summary of existing land status and administration, resource inventory information, and identified social/cultural, ecological, and economic values. Land use zones, management objectives, specific recommendations and thresholds for the two indicators of human-caused disturbance are proposed for each of the units within the IMA.

Integrated Management Area

Fifty-four percent of the planning region is designated as Integrated Management Area, or 'the working landscape'. Most of the IMA has a higher development focus (Zone III or IV), including areas with some of the highest potential for oil and gas and mineral resources. Zone I and II areas contain the highest ecological and cultural values, where more cautious land management is required.

Protected Area

The Plan recommends a new 470 km^2 (1% of region) Protected Area for the central Whitefish Wetlands complex. Most of this area is included within VGFN settlement land. The VGFNFA and previous planning processes designated 32% of the region with long-term Protected Area status. Existing Protected Areas include Old Crow Flats SMA, including Vuntut National Park of Canada, and Ni'iinlii'njik (Fishing Branch) Wilderness Preserve and Ecological Reserve.

Old Crow Community Area

A 5 km area around the Community of Old Crow, between the Porcupine River and Old Crow Flats SMA, is prioritized for community requirements.

5.2 Results-Based Management & Cumulative Effects

The Plan proposes quantitative '**limits of acceptable change**', or thresholds, for the amount of surface and linear disturbance allowed in each LMU. LMUs assigned the highest conservation focus (Zones I and II) have the lowest thresholds for disturbance. These zones include the region's large wetland complexes and the Richardson Mountains.

In the Plan, thresholds are proposed as guidelines to promote and inform integrated decision-making; they are not to be interpreted as an absolute cap on development.

5.3 General Management Direction

Twenty-seven general recommendations are proposed. These address potential land management issues including Sustainable Development (emphasis on cumulative effects management and climate change), existing access routes (Dempster Highway and Old Crow winter road), construction of new access routes, land management in the vicinity of Old Crow, conservation of heritage and community use areas, siting of work camps/infrastructure, gravel resources, fuelwood harvest, renewable energy, conservation of wildlife and fish habitat, wetlands/lakes, and major river corridors.

For each recommendation, an overview of the management issue and supporting rationale for the proposal is provided. Operating guidelines and best management practices related to the recommendations are also discussed.

5.4 North Yukon Interim Land Withdrawal

The Plan provides land use designation options for future consideration within the North Yukon Interim Land Withdrawal. All options currently being examined have a moderate or strong conservation focus, including a Protected Area option for the Summit Lake-Bell River area of the Northern Richardson Mountains.

6. Implementation

As established by the VGFNFA, the Yukon and Vuntut Gwitchin governments have primary implementation responsibilities for this Plan, once approved. However, it is expected that Plan implementation will also involve the Government of Canada, the Yukon Environmental and Socio-economic Assessment Board, the North Yukon Planning Commission, and other groups.

A detailed implementation plan will be developed following Plan approval. The Plan will be reviewed on an agreed-upon schedule, or whenever the Yukon and Vuntut Gwitchin governments agree a review is required.

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Message from the Chair

For thousands of years, the Vuntut Gwitchin and its neighbouring Gwich'in Nations have used and managed the land. Our ancestors were highly educated in land use and the management of all resources. Their land use practices were effective. What we take from the Mother Earth, we give thanks for and use with the utmost respect. Our ancestors taught us the most sacred of teachings…not to use or take more than you need and only what Mother Earth or all of Creation can provide. This teaching ensures a sustainable future for generations to come.

In North Yukon, the Porcupine Caribou hold a special place in Gwich'in culture and life. It has been said that the Gwich'in and the Caribou hold a piece of each other's heart. The Creator gave the Gwich'in the Caribou to feed and sustain the people, and to keep the teachings and responsibilities to our past, current and future generations alive. Like the relationship between the Gwich'in people and the Caribou, the Porcupine herd holds a special place in this land use plan.

The Vuntut Gwitchin are a resourceful people and will not shy away from economic opportunities. However, the teachings of our ancestors resonate with each land use issue we are engaged in, and with each decision we must make. Vuntut Gwitchin Elders have been consulted throughout this process to gather, document and map important traditional use and wildlife areas. Their knowledge is represented directly in the North Yukon regional land use plan.

We have been taught to do things in co-operation with others. The Plan Partners concept initiated from the beginning of this exercise embraces this teaching. Our intent has been to develop a regional land use plan for the Vuntut Gwitchin traditional territory with cooperation and engagement of our Plan Partners. The end result is a Plan that reflects the values of residents, is balanced, assists in making informed land use decisions, and can be implemented. A special Mahsi` Choo (thank you) to our Plan Partners.

Our staff worked extremely hard to produce this Plan. Their skills, energy, dedication and commitment throughout this long and challenging planning process was a source of inspiration for the Commission members. Thank you to Shawn Francis, John Ryder, Richard Vladars and Kathleen Zimmer. We couldn`t have done this without you.

The North Yukon regional land use plan embodies the guiding principles of the Vuntut Gwitchin people – *Nichih Gwanal'in, Looking Forward.* We trust this Plan will assist in establishing a framework for sustainable land use in northern Yukon.

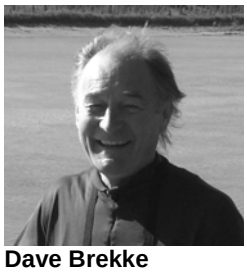
Mahsi` Choo,

Shirlee Frost, Chair
North Yukon Planning Commission

About the North Yukon Planning Commission

The North Yukon Planning Commission is an arms length public planning body made up of six people nominated by the Yukon and Vuntut Gwitchin governments.

Shirlee Frost
Chair



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Acknowledgements

This Plan was produced with the assistance of a number of **Plan Partners** - groups and agencies that directly assisted NYPC with information collection and analysis, planning concepts and approaches, and writing/editing of various planning documents.

Major contributors included Yukon Government (special thanks to Tim Sellars and John Meikle), Vuntut Gwitchin Government (special thanks to William Josie), Ducks Unlimited Canada (special thanks to Amy Leach), Environment Canada, Canadian Wildlife Service (special thanks to Philippa McNeil), Environment Canada, Northern Ecosystems Initiative, Fisheries and Oceans Canada, the Yukon Land Use Planning Council (special thanks to Jeff Hamm and Ron Cruikshank), and the Peel Watershed Planning Commission (special thanks to Brian Johnston).

Vuntut Gwitchin Elders shared their traditional knowledge, wisdom and humour during the planning process. Several Elders passed on during production of the Draft Plan but their legacy, spirit and teachings remain. To them, we extend a special Mahsi' Choo (thank you).

Many Old Crow community members and land users made significant contributions to this regional land use plan. Without their knowledge and ongoing participation, this exercise would not have been possible.

Other assistance was provided by Parks Canada, the North Yukon Renewable Resources Council, Environmental Dynamics Inc., Gartner Lee Limited, the United States Geological Survey—Cooperative Research Units (Alaska), the United States Fish & Wildlife Service (Alaska), Alaska Department of Fish and Game, the Porcupine Caribou Management Board, the Yukon Environmental and Socio-economic Assessment Board, Yukon College, the Yukon Habitat Stewards Program (Yukon Fish and Wildlife Management Board), the Gwich'in Tribal Council, the Gwich'in Social and Cultural Institute, Canadian Association of Petroleum Producers, Devon Canada Corporation, and Access Consulting Group.

Geoff Bradshaw of the Yukon Geological Survey provided the Commission with an assessment of the region's mineral potential, which greatly assisted the production of this Plan. Geoff died in a tragic helicopter accident in the summer of 2006. His energy, enthusiasm and dedication will be greatly missed.

The Commission wishes to specifically thank the following people for their contributions to the Plan:

Vuntut Gwitchin Elders and Old Crow Community Members

Rosalie Abel, Ellen Bruce, Robert Bruce Jr., Shawn Bruce, Alfred Charlie, Fanny Charlie, Josephine Feur, Donald Frost, Freddie Frost, Stephen Frost Sr., Edith Josie, Peter Josie, Danny Kassi, Harvey Kassi, John Joe Kyikavichik, Irwin Linklater, Hannah Netro, Stan Njootli Sr., Stan Njootli Jr., Dick Nukon, Joel Peter, Victor Peterson, Esau Schaeffer, Joe Tetlichi, Kenny Tetlichi, Patti Tetlichi, Charlie Thomas, Lydia Thomas, and Peter Tizya

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Yukon Government

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List of Acronyms

ABEKC	Arctic Borderlands Ecological Knowledge Co-op
ANWR	Arctic National Wildlife Refuge
ALCES	A Landscape Cumulative Effects Simulator
BMPs	Best Management Practices
CA	Community Area
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
CYFN	Council of Yukon First Nations
DFO	Department of Fisheries and Oceans
DU	Ducks Unlimited
EMR	Energy, Mines and Resources (Yukon Government Department)
FN	First Nations
GIS	Geographic Information System
GTOR	General Terms of Reference
GTC	Gwich'in Tribal Council
HPA	Habitat Protection Area
Ha	Hectares
IMA	Integrated Management Area
IUCN	International Union for Conservation of Nature
IPA	Interim Protected Area
ISR	Inuvialuit Settlement Region
LMU	Land Management Unit
MMbbls	Million barrels (oil)
NND	First Nation of Na-cho Nyak Dun
NWT	Northwest Territories
NY	North Yukon
NYPC	North Yukon Planning Commission
NYRRC	North Yukon Renewable Resources Council
O & G	Oil and Gas
OCF	Old Crow Flats

OIC	Order in Council
PA	Protected Area
PCH	Porcupine Caribou Herd
PCMB	Porcupine Caribou Management Board
R.S.Y.	Revised Statutes of Yukon
SARA	Species at Risk Act
SDL	Significant Discovery License
SMA	Special Management Area
Tcf	Trillion cubic feet (natural gas)
TGFN	Tetlit Gwich'in First Nation
THFN	Tr'ondek Hwech'in First Nation
TWG	Technical Working Group
UFA	Umbrella Final Agreement
VG	Vuntut Gwitchin
VGFN	Vuntut Gwitchin First Nation
VGFNFA	Vuntut Gwitchin First Nation Final Agreement
VGG	Vuntut Gwitchin Government
YESAA	Yukon Environmental and Socio-Economic Assessment Act
YESAB	Yukon Environmental and Socio-Economic Assessment Board
YG	Yukon Government
YLUPC	Yukon Land Use Planning Council
VNP	Vuntut National Park

Glossary of Terms

Adaptive Management: a systematic approach to resource management that uses structured, collaborative research and monitoring with the goal of improving land and resource management policies, objectives and practices over time.

Aggregate Resources: any combination of sand, gravel, or crushed stone in a natural or processed state. Aggregates are used in the construction of highways, dams and airports, as well as residential, industrial and institutional buildings. Also known as granular resources.

Alluvial Sediments: relatively recent deposits of unsorted sedimentary material (gravel, sand, silt and clay or combinations) deposited in river beds, flood plains, lakes, or at the base of mountain slopes

Alpine Bioclimate Zone: The Alpine bioclimate zone represents the highest elevations of mountain regions; sparsely vegetated dwarf shrub, herb, moss and lichen, and scattered low stature coniferous trees, are the dominant vegetation types. In very high elevation areas, or given certain bedrock conditions, large expanses may include bare rock, colluvium or scattered semi-permanent snow/ice patches. The extent of un-vegetated alpine areas in northern Yukon is generally more extensive than in the Boreal Cordillera of southern Yukon. This is one of four bioclimate zones recognized in the planning region.

Aspect: the azimuth (e.g. north) direction toward which a hill slope faces. Aspect plays a large role in controlling the amount of solar energy received by a site, particularly at high latitudes.

Baseline (or benchmark): a starting point of reference for an indicator. This can be the current state or status of the indicator, or some past measure of indicator status.

Batholith: a large mass of intrusive igneous rock (rock made of once-molten material that solidified below the earth's surface) that protrudes through non-igneous materials. Batholiths are usually composed of granite.

Beringia: An ancient landscape of northwestern North America and eastern Siberia that remained unglaciated during the last ice ages (3 million to 10,000 years ago).

Best Management Practices: A range of practices that can reduce the time, intensity or duration of industrial activities (i.e. footprints) on the land base. Best management practices are not usually prescriptive; they are innovative, creative and responsive measures or approaches intended to deal with unique cultural, economic, ecological and geographical sensitivities (Yukon Dept of Energy, Mines and Resources, Oil and Gas Management Branch, 2007).
http://www.emr.gov.yk.ca/oilandgas/best_management_practices.html#What_are_Best_Management_Practices

Bioclimate Zone: An ecological zone, observable at broad spatial scales that represents a relatively stable, observable vegetation type or environment. Bioclimate zones provide a method to stratify the broad landscape based on observable vegetation types that result from climatic, elevation or latitudinal influences. Four bioclimate zones are recognized in the planning region: Alpine, Taiga Shrub, Taiga Wooded and Tundra.

Biomass: The total amount (mass) of organic material contained in a given area. Wood, plant material, or agricultural waste products used to generate heat or electricity are also known as biomass, and are a renewable form of energy.

Biophysical (Ecosystem) Mapping: An integrated approach to land survey in which areas of land are classified and mapped according to their ecological similarity. The developing Yukon Biophysical Mapping Framework has chosen to use the term *'biophysical'* to describe the current approach of physical integration between biological (i.e. vegetation) and abiotic (i.e. terrain and soil) ecosystem components to describe the biophysical environment. The term 'biophysical mapping' can be used interchangeably with '*ecosystem mapping'* or '*ecological land classification'*.

Category A: settlement land owned fully by a Yukon First Nation, including both surface and sub-surface (mines and minerals) rights.

Category B: settlement land owned fully by a Yukon First Nation, not including sub-surface (mines and minerals) rights.

Cautionary Threshold: a point where an indicator is reaching a level such that undesired impacts to ecological, social/cultural, or economic resources may begin to occur. A cautionary threshold is an early warning signal, showing that an indicator may be close to a point where additional activities in the area may result in undesirable impacts.

Clastic: rock formations composed of rock fragments cemented together through a variety of processes. Rock fragments may include gravel, cobbles, sand, silt or any other materials.

Colluvial: 1) in soils, material that has been transported downhill and accumulated on lower slopes and/or at the bottom of a hill; 2) in geology, any angular fragments of rock deposited by gravity, including talus, scree, cliff debris and material from avalanches.

Community Area: a land use category in the proposed draft Plan land use designation system. Community Areas are located around communities or municipalities where local planning is undertaken. This would apply to the community of Old Crow.

Concentrated Use Area: a geographic area or habitat that is occupied at a higher density of animals (e.g., area where animals are congregated) compared to other areas within the animals range. This term is specifically used in the plan to describe areas where satellite-collared Porcupine Caribou Herd cows congregate, for various seasons. Concentrated use areas are often referred to as core areas.

Conservation (principle of): the management of Fish and Wildlife populations and habitats and the regulation of users to ensure the quality, diversity and Long Term Optimum Productivity of Fish and Wildlife populations, with the primary goal of ensuring a sustainable harvest and its proper utilization (Chapter 1, VGFNFA)

Contaminated Site: an area of land in which the soil, including groundwater lying beneath it, or the water, including the sediment and bed below it, contains a contaminant in an amount, concentration or level which is equal to or greater than that prescribed by the *Contaminated Sites Regulations*, Yukon O.I.C. 2002/171 (YESAA).

Critical Threshold: a point where an indicator has reached or surpassed an acceptable limit of change.

Cryosols: soils that underlain by near-surface permafrost and that are strongly influenced by freeze-thaw processes.

Cryoturbation: the displacement and mixing of soil that results from freezing and thawing processes. Cryoturbation occurs to varying degrees in most permafrost soils. Also known as frost churning.

Cultural Resources: places and locations associated with events, stories and legends. Cultural resources can include such things as the Porcupine caribou herd, moose, marten, wetlands, lakes and rivers, locations where legends occurred (e.g. Bear Cave Mountain) and traditional economic and cultural activities.

Cumulative Effects: changes to the environment and/or society that result from a land use activity in combination with other past, present and future activities. The changes can be positive or negative.

Cumulative Impacts: negative consequences of cumulative effects, and may involve both direct and indirect impacts. Incremental habitat loss or conversion is a direct cumulative impact that can result from multiple land use activities.

Direct Impacts: impacts that result directly from a land use activity. Physical development ‘footprints’ create direct habitat impacts. Habitat loss is an example of a direct impact of residential development.

Direct Surface Disturbance: visible human-caused disturbances that result in the physical disruption of soil or hydrology, or the clearing of trees and woody vegetation. Roads, seismic lines, residential development and any other physical development footprint result in surface disturbances of varying lifespan. This Plan proposes that the amount of direct human-caused surface disturbance, measured as percentage of a landscape management unit, be monitored as an indicator of cumulative effects.

Disposition Process: a legal instrument (such as a sale, lease, license or permit) that allows a government to give a benefit from public land to any person or company.

Draft Land Use Plan: in the Yukon Common Land Use Planning Process, a land use plan that has been prepared for public consultation. Following public consultation, the Draft Land Use Plan is revised. A Recommend Land Use Plan is then prepared and submitted to Government for approval (see below). This document is a Draft Land Use Plan.

Draft Plan Summary: a non-technical summary of the full Draft Land Use Plan that highlights major plan recommendations. The Draft Plan Summary is a separate document from the full Draft Land Use Plan.

Ecodistrict: part of an Ecoregion characterized by a distinct assemblage of relief, geology, landforms, soils and vegetation. Ecodistricts are commonly mapped and expressed at a scale of 1:250,000. In this Plan, proposed landscape management units conform to the Ecodistrict concept, where possible. Ecodistricts are part of the National Ecological Framework; they are sub-units of Ecoregions.

Ecological Integrity: the degree to which the physical, chemical and biological components, including composition, structure and function, of an ecosystem and their relationships are present, functioning and capable of self-renewal (adapted from U.S. National Park Service).

Ecological Reserve: a park established to protect an area of unique natural significance, unique ecological characteristics or importance for a population of rare or endangered flora or fauna which is intended to remain in its natural state (*Parks and Land Certainty Act*).

Ecoregion: an area of the earth surface characterized by distinctive physiography (geology and surface features) and ecological responses to climate as expressed by the development of vegetation, soil, water, fauna, etc. Ecoregions are commonly mapped and expressed at a scale of 1:1,000,000. Ecodistricts are subdivisions of Ecoregions. Under the National Ecological Framework, the planning region contains portions of six Ecoregions.

Ecosystem: a community of organisms and their physical environment interacting as a distinct ecological unit. Ecosystems can be described at many spatial scales.

Ecozone: very large areas of the earth's surface representative of broad-scale and generalized ecological conditions. Major physiographic conditions (e.g. mountains versus plains) and climate are the primary basis for determining terrestrial Ecozones. The planning region is entirely within the Taiga Cordillera Ecozone. Ecozones are the most generalized level of the National Ecological Framework.

Emergent Vegetation: vegetation growing in waterbodies or watercourses that is tall enough to extend out of the water.

Endangered Species: those species listed in Part 2 of Schedule 1 to the *Species at Risk Act*. (YESAA).

Endemic: a species or organism that is only found in a particular region and that has a relatively restricted distribution. This can be due to factors such as isolation or response to soil or climatic conditions.

Ephemeral: a waterbody or watercourse that is not permanent. Ephemeral water features may only contain water for part of a year, or only during years with large amounts of precipitation or snow melt.

Fauna: a general term used to describe animals; fauna are the opposite of flora (plants).

Fish Habitat: spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes (YESAA).

Flexibly-prescriptive: a planning approach where management guidelines are prescribed for a given area, but land users and managers are allowed adequate flexibility to determine the type and nature of land uses that will occur, and the detailed methods under which they will be conducted. Management prescriptions typically focus on the desired outcome, or future desired condition, and what must be maintained to avoid or minimize potential impacts to valued resources.

Focal species: the species of most value and interest, either socially or economically, to residents of a region. The population status and habitat preferences of focal species may be assessed to recommend conservation priorities in a land use plan. The focal species in this Plan (Porcupine caribou, moose, and marten) were determined by Vuntut Gwitchin First Nation and other Plan Partners.

Footprint: the physical area of land use features that result in direct surface disturbance. The area directly disturbed by a road, gravel pit, seismic line or any other feature is considered the physical 'footprint' of that feature. Footprints create direct habitat impacts in this context.

Fragmentation: the disruption of large continuous areas of habitat into smaller, less continuous areas of habitat. Human-caused surface disturbances such as land clearing, creation of linear features, and habitat conversion result in habitat fragmentation. The Plan proposes to use and monitor linear (access) density as an indicator of habitat fragmentation.

Functional Disturbance(s): physical human-caused land use disturbances that result in disruption of soil or hydrology, or that require the cutting of trees and woody vegetation. In this Plan, activities that do not contribute to the creation of functional disturbances are considered to be: 1) new linear features (seismic lines, trails, survey lines, etc.) that are less than 1.5 m in width; 2) land use activities that occur on frozen water-bodies; 3) winter work that is undertaken with no required clearing of trees and woody vegetation (e.g., non-forested landscape types); 4) winter work that utilizes existing un-reclaimed disturbances and linear features from previous activities.

Functional Integrity: maintaining the functional capacity of an area or value in an adequate state to maintain ecological integrity and ecosystem function, even though the area or value may be altered from its pristine state. This concept has special relevance for wetlands, where minor alterations to hydrology may have large impacts. Ecological integrity is defined above.

General Management Direction: in this Plan, prescriptive resource management recommendations and approaches that address region-wide issues (e.g. caribou habitat or river valleys). Some recommendations may relate to features of a more localized or site-specific nature. Strategies, guidelines, and best management practices related to the recommendations are important considerations for establishing effective management direction.

Glacial Till: an unsorted, non-stratified deposit of gravel, boulders, sand and finer sediments transported and deposited directly by glacial ice. Also known as glacial drift or moraine. Due to the long period of unglaciated conditions, the North Yukon Planning Region contains very few glacial deposits. Glacial till and other glacial depositional landforms are important sources of aggregate.

Habitat: the particular kind of environment in which a plant or animal lives. Habitats provide the necessary life needs for plants and animals. Based on their biophysical properties, habitats may have higher or lower value for particular species at different times of year.

Habitat Integrity: the ability or capacity of habitat to support wildlife or plant populations. For wildlife, a landscape with high habitat integrity contains habitat of adequate amount, composition, structure and function to support the long-term persistence of healthy wildlife populations. Human caused-surface disturbances may decrease habitat integrity through increased fragmentation or habitat loss.

Habitat Protection Area (HPA): an area identified as requiring special protection under the Yukon *Wildlife Act*. It is an area where disturbance to wildlife, or to the habitat on which it depends, could lead to the decline of a species or population. The level of protection varies depending on the management plan developed for each particular HPA. Management is undertaken by Yukon government, First Nation governments, and/or other agencies, depending on the area and jurisdiction.

Harvesting: gathering, hunting, trapping or fishing in accordance with a Yukon First Nation Settlement Agreement (Chapter 1, VGFNFA).

Heath: open land covered with low stature shrubs. Common shrub species include heather, blueberry or cranberry.

Heritage Resources: sites and objects that are 45 years old or older and relate to human history, including archaeological and historic sites and artefacts. This definition also includes palaeontological resources, which are fossil and other remains of extinct or prehistoric plants and animals.

Historic Site: a location at which is found a work or assembly of works of human endeavour or of nature that is of value for its archaeological, palaeontological, prehistoric, historic, scientific or aesthetic features. Yukon historic sites are designated under the Yukon *Historic Resources Act* and Chapter 10 of the Umbrella Final Agreement. Within the planning region, Rampart House and Lapierre House are designated Yukon Historic Sites. National Historic Sites are designated under the federal *Historic Sites and Monuments Act*.

Hummocks: low, rounded knobs of fine soil covered by a tight mass of moss, scrubby plants and small trees common across the sub-arctic. Freeze-thaw processes are important to forming and maintaining hummocks. Also known as tussocks.

Humus: the dark organic material in soil, produced by the decomposition of plant or animal matter.

Hydric (soil): soils that have a high water content and poor drainage capacity (i.e. wet soils).

Hydrocarbon: any of numerous organic compounds such as benzene and methane that contain only carbon and hydrogen. Natural gas and oil are hydrocarbons.

Hydrologic system: the interconnected water system, including soil, surface water, groundwater and atmosphere. Wetlands are complex hydrologic systems.

Indicator: a signal, typically measurable, that can be used to assess performance of a system.

Indirect Impacts: impacts that result indirectly from a land use activity. Physical development 'footprints' create direct habitat impacts, but may also create indirect impacts around the feature. Habitat avoidance of impacted features or increased hunting mortality around roads are examples of indirect impacts of road development.

Industrial Development: (YESAA)

a) mining and the development of an energy resource or of agricultural land;
b) for commercial purposes, cutting standing or fallen trees or removing fallen or cut trees;
c) the development of a townsite; and
d) any land use or the construction, operation, modification, decommissioning or abandonment of a structure, facility or installation associated with any activity referred to in the paragraphs (a) to (c), above.

Impact(s): when a land use activity or activities have a negative effect or influence on a value(s) and/or resource(s). Impacts may be direct or indirect. Recommending ways to minimize potential impacts of land use activities on ecological and cultural resources is a major focus for the Plan.

In-situ: materials or resources that are found in their original location.

Integrated Management Area: in the draft Plan, a land use category proposed under the land use designation system. There are areas where mineral and oil and gas disposition processes, other industrial activities, and other land uses are allowed, subject to the approved recommendations of a regional plan and existing legislation/regulations. The Integrated Management Area is further divided into four Zones. In other jurisdictions, this area is often referred to as the 'working landscape'.

Integrated Resource Management: a land management approach that uses and manages the environment and natural resources to achieve Sustainable Development. An integrated resource management approach considers environmental, social and economic issues, and attempts to accommodate all uses with less conflict and impact.

Interim Land Withdrawal: an area of land withdrawn from land disposition and resource exploration for a specified or unspecified period of time. The area is not considered a Protected Area due to its undetermined land status. Industrial activities or other land uses could occur in the area following the expiry of the time limit or the lifting of withdrawn status by government. In the Plan, the North Yukon Interim Land Withdrawal affects lands north of the Porcupine River and west of the Bell River.

Landscape: a large (>100,000 ha) observable land unit that has identifiable and repeating patterns of landforms and vegetation. Landscapes may also have characteristic natural disturbance regimes and hydrologic patterns. Landscapes with similar properties are assumed to respond in a consistent manner to management prescriptions. Landscape Types are the individual 'building blocks' that form landscapes (see below). In this Plan, individual landscape management units are intended to represent similar landscapes.

Landscape Management Unit (LMU): An observable land unit that has identifiable and repeating patterns of landforms and vegetation (i.e. a landscape) and that forms a logical land management unit for regional planning. Some LMUs may contain sub-units that require special consideration. In this Plan, LMUs form the primary land management units to which land use designation categories or zones are applied. LMU borders are usually drawn around rivers, roads, existing SMAs or other identifiable features.

Landscape Type: a generalized vegetation-terrain association or land cover class that is readily observable and has definable characteristics. Detailed flora (floristic) composition is not inherent in the description of landscape type; landscape types are defined by a general vegetation condition and its associated relevant generalized terrain condition (e.g landscape position, physiographic location, or similar). Landscape types are the biophysical 'building blocks' of landscapes. The current version of the North Yukon biophysical map (current February 2006) recognizes 28 distinct landscape types.

Land Use Designation System: a land use designation system consists of different land categories that describe either the type or intensity of land uses that are allowed or recommended for each specific **landscape management unit** or sub-unit. It provides the broadest level of guidance for land and resource decision-making. A land use designation system may also be referred to as 'land use zoning' or 'resource management zoning'.

Land Withdrawal: a land area that is not available, either permanently or temporarily, for land disposition and oil and gas or mineral exploration activities. Land withdrawals are enacted or terminated by government Orders in Council. Permanent land withdrawals are required to create Protected Areas.

Limits of Acceptable Change (or levels of acceptable change): *see* thresholds. A planning approach that establishes an acceptable limit or level of change for a specific value or resource. Under a results-based management system, limits of acceptable change for indicators are required to differentiate between 'acceptable' and 'unacceptable' conditions. The limits are based on a combination of science and social choice.

Linear (Access) Density: the total length of all linear features (measured in km), within a landscape management unit or sub-unit (measured in km^2). Linear density is expressed as km/km^2. Linear density provides a measure of landscape fragmentation. In this Plan, linear features less than 1.5m in width are exempt from linear density calculations.

Linear Features: a type of human-caused surface disturbance. These include trails, survey lines, seismic lines, roads, power transmission lines, and any similar feature.

Major River Corridor: refers to the large rivers in the region having the greatest ecological and cultural significance; these are also generally navigable watercourses. In this Plan, Major River Corridors are the Porcupine, Eagle, Bell, Fishing Branch, Old Crow, Whitestone, and Miner rivers;

Market-based Economy: an economy that relies primarily on market forces to allocate goods and resources, and to determine prices. Monetary exchange and wage-based employment are important characteristics of a market economy.

McConnell Phase: the most recent glacial period between approximately 35,000 and 10,000 years ago in the mountain ranges of southern and central Yukon. In other areas of North America, this period is also known as Wisconsinian.

Mesic (soils): soils of moderate moisture content and drainage capacity.

Mesozoic: on the geologic time scale, the Mesozoic era spans 250 – 70 million years ago, and includes the Triassic, Jurassic and Cretaceous periods. Given the dominance of dinosaurs during this era, it is often referred to as the 'age of the reptiles'. Mammals first appeared in the middle of this era. The Eagle Plain oil and gas basin is composed of sedimentary rocks deposited during the Mesozoic era.

Mitigate: decreasing the impact or effect of an action or land use activity. Mitigation of the potential effects of land use activities is a central role of the Yukon Environmental and Socio-economic Assessment Board during project assessments.

Mixed Economy: an economy where both traditional subsistence harvesting and wage-based (or market-based) activities co-exist. The economy of the North Yukon Planning Region is a mixed-economy.

Mixed-wood: forests composed of a mixture of deciduous (trees with leaves) and coniferous (trees with needles) species.

Non-settlement Land: all public land in Yukon not affected by First Nation settlement lands (i.e. land owned by First Nations as established through their respective Final Agreements—see settlement land definition below).

North Yukon Interim Land Withdrawal: the North Yukon Interim Land Withdrawal was established in 1978 as part of the Inuvialuit Final Agreement. It applies to all lands north of the Porcupine River and west of the Bell River, including the Yukon North Slope. The withdrawal was established to secure lands required for conservation planning, and at this time has no expiry date. The withdrawal order removes this area from mineral and oil and gas disposition, and prevents exploration activities. The interim land withdrawal affects about 13% (7,334 km^2) of the planning region.

Off-channel Wetland Habitats: wetland habitats (e.g. bogs, fens, lakes) that are located adjacent to an active river or stream channel.

Oxbow Lake: a crescent-shaped lake located in an abandoned river bend that became separated from the main stream by a change in the course of a river. Oxbow lakes are off-channel wetland habitats.

Palaeontological Resources: Animal and plant remains from long ago. The key to the study of organisms and their environments of earlier times are fossils, the preserved remains or evidence of animals and plants.

Pediments (pediment slopes): Broad, gently sloping bedrock surfaces with low relief that are situated at the base of a steeper slope, and is usually thinly covered with unconsolidated alluvial or colluvial materials. The slopes are comprised of material transported and deposited by gravity over very long time periods (millions of years). In Yukon, they only occur in unglaciated environments like the North Yukon Planning Region. Pediment slopes are prominent landscape features in northern Yukon, particularly in the Old Crow Basin Ecoregion.

Perched Wetland: a wetland that is located on a terrace or similar feature, and that is raised above the level of local surface waters. Water flow in perched wetlands is not connected to adjacent groups of wetlands.

Periglacial: a general term used to describe landforms and processes related to freeze – thaw cycles. Periglacial landscapes are strongly influenced by freeze-thaw processes and may include glaciers, permafrost, patterned ground and similar features. The North Yukon Planning region is a periglacial landscape.

Permafrost: Ground in which a temperature below 0°C has existed continuously for two or more years. Permafrost is defined exclusively on the basis of temperature; moisture or ground ice does not need to be present.

Plan Partners: agencies, organizations and stakeholders that directly assisted the NYPC with information collection and analysis, planning concepts and approaches, development and evaluation of land use scenarios, and writing and editing of various planning documents.

Porcupine Caribou Herd: a tundra (barren-ground) herd of Grant's caribou that range from Northeastern Alaska to the Yukon/Northwest Territories border (west to east), and from the Beaufort Sea to the Ogilvie Mountains (north to south). The most recent population survey in 2001 estimated the herd size at 123,000 animals.

Precautionary Principle: a lack of conclusive scientific evidence does not justify inaction on managing the environment, particularly when the consequences of inaction may be undesirable or when the costs of action are negligible.

Prescriptive: stipulation(s) applied to a land use activity, with specific requirements as to how that activity should proceed or be conducted. This Plan is a 'flexibly-prescriptive' land use plan (see above).

Protected Area: *see* Special Management Areas. A land use category in the proposed draft Plan land use designation system. A Protected Area land use designation category removes an area from oil and gas and mineral disposition, and prohibits exploration activities. Protection of ecological and cultural resources is the management goal. Protected Areas are intended to meet International Union for Conservation of Nature (IUCN) Protected Area Categories I, II or III conservation criteria for 'full protection'. Protected Areas identified and established within a Traditional Territory of a Yukon First Nation under a Final Agreement are called Special Management Areas.

Public Road: a public road within a municipality and a public road outside of a municipality that the Minister responsible for the *Highways Act, R.S.Y. 2002, c. 108*, has a duty to maintain (YESAA).

Reclamation: focused and deliberate actions that attempt to restore or return disturbed lands to a pre-disturbed state, or to a former productive capacity. Reclamation activities generally attempt to restore disturbed lands resulting from human land use impacts, including mine sites, roads or contaminated soils.

Recommended Land Use Plan: in the Yukon Common Land Use Planning Process, a land use plan that has been prepared for submission to Government for approval. The Recommended Land Use Plan is prepared following consultation on the Draft Land Use Plan (see above).

Regional Land Use Plan: a collective statement about how to use and manage land and resources within a geographic area. A regional land use plan helps us to visualize and achieve the kind of future we want to see.

Regional Sustainable Development Indicators: general signals or information about the status and health of the region's economy, society and the environment.

Renewable Energy: the generation of heat and electricity from natural resources that are not depleted over time. Examples of renewable energy sources include hydro (energy from flowing water), wind, solar (energy from the sun), geothermal (heat from steam or hot groundwater), earth (heating or cooling using below ground ambient temperatures), and trees or other forms of biomass that can fully regenerate after some of the resources are used.

Results-Based Management Framework: a structured process to link a plan's goals and objectives, tools, approaches, and monitoring needs into one cohesive strategy. Monitoring and tracking progress toward meeting various plan goals and objectives is an important outcome in the delivery of results-based management. This Plan proposes a results-based management framework to determine if goals and objectives are being met; a component of this includes cumulative effects management.

Riparian Zone (or area): flowing water (lotic) environments and their adjacent terrestrial surroundings influenced by the moving water (fluvial) processes of erosion and deposition. In northern Yukon, riparian zones typically support the most productive vegetation and tree growth due to warmer and better drained soil conditions. Some landscape types within riparian zones are considered to be wetlands. Riparian zones are commonly referred to as river or stream valleys.

S-Sites: site-specific Yukon First Nation settlement lands. Generally, these are parcels of land smaller than Category A and B land selections, and are of heritage, cultural or traditional economic significance to the First Nation. Tlo-Kut is an example of an s-site in the North Yukon Planning Region.

Scenarios (land use scenarios): in land use planning, the development of an outline or model of plausible land uses that may occur, including possible time-lines, benefits, and impacts of those land uses. The development of land use scenarios differs from discrete options. Scenarios are used to explore potential alternate futures; they are considered more appropriate for a consensus-based planning model, such as the Chapter 11 process in Yukon. NYPC utilized the ALCES® computer simulation model to explore future potential land use scenarios for the region.

Scree: an accumulation of loose stones or rocky debris lying on a slope or at the base of a hill or cliff. Also known as talus.

Secondary Use Area: a large area of land in the Richardson Mountains and foothills where the Tetlit Gwich'in of NWT have the right to subsistence harvesting and trapping, use of water, and forest harvesting in relation to subsistence harvesting, under the terms of the Gwich'in Comprehensive Land Claim Agreement.

Sedimentary Rocks: rock composed of particles deposited from water, wind or gravity. Sedimentary rocks have not been modified by heating and/or compression. Examples of sedimentary rocks include limestone, shale, sandstone and conglomerate.

Seeps: a spot where water or petroleum trickles out of the ground to form a pool. Water seeps may be important sources of minerals for wildlife.

Settlement Land: all land in Yukon owned by a Yukon First Nation with a Final Agreement. With reference to surface and sub-surface ownership, settlement land may be Category A or B (see above).

Solifluction: downhill movement ("flowing soil") of earth materials resulting from frost action. Solifluction processes are characteristic of areas with cold Arctic or alpine climates.

Special Management Area (SMA): a conservation area identified and established within a Traditional Territory of a Yukon First Nation under a Final Agreement. SMAs can be Yukon Parks, Habitat Protection Areas, National Parks or Wildlife Areas, or other types. The level of protection is defined in a management plan developed for each particular area, with management shared between the Yukon government, First Nation governments, and Renewable Resource Councils, depending on the area and jurisdiction (Chapter 10, VGFNFA).

Sub-arctic: the forest-tundra ecotone (transition) between the treeless arctic and the forested boreal zones. The sub-arctic may also be referenced as Taiga—these refer to high northern latitudes dominated by stunted, open-stature coniferous forests. The North Yukon Planning Region is in the sub-arctic zone.

Submergent Vegetation: aquatic vegetation growing entirely below the surface of a waterbody or watercourse.

Subsistence Harvesting (for VGFN): (a) the use of Edible Fish or Wildlife Products, or edible Plant products, by Vuntut Gwitchin for sustenance and for food for traditional ceremonial purposes including potlatches; and (b) the use by Vuntut Gwitchin of Non-Edible By-Products of harvests of Fish or Wildlife under (a) for such domestic purposes as clothing, shelter or medicine, and for domestic, spiritual and cultural purposes; but (c) except for traditional production of handicrafts and implements by Vuntut Gwitchin, does not include commercial uses of: (i) Edible Fish or Wildlife Products; (ii) Non-Edible By-Products; or (iii) edible Plant products. (Chapter 10, VGFNFA)

Sustainable Development: beneficial socio-economic change that does not undermine the ecological and social systems upon which communities and societies are dependent (Chapter 1, VGFNFA).

Taiga Shrub Bioclimate Zone: Taiga Shrub generally occurs at mid-high elevations in northern mountain systems. The Taiga Shrub zone is characterized by low or tall stature shrubs, herbs and sparse or sporadic tree cover. Geographic distribution of the Taiga Shrub bioclimate zone in some areas of northern Yukon is stongly influenced by arctic weather systems (e.g. along the east slopes of the Richardson Mountain) and topography, resulting in potentially complex ecological patterns. This bioclimate zone is functionally similar to the Sub-apline zone in southern and central Yukon – a transition between forested and alpine environments. This is one of four bioclimate zones recognized in the planning region.

Taiga Wooded Bioclimate Zone: The Taiga Wooded bioclimate zone generally occurs in low-middle elevations and is characterized by open canopy coniferous (spruce) and mixed-wood forests. Permafrost, aspect and soil moisture are important factors influencing the actual distribution of forested areas. This bioclimate zone is functionally similar to the Boreal zone of southern and central Yukon. The majority of the planning region is within the Taiga Wooded bioclimate zone, with Eagle Plains being a representative area.

Target: a point where an indicator is reaching, or has reached, a desired level. The target is a desired condition related to a specific management goal or objective. For example, targets are often set by businesses in relation to desired annual revenues.

Temporary Trail: a trail that is established or used as part of a quartz exploration program and that is required under a territorial or First Nation law to be reclaimed and for which access is required, under that law, to be blocked at the end of the program (YESAA).

Terranes: A fault-bounded body of rock of regional extent characterized by a geologic history different from that of adjacent terranes. Terranes are considered to have been displaced from their place of origin.

Thermokarst: in a permafrost region, a land surface produced by local melting of ground ice and subsequent uneven settling. Thermokarst processes typically occur in fine-grained, ice-rich sediments. In North Yukon Planning Region, the major wetland complexes, Old Crow Flats, Bluefish-Cadzow and Whitefish, were all formed by thermokarst processes acting in glacial lake sediments.

Threatened Species: those species listed in Part 3 of Schedule 1 to the *Species at Risk Act*. (YESAA)

Threshold: a point where an indicator is reaching, or has reached, a level such that undesired impacts to ecological, social/cultural, or economic resources may begin to occur. In this Plan, recommended land use thresholds are based on a combination of science and social choice. Thresholds are applied in a results-based management framework.

Timing windows: in land management, the practice of conducting land use activities during specific time periods with the purpose of minimizing potential impacts on a valued ecological or cultural resource. Conducting winter seismic surveys in a wetland complex to avoid spring waterbird nesting activity would be an example.

Topography: the shape and arrangement of surface features in a place or region; also referred to as landform.

Tors: isolated rock outcrops. They are generally heavily weathered pillar-like remnants atop flat ridges.

Traditional Economy: an economy based on hunting, trapping, gathering and fishing activities, for household use or barter; this type of economy is also referred to as a subsistence economy or land-based economy.

Tussock Tundra: A tundra landscape with a vegetation cover of tussock plants (grass plant forms that are tufted). The northern portion of the planning region contains extensive areas of tussock tundra vegetation.

Ungulate: a four-legged, plant eating mammal with hoofs. Caribou, moose, deer and musk-oxen are ungulates.

Vegetative Mat: organic surface of soil, characterized by the accumulation of organic matter, or partly decomposed organic matter, derived mainly from leaves, twigs and woody materials, and includes the too mass of living vegetation (YESAA).

Wage-Based Economy: an economic system in which goods and services are produced and exchanged for money. Old Crow maintains both a wage-based and traditional economy, where wage-based work is performed to financially support traditional economic activities such as hunting and fishing.

Water Body: an inland water body, up to its ordinary high-water mark, in a liquid or frozen state, including a swamp, marsh, bog, fen, reservoir and any other land that is covered by water during at least three consecutive months of the year, but does not include a sewage or waste treatment lagoon, a dugout to hold water for livestock and a mine tailings pond (YESAA).

Watercourse: a natural water-way, water body or water supply, including one that contains water intermittently, and includes groundwater, springs, swamps and gulches (YESAA).

Watershed: the region or area drained by a river or stream system, divided from adjacent drainage basins by a height of land. The planning region boundary generally follows the height of land identifying the Porcupine River watershed.

Wetland: *For this Plan, wetlands are defined as all open water aquatic environments, both still water (lentic) and moving water (lotic) features, or concentrations of those features, and their adjacent environments.*

> Providing a concise definition for wetlands in high latitude boreal and taiga regions with nearly continuous permafrost is difficult. The National Wetlands Working Group (1988) definition of wetlands as "*land that has the water table at, near, or above the land's surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic* (water loving) *vegetation, and various kinds of biological activity that are adapted to the wet environment*", is problematic. Permafrost conditions can create poor soil drainage conditions across broad geographic areas, resulting in hydric soil conditions for much of the growing season with possible seasonal standing water. Given this complicated issue, wetlands in the North Yukon biophysical map have not been identified using this soils-based definition.

Wetland Complex: A concentrated geographic grouping of individual wetlands. Wetland complexes may include both wetland and non-wetland biophysical landscape types. Wetland complexes function as an integrated hydrologic system and should be considered and managed as such.

Wilderness Preserve: a park established with a view to protecting an ecological unit or representative core area by conserving biodiversity and ecological viability **(***Parks and Land Certainty Act*).

Wildlife Key Areas: locations used by wildlife for critical, seasonal life functions. Loss or disturbance of these habitats may result in wildlife population decreases. The Yukon Department of Environment Wildlife Key Area Inventory Program maintains a database of key areas for Yukon.

Winter: the period of the year during which the ground is frozen sufficiently to support a vehicle that applies more than 35kPa of pressure to the ground without rutting or gouging of the surface and during which there is sufficient amount of snow on the ground to produce a packed base of at least 10 cm (YESAA).

Working Landscape: *see* Integrated Management Area.

Yukon First Nations: as stated in the Yukon Umbrella Final Agreement, any one of the following: Carcross/Tagish First Nation; Champagne and Aishihik First Nations; Tr'ondek Hwech'in First Nation; Kluane First Nation; Kwanlin Dun First Nation; Liard First Nation; Little Salmon/Carmacks First Nation; First Nation of Nacho Nyak Dun; Ross River Dena Council; Selkirk First Nation; Ta'an Kwach'an Council; Teslin Tlingit Council; Vuntut Gwitchin First Nation; or White River First Nation (Yukon UFA).

Yukon Indian People: a term used in the Yukon First Nations Final Agreements referring to people of aboriginal ancestry. A person enrolled under one of the Yukon First Nation Final Agreements in accordance with criteria established in Chapter 3, Eligibility and Enrolment.

Zone I: *see* Land Use Designation System. One of four proposed land use zones to be applied within the Integrated Management Area (IMA) land use category. Zone I areas have the highest conservation and lowest development focus; maintenance of ecological integrity and functional habitats is the management goal.

Zone II: *see* Land Use Designation System. One of four proposed land use zones to be applied within the Integrated Management Area (IMA) land use category. Zone II areas have a high conservation and low development focus; maintaining ecological integrity and minimizing land use impacts is the management goal.

Zone III: *see* Land Use Designation System. One of four proposed land use zones to be applied within the Integrated Management Area (IMA) land use category. Zone III areas have a moderate conservation and moderate development focus; conservatively managed land use is the management goal.

Zone IV: *see* Land Use Designation System. One of four proposed land use zones to be applied within the Integrated Management Area (IMA) land use category. Zone IV areas have a lower conservation and a higher development focus; carefully managed economic development is the management goal.

Understanding the Plan

This forward to the draft land use plan is intended to assist readers in navigating the document. Readers are directed towards those sections of the Plan that will have the most relevance for their intended application.

This Plan is organized into five major parts:

Part 1 – Background and Context

Sections 1 and 2 provide supporting information and context for the Draft North Yukon Regional Land Use Plan. Section 1 describes the Plan's relationship to the VGFN Final Agreement, and its' guiding principles, goals and objectives. An overview of key regional planning issues is also provided.

Section 2 is a description of the North Yukon Planning Region. The biophysical environment, wildlife and fish, people and communities, heritage and cultural resources, and economic activities and potentials are described. This section is an overview of the North Yukon Planning Region Resource Assessment Report (North Yukon Planning Commission, 2007a,b); it provides the knowledge foundation for the Plan.

Part 2 – Tools and Approaches (Plan Concepts)

Section 3 describes the tools and approaches used by the Plan. As the first Chapter 11 regional land use plan in Yukon, new tools and approaches have been developed; these require description and explanation. Important concepts include landscape management units, a land use designation system, a results-based management framework, with cumulative effects management concepts, and general management direction. Readers are encouraged to read Section 3 and Appendix 3 prior to proceeding to Plan recommendations.

Part 3 – General Management Recommendations

Section 4 provides general management direction and specific recommendations to guide land management decision-making for a range of values and issues throughout the planning region. Management strategies and practices are recommended where applicable. These strategies and recommendations are applied to specific geographic areas through the use of landscape management units, which are described in Section 5. Readers are encouraged to read Section 4 prior to using Section 5.

Part 4 – Landscape Management Units and Land Use Designation

Section 5 applies the tools, approaches and general management direction to specific geographic areas, or landscape management units. Land use designation categories and zones provide broad management direction to these units. This section also contains detailed ecological, heritage/cultural and economic descriptions for each landscape management unit.

After concepts and general recommendations are understood, most users of the Plan will refer to Section 5 for specific management direction. Industry, government regulators and assessment boards should refer to Section 5 for project-level guidance.

Part 5 – Implementing and Changing the Plan

Sections 6 and 7 provide a description of current Plan implementation concepts. While Yukon and Vuntut Gwitchin governments have primary implementation responsibilities, other governments and groups may also play important roles. Concepts for changing the Plan – variance, review and amendment – are also presented. These sections currently represent NYPC's proposed implementation concepts. Further discussion will be required.

Appendices

Several Appendices provide additional background information and expanded discussions regarding land use designation options. Appendices 3, 4 and 5 contain important information regarding Plan concepts and recommendations.

- Legislation – Appendix 1
- Technical Resources – Appendix 2
- Cumulative Effects Concepts (indicators, land use models and thresholds) – Appendix 3
- Whitefish Wetlands Protected Area Options – Appendix 4
- North Yukon Interim Land Withdrawal Land Use Designation Options – Appendix 5
- Plan Variance, Amendment and Review – Appendix 6

1. Introduction and Context

1.1 Introduction

A regional land use plan is a collective statement about how to use and manage land and resources within a geographic area. The North Yukon Regional Land Use Plan (the Plan) provides long-term management direction for the 55,568 km^2 North Yukon Planning Region (Figure 1.1). The planning region is the traditional territory of the Vuntut Gwitchin First Nation. The Plan aims to reflect the vision, values and interests of the Vuntut Gwitchin, and Yukoners as a whole.

The Plan strives to balance opportunities and requirements for economic development with the protection of Vuntut Gwitchin culture and traditional economy, and the environment upon which we all depend.

The Plan was produced by the North Yukon Planning Commission (NYPC) as part of the implementation of Chapter 11 of the Vuntut Gwitchin First Nation Final Agreement (VGFNFA). This is the first regional land use plan in the Yukon to be produced under the mandate of a Yukon First Nations land claim agreement. This and future plans will make up the territory's regional planning regime.

1.2 Plan Context

1.2.1 The Vuntut Gwitchin First Nation Final Agreement (VGFNFA)

The Vuntut Gwitchin First Nation (VGFN) settled its land claim and self-government agreements with the Government of Canada and Government of Yukon in 1993. The VGFNFA was the culmination of over 20 years of negotiations between the three Parties. The Umbrella Final Agreement (UFA), signed between the Council of Yukon First Nations, the Government of Canada and the Government of Yukon in 1993, formed the framework agreement for the VGFNFA.

Under the mandate of Chapter 11 of the VGFNFA, the NYPC is responsible for developing and recommending a regional land use plan for the North Yukon Planning Region (Figure 1.1). The NYPC is an arms length commission jointly appointed by the Yukon and Vuntut Gwitchin governments.

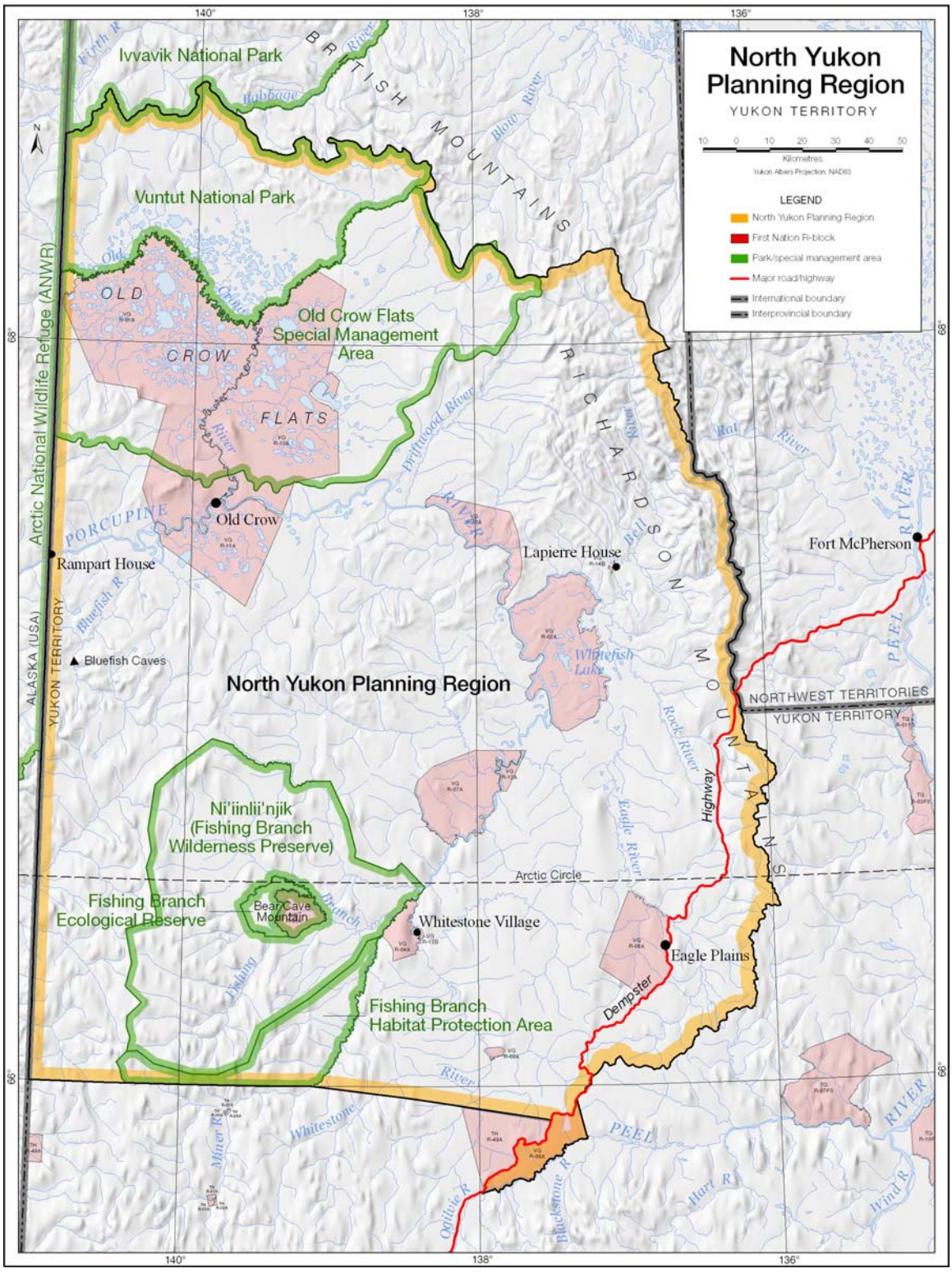

Figure 1.1. Overview of North Yukon Planning Region.

The VGFNFA provides the following guidance for developing a regional land use plan within the Vuntut Gwitchin traditional territory:

- to ensure that social, cultural, economic and environmental policies are applied to the management, protection and use of land, water and resources in an integrated and coordinated manner so as to ensure *Sustainable Development* (VGFNFA 11.1.1.6);
- shall promote the well being of Yukon Indian People, other residents of the planning region, the communities, and the Yukon as a whole, while having regard to the interests of other Canadians (VGFNFA 11.4.5.7);
- shall recommend measures to minimize actual and potential land use conflicts throughout the planning region (VGFNFA 11.4.5.4);
- to recognize and promote the cultural values of Yukon Indian People (VGFNFA 11.1.1.3);
- to utilize the knowledge and experience of Yukon Indian People in order to achieve effective land use planning (VGFNFA 11.1.1.4); and
- be linked to all other land and water planning and management processes established by Government and Yukon First Nations minimizing where practicable any overlap or redundancy between the land use planning process and those other processes (VGFNFA 11.2.1.2).

Additional guidelines are provided in Chapters 14, 16 and 22 of the VGFNFA, with linkage to the *Sustainable Development* principles of Chapter 11:

- the management and Harvesting of Fish, Wildlife and their habitats shall be governed by the principle of Conservation (VGFNFA 16.3.2);
- subject to the rights of Water users authorized in accordance with this chapter and Laws of General Application, a Yukon First Nation has the right to have Water which is on or flowing through or adjacent to its Settlement Land remain substantially unaltered as to quantity, quality and rate of flow, including seasonal rate of flow (VGFNFA 14.8.1);
- to provide Yukon Indian People with opportunities to participate in the Yukon economy (VGFNFA 22.1.1.1); and
- to develop economic self-reliance for Yukon Indian People (VGFNFA 22.1.1.2)

The NYPC General Terms of Reference (YLUPC 2003) also states that the NYPC is to consider the potential cumulative effects of proposed development and planned activities.

1.2.2 Land Management Considerations

1.2.2.1 Existing Land Ownership and Status

Land Ownership

Within the region there are three major landowners and administrators: VGFN, Government of Canada (Parks Canada), and Yukon Government. VGFN Settlement Lands encompass 14% (7,764 km^2) of the planning region and are almost all Category A lands (First Nation ownership of both surface and subsurface rights). Vuntut National Park of Canada, administered by the federal government, makes up 8% (4,376 km^2) of the planning region. The remaining area is Yukon public land administered by Yukon Government – this accounts for 78% (43,406 km^2) of the total planning region. With the exception of VGFN Settlement Lands and land within the community of Old Crow, there is no private land ownership in the region.

Land Status and Administration

North Yukon Planning Region contains a complex land management framework where management responsibilities are shared between governments, other agencies and land claim boards. Six general types of land status occur in the region: VGFN Settlement Lands, Special Management Areas (e.g., Protected Areas, Conservation Areas), Order in Council interim land withdrawals (i.e., North Yukon Interim Land Withdrawal), Yukon Public Lands (including leased land), and Village of Old Crow unincorporated lands (Table 1.1).

Map 1 shows the location of First Nation Settlement Lands, existing Protected/Special Management Areas, interim land withdrawals (North Yukon Interim Land Withdrawal), and First Nation traditional territories/settlement regions. The remainder of the land in the region is Yukon public land. First Nations with portions of their traditional territories in the North Yukon Planning Region include the Tr'ondek Hwech'in of Dawson, the Tetlit Gwich'in of Ft. McPherson (i.e., the Tetlit Gwich'in Secondary Use Area), and the Na-cho Nyak Dun of Mayo. The Inuvialuit Settlement Region, on the Yukon North Slope, is located to the north of the planning region.

Table 1.1. Existing Land Administration.

Land Type	Administrator(s)	Area	Status/Description
First Nation Settlement Lands (Category A, Category B, S-Sites)	VGFN	7,764 km^2 (14% region)	• 59% of VGFN Settlement Lands are incorporated within existing Protected Areas, with largest amount in Old Crow Flats SMA
Protected Areas Vuntut National Park of Canada; Old Crow Flats SMA; Ni'iinlii'njik (Fishing Branch) Wilderness Preserve, Ecological Reserve and VG R-05A	Yukon Government, VGFN, Parks Canada, Environment Canada (Canadian Wildlife Service), Fisheries and Oceans Canada	17,646 km^2 (32% region)	• Lands with legally designated Protected Area status and lands not available for land disposition processes • 59% of VGFN Settlement lands are incorporated within Protected Areas • Specific management plans apply to Protected Areas
Conservation Areas Fishing Branch Habitat Protection Area	Yukon Government, VGFN	980 km^2 (2% region)	• Lands established for conservation purposes but not withdrawn from disposition processes
Order in Council Interim Land Withdrawals North Yukon Interim Land Withdrawal	Yukon Government	6,556 km^2 (12% region) *	• North Yukon Interim Land Withdrawal established through 1978 Order in Council to withdraw lands required for park creation as part of Inuvialuit Settlement Agreement. • See Appendix 5 for detailed discussion
Public Lands Yukon Government lands, including leased land	Yukon Government	27,198 km^2 (49% region)	• Yukon public lands • Subject to general laws of application and land use regulations • Eagle Plains Lodge is on leased public land
Unincorporated Municipal Lands Village of Old Crow	VGFN, Yukon Government	10 km^2	• Unincorporated village of Old Crow lands (including airport)

* refers to area *directly* affected by North Yukon Interim Land Withdrawal outside of existing SMAs and First Nation Settlement Lands.

Adjacent Land Management Considerations

Adjacent jurisdictions and First Nation Settlement Agreements affect land management and land planning in the North Yukon Planning Region (Map 1). Much of the lands adjacent to the planning region are managed for the purpose of conservation. To the west, in Alaska, is the Arctic National Wildlife Refuge; to the north is the Inuvialuit Settlement Region including Ivvavik National Park of Canada and the Yukon North Slope; and to the east is the Gwich'in Settlement Region in NWT, including the NWT portion of the Dempster Highway Corridor and two Gwich'in Conservation Zones (Rat River and James Creek-Vittrekwa River).

Along the Richardson Mountains and Eagle Plains, the planning region shares a common boundary with the Peel Watershed Planning Region. The southern boundary is the VGFN - Tr'ondek Hwech'in First Nation traditional territory overlap area, which will be part of the future Dawson Planning Region.

1.2.3.2 Existing Plans

The North Yukon Regional Land Use Plan has linkages to several existing management plans relating to wildlife, lands, resources and economic development. As required by Section 11.2.1.2 of the VGFNFA, the regional land use plan is to consider and be linked to other plans and planning processes. Section 2.9 illustrates these linkages.

1.2.3.3 Legislation

Yukon and First Nation land claim agreements, such as the VGFNFA, are legal documents and provide primary guidance for land use planning. The Plan will be implemented through policies, procedures and existing regulatory tools administered by government and associated bodies, such as the Yukon Environmental and Socio-Economic Assessment Board. In order to implement the Plan, existing legislation will be used. The Vuntut Gwitchin Government is currently developing legislation for their Settlement Lands, which will also be used when completed. The Plan may recommend changes to legislation, if valid reasons are provided. Appendix 1 provides a list of relevant legislation affecting the implementation of the Plan.

1.3 Scope of Application

This Plan provides management direction for all Yukon public lands and all VGFN Settlement Lands outside of existing Protected Areas and Special Management Areas in the North Yukon Planning Region.

The approved Plan is not a legal document and does not supplant existing legislative requirements and laws of application. First Nation rights as established by various land claim agreements and constitutional law are not affected by or addressed in the Plan.

The Plan does not apply to Vuntut National Park of Canada, Ni'iinlii'njik (Fishing Branch) Ecological Reserve and Wilderness Preserve, and Old Crow Flats SMA. The Plan does not apply to the municipal area of Old Crow. The Plan does, however, consider these areas and existing management plans in providing management direction.

1.4 Plan Principles

The VGFNFA provides guidance for developing Plan principles. During the planning process, Vuntut Gwitchin Elders also stressed the importance of "respect for the land" and "conservation of the land and water", while allowing for future economic opportunities. Governments and industry stressed the need for the Plan to provide "certainty and flexibility" so that land management can adapt to change.

Four major principles were used to guide the planning approach and recommendations:

- Sustainable Development
- Precautionary Principle
- Conservation
- Adaptive Management

Sustainable Development

The VGFNFA provides guidance to the regional land use plan with respect to plan principles (see Section 1.2.1). Chapter 11 states that the Plan is to apply land use decisions in an integrated and coordinated manner so as to promote and ensure *Sustainable Development* (VGFNFA 11.1.1.6). ***Sustainable Development***, as defined in Chapter 1 of the VGFNFA, is:

> "*beneficial socio-economic change that does not undermine the ecological and social systems upon which communities and societies are dependent.*"

The main goal of the Plan is to ensure and promote *Sustainable Development*. The logo of the NYPC is based on this principle.

Precautionary Principle

Consistent with, and inclusive of the principle of *Sustainable Development*, the Plan is also based upon application of the ***Precautionary Principle***:

> *"A lack of conclusive scientific evidence does not justify inaction on managing the environment, particularly when the consequences of inaction may be undesirable or when the costs of action are negligible".*[1]

[1] Source: International Institute for Sustainable Development (2007)

The precautionary principle is consistent with the proactive nature of planning, and also with our relatively limited understanding of land use impacts on other resources in the North. Regional planning encourages consideration of impacts *before* making resource decisions. During the planning process, NYPC considered the potential consequences and cumulative effects of alternative land use scenarios (see Appendix 3, and North Yukon Planning Commission 2007c).

Conservation

Managing wildlife, fish and the habitats upon which they depend on the basis of conservation is an important principle of the VGFNFA. ***Conservation***, as defined in Chapter 1 of the VGFNFA is:

> *"the management of Fish and Wildlife populations and habitats and the regulation of users to ensure the quality, diversity and Long Term Optimum Productivity of Fish and Wildlife populations, with the primary goal of ensuring a sustainable harvest and its proper utilization."*

Conservation speaks to the maintenance of healthy fish and wildlife populations and sustainable use of those populations. The Plan incorporates the principle of *Conservation* in its goals and land management recommendations.

Adaptive Management

Adaptive management – ''Look, learn and adjust as required' – is an important principle of the Plan, especially during its implementation. The Plan is a 'living document'; it will be reviewed, updated and amended in response to changing land use and/or environmental conditions, or as better information becomes available (see Section 7, Changing the Plan). For the Plan to exemplify effective adaptive management, monitoring and evaluation must take place and management responses must be developed.

1.5 Plan Goals and Objectives

The Plan's overarching purpose is to balance social, economic and environmental considerations. This balance is attainable through the application of *Sustainable Development* concepts. The goal of *Sustainable Development* is to balance social, economic and ecological values, such that any benefit to one value does not result in unacceptable effects to either one or both of the other values.

The proposed goals and objectives of the Plan address five general desires and expectations of a regional land use plan, as expressed by various stakeholders:

1) Fulfill *Sustainable Development* requirements and expectations outlined in the VGFNFA;

2) Fulfill government and industry desire for 'certainty and flexibility' in the management of industrial land use activities;

3) Address conservation expectations of First Nations, the public, governments and other groups by providing meaningful conservation measures for valued ecological and cultural resources;

4) Recommend measures to minimize potential land use conflicts; and,

5) Provide ways to monitor and manage cumulative effects

Table 1.3 lists Plan goals and objectives[2], organized by *Sustainable Development* themes (social, economic and ecological). Figure 1.2 illustrates how the different regional goals and objectives are interconnected and address the elements of *Sustainable Development*. Plan goals and objectives link to the major issues, expectations and concerns expressed by stakeholders (see Section 1.6). Additional requirements established by Chapter 11 and other supporting chapters of the VGFNFA (see Section 1.2.1) are also addressed.

[2] Goals and Objectives have been numbered for cross reference to other Sections of the Plan. Chapters 4 and 5 provide detailed strategies, or actions recommended by the plan, that relate to achieving the Goals and Objectives.

Table 1.2. Plan Goals and Objectives.

Goals	Objectives
Sustainable Development Issues and Considerations	
GOAL 1 Promote *Sustainable Development* by ensuring that social, cultural, economic and environmental policies are applied to the management, protection and use of land, water and resources in an integrated and coordinated manner	**OBJECTIVE 1.1** Consider social, economic and ecological risks and benefits of land use decisions **OBJECTIVE 1.2** Develop an integrated landscape management framework that facilitates coordinated and integrated decision-making **OBJECTIVE 1.3** Minimize and manage the cumulative impact of multiple land use activities on wildlife and fish habitat, water quality, and people
Socio-Economic Issues and Considerations	
Heritage and Culture **GOAL 2** Recognize and promote the heritage and cultural values of the Vuntut Gwitchin, other affected First Nations, and the Yukon	**OBJECTIVE 2.1** Apply appropriate protection and conservation measures for identified heritage and cultural resources **OBJECTIVE 2.2** Provide opportunities for the continuation of First Nations land-based subsistence lifestyles and harvesting **OBJECTIVE 2.3** To utilize the knowledge and experience of Yukon Indian People in order to achieve effective land use planning (11.1.1.4)

Table 1.2 (Cont'd). Plan Goals and Objectives.

Goals	Objectives
Socio-Economic Issues and Considerations *(continued)*	
Economic **GOAL 3** Facilitate economic development opportunities and activities that result in socio-economic benefits to the community of Old Crow, other affected First Nations and Yukon as a whole, and that meet the sustainable development criteria established by this Plan	**OBJECTIVE 3.1** Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting and cultural pursuits **OBJECTIVE 3.2** Create land use status certainty **OBJECTIVE 3.3** Maintain opportunities for a mixed economy to continue where traditional subsistence harvesting, cultural activities and wage-based economic activities co-exist, ensuring long-term maintenance of First Nation culture, people's connection with the land and their well-being
Ecological Issues and Considerations	
Wildlife **GOAL 4** Maintain the integrity of terrestrial habitat in a condition required to sustain regional wildlife populations, with special focus on the Porcupine Caribou Herd	**OBJECTIVE 4.1** Minimize direct and indirect human-caused habitat disturbance and alteration **OBJECTIVE 4.2** Minimize habitat fragmentation as a result of human features **OBJECTIVE 4.3** Minimize potential habitat avoidance that results from human activities

Table 1.2 (Cont'd). Plan Goals and Objectives.

Goals	Objectives
Ecological Issues and Considerations *(continued)*	
Fish **GOAL 5** Maintain the integrity of aquatic habitat in a condition required to sustain regional fish populations	**OBJECTIVE 5.1** Minimize human-caused aquatic habitat disturbance and alteration **OBJECTIVE 5.2** Minimize stream crossings and/or stream crossing impacts as a result of roads and trails **OBJECTIVE 5.3** Maintain fish migration routes and access to required seasonal habitats **OBJECTIVE 5.4** Maintain quantity, quality and rate of water flow, including seasonal rate of flow
Wetlands, Lakes and Rivers **GOAL 6** Maintain functional integrity and hydrological processes of wetlands, lakes, rivers and sensitive permafrost areas	**OBJECTIVE 6.1** Minimize amount of human-caused surface disturbance within and adjacent to wetlands, lakes, rivers and sensitive permafrost areas

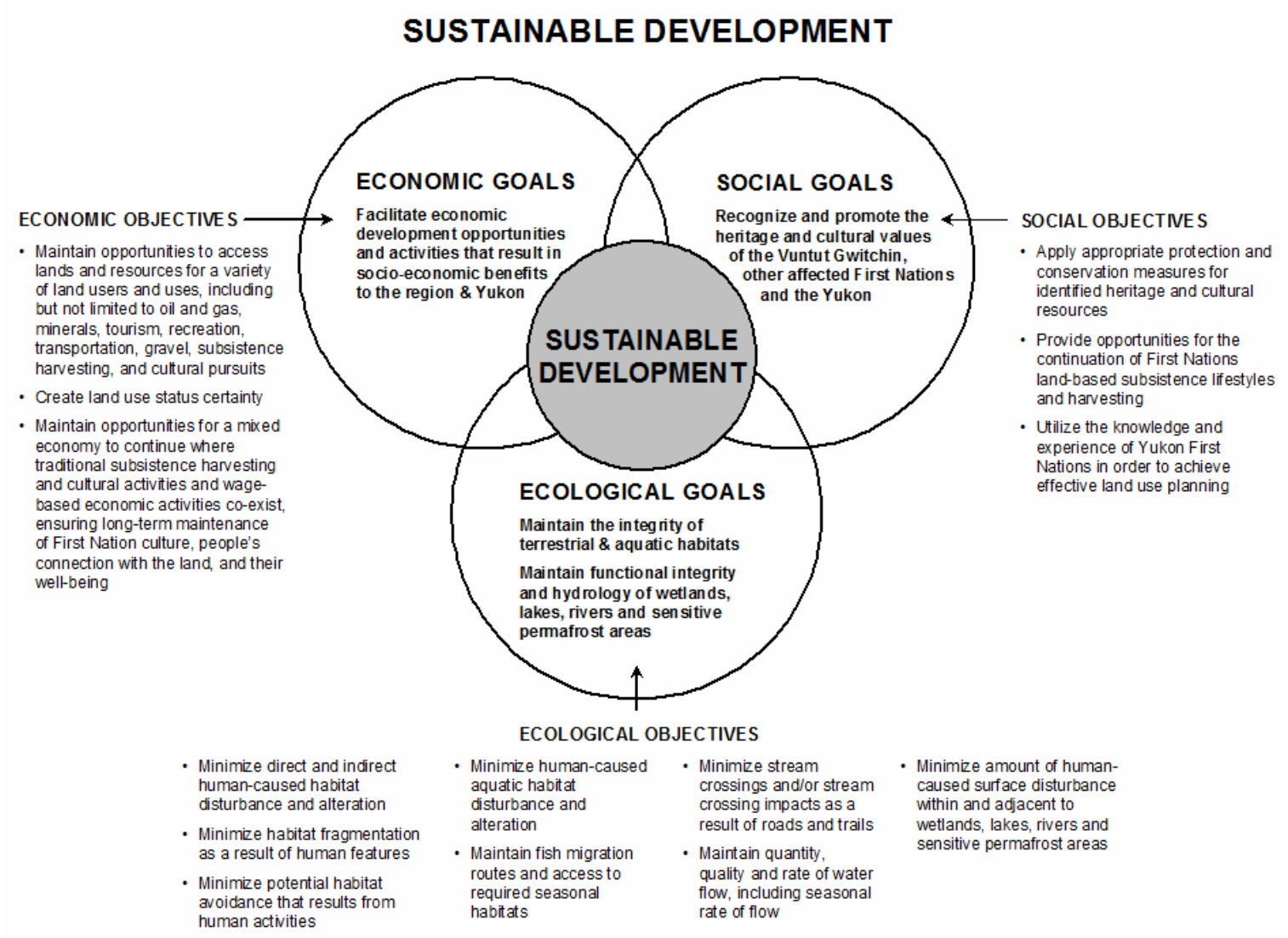

Figure 1.2. Plan Goals and Objectives as they relate to the Guiding Principle of *Sustainable Development*.

1.6 Issues and Interests

Through workshops and dialogue with governments, plan partners, stakeholders and the community of Old Crow, six major planning issues were identified, along with several additional considerations. Major planning issues are:

- Oil and gas exploration and development in Eagle Plains;
- Land management and the Porcupine Caribou Herd;
- Future development impacts on water, wetlands and riparian habitat;
- Opportunities to access land and resources;
- Transportation; and,
- Climate change

Many of the issues relate to broader *Sustainable Development* considerations and future land uses. These six major issues emerged as the most important factors that could affect regional socio-economic and ecological conditions in the North Yukon Planning Region. A detailed analysis of sectoral planning issues and management strategies is provided in Section 4.

Regional Issue 1:

Oil and gas exploration and development in Eagle Plains

Concern:

How will potential future exploration and development of North Yukon's oil and gas resources affect the region? What are the cumulative effects of this land use and associated land uses and how will they affect the region's economy, society and environment, with special consideration of the Porcupine Caribou Herd?

Situation:

The North Yukon Planning Region hosts a significant portion of Yukon's total oil and gas potential, and experienced the highest levels of historical exploration activity and impacts in Yukon. The Eagle Plain basin contains discovered resources, is the most prospective area in the region, and is also considered to be the area of highest interest to industry. This land use activity has the potential to provide large economic benefits to the region and to Yukon as a whole. However, more than any other land use, it also has the potential to create landscape-level change in a significant portion of North Yukon Planning Region.

In addition to energy sector features such as well sites, pipelines and seismic lines, oil and gas activity in Eagle Plains will require construction of all season roads, which will result in significant amounts of gravel extraction. Water may also be required for ice road construction and oil production.

The economic, social/cultural and ecological changes that oil and gas development may introduce to the region could be significant. Understanding and mitigating the potential cumulative effect of oil and gas activity, and other land uses, on important ecological and cultural values was identified as the primary land use concern. Potential impacts to the Porcupine Caribou Herd require special consideration.

Implication for Plan:

The Plan must understand, consider and account for future potential oil and gas activity in Eagle Plains, and recommend ways to ensure adequate conservation measures are in place prior to large-scale development.

Regional Issue 2:

Land management and the Porcupine Caribou Herd

Concern:

The Porcupine Caribou Herd is central to the well-being of Vuntut Gwitchin culture. The herd is suspected to be declining, and residents of Old Crow are concerned about immediate and long-term conservation of the herd. Vuntut Gwitchin culture, traditional values and subsistence economy are dependent on a healthy Porcupine Caribou Herd and continued access to and utilization of the herd.

Situation:

Management of the Porcupine Caribou Herd is a shared responsibility between many governments, agencies, boards and committees, with the Porcupine Caribou Management Board being the principle group. The herd is a high profile barren-ground species that receives international attention and is managed under an international agreement with the United States.

Threats to the herd include habitat effects as a result of future industrial land uses such as large-scale oil and gas activity, habitat and energetic effects as a result of climate change, population effects due to over-harvesting, and the resulting cumulative effect of all factors. Harvesting issues are not the mandate of NYPC – the Plan's priority is to understand and recommend measures to minimize the adverse cumulative effects on the herd's habitat.

Implication for Plan:

To sustain the long-term health of the herd, the plan must ensure adequate conservation measures are recommended for important Porcupine Caribou Herd habitats throughout the North Yukon Planning Region prior to large-scale industrial land uses occurring.

Regional Issue 3:

Future development impacts on water, wetlands and riparian areas

Concern:

Wetlands, lakes, rivers and riparian environments are biologically productive areas that hold many of the heritage, cultural and ecological values of the region. Future land use activities have the potential to impact these values.

Situation:

Wetlands, lakes and riparian areas are important habitats for many species, including fish, marten and moose. *Vuntut,* or *Van Tat,* means 'People of the Lakes.' The Vuntut Gwitchin First Nation has a strong cultural and traditional economic connection to the lakes, wetlands and rivers of the region. This connection is expressed through VGFN land selections: 80% of their lands encompass major wetland complexes and riparian areas, with the majority of the settlement lands in Old Crow Flats, Bluefish and Whitefish wetland complexes. The major rivers and lakes are the summer and winter highways of the region, and people's use of the land focuses on the river corridors for harvesting and cultural practices. Future wilderness tourism activities will also likely focus on these areas.

Old Crow Flats, the most significant wetland and lake complex in Yukon, is fully protected within Old Crow Flats SMA and Vuntut National Park of Canada. Major portions of the Bluefish and Whitefish wetland complexes are within VGFN settlement lands, but are not designated as protected.

The entire Whitefish wetland complex falls within the Eagle Plain oil and gas basin, one of the major unprotected wetlands in the region, and this area has the greatest potential to sustain impacts resulting from industrial land use. Important summer and winter river travel corridors include the Porcupine, Eagle and Bell rivers; portions of each run through or along the Eagle Plain oil and gas basin. Status and management options for the Whitefish wetlands are discussed in Section 5 and Appendix 4.

Implications for Plan:

The Plan must consider potential future development impacts on water, wetlands and riparian areas, and recommend specific management strategies for such features (outside of existing protected areas) to ensure adequate conservation measures are in place prior to large-scale industrial land uses occurring.

Regional Issue 4:

Opportunities to access land and resources

Concern:

Future natural resource development will require access to resources (e.g., oil and gas, aggregate and minerals). Current and additional restrictions on accessing these resources may impact establishment and growth of the region's natural resource economy.

Two specific areas require special consideration:

Eagle Plains

The Eagle Plain oil and gas basin covers one third of the planning region. Additional land withdrawals in areas of high oil and gas potential, particularly Eagle Plains, may affect the ability to develop a viable energy sector.

North Yukon Interim Land Withdrawal

The interim land withdrawal directly affects 12% of the lands in the northern portion of the region. The interim withdrawal was created in 1978 to secure lands required for conservation planning—this planning included boundary delineation for the creation of Ivvavik National Park, Vuntut National Park and Old Crow Flats SMA. Now that the park and SMA boundaries have been established, and management plans for these areas have been completed, the Yukon Government has requested that NYPC consider land use designation options for the area.

These options do not represent a recommendation by the Commission to lift the interim withdrawal. Rather, they offer land use designations for consideration should the applicable authorities make the decision to lift the interim land withdrawal at a future date. Status and land use designation options currently being considered for the North Yukon Interim Land Withdrawal are discussed in Section 5 and Appendix 5.

Situation:

Natural resource industries require the ability to secure rights to, explore for and develop the desired resources. Establishing land use certainty is an important consideration for investment in natural resource industries. Establishing a 'working landscape' and providing clear management guidelines for accessing that landscape is important to create a positive investment climate for natural resource industries.

A large amount of land in the North Yukon Planning Region is currently withdrawn from oil and gas and mineral exploration, gravel extraction and similar industrial activities. Existing Parks and Special Management Areas provide long-term protection for approximately 32% of the planning region; an additional 12% of the region is currently not available for natural resource exploration and development activities as the result of an Order in Council interim land withdrawal (i.e., North Yukon Interim Land Withdrawal).

Implications for Plan:

The Plan must recommend tools and approaches to ensure adequate conservation measures are in place while providing opportunities to access lands for a range of activities, including natural resource exploration and development.

Regional Issue 5:

Transportation

Concern:

Construction of future all-season access roads may be required to support economic development in the region. A lack of ground transportation infrastructure is commonly referenced as being a barrier to natural resource development. All-season access roads and people's use of those roads have the potential to cause impacts to wildlife and fish populations.

Existing transportation issues in the region include management of the Dempster Highway and required access to aggregate (gravel) resources. The Old Crow winter road is also required periodically to support community infrastructure needs in Old Crow.

Situation:

Transportation is a common component of most land use activity. Air and ground transportation plays an important role in supporting communities and economic development in northern regions.

Future transportation considerations include potential construction of industrial access roads required for oil and gas, mineral and other resource development, construction of an all-season access road to Old Crow, and long-term transportation concepts associated with port access on the Yukon North Slope. Identification of and access to adequate aggregate (gravel) resources is a key consideration for all future transportation issues in the region.

Implications for Plan:

The Plan must consider and account for the management of existing transportation infrastructure and future transportation requirements. The Plan must also recommend measures to minimize the potential impacts of existing and future transportation requirements.

Regional Issue 6:

Climate Change

Concern:

Climate change impacts land, water, wildlife, fish and people's use of these resources. Climate change impacts may also compound potential future land use impacts.

Situation:

Climate change has the potential to affect all sectors and/or resources in the North Yukon Planning Region. Climate-induced changes will result in habitat change, wetland loss, changes in water flow, permafrost degradation, increasing fire rates and variable winter temperature and snow conditions. These changes will impact wildlife and their habitats, people's ability to travel on and use the land (both for subsistence and transportation), and the length of the winter work period available for industrial land uses.

Implications for Plan:

The Plan must consider and account for current and future effects of climate change in land use decisions, with special consideration of climate change impacts to the Porcupine Caribou Herd and important caribou habitats.

1.7 Overview of Planning Process

The Plan was produced in 6 phases, as outlined below. Throughout this process, NYPC worked closely with Plan Partners – agencies, organizations and stakeholders – that directly assisted the NYPC with planning tasks, primarily in the area of information collection and analysis, and in the development and evaluation of land use scenarios. Vuntut Gwitchin Elders and land users made significant contributions throughout the planning process.

Phase 1: Commission Start-up

The planning process began in October 2003, when the NYPC held their first meeting. This phase also included the drafting of a Precise Terms of Reference, a three-year work plan to guide the production of the Plan (North Yukon Planning Commission 2004).

Phase 2: Issues Gathering

Prior to the establishment of the NYPC, the Vuntut Planning Commission held consultations with the community of Old Crow, governments, Plan Partners and other stakeholders to identify their concerns, priorities, values and vision for the planning region. The feedback received through those consultations informs and guides this Plan. For discussion on results of the Issues Gathering phase, see Section 1.6.

Phase 3: Information Gathering

NYPC, working in partnership with a number of agencies and groups, invested significant effort developing adequate and defensible regional information upon which management recommendations are based. Traditional, local, and scientific knowledge was utilized throughout. Key ecological data sets developed in support of the plan included regional biophysical mapping, climate change risk assessment, focal wildlife species (barren-ground caribou, moose and marten) habitat suitability mapping, barren-

ground caribou seasonal concentrated use area and migration corridor analysis, waterbird and wetlands habitat mapping, fish habitats, bird species and habitat associations, and human disturbance mapping.

Heritage values, traditional land use and current First Nations land use were documented and mapped. Oil and gas, minerals and coal, tourism, forest resources, aggregate (gravel) and renewable energy resource assessments were also conducted. The results of this work, including 53 resource maps, can be viewed in the *North Yukon Planning Region Resource Assessment Report*, available from the NYPC website (www.nypc.planyukon.ca) (North Yukon Planning Commission 2007a,b)

Appendix 2 contains a list of supporting documents and additional details on results of the information gathering.

Phase 4: Development of Planning Tools and Components

In response to the major management issues and goals for the Plan, a number of different planning tools and components were developed and applied. These tools and components were developed with consideration of agency and stakeholder criteria. A full description of the major concepts recommended in the Plan is provided in Section 3.

Phase 5: Development and Evaluation of Land Use Scenarios

A landscape simulation model was used to examine different land use scenarios to assist in identifying potential planning issues and the outcomes of different management options on selected indicators. Working with domain experts, NYPC developed future land use scenarios for oil and gas, tourism and minerals. NYPC utilized the ALCES® integrated landscape management model to examine economic and ecological outcomes of individual land use sectors, the cumulative effect of multiple land use sectors, and the cumulative land use scenario combined with projected climate change impacts.

Modeling results can be viewed in the *North Yukon Planning Region Land Use Scenarios Report* available from the NYPC website (www.nypc.planyukon.ca) (North Yukon Planning Commission 2007c). Important land use scenario results and their linkage to the Plan are discussed in Appendix 3.

Phase 6: Development of the Draft Regional Land Use Plan

The Plan (this document) provides both strategic and detailed management direction for the planning region. It presents a description of the desired future landscape condition for each landscape management unit. This Plan is intended to provide a long-term vision, practical strategies for managing land use, and a foundation for future land use and resource planning in the North Yukon Planning Region.

2. Description of Planning Region

This section describes the North Yukon Planning Region social, economic and ecological setting. Historical context, current land ownership and uses, and renewable and non-renewable resources are discussed. The North Yukon Planning Region Resource Assessment Report should be referenced for detailed regional descriptions and maps (North Yukon Planning Commission, 2007a,b). Detailed descriptions of specific landscape management units are provided in Section 5.

2.1 Communities and First Nations

The planning region is the traditional territory of the Vuntut Gwitchin First Nation (Map 1). It is part of the larger Gwich'in homeland of northwest Canada and Alaska. First Nations with interests in the North Yukon Planning region include the Tr'ondek Hwech'in, Tetlit Gwich'in, Na-cho Nyak Dun and Inuvialuit.

Old Crow is the only permanent community in the planning region, and the only community in Yukon without all-season road access (Figure 2.1). Located at the confluence of the Porcupine and Old Crow Rivers, the community was established in approximately 1910. Old Crow is the home of the Vuntut Gwitchin First Nation. There are strong Gwich'in family ties between the communities of Old Crow, Ft. Yukon (Alaska) and Ft. McPherson (NWT).

Old Crow has a modern, newly constructed airport terminal, a Northern® store providing grocery, postal, banking and fuel services, and a new school serving the education needs of kindergarten to grade nine students. A permanently staffed nursing station, a Yukon College community campus, and a Royal Canadian Mounted Police detachment are also located in the Old Crow. While the community has two privately operated lodging accommodations, there are no full service restaurants or similar visitor facilities. A modern administrative centre, the Sarah Abel Chitze building, houses all Vuntut Gwitchin Government departments and Chief and Council. Residents live in log or wood frame housing with trucked water and sewer service. Diesel generators operated by Yukon Electrical Company Ltd. provide electricity for the community. Air North provides scheduled air passenger and cargo service to Old Crow from Whitehorse and Inuvik.

The total regional population is slightly less than 300 residents. All residents live in Old Crow with approximately 90% being Vuntut Gwitchin beneficiaries. For the period 1985 to present, the Old Crow population has remained relatively stable, fluctuating only moderately between 265 and 300 residents. Population growth trends in Old Crow are currently less than 1% with no major changes expected in the near future. More than half of the total Vuntut Gwitchin beneficiaries live outside the region. The total number of VGFN beneficiaries is currently estimated to be approximately 800.

Figure 2.1. Community of Old Crow. Photo: J.Hawkings, CWS.

The Dempster Highway, the only major all-season road in the region, runs through approximately 200 km of Eagle Plains and the Richardson Mountains and foothills. The highway provides the only all-season road link between southern Canada, Yukon and the Mackenzie Delta communities of the Northwest Territories. The Dempster Highway was completed in 1979. Outside of Old Crow, the only permanent facility is the Eagle Plains visitor/transportation centre on the Dempster Highway. Beginning near the Eagle Plains Lodge, a winter road provides surface access between the Dempster Highway and Old Crow. The winter road is constructed every 2-3 years, or as required.

2.2 History of the Region

Human history of the region is linked to Beringia, the vast land area of northwest North America and eastern Siberia that remained unglaciated during the most recent ice ages. The region contains a record of human habitation spanning at least the past 12,000 years, with evidence possibly as old as 40,000 years. Bluefish Caves, the oldest documented archaeological site in the Western Hemisphere is dated to 24,000 years.

Initial contact between the Gwich'in and European explorers and fur traders occurred in the 1840s. This contact introduced new foods, tools, materials and cultures to northern Yukon. A vibrant fur trade flourished in the late 1800s and early 1900s, introducing a cash economy to the region. The fur trade period lead to a significant change in the pattern of First Nation seasonal use, resulting in the establishment of more permanent settlements, including Old Crow. Lapierre House, Rampart House, Whitestone Village, and Johnstone Creek Village are part of this fur trade history. The Gwich'in of the Upper Porcupine River, the Tukudh, eventually settled in the communities of Old Crow, Ft. McPherson, Dawson and Mayo. Yukon First Nation traditional territory maps reflect

these historic communal ties to the Blackstone, Ogilvie River and Dempster Highway area.

Similar to adjacent jurisdictions in northern Canada, northern Yukon experienced a period of rapid oil and gas and mineral exploration during the 1950s-1970s. The Eagle Plains oil and gas basin was the focus for most exploration activities. Historical oil and gas exploration activities in the North Yukon Planning Region left a legacy of seismic lines, winter roads and trails, airstrips and abandoned well pads. Many of these features are still visible on the landscape today. Constructed in phases during the 1950s to 1970s, the Dempster Highway was initiated in response to oil and gas discoveries in Eagle Plains and the Mackenzie Delta.

Historical oil and gas and mineral exploration activities occurred prior to the settlement of Yukon First Nation land claim agreements. Land use permits were granted and exploration activities were initiated and conducted with limited consultation of the Vuntut Gwitchin of Old Crow, and other affected First Nations. In 1972 the people of Old Crow presented a petition to the Federal Government concerning oil and gas exploration in Old Crow Flats, providing the catalyst that initiated nearly 20-years of negotiations leading to the completion of the VGFN Final Agreement in 1993.

In 1978, during negotiations leading to the Inuvialuit Land Claim Agreement, the North Yukon Interim Land Withdrawal was established. The withdrawal order removed all lands north of the Porcupine River to the arctic coast of Yukon from mineral and oil and gas disposition, and prevented exploration activities from occurring there.

The VGFN Final Agreement resulted in the creation of Vuntut National Park of Canada and Old Crow Flats Special Management Area. The Ni'iinlii'njik (Fishing Branch) Special Management Area was created in 2003.

2.3 Economy

The regional economy can be considered a ‘mixed economy’ where both traditional subsistence harvesting and wage-based activities co-exist. Subsistence hunting, gathering and trapping is still a very important economic and cultural activity in Old Crow.

The region currently has one of the lowest levels of wage-based economic activity in Yukon. The planning and delivery of Government services (health and social services, housing, education, administration and transportation) and government transfer payments are the primary economic inputs. Over the past 20-years, resource-based economic activities have not provided significant wage-based employment opportunities to Old Crow residents.

2.3.1 Old Crow

A limited market-based economy in Old Crow supplements traditional harvesting activities. According to a 1993 assessment, Old Crow's cash economy provides about 90 total jobs, most of which are part time or seasonal, amounting to approximately 53 full-time equivalent jobs (Kofinas 1998). These employment figures have not changed significantly over the past ten years. Most of the jobs in Old Crow depend directly or indirectly on funds allocated through the VGFN Final Agreement. Through their Final Agreement, the Vuntut Gwitchin Government receives approximately $9.8 million in federal transfer payments annually (approximately $35,000 per Old Crow resident).

Vuntut Gwitchin Government services provide about 80% of the total wage-based employment in Old Crow. Since the Vuntut Gwitchin Government is also responsible for providing many municipal services in the unincorporated community, First Nation Government employment also includes such things as construction, building maintenance, water and fuel delivery, and similar municipal responsibilities. Vuntut Gwitchin Government provides social services, justice, health, education and Elder support programs, some of which are offered in partnership with other governments and agencies.

Yukon and Federal Government-financed capital infrastructure projects such as the Old Crow airport terminal and runway upgrade, the riverbank stabilization program and construction of the Old Crow winter road offer important short-term or seasonal wage employment opportunities. Other service employers such as power utilities, education, communications and health care provide additional full and part-time employment for Old Crow residents. Parks Canada, through Vuntut National Park operations, also provide seasonal or project specific employment opportunities. Air North, providing scheduled air passenger and cargo transportation service to Old Crow, is the largest private sector employer in the community.

Table 2.1 shows income statistics for Old Crow. The community has a median household income of $28,000. Wage-based work in Old Crow is less likely to be full-time, full-year than the Yukon average. The 2001 Census reported that 32% of all Old Crow workers were working full time, full year compared with 46% for the Yukon as a whole (Yukon Community Profiles 2004).

Table 2.1. Income Statistics for Old Crow Residents Compared to Yukon and Canada. Source: Yukon Bureau of Statistics (2001).

Group	Annual Median Income ($)		
	Old Crow	Yukon	Canada
Males (15 years and older)	$15,232 (105 males)	$29,753 (10,865 males)	$29,276 (11,189,035 males)
Females (15 years and older)	$14,667 (105 females)	$24,579 (10,810 females)	$17,122 (11,534,015 females)
Families	$44,672 (75 families)	$63,490 (7,815 families)	$55,016 (8,371,020 families)
Households	$28,224 (120 households)	$51,930 (11,360 households)	$46,752 (11,562,975 households)

2.3.2 Other Economic Sectors

Outside of the Dempster Highway corridor, regional economic activity is currently very low. Economic activity and resource potentials associated with specific economic sectors, including traditional economic activities, are discussed in Section 2.8.

2.4 Land Ownership, Status and Dispositions

An overview of existing land ownership and status was provided in Section 1.2.2 (also see Map 1). There are three major landowners and administrators in the region: VGFN, Government of Canada (Parks Canada), and Yukon Government. Approximately 78% of the 55,568 km^2 planning region is public land administered by Yukon Government.

Vuntut Gwitchin settlement lands account for 14% or 7,762 km^2 of the planning region. Most of the Vuntut Gwitchin settlement land is Category A, which includes both surface and subsurface rights. Vuntut National Park of Canada, administered by the federal government, comprises the remaining 8% of the planning region (4,374 km^2 by area). With the exception of VGFN settlement lands and some land within the community of Old Crow, there is no private land ownership in the region.

Approximately 45% (24,980 km^2) of the region is withdrawn from land disposition (e.g., oil and gas and mineral exploration and development). Roughly half of these lands are interim withdrawals through existing Orders in Council, or include VGFN settlement land within SMAs. Protected areas include Vuntut National Park of Canada, Old Crow

Flats Special Management Area, and the Ni'iinlii'njik (Fishing Branch) Wilderness Preserve and Ecological Reserve.

The North Yukon Interim Land Withdrawal directly affects 13% of the planning region, and has no specified time for expiry. The interim land withdrawal extends north of the Porcupine River and west of the Bell River (Yukon Department of Energy, Mines and Resources, 2003, 2005: Orders in Council 2003/143 and 2005/53, and Section 17 of *Oil and Gas Act, R.S.Y. 2002, c.162*). The area under interim land withdrawal is not considered to be a protected area, as it has undetermined land status.

The Dempster Highway traverses approximately 200 km of the southeastern portion of the planning region, through Eagle Plains and skirting the foothills of the Richardson Mountains. The Eagle Plains service facility is located on leased public land along the highway. Two communication towers and a number of Yukon Government gravel quarries are located along the highway, within the region.

Fourteen land parcels within the Eagle Plains oil and gas basin are currently under oil and gas permits (see Map 1). Northern Cross (Yukon) Limited is the majority owner of all permit areas. Permit #0001 has an expiry date of November 30, 2008. Permit #s 0005-0017 have an expiry date of August 31st, 2013. Two significant discovery licences were issued in the region in 1988, and have no expiry date. Future exploration activities in the Eagle Plains basin are uncertain. As per the Yukon oil and gas disposition process, it is anticipated that the region will continue to receive regular calls for bids.

Approximately 475 active mineral claims are present in the region (see Map 1). These include the Rusty Springs and Alto properties to the west of Ni'iinlii'njik (Fishing Branch) Wilderness Preserve, and the recent Fox and Rich claims in the southeastern portion of the region. As of September 2007, an application to explore the Sun mineral claims, also in the southeastern portion of the region, is pending.

2.5 Biophysical Environment

2.5.1 Geological Setting and Glacial History

In contrast to most of southern Yukon, which is composed of rocks of various affinities and ages, the geology of northern Yukon is generally comprised of sedimentary rocks that formed in the ancient continental shelf environment of North America. Limestones, shales, sandstones and related sedimentary and clastic formations are the dominant rock types. The Old Crow batholith in the Old Crow Range to the northwest of the community of Old Crow is the exception. The batholith is a granitic intrusion protruding through the surrounding sedimentary rock formations.

The region contains three distinct physiographic landscapes - mountains, plateaus, and basins. Major mountain ranges include the British Mountains, Barn Mountains, Old Crow Range, Keele Range, David Lord Range, Richardson Mountains and Northern Ogilvie

Mountains. The Eagle Plains is a broad plateau bounded by the Richardson Mountains, Northern Ogilvie Mountains and David Lord Range. Old Crow Flats and its surrounding pediment slopes is the major structural basin.

Glacial history has influenced the landforms, hydrology, ecology and human history of the region. The region is part of Beringia, the ancient landscape of northwestern North America and eastern Siberia that remained unglaciated during the last ice ages. Portions of the region have remained free of ice for at least two million years. In this ancient landscape, most upland areas outside of major river valleys are comprised of colluvial or bedrock surficial materials; there are no recent glacial tills. Extensive pediment slopes, formed over thousands of years of weathering and slope processes, are a conspicuous part of the northern Yukon landscape. The Old Crow basin (e.g., Driftwood River and Blackfox Creek) contain the best examples of these pediments. Glacial lake sediments are present in Old Crow Flats, Bluefish and Whitefish wetlands, and some other low-lying areas. All major wetland complexes are associated with the glacial lake sediments.

The course of the Porcupine River has undergone a significant diversion in the past 15,000 years. Prior to the most recent glacial advance, the McConnell phase, the Porcupine River watershed drained to the northeast through the Bell River and Summit Lake-Rat Pass, into the Mackenzie River and Arctic Ocean. As the Laurentide ice sheet approached the Richardson Mountains from the east, it created an ice dam across Rat Pass blocking the flow of the Porcupine River. Water from the Porcupine River began to collect in Old Crow Flats, Bluefish and Whitefish basins. Eventually, approximately 10,000 years ago, the Porcupine River cut a new channel to the west, along its present course through the Ramparts, draining into the Yukon River system. The draining of the glacial lakes was likely a catastrophic event. Evidence of the glacial lakes include elevated beach ridges and many metres of fine-grained lake sediments. Also at the end of the last ice age, large volumes of water from melting ice sheets in the Peel River watershed flowed into the region through the major rivers. The extensive terraces and incised valleys of these rivers were formed by the glacial meltwaters, with the best example being the Eagle River.

2.5.2 Climate

The region receives 300-400 mm of precipitation annually, with most falling as rain during the summer period. The North Yukon Planning Region has the coldest average winter and annual temperatures in Yukon (–8 to –12^{o}C). Average January temperatures hover around –35^{o}C with Old Crow Flats experiencing the coldest average winter temperatures (-40^{o}C). July temperatures occasionally reach 30^{o}C.

Northern Yukon and surrounding areas have undergone detectable warming over the past three to four decades. Estimates for the period 1966-1995 are approximately 0.5°C warming per decade (Serreze et al. 2000). Although current and predicted rates of warming are highest in winter, analyses of temperature trends at individual climate stations in northern Yukon also indicate a significant summer warming trend of about

0.3-0.5°C per decade (Arctic Borderlands Ecological Knowledge Co-op, 2007). An annual warming rate of 0.5°C per decade corresponds to a warming of 5°C in annual temperatures between 1970 and 2070. This scenario lies within the temperature envelopes predicted for northern regions with a doubling of atmospheric CO_2.

Northern Yukon is expected to experience some of the highest rates of climate change globally. Climate change is anticipated to result in altered summer fire regimes, increased frequency and severity of terrain hazards, more variable, but generally decreased surface water flow, changed permafrost characteristics, vegetation community change, and a shorter winter 'frozen ground' work period. Cumulatively, the impacts of climate change may be one of the largest future challenges facing the North Yukon Planning Region.

2.5.3 Permafrost, Hydrology and Watersheds

The entire region is underlain by continuous permafrost. Summer active soil depths range from 30cm in low-lying, poorly drained areas to greater than 100cm on well drained, south-facing slopes. Permafrost has a large effect on the hydrology, terrain and distribution of landscape types.

The hydrologic regime is Northern; underlying continuous permafrost largely controls streamflow characteristics. As a result, rivers experience very low winter flows and dramatic variation in summer flow. Permafrost reduces the capacity of the soil to store groundwater, resulting in rapid spring and summer run-off and limited storage over the winter period. Peak flows, normally occurring in June, are greater relative to areas with less permafrost. Minimum flows generally occur in March and tend to be lower than more southern areas of Yukon due to the effect of lower winter temperatures on groundwater flow. Small streams within this region frequently experience zero flow, while some intermediate-sized streams may occasionally experience zero winter flow.

The Porcupine River watershed is the primary watershed and generally forms the planning region boundary. With a watershed covering approximately 12% of Yukon, the Porcupine River watershed is a major sub-basin of the Yukon River. Major tributaries to the Porcupine River include the Eagle, Bell, Bluefish, Driftwood, Miner, Fishing Branch, Whitestone and Old Crow rivers. The Kandik River, in the southwest of the planning region, is not part of the Porcupine River watershed and flows south directly to the Yukon River.

Almost all of the region's lakes are concentrated in the glacial lake basins of Old Crow Flats, Bluefish wetlands and Whitefish wetlands. In these areas, most lakes are thermokarst in origin and occur in sensitive permafrost environments. In the major river valleys, as they run through the glacial lake basins (e.g., Eagle, Bell, Porcupine and Old Crow rivers), off-channel lakes are also common.

2.5.4 Ecosystems

The planning region contains a diversity of ecosystems. Climate, latitude, landforms, geology, elevation, surficial materials and natural disturbance regimes all play a role in affecting their distribution and composition. Ecosystems can be described at a range of spatial scales. Regional ecosystems describe general ecological conditions across broad geographic areas. They are influenced by regional climate and landforms. Local ecosystems refer to specific Landscape Types, or vegetation-soil associations.

2.5.4.1 Regional Ecosystems

The planning region is within the Taiga Cordillera Ecozone, and contains portions of six Ecoregions, including Old Crow Flats, Old Crow Basin, Eagle Plains, North Ogilvie Mountains, British Richardson Mountains and Davidson Mountains[1] (Table 2.2). Portions of 24 Ecodistricts are nested within the Ecoregions (Table 2.2). Three bioclimate zones, the Taiga Wooded (76% by area), Taiga Shrub (17% by area), and Alpine (7% by area), characterise the area. The most northerly portion of the planning region is strongly influenced by Arctic storm systems, representing a transition to the non-forested Tundra bioclimate zone of the Yukon North Slope. Detailed regional ecosystem descriptions are provided in Section 5 and the North Yukon Planning Region Resource Assessment Report (NYPC 2007a,b).

2.5.4.2 Local Ecosystems

Landscape Types are general vegetation – soil associations within regional ecosystems. Landscape Types represent the 'building blocks' of ecosystems and form the basis for the description of regional wildlife habitats. Twenty-eight distinct Landscape Types are recognized in the region (Table 2.3).

Approximately 600 plant species have been documented within the region; ninety-three of these are recorded as rare (Bruce Bennett, Yukon Department of Environment, unpublished data, 2005), based on criteria developed by NatureServe International (2007). There are no plant species of national concern in the region according to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Species at Risk Act (SARA) (Environment Canada, 2007).

Soils are predominantly cryosols – soils affected by permafrost. Outside of stream valleys, colluvium and bedrock are the most important parent materials. Bedrock chemistry plays a large role in determining the acidity of soils, with soils derived from weathered shale and sandstone generally being very acidic. Soil chemistry plays an important role in water chemistry.

[1] The Davidson Mountains Ecoregion is not described in Ecoregions of Yukon (Smith et al. 2004). This Ecoregion resulted from the correlation of ecological boundaries with Alaska following publication of Smith et al. (2004). The Davidson Mountains is the 'mountainous' portion of the western Old Crow Basin Ecoregion.

Table 2.2. Summary of North Yukon Ecoregions and Ecodistricts.

Ecoregion	Area (% NYPR)	Major Bioclimate Zones	Ecodistrict	Area (% NYPR)
Eagle Plains	33.6	Taiga Wooded	Chance Creek	11.5
			Richardson Foothills West	7.3
			David Lord Range	4.5
			Johnson Creek	4.0
			Whitefish Wetlands	3.6
			Whitestone River	2.6
			Upper Peel River	0.1
North Ogilvie Mountains	22.9	Taiga Wooded; Taiga Shrub; Alpine	Keele Range	7.1
			Kandik River	6.7
			Fishing Branch River	6.2
			Nahoni Range	2.8
			Tatonduk Mountains	0.1
Old Crow Basin	14.6	Taiga Wooded; Taiga Shrub	Driftwood River	9.9
			Lord Creek	4.7
Old Crow Flats	11.9	Taiga Wooded	Old Crow Flats Wetlands	9.2
			Bluefish Wetlands	2.7
British Richardson Mountains	8.8	Taiga Shrub; Alpine;	Bell River	5.7
			Richardson Mountains North	1.3
			Canyon Creek	1.2
			Barn Range	0.3
			Richardson Mountains South	0.2
			British Mountains	0.1
Davidson Mountains	8.2	Taiga Wooded; Taiga Shrub; Alpine	Timber Creek	4.4
			Old Crow Range	3.8

Table 2.3. Summary of North Yukon Landscape Types.

Landscape Type	Area (km^2)	Area (% NYPR)
HIGH ELEVATION, UPLAND ECOSYSTEMS		
High Elevation Rock/Exposed	2,756	5.0
High Elevation Sparsely Vegetated	2,628	4.7
High Elevation Herb	1,785	3.2
High Elevation Shrub	835	1.5
High Elevation Coniferous Forest	331	0.6
LOW-MIDDLE ELEVATION, UPLAND ECOSYSTEMS		
Low Elevation Exposed/Sparsely Vegetated	343	0.6
Wet Sites		
Wet Herb	4,674	8.4
Wet Shrub	7,028	12.6
Wet Mixedwood Forest	137	0.3
Wet Coniferous Forest	2,515	4.5
Moist Sites		
Moist Herb	3,769	6.8
Moist Shrub	5,823	10.5
Moist Mixedwood Forest	297	0.5
Moist Coniferous Forest	3,057	5.5
Mesic Sites		
Mesic Herb	3,787	6.8
Mesic Shrub	4,212	7.6
Mesic Mixedwood Forest	324	0.6
Mesic Coniferous Forest	3,672	6.6
RIPARIAN ECOSYSTEMS		
Riparian - Exposed	131	0.2
Riparian - Herb	1,073	1.9
Riparian - Shrub	2,256	4.1
Riparian - Mixedwood	119	0.2
Riparian - Conifer	763	1.4
Riparian - Wetland	436	0.8
WETLAND ECOSYSTEMS *		
Wetland - Herb	48	0.1
Wetland - Shrub	353	0.6
Wetland - Forest	823	1.5
AQUATIC ECOSYSTEMS *		
Open Water (standing and running)	1588	2.9

* Note: see Section 2.5.4.3 regarding Wetlands

2.5.4.3 Wetlands

Wetlands are a specific Landscape Type, but require special consideration. Wetlands represent some of the most biologically and culturally important areas in the planning region. In this Plan, wetlands are defined as:

> "*all open water aquatic environments, both lentic (still water) and lotic (moving water) features and their adjacent environments"*.

Wetland complexes are concentrated geographic groupings of individual wetlands, and may include both wetland and non-wetland Landscape Types. Wetland complexes function as an integrated hydrologic system. A comprehensive and accurate map showing all wetland habitats in the region is not currently available. Based on available information, between 8 and 16% of the region may be considered a wetland environment[2], with Old Crow Flats accounting for the majority of this area. Open water (lakes, rivers and streams) accounts for approximately 3% (1,667 km^2) of the planning area.

The region contains three major wetland complexes of territorial significance: Old Crow Flats, Bluefish-Cadzow Lake, and Whitefish (Yukon Department of Environment, 2005). All occur in old glacial lake basins. Fine-grained, ice-rich glacial lake sediments underlie these areas and most lakes are thermokarst in origin. These wetland complexes are very sensitive permafrost environments that are susceptible to permafrost degradation and altered hydrology as a result of surface disturbance.

2.5.4.4 Natural Disturbance Regimes

Natural disturbances include agents such as wildfire, forest insects, extreme weather events and terrain disturbances. Natural disturbances play a large role in shaping and controlling the distribution of Landscape Types, and therefore affect wildlife habitat quality and abundance.

Wildfire is the most active natural disturbance agent in the region. Fire rates vary by Ecoregion and Landscape Type. Estimated fire rates and fire cycles are listed in Table 2.4. Although on average less than 1% of each Ecoregion burns in a given year, over the past 50-years a detectable trend in increasing fire activity has been recorded, consistent with climate change impact projections. The estimated burn rates and fire cycles reflect the Landscape Type composition of each Ecoregion, and the susceptibility of each Landscape Type to fire. Wet upland sites, wetlands and riparian Landscape Types typically have lower burn rates in all Ecoregions.

[2] The National Wetlands Working Group (1988) define wetlands as "land that has the water table at, near, or above the land's surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to the wet environment". Permafrost conditions can create poor soil drainage conditions across broad geographic areas, resulting in hydric soil conditions for much of the growing season with possible seasonal standing water. Such areas would typically not be considered 'wetlands'.

Within the planning area, the Eagle Plains Ecoregion experiences the highest level of wildfire activity, with fire rates that are similar to more southern areas of Yukon. Coniferous forest cover is dominant in this Ecoregion, and upland forests have burn cycles that occur on the order of 200-250 years. During the extreme 2004 fire season, almost 500,000 ha was burnt, with the majority in Eagle Plains. The Old Crow Basin and Davidson Mountains Ecoregions also experience relatively high fire rates.

The role of forest insects and extreme climatic events (e.g. wind storms) in the planning region is not well understood, but these are not currently considered to be major forest disturbances. Climatic change may increase the rate and frequency of these disturbances.

Many rock slides and debris flows have been observed throughout the North Ogilvie and Richardson Mountains, but it is not currently possible to quantify the extent or frequency of these events. Small-scale debris flows and slumps are common throughout the region; most appear to be associated with wildfire activity and resultant permafrost degradation.

Table 2.4. Estimated Ecoregion Fire Rates (annual % of area burned) and Fire Cycles (length of time required to burn area equal to the Ecoregion), Based on 1950-2005 Fire Records.

Ecoregion	Annual Area Burned (%)	Fire Cycle (Years)
Eagle Plains	0.65	153
Old Crow Basin	0.30	329
Davidson Mountains	0.22	453
Old Crow Flats	0.08	1270
British Richardson Mountains	0.07	1472
North Ogilvie Mountains	0.04	2285

2.6 Wildlife and Fish

2.6.1 Wildlife

Approximately 40 species of mammals and 150 species of birds occupy the region on a seasonal or annual basis (O'Donoghue and Staniforth, 2004; Sinclair et al. 2003; Canadian Wildlife Service and Yukon Department of Environment, unpublished data, 2006). Mammal species include shrews, hares, pikas, rodents, carnivores, and ungulates (sheep, moose, and caribou). Woodland caribou and Musk-ox occupy the region infrequently. Bird species include seabirds, loons, ducks, geese, swans, shorebirds, raptors, owls, cranes, rails, nightjars, kingfishers, woodpeckers, flickers, upland birds (grouse and ptarmigan), and songbirds (i.e. thrushes, swallows, sparrows, etc.). The majority of the bird species are migratory, and are present only during the breeding season, which extends from approximately May to September.

Four wildlife species in the region are listed as being of national conservation concern—the Grizzly Bear, Wolverine, Short-eared Owl and Peregrine Falcon. The population status of Grizzly Bears in the region is unknown, but available information for the other three species suggests they are stable (Christensen, 2004; Henry, 2004; Tom Jung, Yukon Department of Environment, pers. comm.).

The barren-ground Porcupine Caribou Herd is the most significant wildlife resource in the North Yukon Planning Region. The herd is a vital cultural and economic resource for the community of Old Crow and neighbouring Gwich'in communities. The Vuntut Gwitchin have utilized the herd for thousands of years. The entire planning region is occupied by the herd at various times of year, but primarily during the winter, spring migration, fall migration, and late fall seasons. The herd is currently estimated at 123,000 animals (2001 survey), down from a 30 year high of 178,000 animals in 1989 (McNeil et al. 2005). The herd is expected to have declined further over the past few years.

Moose use most of the region during all times of year, and they appear to be increasing in abundance and expanding their range. Abundance is highest during the summer season when there are an estimated 5000 moose present in the region (Yukon Department of Environment, unpublished data, 2006). Populations of some moose in the region are known to migrate into Old Crow Flats during the summer season and back into Alaska during the winter season (Mauer, 1998).

Pine marten are present, or expected to be present, across most of the region south of the tree-line. A likely northern limit of marten distribution is the treed area near the Firth River in southwestern Ivvavik National Park (Gray and Alt, 2001). There is no information on marten population status for the region, outside of Old Crow Flats. Results from that study to date suggest that marten populations fluctuate substantially between years, and locations, in the region (Henry, 2004).

The region's wetlands and wetland complexes are particularly important and sensitive habitats for a variety of wetland species. Old Crow Flats is the largest wetland complex in Yukon and of continental significance for migratory waterbirds. Other significant wetland complexes of ecological importance include Bluefish, Cadzow, and Whitefish Wetlands (Yukon Wetlands Technical Committee, 2005). The combined estimated area of these four wetland complexes is 758,871 hectares (ha), representing 14% of the region (Map 2). The Porcupine, Eagle and Bell rivers are also significant areas for a variety of species.

Map 2 shows the identified areas of ecological importance for the focal species and the habitats they occupy. Many of the region's mountains and mountain ranges are important habitats for large mammal species (sheep, caribou, moose, bears, and furbearers), particularly the Richardson Mountains (Yukon Department of Environment, 2005). Major lakes, river/stream valleys and wetland areas (particularly the large wetland complexes) are significant areas for moose, furbearers, birds, and a variety of other species. Fishing Branch is a significant area for bears and furbearers. Areas in the vicinity of Old Crow and Whitestone Village were also identified as important ecological areas.

2.6.2 Fish

Approximately 18 fish species, including three species of salmon, occupy the region, on a seasonal or annual basis (North Yukon Planning Commission, 2004). Freshwater fish species include Arctic grayling, Least cisco, Broad whitefish, Lake whitefish, Burbot (Loche), Inconnu (Coney), and Northern pike. Salmon species include Chinook (King) salmon, Sockeye (Red) salmon, Chum (Dog) salmon, and Coho salmon. There are several non-game fish species in the region including the Longnose sucker, Lake chub, Slimy sculpin, Spoonhead sculpin, Round whitefish, Trout perch, and Arctic lamprey.

Maps of identified fish habitats in the region, including critical over-wintering and spawning habitats, are provided in the North Yukon Resource Assessment (Maps 33-39, North Yukon Planning Commission, 2007b). Significant fish areas generally include the major rivers (Porcupine, Eagle, and Bell), portions of several major river/streams (i.e. Fishing Branch, Miner, Whitestone rivers, etc.), and identified lakes within the Old Crow Flats, Bluefish Basin, and Whitefish Wetland areas. Significant salmon spawning areas include the Porcupine, Fishing Branch and Miner rivers.

2.7 Heritage and Cultural Resources

Heritage resources include sites and objects that are 45-years old or older and relate to human history, including archaeological and historic sites and artefacts. This definition also includes palaeontological resources, which are fossil and other remains of extinct or prehistoric plants and animals. **Cultural resources** refer to places and locations associated with events, stories and legends. Map 3 shows the location of known significant heritage and cultural resources.

The North Yukon Planning Region contains a remarkable assemblage of heritage resources spanning at least 2 million years of earth history. Palaeontological resources associated with Beringia, the unglaciated Pleistocene refugium of northwest North America and eastern Siberia, are recognized as being of global significance. The region hosts some of the oldest and best-preserved examples of early human habitation and land use in North America. First Nations and Elders oral history and tradition provide an unbroken link to the recent past.

The Beringian environment has resulted in an exceptionally well-preserved record of archaeological and palaeontological resources. The fossil remains of extinct ice age mammals (e.g. mammoths, steppe bison, and the short-faced bear) are common in Old Crow, Bluefish and Bell-Whitefish basins. The Beringian history of northern Yukon has been the focus of international scientific studies for more than 30 years, and new information continues to emerge on this significant chapter in human history.

The planning region includes some of the oldest recorded sites of human occupation in North America. Bluefish Caves, a cave complex 50 km southwest of Old Crow, contain one of the oldest recorded sites of human occupation in North America (24,000 years).

Sites in the western foothills of the Richardson Mountains record at least 12,000 years of human history. Many additional sites have been recorded and remain to be found.

The region contains several intact caribou fences, a communal form of caribou interception hunting technology. Most intact caribou fences are located around Old Crow Flats but others have been documented in the Richardson Mountains and in the vicinity of Whitestone River. Caribou fences were formerly used throughout the entire western subarctic. The fences in the North Yukon Planning Region may represent the last remaining examples of a traditional way of life in North America.

Important fur trade era trading centres include Rampart House (established at current location in 1891) and Lapierre House (established at current location in 1851). Over the past 10-years, Rampart House has undergone extensive reconstruction efforts. The historical Gwich'in communities of Whitestone Village and Johnson Creek Village played an important role in the family and economic history of the region during the fur trade period.

Vuntut Gwitchin Heritage Routes and Sites are identified in the VGFN Final Agreement (see Figure 4.1, this Plan). Some of the routes are still used today, with the Old Crow – Fort McPherson Trail receiving increasing levels of use.

Identified heritage and cultural priorities for VGFN and adjacent First Nations include the vicinity of Old Crow, Old Crow Flats, Vuntut National Park, Whitefish Lake (wetlands), Cadzow Lake (wetlands), Bluefish Basin (wetlands), Bluefish Cave, Driftwood River – Salmon Cache, Fishing Branch, vicinity of Whitestone Village, Bell River-Summit Lake, and Rock River-Richardson Mountains. The major rivers (Porcupine, Eagle, Bell and Whitestone) are also important cultural areas, particularly for travel and harvesting.

2.8 Economic Interests

2.8.1 Transportation

Transportation networks and infrastructure play a major role in land use and economic development in remote northern jurisdictions. In northern Yukon, transportation infrastructure is currently limited. Much of the region is remote and inaccessible for portions of the year.

Road, air and water are all important modes of transportation in the North Yukon Planning Region. The Dempster Highway is the only all-season, maintained highway in the North Yukon Planning Region (see Map 1 and 4). Completed in 1979, the highway links Yukon and southern Canada to the Mackenzie delta communities of Ft. McPherson, Tsiigehtchic and Inuvik in NWT. The surfaced gravel road traverses approximately 200 km of the southeast portion of the planning region, through Eagle Plains and skirting the foothills of the Richardson Mountains. Most transportation interests within the region relate to the transport of materials and goods along the Dempster Highway corridor.

Old Crow is the only community in Yukon without all-season road access. Regular scheduled air service meets the daily needs of Old Crow, with chartered air service used to accommodate major freight volumes, including fuel. Air transport facilitates the movement of people between Old Crow, Dawson, Inuvik, Whitehorse and seasonally, Fairbanks (Alaska). The Old Crow winter road is used occasionally to transport large materials and goods between the Dempster Highway at Eagle Plains and Old Crow, on an 'as needed' basis.

Some of the major rivers of the region, most importantly the Porcupine, Eagle, and Bell, facilitate summer and winter travel for residents, and river-based wilderness tourism. An extensive network of winter trails exists in the vicinity of Old Crow. The Old Crow – Fort McPherson winter trail is used for occasional snowmobile and dogsled travel between the two communities (see Maps 3 and 4).

2.8.2 Tourism and Recreation

Tourism activity in the region is currently low, and limited to occasional visitors. A market for tourism is not well developed. Current activities are associated with wilderness travel, wildlife viewing, Old Crow visits and stays, and Dempster Highway tours. Tourism opportunities are currently marketed around VGFN culture, wildlife, and natural scenery. Areas of tourism and recreation interest are shown in Map 4.

Most tourism and recreation activities occur along the Dempster Highway. Approximately 7000 tourists travel the Dempster on an annual basis, either using their own transportation or through scheduled tours (Yukon Department of Tourism and Culture, 2004). The region receives approximately 50-60 self-guided wilderness travelers, with most participating in river travel along the Eagle, Bell and Porcupine rivers. An unknown number of specialty visitors such as writers, film crews, scientists and researchers also visit the planning region.

The region's two parks, Vuntut National Park and Ni'iinii'njik (Fishing Branch) are relatively new and are not major tourism draws at present. Both are remote and contain limited infrastructure to support regional tourism. In 2006, cabins and a helicopter pad were constructed at Bear Cave Mountain in the Ni'iinii'njik Ecological Reserve to support specialty tourism visits on an experimental basis.

The region has limited visitor services. Two bed and breakfasts in the community of Old Crow, and the Eagle Plains lodge along the Dempster Highway (includes a motel, restaurant, and garage), provide the only all-season visitor facilities. There are no restaurants in Old Crow. Along the Dempster Highway, north of the Eagle Plains lodge, the Rock River Territorial campground, Arctic Circle viewpoint and interpretive panels are important tourism resources.

Other recreational pursuits in the region include hunting and fishing, wilderness river travel, camping, hiking, sightseeing, wildlife viewing, skiing, bicycling, recreational vehicle use (ATVs, snowmobiles, aircraft), mountain climbing, dog mushing, and

photography. The number of recreationalists is not currently known. First Nations subsistence harvesting and travel on the land is not considered to be a recreational activity.

2.8.3 Oil and Gas Resources

While oil and gas exploration and development activities in the region are currently low, the region contains a significant portion of Yukon's total estimated natural gas and oil potential. Current resource assessments suggest substantial natural gas potential, and moderate oil potential (Hannigan, 2001; Hannigan et al. 2000; Osadetz et al. 2005). There are three recognized oil and gas basins: Eagle Plains, Kandik, and Old Crow (see Map 4). Section 2.4 provides a summary of existing oil and gas permits and significant discovery licenses.

The estimated mean natural gas resource is 7.9 trillion cubic feet (Tcf), and the estimated mean oil resource is 536 million barrels (MMbbls). Portions of the three basins are outside of the region or are unavailable for exploration and development. In other jurisdictions where resource assessments have been completed early in the life of an oil and gas play, they have tended to be conservative.

The Eagle Plains basin contains the majority of the total natural gas and oil potential. The basin was the focus of a large amount of exploration in the 1960 and 1970s. Three oil and gas discoveries were made, and a number of other wells had oil and gas shows. Given this situation, and its proximity to the Dempster Highway, Eagle Plains is considered to be the area of highest interest to industry. The basin recently received industry interest in a call for postings by the Yukon Oil and Gas Management Branch (April 2007), resulting in 13 new oil and gas permits. In the near future, the Old Crow and Kandik basins are of lower interest due to limited exploration history, existing protected area status (Old Crow), and remoteness (Kandik).

Natural gas production will depend on prior construction of pipeline infrastructure in adjacent jurisdictions, and access to the pipeline. Lack of pipeline infrastructure is currently a major barrier to the development of a natural gas industry in northern Yukon. Oil resource estimates are insufficient, at present, to justify construction of a separate oil pipeline. Oil development is anticipated to be on a smaller, localized scale and may occur separately from, and prior to, natural gas. Natural gas production is not anticipated until at least 2020.

2.8.4 Mineral Resources

Direct interest in the mineral and coal resources of the region is currently very low. Mineral resources remain largely unexplored, and there is a limited understanding of mineral potential. There are currently no operating mines, and there is limited potential for a producing mine to be established in the near future. In the late 1960s and 70s, the level of geological and mineral exploration in the region was much higher than present;

many activities were associated with oil and gas exploration. A summary of existing mineral claims is provided in Section 2.4.

Poorly understood geology, remoteness and the relative lack of road access have been identified as important factors contributing to low levels of mineral exploration. Uncertainty regarding land status and land withdrawals associated with Inuvialuit, Tetlit Gwich'in and Vuntut Gwitchin land claim negotiations is also a contributing factor.

Based on current mineral assessments, 3% of the planning region is considered to contain 'high' mineral potential (Bradshaw 2005). Most areas of higher mineral potential are located in the western portion of the planning region, in the vicinity of Ni'iinlii'njik (Fishing Branch) Special Management Area (see Map 4).

Five percent of the region contains potential for coal deposits, and 1% of the region has potential for iron. Given the transportation issues, it is unlikely that coal would be pursued for large-scale production anywhere in the region; there are coal deposits in close proximity to Old Crow that may represent a potential future energy source for the community. The Alto iron deposit west of Ni'iinlii'njik (see Map 4) is the only currently recognized mineral deposit.

2.8.5 Aggregate (Gravel) Resources

Aggregate (including sand, gravel, and crushed rock) is critical for the development of municipal, transportation and industrial infrastructure in northern permafrost landscapes. Gravel or crushed rock is required for road and building pad construction. Granular resources are required 'close to source' as it is cost prohibitive to transport large volumes of aggregate long distances. In the region, gravel is a non-renewable resource in relatively limited supply. Given the permafrost conditions of the region, large volumes of aggregate will be required to support any future industrial land uses.

The region has 28 active gravel quarries; twenty-seven of these service the Dempster Highway and are located within 1 km of the road corridor. The community of Old Crow has one aggregate quarry on Crow Mountain to service community needs (river bank stabilization, airport re-surfacing and various road and municipal requirements). Existing gravel pits are currently adequate to supply the maintenance requirements of the Dempster Highway and the community of Old Crow.

Outside of the Dempster Highway corridor, a regional aggregate assessment has not been completed. The surficial geology mapping of Thomas and Rampton (1982a,b,c) provides a source of information to identify potential granular materials in the vicinity of the Dempster Highway.

The distribution and availability of aggregate resources is currently not well documented. The main sources of aggregate in the region appear to be high terraces above rivers, exposed ridges, and dry river/creek beds. River valleys contain the most readily available and accessible sources of aggregate. High terraces along the major rivers in the Dempster

Highway area, primarily the Eagle, Bell, Whitestone, and Porcupine Rivers, are a potential source of aggregate.

2.8.6 Traditional Economy

Vuntut Gwitchin and other First Nations spend a considerable amount of time on the land enjoying and participating in subsistence harvest activities including hunting, fishing, and trapping. Old Crow residents participate in traditional economic pursuits such as hunting, fishing and berry harvesting to provide staple food items, and to provide feed (e.g. Chum salmon) for dog teams. Subsistence harvesting of caribou, moose, waterfowl, muskrat, ptarmigan, rabbits, fish, berries, and edible plants is still an important cultural and economic activity for residents and other communities. A high participation rate in the traditional economy is important for the maintenance of Vuntut Gwitchin culture, ties to the land, and community well-being. These activities also play a major role in offsetting the high cost of food item purchases in Old Crow.

While the areas around Old Crow, the Porcupine, Bell and Eagle river corridors, and the Dempster Highway currently experience the highest level of subsistence use and harvesting, many other areas utilized historically are still used today, only less frequently (see Map 3). Subsistence harvest rights extend into Vuntut National Park.

Approximately 600 caribou are harvested annually. Caribou is the most frequently consumed wild food in Old Crow. Based on the most recent survey information, Old Crow households serve caribou on average 240 times per year (Wein, 1994). The entire area around Old Crow is utilized for caribou hunting, with some of the most important locations being along the Porcupine River, where hunters intercept caribou along their spring and fall migration. Some of the Porcupine River sites, such as Klo-Kut and Rat Indian Creek, have been utilized as caribou hunting locations for at least 1000 years. When caribou winter in the Old Crow area, important hunting areas include Ahvee Mountain, Lone Mountain, Sharp Mountain, White Snow Mountain and Caribou Bar Creek-Rampart House. Caribou hunters will travel as far as the Whitefish Wetlands, Rock River and the Bell River area, when required.

Outside of the Old Crow area, the Dempster Highway corridor is the focus for the majority of First Nation subsistence and non-First Nation caribou harvesting effort. Fort McPherson and Aklavik residents also hunt and trap in the Gwich'in Secondary Use Area of the Richardson Mountains via Rat River – Summit Lake, and at the headwaters of LaChute and Rock Rivers.

Fish harvesting activities are primarily centred on the Porcupine River and major tributaries. The Porcupine River from Driftwood River downstream to Ramparts, at the Yukon-Alaska border, receives the highest level of fishing effort. Areas on Old Crow Flats, the lower Driftwood River and Porcupine Lake, a broad slow moving stretch of the Porcupine River adjacent to Whitefish Wetlands, are also utilized frequently. Tizya Creek, the outflow of Whitefish Wetlands to the Porcupine River, has been noted as a fishery resource of regional significance.

The summer and fall periods are important salmon harvesting times. Chinook (King) and Sockeye (Red) salmon are important food items for Old Crow residents, while Chum (Dog) salmon is generally utilized as food for dog teams.

Trapping is still practiced as a main or supplementary economic activity, when fur prices warrant, but trapping activities are not considered a "main stay" economic activity. When fur prices are high, 10 to 20 Old Crow land users may be actively trapping during the winter months. The entire VGFN traditional territory is a single group trapping area (Group Trapping Concession #401). Important Vuntut Gwitchin trapping areas include Old Crow Flats, lower Porcupine and Driftwood rivers, Bluefish Lake, Keele Range, Bluefish wetlands, Ahvee and Sharp Mountains, Johnson Creek, and Whitefish wetlands.

2.8.7 Forest Resources

The planning region currently has very limited or no commercial forestry potential. Commercial forestry activities do not occur and are not expected in the near future. The community of Old Crow has economic interests in forest resources as sources of local fuelwood and building materials. Map 3 shows current fuelwood and forest harvesting areas around the community. Fuelwood cutting and hauling is an important source of employment in Old Crow.

Old Crow may be considered the most forest dependent community in Yukon. Approximately 600 cords of fuelwood are harvested annually, supplying 30% of Old Crow's energy requirements. Harvesting generally occurs within a 20-30 km radius of the community, along the Porcupine River and tributaries. Most harvesting activities occur between the Bluefish and Driftwood rivers in the winter, using snowmobiles. In the summer, forest harvesting activities occur in areas upstream of the Porcupine River. These are accessed by boat, and the logs are floated down to the community.

Large diameter trees for building materials are a scarce resource in the Old Crow area. Large diameter trees are confined to riparian sites and well-drained southerly and westerly slopes. Some of the best quality and largest timber is located along David Lord Creek and lower Driftwood River. Forest cover (vegetation) mapping (1:50,000 scale) produced by the Yukon Forest Management Branch is available for a large area around Old Crow (North Yukon Planning Commission, 2007b, Map #47).

2.8.8 Renewable Energy

Renewable energy refers to the generation of heat and electricity from natural resources that are not depleted over time. Examples include hydro (energy from flowing water), wind, solar (energy from the sun), geothermal (heat from steam or hot groundwater), earth (heating or cooling using below ground ambient temperatures), and trees or other forms of biomass that can regenerate after some of the resources are used.

Renewable energy is not a major economic consideration in the North Yukon Planning Region at this time. Most power generation requirements in the region are met by non-renewable energy sources, particularly diesel power generation. Growing concerns over cost and environmental factors have resulted in the community of Old Crow beginning to explore renewable energy options and energy efficiency. Locally harvested fuelwood, a renewable energy source, provides a portion of the residential heating requirement for residents of Old Crow.

Wind power generation on Crow Mountain has been investigated in the recent past, but was determined to not be feasible at that time. The Northern Canada Power Commission identified two potential large-scale hydro sites in the region in the 1960s and 70s, including Porcupine Canyon at Rampart House, and Salmon Cache Canyon on the Porcupine River. Neither site received a formal feasibility study or assessment.

If large-scale industrial development does not occur in the future, energy demands in the region are not anticipated to increase significantly from existing levels.

2.8.9 Guiding and Outfitting

There are no guiding or outfitting concessions in the region. The VGFN do not currently wish to participate in or have commercially guided sport hunting or fishing occur in the region.

2.9 Existing Plans and Planning Processes

The VGFN Final Agreement clauses 11.2.1 and 11.2.1.2 state that *'Any regional land use planning process in the Yukon shall be linked to all other land and water planning and management processes established by Government and Yukon First Nations minimizing where practicable any overlap or redundancy between the land use planning process and those other processes.'*

Table 2.5 provides a description of existing plans, processes, responsible agencies, and the current status of such plans/processes as they relate to the North Yukon regional planning exercise. These other plans and/or processes were considered during the production of this Plan.

Table 2.5. Existing Management Plans, Agreements and Processes in the North Yukon Planning Region.

Plan or Planning Process	Agency	Description	Relationship to North Yukon Regional Land Use Plan
Existing Plans			
Old Crow Flats Special Management Area Management Plan (2006)	• VGG • YG • NYRRC	Management plan for Old Crow Flats Special Mgmt Area (see Chapter 10, Schedule C of VGFNFA)	• OCF management objectives and recommendations informs NY land use plan • NY land use plan does not apply directly to OCF SMA
North Yukon Tourism Strategy (2004) * Approved in 2006	• VGG • YG	Tourism strategy for Vuntut Gwitchin Traditional Territory	• Identifies current and future potential tourism opportunities in the North Yukon Planning Region
Dempster Highway Economic Development Agreement (2006)	• VGFN • YG • NND • THHN	YG/FNs Development Partnership Agreement	• Scoping document that may lead to detailed study of economic opportunities within 50km of the Dempster Hwy
Vuntut National Park of Canada Management Plan (2004)	• Parks Canada • VGFN • CWS • NYRRC	Management plan for Vuntut National Park of Canada (see Chapter 10, Schedule A of VGFNFA)	• VNP management objectives and recommendations inform NY land use plan • VNP ecological criteria and indicators assist NY land use plan • NY land use plan does not apply directly to Vuntut National Park of Canada
Ni'iinlii'njik (Fishing Branch) Wilderness Preserve, Ecological Reserve and Settlement Land R-5A and S-3A1 Management Plan (2004)	• VGFN • Yukon Environment • DFO • NYRRC	Management plan for Ni'iinlii'njik (Fishing Branch) SMA (see Chapter 10, Schedule B of VGFNFA)	• Ni'iinlii'njik (Fishing Branch) management objectives and recommendations inform NY land use plan • Identified special wildlife considerations inform NY land use plan • NY land use plan does not apply directly to Ni'iinlii'njik (Fishing Branch) SMA
Ni'iinlii'njik (Fishing Branch) Wilderness Preserve and Habitat Protection Area (2004)	• VGFN • Yukon Environment	Management plan for Ni'iinlii'njik (Fishing Branch) SMA (See Chapter 10, Schedule B of VGFNFA)	• NY land use plan considers HPA as part of the region's IMA or 'working landscape' and makes relevant management recommendations in order to provide linkage with remainder of region
Old Crow Physical Development Plan / Capital Plan (2003 – 2008)	• VGFN	Community development plan for Old Crow	• Identifies community infrastructure development needs for Old Crow • Outlines transportation and material requirements for Old Crow • Plan informs NY land use plan regarding community needs

Table 2.5 (con't). Existing Management Plans, Agreements and Processes in the North Yukon Planning Region.

Plan or Planning Process	Agency	Description	Relationship to North Yukon Regional Land Use Plan
Porcupine Caribou Herd Management Plan (2000)	• Porcupine Caribou Management Board	Transboundary management plan for Porcupine caribou herd	• Management objectives, recommendations and strategies for PCH inform NY land use plan • Important PCH habitats identified in plan are considered in NY land use plan
Rampart House Historic Site, Lapierre House Historic Site Management Plan (1999) * Approved in 2001	• VGFN • YG	Management plan for Rampart House and Lapierre House historic sites (See Chapter 13, Schedule B of VGFNFA)	• Plan informs NY land use plan regarding management recommendations for site-specific historic and heritage resources • NY land use plan does not apply directly to Rampart House or Lapierre House historic sites
Draft VGFN Chapter 22 Economic Development Plan (1998)	• VGFN	Strategic economic development plan for VGFN (See Chapter 22 of VGFNFA)	• NY land use plan considers strategic economic direction and goals for VGFN and VGFN Settlement Lands/Traditional Territory
Plans in Preparation or under Review			
North Richardson Sheep Management Plan (in prep)	• VGG • YG • NYRRC • NWT Gov't • Others	Sheep management plan for North Richardson Mountains	• Provides Best Management Practices and recommendations for sheep harvesting and management
North Yukon Fish and Wildlife Management Plan (updating of plan – reviewed on 5-year cycle)	• VGFN • Yukon Environment • NYRRC	Management plan for fish and wildlife resources of Vuntut Gwitchin Traditional Territory (see Chapter 16 of VGFNFA)	• Fish and wildlife management objectives and recommendations inform NY land use plan • Important fish and wildlife habitats identified in management plan are considered in NY land use plan • Management plan informs NY land use plan regarding focal wildlife species

3. Plan Concepts

Described in detail below are four major land management tools and approaches proposed for the North Yukon Planning Region: **Landscape Management Units**, a **Land Use Designation System**, a **Results-based Management Framework** and **General Management Direction**. The proposed tools and approaches are anticipated to achieve the broader intentions of the plan, as directed by stakeholders. These tools and approaches are commonly applied in land use plans from other jurisdictions to guide land management decisions.

3.1 Landscape Management Unit (LMU)

Landscape Management Unit (LMU) is the term proposed for the primary land management units described within the North Yukon Regional Land Use Plan. An LMU is a large (larger than 100,000 ha) land area that has identifiable and repeating patterns of topography and vegetation. LMUs generally conform to the ecodistrict concept – land units that have identifiable and repeating patterns of topography and vegetation. Each unit contains specific ecological, cultural and/or economic resource values.

Where required, LMUs are modified to reflect existing management boundaries such as Special Management Areas (e.g. Protected Areas and Habitat Protection Areas), interim land withdrawals, watersheds, important ecological, cultural or economic values, or existing infrastructure (e.g., Dempster Highway). An LMU may be further subdivided to identify discrete sub-units that reflect areas of special management consideration or identified values.

Proposed North Yukon Planning Region LMUs are shown on Map 5 and described in Section 5.

3.2 Land Use Designation System

A **Land Use Designation System** is used to guide the management of land use activities within different areas of a region or landscape. It provides the broadest level of guidance for land and resource decision-making. A land use designation system consists of different land categories that describe either the type or intensity of land uses that are allowed or recommended for each specific LMU. A combination of maps and text communicate what the different categories mean. A land use designation system may also be referred to as ‘land use zoning’ or ‘resource management zoning’ – the term ‘land use designation’ is recommended for Yukon regional planning to avoid potential confusion with municipal applications of the term ‘land use zoning’.

The proposed land use designation system for North Yukon Planning Region is summarized in Table 3.1. The system includes three general land use categories:

Protected Area (PA), Integrated Management Area (IMA) and Community Area (CA). The IMA category is further described by four distinct zones, each referring to a relative level of conservation or development focus as it is prescribed to a given land unit. Land use designation categories and zones are applied to each LMU or sub-unit. Each land category is described below and shown on Map 6.

3.2.1 Protected Area (PA)

The Protected Area (PA) land category refers to legally designated land areas withdrawn from surface and subsurface rights issuance (e.g., land disposition). National Parks managed by the federal government are an example. PAs are intended to meet International Union for Conservation of Nature (IUCN) Protected Area Categories I, II or III conservation criteria for 'full protection'. Regional planning can only recommend PAs as PA management plans are created under separate processes.

Under special circumstances, PA management plans may provide specific terms and conditions allowing required surface access or opportunities for sub-surface exploration and resource extraction. Protected Areas can also include interim protected lands. Interim protected areas generally have a specific time limit for protection. When the time limit is close to expiry, a review of the management recommendations and land status of such areas is undertaken. For example, the East and West portions of the Old Crow Flats Special Management Area are currently under interim protection until 2026.

Table 3.1. Proposed Land Use Designation System for North Yukon Planning Region.

<table>
<tr><th>Land Use Category</th><th colspan="2">Description</th></tr>
<tr><td>Protected Area (PA)</td><td colspan="2">• Legally-designated protected areas that are not available for land disposition or industrial activities
• Managed by existing and/or future management plans
• Protected area management plans are created under separate processes from regional planning, but regional planning may recommend creation of PAs</td></tr>
<tr><td rowspan="6">Integrated Management Area (IMA)</td><td colspan="2">• The ‘working landscape’: areas where mineral and oil and gas disposition processes, other industrial activities and other land uses are allowed, subject to the approved recommendations of the regional plan and existing legislation/regulations
• Each landscape management unit within the Integrated Management Area is further categorized by one of the following zones, in consideration of the heritage, cultural, ecological and economic resources and values identified in the unit</td></tr>
<tr><td>IMA Zone</td><td>Management Intent</td></tr>
<tr><td>Zone I</td><td>highest conservation / lowest development focus</td></tr>
<tr><td>Zone II</td><td>high conservation / low development focus</td></tr>
<tr><td>Zone III</td><td>moderate conservation / moderate development focus</td></tr>
<tr><td>Zone IV</td><td>lower conservation / higher development focus</td></tr>
<tr><td>Community Area (CA)</td><td colspan="2">• Areas adjacent to communities/municipal areas where land uses that support community development and infrastructure requirements are prioritized
• Community (local area) planning is generally undertaken in these areas</td></tr>
</table>

3.2.2 Integrated Management Area (IMA)

The Integrated Management Area (IMA) is available for surface and subsurface rights issuance (e.g., land disposition). The IMA would be managed in an integrated manner for multiple land uses within the sustainable development parameters established by the North Yukon Regional Land Use Plan, subject to the approval of plan recommendations, and existing legislation and regulations. The IMA may be considered the 'working landscape' where multiple land uses and activities are allowed. Such uses can include, but are not limited to, transportation, mining, oil and gas, sand and gravel extraction, hydroelectric utilities, commercial forestry, tourism and recreation.

Management direction within the IMA can be considered 'flexibly-prescriptive' in that it prescribes appropriate management guidelines to avoid potential impacts to valued resources within a specific LMU, but allows adequate flexibility for land users and managers to determine the type and nature of land use that will occur. Within the IMA, the proposed land use designation system does not prescribe acceptable or unacceptable land uses. Achieving specific management objectives and results is the primary consideration.

As discussed above, four land use zones are proposed and identified within the IMA. Each is prescribed based on relative levels of conservation or development and in consideration of all identified values and resources. The IMA zones incorporate a risk-based land management approach where LMUs with the highest identified ecological, heritage, and/or cultural values, occurring on landscapes with a high sensitivity to human disturbance, are managed conservatively to prevent or minimize impacts to valued resources. The four IMA zones establish a framework to focus conservation and development priorities for specific LMUs within the planning region. The risk-based approach to land management for IMA zones is illustrated in Figure 3.1. A description of each IMA zone is provided below and shown on Map 7.

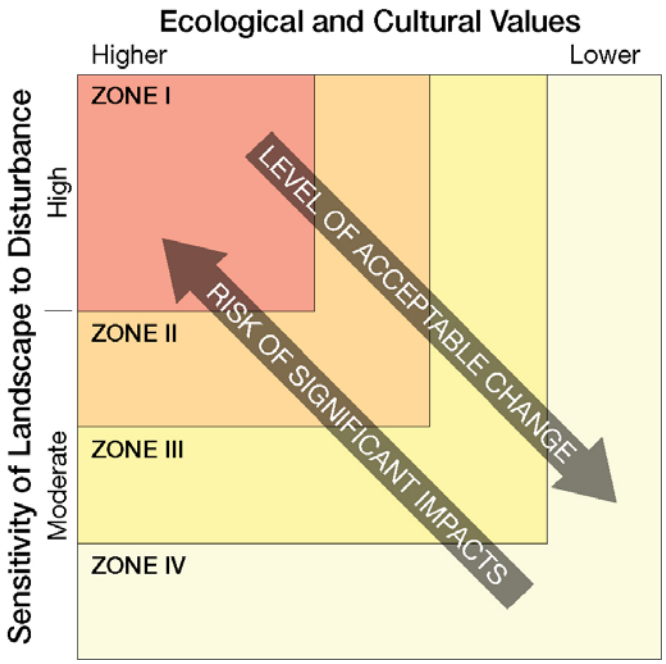

Figure 3.1. Zoning Considerations for Integrated Management Area (IMA) of North Yukon Planning Region. Zone Designations are Applied to LMUs Within an IMA Based on Consideration of Ecological, Cultural, Heritage and Economic Values, as well as Sensitivity of Landscape to Human Surface Disturbance.

3.2.2.1 Zone I

Zone I areas contain very high ecological, heritage and/or cultural values within a biophysical setting that is sensitive to potential human surface disturbance. Zone I areas contain irreplaceable habitats – significant impacts to these habitats may be irreversible. Due to the combination of sensitive terrain, hydrology and features, and the very high ecological and/or cultural values, Zone I areas require the highest level of conservation management within the IMA. As an example, major wetland complexes within the IMA are considered Zone I areas in the North Yukon Planning Region.

Maintaining ecological integrity and functional habitats, while minimizing potential industrial land use impacts is a management priority. A range of land uses are allowed provided they do not result in creation of functional disturbances[1]. All-season industrial

[1] **Functional Disturbances:** Physical land use disturbances that result in disruption of soil or hydrology, or that require the cutting of trees and woody vegetation. Activities considered exempt from functional disturbance creation are: 1) new linear features (seismic lines, trails, survey lines, etc.) less than 1.5m in width; 2) land use activities that occur on frozen water-bodies; 3) winter work that is undertaken with no required clearing of vegetation (e.g., non-forested landscape types); 4) winter work that utilizes existing un-reclaimed disturbances and linear features from previous activities.

infrastructure, aggregate extraction and establishment of permanent human settlements/structures are discouraged activities.

3.2.2.2 Zone II

Zone II areas contain very high ecological, heritage and cultural values within a biophysical setting that is moderately sensitive to potential human surface disturbance. Zone II areas contain important wildlife habitats and have concentrated wildlife use either seasonally or year round. As an example, due to the multi-season concentrated use of the Richardson Mountains by Porcupine Caribou Herd, this area is proposed as a Zone II area in the North Yukon Planning Region. Zone II areas also contain concentrations of archaeological and heritage sites and/or have the potential for finding such sites. They can also have high potential for wilderness tourism and interpretation.

Due to very high ecological, heritage and/or cultural values, Zone II areas require a high level of conservation management. Maintaining ecological integrity and minimizing potential industrial land use impacts is a management priority.

3.2.2.3 Zone III

Zone III areas contain moderate-high ecological, heritage and/or cultural values within a biophysical setting that is moderately sensitive to potential human surface disturbance. Concentrated seasonal wildlife use of Zone III areas tends to be focused within portions of LMUs, and documented or potential archaeological sites and heritage values are more dispersed or site-specific compared to Zone II areas.

Due to the nature of the ecological, heritage and/or cultural values, Zone III areas require a moderate level of conservation management. Potential impacts of industrial development can generally be mitigated through use of timing windows, avoidance of wildlife concentrated use areas, best management practices and cumulative effects management strategies.

3.2.2.4 Zone IV

Zone IV areas contain lower ecological, heritage and/or cultural values within a biophysical setting that is moderately sensitive to potential human surface disturbance. Concentrated seasonal wildlife use of Zone IV areas tends to occur in small portions of an LMU or do not occur at all. Zone IV areas have few documented archaeological and heritage sites and those that are identified are generally site-specific.

Due to the nature of the ecological, heritage and/or cultural values, Zone IV areas require a lower level of conservation management. Potential impacts of industrial development can generally be mitigated through use of timing windows, avoidance of wildlife concentrated use areas, best management practices and cumulative effects management strategies. Properly managed industrial land use activity is considered consistent with Zone IV management objectives.

3.2.3 Community Area (CA)

A Community Area (CA) is a local or municipal planning area that surrounds a city, town or village boundary. Regional land use plans may identify where CAs are required and provide higher-level direction to those areas, but the management of a CA is usually the responsibility of detailed planning exercises independent of the regional planning process.

CAs are intended to identify areas where land uses that support community development and infrastructure requirements are prioritized. In the North Yukon Planning Region, the CA applies to an approximate 5km area around the unincorporated village of Old Crow, not including the Old Crow Flats Special Management Area.

3.3 Results-Based Management Framework

To address the planning objectives in the North Yukon Planning Region, this land use plan proposes the adoption of a **Results-based Management Framework** as an effective planning model to guide management decisions. This is accomplished by linking the Plan's goals and objectives, tools, approaches, and environmental monitoring needs into one cohesive strategy. Monitoring tends to focus on the IMA or 'working landscape', where ecological, cultural and economic values transect – a scenario with the greatest potential for cumulative effects.

A results-based management framework follows a structured approach where the broad purpose, principles, and management intentions of the plan dictate specific actions and information requirements necessary to achieve plan objectives. A successful results-based management framework would link explicit plan objectives to regional indicators of environmental condition, allowing for informed and directed decision-making. Results to be achieved by the plan are always the focus of this framework.

A general example of a results-based management framework is provided in Figure 3.3. The framework applies to the IMA land use category, and also to the individual landscape management units within the IMA that are zoned for varying levels of conservation and development (see Section 3.2 for discussion). Such frameworks have been proposed, adopted and implemented in other jurisdictions and planning exercises (e.g., the Teslin Strategic Forest Management Plan; the Northeast National Petroleum Reserve Alaska Plan; the Peace-Moberly Tract Sustainable Resource Management Plan in BC; and the Muskwa-Kechika Land and Resource Management Plan, also in BC).

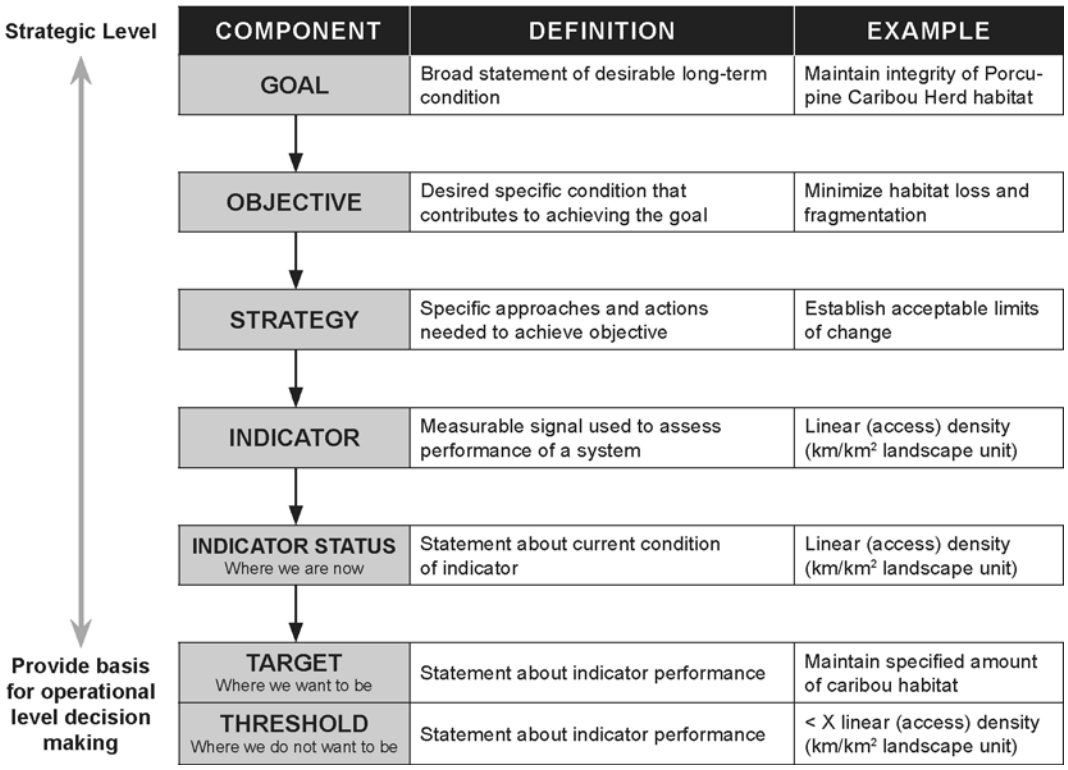

Figure 3.2. Components of a Results-Based Management Framework (Adapted from the BC Integrated Land Management Bureau, 2007). The Purpose and Guiding Principles of the Plan Provide Strategic Direction for Setting Plan Goals and Objectives.

An important principle of the framework is that as the level and intensity of land use increases, so does the risk of damage to valued ecological and cultural resources. As risk increases, so generally do the costs of action or inaction. The level of risk to valued resources is assessed through evaluation of the condition of an indicator. This evaluation can be performed by comparing the status of the indicator against a stated target or threshold value. This is one measure of environmental performance that can be used to determine if objectives are being met or if there is a risk that they might not be met.

The link between objectives, indicators and targets/thresholds is crucial for tracking, reporting and decision-making. In the absence of targets or thresholds, it is difficult to determine if a plan is achieving its stated objectives.

3.3.1 Indicators of Cumulative Effects

In regional planning, emphasis is often placed on determining possible impacts of multiple human activities on ecological and cultural systems and values. Cumulative effects are changes to the environment and/or society that result from a land use activity

in combination with other past, present and future activities. The effects can be positive or negative. While one activity may have only a small impact, the combined effect of a number of activities may have a significant impact. Appendix 3 has additional discussion of cumulative effects management.

Addressing cumulative effects can be accomplished by applying a suite of integrated and coordinated actions to land management—assessment, mitigation, and government policy are examples of approaches that can be applied to manage cumulative effects. Cumulative effects indicators can also provide signals of environmental condition relevant for tracking the effects of multiple land use activities.

One evaluation of cumulative effects results from comparing the current status of an indicator to a stated threshold. When the current status or condition of an indicator is close to a threshold, there may be risks to the ecological and cultural systems and values if additional land use activities occur. The comparison of indicator status to a threshold represents a risk-based management strategy for resources, as discussed in Section 3.3 above. Risks to valued resources can occur from direct effects (e.g., loss of heritage resources or wildlife habitat) or indirect effects (e.g., hunting mortality on caribou).

This Plan proposes two indicators relevant for monitoring potential cumulative effects in the IMA, or 'working landscape'. The two indicators provide measures of risk related to estimates of human-caused disturbance. The two indicators are: 1) **Human-caused surface disturbance**, and 2) **Linear (access) density**.

3.3.1.1 Human-caused Surface Disturbance

Human-caused surface disturbance is defined as 'the physical disruption of soil or hydrology, or the clearing of trees and woody vegetation'. This indicator is expressed as the proportion (%) of direct surface disturbance within a specific LMU or sub-unit. The amount of surface disturbance provides a measure of direct habitat-related impacts.

This indicator may also be considered the direct human 'footprint' on a landscape that results from land use activities. Ecological and cultural values may be impacted when too many structures, roads, gravel pits, etc. are constructed and utilized on the landscape. High levels of habitat removal or conversion may result in changes to native animal and plant communities.

3.3.1.2 Linear (access) Density

Linear features are roads, trails, seismic lines, power transmission lines, and similar features; they are a type of human-caused surface disturbance that facilitates access into previously inaccessible areas. Linear features less than 1.5m in width are not considered to contribute greatly to increased access, and are therefore not counted or reported as new linear features for this indicator.

Linear (access) density is expressed in km/km^2. It is the total length of all linear features greater than 1.5m in width, per total area of the LMU or sub-unit. Linear (access) density is calculated based on the total area (km^2) of the entire LMU or sub-unit. Such a method provides adequate flexibility for land users and permits more intensive land use in specific areas.

Linear features fragment landscapes and facilitate increased access to areas, and may have several direct and indirect effects on wildlife and fish. Linear density provides a measure of landscape fragmentation, and may therefore also be used as an index of core habitat area. Core habitat refers to the area of a landscape that remains intact and unaffected by human features.

Linear (access) density is an important consideration in maintaining ecological integrity. Fragmented habitats are often a disadvantage to sensitive species, and they provide more access to the landscape for a variety of activities, including additional harvest. In highly fragmented areas, sensitive species are often displaced or are indirectly impacted through additional hunting, road-kills, etc.

In some studies, animals such as caribou have been observed to avoid areas of disturbance like roads and active trails, in part, because of increased visibility and vulnerability to predators. This avoidance of linear features can, in turn, reduce the caribou's access to and availability of key habitat. This indicator is also appropriate for tracking potential cumulative effects.

The rationale for monitoring these two indicators is well supported in the literature. A growing body of research suggests that the total amount of surface disturbance (human-caused footprint) and linear (access) density of roads, trails, seismic lines, etc. is related to overall ecological integrity of natural systems (Duinker, 2000; Dyer et al., 2001; Environment Directorate, Northern Affairs Program, 2002; Cameron et al., 2005). As the levels of these two indicators increase within a region, the ecological and cultural integrity of natural systems, resources and values generally decrease. The ability to enjoy cultural pursuits and opportunities such as subsistence harvesting may also be compromised. Managing these risks is a central aspect of the thresholds concept and delivery.

Setting thresholds for these indicators provides ecologically meaningful reference points to assess overall environmental condition in the IMA or a specific LMU. Thresholds are particularly useful reference points for the 'working landscape' where the conservation of important ecological and cultural resources must be balanced with land use and economic development activity. This Plan does not consider thresholds for Protected Areas as these fall under separate management regimes and management plans.

Determining the status of these two indicators is also relatively easy to obtain through existing development assessment processes. Within the North Yukon Planning Region, the indicators would be monitored within specific land management units present within the IMA (see Map 6). Specific indicator thresholds would apply to a land management

unit, dependent upon the zone to which the LMU is assigned (see Section 3.2 above). Land use activity can be expressed and evaluated in many ways, but these two indicators provide a relevant and reliable measure of environmental condition – the "results" of a results-based management framework.

An expanded list and rationale explaining why these indicators were selected and how they are proposed to be calculated is provided in Appendix 3.

It should be noted that an indicator provides one piece of information for a specific measure of environmental condition. While indicator tracking is an additional tool for integrated decision-making, indicators do not and should not replace the discretion of decision-making pertaining to environmental assessment, permitting or appropriate industry operating practices, which necessarily must consider many sources of information during the decision-making process.

Included in Appendix 6 are a suite of potential cumulative effects indicators that provide information on a broad suite of regional ecological, social/cultural and economic conditions. These indicators may be considered Regional Sustainable Development Indicators. An integrated assessment of such indicators could be used to determine if the *Sustainable Development* criteria of a land use plan are being met. Interpreting these indicators to assess regional "well-being" is currently beyond the scope of this planning exercise but should be considered during future Plan Reviews (see Section 7 and Appendix 6).

3.3.2 Thresholds

A threshold marks the point beyond which any further change to a landscape may undermine the ecological and social systems upon which communities depend.

As discussed above, thresholds in a land use plan are intended to provide reference points needed for indicator performance evaluation that can offer guidance for land use managers on the state of the environment. A general land management guideline should be to maintain the level of the proposed cumulative effects indicators below the proposed threshold value.

Thresholds do not necessarily have to represent a single value at which point some management action may be required. A **cautionary threshold** represents a point where an indicator is reaching a level where undesired impacts to resources may begin to occur. A cautionary threshold is an early warning signal, showing that an indicator may be close to a point where additional activities in the area may reach undesirable levels. A **critical threshold** represents a point where an indicator has reached or surpassed an acceptable limit of change. The status or condition of an indicator cannot be evaluated as acceptable or unacceptable without establishing a threshold.

Threshold establishment is based on the principle of **levels or limits of acceptable change**. Under this approach, an indicator threshold is predetermined in a plan and

management strategies can be adjusted as thresholds are reached. Often, monitoring information on the status of other indicators is required to determine if reaching a threshold is actually having undesired cumulative effects on ecological and cultural values.

Threshold setting is inherently a social choice that is informed by scientific, traditional, and local knowledge. Threshold estimation is not exact and the estimates are based upon the best available information, which is necessarily incomplete. Thus, there is uncertainty in determining appropriate levels and discerning how reaching those levels may impact valued resources.

Thresholds are not new to the Yukon and are present in many management applications. Examples of thresholds in a Yukon context include annual moose harvest quotas in the Faro area. When the quota is reached, a voluntary harvest ban is imposed for the area. In the Dawson area, the Yukon placer regime sets thresholds for acceptable sediment loads within stream basins. Under the guiding principles that the Commission must follow, thresholds are appropriate tools to balance regional economic development opportunities with the desire to ensure that current and potentially future important areas for wildlife and fish, and cultural and heritage resources have adequate conservation measures.

Thresholds in a Yukon regional land use planning context have no legislative or regulatory backing or implementation requirement. **Thresholds are not intended to be an absolute cap or limitation on activities. Thresholds are intended to provide a concise statement regarding the level of environmental change considered socially acceptable within a specific land unit, and to promote pro-active and integrated land management**. Within the IMA and specific land management units, all exploration, development and tourism activities would be considered equal opportunities, subject to usual permitting processes and general operating terms and conditions recommended by assessment boards and approved by government decision bodies.

Thresholds are intended to provide guidance for resource managers to improve their decision-making abilities in a cumulative effects context, particularly for project level assessments under YESAA legislation. To provide adequate tools to YESAB and government for consideration of cumulative effects, an acceptable level of activity or threshold must be defined as a point of reference.

To assist decision-making, the current status of the indicators within the IMA or a specific LMU must be effectively monitored, tracked, reported, and evaluated against thresholds. It is anticipated that indicator status and thresholds would be periodically updated/revised as new data becomes available.

Proposed cautionary and critical thresholds for each LMU within the IMA are discussed in Section 5. Some proposed requirements for indicator and threshold adoption and implementation are discussed in Section 6.

3.4 General Management Direction

The results-based management framework is one tool and approach to link explicit management objectives with tangible and tractable measures of environmental condition and performance. **General Management Direction** is also required in a land use plan to address various issues and concerns—this direction is provided in the form of recommendations.

Within the IMA, there are a number of identified features and interests that require management recommendations. The recommendations generally address region-wide resource management issues, although some of the recommendations pertain to features that are more localized or site-specific. Proposed management strategies, guidelines, and best management practices related to the recommendations are important considerations.

Best management practices can support the achievement of regional planning objectives by providing an important linkage between regional management strategies and prescribed actions – provided that they are agreed upon, accepted and adhered to. Management direction for various features and interests within the IMA, and within specific LMUs, is necessarily more prescriptive in order to mitigate or minimize damage to specific resources. These features and prescriptive management recommendations are discussed below in Sections 4 and 5.

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4. General Management Direction

This section provides general management direction for regional issues and land use sectors within the Integrated Management Area. Application of this general management direction to specific geographic areas of the planning region (i.e., LMUs) occurs in Section 5.

Within the Integrated Management Area, there are many values, interests and resources that require management consideration. Recommendations and strategies regarding regional management direction are organized by Sustainable Development theme – social (heritage and culture), economic and ecological (wildlife, fish, and wetlands, lakes and rivers) considerations. Issues and interests, responsible agencies and relevant legislation affecting management direction and decisions are discussed. The results-based management framework concepts discussed in Section 3.3 are applied. General strategies to achieve Plan Goals and Objectives are proposed. Specific recommendations, guidelines and best management practices to avoid or mitigate impacts on valued social, ecological and economic resources are also listed. Several recommendations relate to specific provisions of the VGFN Final Agreement.

General management direction recommendations are summarized in Section in 4.2.5.

Maps 2 to 4 of this Plan provide on overview of documented ecological, cultural and economic values and resources. Detailed maps and descriptions of resource values referenced in this section are contained in the North Yukon Resource Report (North Yukon Planning Commission, 2007a,b), and are available from the NYPC website (www.nypc.planyukon.ca).

4.1 Management Objectives and Strategies

Management objectives and strategies build on the Plan Goals discussed in Section 1.5. Plan Objectives and Strategies to achieve these Goals are summarized in Table 4.1. References to relevant sections of this Plan and indicators introduced in Section 3.3.1 are listed where they link to specific strategies. Some of the proposed indicators will be developed and implemented at a future date and are further discussed in Plan Implementation (Section 6 and Appendix 6).

Best management practices can support the achievement of regional objectives by providing an important link between general management strategies and actions. Many currently recognized best management practices (e.g., Yukon Department of Energy, Mines and Resources 2007a-c; Yukon Environmental and Socio-economic Assessment Board, 2007) relate directly to achieving the Objectives and Strategies listed in Table 4.1. Operational best management practices are at the discretion of responsible authorities.

Management strategies and their relationship to proposed recommendations, guidelines and best management practices for land use sectors and resource values are discussed in Section 4.2. The application of general management strategies and recommendations to achieve objectives within specific Landscape Management Units are discussed in Section 5.

Table 4.1. Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Plan References
Sustainable Development Issues			
GOAL 1 Promote ***Sustainable Development*** (see VGFNFA 11.1.1.6) by ensuring that social, cultural, economic and environmental policies are applied to the management, protection and use of land, water and resources in an integrated and coordinated manner	**OBJECTIVE 1.1** Consider social, economic and ecological risks and benefits of land use decisions	**STRATEGY 1.1.1** Create and evaluate land use scenarios to understand social, economic and ecological consequences of land use decisions **STRATEGY 1.1.2** Establish acceptable limits of change and indicators of environmental condition	Land Use Scenario Modeling (North Yukon Planning Commission 2007c) Section 3.3, Appendix 3, Table 5.3; Recommendation #1
	OBJECTIVE 1.2 Develop an integrated landscape management framework (see VGFNFA 11.1.1.6) that facilitates coordinated and integrated decision-making	**STRATEGY 1.2.1** Develop and apply a land use designation system **STRATEGY 1.2.2** Develop and implement a results-based management framework	Sections 3.2 and 5 Sections 3.3 and 5.2.1.2; Implementation responsibility of Approval Governments.

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Plan References
Sustainable Development Issues (cont'd)			
GOAL 1 (cont'd) Promote ***Sustainable Development*** (see VGFNFA 11.1.1.6) by ensuring that social, cultural, economic and environmental policies are applied to the management, protection and use of land, water and resources in an integrated and coordinated manner	**OBJECTIVE 1.3** Minimize and manage the cumulative impact of multiple land use activities on wildlife and fish habitat, water quality, and people	**STRATEGY 1.3.1** Create and evaluate land use scenarios to forecast, understand, and mitigate cumulative land use impacts during land use planning	Land Use Scenario Modeling (North Yukon Planning Commission 2007c); Recommendation #2
		STRATEGY 1.3.2 Promote proactive land management through application of a results-based management framework	Sections 3.3 and 5.2.1.2; Implementation responsibility of Approval Governments
		STRATEGY 1.3.3 Develop appropriate tools, approaches and indicators to monitor and manage cumulative impacts to land, water, and ecosystems	Sections 3-5 and Appendix 3; Implementation Plan to address in further detail
		STRATEGY 1.3.4 Consider project-level contributions to regional cumulative impacts to land, water, fish, wildlife and people	Responsibility of YESAB
		STRATEGY 1.3.5 Manage pace, location and scale of land use	Implementation responsibility of Approval Governments

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region. (* = VGFNFA claim clause).

Goal	Objectives	Strategies	Indicators	Plan References
Socio-Economic Issues				
HERITAGE and CULTURE **GOAL 2** Recognize and promote the heritage and cultural values of the Vuntut Gwitchin, other affected First Nations, and the Yukon	**OBJECTIVE 2.1** Apply appropriate protection and conservation measures for identified heritage and cultural resources	**STRATEGY 2.1.1** Avoid identified heritage and cultural sites and resources; where impacts are unavoidable, implement appropriate mitigation practices **STRATEGY 2.1.2** Minimize land use impacts in the vicinity of identified heritage resources	Potential indicators discussed in Appendix 3	Section 4.2.2; Recommendations #3, #4
	OBJECTIVE 2.2 Provide opportunities for the continuation of First Nations land-based subsistence lifestyles and harvesting	**STRATEGY 2.2.1** Minimize land use conflicts (see VGFNFA 11.4.5.4) by avoiding or reducing the level of land use activities in important subsistence harvesting and wilderness tourism areas (i.e. Land Use Designation), and/or conduct activities outside of important use seasons	Potential indicators discussed in Appendix 3	Sections 3.2, 4.2.2.2 and 4.2.3.3; Recommendations #5, #6
	OBJECTIVE 2.3 *To utilize the knowledge and experience of Yukon Indian People in order to achieve effective land use planning* (11.1.1.4)*	**STRATEGY 2.3.1** *Shall take into account oral forms of communication and traditional land management practices of Yukon Indian People* (11.4.5.6)*	Potential indicators discussed in Appendix 3	Sections 4.2.2 (heritage), 4.2.3 (economy), 4.2.4 (wildlife) and 5

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Indicators	Plan References
Socio-Economic Issues (cont'd)				
ECONOMIC **GOAL 3** Facilitate economic development opportunities and activities that result in socio-economic benefits to the community of Old Crow, other affected First Nations and Yukon as a whole, and that meet the sustainable development criteria (see VGFNFA 11.1.1.6) established by this land use plan	**OBJECTIVE 3.1** Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits	**STRATEGY 3.1.1** Minimize land use conflicts (see VGFNFA 11.4.5.4) by avoiding or reducing the level of land use activities in important subsistence harvesting areas (i.e. Land Use Designation), and/or conducting activities outside of important use seasons	Potential indicators discussed in Appendix 3	Sections 3.2, 4.2.2, 4.2.3 and 4.2.4; Recommendations #5 - #8, #10 - #16
	OBJECTIVE 3.2 Create land use status certainty	**STRATEGY 3.2.1** Provide clear rules and guidelines for operators **STRATEGY 3.2.2** Develop clear guidelines and process links to YESAA **STRATEGY 3.2.3** Provide clear and consistent land management intent linked to measurable objectives	Potential indicators discussed in Appendix 3	Sections 4 and 5; Recommendation #1 Section 7; Recommendation #1 Sections 3, 4 and 5

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Indicators	Plan References
Socio-Economic Issues (cont'd)				
ECONOMIC **GOAL 3 (cont'd)** Facilitate economic development opportunities and activities that result in socio-economic benefits to the community of Old Crow, other affected First Nations and Yukon as a whole, and that meet the sustainable development criteria (see VGFNFA 11.1.1.6) established by this land use plan	**OBJECTIVE 3.3** Maintain opportunities for a mixed economy to continue where traditional subsistence harvesting and cultural activities and wage-based economic activities co-exist, ensuring long-term maintenance of First Nation culture, people's connection with the land, and their well-being	**STRATEGY 3.3.1** Minimize land use conflicts (see VGFNFA 11.4.5.4) by avoiding or reducing the level of land use activities in important subsistence harvesting areas (i.e. Land Use Designation), and/or conducting activities outside of important use seasons **STRATEGY 3.3.2** Manage pace, location and scale of land use	Potential indicators discussed in Appendix 3	Sections 3.2 and 4.2.2.2; Recommendations #1, #5, #6

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Indicators	Plan References
Ecological Issues				
WILDLIFE **GOAL 4** Maintain the integrity of terrestrial habitat in a condition required to sustain regional wildlife populations, with special focus on the Porcupine Caribou Herd	**OBJECTIVE 4.1** Minimize direct and indirect human-caused habitat disturbance and alteration	**STRATEGY 4.1.1** Reduce size, intensity and duration of human-caused physical surface disturbances (e.g. low impact seismic, winter roads, enhanced reclamation)	***Human-caused surface disturbance*** (% surface disturbance, reported by LMU) ***Linear (access) density*** (km/km^2 linear features, reported by LMU)	Sections 3.3, 4 and 5, Appendix 3; Recommendations #1, #2, #18, #21 - #27
	OBJECTIVE 4.2 Minimize habitat fragmentation as a result of human features	**STRATEGY 4.2.1** Coordinate and manage road and trail access	***Linear (access) density*** (km/km^2 linear features, reported by LMU)	Sections 3.3, 4 and 5, Appendix 3; Recommendations #1, #10 - #14, #18, #21, #24, #27
	OBJECTIVE 4.3 Minimize potential habitat avoidance that results from human activities	**STRATEGY 4.3.1** Avoid or reduce activities in significant wildlife habitats during important biological periods (timing windows)	N/A	Sections 3.3, 4 and 5, Appendix 3; Recommendations #13, #18, #25

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Indicators	Plan References
Ecological Issues (cont'd)				
FISH **GOAL 5** Maintain the integrity of aquatic habitat in a condition required to sustain regional fish populations	**OBJECTIVE 5.1** Minimize human-caused aquatic habitat disturbance and alteration	**STRATEGY 5.1.1** Minimize surface and vegetation disturbance in riparian areas **STRATEGY 5.1.2** Avoid in-stream aggregate (gravel) extraction	***Stream crossing index*** (to be developed)	Sections 4.2.4.2 and 5; Recommendations #20, #23 - #25
	OBJECTIVE 5.2 Minimize stream crossings and/or stream crossing impacts as a result of roads and trails	**STRATEGY 5.2.1** Coordinate and manage road and trail access	***Stream crossing index*** (to be developed)	Sections 4.2.4.2 and 5; Recommendations #12, #24
	OBJECTIVE 5.3 Maintain fish migration routes and access to required seasonal habitats	**STRATEGY 5.3.1** Avoid critical over-wintering and spawning habitats **STRATEGY 5.3.2** Avoid direct or indirect blocking of identified fish migration routes	***Stream crossing index*** (to be developed)	Sections 4.2.4.2 and 5; Recommendations #12, #19, #20, #24
	OBJECTIVE 5.4 Maintain quantity, quality and rate of water flow, including seasonal rate of flow	**STRATEGY 5.4.1** Avoid or reduce activities in fish habitat during important biological periods (timing windows) **STRATEGY 5.4.2** Avoid or reduce winter in-stream water withdrawals in over-wintering fish habitat	***CCME's[1] water quality index*** N/A	Sections 4.2.4.2 and 5 Sections 4.2.4.2 and 5; Recommendation #19

Table 4.1 (Cont'd). Proposed Goals, Objectives and Strategies for North Yukon Planning Region.

Goal	Objectives	Strategies	Indicators	Plan References
Ecological Issues (cont'd)				
WETLANDS, LAKES and RIVERS **GOAL 6** Maintain functional integrity and hydrological processes of wetlands, lakes, rivers and sensitive permafrost areas.	**OBJECTIVE 6.1** Minimize amount of human-caused surface disturbance within and adjacent to lakes, rivers, wetlands and sensitive permafrost areas	**STRATEGY 6.1.1** Identify significant wetlands and wetland complexes **STRATEGY 6.1.2** Avoid or minimize land use activities in wetlands and riparian areas **STRATEGY 6.1.3** Reduce surface and vegetation impacts in riparian and sensitive permafrost areas **STRATEGY 6.1.4** Minimize alteration of drainage patterns, water flow and soil temperature **STRATEGY 6.1.5** Coordinate and manage road and trail access	***Stream crossing index*** (to be developed) ***CCME's[1] water quality index*** ***Human-caused surface disturbance*** (% surface disturbance, reported by LMU) ***Linear (access) density*** (km/km^2 linear features, reported by LMU)	Sections 4.2.4.3 and 5; Recommendations #12, #13, #21 - #26

[1] Canadian Council of Ministers of the Environment (CCME) Water Quality Task Group (WQTG) is mandated to undertake technical work on CCME water quality initiatives

4.2 Recommendations

This section proposes 27 recommendations related to regional management direction. Some recommendations are VGFN Final Agreement responsibilities of NYPC. Several recommendations link directly to implementation activities referenced in Section 6, Plan Implementation. Addressing these regional recommendations will require collaboration and sharing of resources and information between the relevant governments, management boards, and non-governmental organizations.

4.2.1 Sustainable Development Considerations

GOAL 1 – Sustainable Development
Promote ***Sustainable Development*** by ensuring that social, cultural, economic and environmental policies are applied to the management, protection and use of land, water and resources in an integrated and coordinated manner

Sustainable Development is an important guiding principle for the VGFN Final Agreement; it is also the guiding principle for this Plan. Achieving Sustainable Development requires consideration of economic, social and ecological consequences of land use decisions. Managing lands and resources in an integrated and coordinated manner, and minimizing and managing potentially adverse cumulative impacts of multiple land use activities, are important objectives towards achieving Sustainable Development.

4.2.1.1 General Sustainable Development Considerations

OBJECTIVE 1.1	**Consider social, economic and ecological risks and benefits of land use decisions**
OBJECTIVE 1.2	**Develop an integrated landscape management framework that facilitates coordinated and integrated decision-making**

Table 4.1 lists general strategies to achieve Objectives 1.1 and 1.2. Social, economic and ecological risks and benefits of land use decisions were considered during the planning process through the use of the ALCES® computer model. Outcomes of land use scenarios based on different management assumptions were examined for a range of social, ecological and economic indicators (North Yukon Planning Commission, 2007c). Balancing the benefits and potential impacts of economic development on ecological and social values was facilitated through consideration of the land use modeling results.

The land use designation system (Section 3.2), and the results-based management framework (Section 3.3) developed for this Plan are intended to facilitate integrated

landscape management. Establishing indicators of environmental condition within the results-based management framework and limits of acceptable change (i.e., thresholds) for the indicators provides the basis for cumulative effects monitoring and management, and effective project assessment through the YESAA process.

4.2.1.2 Cumulative Effects Management

OBJECTIVE 1.3 Minimize and manage the cumulative impact of multiple land use activities on wildlife and fish habitat, water quality, and people

Cumulative effects are changes to the environment and/or society that result from a land use activity in combination with other past, present and future activities. Regional land use planning is well suited to address cumulative effects management. This Plan considers the cumulative effect of current and future land use activities, and proposes management strategies to mitigate potentially adverse cumulative effects. Sustainable Development cannot be achieved without minimizing and actively managing the cumulative impact of multiple land use activities on ecological resources and society.

Table 4.1 lists general strategies to achieve Objective 1.3. During the planning process, land use scenarios were created and evaluated through the use of the ALCES® computer model to forecast and understand the consequences of potential future land use activities. Two indicators of cumulative effects and ecological integrity, total amount of human-caused surface disturbance and linear (access) density, are proposed to monitor potential cumulative impacts of land use activities within Landscape Management Units. Additional indicators may be required in the future. Cautionary and critical thresholds have been proposed for these indicators, based on management objectives and levels of acceptable risk for specific land use zones within the Integrated Management Area (Table 5.1). Used within the results-based management framework, these indicators provide a mechanism for YESAB to consider potential project-level contributions to regional cumulative impacts.

Section 3 and Appendix 3 provide a detailed discussion of this topic. All recommendations, management strategies and best management practices associated with Heritage and Culture (Goal 2) and Ecological (Goals 4, 5 and 6) considerations contribute to minimizing potentially significant adverse cumulative land use impacts.

Recommendation

In order to minimize and manage the potential cumulative impacts of multiple land use activities on wildlife and fish habitat, water quality, and people, NYPC recommends the following:

Recommendation #1:
As a general guideline for land users and decision makers, the amount of functional and unreclaimed surface disturbance in a given landscape management unit should be maintained at levels below the threshold values for the cumulative effects indicators proposed in the Plan.

4.2.1.3 Climate Change

Climate change is an important Sustainable Development consideration. Perhaps more than any other factor, climate change and its potential impacts have the ability to affect all aspects of the North Yukon Planning Region. Northern Yukon is anticipated to experience some of the largest biophysical and climate-related changes in Canada. Residents of the region are concerned about future climate change impacts on the land, water, wildlife and fish, and the changes this may bring to the culture and traditional economy of the Vuntut Gwitchin and other First Nations. Climate change was identified as a key regional issue (Section 1.6).

A climate change risk assessment was completed as part of this Plan (North Yukon Planning Commission 2007a,b). A number of ecological changes are predicted to occur, but with uncertain magnitude. These include increasing and more variable winter snow depths, increasing fire rates, and vegetation community conversion on specific biophysical landscape types. Low elevation, non-forested landscape types (wet herb and wet shrub), and high elevation, non-forested landscape types (high elevation shrub and sparsely vegetated) are considered to be most at risk from vegetation conversion. All of these factors are expected to impact habitat quality for a variety of wildlife species, but particularly the Porcupine Caribou Herd, the key ecological resource of the region.

The following climate-change related issues affect land use decisions in this Plan:

- Many of the region's mountain and high elevation environments are significant use areas for the Porcupine Caribou Herd and other species, including sheep, caribou, moose, bears, and furbearers (see Map 2). It is anticipated that increasing winter snow depths will result in increasingly concentrated use of the higher elevation, wind-swept habitats by caribou. Minimizing potential land use impacts in the important high elevation concentrated use areas, which are also at risk from climate change, is a logical precautionary approach to Porcupine Caribou Herd habitat management.
- Major wetland complexes are at risk of significant change due to permafrost degradation and enhanced thermokarst processes. The amount and configuration

of open water habitats and resultant vegetation community change may result in altered ecological and social values. Minimizing potential land use impacts in major wetland complexes will assist in mitigating the potential cumulative changes associated with climate-induced change and land use.

Recommendation

In recognition of the potentially significant effects of climate change on the ecological, social and economic values in the region, NYPC recommends the following:

Recommendation #2:
In the North Yukon Planning Region, potential climate change impacts should be considered in all land management decisions, with special emphasis on land management decisions affecting the habitat of the Porcupine Caribou Herd.

4.2.2 Heritage, Social and Cultural Considerations

GOAL 2.0 – Heritage and Culture
Recognize and promote the heritage and cultural values of the Vuntut Gwitchin, other affected First Nations, and the Yukon

Recommendations related to heritage considerations are proposed in this section, with supporting rationale. Heritage considerations addressed by this Plan focus on the Integrated Management Area. Heritage site considerations within existing Protected Areas and Special Management Areas, and related tourism opportunities and interests, are addressed through their respective management plans (Parks Canada et al., 2004; Yukon Department of Environment and Vuntut Gwitchin Government. 2004a,b);Yukon Department of Environment and Vuntut Gwitchin Government, 2006).

The planning region is within the Gwich'in traditional territory, and includes significant portions of the Vuntut, Tukudh, and Tetlit Gwich'in homeland. The region contains a remarkable assemblage of heritage resources spanning the last 2 million years of earth history, including some of the oldest and best-preserved examples of early human habitation and land use in North America. **Heritage resources** include sites and objects that are 45 years old or older and relate to human history, including archaeological and historic sites and artifacts. This definition also includes palaeontological resources, which are fossil and other remains of extinct or prehistoric plants and animals.

The protection and awareness of significant heritage and cultural resources are important Goals/Objectives of the Plan. Significant resources were identified and mapped from local and traditional knowledge, with focus on the Vuntut Gwitchin and community of Old Crow areas of importance. Significant heritage resources, current community use

areas, and Vuntut Gwitchin cultural areas of interest are shown on Map 3. The presence of significant cultural areas and documented heritage resources were key considerations during the development of land use designation and general management recommendations.

Heritage management considerations and recommendations for specific LMUs are discussed in Section 5.

Legislation and Regulation of Activities

The protection and management of site-specific heritage (archaeological) areas in the region are under the *Historic Resources Act, R.S.Y. 2002, c.109* and *Archaeological Sites Regulation, Territorial Lands Act, R.S.Y. 2003, c.17,* Section fifteen, and VGFN Final Agreement Chapter 13. VGFN Final Agreement responsibilities of the planning exercise (Chapter 13, Schedule A) and management responsibilities and recommendations for identified heritage and cultural resources are discussed below.

4.2.2.1 Heritage Resources

OBJECTIVE 2.1	**Apply appropriate protection and conservation measures for identified heritage and cultural resources**
OBJECTIVE 2.2	**Provide opportunities for the continuation of First Nations land-based subsistence lifestyles and harvesting**
OBJECTIVE 2.3	***To utilize the knowledge and experience of Yukon Indian People in order to achieve effective land use planning* (VGFN 11.1.1.4)**

4.2.2.1.1 VGFN Heritage Routes and Sites

Issues and Analysis

Heritage routes and sites are important cultural resources for affected First Nations. VGFNFA Specific Provision 13.4.6.2 states that: *'In developing a land use plan which includes all or part of the Vuntut Gwitchin First Nation Traditional Territory, A Regional Land Use Planning Commission shall take into account the cultural and heritage significance of the heritage routes and sites identified in Schedule A – Heritage Routes and Sites, attached to this chapter, and on map "Vuntut Gwitchin Heritage Routes and Sites, VGHRAS", in Appendix B – Maps, which forms a separate volume to this Agreement.'*

Within the Integrated Management Area, Chapter 13, Schedule A identifies eight VGFN heritage routes[2] and no sites. The remaining identified VGFN Final Agreement heritage

[2] VGFN identified heritage routes include: 1) Old Crow to Whitestone Village, 2) Old Crow to Ft. McPherson via Salmon Cache and LaPierre House, 3) Whitestone Village to Johnson Creek Village, 4)

routes and sites are located in protected areas with existing management plans discussed above. In the IMA, the identified heritage routes occur on both settlement and non-settlement lands (Figure 4.1). A variety of heritage resources not identified specifically within the VGFN Final Agreement are shown on Map 3.

Issues associated with the management of VGFN Final Agreement Chapter 13 identified heritage routes and sites within the Integrated Management Areas were not included as major management considerations during the planning process, as there are currently few risks to the routes.

Recommended Management Direction

As per the requirement of the VGFN Final Agreement, NYPC recommends the following:

Recommendation #3:
Pursuant to VGFN Final Agreement Specific Provision 13.4.6.2 and Chapter 13, Schedule A, management recommendations and procedures for identified routes and sites within the Integrated Management Area should be developed jointly by VGG and YG.

This recommendation is supported by the following considerations:

- There are no short-term threats to the maintenance of the identified routes; all identified sites are within existing Protected Areas.
- Management considerations for the conservation of heritage areas, historic use areas, and current use areas identified during the planning exercise are included in the general management recommendations proposed by the Plan.
- Until specific management procedures are developed, existing heritage resource evaluation procedures (e.g., archeological investigations prior to development activities) provide adequate protection to identified routes.
- Until specific management procedures are developed, work camps associated with resource exploration and development activity should be sited near areas of resource production, away from identified VGFN Heritage Routes.
- The management status and requirement for detailed management procedures should be re-evaluated at next Plan review.

Johnson Creek Village to LaChute River via Whitefish Lake, 5) Whitestone Village route connecting with the Old Crow—Ft. McPherson route (Route #2, above) at the western approach to the Northwest Territories border, 6) Whitestone Village route connecting with the Old Crow—Ft. McPherson route (Route #2, above) via Upper Stony Creek, 7) Old Crow to Rampart House, and 8) Old Crow to Johnson Creek Village via White Snow Mountain (#10 shown on map)

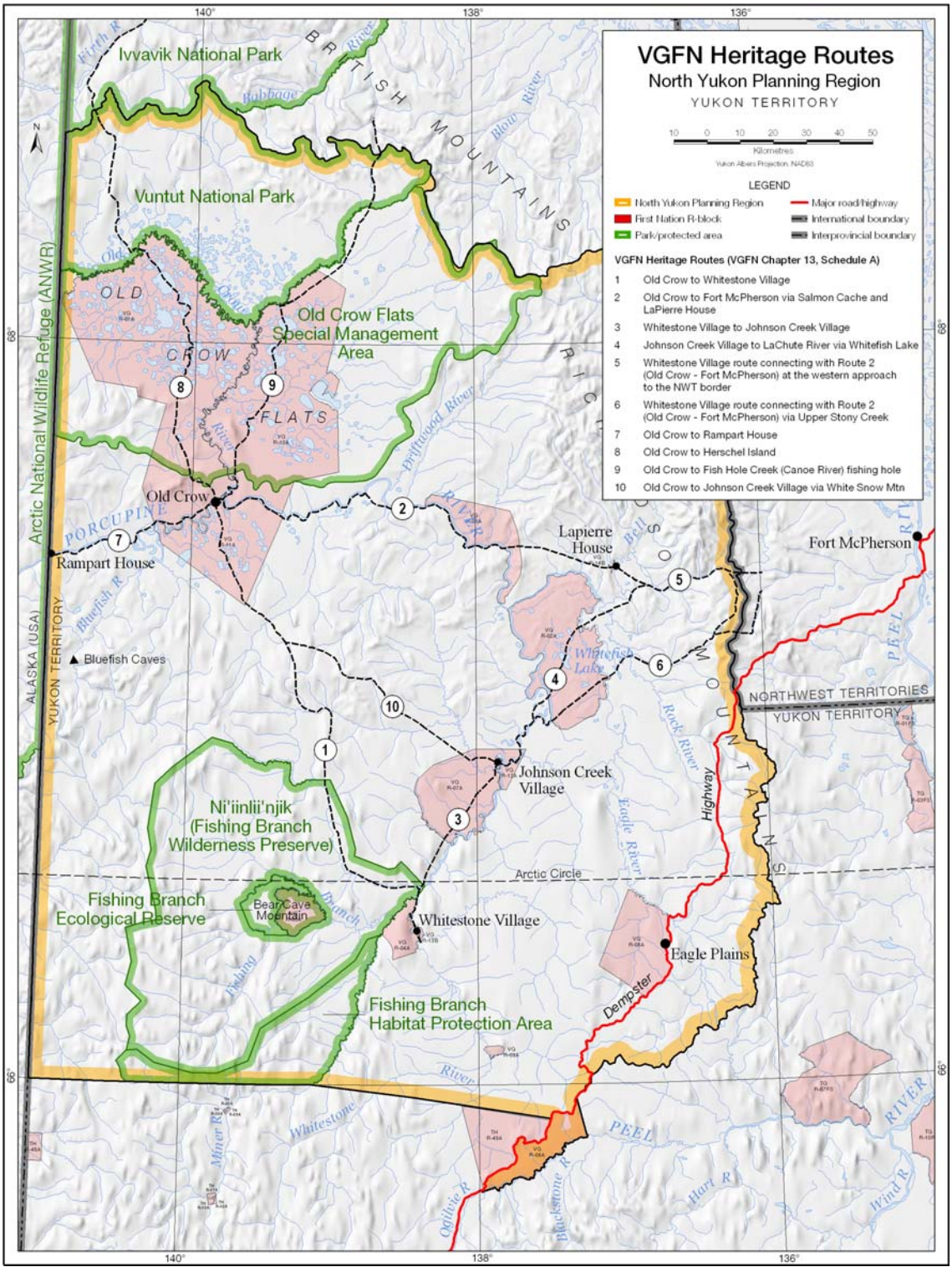


Figure 4.1. VGFN Identified Heritage Routes.

4.2.2.1.2 Other Heritage and Historic Resources

Locations of documented heritage and historic resources in the region are shown in Map 3. Heritage and historic resources are discussed in more detail in Chapter 3 of the North Yukon Resource Assessment report (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Priority areas for heritage and cultural resource conservation were identified during community consultations and research. These include: the vicinity of Old Crow, Old Crow Flats, Vuntut National Park, Whitefish Lake (wetlands), Cadzow Lake (wetlands), Bluefish Basin (wetlands), Bluefish Cave, Driftwood River – Salmon Cache, Fishing Branch, vicinity of Whitestone Village, Bell River – Summit Lake, and Rock River – Richardson Mountains. Important First Nation heritage resources include Vuntut Gwitchin camps/cabins, historical fish trap locations, travel routes, and hunting/trapping/fishing areas, and caribou fences. Many camps and cabins are S-sites.

Locations of identified historic, archaeological, and palaeontological sites in the region were obtained from Yukon Department of Tourism and Culture, Cultural Services Branch (Yukon Historic Sites Inventory and Yukon Archaeological Sites Inventory; Yukon Department of Tourism and Culture, 2007) and these site-specific locations were considered during the land use plan process (Map 3). Many important site-specific (S-site) heritage sites, owned by VGFN, including graves, cabins and similar sites, are also shown on Map 1. These are discussed in further detail in Section 5.

Specific settlement locations of heritage importance to VGFN include Johnson Creek Village, Whitestone Village, Rampart House, and LaPierre House. Rampart House and LaPierre House are Yukon Historic Sites. Tetlit Gwich'in areas of cultural significance have also been considered within the Tetlit Gwich'in Secondary Use Area (Mackenzie Delta-Beaufort Sea Regional Land Use Planning Commission, 1991).

The Rock River – western Richardson Mountains foothills area has also been identified as an important heritage resource area with many documented and potential archaeological sites requiring conservation consideration (Yukon Department of Tourism and Regional Planning and Yukon Department of Renewable Resources, 1989). Much of this area is within the Tetlit Gwich'in Secondary Use Area, and is part of the Tukudh Homeland.

Few of these documented sites and areas are currently at risk of being impacted by existing land use activities. Some areas, specifically in the vicinity of the Dempster Highway and Whitefish Wetlands, have the potential to be impacted from current and future land use. A large number of new archaeological and palaeontological discoveries can be expected in the Beringian landscape of northern Yukon.

Legislation and Management of Activities

The *Historic Resources Act, R.S.Y. 2002, c.109* and *Archaeological Sites Regulation,* and VGFNFA Chapter 13 apply to the protection and management of historic resources and sites in the region. Protection of archaeological sites and burials is addressed as well under the *Territorial Lands Act, R.S.Y. 2003, c.17,* Section fifteen (*as cited in* Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, 2007a).

The Government of Yukon is responsible for managing historic resources (as defined in the *Historic Resources Act*[*]) on non-settlement land outside of national parks. Vuntut Gwitchin Government is responsible for managing historic resources on settlement land outside of national parks.

Recommendations concerning historic resource protection and mitigation actions for activities which may impact these resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators. Heritage impact assessments are currently required for any development which impacts ground surfaces or alienates the land from the public trust.

Recommended Management Direction

1. Recommendations

In order to adequately protect and conserve known heritage and cultural resources, NYPC recommends the following:

Recommendation #4:
Historic camps/cabins, historical fish trap locations, archaeological sites and other heritage resources should be identified prior to exploration and development activities, and protected from disturbance

This recommendation is supported by the following considerations:

- Map 3 should be consulted prior to any exploration and development activities or land disposition process
- Project proponents should contact VGG and YG Heritage Offices for information on the location of heritage sites of concern for a proposed development
- Presently undocumented heritage resources are expected to occur in the areas of high heritage potential, noted above

[*] "Historic resource" includes: (a) a historic site, (b) a historic object, and (c) any work or assembly of works of nature or of human endeavour that is of value for its archaeological, palaeontological, pre-historic, historic, scientific, or aesthetic features; "Historic objects" include: (a) an object that is more than 45 years old and has been abandoned, (b) an archaeological object, (c) a palaeontological object, and (d) an object designated under subsection (2) as a historic object

- Detailed archaeological site investigations, as per existing procedures, should be conducted prior to exploration and development activities

Management recommendations for specific LMUs are discussed below in Section 5.

2. General Strategies

General strategies to achieve the management objectives are to avoid and/or mitigate exploration and development activities and impacts in areas with known heritage resource values, if possible, where such areas or sites are not otherwise protected through existing land withdrawals. This strategy is consistent with VGFNFA clause 13.1.1.8 *'to identify and mitigate the impact of development upon Heritage Resources through integrated resource management including land use planning and development assessment processes'*.

Protection of heritage and historic resources generally precludes surface disturbance from occurring at that specific location. Carefully managed wilderness/cultural tourism and recreation activities may be compatible with heritage and historic resource protection.

Best management practices in the Yukon have been developed for oil and gas activities near heritage resources (Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, 2007a). Existing site-specific best management practices, used in combination with knowledge of important resources and regional management direction recommended by this Plan, are considered to be effective strategies to mitigate potential impacts to site-specific heritage resources.

4.2.2.2 Current Community Use and Harvesting Areas

OBJECTIVE 2.2 Provide opportunities for the continuation of First Nations land-based subsistence lifestyles and harvesting

As documented by Old Crow land users and the Vuntut Gwitchin Natural Resources Department, locations of current community use areas in the region are shown in Map 3. Current use areas are discussed in more detail in Chapter 3 of the North Yukon Resource Assessment report (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Maintaining VGFN culture and ties to the land is an important goal of the VGFN Final Agreement. First Nations and other residents spend a considerable amount of time on the land participating in various seasonal activities. Maintaining opportunities for continuance of these traditional economic and cultural activities is central to maintaining Vuntut Gwitchin culture and traditional economy. Use of current First Nations cultural and subsistence areas depends on the continued health of the land, water, and ecosystems.

Objectives for current community use and harvesting areas are closely linked to Economic Objective 3.3, maintaining a mixed-economy.

Current community use and harvesting activities include hunting, fishing, wood cutting, berry picking, and general travel. The highest level of current community use occurs in the vicinity of Old Crow, but areas as far south as Whitestone Village are still used. Summer use areas are generally centered on the large rivers – the Porcupine, Bell, and Eagle Rivers – which are important river travel corridors. The mountainous areas around Old Crow also receive high levels of summer use. In winter, current use areas expand significantly as much of the region becomes accessible by snow machine or dog team. Winter use areas may expand or contract significantly, depending largely on fur prices – areas as far south as Johnson Creek, the northern portion of Eagle Plains and Whitefish Wetlands are used occasionally for trapping. Residents of Old Crow and Ft. McPherson still travel by snow machine between the two communities via the Old Crow – Ft. McPherson trail (Figure 4.1, Route 2)

Legislation and Regulation of Activities

At this time, there is no formal regulation of VGFN harvesting and subsistence activities in identified current use areas.

Recommendations concerning protection of current use areas and mitigation actions for activities which may impact the resources present within them are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

To provide for current and future opportunities for the continuation of First Nations land-based subsistence lifestyles and harvesting, NYPC recommends the following:

Recommendation #5:
In identified current Community Use Areas (Map 3), exploration and construction activities should be minimized or mitigated during subsistence harvesting or other periods of seasonal cultural activities.
Recommendation #6:
Work camps associated with resource exploration and development activity should be sited near areas of resource production, away from current Community Use Areas (Map 3).

Management recommendations for current use areas and activities in specific LMUs are discussed below in Section 5.

2. General Strategies

General strategies to achieve the objectives are to avoid and/or mitigate exploration and development activities and impacts in current use areas, if possible, and to time exploration and development activities to avoid seasonal periods when people are on the land pursuing cultural activities.

4.2.3 Economic Considerations

GOAL 3 – Economic
Facilitate economic development opportunities and activities that result in socio-economic benefits to the community of Old Crow, other affected First Nations and Yukon as a whole, and that meet the sustainable development criteria established by this land use plan

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.2	**Create land use status certainty**
OBJECTIVE 3.3	**Maintain opportunities for a mixed economy to continue where traditional subsistence harvesting and cultural activities and wage-based economic activities co-exist, ensuring long-term maintenance of First Nation culture, people's connection with the land, and their well-being**

Recommendations related to economic considerations and opportunities are proposed in this section, with supporting rationale. Economic considerations addressed by this Plan focus on the Integrated Management Area. Economic opportunities and considerations relating to existing Protected Areas and Special Management Areas are addressed through their respective management plans (Parks Canada et al., 2004; Yukon Department of Environment and Vuntut Gwitchin Government, 2004a,b);Yukon Department of Environment and Vuntut Gwitchin Government, 2006).

The primary economic goal of the land use plan is to provide economic benefits to the region that do not result in unacceptable impacts to valued social and ecological resources and values. The regional economy can be considered a 'mixed economy', where traditional and wage-based economic pursuits co-exist.

Levels of wage-based economic activity are currently low, but participation rate in traditional economic activities are relatively high. Maintaining a mixed economy, and

recognizing the importance of traditional economic pursuits, is an important consideration for maintaining Vuntut Gwitchin culture and community well-being.

Achieving the primary economic Goal and Objective 3.1 in the North Yukon Planning Region requires providing opportunities to access lands and resources within the Integrated Management Area for a variety of uses. The main economic sectors and management considerations are discussed below. General management strategies and best management practices to mitigate potential land use conflicts and impacts are also provided or referenced for each sector, where available or required. Many of the identified strategies are specific recommendations to minimize or avoid land use activities in important cultural and subsistence use areas, and within important wildlife and fish habitats. Through the combination of land use designation, regional management direction, cumulative effects management and results-based monitoring, the Plan promotes sustainable economic development and increases land use certainty.

4.2.3.1 Old Crow Community Area

Issues and Analysis

The community of Old Crow is the home of the Vuntut Gwitchin people, and the economic and cultural center of the planning region. Outside of the Dempster Highway corridor, the community of Old Crow and the surrounding area receives the highest level of land use in the region. Many of the issues facing the community of Old Crow are municipal concerns – in particular housing, roads, transportation and recreation facilities. These issues cannot be addressed by the regional land use plan.

Two plans have been produced for the community, an Old Crow Physical Development Plan and a Capital Plan (see Section 2.9). These plans provide detailed management direction for the community of Old Crow and the immediate area. Key issues facing Old Crow are access to gravel resources and land for new development.

Recommended Management Direction

1. Recommendations

In recognition of the importance of the community of Old Crow to the economic future of the region, NYPC recommends the following:

Recommendation #7:
To support maintenance and growth of Old Crow, a 5 km Community Area (CA) should be recognized around the community. The CA applies on the north bank of the Porcupine River, out to a distance of 5 km from the community boundary, not including the Old Crow Flats Special Management Area

Recommendation #8:
The Community Area within 5 km of the community of Old Crow should be exempt from surface disturbance and linear (access) density indicator monitoring.

These recommendations are supported by the following considerations:

- The Community Area (CA) is part of the land use designation system proposed for the planning region, and is discussed in Section 3.2
- Gravel, fuelwood, transportation and other community infrastructure requirements should be given priority within the CA.
- The regional land use plan does not provide specific management direction for the CA; existing and future plans should be referenced for detailed management direction within the CA.

To mitigate potential social impacts of future development activities in the vicinity of Old Crow, NYPC recommends the following:

Recommendation #9:
Work camps associated with resource exploration and development activity should be sited near areas of resource production, away from the Old Crow Community Area.

4.2.3.2 Transportation

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.2	**Create land use status certainty**

Road access to the region is currently limited, and management of new and existing transportation corridors requires careful consideration. Perhaps more than any other factor, transportation networks and infrastructure have a major influence on the pattern of land use and economic development in remote northern jurisdictions. Road, air and water are all important modes of transportation in the North Yukon Planning Region. This section addresses existing and future road and surface transportation considerations.

The Dempster Highway is the only all-weather, maintained highway in the region, and requires specific management direction. The VGFN Final Agreement, Specific Provision 11.10.0 required that the Plan provide a specific recommendation regarding an all-weather road to Old Crow. Major rivers, particularly the Porcupine, Eagle, and Bell, are

also important transportation corridors for residents and visitors to the region. Management direction for Major River Corridors is discussed under Section 4.2.4.3, Wetlands, Lakes and Rivers.

A detailed discussion of transportation, associated economic considerations and potential surface transportation-related impacts on other values is provided in Chapter 4 of the North Yukon Planning Region Resource Assessment report and Land Use Scenario report (North Yukon Planning Commission, 2007a,b,c).

4.2.3.2.1 Dempster Highway

Issues and Analysis

Completed in 1979, the Dempster Highway links the Yukon and southern Canada to the Mackenzie delta communities of Ft. McPherson, Tsiigehtchic and Inuvik in NWT. The surfaced gravel highway traverses approximately 200 km of the southeast portion of the planning region, through Eagle Plains and skirting the foothills of the Richardson Mountains. Near the Ogilvie River, the highway is bordered by a Vuntut Gwitchin (VG R-08A) and a Tr'ondek Hwech'in land selection (TH R-49A).

The Dempster Highway provides an important corridor for many activities, including transportation, tourism, subsistence harvesting and communications. The Dempster Highway is recognized as critical infrastructure for future regional economic development. A cooperative Yukon Government and northern Yukon First Nations (VGFN, THFN, and NNDFN) effort to develop an economic development plan for the Dempster Highway area is ongoing. In 2005, the highway was designated as a Northern and Remote Route under the National Highway System (Council of Ministers Responsible for Transportation and Highway Safety, 2005).

The Dempster Highway is important to facilitate future economic activities, including communications, transportation, aggregate (gravel), oil and gas and mineral sectors, and tourism. New potential access routes off the Dempster Highway will likely be one of the most important management future issues facing the region (see Section 4.2.3.2.3). The highway facilitates access to the Porcupine Caribou Herd for the purposes of harvesting. Access to adequate gravel resources in close proximity to the highway for regular maintenance and potential future upgrades is an important management consideration.

Maintaining a highway development corridor to support current and future land use activity, without undermining the social and ecological resource values in the vicinity of the highway, is a key management consideration for the Dempster Highway.

Legislation and Regulation of Activities

The *Area Development Act, R.S.Y. 2002, c.10* and *Dempster Highway Development Area Regulations* apply to the Dempster Highway across the planning region. The regulations apply within 8 km on each side of the road centre line, for a total of 16 km.

Recommendations concerning Dempster Highway corridor development are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In recognition of the importance of the Dempster Highway to the planning region and the NWT, NYPC recommends the following:

Recommendation #10:
In recognition of the strategic importance of the Dempster Highway and its designation as a Northern and Remote Route under the National Highway System, surface disturbance and linear (access) density indicator monitoring are exempt within a distance of 2 km on each side of the highway center line (4 km total corridor width).

Under this recommendation, surface disturbance and linear (access) density indicator monitoring and threshold evaluation would only be considered for new activities outside of the 4 km Dempster Highway corridor buffer. The following considerations support this recommendation:

- The highway is a well established access route with existing land uses and historical and current impacts; the established highway passes through areas of high cultural and ecological value
- A development corridor balances required Dempster Highway management and maintenance activities with ecological[3] and cultural resource management considerations
- Cumulative effects management of human activities along the corridor is an issue for both First Nations settlement and Yukon public land
- A Dempster Highway development corridor will encourage land use activities to be located within the existing zone of influence of the highway

[3] Recent research has indicated that when compared to adjacent areas, the Dempster Highway corridor receives reduced use by the Porcupine Caribou Herd (Cooley, 2001).

4.2.3.2.2 Old Crow All-weather Road

Issues and Analysis

The Old Crow winter road provides transportation between the Dempster Highway, near Eagle Plains Lodge, and the community of Old Crow. The winter road was first established in the 1970s on a series of historical seismic lines and exploration trails. The road is opened on an 'as needed' basis, typically once every 3-4 years. The winter road provides an opportunity to transport large shipments of materials, equipment and vehicles to the community. Depending on conditions, the winter road has cost between $0.5-1 million to construct and maintain for a 2-4 week late winter operating period.

VGFN Final Agreement, Specific Provision 11.10.1 states that: '*Government shall not construct on Crown Land an all-weather road which connects with the community of Old Crow, as defined in 21.2.5.1, before there is an approved regional, sub-regional or district land use plan which includes recommendations on the need for, the planning of and the siting of that road.*'

All-season road construction to Old Crow received limited attention during the regional planning exercise. NYPC did not evaluate specific issues associated with potential all-season road access or possible alternative surface transportation options. The Yukon Department of Transportation preliminary estimates for construction of a two-lane all-weather road from Eagle Plains to Old Crow would be a minimum of $75-100 million. Gravel requirements were not evaluated.

Legislation and Regulation of Activities

The route of the winter road passes through both VGFN settlement land and public land administered by Yukon Government. The winter road is not a permanent feature, and is not publicly accessible. It is therefore not regulated under the Yukon *Highways Act*.

Each time the Old Crow winter road is constructed, YESAB is required to perform a review under the development assessment process.

Recommended Management Direction

1. Recommendations

Periodic construction of the winter road along the existing access route (Map 3) is sufficient to meet current community of Old Crow needs for transportation of materials and goods. Given this situation, and with consideration of the potential costs associated with the construction of an all-season road to Old Crow, NYPC recommends the following:

Recommendation #11:
An all-season access road to Old Crow is not required at this time.

Additional considerations relating to this recommendation are as follows:

- The existing Old Crow winter road route should be maintained and used as required
- If an all-season road proposal is examined at a future date, social and ecological issues associated with such a proposal will require careful consideration and detailed study
- This recommendation should be re-evaluated at the next Plan review

4.2.3.2.3 New Roads and Access Routes

Issues and Analysis

Maintaining existing access routes and options to develop new routes for resource exploration and development is a major consideration in the Plan, particularly for mining and oil and gas sectors. More than any other land use features, new roads and access routes have the potential to create significant change in the North Yukon Planning Region. Most future industrial land uses in the planning region will require new roads and access routes. Many of the impacts that result from industrial land uses, particularly to wildlife and fish populations, are a result of the direct and indirect effects of roads and peoples use of them. Managing new potential roads and access routes is anticipated to be one of the most challenging land use issues facing the region.

A detailed discussion of roads and access routes, their economic considerations and potential impacts on other values and land uses is provided in Chapter 4 of the North Yukon Planning Region Resource Assessment report and Land Use Scenario report (North Yukon Planning Commission, 2007a,b,c). Key issues associated with construction and use of new roads and access routes include:

- Linear features, including access roads and seismic lines, contribute to direct loss and fragmentation of wildlife habitat
- Linear features, and peoples use of those features, may result in indirect impacts on wildlife, including avoidance of such features, increased harvest pressures, and/or increased levels of predation
- Where roads and access routes cross rivers, stream crossings may impact fish through direct habitat disturbance, or indirectly through increasing harvesting pressures
- In permafrost landscapes, access road construction requires significant quantities of gravel. Winter ice roads may require significant volumes of water.

- Water and gravel withdrawals necessary for road building or maintenance may cause direct disturbance to fish and wildlife habitat
- Where all season roads and access routes become established, they tend to persist for long periods of time. It is difficult to regulate and manage use of these features, making full decommissioning and reclamation difficult

Legislation and Regulation of Activities

There are several Yukon Government and Federal Acts that apply to construction and management of roads and other features (listed in Appendix 1). Public roads and highways are regulated under the *Yukon Highways Act, R.S.Y. 2002, c.108*. The Yukon and Federal governments have various management responsibilities for roads and construction of new access routes. Vuntut Gwitchin Government is responsible for managing roads and construction of new access routes on settlement land outside of National Parks and Special Management Areas.

Once a new road or access route is constructed on Yukon public land, the public are generally free to use that road or access route at their discretion, unless the operator of the road is required to restrict such access under the terms and conditions of the road permit (i.e. where access gates are required). Section 35 of the *Highways Act* provides some guidance for access restrictions to public roads or access routes.

Recommendations concerning road and access route construction and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In consideration of the potential impacts new roads and access routes may create, NYPC recommends the following:

Recommendation #12:
Creation of new access roads and trails should be minimized and existing routes utilized where possible.
Recommendation #13:
Where new access roads and/or trails are required, these should be designed, constructed, and used in a manner that minimizes direct and indirect impacts to fish and wildlife, their habitats, and human viewscapes.

Recommendation #14:
In advance of significant levels of energy sector activity, an access management plan should be developed for the Eagle Plain oil and gas basin.

In addition to these specific recommendations, many recommendations relating to the mitigation of potential impacts of new roads and access routes on identified social, economic and ecological values are included in other sections:

- Sustainable Development Considerations (i.e., cumulative effects), Section 4.2.1
- Heritage, Social and Cultural Considerations, Section 4.2.2
- Economic Considerations, Section 4.2.3
- Ecological Considerations, Section 4.2.4

This Plan does not recommend specific locations for future road and access route siting, nor prescriptive road construction techniques. No specific recommendations are required at this time. New road and access construction requirements and locations are at the discretion of a project proponent in consideration of the recommendations and guidelines proposed in this Plan. Relevant management agencies and boards (i.e., YESAB) review new road and access route proposals during the development assessment process to assist in determining conformity to the Plan and to provide appropriate mitigation recommendations. Government decision bodies consider recommendations and are ultimately responsible for setting terms and conditions for road and access siting and development.

Recommendation #14 relating to access management planning in the Eagle Plain basin is intended to foster a coordinated approach to new road and access route development for this specific area. Given the current low levels of activity, implementation of this recommendation is not required at this time. The need for an access management plan should be reviewed as required (suggested as part of annual plan monitoring activity – see Section 6, Plan Implementation). Specific recommendations relating to road and access route locations may be included as part of this future access management plan.

Management direction regarding new roads and access routes for specific LMUs is discussed in Section 5.

2. General Strategies

Strategies to mitigate potential road and access route impacts on identified social, ecological and economic resources are summarized in Table 4.1. Most cultural, heritage, wildlife, fish and wetland habitat management objectives and strategies relate to roads and the mitigation of potential impacts. The management approaches advocated by the Plan are intended to provide opportunities to create required road and access routes, while mitigating their potential impacts.

Key mitigation strategies, as summarized in Table 4.1, are as follows. These are addressed in more detail for the LMU management considerations discussed in Section 5. A future access management plan applicable to the region would provide detailed management direction to accompany these general strategies.

- Avoid significant moose and caribou habitat (North Yukon Planning Commission 2007a,b) where possible when constructing new access routes
- Where possible, avoid important trapping, harvesting, and current use areas
- Consider and account for the cumulative effect of all existing and new linear features on valued resources
- Utilize existing rights-of-way and linear features, whenever possible, unless use of the existing feature would cause long-term environmental impacts (e.g. permafrost issues)
- Minimize size and extent of new all-season road access features
- To minimize potential cumulative impacts of multiple roads and associated land use activities, where new access routes are required land use activities should be coordinated to utilize the same access route
- Reclamation requirements and decommissioning strategies should be considered during planning and assessment of new road and access features
- Limit and/or control use of new industrial access routes to authorized users only

Best management practices for seismic exploration, which include some road access considerations, have been developed for oil and gas activities (Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, 2007b). Many of the general strategies recommended by the land use plan are considered best management practices and are consistent with published sources.

4.2.3.3 Tourism and Recreation

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.2	**Create land use status certainty**

Maintaining opportunities for tourism and recreation is an important economic consideration. Current tourism activity in the North Yukon Planning Region is low, tourism products and services are modest and the tourism market is not well developed. Opportunities are associated with wilderness travel, wildlife viewing, Old Crow visits and stays, and touring along the Dempster Highway. Tourism activities are currently marketed around the Dempster Highway's unique and accessible sub-arctic landscapes,

wildlife viewing opportunities, and VGFN culture. VGFN culture is also an important component of Old Crow activities and wilderness travel. There is good potential to develop a small-scale, carefully managed tourism industry based on the cultural and ecological resources of northern Yukon.

Locations of identified tourism and recreation resources and potential areas are shown in Map 4. A detailed discussion of tourism and recreation resources, economic considerations and potential impacts on other values is provided in Chapter 4 of the North Yukon Planning Region Resource Assessment report and Land Use Scenario report (North Yukon Planning Commission, 2007a,b,c).

Issues and Analysis

The North Yukon Tourism Strategy provides guidance on the development of tourism products and markets within the region, with focus on activities around Old Crow. Areas of future tourism interest include Old Crow and surrounding area (including Old Crow Flats SMA and Vuntut National Park), the southern Richardson Mountains (east of the Dempster Highway), the northern Richardson Mountains (Summit Lake), and important corridors, including the Dempster Highway and Major Rivers Corridors (i.e. Porcupine, Eagle and Bell rivers).

In this region, the most important land use issues affecting wilderness tourism are expected to be visual quality and impacts resulting from industrial land uses. Maintenance of visual quality and ecological values in a relatively intact landscape is an important consideration for wilderness tourism activities. Priority areas for maintaining visual quality are the Dempster Highway and Major River Corridors (shown on Map 4 with a 4 km buffer, 2 km each side of feature).

If not carefully managed, tourism activities can impact traditional economic activities. However, the site-specific and temporary nature of wilderness tourism activity, the relatively small ecological footprint of these operations, and the anticipated low levels of future tourism activity are expected to result in relatively few significant impacts to ecological resources or other land use sectors in the region.

Legislation and Regulation of Activities

The *Wilderness Tourism Licensing Act, R.S.Y. 2002, c.228* and several VGFN Final Agreement chapters apply to the management of wilderness tourism activities in the region.

The management of tourism activities in the North Yukon Planning Region is a cooperative effort between Yukon, Vuntut and Federal government departments. The Government of Yukon, Department of Environment, manages and enforces the *Wilderness Tourism Licensing Act*, which governs activities carried out by licensed guides. The Government of Yukon, Department of Tourism and Culture is responsible for promoting tourism opportunities on Yukon public land outside of National Parks. Vuntut

Gwitchin Government is responsible for managing tourism activities on VGFN settlement land outside of National Parks. Parks Canada is responsible for managing tourism activities within Vuntut National Park. Other jurisdictions (i.e. Northwest Territories) and private operators and companies promote tourism opportunities and activities in the region.

Commercially guided river rafting, horseback riding and motorized boating where more than 10 guides are employed, and off-road vehicle tours where more than 5 guides are employed are the only activities subject to an assessment under YESAA. Other guided activities and all self-guided tourism activities are not included in the regulations and are not subject to assessment.

Recommendations concerning wilderness tourism activities and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

No specific recommendations relating to tourism and recreation activities are required at this time. Recommendations relating to the mitigation of potential tourism and recreation impacts on identified ecological and cultural resources are provided under the following sections:

- Sustainable Development Considerations, Section 4.2.1
- Heritage, Social and Cultural Considerations, Section 4.2.2
- Economic Considerations, Section 4.2.3
- Ecological Considerations (including Major River Corridors), Section 4.2.4

Management direction relating to specific LMUs is discussed in Section 5.

2. General Strategies

Specific strategies to mitigate potential tourism and recreation related impacts on identified social, ecological and economic resources are summarized in Table 4.1. Many of the recommended strategies also mitigate the potential impact of other land uses on tourism and recreation activities. Maintaining visual integrity by avoiding or minimizing industrial land use activities in Major River Corridors is a key strategy. The management approaches advocated by the Plan are intended to protect the resources upon which wilderness tourism opportunities are dependent.

Best management practices for oil and gas activities in wilderness tourism areas have been developed by the Yukon Department of Energy, Mines and Resources, Oil and Gas

Management Branch (2007c). Many of the strategies and recommendations of this Plan are consistent with the stated oil and gas best management practices, and relate to the reduction or avoidance of industrial activity (and construction of associated features) in identified tourism and recreation areas.

Existing best management practices (e.g., Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, 2007c), used in combination with the regional management direction and strategies recommended by this Plan, are considered to be effective strategies to mitigate potential impacts of other land uses on wilderness tourism and recreation.

4.2.3.4 Oil and Gas Resources

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.2	**Create land use status certainty**

Maintaining opportunities to access, explore for, and possibly develop oil and gas resources is an important economic consideration in the North Yukon Planning Region. While oil and gas activity in the region is currently low, the region holds moderate oil and significant natural gas potential.

The region contains three oil and gas basins: Eagle Plain, Kandik, and Old Crow Flats. Given its proximity to the Dempster Highway and proven reserves, Eagle Plain is currently the basin of highest interest. Eagle Plain is considered to be one of most prospective oil and gas basins in Yukon; resource estimates predict a mean volume of 6.1 Tcf of natural gas and 437 MMbbls of oil, representing approximately 20% of Yukon's estimated total natural gas potential and 50% of the total oil potential. Access to pipeline infrastructure is considered to be one of the major factors limiting natural gas development in northern Yukon.

Locations of identified oil and gas resources and potential areas are shown on Map 4. A detailed discussion of oil and gas resources, economic considerations and potential impacts on other values is provided in Chapter 4 of the North Yukon Planning Region Resource Assessment report and Land Use Scenario report (North Yukon Planning Commission, 2007a,b,c).

Issues and Analysis

Many of the major regional planning issues and concerns relate to future oil and gas exploration and development and its potential impact on identified ecological and cultural resources, including Porcupine Caribou Herd, moose, marten, wetlands, lakes and rivers, and traditional economic and cultural activities (see Section 1.6).

More than any other land use, oil and gas exploration and development activities and their associated land uses (i.e., transportation, gravel extraction and water withdrawal) have the potential to cause landscape-level change in a significant portion of the region. If not carefully managed, this land use activity may impact a range of ecological and cultural values. Where competing interests exist, land use conflicts may also occur between oil and gas and tourism.

A key ecological resource in the North Yukon Planning Region is the Porcupine Caribou Herd. The herd uses the entire region, but most identified Porcupine caribou concentrated use areas are located outside the Eagle Plain oil and gas basin. However, there is an expectation from residents and other stakeholders that adequate conservation measures will be established across the herd's range in response to recent population declines and in advance of increasing levels of industrial land use.

Caribou are present in the Eagle Plain basin during the rutting and winter seasons, which is a focused period for oil and gas exploration and infrastructure construction. It is therefore inevitable that oil and gas activities will occur while the herd is on the winter range. Minimizing the amount of linear features (e.g. all season roads, winter roads and seismic lines), and managing access on those features is a key management issue associated with oil and gas activity. Understanding re-vegetation rates of oil and gas-related footprints is an important consideration in regional land management (see Section 4.2.4.4). Forecasting and managing the transportation, gravel, and water requirements to support oil and gas activity is an important consideration for cumulative effects management.

Legislation and Regulation of Activities

The Yukon *Oil and Gas Act*, *R.S.Y. 2002, c.162* applies to the management of oil and gas activities in the region. On VGFN settlement land, VGG legislation may mirror the Yukon *Oil and Gas Act* in the future.

The Government of Yukon, Department of Energy, Mines, and Resources, Oil and Gas Management Branch is responsible for promoting and managing oil and gas activities on Yukon public land. The disposition process for oil and gas interests was recently changed from a government-lead to a proponent-lead exercise. Under the new regime, oil and gas proponents submit expressions of interest to the Oil and Gas Management Branch for Yukon public lands outside of protected areas. Vuntut Gwitchin Government is responsible for managing oil and gas activities on VGFN settlement land.

Recommendations concerning oil and gas activities and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

No specific recommendations relating to oil and gas resources are required at this time. Recommendations relating to the mitigation of potential oil and gas and associated land use impacts on identified resources are provided under the following sections:

- Sustainable Development Considerations, Section 4.2.1
- Heritage, Social and Cultural Considerations, Section 4.2.2
- Economic Considerations, Section 4.2.3
- Ecological Considerations (including reclamation and re-vegetation), Section 4.2.4

Management direction relating to specific LMUs is discussed in Section 5.

2. General Strategies

Specific strategies to mitigate potential oil and gas and associated land use impacts on identified social, ecological and economic resources are summarized in Table 4.1. Most strategies relate to minimizing the extent and duration of activities, and avoiding or minimizing the amount of oil and gas activities within specific areas at specific time periods. The management approaches advocated by the Plan are intended to assist in providing access to oil and gas resources and establishing land use certainty.

Best management practices for oil and gas seismic line construction, oil and gas activities in relation to historic resources, and oil and gas activities in relation to wilderness tourism areas have been developed (Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, 2007a,b,c). Many of the general strategies recommended by the land use plan are considered best management practices.

YESAB recently proposed a suite of best management practices to mitigate site-specific oil and gas exploration impacts in the Eagle Plains area (Yukon Environmental and Socio-economic Assessment Board, 2007) that may be broadly applicable to the region. Existing site-specific best management practices, used in combination with the regional management direction and strategies recommended by this Plan, are considered to be adequate strategies to mitigate potential impacts of oil and gas activity.

4.2.3.5 Mineral Resources

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.2	**Create land use status certainty**

Maintaining opportunities to access, explore for, and possibly develop mineral resources is an important economic consideration in the North Yukon Planning Region. Mineral interest and activity in the region is currently very low. Given the limited exploration that has occurred, mineral potential is not well understood but relative to other areas of Yukon, is currently considered to be low. Placer and gemstone potential has not been assessed. There is limited potential for a producing mine to be established in the region in the near future.

There are approximately 475 active mineral claims in the North Yukon Planning Region. These include the Rusty Springs and Alto properties to the west of Ni'iinlii'njik (Fishing Branch) Wilderness Preserve, and the Fox and Rich claims in the southeastern portion of the region. An application to explore the Sun mineral claims, also in the southeastern portion of the region, is pending approval.

Most areas of higher mineral potential are located in the western portion of the planning region (Map 4). A detailed discussion of mineral resources, economic considerations and potential impacts on other values is provided in Chapter 4 of the North Yukon Planning Region Resource Assessment report and Land Use Scenario report (North Yukon Planning Commission, 2007a,b,c).

Issues and Analysis

Due to the sub-surface nature of mineral resources, mineral exploration and development requires a large amount of exploration to identify suitable deposits that can be extracted economically. A range of factors can affect mineral activity, with global market commodities being very important. In the North Yukon Planning Region, a lack of land use certainty, generally lower mineral potential, remoteness, and a lack of road infrastructure are additional factors that have resulted in very low levels of mineral exploration. Mineral exploration opportunities may be enhanced where new access roads or similar transportation infrastructure are constructed for other land use sectors.

In comparison to other industrial land use activities like oil and gas or commercial forestry, mining activities generally result in more localized impacts on values. Mine site impacts are intensive 'point source' impacts. Water impacts, localized habitat disturbance, reclamation and road-related access considerations are typically the most important issues associated with mineral development.

While mining impacts may be more site-specific than other sectors, where competing interests exist land use conflicts may also occur between mineral activity, tourism and traditional economic and cultural activities. If future mines were to be constructed within the region, managing access and use of roads to service the mine-site would be a key issue associated with developing mineral resources.

Legislation and Regulation of Activities

The *Yukon Quartz Mining Act, R.S.Y. 2003, c.14* and *Quartz Mining Land Use Regulation, Placer Mining Act, R.S.Y. 2003, c.13,* and *Territorial Lands Act, R.S.Y. 2003* and *Coal Regulation* apply to the management of mining activities in the region. Vuntut Gwitchin Government is currently drafting a *Lands and Resources Act* that will apply mining activities on VGFN settlement land.

The Government of Yukon, Department of Energy, Mines, and Resources, Mineral Resources Branch, is responsible for promoting and managing mining activities on Yukon public land. The Yukon Water Board, an independent administrative tribunal established under the *Waters Act*, is responsible for the issuance of water use licenses for the use of water and/or the deposit of waste into water. Water licenses are issued for Placer Mining and other activities.

The Yukon Geological Survey is responsible for collecting and disseminating information on geology and potential mineral areas of interest to various stakeholders. The Yukon mineral exploration regime is based on a free entry system whereby proponents can establish mineral claims anywhere on Yukon public lands, outside of protected areas.

Several Federal Government departments, including Fisheries and Oceans Canada through the federal *Fisheries Act*, play various roles in permitting and monitoring mineral activities. Vuntut Gwitchin Government is responsible for managing mineral activity on settlement land.

Recommendations concerning mineral activities and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

No specific recommendations relating to mineral resources are required at this time. Recommendations relating to the mitigation of potential mineral activity and associated land use impacts on identified resources are provided under the following sections:

- Sustainable Development Considerations, Section 4.2.1
- Heritage, Social and Cultural Considerations, Section 4.2.2
- Economic Considerations, Section 4.2.3
- Ecological Considerations (including reclamation and re-vegetation), Section 4.2.4

Management direction relating to specific LMUs is discussed in Section 5.

2. General Strategies

Specific strategies to mitigate potential mineral activity and associated land use impacts on identified social, ecological and economic resources are summarized in Table 4.1. Most strategies relate to minimizing the extent and duration of activities, and avoiding or minimizing activities within specific areas at specific time periods. Managing road-related access issues, work camps, and mine site reclamation are key considerations. The management approaches advocated by the Plan are intended to assist in providing access to mineral resources and establishing land use certainty.

Best management practices for Yukon placer mining operations to mitigate impacts to fish and fish habitats have been developed (Yukon Placer Implementation Steering Committee and the Yukon Placer Working Committee, 2005). Existing site-specific best management practices, used in combination with the regional management direction and strategies recommended by this Plan, are considered to be adequate strategies to mitigate potential impacts of mineral activity.

4.2.3.6 Aggregate (Gravel) Resources

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.2	**Create land use status certainty**

Aggregate (gravel) is a critical resource for the development of transportation and industrial infrastructure in northern permafrost landscapes. In the North Yukon Planning Region gravel is a resource in relatively limited supply. Existing gravel pits supply the requirements of the Dempster Highway and the community of Old Crow. Outside of the Dempster Highway corridor, a regional aggregate assessment has not been completed. River valleys represent the most readily available source of aggregate.

Locations of existing and potential aggregate resources, and economic considerations and potential impacts of aggregate extraction on other values are discussed in Chapter 4 of the

North Yukon Planning Region Resource Assessment report and Land Use Scenario report (North Yukon Planning Commission, 2007a,b,c).

Issues and Analysis

Future land use scenarios for the region project that substantial volumes of aggregate will be required to support the development of industrial infrastructure, with oil and gas and transportation infrastructure requiring special consideration (North Yukon Planning Commission, 2007c). Obtaining the required volume of aggregate may disturb large land areas, in some cases nearly as large as the direct infrastructure footprint itself. Future aggregate requirements would be in addition to existing volumes required to support the Community of Old Crow, annual Dempster Highway maintenance, or any future major Dempster Highway upgrades. River valleys containing aggregate are also some of the most important ecological and cultural places in the region.

Important issues associated with aggregate extraction include habitat disturbance, visual impacts and reclamation/re-vegetation of quarries.

Legislation and Regulation of Activities

Several Yukon and Federal Acts apply to the permitting and management of aggregate extraction (see Appendix 1). The Government of Yukon and Federal government have various management responsibilities for aggregate permitting and extraction. Vuntut Gwitchin Government is responsible for managing aggregate extraction on VGFN settlement land, outside of existing parks and Special Management Areas. Vuntut Gwitchin Government authority includes management of aggregate extraction within the Old Crow Community Development Area (see Section 4.2.3.1).

Recommendations concerning aggregate extraction activities and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In consideration of the importance of identifying and establishing adequate aggregate supply to support regional infrastructure development, NYPC recommends the following:

Recommendation #15:
In advance of industrial development, the identification and mapping of potential sources of aggregate should be made a regional priority.

Recommendations relating to the mitigation of potential aggregate extraction impacts on identified resources are provided under the following sections:

- Sustainable Development Considerations, Section 4.2.1
- Heritage, Social and Cultural Considerations, Section 4.2.2
- Economic Considerations, Section 4.2.3
- Ecological Considerations (including reclamation and re-vegetation), Section 4.2.4

Management direction relating to specific LMUs is discussed in Section 5.

2. General Strategies

Specific strategies to mitigate potential aggregate extraction activities on identified social, ecological and economic resources are summarized in Table 4.1. Most strategies relate to avoiding or minimizing gravel extraction activities within specific areas, or minimizing activities during specific time periods. Avoidance of in-stream aggregate extraction and consideration of long-term reclamation/re-vegetation trajectories are key considerations.

At the regional-scale, the most effective management strategies to minimize potential aggregate extraction impacts may be to minimize gravel requirements for necessary infrastructure through coordinated access, feature reduction and geotechnical engineering, and to utilize required aggregate resources efficiently.

Best management practices to mitigate aggregate extraction activities are not currently available.

4.2.3.7 Traditional Economy

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.3	**Maintain opportunities for a mixed economy to continue where traditional subsistence harvesting and cultural activities and wage-based economic activities co-exist, ensuring long-term maintenance of First Nation culture, people's connection with the land, and their well-being**

The regional economy can be considered a 'mixed economy' where both traditional subsistence harvesting and wage-based activities co-exist. A large amount of the economic activity in Old Crow is still focused on subsistence harvesting. Old Crow residents participate in traditional economic pursuits such as hunting, fishing and berry harvesting to provide staple food items, and to provide feed (e.g. chum salmon) for dog

teams. Trapping is still practiced as a main or supplementary economic activity when fur prices warrant. Traditional economic activities are strongly linked to the maintenance of Vuntut Gwitchin culture and Old Crow community well-being.

A detailed discussion of current use areas, economic considerations and potential impacts of other land uses on traditional economic activities is included in Sections 3 and 4 of the North Yukon Planning Region Resource Assessment report (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Maintaining opportunities for VGFN and other First Nations to continue subsistence harvesting of wildlife, fish and plant resources is an important economic consideration. Traditional economy is strongly linked to the maintenance of Vuntut Gwitchin culture and community well-being.

Vuntut Gwitchin and other First Nations spend a considerable amount of time on the land enjoying and participating in hunting, fishing, and trapping activities. This high participation rate in the traditional economy is important for the maintenance of Vuntut Gwitchin culture and ties to the land, but also plays a major role in offsetting the high cost of food item purchases in Old Crow.

As documented by Vuntut Gwitchin land users and the VGFN Natural Resources Department, locations of identified subsistence harvesting areas are shown on Map 3. These areas are considered to be representative of important subsistence harvest areas. While the areas around Old Crow, the Porcupine, Bell and Eagle river corridors, and the Dempster Highway currently experience the highest level of subsistence use and harvesting, many other areas of the region may be utilized occasionally.

Trapping still plays an important economic and cultural role in Old Crow. The entire Vuntut Gwitchin traditional territory is a single group trapping area (Group Trapping Concession #401). Trapping locations are dependent on fire history, trail access, and other factors. Important Vuntut Gwitchin trapping areas include: Old Crow Flats, lower Porcupine and Driftwood rivers, Bluefish Lake, Keele Range, Bluefish wetlands, Ahvee and Sharp Mountains, Johnson Creek, and Whitefish wetlands.

Subsistence use/harvesting activities have few, if any, direct impacts on other land use sectors. If not carefully managed, oil and gas, mining, aggregate extraction, and possibly tourism and recreation can create land use conflicts subsistence harvesting activities, where competing interests exist. Subsistence use/harvesting opportunities may benefit from the construction of new roads and trails, facilitating easier access to wildlife and fish resources.

Legislation and Regulation of Activities

The management of subsistence harvest and trapping is under the *Wildlife Act, R.S.Y. 2002, c.229,* and VGFN Final Agreement, Chapter 16. Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. The Government of Yukon, Parks Canada, Vuntut Gwitchin Government, the North Yukon Renewable Resources Council, the Yukon Fish and Wildlife Board, and the Porcupine Caribou Management Board have various responsibilities for subsistence harvest management. Subsistence harvest rights extend into Vuntut National Park.

Forest harvesting for First Nation personal use is regulated under the VGFN Final Agreement, Chapter 17, and is discussed under Section 4.2.3.8.

Recommendations concerning avoiding or mitigating potential impacts of other land uses on traditional land uses are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

No specific recommendations regarding traditional economic activities are required at this time. Recommendations regarding the mitigation of potential development impacts on current community use and harvesting areas are included in Section 4.2.2.2.

Management direction relating to specific LMUs is discussed in Section 5.

2. General Strategies

Specific strategies to mitigate potential land use impacts on subsistence use areas and traditional economic activities are summarized in Table 4.1. Most strategies relate to avoiding or minimizing land use activities in identified harvesting areas during specific time periods. The management approaches advocated by the plan are intended to maintain traditional use areas and opportunities for pursuit of traditional economic activities.

4.2.3.8 Forest Resources

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**
OBJECTIVE 3.3	**Maintain opportunities for a mixed economy to continue where traditional subsistence harvesting and cultural activities and wage-based economic activities co-exist, ensuring long-term maintenance of First Nation culture, people's connection with the land, and their well-being**

Management of forest resources is a local issue for the community of Old Crow. Forests in the vicinity of Old Crow are an important source of fuelwood and building materials. Commercial forestry activities are not anticipated to occur in the near future, as the region has very limited or no commercial forestry potential.

The location of the Old Crow community forest harvesting area is shown in Map 3. A detailed discussion of current forest harvesting areas, economic considerations and potential impacts of forest harvesting is included in Chapter 4 of the North Yukon Planning Region Resource Assessment report (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Old Crow may be considered the most forest dependent community in Yukon. Approximately 600 cords of fuel wood is harvested annually, supplying 30% of Old Crow's energy requirements. Forest harvesting generally occurs within a 20-30 km radius of the community, centered on the Porcupine River corridor.

Large diameter trees are a limited resource in the Old Crow area, and are generally located along river valleys and steep, south-facing slopes. David Lord Creek and lower Driftwood River produce some of the best quality and largest timber in the vicinity of Old Crow.

Forest harvesting concerns in the vicinity of Old Crow relate to securing an adequate and accessible wood supply, and harvesting activities that occur in proximity to cabins and camps.

Due to permafrost conditions, cold climate and active fire regimes, the region has no or very limited commercial forestry potential. Commercial forestry activities are not anticipated to occur in the region in the near future. A regional forest management plan is not required at this time.

The North Yukon Planning Region is within Forest Management Unit Y13, Porcupine River. Wildland fire management zones have been developed for the Old Crow area; the

community forest harvesting area shown on Map 3 has been identified as either Transitional or Strategic.

Legislation and Regulation of Activities

Forest harvesting is not currently regulated or coordinated. Chapter 17 of the VGFN Final Agreement provides guidance for forest resource and fire management in the planning region. The VGFN Final Agreement provides for Vuntut Gwitchin citizens to harvest trees on VGFN settlement land and on Yukon public land for traditional and non-commercial purposes. If commercial forest harvesting were to occur on public land in the future, forest harvesting would be managed under the *Territorial Lands (Yukon) Act, Timber Regulations.*

Recommendations concerning commercial forest harvesting activities and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In recognition of the importance of forest resources in the vicinity of Old Crow, NYPC recommends the following:

Recommendation #16:
A future Old Crow Forest Management Plan should maintain community fuelwood and forest harvesting opportunities within the identified fuelwood and forest harvesting area, as shown on Map 3.

2. General Strategies

This Plan does not directly address forest management or forest harvesting strategies. However, the maintenance of specific forest harvest areas near the community of Old Crow is discussed in Section 5.

Many of the fish, wildlife and water related management strategies summarized in Table 4.1 provide general guidance that may be used toward the production of a future Old Crow Forest Management Plan.

4.2.3.9 Renewable Energy

OBJECTIVE 3.1	**Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to oil and gas, minerals, tourism, recreation, transportation, gravel, subsistence harvesting, and cultural pursuits**

Renewable energy refers to the generation of heat and electricity from natural resources that are not depleted over time. Examples include hydro (energy from flowing water), wind, solar (energy from the sun), geothermal (heat from steam or hot groundwater), earth (heating or cooling using below ground ambient temperatures), and trees or other forms of vegetation that can regenerate after some of the resources are used. As discussed in Section 4.2.3.8, above, the community of Old Crow also utilizes fuel wood for a portion of its heating requirements.

Old Crow, through a variety of partnerships, has actively investigated wind energy on Crow Mountain. Through the Northern Canada Power Commission, potential large-scale hydro sites were identified in the planning region the 1960s and 70s, including Porcupine Canyon at Rampart House, and Salmon Cache canyon, both on the Porcupine River. Neither site received a formal feasibility assessment and given the scale of the conceptual projects, would likely not be economic.

A detailed discussion of existing assessments, renewable energy options, economic considerations and potential renewable energy impacts is included in Chapter 4 of the North Yukon Planning Region Resource Assessment report (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Given the long winter season and extreme cold temperatures, Old Crow and other facilities (e.g., Eagle Plains Lodge) require a stable, cost effective energy supply. Almost all power generation requirements in the region are currently met by non-renewable sources, specifically diesel power generation. Delivering diesel fuel to Old Crow by air transport is very costly, and diesel power generation results in a large per capita contribution of carbon emissions. Per resident, Old Crow carbon emissions are approximately twice those of the average Canadian.

The community of Old Crow actively desires to decrease its diesel fuel consumption, and increase its use of renewable energy options. In northern Yukon, wind and small-scale hydro are considered to hold the greatest potential for renewable energy production. Site-specific seasonal solar power and additional tree biomass fuels may also be options. It is unlikely that diesel generation would be replaced completely by renewable energy in the near term.

If future large-scale industrial development does not occur, energy demands in the region are not anticipated to increase significantly from existing levels. If future large-scale

industrial development does occur, on-site power generation will likely be required and renewable energy options such as wind or hydro may play a larger role.

Legislation and Regulation of Activities

If future hydro development were pursued, the Federal Government *Fisheries Act* and *Navigable Waters Protection Act* would be important pieces of legislation. A variety of other Yukon and Vuntut Gwitchin Government legislation would also require consideration. Several chapters of the VGFN Final Agreement would also provide guidance, with Chapter 14 (Water) being most relevant.

Recommendations concerning renewable energy project activities and mitigation actions for activities which may impact resources are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

Addressing renewable energy issues was not a major focus of the planning effort. However, given the potential future importance of this issue, and in consideration of the increasing awareness and requirements for national and international carbon emission reduction strategies, NYPC recommends the following:

Recommendation #17:
Renewable energy options for the community of Old Crow should continue to be actively researched and promoted.

2. General Strategies

This Plan does not address directly address strategies for renewable energy generation. Many of the fish, wildlife and water related management strategies summarized in Table 4.1 provide general guidance to future renewable energy generation options for the purpose of reducing potential impacts of this activity on ecological and cultural resources.

4.2.3.10 Guiding and Outfitting

OBJECTIVE	**Management objectives have not been developed for this land use activity at this time**

There are no guiding and outfitting concessions in the North Yukon Planning Region. VGFN view the communal use of wildlife and fish resources for subsistence purposes as culturally important, and not for monetary gain. VGFN does not wish to participate in or have commercially guided sport hunting or fishing occur within their traditional territory at this time.

A discussion of guiding and outfitting issues, economic considerations and potential impacts is included in Chapter 4 of the North Yukon Planning Region Resource Assessment report (North Yukon Planning Commission, 2007a).

Issues and Analysis

In some areas of Yukon, guiding and outfitting is an important economic activity. In the North Yukon Planning Region, there are no established guiding and outfitting concessions. The harvesting of wildlife and fish resources for subsistence use plays a critical role in Vuntut Gwitchin culture and economy. However, VGFN view the use of these resources as a communal and cultural activity and not for monetary gain. Given this position, VGFN does not currently wish to participate in or have commercially guided sport hunting occur within their traditional territory.

Non-consumptive guiding and outfitting tours may represent future business and employment opportunities for VGFN citizens and other residents of Yukon. A range of opportunities related to wildlife viewing and wilderness travel have been recognized as potential tourism opportunities by the North Yukon Tourism Strategy.

Legislation and Regulation of Activities

The *Wildlife Act*, R.S.Y. 2002, c.229, and VGFN Final Agreement Chapter 16 regulate guiding and outfitting activities relating to wildlife harvesting and viewing.

Recommended Management Direction

1. Recommendations

No specific recommendations relating to guiding and outfitting are required at this time. Potential opportunities for guiding and outfitting activities should be examined at the next Plan review.

2. General Strategies

Specific strategies regarding guiding and outfitting have not been developed as part of this Plan.

4.2.4 Ecological Considerations

GOAL 4 - Wildlife
Maintain the integrity of terrestrial habitat in a condition required to sustain regional wildlife populations, with special focus on the Porcupine Caribou Herd
GOAL 5 - Fish
Maintain the integrity of aquatic habitat in a condition required to sustain regional fish populations
GOAL 6 - Wetlands, Lakes and Rivers
Maintain functional integrity and hydrological processes of wetlands, lakes, rivers and sensitive permafrost areas

Recommendations related to ecological considerations are proposed in this section, with supporting rationale. Ecological considerations addressed by this Plan focus on the Integrated Management Area. Ecological considerations within existing Protected Areas and Special Management Areas, are addressed through their respective management plans (Parks Canada et al., 2004; Yukon Department of Environment and Vuntut Gwitchin Government. 2004a,b);Yukon Department of Environment and Vuntut Gwitchin Government, 2006).

The North Yukon Planning Region contains significant ecological resources. The Vuntut Gwitchin and other First Nations have relied on the wildlife and fish resources of the region for thousands of years. Establishing adequate conservation measures for wildlife, fish and their habitats prior to large-scale development occurring was a central focus for the Plan, and is the primary concern for residents of the region. Sustaining regional wildlife and fish populations requires the maintenance of regional habitat integrity, with special consideration of significant habitats.

The management of wildlife, fish and their habitat requires an integrated approach to land management. The management approaches advocated by the Plan were developed to achieve an integrated approach to conservation of these valued resources.

VGFN Final Agreement clause 16.3.2 states that: *'the management and harvesting of fish, wildlife and their habitats shall be governed by the principle of Conservation.'* The Conservation of ecological resources was a key consideration during the development of

land use designation and management recommendations. Management recommendations are directed at significant habitats that support regional fish and wildlife populations.

Ecological resource values were identified and mapped from scientific, local, and traditional sources of knowledge. NYPC identified important areas and management recommendations for wildlife resources, with emphasis on the Porcupine Caribou Herd, moose, marten, sheep, and wildlife key areas. Recommendations for managing water resources (wetlands, lakes and rivers, and river corridors) are also discussed below, owing to the importance of these habitats in sustaining a variety of species in the region (e.g. waterfowl and fish).

Many specific strategies related to the management of ecological resources are also relevant to mitigating the potential impacts of economic land uses (Section 4.2.3). Minimizing potential development impacts on wildlife and fish populations and habitats, and maintaining regional ecological integrity are key requirements to achieving the Sustainable Development objectives of the Plan.

4.2.4.1 Wildlife

OBJECTIVE 4.1	**Minimize direct and indirect human-caused habitat disturbance and alteration**
OBJECTIVE 4.2	**Minimize habitat fragmentation as a result of human features**
OBJECTIVE 4.3	**Minimize potential habitat avoidance that results from human activities**

The region is occupied seasonally or annually by approximately 40 species of mammals and 150 species of birds. Insect diversity is not well documented. The most significant wildlife resource in the region is the Porcupine Caribou Herd. Management direction is provided for four culturally important focal species - Porcupine caribou, moose, marten and sheep. Management direction for other wildlife species is provided through a combination of land use designation, cumulative effects management and wetland, lake and river recommendations.

4.2.4.1.1 Porcupine Caribou Herd

Vuntut Gwitchin culture, traditional values and subsistence economy are dependent on a healthy Porcupine Caribou Herd and continued access to and utilization of the herd. The conservation of the herd and its habitat is the most important ecological and cultural consideration in the planning region.

Locations of identified Porcupine caribou concentrated use areas are shown in Map 2. These are discussed in more detail in the North Yukon Resource Assessment report, including specific maps showing Porcupine caribou range, distribution, migration corridors and suitable habitats (North Yukon Planning Commission, 2007a,b). Of

particular note, map 19B in the resource map series shows concentrated use areas of the herd by season, which relates directly to the best management practices discussed below.

Areas that have received concentrated caribou use since the mid-1980s include the entire Richardson Mountains and foothills, Ahvee, Lone and Sharp Mountains, Whitefish Wetlands, Whitestone River, and all LMUs north of the Porcupine River (Old Crow Flats and Driftwood River, areas currently protected or under interim land withdrawal). These areas consistently receive concentrated seasonal caribou use as determined by scientific information and local knowledge. Several of the concentrated use areas occur outside of existing Protected Areas, with the most significant being the Richardson Mountains and Ahvee-Lone-Sharp Mountains.

Issues and Analysis

The Porcupine caribou herd uses the entire planning region, at various times of year. It is difficult to specify particular areas to conserve to meet long-term herd management objectives as caribou may occupy different parts of the region in response to short term environmental factors (e.g., fire history and annual snow conditions), or longer-term trends such as climate change. NYPC recognizes that there is potential for significant caribou use areas to change in the future with climate and associated environmental change.

The herd is susceptible to a variety of impacts that can reduce its health and the integrity of its habitat. Key issues with respect to resource development and land management within the winter range of the Porcupine Caribou Herd are:

- Oil and gas activity (and other land uses) creates direct wildlife habitat impacts including habitat loss, alteration and fragmentation. Indirect wildlife habitat effects include possible avoidance and reduced-use of habitat around industrial land use features.
- Access facilitated by linear features associated with oil and gas activity (seismic lines, all-season and winter roads) provides increased opportunity for harvesting and/or predation in previously inaccessible areas and needs to be given special management consideration
- Climate change effects on herd health and population status are uncertain and require a precautionary management approach.

Legislation and Regulation of Activities

Management of the ***herd*** and its ***harvest*** is under the *Wildlife Act, R.S.Y. 2002, c.229* and VGFN Final Agreement Chapter 16. Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. Many different groups have management responsibilities for the herd and its habitat. The *Porcupine Caribou Management Agreement, 1985*, establishes a co-management framework between the Governments of Canada, Yukon and Northwest Territories, the Council for Yukon First Nations and the Inuvialuit Game Council, with

the Porcupine Caribou Management Board being the primary management instrument. Other groups such as the North Yukon Renewable Resource Council and the Yukon Fish and Wildlife Board also play a role in herd and habitat management.

Recommendations concerning Porcupine caribou herd populations and habitats and mitigation actions for activities which may impact the herd or its habitat are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In recognition of the importance of the Porcupine Caribou Herd to the residents of the planning region and other affected First Nations, and to fulfill the conservation objectives of the VGFN Final Agreement and the *Porcupine Caribou Management Agreement, 1985,* NYPC recommends the following:

Recommendation #18:
To minimize potential human caused land use impacts, maintain a higher level of conservation focus in areas that receive a consistently higher level or intensity of caribou use.

The following considerations support this recommendation:

- There is substantial evidence that increasing levels of habitat alteration and fragmentation represent increasing risks to ungulate populations, with particular emphasis on caribou
- Given the importance of the herd to the people and ecology of the region, and in consideration of the potential risks to the herd, managing important habitats based on the principles of Precaution and Conservation is a prudent management approach
- Managing concentrated use areas with a higher level of conservation focus will support the Yukon and Vuntut Gwitchin government territorial and international efforts to conserve the herd

Porcupine caribou habitat management recommendations for specific LMUs are discussed in Section 5.

2. General Strategies

Regional caribou conservation priorities are focused on areas showing concentrated use by animals over many years (mid-1980s to present), or where animals occupy the same area during many seasons within a year, suggesting a high intensity of caribou use.

The land use designation system and results-based management framework indicators and thresholds concepts introduced in Sections 3.2 to 3.3, and Appendix 3 are intended to assist with maintaining habitat integrity for the herd, especially in areas of concentrated use. Through the land designation system, important unprotected habitats have been designated as requiring a higher level of conservation focus (Zone I, II or III). Utilization of disturbance thresholds to manage cumulative effects of multiple land use activities is a key component of the zoning strategy. Potential climate change effects have also been considered in Porcupine Caribou Herd habitat-related decisions.

A variety of best management practices have been or are being developed to provide guidance to operators while working near the Porcupine Caribou Herd and in its habitat, with focus on oil and gas activities (Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, *in prep*). Most best management practices focus on minimizing the size, extent and duration of activities or habitat impacts, or limiting activities to particular timing windows. The use of timing windows is challenging as most exploration and construction activities will occur during the winter period when the herd is utilizing its winter range.

Environment Canada, Canadian Wildlife Service and NYPC propose several preliminary best management practices for Porcupine Caribou Herd management in the North Yukon Planning Region:

- Avoid where possible, or minimize the size, extent and level of activities in concentrated seasonal use areas
- Where possible, avoid using or crossing seasonal migration corridors with new access routes
- Use appropriate operational timing-windows for activities in general use areas to avoid periods when the herd is in the planning region (see Map 19B, North Yukon Planning Commission 2007b)
- Limit habitat disturbance and fragmentation in general use areas (linked to threshold values)
- Minimize direct habitat disturbance and fragmentation
- Minimize use of direct footprints, with special emphasis on linear features (linked to access management)
- Implement safe operating distances from the herd

4.2.4.1.2 Moose

Significant areas and habitats for moose are discussed in more detail in the North Yukon Resource Assessment report, including maps showing existing moose survey information and habitat suitability (North Yukon Planning Commission, 2007a,b).

Scientific documentation of moose distribution in the region is limited, but local knowledge is extensive. Old Crow land users identified significant moose areas around Old Crow Flats, Old Crow Range, Bluefish wetlands, Whitefish wetlands, Driftwood River, Johnson Creek, lower and middle Porcupine River, Whitestone Village (including Whitestone and Miner Rivers), Bear Cave Mountain, Eagle Plains, Choho Hill, Mason Hill, and the north Richardson Mountains. Two migration routes were identified (Little Flats to Driftwood hills, and Lone mountain to Old Crow Flats). Outside of Old Crow Flats, the Bell River and Eagle River corridors have been noted as significant moose habitat.

Issues and Analysis

Moose are an important part of the region's ecology, and are harvested by First Nation and non-First Nation hunters. In the North Yukon Planning Region, moose do not receive as high a harvesting pressure as Porcupine caribou.

Most of the planning region is used by moose at various times of year, but the major areas of importance on a seasonal or annual basis are generally the region's lakes, wetlands, rivers, and river valleys (see Section 4.2.4.3). Moose are fairly tolerant of disturbance from land use activities, but they are susceptible to impacts that can reduce the health of populations and habitats. The most significant issue related to moose population and habitat management is increased harvest as a result of new road and trail access. Management of linear features (roads, trails and seismic lines) and use of those features require special consideration. Moose prefer younger forest and shrub conditions; habitat conditions may improve as a result of increased fire activity and regenerating land use disturbances.

Legislation and Regulation of Activities

The management of moose harvest is under the *Wildlife Act, R.S.Y. 2002, c.229* and VGFN Final Agreement Chapter 16. Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. The Government of Yukon, Vuntut Gwitchin Government, and UFA Boards have various management responsibilities for management of moose.

Recommendations concerning moose populations and habitats and mitigation actions for activities which may impact moose or their habitat are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

No specific recommendations relating to the management of moose habitat are required at this time. General management strategies and the other tools of this Plan are adequate to address potential moose-related habitat issues.

Moose habitat management recommendations for specific LMUs are discussed in Section 5.

2. General Strategies

The land use designation system and results-based management framework indicators and thresholds concepts introduced in Sections 3.2 to 3.3, and Appendix 3 are intended to assist with maintaining habitat integrity for moose, and mitigating potential land use related impacts. Recommendations relating to lakes, wetlands and Major River Corridors are also important strategies to maintaining moose habitat integrity (see Section 4.2.4.3).

General strategies to conserve moose habitats and reduce impacts on populations focus on avoiding important moose habitats, minimizing the extent, duration and intensity of disturbances, and minimizing and managing access. Proposed best management practices regarding moose habitat management, as provided by Yukon Department of Environment, include the following:

- Avoid seasonal use/concentration areas and migration corridors
- Minimize disturbance and direct/indirect habitat loss
- Avoid creation of new/permanent access
- When it is necessary to create new access routes:
    - Gate or otherwise restrict hunting along the new access routes
    - To the extent possible, route new access routes through non-moose habitats

4.2.4.1.3 Marten

Significant marten habitats are discussed in detail in the North Yukon Resource Assessment report, including maps of habitat suitability (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Marten play an important role in the regional traditional economy. Due to their importance as a trapping resource for First Nation residents, marten was chosen as a focal

species for the regional land use plan. Maintaining suitable marten habitat conditions is a consideration of the land use plan.

Much of the planning region is used by marten at various times of year, but the major areas of importance on a seasonal or annual basis are generally the region's lakes, wetlands, rivers, and river valleys (see Section 4.2.4.3).

Documented information on marten distribution in the region is limited and the species is poorly understood in northern environments. Marten are expected to be fairly tolerant of and resilient to land use disturbance.

Legislation and Regulation of Activities

The management of trapping is under the *Wildlife Act, R.S.Y. 2002, c.229,* and VGFN Final Agreement, Chapter 16. The Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. At this time, trapping activities are not formally regulated or monitored in Old Crow.

Recommendations concerning marten populations and habitats and mitigation actions for activities which may impact marten or their habitat are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

Specific recommendations relating to the management of marten habitat are not required at this time. General management strategies and the other tools of this Plan are adequate to address potential marten-related habitat issues.

Marten habitat management recommendations for specific LMUs are discussed in Section 5.

2. General Strategies

The land use designation system and results-based management framework indicators and thresholds concepts introduced in Sections 3.2to 3.3 and Appendix 3 are intended to assist with maintaining habitat integrity for marten, and mitigating potential land use related impacts. Recommendations relating to lakes, wetlands and Major River Corridors are also important strategies to maintaining moose habitat integrity (see Section 4.2.4.3).

General strategies to conserve marten habitats and reduce impacts on populations focus on avoiding important moose habitats, minimizing the extent, duration and intensity of

disturbances, and minimizing and managing access. Detailed best management practices for marten habitat management in the region have not been developed.

4.2.4.1.4 Sheep

Locations of identified Dall's sheep areas are shown in Map 2. These are discussed in more detail in the North Yukon Resource Assessment report, including a specific map of identified sheep areas from local knowledge and the wildlife key areas database (Yukon Department of Environment, 2005) (North Yukon Planning Commission, 2007a,b).

The map of significant areas for sheep highlights several mountain ranges. Old Crow land users identified significant sheep areas in the Barn Mountains (Vuntut National Park), Ahvee Mountain (historical, from 1930s-40s), Mahoney Lake, Cody Hill, Fishing Branch, Bear Cave Mountain, Mount Rover (south), Mount Dewdney, and the entire North Richardson Mountains, with emphasis on Summit Lake - Rat Pass. Workshop participants noted that many of these ranges do not support sheep populations at present; current sheep areas near Old Crow included the Barn Mountains, Mount Miller, and Mount Rover (south). Local knowledge was provided for all seasons. The sheep key areas (Yukon Department of Environment, 2005) shows much of the northern and southern Richardson Mountains as a significant sheep area for a variety of seasons and functions.

Issues and Analysis

Sheep are reliant on high elevation and alpine habitats, and serve as a general indicator of the health of alpine conditions. Sheep hunting is not a major focus for First Nation subsistence harvesting. Until recently there has been relatively limited interest in sheep hunting in the region; two sheep permits are now available annually in the Northern Richardson Mountains. VGFN, the Tetlit Gwich'in First Nation, and other groups are preparing a sheep management plan for the Northern Richardson Mountains, due for release in fall 2007. Pending approval of the sheep management plan, the sheep hunting permits have been suspended.

Sheep winter range is an important and sensitive habitat. Critical winter sheep habitat is generally characterized as relatively snow-free, wind-swept, south-facing slopes. Sheep have a strong fidelity to specific areas, and tend to use those areas around the same time each year. Sheep populations are vulnerable to direct habitat loss and disturbance from various activities. There are currently few direct risks to sheep populations or habitats.

Legislation and Regulation of Activities

The management of sheep harvest is under the *Wildlife Act, R.S.Y. 2002, c.229* and VGFN Final Agreement Chapter 16. Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. The Government of Yukon, Vuntut Gwitchin Government, and UFA Boards have various management responsibilities for management of sheep. The

management of North Richardson sheep populations extends into the jurisdiction of the NWT.

Recommendations concerning alpine and high elevation habitat, sheep populations, and mitigation actions for activities which may impact sheep or their habitats, are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

Specific recommendations relating to the management of sheep habitat are not required at this time. Sheep habitat management recommendations for specific LMUs are discussed in Section 5.

The Northern Richardson Mountains sheep management plan will provide specific sheep management recommendations for the Northern Richardson Mountains and best management practices that may be applicable to the entire region.

2. General Strategies

An important general strategy relating to the conservation of sheep and sheep habitat is to avoid sensitive sheep habitats and key areas (Map 2), with emphasis on winter range avoidance, where possible. Best management practices for aircraft operations in Yukon sheep habitats have been developed (Mining Environment Research Group, 2006).

4.2.4.1.5 Other Species

A full listing of mammals and birds that have been documented in the North Yukon Planning Region is provided in the North Yukon Resource Assessment Report, including maps of wildlife key areas (Yukon Department of Environment, 2005) (North Yukon Planning Commission, 2007a).

Issues and Analysis

In addition to the focal species, the North Yukon Planning Region contains a number of other important mammal species, including grizzly bear, black bear, wolverine, wolf, and fox. Most of these species are occasionally hunted or trapped. Under the *Species at Risk Act* (SARA) (Environment Canada, 2006) grizzly bear and wolverine are listed as species of national conservation concern. There are no immediate conservation or management concerns regarding these two species in northern Yukon.

A large number of bird species are also present in the region. The majority of the 150 documented species are migratory, and are only present during the breeding season, which extends from approximately May to September. The Short-eared owl and Peregrine falcon are two species of national conservation concern in the region. There are no immediate conservation or management concerns regarding these two species in northern Yukon. In the past, northern Yukon has served as a source population for Peregrine falcons in other jurisdictions.

Legislation and Regulation of Activities

The management of wildlife harvest is under the *Wildlife Act, R.S.Y. 2002, c.229* and VGFN Final Agreement Chapter 16. Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. Other relevant legislation includes the Federal government *Migratory Birds Convention Act* and the *Species at Risk Act*. The Government of Yukon, Government of Canada, Vuntut Gwitchin Government, and UFA Boards have various management responsibilities for management of wildlife.

Recommendations concerning wildlife and wildlife habitat and mitigation actions for activities which may impact wildlife or their habitat are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

Specific recommendations relating to the management of other wildlife species and habitat are not required at this time. General management strategies and the other tools of this Plan are currently considered adequate to address other potential wildlife-related habitat issues.

There is no specific SARA guidelines or required management prescriptions for species with special concern status.

2. General Strategies

Maintaining an intact assemblage of native mammals and birds relies on maintaining overall ecological integrity, with emphasis on the integrity of important habitats. It is not possible, nor desirable, to manage each species individually. Given the relatively few existing conservation concerns regarding other species, the Plan does not address each species in further detail. Instead, the Plan focuses on maintaining regional ecological and habitat integrity through the various tools and approaches of the Plan. Existing wildlife plans such as the North Yukon Wildlife Management Plan provide additional guidance for species management.

The land use designation system and results-based management framework indicators and thresholds concepts introduced in Sections 3.2 to 3.3, and Appendix 3 are intended to assist with maintaining habitat integrity for most species, and mitigating potential land use related impacts. Recommendations relating to lakes, wetlands and Major River Corridors are also important strategies to maintaining habitat integrity for a broad suite of wildlife and bird species (see Section 4.2.4.3).

4.2.4.2 Fish

OBJECTIVE 5.1	**Minimize human-caused aquatic habitat disturbance and alteration**
OBJECTIVE 5.2	**Minimize stream crossings and/or stream crossing impacts as a result of roads and trails**
OBJECTIVE 5.3	**Maintain fish migration routes and access to required seasonal habitats**
OBJECTIVE 5.4	**Maintain quantity, quality and rate of water flow, including seasonal rate of flow**

The Porcupine River watershed supports abundant fish populations. Approximately 18 species of fish, including 3 species of salmon and 8 species of freshwater game-fish, have been documented in the North Yukon Planning Region. Salmon, Arctic grayling, whitefish and northern pike are important subsistence species for First Nations and provide recreational fishing opportunities for non-residents. The conservation of fish stocks and habitats is an important ecological and cultural consideration in the planning region.

Locations of lakes and rivers that can support fish populations are shown in Map 2. Management direction for regional lakes, rivers and wetlands are discussed in Section 4.2.4.3. Important fish habitats are discussed in more detail in the North Yukon Resource Assessment report (North Yukon Planning Commission, 2007a,b). Detailed maps showing documented and potential fish habitat, with emphasis on critical over-wintering and sensitive spawning areas, are also provided. A detailed summary of Porcupine River fisheries information is available in the Porcupine River Watershed Fisheries Information Summary Report (Anderton, 2004).

Issues and Analysis

The northern Yukon experiences large seasonal natural variations in water quality and quantity. In winter, due to the extensive permafrost and lack of groundwater storage, water flow decreases markedly. Winter becomes a critical period for resident fish populations, as the occurrence and extent of suitable over-wintering habitats is limited. Suitable spawning habitats may also be a limiting factor.

Generally, the level of understanding of fish in the region is poor, particularly for the region's lakes and wetlands. The main rivers containing critical fish over-wintering habitat are the Whitestone, Miner, Fishing Branch, Eagle, Bell, Porcupine, and Old Crow rivers. Significant lakes for fish are generally within the Old Crow Flats, Bluefish wetlands, and Whitefish wetland areas. A few additional lakes are located along the Porcupine, Bell, and Eagle Rivers. Salmon (Coho, Chum, and Chinook) use most of the major river/streams in the Porcupine watershed. Salmon are present in the region from approximately July (Chum migration) to December (Coho migration).

It is important to note that many of the identified areas of significance to fish are also important cultural and subsistence harvesting areas.

Potential threats to fish stocks within the region include habitat loss, degradation, barriers to fish migration, impacts on water quality and quantity, and climate change effects. Given the importance of critical over-wintering habitats, in-stream or lake water extraction for industrial or municipal purposes during the winter period can have substantial impacts on fish populations and habitats. There are currently very few land use-related impacts on fish and fish habitat.

Legislation and Regulation of Activities

There are several Yukon and Federal government Acts that apply to the management of fish and fish habitats in the region (see Appendix 1). One of the main Acts is the *Federal Fisheries Act, R.S., 1985, c. F-14*. VGFN Final Agreement Chapter 16 applies to the management of fish. Vuntut Gwitchin Government is currently drafting a *Fish and Wildlife Act*. The Government of Yukon, Federal Government, Vuntut Gwitchin Government, and UFA Boards and Committees have various management responsibilities for fish and fish habitat. The Yukon Water Board, an independent administrative tribunal established under the *Waters Act*, is responsible for the issuance of water use licenses for the use of water and/or the deposit of waste into water. Water licenses are issued for a variety of undertakings.

Recommendations concerning fish populations and habitats and mitigation actions for activities which may impact fish or their habitat are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In recognition of the importance of critical over-winter and spawning habitats to the maintenance of regional fish populations, NYPC recommends the following:

Recommendation #19:
To minimize potential impacts to regional fish populations, in-stream and lake water withdrawals should be prohibited during the winter period in identified fish over-wintering areas.
Recommendation #20:
To minimize potential impacts to regional fish populations, aggregate (gravel) mining should be prohibited in identified fish spawning areas.

Fish habitat management recommendations for specific LMUs are discussed below in Section 5.

2. General Strategies

Table 4.1 provides a summary of recommended strategies that will assist in achieving the Plan Goals and Objectives related to fish and fish habitat. Avoiding important habitats, maintaining fish migration routes, minimizing riparian disturbance and utilization of timing windows are key concepts. Objectives and Strategies related to Wetlands, lakes and rivers are also important considerations (see Section 4.2.4.3)

In Yukon, best management practices for projects that may impact fish populations or habitats are currently developed on a project-by-project basis (Susan Thompson, Yukon Department of Environment, Al von Finster, Fisheries and Oceans Canada, pers. comm.). Standard mitigation practices for 'low risk' activities have been developed and these are generally applied in the Yukon (Fisheries and Oceans Canada, 2007). However, best management practices for mitigating potential fish and fish habitat impacts in permafrost environments such as northern Yukon are not currently available (Al von Finster, Fisheries and Oceans Canada, pers. comm.).

4.2.4.3 Wetlands, Lakes and Rivers

OBJECTIVE 6.1	**Minimize the amount of human-caused surface disturbance within and adjacent to wetlands, lakes, and rivers.**

Wetlands, lakes and rivers hold many of the ecological, heritage and cultural values in the region. The majority of the lakes and open water habitats in northern Yukon are associated with the Old Crow Flats, Bluefish-Cadzow, and Whitefish wetland complexes. Outside of these areas, open water habitats are limited in geographic extent, and are generally poorly mapped. Major rivers and river valleys in the region are important transportation corridors for residents, and are the basis for current and anticipated wilderness and cultural tourism activities. The management of wetlands, lakes and rivers

were identified as a major regional issue (see Section 1.6), and are given important consideration in the Plan. Specific recommendations and strategies are provided for the management of wetlands, lakes and rivers within the Integrated Management Area.

4.2.4.3.1 Wetlands, Lakes and Sensitive Permafrost Areas

Locations of identified wetlands, wetland complexes and lakes are shown in Map 2. These are discussed in more detail in the North Yukon Resource Assessment report, including a specific map of identified wetlands and wetland complexes (North Yukon Planning Commission, 2007a,b). Sensitive permafrost areas are associated with all wetland complexes.

Issues and Analysis

Wetlands, wetland complexes and lakes are biologically productive areas that hold many of the regional heritage, cultural, and ecological values. These habitats support and sustain a variety of wetland-dependent organisms. Wetlands require specific management recommendations to maintain their integrity and to mitigate potential land use impacts.

In northern permafrost environments, defining and mapping wetlands is challenging[4]. For this Plan, wetlands are defined as:

> *"all open water aquatic environments, both lentic (still water) and lotic (moving water) features, and their adjacent environments"*.

Wetland complexes are concentrated geographic groupings of individual wetlands, and may include both wetland and non-wetland biophysical landscape types. Most wetland complexes function as an integrated hydrologic system and should be managed as a distinct area. A comprehensive and accurate map showing all wetland habitats in the region is not currently available.

In the planning region, three major wetland complexes have been identified as key wetlands of territorial significance: 1) Old Crow Flats, 2) Bluefish-Cadzow Lake wetlands, and 3) Whitefish wetlands (Yukon Department of Environment, 2005). The central wetland values of Old Crow Flats are within the existing Protected Areas of Old Crow Flats SMA and Vuntut National Park. VGFN settlement land includes large portions of the Bluefish-Cadzow (VG R-11A) and Whitefish (VG R-02A) wetland complexes (Map 2).

[4] The National Wetlands Working Group (1988) define wetlands as "land that has the water table at, near, or above the land's surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to the wet environment". Permafrost conditions can create poor soil drainage conditions across broad geographic areas, resulting in hydric soil conditions for much of the growing season with possible seasonal standing water. Such areas would typically not be considered 'wetlands'.

The three key wetland complexes of the region, Old Crow Flats, Bluefish-Cadzow and Whitefish, occur in old glacial lake basins. Fine-grained, ice-rich glacial lake sediments underlie these areas and most lakes are thermokarst in origin. These wetland complexes are very sensitive permafrost environments that are susceptible to permafrost degradation and altered hydrology as a result of surface disturbance. All wetlands require stringent management recommendations and cautious operating guidelines to mitigate potential land use impacts.

Additional research is required to determine the impacts of development and climate change in northern permafrost areas with wetlands. Some research on this topic is being undertaken as part of the International Polar Year studies on Old Crow Flats.

Legislation and Regulation of Activities

There are several Yukon and Federal Acts that apply to the management of water resources in the region (see Appendix 1). VGFN Final Agreement Chapter 14 also applies to the management of water resources. There is currently no wetlands policy for the Yukon. The Government of Yukon is responsible for managing lakes and wetlands on non-settlement land outside of national parks. Vuntut Gwitchin Government is responsible for managing lakes and wetlands on settlement land outside of national parks.

Recommendations concerning wetland, lake and permafrost habitats and mitigation actions for activities which may impact such habitats are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

In recognition of the importance of wetlands and wetland complexes to the biological, heritage and cultural values of the region, and the sensitivity of these important habitats, NYPC recommends the following:

Recommendation #21:
All-season infrastructure should be discouraged in key wetland complexes (Old Crow Flats, Bluefish-Cadzow and Whitefish).
Recommendation #22:
Where required, surface disturbance within and adjacent to wetlands, lakes and rivers should not result in diminished water quality or quantity.

This recommendation is supported by the following considerations:

- Most wetland complexes function as an integrated hydrologic system; minor alterations to this hydrology through the construction of all season roads, well pads and similar features can result in significant impacts
- Large amounts of aggregate are typically required to support all-season infrastructure in wetland environments, making reclamation difficult

Wetland complex land use designation proposals and recommendations for specific LMUs and are discussed in Section 5. A portion of the Whitefish wetlands complex is proposed for consideration as a Protected Area (see Section 5 and Appendix 4).

2. General Strategies

Table 4.1 provides a summary of recommended strategies that will assist in achieving the Plan Goals and Objectives related to lakes, wetlands and sensitive permafrost terrain. Identifying wetland and sensitive permafrost features, avoiding or minimizing land use activities in these areas, coordinating access and reducing the intensity of surface and shoreline disturbance are key concepts.

The management approaches advocated by the Plan are intended to assist in mitigating potential development impacts on wetlands and lakes.

Best management practices are being developed for oil and gas activities near Yukon wetlands, lakes and rivers with input from several wetland management agencies (Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, *in prep*). NYPC and plan partners[5] propose the following preliminary wetland best management practices to mitigate potential land use impacts:

- When conducting activities, avoid wetlands whenever possible
- All-season infrastructure should be discouraged in all wetlands, with required access by winter roads only
- When conducting activities in vicinity of wetlands and wetland complexes, they should be carried out during the winter period
- Locations of all-season infrastructure should maintain a minimum distance of 100m from waterbodies (Petrula, 1994)
- If land use activities are required in wetlands, natural drainage patterns should be maintained

[5] Wetland best management practices information provided by Environment Canada, Canadian Wildlife Service (Whitehorse), and Ducks Unlimited Canada (Whitehorse office)

4.2.4.3.2 Major River Corridors and River Valleys

Locations of identified Major River Corridors and river valleys are shown in Map 2. These are discussed in more detail in the North Yukon Resource Assessment report, including a specific map of major rivers corridors and significant river valley areas (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

Rivers and river valleys are biologically productive areas that hold many of the regional heritage, cultural, ecological, tourism, and economic values. These areas require specific management recommendations.

The Porcupine, Bell, Whitestone, Miner, Fishing Branch, Old Crow, and Eagle rivers are considered to be **Major River Corridors**. All are current use areas and important summer and winter travel corridors for residents of the region, and for wilderness tourism. The Porcupine River is of particular importance to Old Crow residents.

Rivers are special types of wetlands—rivers, streams and their immediate environments represent some of the most sensitive and important ecological environments within the region. River valleys are key areas for many species including moose, furbearers, and birds. River aquatic environments are fish and waterfowl habitat, and facilitate fish migration between critical seasonal habitats.

Rivers and river valleys are susceptible to a variety of impacts that can result in habitat loss, water diversion, siltation, and water quality impacts. Activities in Major River Corridors can also negatively impact the visual quality, enjoyment, and pursuit of other land uses such as river-based wilderness tourism and First Nations cultural activities and subsistence harvesting.

VGFN Final Agreement clause 14.8.1 states that: *'Subject to the rights of Water users authorized in accordance with this chapter and Laws of General Application, a Yukon First Nation has the right to have Water which is on or flowing through or adjacent to its Settlement Land remain substantially unaltered as to quantity, quality and rate of flow, including seasonal rate of flow.'*

Legislation and Regulation of Activities

Several Yukon and Federal Acts apply to the management of rivers and river valleys in the region (see Appendix 1). VGFN Final Agreement Chapter 14 applies to the management of water resources. The Government of Yukon and Federal government have various management responsibilities for rivers and river valleys. Vuntut Gwitchin Government is responsible for managing river corridors on settlement land outside of national parks.

Recommendations concerning river and river valley habitats and mitigation actions for activities which may impact such habitats are mad by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

In recognition of the importance of rivers and river valleys to the biological, heritage and cultural values of the region, and the sensitivity of these areas, with special consideration of Major River Corridors, NYPC recommends the following:

Recommendation #23:
To maintain the visual quality and aesthetics of Major River Corridors, all-season infrastructure should be discouraged within 1 km of Major Rivers.
Recommendation #24:
Avoid construction of new permanent river crossing structures and routing new all-season access roads through Major River Corridors, where possible.
Recommendation #25:
Where new access roads and/or trails cross Major River Corridors, these should be designed, constructed, and used in a manner that minimizes direct and indirect impacts to fish, wildlife and their habitats.
Recommendation #26:
Surface disturbance and land use activities within and adjacent to Major River Corridors should not result in diminished water quality or quantity.

As shown on Map 2, Major Rivers/River Corridors are defined as the Porcupine, Bell, Whitestone, Miner, Fishing Branch, Old Crow, and Eagle rivers.

Management recommendations for the maintenance of Major River Corridor visual quality are discussed in Section 4.2.3.3, Tourism and Recreation. River corridor management recommendations for specific LMUs are discussed below in Section 5.

2. General Strategies

General strategies related to lakes, wetlands and sensitive permafrost terrain are also relevant for mitigating potential land use impacts in Major River Corridors and river valleys (Table 4.1). Avoiding or minimizing land use activities in Major River Corridors and maintaining visual quality of these areas are the most important considerations.

Best management practices are being developed for oil and gas activities near Yukon wetlands, lakes and rivers (Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch, *in prep*). The development of best management practices for Major River Corridors and river valleys is an important activity to maintain a variety of resource values over the long-term. The following preliminary Major River Corridor and river valley best management practices are proposed by NYPC:

- Stream crossing structures should be oriented and located to avoid re-directing or impacting waterflow and water quality
- Maintain visual quality of river corridors and river valleys
- Avoid aggregate mining activities in Major River Corridors and river valleys, where possible

4.2.4.4 Environmental Quality

Historical industrial land use activities left a legacy of various surface disturbances in the region. Most of the disturbances are associated with the construction and direct footprint of the Dempster Highway, and historical oil and gas exploration activities. Historical disturbances impact habitat and visual quality. Many of the disturbances are readily visible on the landscape today but some have regenerated to a point that they are considered reclaimed (i.e. are no longer functional disturbances). Understanding reclamation rates and trajectories for disturbed sites is an important consideration in the monitoring and calculation of regional indicator status (indicator concepts and status are discussed in Appendix 3).

Impacts from previous land use activities also resulted in several contaminated sites in the region and these are briefly discussed. Construction of new land use features on the landscape may require active restoration or reclamation efforts.

4.2.4.4.1 Restoration and Reclamation

The type, location and status of historical and current surface disturbances resulting from land use activities (i.e., human footprints) are discussed in Chapter 4 of the North Yukon Resource Assessment Report, including maps of documented human surface disturbances and contaminated sites (North Yukon Planning Commission 2007a,b).

Issues and Analysis

Historical and current surface disturbance and linear features may cause a variety of direct and indirect impacts, including habitat loss, habitat fragmentation, increased levels of predator or human-caused mortality, the introduction of non-native plant and animal species, and reduced visual aesthetics. A growing body of information suggests that increasing levels of surface disturbance and linear features represents increasing risks to

wildlife and fish populations, and overall ecological integrity of natural systems. Historical disturbances and their status must be considered when evaluating current and future ecological conditions.

Approximately 10,200 km of linear features, representing 9,500 ha of surface disturbance, were created in the region by historical oil and gas exploration, mineral exploration, and transportation infrastructure construction. The majority of these impacts are located in the Eagle Plain oil and gas basin. Some of the historical disturbances have re-vegetated and recovered to the point that they can now be considered recovered or reclaimed. However, the rate and amount of recovery is currently uncertain. Preliminary estimates suggest that approximately 20% of historical surface disturbances are functionally reclaimed.

An accurate comparison between the current state (status) of cumulative effects indicators (amount of human-caused surface disturbance and linear feature density) and stated thresholds is required to determine when cautionary or critical thresholds are being reached, possibly indicating that significant impacts may be occurring to valued resources. This comparison is the performance evaluation requirement for cumulative effects indicators discussed in Section 3.3.1.

Restoration and reclamation is an important consideration for future land use activities that create surface disturbance. Restoring or reclaiming sites and features as quickly as possible upon completion of activities will reduce overall levels of direct habitat impacts, allowing higher levels of land use to occur below the stated threshold. Reclamation and restoration therefore plays a key role in the cumulative effects management strategies of this Plan.

Legislation and Regulation of Activities

There are several Yukon and Federal Acts that apply to the restoration and reclamation of impacted sites (see Appendix 1). Restoration and reclamation responsibilities fall under different Acts depending on the activity that led to the disturbance. Project proponents and the Yukon Government have management responsibilities for restoration and reclamation of impacted sites, outside of national parks. Vuntut Gwitchin Government is responsible for restoration and reclamation of impacted sites on settlement land, outside of national parks.

Recommendations concerning restoration and reclamation activities are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for activities. Yukon and First Nation governments play a large role in reclamation planning for new industrial projects, reclamation monitoring and site closure.

Recommended Management Direction

1. Recommendations

In recognition of the importance of understanding and documenting current levels of human-caused disturbance and land impacts in the region, and its potential contribution to future land use impacts, NYPC recommends the following:

Recommendation #27:
Reclamation trajectories and rates for previously disturbed sites should be determined to verify when footprints are functionally removed from the landscape. This activity is required to develop accurate estimates of current indicator status for reporting and evaluation purposes.

The following considerations support the above recommendation:

- The current status of both proposed indicators is currently uncertain and has been estimated based on visual inspection of low-level aerial photographs on representative site conditions
- Indicator performance evaluation for decision-making requires an accurate comparison of current status to a threshold
- Additional research is required to refine indicator status, and will aid in improved future decision-making regarding best practices and reclamation rates
- Improving the indicator information base is consistent with the application of adaptive management principles

2. General Strategies

Many of the general strategies related to wildlife, fish and wetlands, lakes and rivers objectives are relevant to future reclamation and revegetation considerations (Table 4.1). Minimizing the size, intensity and duration of human-caused physical surface disturbances through a variety of operating practices (Strategy 4.1.1) is considered to be the most proactive strategy for addressing future reclamation/revegetation requirements. In addition to this general strategy, NYPC recommends the following general strategies to achieve effective reclamation of future land use impacts:

- Reclamation/revegetation considerations should be considered for all future land use activities.
- Detailed planning and site closure/remediation plans should be developed, implemented, and monitored for all future land use activities that create surface disturbance, including aggregate (gravel) mining, mineral exploration and development, oil and gas exploration and development, forestry and transportation.

- Native endemic plants should be used for active reclamation, whenever possible.

Best management guidelines for reclamation/revegetation of sites in the Yukon have been developed (Yukon Department of Environment, 1996).

4.2.4.4.2 Contaminated Sites

Contaminated sites are discussed in more detail in Chapter 4 of the North Yukon Resource Assessment report, including a map of contaminated sites and their status (North Yukon Planning Commission, 2007a,b).

Issues and Analysis

A number of potential contaminated sites have been identified in the North Yukon Planning Region. Based on existing information, one site requires remediation (Bonnet Lake) and 6 require assessment. All other documented sites have been remediated or have been determined to not require remediation. Most documented sites consist of empty fuel drums and assorted refuse resulting from historical oil and gas or mineral exploration activities.

Old Crow residents expressed concern over potential contaminated sites that resulted from historical land use activities. Various efforts have occurred over the past decade to identify and remediate identified contaminated sites, including the recent removal of fuel drums from Whitefish Wetlands-Tizya Creek. Contaminated site identification and remediation recommendations were not identified as a major issue during the regional planning exercise.

Legislation and Regulation of Activities

The *Environment Act, R.S.Y. 2002, c.76* and *Contaminated Sites Regulations* applies to the management and remediation of contaminated sites. The Government of Yukon and Federal Government have various management responsibilities for contaminated sites.

Recommendations concerning the avoidance or mitigation of potential site contamination from activities are made by YESAB during the development assessment process. Government decision bodies consider these recommendations and are ultimately responsible for setting terms and conditions for operators.

Recommended Management Direction

1. Recommendations

Specific recommendations relating to contaminated sites are not required at this time. Existing efforts to identify and remediate potentially contaminated sites are in place, including well site inspections and wetland/waterfowl surveys.

2. General Strategies

The most effective strategy to mitigate potential impacts of future contaminated sites is prevention. This Plan does not recommend specific strategies to prevent future environmental contamination as a large number of detailed operating procedures are in place and considered adequate to prevent the creation of future contaminated sites.

4.2.5 General Management Direction Recommendation Summary

4.2.1.2 Sustainable Development – Cumulative Effects Management

Recommendation #1:
As a general guideline for land users and decision makers, the amount of functional and unreclaimed surface disturbance in a given landscape management unit should be maintained at levels below the threshold values for the cumulative effects indicators proposed in the Plan.

4.2.1.3 Sustainable Development – Climate Change

Recommendation #2:
In the North Yukon Planning Region, potential climate change impacts should be considered in all land management decisions, with special emphasis on land management decisions affecting the habitat of the Porcupine Caribou Herd.

4.2.2.1.1 VGFN Heritage Routes and Sites

Recommendation #3:
Pursuant to VGFN Final Agreement Specific Provision 13.4.6.2 and Chapter 13, Schedule A, management recommendations and procedures for identified routes and sites within the Integrated Management Area should be developed jointly by VGG and YG.

4.2.2.1.2 Other Heritage and Historic Resources

Recommendation #4:
Historic camps/cabins, historical fish trap locations, archaeological sites and other heritage resources should be identified prior to exploration and development activities, and protected from disturbance.

4.2.2.2 Current Community Use and Harvesting Areas

Recommendation #5:
In identified current Community Use Areas (Map 3), exploration and construction activities should be minimized or mitigated during subsistence harvesting or other periods of seasonal cultural activities.
Recommendation #6:
Work camps associated with resource exploration and development activity should be sited near areas of resource production, away from current Community Use Areas (Map 3).

4.2.3.1 Old Crow Community Area

Recommendation #7:
To support maintenance and growth of Old Crow, a 5 km Community Area (CA) should be recognized around the community. The CA applies on the north bank of the Porcupine River, out to a distance of 5 km from the community boundary, not including the Old Crow Flats Special Management Area.
Recommendation #8:
The Community Area within 5 km of the community of Old Crow should be exempt from surface disturbance and linear (access) density indicator monitoring.
Recommendation #9:
Work camps associated with resource exploration and development activity should be sited near areas of resource production, away from the Old Crow Community Area.

4.2.3.2.1 Transportation - Dempster Highway

Recommendation #10:
In recognition of the strategic importance of the Dempster Highway and its designation as a Northern and Remote Route under the National Highway System, surface disturbance and linear (access) density indicator monitoring are exempt within a distance of 2 km on each side of the highway center line (4 km total corridor width).

4.2.3.2.2 Transportation - Old Crow Winter Road

Recommendation #11:
An all-season access road to Old Crow is not required at this time.

4.2.3.2.3 Transportation - New Roads and Access Routes

Recommendation #12:

Creation of new access roads and trails should be minimized and existing routes utilized where possible.

Recommendation #13:

Where new access roads and/or trails are required, these should be designed, constructed, and used in a manner that minimizes direct and indirect impacts to fish and wildlife, their habitats, and human viewscapes.

Recommendation #14:

In advance of significant levels of energy sector activity, an access management plan should be developed for the Eagle Plain oil and gas basin.

4.2.3.6 Aggregate (Gravel) Resources

Recommendation #15:

In advance of industrial development, the identification and mapping of potential sources of aggregate should be made a regional priority.

4.2.3.8 Forest Resources

Recommendation #16:

A future Old Crow Forest Management Plan should maintain community fuelwood and forest harvesting opportunities within the identified fuelwood and forest harvesting area, as shown on Map 3

4.2.3.9 Renewable Energy

Recommendation #17:

Renewable energy options for the community of Old Crow should continue to be actively researched and promoted.

4.2.4.1.1 Wildlife – Porcupine Caribou Herd

Recommendation #18:

To minimize potential human caused land use impacts, maintain a higher level of conservation focus in areas that receive a consistently higher level or intensity of caribou use.

4.2.4.2 Fish

Recommendation #19:
To minimize potential impacts to regional fish populations, in-stream and lake water withdrawals should be prohibited during the winter period in identified fish over-wintering areas.
Recommendation #20:
To minimize potential impacts to regional fish populations, aggregate (gravel) mining should be prohibited in identified fish spawning areas.

4.2.4.3.1 Wetlands, Lakes and Rivers – Wetlands, Lakes and Sensitive Permafrost Areas

Recommendation #21:
All-season infrastructure should be discouraged in key wetland complexes (Old Crow Flats, Bluefish-Cadzow and Whitefish).
Recommendation #22:
Where required, surface disturbance within and adjacent to wetlands, lakes and rivers should not result in diminished water quality or quantity.

4.2.4.3.2 Wetlands, Lakes and Rivers – Major River Corridors and River Valleys

Recommendation #23:
To maintain the visual quality and aesthetics of Major River Corridors, all-season infrastructure should be discouraged within 1 km of Major Rivers.
Recommendation #24:
Avoid construction of new permanent river crossing structures and routing new all-season access roads through Major River Corridors, where possible.
Recommendation #25:
Where new access roads and/or trails cross Major River Corridors, these should be designed, constructed, and used in a manner that minimizes direct and indirect impacts to fish, wildlife and their habitats.
Recommendation #26:
Surface disturbance and land use activities within and adjacent to Major River Corridors should not result in diminished water quality or quantity.

4.2.4.4.1 Environmental Quality – Restoration and Reclamation

Recommendation #27:
Reclamation trajectories and rates for previously disturbed sites should be determined to verify when footprints are functionally removed from the landscape. This activity is required to develop accurate estimates of current indicator status for reporting and evaluation purposes.

5. Landscape Management Units and Land Use Designation

This section contains the landscape management unit (LMUs) and land use designation recommendations of the Plan. Section 3 introduced the concepts of landscape management units (LMUs) and land use designation as methods to identify discrete management areas in the region with differing management intentions. LMUs form the primary land management units of the North Yukon Regional Land Use Plan. The general management direction recommendations described in Section 4 apply to LMUs in the Integrated Management Area, the working landscape.

5.1 Landscape Management Units

Table 5.1 and Map 5 provide an overview of the existing or proposed LMUs. Thirteen distinct LMUs are proposed for the North Yukon Planning Region (Map 5). Two LMUs encompass existing Protected Areas (i.e., Old Crow Flats SMA, including Vuntut National Park, and Ni'iinlii'njik (Fishing Branch) Protected Area)). Some LMUs contain sub-units, shown by a letter following the number. LMUs range in size from 1,740 km^2 (LMU #11, Whitestone River) to 12,122 km^2 (LMU #1, Old Crow Flats SMA).

5.2 Land Use Designation

Map 6 shows the 13 proposed LMUs and an existing or proposed land use category for each. As described in Section 3.2, the two major land use categories are Integrated Management Area (IMA) or Protected Area (PA)[1]. Table 5.2 provides a summary of the proposed land use designation categories and zones.

[1] A third land use category is also possible, Community Area (CA). The CA applies to a 5 km zone around the community of Old Crow.

Table 5.1. Summary of Proposed North Yukon Planning Region Landscape Management Units.

LMU	LMU sub-unit	Area (km^2) [1]	Land Use Category [2]	IMA Zone	Management Direction / Plan Reference Document
1. Old Crow Flats SMA	**1A. Vuntut National Park**	4,374 (8%)	PA	N/A	VNP Mgmt Plan (2004)
	1B. Old Crow Flats 'Core Wetlands'	4,504 (8%)	PA	N/A	OCF SMA Mgmt Plan (2006)
	1C. Old Crow Flats West	726 (1%)	PA	N/A	OCF SMA Mgmt Plan (2006)
	1D. Old Crow Flats East	2,518 (5%)	PA	N/A	OCF SMA Mgmt Plan (2006)
	LMU total	**12,122 (22%)**			
2. Lower Porcupine River	**2A. Old Crow – Rampart House**	1,525 (3%)	**	N/A	Old Crow Phys. Dev. Plan (2000), OIC #2003/143 & 2005/53, *O&G Act*, North Yukon Regional Land Use Plan
	2B. Bluefish River – David Lord Creek	3,083 (6%)	IMA	Zone III	North Yukon Regional Land Use Plan
	2C. Bluefish – Cadzow Lake Wetlands	980 (2%)	IMA	Zone I	North Yukon Regional Land Use Plan
	LMU total	**5,558 (11%)**			
3. Driftwood River – Salmon Cache	none	**2,941 (5%)**	**	N/A	OIC #2003/143 & 2005/53, *O&G Act*, North Yukon Regional Land Use Plan
4. Northern Richardson Mountains and Foothills	**4A. Bell River**	2,869 (5%)	**	N/A	OIC #2003/143 & 2005/53, *O&G Act*, North Yukon Regional Land Use Plan
	4B. LaChute River	2,048 (4%)	IMA	Zone II	North Yukon Regional Land Use Plan
	LMU total	**4,917 (9%)**			
5. Bluefish Lake – Keele Range	none	**2,066 (4%)**	IMA	Zone III	North Yukon Regional Land Use Plan
6. Ahvee and Sharp Mountains	none	**2,714 (5%)**	IMA	Zone III	North Yukon Regional Land Use Plan

[1] Percentage of area occupied by each LMU or sub-unit is shown in brackets

[2] Land Use Category: PA=Protected Area (existing or proposed), IMA=Integrated Management Area, **=under North Yukon Interim Land Withdrawal (see Section 5.2.4 and Appendix 5 for discussion)

Table 5.1. (Cont'd). Summary of Proposed North Yukon Planning Region Landscape Management Units.

LMU	LMU sub-unit	Area (km^2) [1]	Land Use Category [2]	IMA Zone	Management Direction / Plan Reference Document
7. Johnson Creek	none	**3,230 (6%)**	IMA	Zone IV	North Yukon Regional Land Use Plan
8. Whitefish Wetlands	**8A. Whitefish – Porcupine Lakes**	468 (1%)	PA [3]	N/A	North Yukon Regional Land Use Plan
	8B. Eagle – Bell River	1,124 (2%)	IMA	Zone I	North Yukon Regional Land Use Plan
	8C. Porcupine River	302 (1%)	IMA	Zone I	North Yukon Regional Land Use Plan
	LMU total	**1,894 (4%)**			
9. Eagle Plains	none	**6,415 (12%)**	IMA	Zone IV	North Yukon Regional Land Use Plan
10. Southern Richardson Mountains and Foothills	**10A. Southern Richardson Mountains**	799 (1%)	IMA	Zone II	North Yukon Regional Land Use Plan
	10B. Rock River – Mount Joyal	2,374 (4%)	IMA	Zone II	North Yukon Regional Land Use Plan
	LMU total	**3,173 (5%)**			
11. Whitestone River	none	**1,740 (3%)**	IMA	Zone III	North Yukon Regional Land Use Plan
12. Ni'iinlii'njik (Fishing Branch) SMA	**12A. Ni'iinlii'njik Protected Area**	5,524 (10%)	PA	N/A	Ni'iinlii'Njik Mgmt Plan (2004a,b)
	12B. Fishing Branch HPA	980 (2%)	IMA	Zone III	Ni'iinlii'Njik Mgmt Plan (2004a), North Yukon Regional Land Use Plan
	LMU total	**6,504 (12%)**			
13. Kandik River	none	**2,266 (4%)**	IMA	Zone IV	North Yukon Regional Land Use Plan

[1] Percentage of regional area occupied by each LMU or sub-unit is shown in brackets
[2] Land Use Category: PA=Protected Area (existing or proposed), IMA=Integrated Management Area
[3] The Plan proposes the core area of Whitefish Wetlands as PA (see Appendix 4 for discussion)

Table 5.2. Land Use Designation Summary. The Area that a Land Use Category Contributes to the Total Area of the Region is Represented by Area (%).

Land Use Category	Area (km^2)	Area (%)
Protected Area	**18,114**	**33**
Old Crow Flats	12,122	22
Ni'iinlii'njik (Fishing Branch)	5,524	10
Whitefish Wetlands *	468	1
Integrated Management Area	**30,120**	**54**
Zone I	2,406	4
Zone II	5,221	9
Zone III	10,582	19
Zone IV	11,911	22
**North Yukon Interim Land Withdrawal ** **	**7,334**	**13**

* Whitefish Wetlands - proposed new Protected Area
** If VGFN settlement lands are excluded, the withdrawal area represents 6,556 km^2 (12% of region)

5.2.1 Integrated Management Area

Fifty-four percent of the region is within the Integrated Management Area. The IMA is proposed to be managed in an integrated manner for multiple land uses within the *Sustainable Development* parameters established by this Plan. In other jurisdictions, the IMA is often referred to as the 'working landscape' where a variety of land uses are permitted provided they meet the approved recommendations of the land use plan, general laws of application and necessary regulatory approvals.

5.2.1.1 Integrated Management Area Zones

In the Integrated Management Area, each LMU has been assigned a specific land use Zone (Map 7, Tables 5.1 and 5.2). IMA Zones are discussed in Section 3.2.2. IMA Zones I through IV are organized based on the concept of increasing levels of acceptable land use activity, with Zone I representing the highest conservation/lowest development focus, and Zone IV receiving the lowest conservation/highest development focus. Cumulative effects indicators and thresholds apply to each IMA Zone designation (see Section 5.2.1.2, below)

Forty percent of the IMA has a high development focus (Zone IV), with 35% designated as moderate development focus (Zone III). These areas have some of the highest potential for significant oil and gas and mineral resources. The remaining 25% has a high (Zone II) or very high (Zone I) conservation focus. As stated in its existing management plan (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a), the Fishing Branch HPA is not withdrawn from land disposition, and is therefore proposed to be included in the IMA with a Zone III designation.

IMA Zone designation was determined through consideration of valued ecological, cultural, and economic resources and interests. Within the IMA, the level of conservation or development significance was determined through overlays of mapped ecological, cultural/social and economic information. Ecological information emphasized identified caribou, moose, marten and sheep population distributions and habitat values, the presence of valued wetland, lake and river valley habitats that support a variety of species, including fish, and the inherent sensitivity of the LMU to habitat disturbance. Important Porcupine caribou herd habitats figured prominently in this analysis. Cultural/social information included heritage, archaeological and palaeontological resources, and historical and current First Nations land use.

Economic resource potential that contributed to the IMA zoning designation was based primarily on identified areas of interest for oil and gas, minerals, wilderness and cultural tourism, traditional economic activities and transportation. Additional details and maps of identified valued resources considered during the planning process are found in the North Yukon Planning Region Resource Assessment Report (North Yukon Planning Commission, 2007a,b). The range of dates for various seasons of importance to wildlife and fish populations referred to in the LMU recommendations are also described in the Resource Assessment report.

5.2.1.2 Cumulative Effects Indicators and Thresholds

Cumulative effects indicators and thresholds are part of the Plan's results-based management framework. They provide a means of monitoring and managing potential impacts to valued ecological and cultural resources within each LMU of the Integrated Management Area. Indicator and threshold concepts are discussed in Sections 3.3.1 to 3.3.2, and Appendix 3.

Table 5.3 lists each IMA Zone and the proposed 'cautionary' and 'critical' thresholds for two cumulative effects indicators, surface disturbance and linear (access) density, that apply within each Zone. Cautionary thresholds are established as 75% of the upper, or critical threshold. From Zone I to IV, threshold tolerance limits increase (i.e., acceptable level of surface disturbance and linear density increase). LMUs assigned to a particular Zone within the IMA receive the cumulative effects thresholds shown in Table 5.3.

The proposed threshold levels were developed through consideration of ecological, cultural and economic values, with additional guidance from land use scenario modeling (North Yukon Planning Commission 2007c, and Appendix 3).

Appendix 3, Table A3.1 lists current indicator status (i.e., benchmark) for the two cumulative effects indicators for each LMU. Proposed threshold levels, as summarized in Table 5.3, are shown for each LMU in Table A3.3—the values are the upper, or 'critical' threshold for each LMU. The difference between the current indicator status (i.e., benchmark) and the threshold value represents the acceptable level of change that can occur for each cumulative effects indicator within a specific LMU.

Table 5.3. IMA Land Use Zones and Proposed Cumulative Effects Indicators and Thresholds.

IMA Zone	Management Intent	Indicators	Thresholds	
			Cautionary [1]	Critical
Zone I	Highest conservation \ Lowest development focus	Surface disturbance	N/A	No functional disturbance [2]
		Linear (access) density	N/A	No functional disturbance [2]
Zone II	High conservation \ Low development focus	Surface disturbance	0.15%	0.2%
		Linear (access) density	0.15 km/km²	0.2 km/km²
Zone III	Moderate conservation \ Moderate development focus	Surface disturbance	0.375%	0.5%
		Linear (access) density	0.375 km/km²	0.5 km/km²
Zone IV	Lower conservation \ Higher development focus	Surface disturbance	0.75%	1.0%
		Linear (access) density	0.75 km/km²	1.0 km/km²

[1] Cautionary threshold is established as 75% of the upper, or critical threshold
[2] See Section 3.2.2.1 for definition of functional disturbance

5.2.2 Protected Area

5.2.2.1 Existing Protected Areas

Thirty-two percent of the region is within an existing Protected Area designation (Old Crow Flats SMA, including Vuntut National Park, and Ni'iinlii'njik (Fishing Branch) Wilderness Preserve and Ecological Reserve)). These areas, LMUs #1 and #12A, have existing management plans where land disposition and industrial land uses are prohibited. Existing protected areas are not addressed directly by this Plan.

5.2.2.2 New Recommended Protected Areas

This Plan recommends an additional 470 km^2 (1% of the region) Protected Area for the central Whitefish Wetlands complex (LMU #8A). Outside of Old Crow Flats SMA, Whitefish contains some of the highest ecological and cultural values in the region, within a sensitive biophysical setting. Most of the area recommended for protection is within an existing VGFN land selection (VG R-02A). The remainder of Whitefish Wetlands (LMU #8) is recommended for IMA Zone I designation. Section 5.3 contains a

detailed description of LMU #8, Whitefish Wetlands. Figure 5.11 shows the detailed protected area proposal for Whitefish Wetlands.

The NYPC considered several Protected Area options for Whitefish Wetlands; this option was considered to provide an adequate level of ecological protection while allowing for a limited amount of carefully managed industrial land use activity in adjacent Zone I areas. Appendix 4 contains a detailed discussion of Whitefish Wetland Protected Area options considered by NYPC.

5.2.3 Old Crow Community Area

A 5 km area around the Community of Old Crow, between the Porcupine River and Old Crow Flats SMA, is prioritized for community development requirements (Maps 6 and 7). This small area is not a major regional land use category, and is not represented in Tables 5.1 or 5.2.

5.2.4 North Yukon Interim Land Withdrawal

As part of the planning process, the Parties have requested that NYPC examine potential land use designation options for those areas in the planning region directly affected by the North Yukon Interim Land Withdrawal (Map 1). The area under consideration includes three LMUs: Old Crow-Rampart House (#2A), Driftwood River (#3) and Bell River (#4A) (Maps 5-7). Appendix 5 contains a detailed discussion of the land use designation options being considered for these areas by NYPC.

5.2.4.1 Background

The North Yukon Interim Land Withdrawal was established in 1978 as part of the Inuvialuit Final Agreement. It applies to all lands north of the Porcupine and Bell rivers, including the Yukon North Slope. The interim withdrawal was created to secure lands required for conservation planning, and at this time has no established expiry date. The withdrawal order removes this area from mineral and oil and gas disposition, and prevents exploration activities. The area being examined covers 7,334 km^2 (13% of the North Yukon Planning Region) and includes both VGFN settlement and Yukon public lands.

5.2.4.2 Values

In addition to the major wetland complexes, the interim land withdrawal contains some of the highest wildlife, fish and cultural/heritage values in the planning region. These areas are of special significance to the Porcupine Caribou Herd; caribou use these areas in all seasons, including spring calving. VGFN caribou fences and other archaeological sites have also been documented. The Summit Lake-Bell River area of the Northern

Richardson Mountains has been the focus of previous conservation proposals, and is considered an area of high wilderness tourism interest. The Northern Richardson Mountains contains the highest diversity of large mammals in the region. There is currently limited knowledge of non-renewable resource potential. Based on existing information there appears to be relatively low potential for oil and gas and mineral resources.

5.2.4.3 Land Use Designation Options

Land use designation options currently being considered by NYPC for the interim land withdrawal are summarized in Table 5.4. All options have a high or moderate level of conservation focus. Each option was developed using the same criteria and approaches applied to other areas of the planning region. These options do not represent a recommendation by the Commission to lift the interim withdrawal. Rather, they offer land use designations for consideration should the applicable authorities make the decision to lift the interim withdrawal at a future date.

Table 5.4. Land Use Designation Options Currently Being Considered by NYPC for North Yukon Interim Land Withdrawal.

LMU	Land Use Designation Option	Discussion
#2A (Old Crow-Rampart House)	*Option A:* Integrated Management Area with Zone II designation	IMA Zone II designation provides opportunities for carefully managed resource exploration and development activities around Old Crow. Conservative land use thresholds (0.2% and 0.2km/km^2) would minimize potential long-term impacts of industrial activities.
	Option B: Integrated Management Area with Zone III designation	IMA Zone III designation provides opportunities for carefully managed resource exploration and development activities around Old Crow. Moderately conservative land use thresholds (0.5% and 0.5km/km^2) would minimize long-term impacts of industrial activities but pose potentially higher risks to focal species and cultural activities than Zone II designation.
#3 (Driftwood River)	Integrated Management Area with Zone II designation (no other options provided at this time)	IMA Zone II designation provides opportunities for carefully managed resource exploration and development activities. Conservative land use thresholds (0.2% and 0.2km/km^2) would minimize potential long-term impacts of industrial activities. Special consideration should be given to the protection of cultural and heritage resources (e.g. caribou fences).

Table 5.4 (Cont'd). Land Use Designation Options Currently Being Considered by NYPC for North Yukon Interim Land Withdrawal.

LMU	Land Use Designation Option	Discussion
#4A (Bell River)	Concept: creation of a protected area-conservation corridor extending from the NWT border at Rat Pass - Summit Lake, southwest along the Bell River, linking with Whitefish Wetlands (LMU#8)	
	Option A: Protected Area centered on Summit Lake, with Bell River corridor as Integrated Management Area Zone I designation. Integrated Management Area Zone II designation for remainder of unit.	The Summit Lake area should be considered for Protected Area designation, consistent with adjacent Rat River Gwich'in Conservation Zone. Protected Area designation would ensure long-term protection for important Porcupine Caribou Herd use area, and establish an anchor to support wilderness and cultural tourism activities. Zone I designation along Bell River corridor would provide opportunities for a limited amount of carefully managed resource exploration activities and winter access. IMA Zone II designation for the remainder of the unit provides opportunities for carefully managed resource exploration and development activities. Conservative land use thresholds (0.2% and 0.2km/km^2) would minimize potential long-term impacts of industrial activities. *** See Figure 5.5 for illustration**
	Option B: Summit Lake-Bell River Protected Area, with Integrated Management Area Zone II designation for remainder of unit	Similar to 'Option A', with the exception that the entire Summit Lake - Bell River corridor would receive Protected Area designation. Establishing Protected Area designation for the entire corridor ensures long-term protection of both the Summit Lake and Bell River landscapes. *** See Figure 5.6 for illustration**

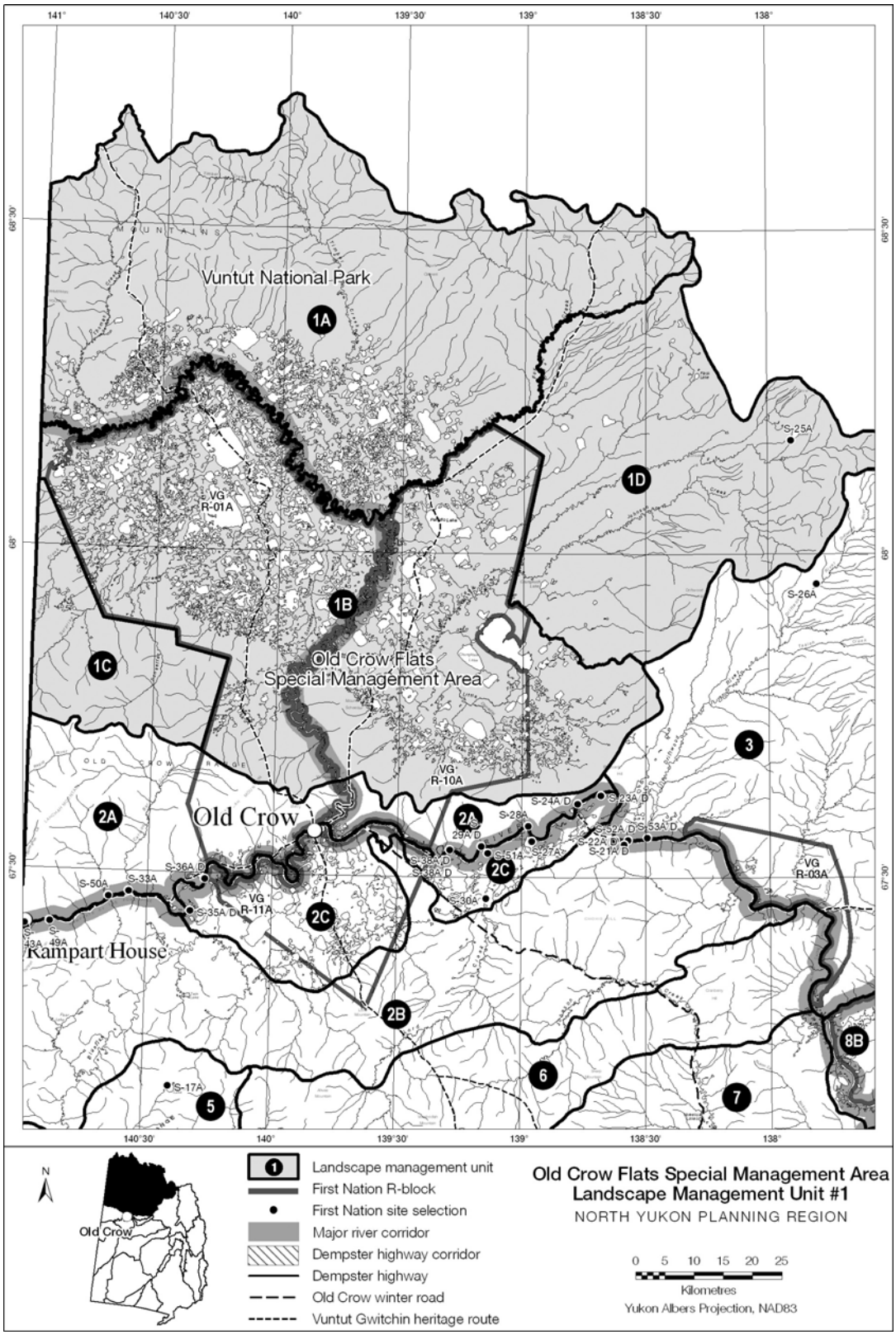
5.3 Landscape Management Unit Descriptions and Recommendations

A detailed description and map of each proposed LMU, current land status and administration, identified values and interests, proposed zoning, and thresholds for cumulative effects indicators are provided below. Note that the individual LMU maps do not show all identified resource values referred to in the LMU descriptions and recommendations; it is very difficult to map and interpret all sources of information on one figure. Maps 2-4 should be referenced for identified ecological, social/cultural, heritage, and economic resources and values where these are not specifically shown on the LMU maps.

Specific management recommendations for identified resources and values in each LMU are listed, where additional detail and direction is required. General management

objectives and strategies that apply to the management of all ecological, cultural and economic resources within the IMA are described in Section 4.

Figure 5.1. Landscape Management Unit #1 (Old Crow Flats Special Management Area), Showing Sub-Units #1A-D.



Landscape Management Unit #1: Old Crow Flats Special Management Area

Area: 12,122 km^2 (1,212,700 hectares) **Area (% of region):** 22%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#1A. Vuntut National Park	4,374 (8%)	PA	**National Park of Canada** – Protected Area
#1B. Old Crow Flats Core	4,504 (8%)	PA	**VGFN VG R-01A, R-10A, S-25A & YG Public Land** – Protected Area
#1C. Old Crow Flats West	726 (1%)	PA	**YG Public Land** – Protected Area (land withdrawn until 2026)
#1D. Old Crow Flats East	2,518 (5%)	PA	**YG Public Land** – Protected Area (land withdrawn until 2026)

Background

LMU #1, Old Crow Flats SMA, is comprised of Vuntut National Park and Old Crow Flats Special Management Area. Old Crow residents frequently use the area for subsistence harvest and cultural activities. Central Old Crow Flats is the most important Vuntut Gwitchin cultural area in the region. The entire unit is a protected area.

LMU #1 is bordered to the north by Ivvavik National Park and the Inuvialuit Settlement Region, and to the east by Driftwood River – Salmon Cache (LMU #3) and Bell River (LMU #4A). The North Yukon Interim Land Withdrawal applies to LMU #s 3 & 4A, which are withdrawn from disposition. The unit is bordered to the south by Old Crow – Rampart House (LMU #2A) which is also withdrawn from disposition. The Arctic National Wildlife Refuge (ANWR) is located to the west of LMU #1.

An overview of significant resource values identified in LMU #1 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #1 are found on NYPC's website (North Yukon Planning Commission, 2007a,b).

Biophysical Setting

The biophysical setting of LMU #1 has been well documented (Gray and Alt, 2001; Parks Canada et al. 2004; Yukon Department of Environment and Vuntut Gwitchin Government, 2006).

Ecological, Heritage and Cultural Values & Economic Interests

Vuntut National Park (VNP) and Old Crow Flats Special Management Area (SMA) ecological, social/cultural, heritage, and economic resource values are documented and described in the management plans and reports referenced above.

Land Administration

All sub-units within LMU #1 have existing management plans (Parks Canada et al. 2004; Yukon Department of Environment and Vuntut Gwitchin Government, 2006).

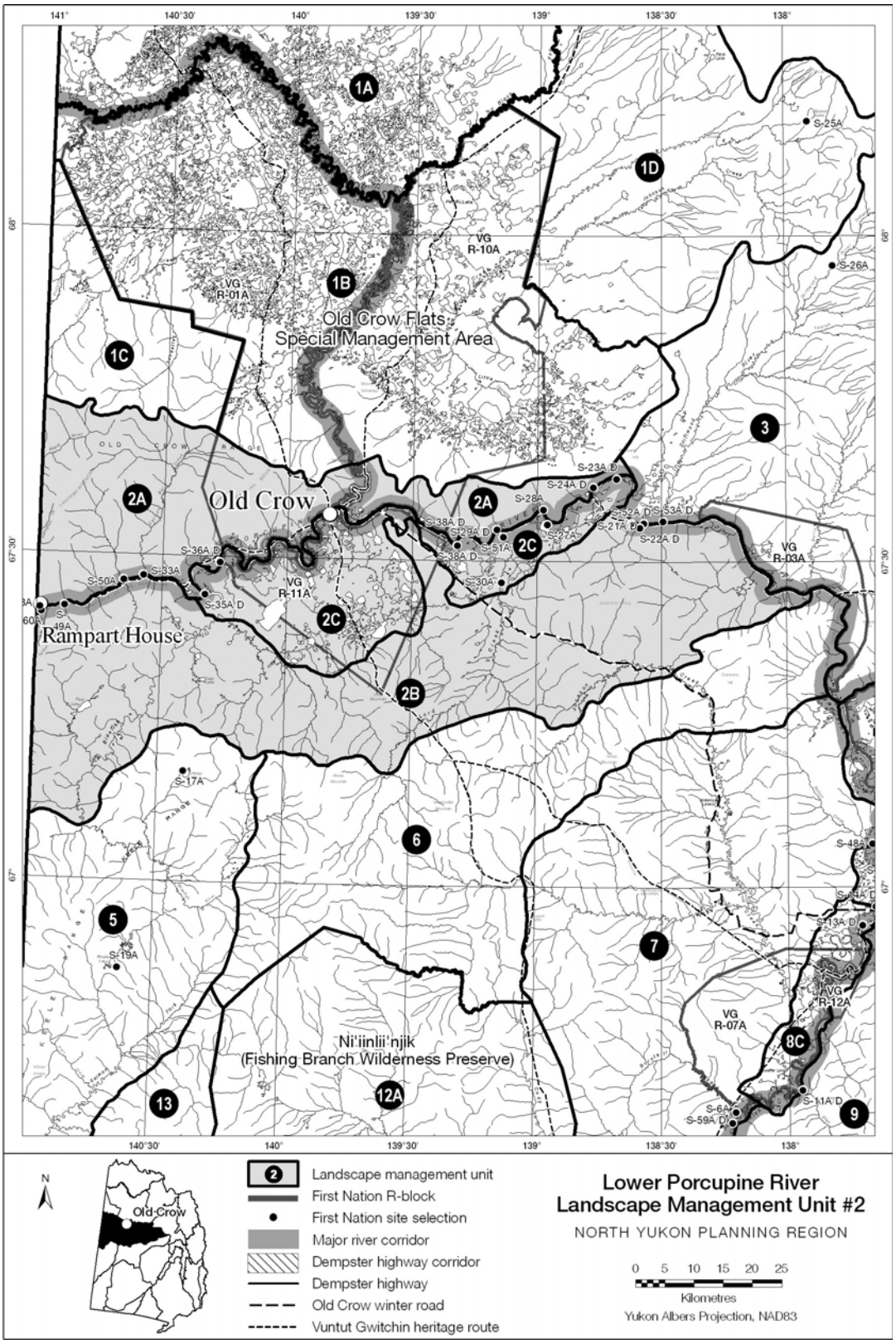
Recommendations

Unit: (#1) Old Crow Flats Special Management Area

Recommended Management Objective: See existing management plans for Old Crow Flats SMA and Vuntut National Park (Parks Canada et al. 2004; Yukon Department of Environment and Vuntut Gwitchin Government, 2006)

No specific recommendations are required at this time. Old Crow Flats SMA and Vuntut National Park management plans provide management direction.

Figure 5.2. Landscape Management Unit #2 (Lower Porcupine River), Showing Sub-Units #2A-C.



Landscape Management Unit #2: Lower Porcupine River

Area: 5,558 km^2 (555,800 hectares) **Area (% of region):** 11%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#2A. Old Crow – Rampart House	1,525 (3%)	North Yukon Interim Land Withdrawal	**VGFN VG R-11A, several S-sites, Community of Old Crow (5 km CA radius), & YG Public Land** – Land withdrawn, no time limit for expiry See Section 5.2.4.3, Table 5.4, and Appendix 5 for discussion of interim land withdrawal
#2B. Bluefish River – David Lord Creek	3,083 (6%)	IMA Zone III	**VGFN VG R-11A, several S-sites & YG Public Land** – Undesignated Land
#2C. Bluefish – Cadzow Lake Wetlands	980 (2%)	IMA Zone I	**VGFN VG R-11A, several S-sites & YG Public Land** – Undesignated Land

Background

Old Crow is within LMU #2, the Lower Porcupine River, and the unit receives high levels of community use. There are many significant cultural and ecological resources. LMU #2 is frequently used by Old Crow residents and, together with LMU #1, is the most important area in the region for supporting community subsistence harvest and lifestyles. The Old Crow winter road traverses the central portion of this unit.

The Lower Porcupine River contains three sub-units, a northern portion, LMU #2A (Old Crow – Rampart House), a southern portion, LMU #2B (Bluefish River – David Lord Creek), and a central wetland complex portion, LMU #2C (Bluefish – Cadzow Lake Wetlands). The boundary between LMU #2A and LMU #s 2B & 2C is the north bank of the Porcupine River. The North Yukon Interim Land Withdrawal applies to LMU #2A (Old Crow – Rampart House), an area withdrawn from disposition and exploration. The Old Crow winter road provides access to the community of Old Crow and the Lower Porcupine River from the Dempster Highway.

LMU #2A is bordered to the north by Old Crow Flats SMA, and to the east by Driftwood River – Salmon Cache (LMU #3). The Arctic National Wildlife Refuge (ANWR) in Alaska is located to the west of LMU #2A.

LMU #2B is bordered to the east by Driftwood River – Salmon Cache (LMU #3), and to the south by Ahvee and Sharp Mountains (LMU #8) and Bluefish Lake – Keele Range (LMU #5). The ANWR and the Alaska border are located to the west of LMU #2B.

LMU #2C is bordered to the east by Driftwood River – Salmon Cache (LMU #3). The rest of the sub-unit is bordered by LMU #s 2A & 2B.

An overview of significant resource values identified in LMU #2 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #2 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #2 contains a mix of low and high elevation landscapes. Portions of four Ecoregions are found within this unit, including the Davidson Mountains (LMU #2A), Old Crow Basin (LMU #2B), Old Crow Flats (LMU #2C) and North Ogilvie Mountains (LMU #2B). Most of the unit is within the Mackenzie Platform and underlain by scattered outcrops of sedimentary rocks.

Most of LMU #2A is a mountainous unit. Its western portion is within the Old Crow Range Ecodistrict of the Davidson Mountain Ecoregion. The Old Crow batholith, a bedrock complex protruding through the Mackenzie Platform carbonates, is the dominant feature of this unit. Lower elevations of the mountains are covered with extensive pediment slopes that grade slowly to the Porcupine River valley.

Much of the western portion of sub-unit #2A is non-forested; mountain peaks and slopes are within the Alpine and Taiga Shrub bioclimate zones, respectively. The eastern portion of the unit is a low rise of sparsely forested hills separating Old Crow Flats from the Porcupine River valley. High elevation rock, sparsely vegetated, herb and shrub are common vegetation types that are at risk from climate change impacts. A substantial area along the lower elevations of LMU #2A, west of Old Crow, was burned in the 1990s.

LMU #2B is situated on the gently sloping pediments of Old Crow Basin, between the North Ogilvie Mountains and the Porcupine River valley. Several low mountains rise above the pediments, with Lone Mountain being most prominent. Outside of Eagle Plains, Bluefish River – David Lord Creek is the most forested landscape in the planning region. Most of the sub-unit is within the Taiga Wooded bioclimate zone. Much of this unit contains conifer forest, and moist shrub. Areas of subdued relief, most importantly around Johnson Creek, also contain wet herb and wetland-related vegetation.

LMU #2C is within the Old Crow Flats Ecoregion, and is a similar basin wetland environment as Old Crow Flats. This sub-unit contains a series of interconnected, perched wetlands, lakes and ponds underlain by glacial lake sediments. Wet shrub, herb and conifer forest are the dominant vegetation types. The entire sub-unit is within the Taiga Wooded bioclimate zone. The wet landscape types around the open water areas of LMU #2C have high susceptibility to climate change impacts. The effects of warmer and drier conditions are expected to result in changes to vegetation community structure

(more shrub and forest) and drying of wetland habitats; some changes have already been observed.

LMU #2 is entirely within the Porcupine River watershed. Major third and fourth order watersheds include Upper Porcupine River, Caribou Bar Creek, Bluefish River, Big Joe Creek, Old Crow River, David Lord Creek, Johnson Creek, and the Middle Porcupine River. The Porcupine and Old Crow are the major rivers flowing through the unit - both are important local travel corridors for Old Crow residents.

Ecological Values

The entire unit contains significant habitat to support Porcupine caribou, moose, bears, furbearers, waterbirds, and fish populations, particularly within the wetlands and river corridors.

The eastern and western portions of both LMU #2A and #2B receive concentrated caribou use during the fall migration season. The western portion of LMU #2A also receives concentrated caribou use during the mid to late summer and rutting season. The eastern portion of LMU #2C receives concentrated caribou use during the fall migration season, and the western portion receives concentrated use during the rutting season. Caribou calving has occurred infrequently in LMU #s 2A and 2C.

The Porcupine River corridor, several tributaries, and lakes adjacent to the river have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b). LMU #2C contains one of three identified regionally significant wetland complexes: Bluefish and Cadzow Lake (Yukon Wetlands Technical Committee, 2005). This sub-unit is underlain by sensitive permafrost terrain, and is an ecologically significant area that supports a variety of wetland-dependent organisms. Many of the regional ecological, heritage, and cultural values are concentrated here. This sub-unit is also an important Old Crow community use area for hunting, trapping, and fishing activities.

Other significant wetland habitats in the unit are located along the Porcupine River, David Lord Creek, Old Crow River, Upper Caribou Bar Creek, Bluefish River, and Upper Johnson Creek.

Heritage and Cultural Values

There are many important heritage and archaeological sites within the unit, including Bluefish Caves (LMU #2B), Rampart House (LMU #2A) and Klo Kut (LMU #2A). Similar to Old Crow Flats, Bluefish Wetlands and the bluffs surrounding the area contain significant preserved remains of ice age fauna and evidence of past Beringian environments. Several identified heritage routes linking Old Crow to other destinations are present here (see Figure 4.1). Many historical fish traps are located in the unit.

Economic Interests

Subsistence harvest and cultural activities are important current land uses in this unit, particularly along the Porcupine River, Unit #2C, and the central portion of Unit #2B. The activities include forest harvesting along the Porcupine and Old Crow Major River corridors (and Lower David Lord Creek), trapping, and harvesting of fish and wildlife.

Tourism potential and interest within the unit is high, relative to the rest of the region. The Porcupine River is an important summer wilderness tourism recreation corridor. Rampart House is an identified tourism node.

Portions of LMU #s 2A (east) and #2C are contained within the Old Crow oil and gas basin. Mineral potential in the unit is high to very high, relative to overall mineral potential for the region. The Old Crow winter road provides the only surface access route for transportation and resource exploration activities.

Land Administration

Unit #2 has no existing regional management plans. The North Yukon Interim Land Withdrawal removes LMU #2A from mineral and oil and gas disposition, and prevents exploration activities. The withdrawal orders include Order in Council #s 2003/143, 2005/53, and Section 17 of *Oil and Gas Act, R.S.Y. 200, c.162*.

The community of Old Crow is present within LMU #2A. A 5 km area around the community, north of the Porcupine River but not including the Old Crow Flats SMA, is the Community Area. Guidance for land use activities in the Community Area is provided by existing municipal plans for the community of Old Crow (Inukshuk Planning and Development and Vuntut Gwitchin First Nation, 2000: Old Crow Physical Development Plan / Capital Plan (2003 – 2008)).

Recommendations

Sub-unit: (#2A) Lower Porcupine River

Recommended Management Objective: LMU #2A is currently within North Yukon Interim Land Withdrawal. Land use designation options being considered are: a) IMA, Zone II, or b) IMA, Zone III. Refer to Section 5.2.4.3, Table 5.4, and Appendix 5 for discussion of land use designation options and recommendations.

- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking)
- Work camp siting should not be located in important community use areas in the vicinity of Old Crow
- Land use activities should not compromise the integrity of Rampart House historic site

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) mid to late summer, fall migration, and rutting seasons in the western portion of LMU #2A, and b) fall migration season in eastern portion of LMU #2A

- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine River and identified adjacent lakes. Surface disturbance adjacent to the river should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to potential Chum (Dog) salmon spawning habitat in the Porcupine River should be avoided

- Old Crow Forest Management Plan should maintain community fuelwood and forest harvesting opportunities along Porcupine and Old Crow rivers

- Old Crow physical development plan (2000) and Old Crow capital plan (2003) should be consulted for community-related development activities within the 5 km Community Area

- In the event a Community plan is developed and approved for Old Crow, the Community plan should be consistent with and conform to this plan, and NYPC should be informed of the approved Community plan (VGFNFA clause 11.2.3)

Sub-unit: (#2B) Bluefish River – David Lord Creek

Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Potential impacts of activities can generally be mitigated by adhering to recommended operating practices.

- Proposed as zone III management area (moderate conservation / development focus)
  - ► Rationale: LMU #2B contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities generally occur in specific portions of the unit during specific seasons.
- Available for general land use subject to proposed thresholds:

Indicator	**Thresholds**	
	Cautionary	Critical
Surface disturbance	0.375%	0.5%
Linear (access) density	0.375 km/km^2	0.5 km/km^2

- A management priority is to minimize potential impacts of exploration and development activities on current use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking)

- Land use activities should not compromise the integrity of Bluefish Caves archaeological site

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the fall migration season in the eastern and western portions of LMU #2B

- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine and Bluefish rivers, and Lower David Lord Creek. Surface disturbance adjacent to the rivers and creek should also be minimized

- In-stream winter water withdrawals and surface disturbance adjacent to potential Chum (Dog) salmon spawning habitat in the Porcupine River should be avoided

- Old Crow Forest Management Plan should maintain community fuelwood and forest harvesting opportunities along Porcupine River and Lower David Lord Creek

Sub-unit: (#2C) Bluefish – Cadzow Lake Wetlands

Recommended Management Objective: Maintaining ecological integrity and minimizing potential land use impacts are the primary management objectives.

- Proposed as zone I management area (highest conservation / lowest development focus)
  - ► Rationale: LMU #2C contains important and sensitive wetland habitats that support a variety of valued wildlife and fish species. These habitats are present across the entire unit. There is a high risk of irreversible impacts to sensitive habitats from land use activities. There is also a high risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in most of the unit

- Available for carefully managed land use subject to proposed thresholds:

Indicator	**Thresholds**	
	Cautionary	Critical
Surface disturbance	N/A	< no functional disturbance[2] >
Linear (access) density	N/A	< no functional disturbance >

[2] See Section 3.2.2.1 above for definition of functional disturbance

- A management priority is to avoid or minimize potential impacts of exploration and development activities on current use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking)

- Construction of permanent all-season infrastructure in Bluefish and Cadzow Lake wetland complexes is discouraged

- Work camp siting should not be located in the Bluefish and Cadzow Lake wetland complexes

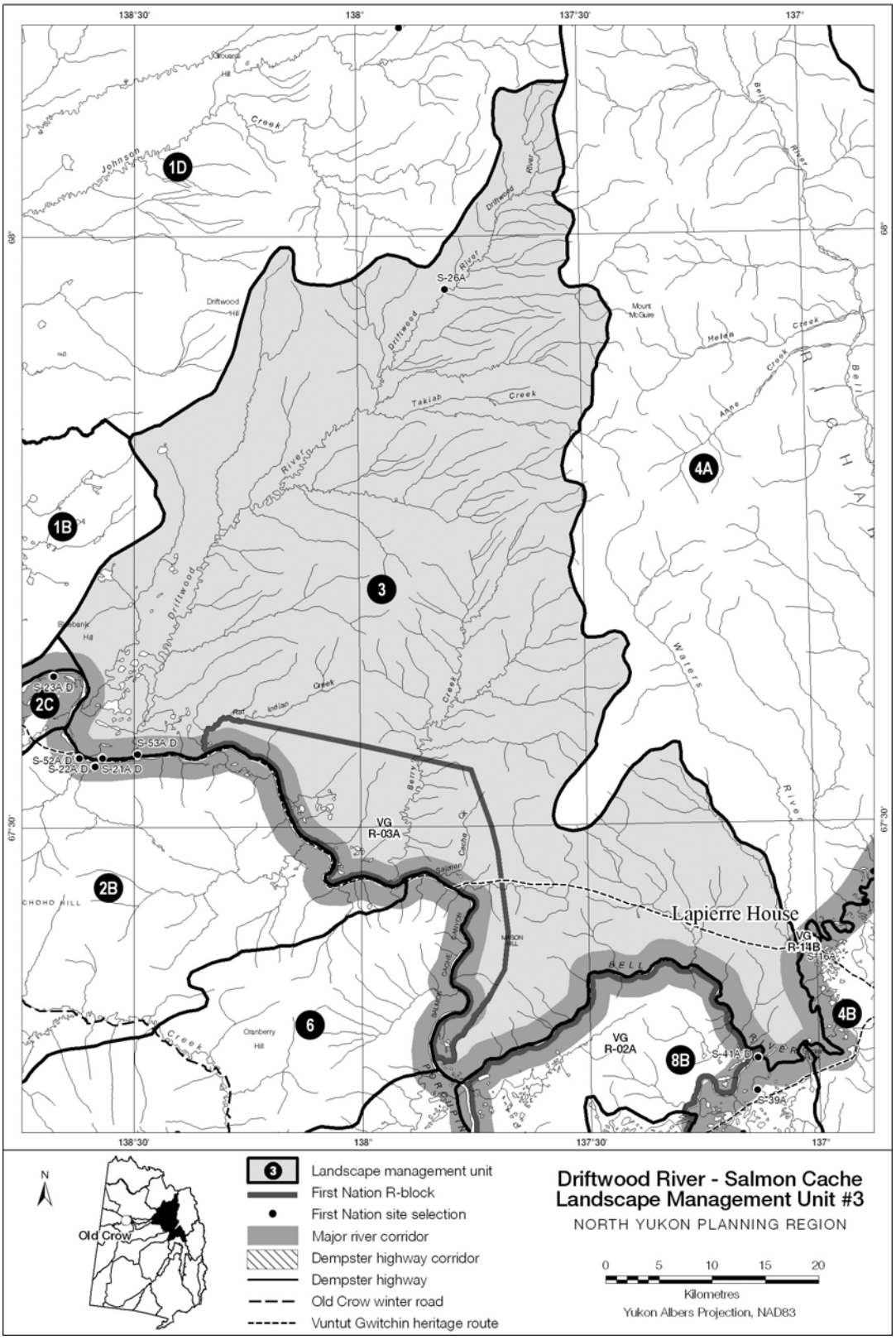
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) fall migration season in eastern portion of LMU #2C, and b) rutting season in western portion of LMU #2C

- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine and Bluefish rivers, identified lakes adjacent to Porcupine River, Lower David Lord Creek, and central portion of Big Joe Creek watershed. Surface disturbance adjacent to these areas should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to potential Chum (Dog) salmon spawning habitat in the Porcupine River should be avoided

- Old Crow Forest Management Plan should maintain community fuelwood and forest harvesting opportunities along Porcupine River and Lower David Lord Creek

Figure 5.3. Landscape Management Unit #3 (Driftwood River – Salmon Cache).



Landscape Management Unit #3: Driftwood River – Salmon Cache

Area: 2,941 km^2 (294,100 hectares) **Area (% of region):** 5%

Unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#3. Driftwood River – Salmon Cache	2,941 (5%)	North Yukon Interim Land Withdrawal	**VGFN VG R-03A, several S-sites, & YG Public Land** – Land withdrawn, no time limit for expiry See Section 5.2.4.3, Table 5.4, and Appendix 5 for discussion of interim land withdrawal

Background

LMU #3, Driftwood River – Salmon Cache, is a remote area within the Driftwood River watershed. There are many significant cultural and ecological resources in this unit, particularly along the Porcupine, Bell, and Driftwood river corridors that flow through the southern portion of this unit. Three caribou fences have been identified, and important archaeological sites are present in the vicinity of Berry and Rat Indian Creeks (VG R-03A). The western portion of the unit and the Porcupine and Bell rivers are frequently used by Old Crow residents for supporting community subsistence harvest and lifestyles.

LMU #3 is bordered to the north by Old Crow Flats SMA, and to the east by the Northern Richardson Mountains and Foothills (LMU #4). The unit is bordered to the west by Old Crow Flats SMA, Lower Porcupine River (LMU #2), and Ahvee and Sharp Mountains (LMU #6). Whitefish Wetlands (LMU #8) are located to the south of LMU #3.

An overview of significant resource values identified in LMU #3 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #3 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #3 includes portions of the Old Crow Basin, Old Crow Flats and Eagle Plain Ecoregions. The most important feature of this unit is the extensive, gently sloping unglaciated pediment slopes grading from the high Richardson Mountains towards the Porcupine River valley. These occur in the Driftwood River Ecodistrict, generally defined by the Driftwood and Berry Creek watersheds. The gently-sloping pediments include many ephemeral, low gradient drainage channels that create ‘ribbons’ of tall shrubs among the lower-stature shrub and sparse forest.

The southern portion of the unit is located in the Richardson Foothills Ecodistrict. The westernmost portion of the unit is within the Bluefish Wetlands Ecodistrict. The Bell River is at the southernmost limit of this unit. The pediments overlay shale, siltstone and sandstone of the Mackenzie Platform. All areas have extensive, near-surface permafrost.

LMU #3 is transitional between the Taiga and southern Arctic tundra. The southern portion of Driftwood River occurs in the Taiga Wooded bioclimate zone, with the uplands in the Taiga Shrub bioclimate zone. The highest mountain peaks are in the Alpine bioclimate zone, occurring mainly in the front range of the Richardson Mountains and Foothills.

Herb and shrub habitat types dominate the landscape, generally comprising open spruce-lichen-heath vegetation. Major river valley areas are characterized by a succession of willow and alder, giving way to white spruce and paper birch in stable locations. Treeline is reached at about 600m above sea level, with stunted trees reaching 4m in height. Approximately 60% of the unit was burned during a forest fire in 1977, and about 10% was burned in 2004.

Ecological Values

The entire unit contains significant habitat to support Porcupine caribou, moose, bears, furbearers, waterbirds, and fish populations, particularly along the Porcupine, Driftwood, and Bell river corridors, Berry Creek corridor, and around the Salmon Cache archaeological site.

LMU #3 is one of the units in the region that receive concentrated use by Porcupine caribou across several seasons, suggesting that caribou use the unit intensively. Porcupine caribou can be found in the area during the summer, fall migration, rutting, and winter seasons. The northern portion of the unit receives concentrated caribou use during the summer, fall migration, and rutting seasons. The southern portion of the unit receives concentrated caribou use during the fall migration, rutting, and winter seasons. The western portion of the unit within the outer margins of Cadzow Lake wetland complex receives concentrated caribou use during the fall migration season. The eastern portion of the unit receives concentrated caribou use during the rutting season. Caribou calving has occurred infrequently in LMU #3.

In LMU #3, The area north of the Porcupine River between the mouth of Driftwood River and Salmon Cache is an identified significant all season range for moose. The area around Mason Hill is also an identified significant area for moose. The Porcupine, Bell and Driftwood river corridors have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b).

The southwestern corner of LMU #3 contains a small portion of Cadzow Lake wetlands complex (Yukon Wetlands Technical Committee, 2005). This area is underlain by sensitive permafrost terrain, and is an ecologically significant area that supports a variety

of wetland-dependent organisms. Other significant wetland habitats are present along the Porcupine and Bell rivers, Lower Driftwood River, and Lower Berry Creek.

Heritage and Cultural Values

LMU #3 contains many important heritage and archaeological sites, including Salmon Cache, Rat Indian-Berry Creek, and Driftwood Village. Three caribou fences have been documented. Most archaeological sites are present along the Porcupine River between the mouth of Driftwood River and Bell River, and relate to the centuries old tradition of seasonal caribou interception. A large portion of the unit was a historically important hunting and trapping area.

An identified heritage route linking Old Crow to Fort McPherson via Salmon Cache and LaPierre House is present in the southern portion of the unit (see Figure 4.1). Three documented historical fish traps are located on Upper Driftwood, Lower Driftwood at confluence of Porcupine River, and Berry Creek at confluence of Porcupine River.

Economic Interests

Subsistence harvest and cultural activities are important current land uses in this unit, particularly along the Porcupine River, Driftwood River, and Bell river corridors. The activities include forest harvesting along the Porcupine River to Lower Driftwood River corridor, trapping, and harvesting of fish and wildlife along the three river corridors.

Tourism potential and interest within the unit is low relative to the rest of the region, with the exception of the southern portion of the unit that has some tourism-related visits. The Porcupine and Bell Rivers are recognized summer wilderness tourism recreation corridors. The southern portion of unit #3 is contained within the Eagle Plain oil and gas basin. Mineral potential in the unit is low relative to overall mineral potential for the region, with high to very high potential in the western portion of the unit. At present, there are no surface access routes into LMU #3.

Land Administration

Unit #3 has no existing regional management plans. The North Yukon Interim Land Withdrawal removes LMU #3 from mineral and oil and gas disposition, and prevents exploration activities. The withdrawal orders include Order in Council #s 2003/143, 2005/53, and Section 17 of *Oil and Gas Act, R.S.Y. 200, c.162*.

Recommendations

Unit: (#3) Driftwood River – Salmon Cache

Recommended Management Objective: LMU #3 is currently within North Yukon Interim Land Withdrawal. A land use designation option being considered is IMA, Zone II. Refer to Section 5.2.4.3, Table 5.4, and Appendix 5 for discussion of land use designation options and recommendations.

- Construction of permanent all-season infrastructure in Cadzow Lake wetland complex, at mouth of Driftwood River, is discouraged

- Work camp siting should not be located in the Cadzow Lake wetland complex

- Land use activities should not compromise the integrity of Salmon Cache archaeological site

- Exploration and development activities should not compromise the integrity of identified caribou fences

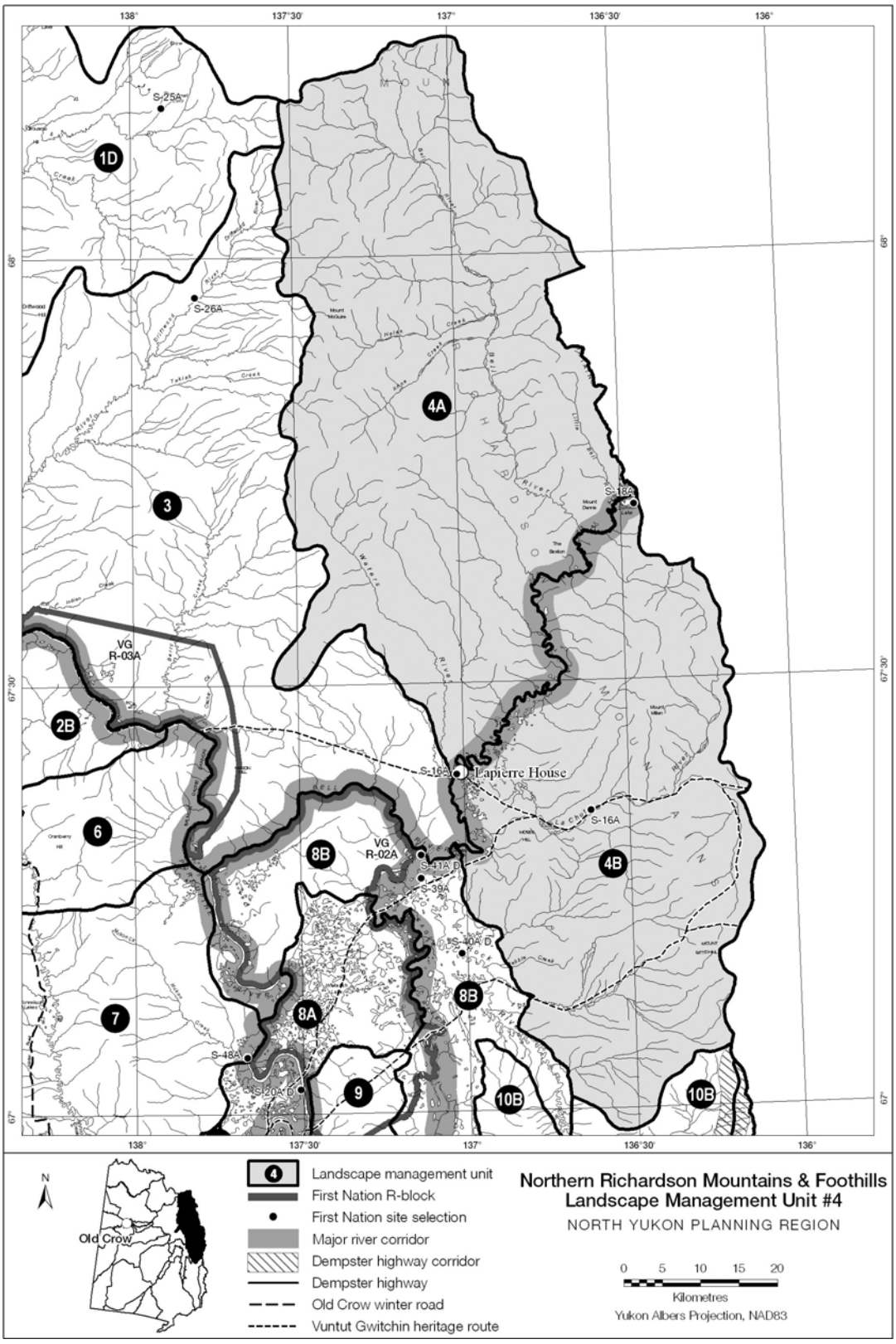
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) summer, fall migration, and rutting seasons in the northern portion of unit, b) fall migration, rutting, and winter seasons in the southern portion of unit, c) fall migration season in the western portion of unit within Cadzow Lake, and d) rutting season in eastern portion of unit

- In-stream water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine, Bell, and Lower Driftwood rivers. Surface disturbance adjacent to the river should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to the following salmon spawning habitats should be avoided: a) Chum (Dog) habitat at the confluence of the Driftwood and Porcupine rivers, and b) Chinook (King) habitat at confluence of the Waters and Bell rivers

- Old Crow Forest Management Plan should maintain community fuelwood and forest harvesting opportunities along Porcupine and Driftwood Rivers

Figure 5.4. Landscape Management Unit #4 (Northern Richardson Mountains and Foothills), Showing Sub-Units #4A-B.



Landscape Management Unit #4: Northern Richardson Mountains and Foothills

Area: 4,917 km^2 (491,700 hectares) **Area (% of region):** 9%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#4A. Bell River	2,869 (5%)	North Yukon Interim Land Withdrawal	**VGFN VG R-14B & YG Public Land** – Land withdrawn, no time limit for expiry See Section 5.2.4.3, Table 5.4, and Appendix 5 for discussion of interim land withdrawal
#4B. LaChute River	2,048 (4%)	IMA Zone II	**VGFN VG S-16A, S-18A, & YG Public Land** – Undesignated Land

Background

LMU #4, the Northern Richardson Mountains and Foothills, is one of the most important and diverse areas in the region for wildlife and fish resources, particularly for large mammals. Many of the ecological values are concentrated along the Bell River valley and in the vicinity of Summit Lake - Rat River. LMU #4 contains many significant cultural resources, particularly along the Bell River and NWT border. The Bell River is an important subsistence harvesting area, used by residents of Old Crow, Aklavik and Ft. McPherson. Much of LMU #4 is within the Tetlit Gwich'in Secondary Use Area.

The Northern Richardson Mountains and Foothills contains two sub-units, a northern portion, LMU #4A (Bell River), and a southern portion, LMU #4B (LaChute River). The boundary between the two sub-units is the Bell River. The North Yukon Interim Land Withdrawal applies to LMU #4A (Bell River), an area withdrawn from disposition and exploration. The Northern Richardson Mountains and Foothills are unroaded, and remain difficult to access.

LMU #4A is bordered to the north by the Inuvialuit Settlement Region, and to the east by the NWT border and the Gwich'in Settlement Region, including the Rat River Conservation Zone. Driftwood River – Salmon Cache (LMU #3) and Old Crow Flats East (LMU #1D) are located to the west of LMU #4A.

LMU #4B is bordered to the west by Whitefish Wetlands (LMU #8), to the east by the NWT border / Gwich'in Settlement Region, including the Rat River and James Creek Conservation Zones, and to the south by the Southern Richardson Mountains and Foothills (LMU #10).

An overview of significant resource values identified in LMU #4 during the planning exercise is provided in Maps 2 to 4. Additional maps and descriptions of all resource values identified for LMU #4 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #4A is the northern extension of the Richardson Mountains and contain some of the most rugged, inaccessible areas in the planning region. LMU #4A is within the British Richardson Mountains Ecoregion and contains the North Richardson Mountain and Bell River Ecodistricts. Most of this mountainous unit is in the Taiga Shrub and Alpine Bioclimate zones. The northern portion of the unit is strongly influenced by Arctic climate and is within the Tundra Bioclimate Zone. With the exception of lower mountain slopes and major river corridors, much of LMU #4A is non-forested. Extensive areas of herb (heath and tussock tundra), low (dwarf) shrub, sparsely vegetated and rock/exposed landscape types are common. Tall shrubs are located alongside rivers and drainage channels.

LMU #4B, LaChute River, includes portions of the British Richardson Mountains Ecoregion and the extensive pediment slopes of the West Richardson Foothills Ecodistrict of the Eagle Plains Ecoregion. The pediment slopes are the foothills of the Richardson Mountains and were formed over millions of years of weathering under unglaciated conditions. In the mountain areas, this sub-unit contains Taiga Shrub and Alpine Bioclimate zones. The lower pediment slopes in the foothills are within the Taiga Wooded Bioclimate zone. LMU #4B is more forested than the northern sub-unit, LMU #4A, with tree line extending to 600m above sea level. In addition to the black and white spruce forests, a variety of herb (heath and tussock tundra), low (dwarf) shrub, sparsely vegetated and rock/exposed landscape types are also present. Tall shrubs are located alongside rivers and drainage channels.

In both sub-units, the mountains and their associated valleys have significant climate effects, funneling gale force Arctic winds southward along valleys. These strong winds play an important role in snow distribution, creating relatively low winter snow depths on ridges and exposed areas. Summer winds, in addition to late lying snow patches, provide summer insect relief for caribou. Permafrost, bedrock and aspect have a strong influence on the distribution of forests. Outside of major riparian areas (i.e., Bell River), forests are sparse and contain sporadic tree cover.

LMU #4 is entirely within the Porcupine River watershed. Prior to last ice age, the Bell River was the primary drainage for much of the current Porcupine River watershed, flowing north to the Mackenzie River through Summit Lake and Rat River. As the Laurentide ice sheet encroached from the east, the flow of the Bell River was reversed the, diverting the drainage to the west through the present course of the Porcupine River. LMU #4A contains the Upper Bell River, Driftwood River (headwaters), Waters River, and the Little Bell River watersheds. The Bell River, the major tributary to the Porcupine,

subdivides LMU #4A and LMU #4B. LaChute River, LMU #4B, contains the LaChute River watershed, and portions of the Rock River, Little Bell and Lower Bell watersheds.

Similar to most of the planning region, the British Richardson Mountains and Eagle Plains Ecoregions remained unglaciated during the last ice age. The Richardsons contain unglaciated landforms such as tors. Ridge crests are sparsely vegetated and covered with frost shattered rock fragments. Rock outcrops are common. Periglacial (freeze/thaw cycles) processes and landforms are important features.

The central and southern Richardson Mountains are seismically active. Unstable slopes in permafrost areas may be subject to flows or slides. Vegetation communities in the Alpine, Taiga Shrub, and Tundra bioclimate zones are susceptible to climate change impacts (North Yukon Planning Commission, 2007a,b). Unlike central Eagle Plains, the Northern Richardson Mountains and Foothills do not have a vigorous fire regime.

Ecological Values

The entire unit contains significant habitat to support Porcupine caribou, moose, sheep, bears, furbearers, waterbirds, and fish populations, particularly along the Bell and Waters river corridors, the Richardson Mountain Range, and the area around LaPierre House. The Summit Lake-Bell River corridor has been identified in three past assessments as an area of conservation interest (DIAND, 1989; Yukon Department of Renewable Resources, 1993; Gwich'in Land Use Planning Board, 1997).

All of LMU #4A receives concentrated caribou use, for one or more seasons, suggesting that caribou use the unit intensively. Porcupine caribou can be found in the area during the fall migration, rutting, winter, and spring migration seasons. The northern portion of the sub-unit receives concentrated caribou use during the summer season. Caribou calving has occurred infrequently in the Driftwood headwaters. LMU #4B also receives concentrated caribou use across most of the sub-unit, during the rutting and winter seasons. The Richardson Mountain range is an important migration corridor for the herd.

In LMU #4A, the Bell River corridor and tributaries are an identified concentrated use area for moose, particularly during the winter season. The area around LaPierre House in LMU #4B is an identified significant area for moose and bears, including the Eagle River corridor. Key all-season sheep habitat is present in the Richardson Mountain range east of the Bell River in LMU #4A, and between the La Chute River and Bell River in LMU #4B.

The Bell, Little Bell, Waters, and La Chute rivers have identified or potential fish critical over-wintering habitat in this unit (North Yukon Planning Commission, 2004b, 2007a,b). Significant wetland habitats in the unit are located along the Bell to the Little Bell River confluence, La Chute River, and around LaPierre House.

Heritage and Cultural Values

LMU #4 contains many important heritage and archaeological sites, including the LaPierre House historic site. LMU #4A contains several documented archaeological sites in the vicinity of Summit Lake (head of Bell and Rat Rivers). LMU #4B contains several documented archaeological sites north of La Chute River and in the southern portion of the sub-unit.

Two Vuntut Gwitchin heritage routes linking Fort McPherson to Whitestone Village and Old Crow are present in LMU #4B (see Figure 4.1). A winter travel route (see Map 4) is still used for travel between Fort McPherson and Old Crow. Five documented historical fish traps are located in the unit; two are found at LaPierre House, one at the Upper reaches of Bell River, and two along the La Chute River.

Economic Interests

Subsistence harvest and cultural activities are current land uses in this unit, particularly along the Bell River corridor and in the vicinity of Summit Lake. The activities include trapping and harvesting of fish and wildlife. Two sheep hunting permits for the Northern Richardson Mountains are awarded annually to Yukon residents. The southern portion of LMU #4A and all of LMU #4B are within the Tetlit Gwich'in Secondary Use Area.

Although the number of tourism-related visitors is currently low, the Bell River is a recognized summer wilderness tourism recreation corridor. Focused on the Bell River and Summit Lake, the area is considered to have high wilderness tourism potential, but is constrained by distance/access. Summit Lake and LaPierre House are identified tourism nodes, with Summit Lake providing float plane access to this area.

There is limited information about non-renewable economic interests. Under the North Yukon Interim Land Withdrawal, LMU #4A has been withdrawn from mineral and oil and gas disposition and exploration since 1978. Portions of sub-units #4A and #4B are within the Eagle Plains oil and gas basin, but are generally considered to not be the most prospective areas. Mineral potential, relative to overall mineral potential for the region, is currently considered low, but is based on very limited information. Portions of both sub-units are considered to have high mineral potential rock tracts along the NWT border. There is no summer or winter vehicle access route into LMU #4A. LMU #4B is in proximity to the Dempster Highway at Wright Pass on the NWT border.

Land Administration

Unit #4 has no existing regional management plans. The North Yukon Interim Land Withdrawal removes LMU #4A from mineral and oil and gas disposition, and prevents exploration activities. The withdrawal orders include Order in Council #s 2003/143, 2005/53, and Section 17 of *Oil and Gas Act, R.S.Y. 200, c.162*.

Recommendations

Sub-unit: (#4A) Bell River

Recommended Management Objective: LMU #4A is currently within North Yukon Interim Land Withdrawal. Land use designation options being considered are: a) IMA, Zone II (majority of unit), IMA, Zone I (Bell River corridor), and PA (Summit Lake), or b) IMA, Zone II (majority of unit), and PA (Bell River corridor and Summit Lake).

Refer to Section 5.2.4.3, Table 5.4, and Appendix 5 for discussion of land use designation options and recommendations. See Figures 5.5 and 5.6 for maps showing general PA interests.

- Potential winter access routes and industrial infrastructure should avoid significant moose and caribou habitats along the Bell River and its tributaries
- In recognition of the ecological, cultural and tourism values of Bell River corridor, any future land use should not compromise the ecological or visual integrity of the corridor from Summit Lake to Bell River confluence with Porcupine River[3]
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) fall migration, rutting, winter, and spring migration seasons, which occur throughout LMU #4, and b) during these seasons and the summer season, primarily in the northern portion of LMU #4A
- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Bell, Little Bell, Waters and LaChute rivers. Surface disturbance adjacent to these rivers should also be minimized
- In-stream water withdrawals and surface disturbance adjacent to potential Chum (Dog) and Chinook (King) salmon spawning habitat in the Bell and Waters rivers should be avoided
- Land use activities should be minimized, or when possible avoided, within sensitive key sheep habitat in the Richardson Mountains. The North Richardson Mountains sheep management plan (*in prep*) should be consulted for detailed sheep management recommendations

[3] This plan recommendation is consistent with the approved management intent for adjacent Gwich'in Settlement Region Rat River Conservation Zone (Gwich'in Land Use Planning Board, 2003)

Figure 5.5. Option A – Summit Lake Protected Area Concept. The Illustration Represents a General Area of Interest for Discussion Purposes.

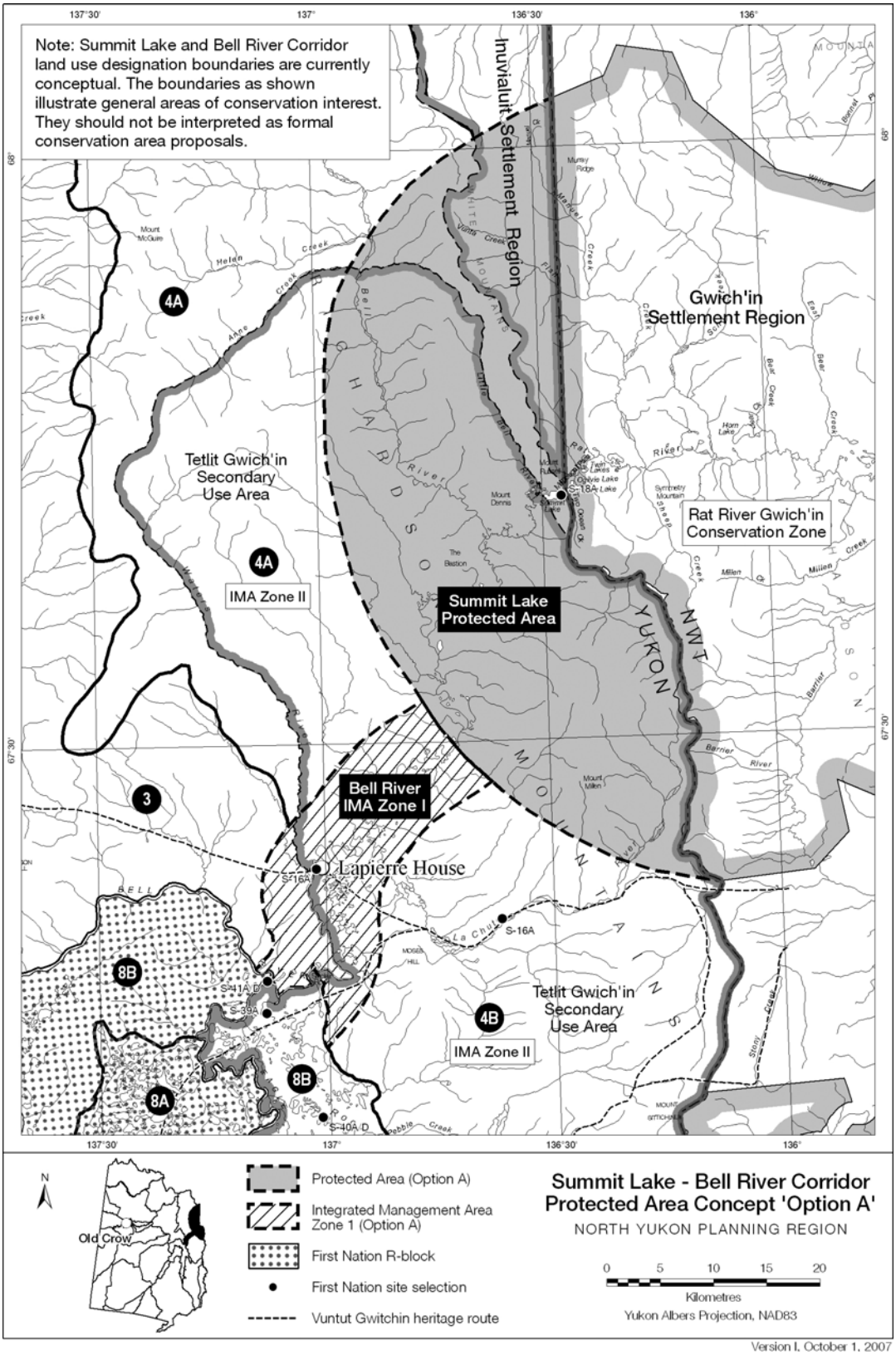
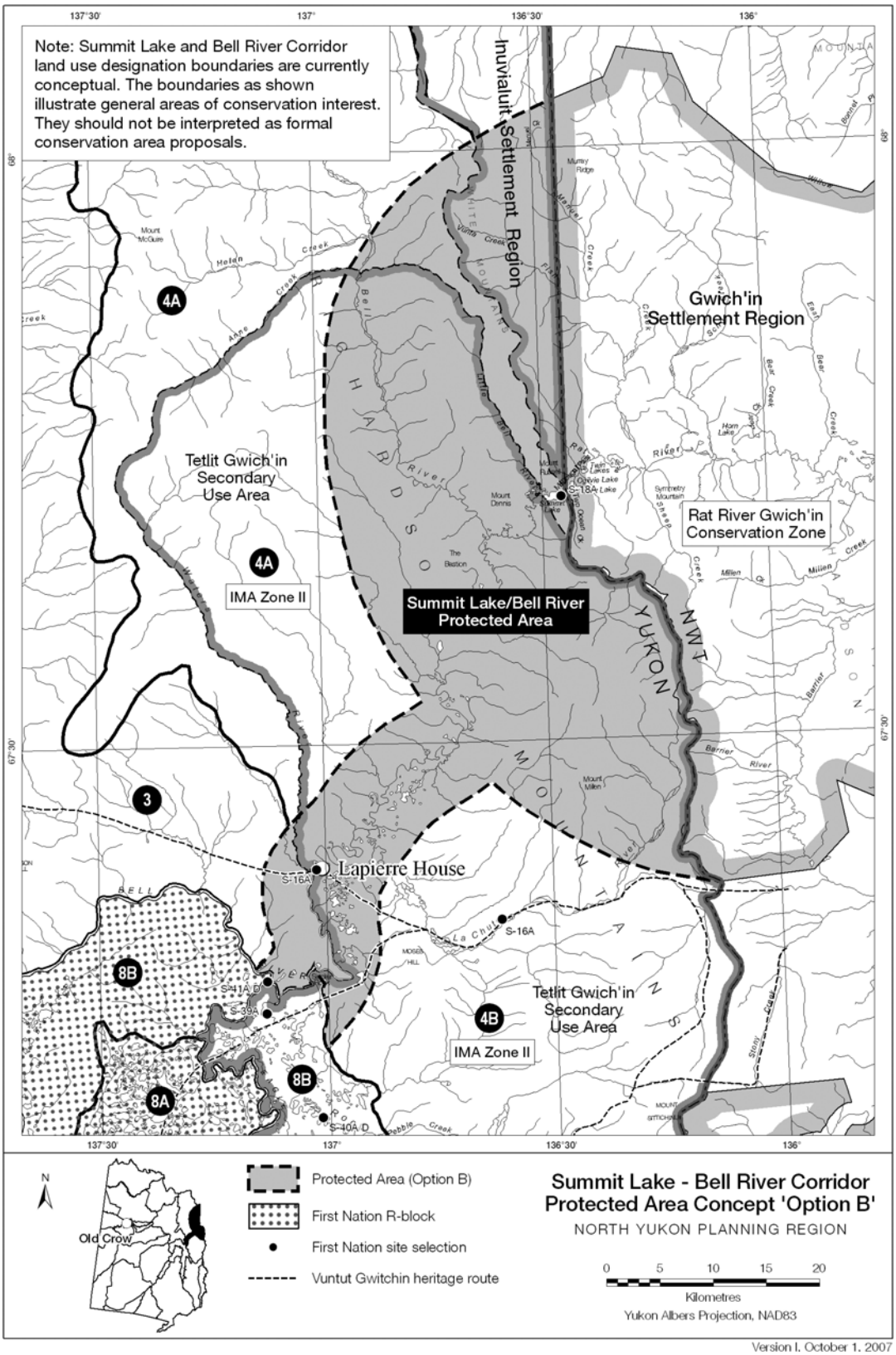


Figure 5.6. Option B – Summit Lake-Bell River Protected Area Concept. The Illustration Represents a General Area of Interest for Discussion Purposes.



Sub-unit: (#4B) LaChute River

Recommended Management Objective: Maintaining ecological integrity and minimizing potential land use impacts are the primary management objectives.

- Proposed as Zone II management area (high conservation / low development focus)
  - ► Rationale: LMU #4B contains important habitats that support a variety of valued wildlife and fish species. These habitats are present across most or all of the unit and have special significance for the Porcupine caribou herd. Many of the habitats are not as sensitive to physical disturbance, but there is a high risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in portions of unit, with most activity concentrated on the Bell River corridor.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.15%	0.2%
Linear (access) density	0.15 km/km^2	0.2 km/km^2

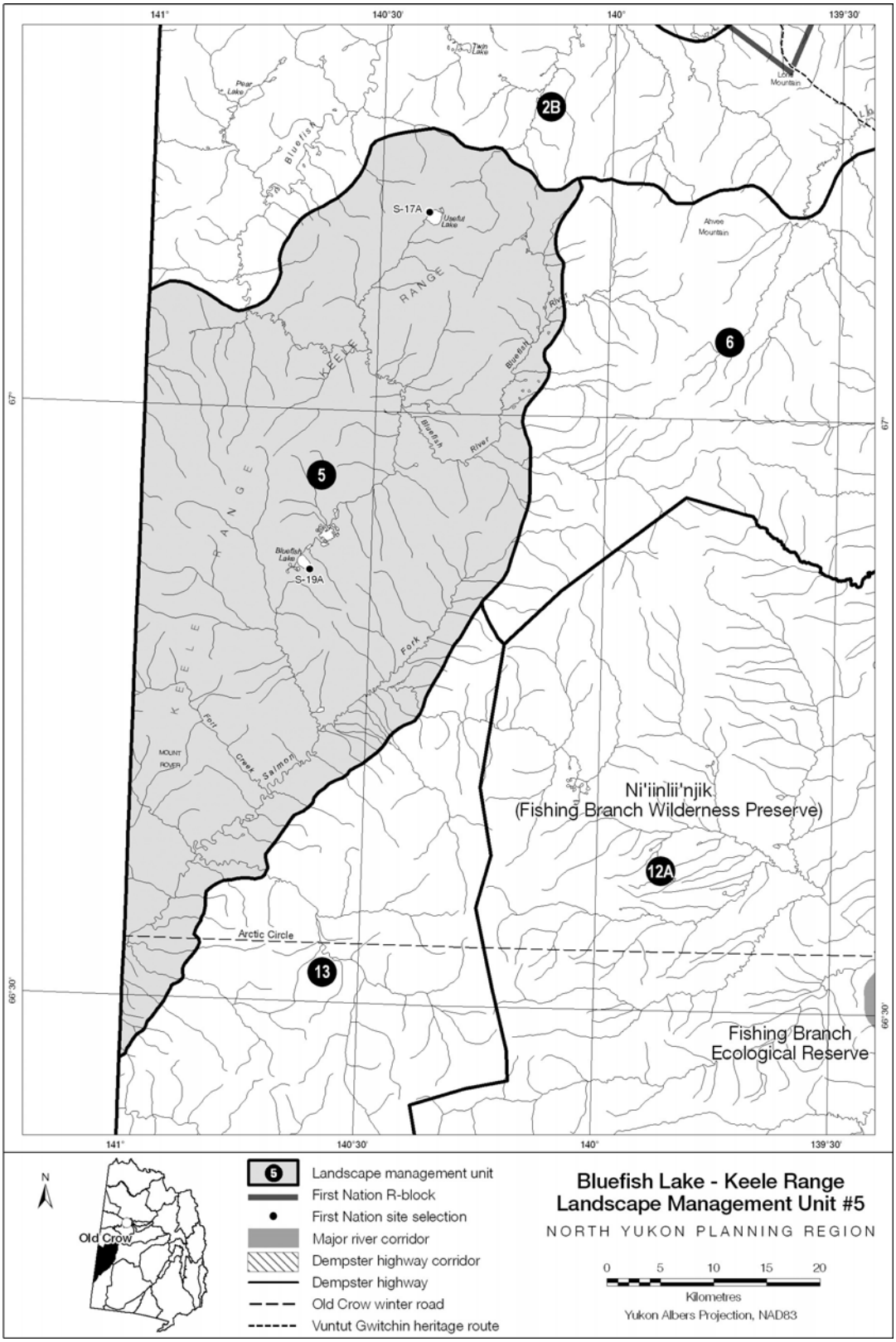
- Potential winter access routes and industrial infrastructure should avoid significant moose and caribou habitats along the Bell River and its tributaries
- In recognition of the ecological, cultural and tourism values of Bell River corridor, any future land use should not compromise the ecological or visual integrity of the corridor from Summit Lake to Bell River confluence with Porcupine River[4]
- Land use activities should not compromise the integrity of LaPierre House historic site
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) rutting season, which includes most of the sub-unit, and b) winter season, primarily in the southern portion of the sub-unit
- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Bell and LaChute rivers. Surface disturbance adjacent to these rivers should also be minimized

[4] This plan recommendation is consistent with the approved management intent for adjacent Gwich'in Settlement Region Rat River Conservation Zone (Gwich'in Land Use Planning Board, 2003)

- In-stream water withdrawals and surface disturbance adjacent to potential Chum (Dog) and Chinook (King) salmon spawning habitat in the LaChute River should be avoided

- Land use activities should be minimized, or when possible avoided, within sensitive sheep habitats in the Richardson Mountains. The North Richardson Mountains sheep management plan (*in prep*) should be consulted for detailed sheep management recommendations

Figure 5.7. Landscape Management Unit #5 (Bluefish Lake – Keele Range).



Landscape Management Unit #5: Bluefish Lake – Keele Range

Area: 2,066 km^2 (206,600 hectares) **Area (% of region):** 4%

Unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#5. Bluefish Lake – Keele Range	2,066 (4%)	IMA Zone III	**VGFN VG S-17A, S-19A & YG Public Land –** Undesignated Land

Background

LMU #5, Bluefish Lake – Keele Range, is a remote and mountainous area of the region within the Bluefish and Salmon Fork watersheds. Several trails originating from the Porcupine River end in this unit; the trails traverse the areas around Bluefish River and Bluefish Lake (see Map 3). The Bluefish Lake area is still used by Old Crow residents. The coal potential of the unit is high relative to most other areas of the region.

LMU #5 is bordered to the north by the Lower Porcupine River (LMU #2), and to the east by the Ahvee and Sharp Mountains (LMU #6). The Alaska border and a portion of the Arctic National Wildlife Refuge are located to the west of the unit. To the south, the unit is bordered by the Kandik River unit (LMU #13).

An overview of significant resource values identified in LMU #5 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #5 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #5 contains a mix of low and high elevation landscapes. The unit occurs within the North Ogilvie Mountains Ecoregion; the Keele Mountain Range is a dominant feature. Mount Rover is located in the southwestern portion of the unit. Most of the unit is underlain by sedimentary formations, and continuous permafrost. There are no large rivers—the Bluefish and Salmon Fork are smaller rivers flowing through the unit.

Mountain ranges are less rugged and lower in elevation compared to the southern Ogilvies—most of the terrain consists of flat-topped hills. Limestone dominates the Keele range, and there is little vegetation cover or soil formation. Pediment slopes formed by erosion are common, extending to the valley bottoms. High elevation, sparsely vegetated and wet or moist coniferous forest and shrub habitat types dominate the landscape. The

unit is within an unglaciated area. The taiga wooded, taiga shrub, and alpine bioclimate zones are all found here. Treeline is reached at about 900m above sea level.

LMU #5 is within the Porcupine and Yukon river watersheds. Major third and fourth order watersheds include Bluefish and Salmon Fork. There are very few lakes and wetland areas present. Many of the streams in the unit are naturally acidic.

Ecological Values

LMU #5 contains significant habitat to support Porcupine caribou, moose, furbearers, waterbirds, and fish populations, particularly along Upper Bluefish River, Bluefish Lake, and the area around Nest Mountain (Chii Too Tsal – see Map 3).

Portions of LMU #5 receive concentrated caribou use. Porcupine caribou can be found in the area during the winter, spring migration, and fall migration seasons. LMU #5 receives concentrated caribou use in the eastern portion of the unit along the Upper Bluefish River corridor and Nest Mountain during each of these seasons. The central portion of the unit northeast of Bluefish Lake also receives concentrated caribou use during the winter season.

In LMU #5, the Bluefish River and tributaries, and Bluefish Lake are identified significant areas for moose. Sheep have been reported as currently present in the Keele Range, south of Mount Rover, but this remains to be confirmed. The Bluefish River corridor and Bluefish Lake have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b).

Significant wetland habitats are present along the Upper Bluefish River and tributaries, Bluefish Lake (and streams connecting Bluefish Lake to Bluefish River and Salmon Fork River), and along the Salmon Fork River.

Heritage and Cultural Values

LMU #5 contains three identified significant heritage sites, including Useful Lake, Bluefish Lake, and the area around Nest Mountain (Chii Too Tsal). One documented archaeological site is present in the west-central portion of the unit, in the vicinity of Bluefish Lake.

Several traditional travel routes traverse the unit. The northern Ogilvie Mountains extension within LMU #5 contains numerous caves that likely have preserved evidence of past environments, fauna, and potentially human habitation.

Economic Interests

Subsistence harvest and cultural activities are current land uses in this unit, primarily in the area around Bluefish Lake and Bluefish River. Activities include trapping and harvesting of fish and wildlife.

There is currently no direct tourism interest in this unit. The unit is not contained within an identified oil and gas basin. All of LMU #5 has high mineral potential relative to overall mineral potential for the region. The eastern portion of the unit has good potential for coal.

The unit is very remote and there is no access into LMU #5 for resource exploration activities.

Land Administration

Unit #5 has no existing regional management plans.

Recommendations

Unit: (#5) Bluefish Lake – Keele Range

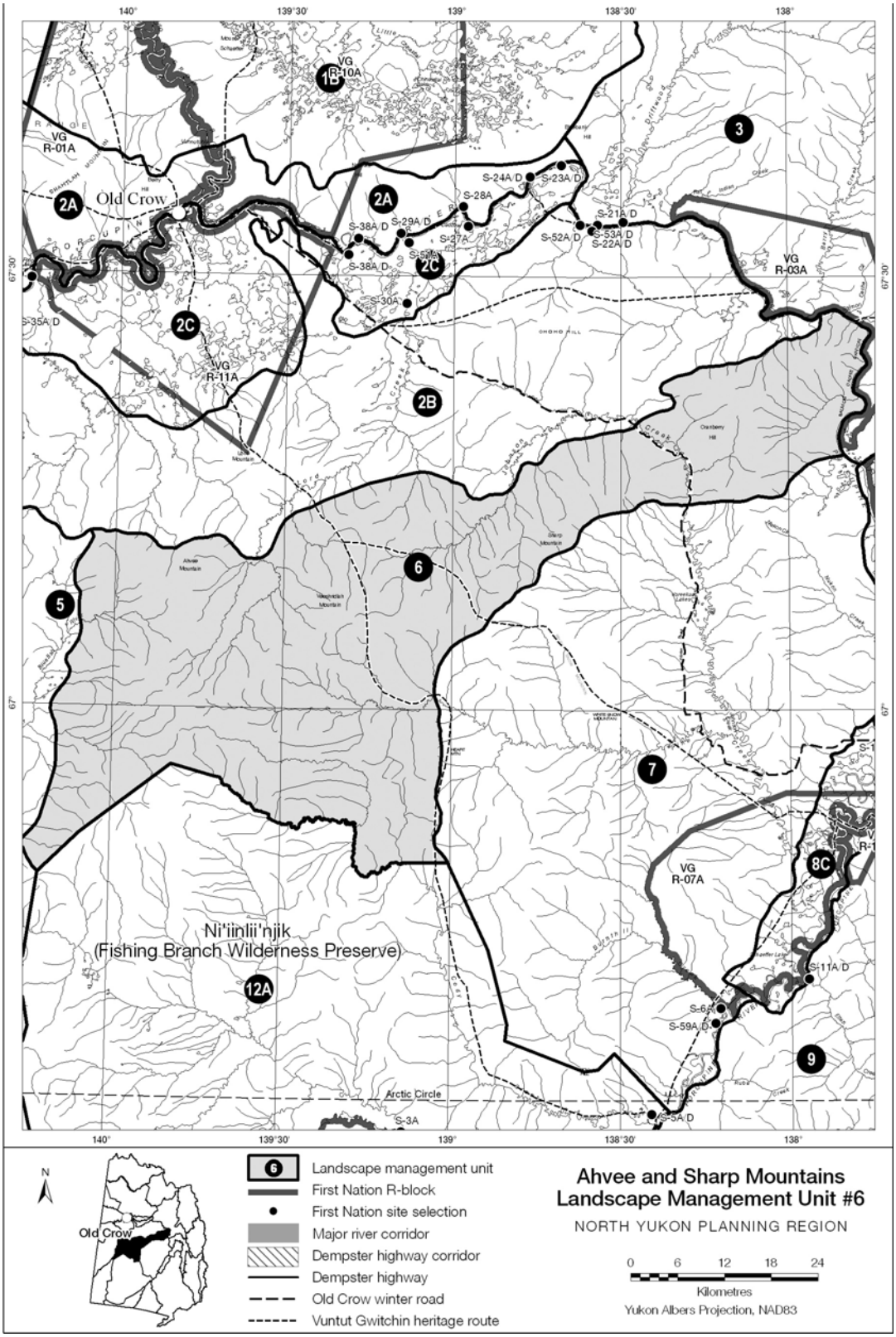
Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Potential impacts of activities can generally be mitigated by adhering to recommended operating practices.

- Proposed as Zone III management area (moderate conservation / development focus)
  - ► Rationale: LMU #5 contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities generally occur in specific portions of the unit during specific seasons.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.375%	0.5%
Linear (access) density	0.375 km/km^2	0.5 km/km^2

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the winter, spring migration and fall migration seasons in the eastern portion of the unit
- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Bluefish River and Bluefish Lake. Surface disturbance adjacent to these habitats should also be minimized

Figure 5.8. Landscape Management Unit #6 (Ahvee and Sharp Mountains).



Landscape Management Unit #6: Ahvee and Sharp Mountains

Area: 2,714 km^2 (271,400 hectares) **Area (% of region):** 5%

Unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#5. Ahvee and Sharp Mountains	2,714 (5%)	IMA Zone III	**YG Public Land** – Undesignated Land

Background

LMU #6, Ahvee and Sharp Mountains, is a relatively mountainous area of the region that is used by residents of Old Crow for subsistence harvest. The mountains in the western portion of the unit receive concentrated use by the Porcupine caribou herd, across several seasons. A few trails access the mountains from Old Crow, and the unit is often used for hunting. The Old Crow winter road traverses the eastern portion of this unit. The mineral potential here is high relative to most other areas of the region.

LMU #6 is bordered to the north by the Lower Porcupine River (LMU #2), and to the east by Johnson Creek (LMU #7). The unit is bordered to the west by Bluefish Lake – Keele Range (LMU #5). The Ni'iinlii'njik (Fishing Branch) SMA (LMU #12), specifically the Wilderness Preserve area of the SMA, is located to the south of LMU #6.

An overview of significant resource values identified in LMU #6 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #6 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

Most of LMU #6 is contained within the North Ogilvie Mountains and Eagle Plains ecoregions. A portion of the unit is located within the Old Crow Basin Ecoregion. Five ecodistricts are present in the unit. These include the David Lord Range, Lord Creek, Keele Range, Kandik River, and Fishing Branch River. The headwaters of David Lord Creek and Johnson Creek are found in the northern portion of the unit.

The unit is composed primarily of Taiga shrub and Taiga wooded bioclimate zones. The western portion of the unit is mountainous, and includes the Ahvee, Sharp, and Veeshridlah mountains. Most of the unit is underlain by continuous permafrost. The unit is within an unglaciated area. High elevation, sparsely vegetated, wet or moist shrub, and

coniferous forest dominate the landscape. These vegetation types in the mountainous western portion of the unit are at risk from climate change impacts.

LMU #6 is within the Porcupine River watershed. Major third and fourth order watersheds include the Bluefish River, Middle Porcupine River, Johnson Creek, David Lord Creek, Pine Creek, Cody Creek, and the Salmon Fork River. There are very few lakes and wetland areas present in the unit.

Ecological Values

LMU #6 contains significant habitat to support Porcupine caribou, moose, bears, and furbearer populations, particularly within the Ahvee, Veeshridlah, and Nest (Chii Too Choo) Mountain ranges, and Johnson Creek corridor.

Most of LMU #6 receives concentrated caribou use, for one or more seasons, suggesting that caribou use the unit intensively. Porcupine caribou can be found in the area during the fall migration, rutting, winter, and spring migration seasons. LMU #6 receives concentrated caribou use in the western portion of the unit near Ahvee, Veeshridlah, and Nest (Chii Too Choo) mountains during the spring migration, fall migration, and rutting seasons. There is extensive seasonal overlap of caribou concentrated use here and it appears to be one of the most significant caribou use areas in the planning region.

The western margin of the unit receives concentrated caribou use during the winter season. The central portion of the unit around Sharp Mountain and Johnson Creek receives concentrated caribou use during the rutting season. The eastern portion of the unit receives concentrated caribou use during the fall migration and winter seasons.

In LMU #6, the area in the vicinity of Johnson Creek is an identified significant area for moose. The headwaters of David Lord Creek are an identified significant area for bears. The Porcupine River corridor along the eastern margin of LMU #6 has identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b).

Significant wetland habitats are present along Upper David Lord Creek and the Johnson Creek corridor.

Heritage and Cultural Values

LMU #6 contains several important heritage and archaeological sites, including Ahvee and Sharp Mountains, and Gwidinee'aa (eastern portion of unit in vicinity of Johnson Creek).

Several areas in the unit were historically important subsistence harvest areas, including Nest Mountain (Chii Too Tsal and Chii Too Choo), the Heart Mountains (Chidree), and Cranberry Hill. The northeastern portion of the unit around Cranberry Hill is part of the Driftwood River trapping area and is a historically important hunting and trapping area.

Two Vuntut Gwitchin heritage routes linking Old Crow to Whitestone Village and Old Crow to Johnson Creek Village (via White Snow Mountain) are present within LMU #6. Two winter travel routes (see Map 3) are still used in this unit; one route connects Old Crow to Ahvee Mountain, and the second traverses the unit along the Old Crow winter road at Johnson Creek.

Economic Interests

Subsistence harvest and cultural activities are significant current land uses in this unit, particularly within the mountain ranges, and along the Porcupine River and Johnson Creek in the eastern portion of the unit. The activities include trapping and harvesting of fish and wildlife.

Tourism interest in the unit is low relative to the rest of the region, with the exception of the eastern margin of the unit where the Porcupine River is present. The Porcupine River is a recognized summer wilderness tourism recreation corridor.

The eastern and southern portions of LMU #6 are contained within the outer northwest margin of the Eagle Plains oil and gas basin. The basin has proven hydrocarbon potential. The unit received no industry interest in a recent call for postings by the Yukon Oil and Gas Management Branch (April 2007).

The unit has moderate to high mineral potential, relative to overall mineral potential for the region. The highest mineral potential is in the western portion of the unit in the Ahvee, Veeshridlah, and Nest mountain ranges. The western limit of the unit has coal potential.

The Old Crow winter road in the eastern portion of the unit provides the only access route into the unit for resource exploration activities. Much of the unit is remote and difficult to access.

Land Administration

Unit #6 has no existing regional management plans.

Recommendations

Unit: (#6) Ahvee and Sharp Mountains

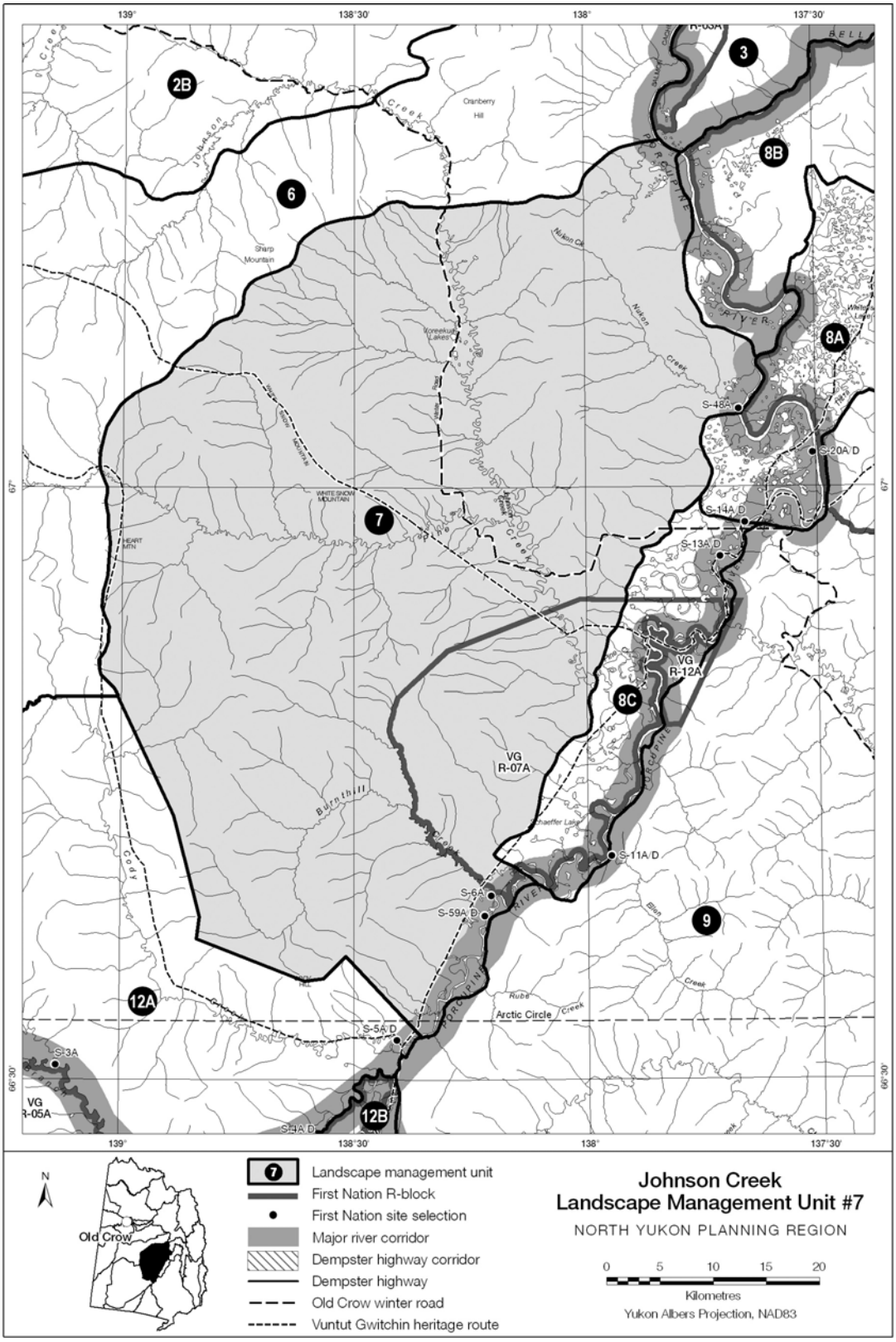
Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Potential impacts of activities can generally be mitigated by adhering to recommended operating practices.

- Proposed as Zone III management area (moderate conservation / development focus)
  - ► Rationale: LMU #6 contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities generally occur in specific portions of the unit during specific seasons.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.375%	0.5%
Linear (access) density	0.375 km/km^2	0.5 km/km^2

- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking)
- Potential winter access routes and industrial infrastructure should avoid significant caribou habitat within the Ahvee, Veeshridlah, and Nest (Chii Too Choo) mountain ranges
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) winter, spring migration, fall migration, and rutting seasons in the western portion of the unit, particularly Ahvee, Veeshridlah, and Nest mountain areas, b) rutting season in the central portion of the unit, and c) winter and fall migration seasons in the eastern portion of the unit
- In-stream water withdrawals should be avoided in identified or potential fish over-wintering habitat in the Porcupine River. Surface disturbance adjacent to the river should also be minimized

Figure 5.9. Landscape Management Unit #7 (Johnson Creek).



Landscape Management Unit #7: Johnson Creek

Area: 3,230 km^2 (323,000 hectares) **Area (% of region):** 6%

Unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#7. Johnson Creek	3,230 (6%)	IMA Zone IV	**VGFN VG R-07A, S-06A, S-48A, S-59A/D, YG Public Land, Yukon Oil and Gas Permit #0005[5] –** Undesignated Land

Background

LMU #7, Johnson Creek, is located within the northern section of the Eagle Plains plateau. Subsistence harvest, trapping, and other cultural activities are current land uses in this unit, particularly along Johnson Creek corridor. Several mountains and hills in the unit are used for hunting and trapping. A few trails traverse the unit between Old Crow, Johnson Creek Village, and Fort McPherson, and these are still actively used. The Old Crow winter road traverses the central portion of the unit. The unit is within the Eagle Plains area of oil and gas potential, and has received significant past exploration activity and recent interest.

LMU #7 is bordered to the north by the Ahvee and Sharp Mountains (LMU #6) and the Eagle – Bell River unit (LMU #8B) within Whitefish Wetlands. The unit is bordered to the east by the Whitefish Wetlands (LMU #8), and Eagle Plains (LMU #9). The Ahvee and Sharp Mountains (LMU #6) are also located to the west of the unit. To the south, the unit is bordered by Ni'iinlii'njik (Fishing Branch) SMA (LMU #12), specifically the Wilderness Preserve area of the SMA.

An overview of significant resource values identified in LMU #7 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #7 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #7 is contained within the Eagle Plains Ecoregion. Three ecodistricts are present, including Johnson Creek, David Lord Range, and Chance Creek in the southern portion of the unit. The Johnson Creek watershed and David Lord Mountain Range are dominant features.

[5] Permit # 0005 expires on August 31st, 2013

The unit is dominated by the taiga wooded bioclimate zone, and is underlain by sedimentary formations and continuous permafrost. Colluvial deposits cover most of the unit. The unit is located within a plateau and there are few mountains present. Most of the rolling terrain lies between 300 and 600m above sea level. Black spruce woodlands and earth hummocks dominate the landscape. The unit is primarily within unglaciated terrain. Herb and shrub vegetation communities, growing under a variety of different soil moisture conditions, are also common. The wet herb habitats in the central portion of the unit, near Johnson Creek, are at risk from climate change impacts. The majority of this unit, particularly the central portion, was burned in the 1990s.

LMU #7 is within the Porcupine River watershed. Major third and fourth order watersheds include Cody Creek, the Middle/Lower Porcupine River, Johnson Creek, Nukon Creek, Pine Creek, Burnthill Creek, and Whitefish Lake. Several rivers and creeks dissect the plateau country, including Nukon, Pine, Burnthill, and Johnson creek. Many of the small streams experience zero winter flows relatively frequently. The Porcupine River parallels the southeastern and northeastern portion of the unit.

Ecological Values

LMU #7 contains significant habitat to support Porcupine caribou, moose, bears, furbearers, waterbirds, and fish populations, particularly along the Porcupine River corridor, and major creeks (Johnson, Pine, Burnthill, and Nukon creeks).

Portions of LMU #7 receive concentrated caribou use. Porcupine caribou can be found in the area during the rutting and winter seasons. LMU #7 receives concentrated caribou use in the northern portion of the unit around the vicinity of Johnson Creek, Old Crow winter road, Voreekua Lakes, Sharp Mountain, and Lower Nukon Creek area during the rutting season.

The areas in the vicinity of major river/creek confluences in the eastern portion of the unit receive concentrated caribou use during the winter season. These areas are west of the Porcupine/Bell river confluence (northeast portion of unit), west of Pine Creek/Porcupine River confluence (east-central portion of unit), and around the Burnthill and Rube Creek confluence with Porcupine River (southeast portion of unit).

In LMU #7, the areas around major creeks (Johnson, Burnthill, and Pine creeks), and the Voreekua lakes, are identified significant areas for moose. These creeks and the Porcupine River corridor also contain significant valley-bottom mixed-wood habitat for marten. The Porcupine River and Lake #15 adjacent to Johnson Creek corridor have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b).

Significant wetland habitats are present along Johnson Creek, Porcupine River, Pine Creek, and Lower Burnthill Creek.

Heritage and Cultural Values

LMU #7 contains several important heritage sites, including Sharp and White Snow mountains, Burnthill area, Gwidinee'aa (northeastern portion of unit in vicinity of Johnson Creek), and the Porcupine River downstream from Whitestone River. There are no documented archaeological sites in LMU #7.

A few areas in the unit were historically important subsistence harvest areas, including the Johnson and Pine creek area, and an area locally known as Vitree'tro'ohli located immediately west of Burnt Hill.

Three Vuntut Gwitchin heritage routes pass through LMU #7. The Old Crow to Johnson Creek route via White Snow Mountain traverses the central portion of the unit. The Old Crow to Whitestone Village route is present along the western margin of the unit. The Whitestone Village to Johnson Creek Village route is present along the southeastern margin of the unit near the Porcupine River. Two winter travel routes (see Map 3) are still used; one route traverses the northern portion of the unit along the Old Crow winter road, and the second connects the Old Crow winter road to the mouth of the Bell River via an old seismic line.

One documented historical fish trap is located on Johnson Creek, near the confluence with the Porcupine River.

Economic Interests

Subsistence harvest and cultural activities are current land uses in this unit, particularly in the vicinity of the Johnson and Pine creek corridors, and the area around White Snow Mountain. This is one of the most important units in the region for winter hunting of caribou by Old Crow residents. Trapping is an important activity in LMU #7 within the vicinity of Johnson Creek.

Tourism potential and interest within the unit is low relative to the rest of the region, with the exception of the southeastern margin of the unit where the Porcupine River is present. The Porcupine River is a recognized summer wilderness tourism recreation corridor.

All of LMU #7 is contained within the Eagle Plain oil and gas basin. The basin has proven hydrocarbon potential. There was a considerable amount of past oil and gas exploration activity in LMU #7, second only to LMU #9 (Eagle Plains) and LMU #8 (Whitefish Wetlands). The area along the Old Crow winter road in LMU #7 recently received some industry interest in the Yukon Oil and Gas Management Branch spring 2007 call for postings (April 2007). As of August 2007, there is a portion of one Oil and Gas Permit in the unit (#0005 held by Northern Cross Yukon Ltd.) (Map 4).

All of LMU #7 has low mineral potential, relative to overall mineral potential for the region. There are no identified areas with coal or iron potential in the unit.

The Old Crow winter road along the east-central and northern portions of the unit provides the only access route into the unit for resource exploration activities. Four identified airstrips are present in the western portion of the unit, but the present status of the strips is unknown.

Land Administration

Unit #7 has no existing regional management plans.

Recommendations

Unit: (#7) Johnson Creek

Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Impacts of activities can generally be mitigated by adhering to recommended operating practices.

- Proposed as Zone IV management area (lower conservation / higher development focus)
  - ► Rationale: LMU #7 contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in portions of the unit, with most activity concentrated near the Johnson/Pine creek corridors along the Old Crow winter road route
  - ► There is relatively little overlap of resource interests and values in the unit and there appear to be few direct potential resource conflicts.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.75%	1.0%
Linear (access) density	0.75 km/km^2	1.0 km/km^2

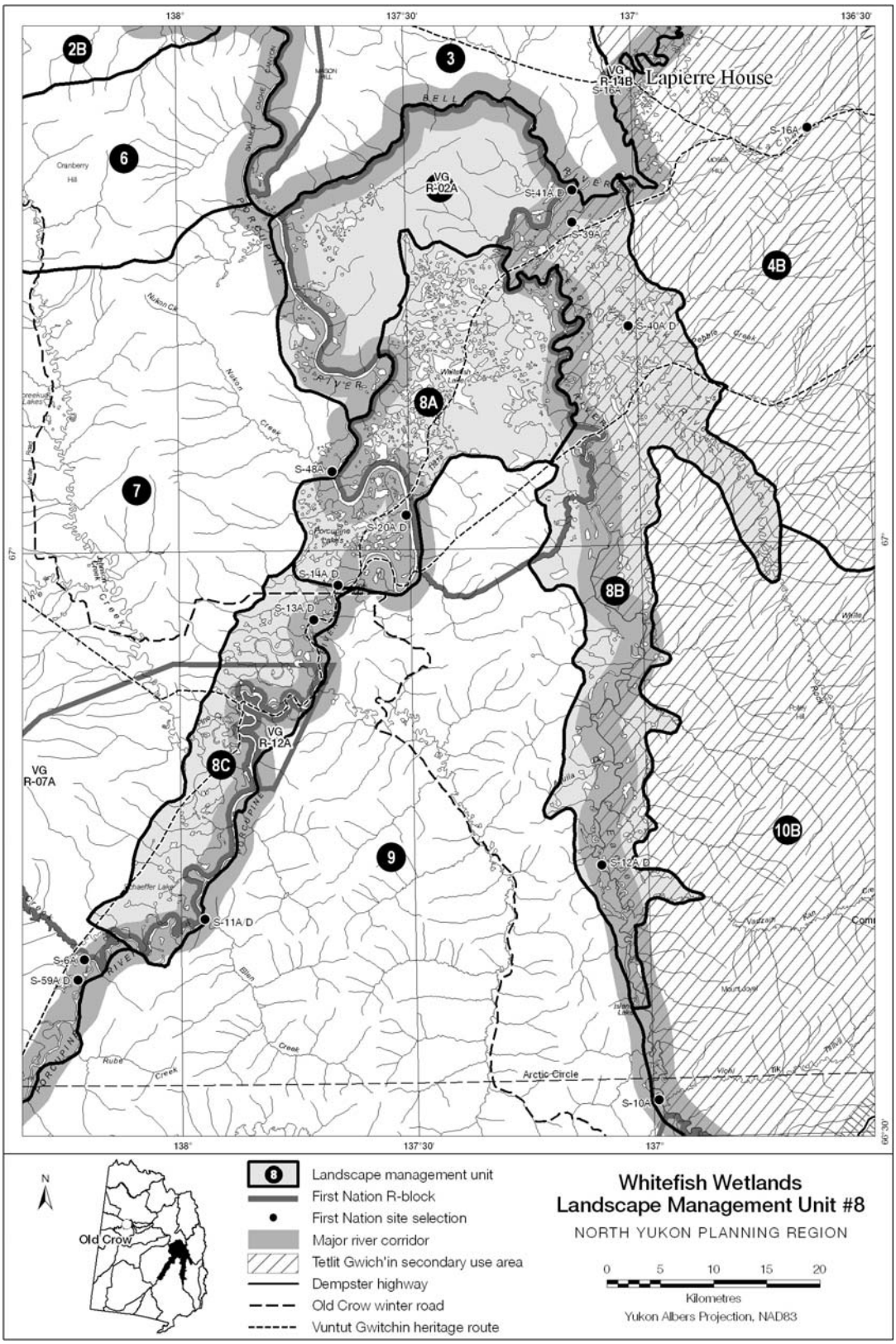
- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking) in the vicinity of Johnson and Pine creek corridor, and the area around White Snow Mountain
- Work camp siting should not be located near Lower Pine Creek in proximity to Johnson Creek Village

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) rutting season in the northern portion of the unit, and b) winter season in the eastern portion of the unit near major river/creek confluences with Porcupine River

- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine River and Lake #15 adjacent to Johnson Creek. Surface disturbance adjacent to the river and the lake should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to potential Chum (Dog) and Chinook (King) salmon spawning habitat in the Porcupine River should be avoided

Figure 5.10. Landscape Management Unit #8 (Whitefish Wetlands), Showing Sub-Units #8A-C.



Landscape Management Unit #8: Whitefish Wetlands

Area: 1,894 km^2 (189,400 hectares) **Area (% of region):** 4%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#8A. Whitefish – Porcupine Lakes	468 (1%)	PA (proposed)	**VGFN VG R-02A, S-14A/D, S-20A/D, & YG Public Land** – Undesignated Land
#8B. Eagle – Bell River	1,124 (2%)	IMA Zone I	**VGFN VG R-02A, S-12A/D, S-39A, S-40A/D, S-41A/D, YG Public Land, & Yukon Oil and Gas Permit #s 0007, 0009)**[6] – Undesignated Land
#8C. Porcupine River	302 (1%)	IMA Zone I	**VGFN VG R-07A, R-12A, S-11A/D, S-13A/D, YG Public Land, & Yukon Oil and Gas Permit #0005)** – Undesignated Land

Background

LMU #8, the Whitefish Wetlands, is one of the most important areas in the region for supporting wildlife and fish resources and subsistence lifestyles. Outside of Old Crow Flats, this is the second largest wetland complex in the planning region. Some of the highest concentrations of ecological values (fresh water fish, seasonal waterbirds, caribou, and moose) outside of Old Crow Flats occur within the area. Ecological and cultural values are concentrated along the Major River Corridors (Porcupine, Bell, Eagle), the Rock River, and the core area of the complex that includes Whitefish Lake and Tizya Creek. Residents of Old Crow and Fort McPherson actively use the wetland complex. The unit is within the Eagle Plains area of oil and gas potential, and has received significant past exploration activity and recent interest.

The Whitefish Wetlands contains three sub-units, a northern portion, LMU #8B (Eagle – Bell River), a central portion, LMU #8A (Whitefish – Porcupine Lakes), and a southern portion, LMU #8C (Porcupine River). LMU #8A is referred to as the 'core' area of Whitefish Wetlands complex. The boundary between sub-units #8A and #8C roughly follows the Old Crow winter road route. The road crosses the Porcupine River at Anik Island in sub-unit #8C. A portion of LMU #8B along the Eagle and Rock Rivers is within the Tetlit Gwich'in Secondary Use Area.

LMU #8 is bordered to the north by Driftwood River – Salmon Cache (LMU #3), which is currently under a land withdrawal order. LMU #8 is bordered to the east by LaChute

[6] Permit #s 0005, 0007, & 0009 expire on August 31st, 2013

River (LMU #4B) and Rock River – Mount Joyal (LMU #10B) in the Southern Richardson Foothills. Johnson Creek (LMU #7) and Ahvee and Sharp Mountains (LMU #6) are located to the west of the unit. The unit is bordered to the south by Eagle Plains (LMU #9).

An overview of significant resource values identified in LMU #8 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #8 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU#8 is within the Eagle Plains Ecoregion and covers 3.7% of the North Yukon Planning Region. The unit is at the confluence for three major river systems, the Eagle, the Bell and the Porcupine. The wetland complex has a similar history as Old Crow Flats. The central portion of the wetland complex is situated in an old glacial lake basin that is underlain by fine-grained, ice-rich lake sediments. The sediments are highly susceptible to surface disturbance impacts; surface impacts have resulted from past land use activities.

The wetland complex contains approximately 1,000 small lakes and ponds, with the largest being Whitefish Lake (about 14 km^2) in LMU #8A. Most lakes and ponds are less than 1 km^2 in size. Lakes tend to be thermokarst in origin, are shallow, and support emergent and submergent aquatic vegetation. Most lakes are perched above the surrounding major rivers. LMU #8A accounts for a large amount of the surface water; lakes and ponds cover approximately 17% of its area. The central wetland complex (LMU #8A) drains to the west into Porcupine River through several small creeks.

The central wetlands (LMU #8A) contain wet or riparian shrub, wet herb and wet forest vegetation communities. Black spruce-lichen-heath communities dominate the peat plateaus, and floating mats of sedges and mosses are also common. A diversity of wetland types have been identified, including bogs, fens, swamps, marshes.

Riparian sites along the Porcupine, Eagle and Bell River (LMU #s 8B and 8C) are influenced by active river processes. Riparian sites are characterized by a diverse mosaic of habitat types, from various shoreline habitats and emergent wetlands to dense shrubs, balsam poplar forests, and white spruce forest. Many open water, off channel habitats are present in oxbows and perched lakes on terraces. LMU #8C contains significant mixed-wood riparian communities.

The area is underlain by continuous permafrost and is reflective of the Eagle Plains Ecoregion climate. In winter, cold air drains into the lower valley bottoms, producing extremely low temperatures, with minimums approaching -60°C.

Ecological Values

The entire unit contains significant habitat to support Porcupine caribou, moose, bears, furbearers, waterbirds, fish, and a variety of other wetland-dependent species. The values are concentrated along the Porcupine, Bell, Eagle, and Rock Rivers, Lower Johnson Creek, and the 'core' area of Whitefish Wetlands. The Whitefish Wetlands complex has been identified in four past assessments as an area of conservation interest (Canadian Arctic Resources Committee, 1980; Blood and Anwieler, 1984; Yukon Waterfowl Technical Committee. 1991; Yukon Department of Renewable Resources, 1993). Whitefish Lake complex was also part of the list of 37 Yukon wetlands that were placed under 'map notation' by DIAND in 1988.

All of LMU #8 contains the regionally and territorially significant Whitefish Wetlands complex (Yukon Wetlands Technical Committee, 2005). LMU #8 is underlain by sensitive permafrost terrain, and is an ecologically significant area. The wetland complex contains a diversity of sensitive open water, riparian and off-channel wetland habitats and wetland vegetation types.

Portions of LMU #8 receive concentrated caribou use. Porcupine caribou can be found in the area during the rutting and winter seasons. LMU #8A receives concentrated caribou use during the rutting season, within the southern portion of the unit. The northeastern and southeastern portions of the unit also receive concentrated caribou use during the winter season.

LMU #8B receives concentrated caribou use during the rutting season within the southeast portion of the sub-unit along the Eagle River corridor, and in the western portion near the confluence of Nukon Creek/Porcupine River. The Porcupine/Bell river confluence (northwest portion of unit), Bell/Eagle and Bell/Rock river confluence (north-central portion of unit), and the Eagle River corridor (southeast portion of unit) of LMU #8B receive concentrated caribou use during the winter season.

LMU #8C receives concentrated caribou use during the winter season within the west-central portion of the sub-unit near the Johnson Creek/Porcupine River confluence, and in the southern portion of the unit near the Porcupine River corridor.

In LMU #8, the Porcupine, Bell, Eagle, and Lower Rock rivers, and the 'core' area of Whitefish Wetlands complex are identified significant areas for moose. The Porcupine River and 'core' area of Whitefish Wetlands are identified significant areas for bears. Waterbirds are particularly abundant in the Porcupine River corridor adjacent to Whitefish Wetlands complex, relative to most other stretches of the river (Ducks Unlimited Canada, unpublished data, 2005). This section of the river is an important spring staging, resting and feeding area for waterbirds, particularly during the period when lakes remain frozen.

The Porcupine, Bell, Eagle, and Rock rivers, Tizya Creek, Whitefish Lake, and Lake #14 adjacent to Johnson Creek corridor have identified or potential fish critical over-wintering

habitat (North Yukon Planning Commission, 2004b, 2007a,b). The creeks connecting the wetland complex to the Porcupine River are recognized as being of regional significance to the freshwater fishery, providing for seasonal migration between spawning, rearing and critical over-wintering habitats for large numbers of grayling, char and whitefish.

Heritage and Cultural Values

LMU #8 contains many important heritage and archaeological sites, including Johnson Creek Village which is a VG fur trade era settlement. The core area of Whitefish Wetlands Complex is also a significant heritage area. Six documented archaeological sites are present in LMU #8 along the Porcupine, Eagle, and Rock river corridors. The unit contains significant preserved remains of ice age fauna and evidence of past Beringian environments.

The wetlands historically received significant levels of First Nations traditional use. Three Vuntut Gwitchin heritage routes are present in LMU #8. Two of the routes link Fort McPherson to Whitestone Village, Old Crow, and Johnson Creek Village. The third route is a connector between the previous two routes that cuts across the Whitefish wetlands and Whitefish lake. Two winter travel routes (see Map 4) are still used to travel between Fort McPherson and Old Crow, and from the mouth of Bell River to Johnson Creek Village.

Two documented historical fish traps are located in LMU #8A near the Tizya Creek/Whitefish Lake outlet, and Tizya Creek at confluence of Porcupine River.

Economic Interests

Subsistence harvest (hunting, trapping, and fishing) and cultural activities are important current land uses in this unit for VGFN and TGFN. The Major River corridors (Porcupine, Bell, and Eagle) and the 'core' area of Whitefish Wetland complex, including Whitefish Lake, are significant subsistence harvest areas and transportation corridors.

The VGFN recognized the importance of the Whitefish Wetlands area through its selection of VG R-02A, which is the second largest land selection outside of Old Crow Flats. The Tetlit Gwich'in Secondary Use Area also encompasses a portion of LMU #8B along the Eagle and Rock Rivers.

Although the number of tourism-related visitors is currently low, the Eagle and Porcupine rivers are recognized summer wilderness tourism recreation corridors. A small number of self-guided wilderness travelers are known to paddle the Eagle River each year. Johnson Creek Village is an identified tourism node, with the Porcupine River providing access to the village site.

All of LMU #8 is contained within the Eagle Plains oil and gas basin. The basin has proven hydrocarbon potential, and oil and gas exploration are primary economic interests for Whitefish Wetlands. In the 1960s and 1970s, the wetlands were the focus of

substantial oil and gas exploration activity. Two wells drilled in central Whitefish Wetlands had significant gas shows, but were subsequently abandoned. No oil and gas related exploration activities have taken place since the 1970s. The southern half of LMUs #8B and 8C recently received industry interest in a call for postings put out by the Yukon Oil and Gas Management Branch (April 2007). Portions of Whitefish Wetlands recently received some industry interest in the Yukon Oil and Gas Management Branch spring 2007 call for postings (April 2007). As of August 2007, there are portions of three Oil and Gas Permits in the unit (#0005, #0007 and #0009 held by Northern Cross Yukon Ltd.) (Map 4).

The wetland complex is considered to have no or very low mineral potential. The Old Crow winter road crosses through unit #8C and provides the only existing access route for resource exploration activities. LMU #8B is in proximity to the Dempster Highway near Eagle Plains service facility and Wright Pass on the NWT border.

Land Administration

Unit #8 has no existing regional management plans.

Recommendations

Sub-unit: (#8A) Whitefish – Porcupine Lakes

Recommended Management Objective: Protection of ecological and cultural resources. Refer to Section 5.2.2.2 and Appendix 4 for discussion of land designation options and recommendations. See Figure 5.11 for a detailed map showing the protected area proposal.

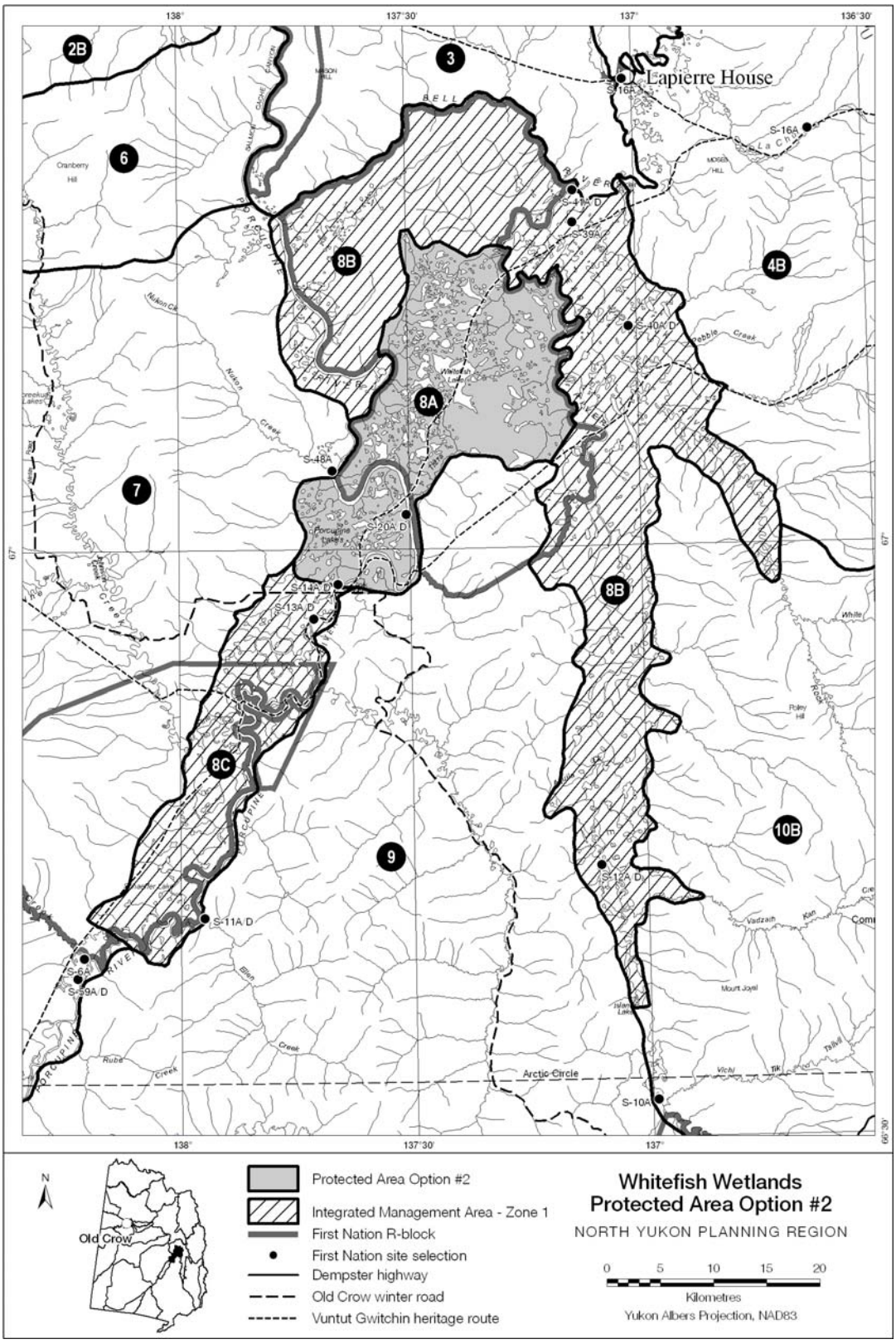
- Recommended for Protected Area designation. The PA designation proposal applies to the central Whitefish Lakes within VGFN VG R-02A, and YG public land around Porcupine Lakes on the west bank of Porcupine River
  - ► Rationale: LMU #8A contains important and sensitive wetland habitats that support a variety of valued wildlife and fish species. These habitats are present across the entire unit. There is a high risk of irreversible impacts to sensitive habitats from land use activities. There is also a high risk of direct and indirect impacts to wildlife and fish populations from land use activities
  - ► Concentrations of ecological values are second only to Old Crow Flats SMA
  - ► Area was repeatedly identified during consultations with Old Crow Elders and community members as an important and significant ecological and cultural area
  - ► Seasonal subsistence harvesting and cultural activities occur in most of the unit

- Protect the central wetland and lake values of the Whitefish Lake complex

- Protect important fish migration routes between the central Whitefish Lake complex, Porcupine Lakes and Porcupine River; Tizya Creek is noted of special significance

- To the greatest extent practicable, provide functional protection of hydrologic and wetland processes (maintain water flow patterns, quality and quantity) across entire Whitefish Wetlands complex

Figure 5.11. Whitefish Wetlands Complex Protected Area Recommendation (LMU #8A).



Sub-unit: (#8B) Eagle – Bell River

Recommended Management Objective: Maintaining ecological integrity and minimizing potential land use impacts are the primary management objectives.

- Proposed as Zone I management area (highest conservation / lowest development focus)
  - ► Rationale: LMU #8B contains important and sensitive wetland habitats that support a variety of valued wildlife and fish species. These habitats are present across the entire unit. There is a high risk of irreversible impacts to sensitive habitats from land use activities. There is also a high risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in most of the unit
- Available for carefully managed land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	N/A	< no functional disturbance[7] >
Linear (access) density	N/A	< no functional disturbance >

- A management priority is to avoid or minimize potential impacts of exploration and development activities on current use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking)
- Construction of permanent all-season infrastructure in Whitefish Wetlands complex is discouraged
- Potential winter access routes and industrial infrastructure should avoid significant moose and caribou habitats along the Bell River and its tributaries
- In recognition of the ecological, cultural and tourism values of Bell River corridor, any future land use should not compromise the ecological integrity of the corridor from Summit Lake to Bell River confluence with Porcupine River
- Work camp siting should not be located in the Whitefish Wetland complex
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) rutting season in southeast and western portion (Nukon Creek/Porcupine River) of LMU #8B, and b) winter season in northwest, north-central, and southeast portions of LMU #8B

[7] See Section 3.2.2.1 above for definition of functional disturbance

- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine, Bell, Eagle, and Rock rivers. Surface disturbance adjacent to these rivers should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to potential Chinook (King) salmon spawning habitat in the Rock River should be avoided

Sub-unit: (#8C) Porcupine River

Recommended Management Objective: Maintaining ecological integrity and minimizing potential land use impacts are the primary management objectives.

- Proposed as Zone I management area (highest conservation / lowest development focus)
  - ► Rationale: LMU #8C contains important and sensitive wetland habitats that support a variety of valued wildlife and fish species. These habitats are present across the entire unit. There is a high risk of irreversible impacts to sensitive habitats from land use activities. There is also a high risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in most of the unit

- Available for carefully managed land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	N/A	< no functional disturbance[8] >
Linear (access) density	N/A	< no functional disturbance >

- A management priority is to avoid or minimize potential impacts of exploration and development activities on current use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking)

- Construction of permanent all-season infrastructure in Whitefish Wetlands complex is discouraged

- Work camp siting should not be located in the Whitefish Wetlands complex

- Land use activities should not compromise the integrity of Johnson Creek Village heritage site

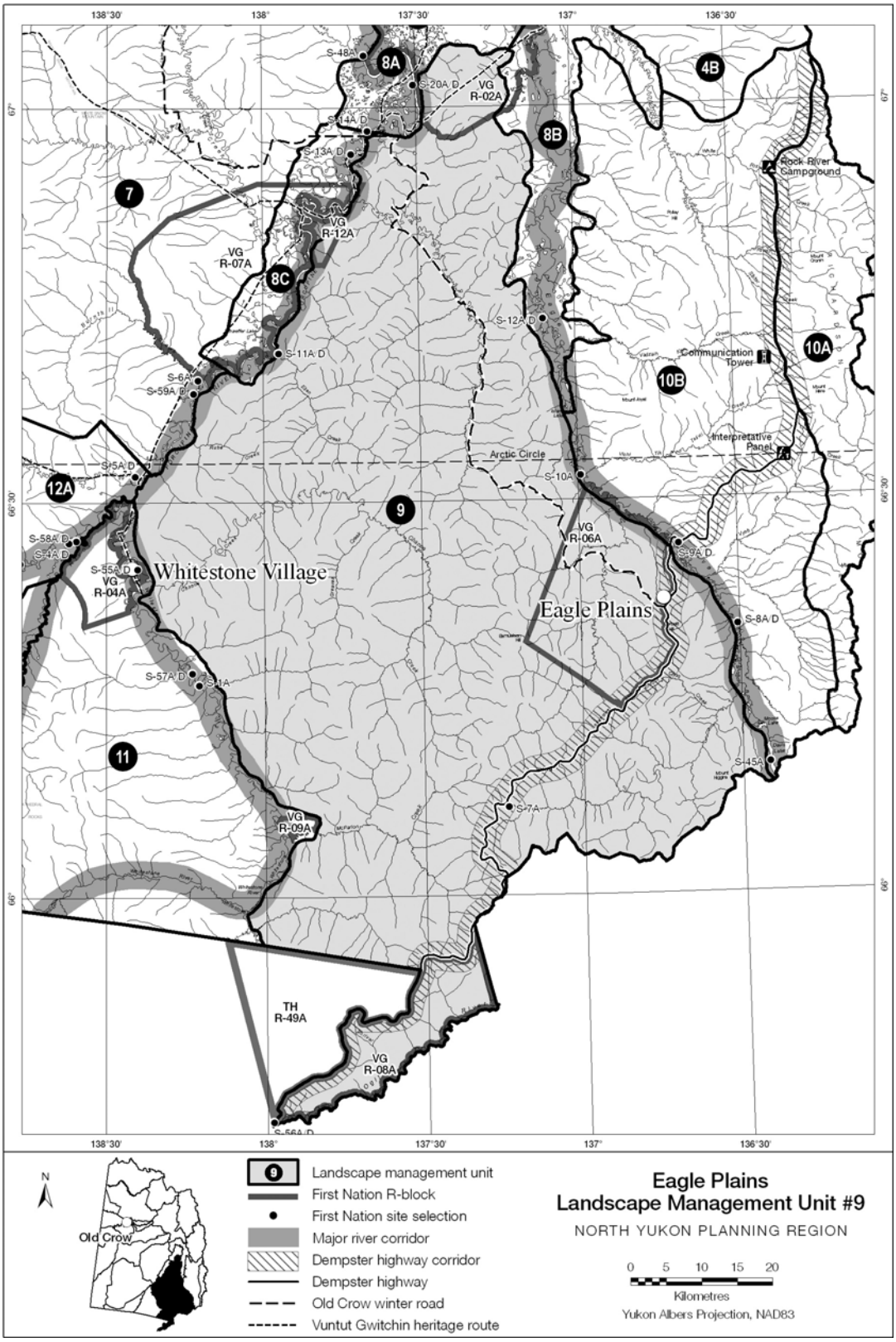
[8] See Section 3.2.2.1 above for definition of functional disturbance

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the winter season in the west-central and southern portions of LMU #8C

- In-stream winter water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine River and Lake #14 adjacent to Johnson Creek. Surface disturbance adjacent to the river and the lake should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to potential Chum (Dog) and Chinook (King) salmon spawning habitat in the Porcupine River should be avoided

Figure 5.12. Landscape Management Unit #9 (Eagle Plains).



Landscape Management Unit #9: Eagle Plains

Area: 6,415 km^2 (641,500 hectares) **Area (% of region):** 12%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#9. Eagle Plains	6,415 (12%)	IMA Zone IV	**VGFN VG R-02A, R-06A, R-12A, S-07A, Dempster Highway corridor, Eagle Plains service facility, YG Public Land, & Yukon Oil and Gas SDL-020, SDL-022, Permit #001, and Permit #s 0005-0017)**[9] - Undesignated Land

Background

LMU #9, Eagle Plains, is the most important area in the region for oil and gas potential and interest, and several discoveries have been made here. The all-season Dempster Highway traverses this unit in the southeast portion. The Eagle Plains service facility is located on leased public land within the eastern portion of the unit.

There are existing land use impacts in the unit resulting from past exploration activities. Historically, much of the unit was an important use area for First Nations, but receives less use today. Tourists and residents of the Yukon and NWT use the Dempster Highway corridor for recreational and subsistence harvesting activities. The Old Crow winter road cuts across the northern portion of this unit. A small portion of LMU #9, in the vicinity of the Dempster Highway, is within the Tetlit Gwich'in Secondary Use Area.

LMU #9 is bordered to the north by Whitefish Wetlands (LMU #8), and to the east by Whitefish Wetlands and Rock River – Mount Joyal (LMU #10B) in the Southern Richardson Foothills. The Whitestone River (LMU #11) and Johnson Creek (LMU #7) are located to the west. Eagle Plains is bordered to the south by the Peel Watershed Planning Region and an area of Traditional Territory overlap (Area B) between Tr'ondek Hwech'in and Vuntut Gwitchin First Nations. The Nacho Nyak Dun First Nation of Mayo also has traditional territory in the vicinity of the Dempster Highway and the Eagle River.

An overview of significant resource values in LMU #9 identified during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #9 are found on the NYPC website (North Yukon Planning

[9] SDL – Significant Discovery License. SDL-020 and SDL-022 have no expiry date. Permit #001 expires in 2008. Permit #s 0005-0017 expire on August 31st, 2013.

Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #9 is in the Eagle Plain Ecoregion of the Chance Creek Ecodistrict. The entire unit is within the Taiga Shrub Bioclimate zone and is underlain by continuous permafrost. Permafrost thickness of 89m in depth has been recorded[10]. During extended winter periods, the settling of cold air in valley bottoms can result in extremely cold temperatures, averaging –31C in January, but dipping as low as –60C. Most precipitation falls as rain during the summer months. Strong winds may occur during outbreaks of arctic air masses (hi-pressure cells moving south). Elevation ranges between 300m and 600m.

LMU #9 is a broad, rolling plateau with dissected stream pattern. Bedrock folds control the rolling surface topography, creating a repeating pattern of hills and valleys dissected by many small streams. Bedrock geology is composed primarily of Mesozoic sedimentary rocks. Although largely unglaciated, melt water from glaciers outside the region caused terraces to form along major rivers. Valleys with active river channels and floodplains are filled with alluvial sediments and gravels. Due to the length of time the area has remained unglaciated, most surficial materials are derived from in-situ weathered bedrock (shale and sandstone colluvium). There are no glacial tills or similar glacial deposits.

LMU#9 is entirely within the Porcupine River watershed. The unit is bordered to the east by the Eagle River, and to the west by the Porcupine River. Major third and fourth order watersheds include Whitestone River, Eagle River, Chance Creek, Ellen Creek and Schaeffer Creek. Sources of water from bedrock formations of sulphurous shale in the area tend to be less productive fish habitats (North Yukon Planning Commission, 2004b).

Eagle Plains is a forested landscape, with open-canopy forests of black spruce being the dominant vegetation. The rolling, dissected topography produces distinct, repeating patterns where better-drained soils occur on ridge crests, moist-poorly drained soils occur on mid-slopes, and wet, poorly drained soils in the valley bottoms. This repeating pattern of topography and soil drainage controls the distribution of landscape types. Valley bottom vegetation is very poorly drained, and includes bogs and wet tussock vegetation.

The Eagle Plains Ecoregion has the most active fire regime in the planning region. Approximately 20% of the unit was burnt in the 2004 fire season, with an additional 5% burnt in 2005. One third of the unit has been affected by fire since 1950, resulting in estimated fire cycle of 130-150 years.

[10] Eagle Plains, From Taylor and Judge, 1974 cited in Yukon Ecoregions Working Group (2004).

Ecological Values

The unit contains significant habitat to support Porcupine caribou, moose, bears, and furbearer populations, particularly adjacent to the Porcupine, Eagle, and Whitestone river corridors, and central Eagle Plains. The eastern portion of Eagle Plains has been identified in two past assessments as an area of conservation interest (Yukon Department of Renewable Resources, 1993; Yukon Government, 2002). The Dempster Highway corridor was also proposed in the past as an environmentally significant area (Canadian Arctic Resources Committee, 1980).

Portions of LMU #9 receive concentrated caribou use. Porcupine caribou can be found in the area during the rutting and winter seasons. The unit receives concentrated caribou use in the Ogilvie River (southern portion), Rube Creek (west-central portion), and the area between the Porcupine and Eagle rivers (extreme northeast portion) during the winter season. The area between the Porcupine and Eagle rivers (northern portion) of the unit receives concentrated use during the rutting season. Most of unit #9 has not received concentrated use by Porcupine caribou in recent times, consistent with findings dating back to the 1970s.

Old Crow residents identified the central Eagle Plains basin as a significant area for moose. The area adjacent to the Porcupine River corridor on the periphery of the unit is a significant area for bears and furbearers. There are no identified or potential fish critical over-wintering habitats identified in LMU #9.

The Porcupine and Eagle rivers fall just outside the east/west boundaries of unit #9, but both rivers have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b) and several tributaries in Unit #9 flow into these rivers. Chance Creek in the west-central portion of the unit contains populations of several freshwater fish species (North Yukon Planning Commission, 2004b). Significant wetland habitats are located along Lower Schaefer Creek.

Heritage and Cultural Values

LMU #9 contains a few identified heritage and archaeological sites, primarily around the Whitestone/Chance Creek trapping area and Schaeffer Creek corridor. Two documented archaeological sites are found south of the Dempster Highway, in the southeastern portion of the unit.

Much of this unit is considered to be the Tukudh Gwich'in homeland, a First Nation cultural group now dispersed among the Vuntut, Tetlit, Tr'ondek and Nacho Nyak Dun First Nations. Much of the Dempster Highway traverses a historically important Gwich'in travel route. A large portion of Eagle Plains was a historically important subsistence harvest area, including the west-central area (includes Whitestone/Chance Creek trapping area and Ellen Creek). Whitestone and Johnson Creek villages were used as central locations for trapping. The northern portion of the unit around the Old Crow

winter road and Schaefer Creek was also a historically important hunting and trapping area.

There are no identified heritage routes in unit #9. One historical fish trap is located at the mouth of Ellen Creek.

Economic Interests

Subsistence harvest and cultural activities along the Dempster Highway corridor are important land use activities for several First Nations. The activities include harvesting of caribou during the winter season in the vicinity of the highway. Outside of the Dempster Highway corridor, Eagle Plains currently receives lower use than other areas of the region. The unit is also an important recreational area for hunting and fishing activities for many Yukon and NWT residents. The southeastern portion of unit #9 is within the Secondary Use Area of the Tetlit Gwich'in First Nation.

Tourism potential and interest within the unit is high relative to the rest of the region. The Dempster Highway is a popular highway-touring route for many residents and non-residents, particularly during the summer months. Eagle Plains lodge is a full service identified tourism node along the Dempster Highway.

All of LMU #9 is contained within the Eagle Plain oil and gas basin. The basin has proven hydrocarbon potential, with several past discoveries of oil and gas reserves. Future exploration and development activities are expected to be focused in this area. Existing significant discovery licenses and permit areas held by Northern Cross Yukon Ltd. in the unit are shown on Map 4. LMU #9 recently received significant industry interest in a call for oil and gas postings. There are 14 permits here as of August 2007; thirteen were awarded in spring 2007.

Mineral potential in LMU #9 is low relative to overall mineral potential for the region. Mineral potential in the southeastern portion of the unit near the Dempster Highway is high. Access to resources in LMU #9 is possible via the Dempster Highway, the Old Crow winter road, other winter access roads, existing seismic lines/trails, and airstrips.

Land Administration

Unit #9 has no existing regional management plans. Along the Dempster Highway corridor, the permitting of activities within 8 km either side of the centre line (16 km total) of the highway is managed under the *Area Development Act, R.S.Y. 2002, c.10* and *Dempster Highway Development Area Regulations*.

Recommendations

Unit: (#9) Eagle Plains

Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Impacts of activities can generally be mitigated by adhering to recommended operating practices.

- Proposed as Zone IV management area (lower conservation / higher development focus[11])
  - ► Rationale: LMU #9 contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in portions of the unit, with most activity concentrated on the Dempster Highway
  - ► There is relatively little overlap of resource interests and values in the unit and there appear to be few direct potential resource conflicts.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds[12]	
	Cautionary	Critical
Surface disturbance	0.75%	1.0%
Linear (access) density	0.75 km/km^2	1.0 km/km^2

- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking) along Dempster Highway corridor[13]
- Work camp siting should be located within or near the vicinity of the Eagle Plains service facility, when feasible
- Land use activities should attempt to minimize impacts to the visual quality of sub-arctic viewscapes along the Dempster Highway corridor

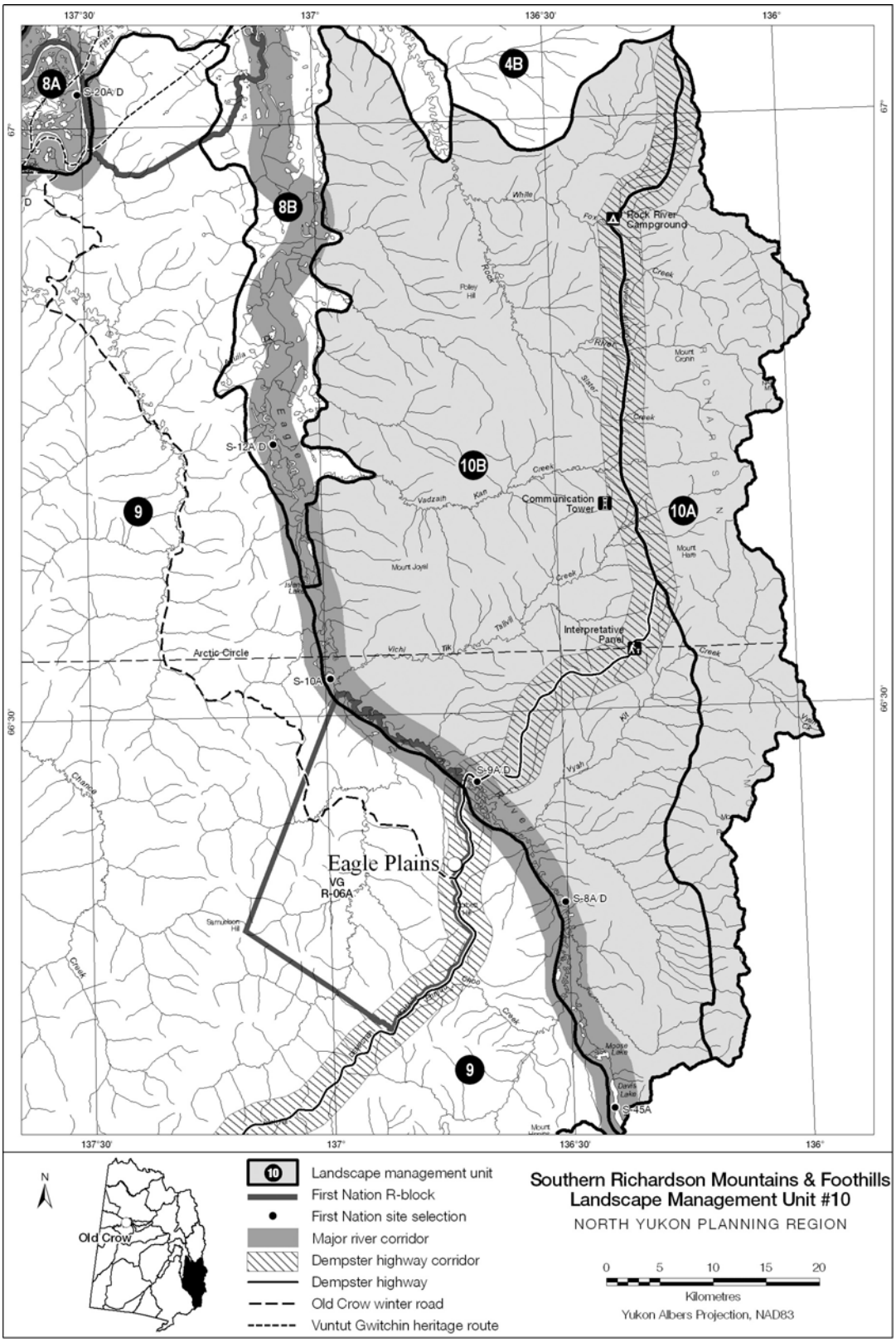
[11] The proposed zoning for the unit is consistent with the economic development management intent of VGFN VG R-06A land selection located in LMU #9

[12] As discussed in Chapter 4, activities within 4 km (2km either side) of Dempster Highway would be exempt from indicator reporting

[13] In accordance with existing and pending fish and wildlife harvest management plans and regulations pertaining to fish and wildlife harvest within the Dempster Highway corridor

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) winter season, primarily in the southern, west-central, and northeast portion of unit, and b) rutting season in northern portion of unit

Figure 5.13. Landscape Management Unit #10 (Southern Richardson Mountains and Foothills), Showing Sub-Units #10A-B.



Landscape Management Unit #10: Southern Richardson Mountains and Foothills

Area: 3,173km^2 (317,300 hectares) **Area (% of region):** 5%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#10A. Southern Richardson Mountains	799 (1%)	IMA Zone II	**YG Public Land, Dempster Highway corridor, and Fox & Rich active mineral claim blocks** – Undesignated Land
#10B. Rock River – Mount Joyal	2,374 (4%)	IMA Zone II	**VGFN VG S-10A, S-45A, S-08A/D, S-09A/D, YG Public Land, Dempster Highway corridor, and Fox & Rich active mineral claim blocks** – Undesignated Land

Background

LMU #10, the Southern Richardson Mountain Range, is traversed by the all-season Dempster Highway. This is one of the most important units in the region for wildlife and fish resources. It is frequently used by tourists and residents of theYukon and NWT for recreational activities. The unit is also one of the most important for archaeological sites in the region – many sites are documented, but there is good potential for discovering additional sites. The entire unit is within the Tetlit Gwich'in Secondary Use Area and is frequently used by TGFN residents, particularly the Dempster Highway corridor.

The South Richardson Mountains and Foothills contains two sub-units, an eastern portion, LMU #10A (South Richardson Mountains), and a western portion, LMU #10B (Rock River – Mount Joyal). The boundary between the two sub-units partially follows the Dempster Highway.

LMU #10A is bordered to the north and east by the Peel Watershed Planning Region, and the NWT border / Gwich'in Settlement Region, including the James Creek Gwich'in Conservation Zone. The Peel Watershed Planning Region is located to the west and to the south of the sub-unit.

LMU #10B is bordered to the north by LaChute River (LMU #4B), to the south by the Peel Watershed Planning Region and Eagle Plains (LMU #9), and to the east by Eagle Plains (LMU #9) and Whitefish Wetlands (LMU #8B).

An overview of significant resource values in LMU #10 identified during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #10 are found on the NYPC website (North Yukon Planning

Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #10, South Richardson Mountains and Foothills, is divided along the Ecoregion boundary between the British Richardson Mountains on the east, and Eagle Plains to the west. LMU #10A (South Richardson Mountains) is in the South Richardson Mountains Ecodistrict – this is a mostly unglaciated mountain range with a small area of glaciation at the northeastern limit of the unit. To the west lies LMU #10B-Rock River/Mount Joyal, in the Richardson Foothills Ecodistrict. Mount Joyal, 925m above sea level, is the highest point within Eagle Plains. LMU #10 lies in the Eagle River and Rock River watersheds.

LMU #10A is a mountainous unit that is predominantly high elevation sparsely vegetated or exposed rock within the Alpine and Taiga Shrub Bioclimate zones. Taiga Wooded Bioclimate zones are found in valleys or major river channels. The high elevation environments are susceptible to climate change impacts. Warmer and drier conditions under climate change scenarios are expected to result in changes to vegetation community structure (more shrub and forest) in high elevation habitats.

LMU #10B is in the Taiga Wooded Bioclimate zone. A gently sloping pediment, extending west from the Richardson Mountains to the Eagle River, began forming here over 5 million years ago. Pediment slopes, comprised of material transported by gravity and water over very long time periods (~5 million years), are marked by permafrost and periglacial features such as solifluction, thermokarst and cryoturbation. Incised drainage channels or seeps are lined with medium to tall shrubs. Black spruce-tussock tundra is prevalent on poorly drained gently sloping and low relief locations. White spruce with lichen understory is more common on better-drained sites.

Ecological Values

The entire unit contains significant habitat to support the Porcupine caribou herd. There are many significant areas for moose, sheep, bears, furbearers, waterbirds, and fish populations, particularly along the Eagle and Rock river corridors, the Richardson Mountain Range, and several creeks that flow into the Eagle River.

The Southern Richardson Mountains has been identified in four past assessments as an area of conservation interest (Yukon Department of Renewable Resources, 1993; Peel River Watershed Advisory Committee, 1996; Gwich'in Land Use Planning Board, 1997; Yukon Government, 2002). The Dempster highway corridor was also proposed in the past as an environmentally significant area (Canadian Arctic Resources Committee, 1980).

All of LMU #10 receives concentrated caribou use, for one or more seasons, suggesting that caribou use the unit intensively. LMU #s 10A & #10B receive concentrated caribou use in the northern portion of the unit during the rutting, winter, and spring migration

seasons. The remainder of LMU #10 receives concentrated use during the rutting season, with some concentrated winter use in the central portion of the unit. The Richardson Mountain range is an important migration corridor for the herd.

In LMU #10B, Old Crow residents identified the Eagle River corridor as a significant area for moose. The Eagle River corridor also contains significant valley-bottom mixed-wood habitat for marten. The South Richardson Mountains in LMU #10A is a significant area for Grizzly bears. Key all-season sheep habitat is present in the Richardson Mountain range east of the Dempster Highway in LMU #10A.

The Eagle and Upper Rock rivers in LMU #10B have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b). Significant wetland habitats are located along the Eagle River, Lower Rock River, and Vyah Kit Creek within LMU #10B.

Heritage and Cultural Values

LMU #10 contains many important heritage and archaeological sites. Most of the documented sites are found close to the Dempster Highway corridor. Several sites are concentrated in the northeastern portion of LMU #10B. The central portion of LMU #10B, west of the Dempster highway, was a historically important hunting, trapping and fishing area. The Rock River – western Richardson Mountains foothills has been identified as an important area for heritage resources with many documented and potential archaeological sites (Yukon Department of Tourism and Regional Planning and Yukon Department of Renewable Resources, 1989).

There are no identified heritage routes in unit #10. Several hunting blinds were recently documented in the headwaters of the White Fox Creek/Rock River area. One documented Tetlit Gwich'in caribou fence is present in the Upper White Fox Creek portion of the unit (not shown on Map 3).

Economic Interests

Subsistence harvest and cultural activities are important current land uses in this unit for several First Nations, particularly along the Dempster Highway corridor. The activities include harvesting of caribou during the winter season in the vicinity of the highway. The unit is also an important recreational area for hunting and fishing activities for many Yukon and NWT residents. All of unit #10 is within the Secondary Use Area of the Tetlit Gwich'in First Nation.

Tourism potential and interest within the unit is high relative to the rest of the region. The Dempster Highway is a popular highway touring route for many residents and non-residents, particularly during the summer months. The Arctic Circle viewpoint and Rock River campground are two stop-over sites along the Dempster highway in LMU #10B. Most of LMU #10A, east of the Dempster Highway, has high tourism value for a variety

of activities. The Eagle River corridor in LMU #10B has summer wilderness tourism recreation potential.

The northwestern limit of LMU #10B is contained within the Eagle Plains oil and gas basin. This unit contains recently established mineral claims (Fox and Rich properties) near the Dempster highway—these are held by Archer Cathro & Associates. An application to explore the Sun mineral claims held by Shawn Ryan is pending. The Sun claims are also located near the Dempster Highway (Map 4). Mineral potential in LMU #10A along the Richardson Mountain range is high. Mineral potential in LMU #10B is low relative to overall mineral potential for the region. Access to resources in both sub-units is possible via the Dempster Highway.

Land Administration

Unit #10 has no existing regional management plans. Along the Dempster Highway corridor, the permitting of activities within 8 km either side of the centre line (16 km total) of the highway is managed under the *Area Development Act, R.S.Y. 2002, c.10* and *Dempster Highway Development Area Regulations*.

Recommendations

Sub-unit: (#10A) Southern Richardson Mountains

Recommended Management Objective: Maintaining ecological integrity and minimizing potential land use impacts are the primary management objectives[14].

- Proposed as Zone II management area (high conservation / low development focus)
  - ► Rationale: LMU #10A contains important habitats that support a variety of valued wildlife and fish species. These habitats are present across most or all of the unit and have special significance for the Porcupine caribou herd. Many of the habitats are not as sensitive to physical disturbance, but there is a high risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in portions of unit, with most activity concentrated on the Dempster Highway
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds[15]	
	Cautionary	Critical
Surface disturbance	0.15%	0.2%
Linear (access) density	0.15 km/km^2	0.2 km/km^2

[14] This plan recommendation is consistent with the approved management intent for adjacent Gwich'in James Creek and Vittrekwa River Conservation Zone (Gwich'in Land Use Planning Board, 2003)
[15] As discussed in Chapter 4, activities within 4 km (2km either side) of Dempster Highway would be exempt from indicator reporting

- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking) along Dempster Highway corridor[16]

- No all-season road access outside the 4 km Dempster highway corridor is recommended until next plan review to provide for adoption and implementation of plan recommendations

- Land use activities should not compromise the visual quality of the Richardson Mountains identified area of tourism interest, east of the Dempster Highway corridor

- Land use activities should not compromise the integrity of identified caribou fences

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) rutting season, which includes all of the sub-unit, b) winter and spring migration seasons, primarily in the northern portion of sub-unit, and c) winter season, primarily in the central portion of sub-unit

- In-stream water withdrawals and surface disturbance adjacent to potential Chinook (King) salmon spawning habitat in the Upper Rock River should be avoided

- Land use activities should be minimized, or when possible avoided, within sensitive key sheep habitats in the South Richardson Mountains. The North Richardson Mountain sheep management plan (*in prep*) should be consulted for detailed sheep management recommendations

[16] In accordance with existing and pending fish and wildlife harvest management plans and regulations pertaining to fish and wildlife harvest within the Dempster Highway corridor

Sub-unit: (#10B) Rock River – Mount Joyal

Recommended Management Objective: Maintaining ecological integrity and minimizing potential land use impacts are the primary management objectives[17].

- Proposed as Zone II management area (high conservation / low development focus)
  - ► Rationale: LMU #10B contains important habitats that support a variety of valued wildlife and fish species. These habitats are present across most or all of the unit and have special significance for the Porcupine caribou herd. Many of the habitats are not as sensitive to physical disturbance, but there is a high risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities occur in portions of unit, with most activity concentrated on the Dempster Highway
- Available for general land use subject to proposed thresholds:

Indicator	**Thresholds[18]**	
	Cautionary	Critical
Surface disturbance[19]	0.15%	0.2%
Linear (access) density	0.15 km/km^2	0.2 km/km^2

- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking) along Dempster Highway corridor[20]
- No all-season road access outside the 4 km Dempster highway corridor is recommended until next plan review to provide for adoption and implementation of plan recommendations
- Future potential all season road access to Eagle Plains (LMU #9) should avoid routing through sub-unit #10B

[17] This plan recommendation is consistent with the approved management intent for adjacent Gwich'in James Creek and Vittrekwa River Conservation Zone (Gwich'in Land Use Planning Board, 2003)
[18] As discussed in Chapter 4, activities within 4 km (2km either side) of Dempster Highway would be exempt from indicator reporting
[19] The estimated current footprint for LMU #10B exceeds the proposed threshold for the unit (see Appendix 3, Table A3.4). Most of the current footprint is a result of the Dempster Highway and existing gravel pits along the highway. If the Dempster Highway footprint exemption recommendation is accepted, the adjusted current footprint estimate would be well below the proposed threshold
[20] In accordance with existing and pending fish and wildlife harvest management plans and regulations pertaining to fish and wildlife harvest within the Dempster Highway corridor

- Future land use should not compromise the visual quality of the sub-arctic viewscape west of the Dempster Highway corridor

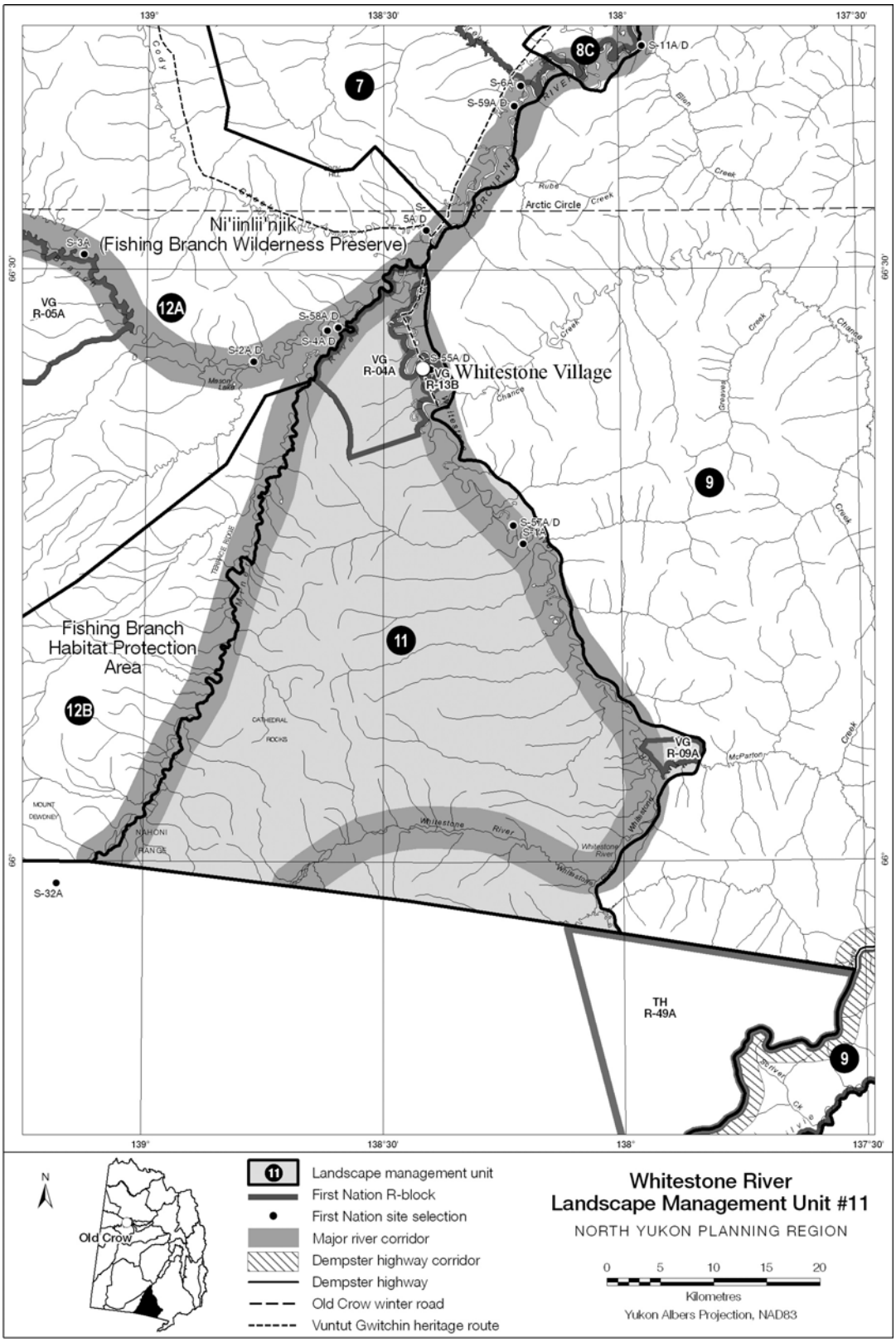
- Land use activities should not compromise the integrity of identified caribou fences

- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant Porcupine caribou periods: a) rutting season, which includes all of the sub-unit, b) winter and spring migration seasons, primarily in the northern portion of sub-unit, and c) winter season, primarily in the central portion of the sub-unit

- In-stream water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Eagle and Upper Rock rivers. Surface disturbance adjacent to these rivers should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to potential Chinook (King) salmon spawning habitat in the Upper Rock River should be avoided

Figure 5.14. Landscape Management Unit #11 (Whitestone River).



Landscape Management Unit #11: Whitestone River

Area: 1,740 km^2 (174,000 hectares) **Area (% of region):** 3%

Unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#11. Whitestone River	1,740 (3%)	IMA Zone III	**VGFN VG R-04A, R-09A, R-13B, S-01A, S-55A/D, S-57A/D, YG Public Land, & Yukon Oil and Gas Permit #s 0016-0017)**[21] – Undesignated Land

Background

LMU #11, Whitestone River, is located within the western section of the Eagle Plains plateau. Historically the unit was important for subsistence harvest and cultural activities, but has received less use in recent times. The Porcupine River starts at the northern limit of this unit, at the confluence of the Miner, Whitestone, and Fishing Branch rivers. The abandoned Whitestone Village is located in the northeast section of the unit. The unit contains significant habitat for a variety of wildlife and fish species.

The unit is within the Eagle Plains area of oil and gas potential. The southeast portion of the unit near the Whitestone River has received significant past exploration activity and recent interest. There is high mineral potential in the western portion of the unit.

LMU #11 is bordered to the north by Ni'iinlii'njik (Fishing Branch) SMA (LMU #12), specifically the Wilderness Preserve area of the SMA. Eagle Plains (LMU #9) borders the unit to the north and east. The Ni'iinlii'njik (Fishing Branch) SMA (LMU #12), specifically the Habitat Protection Area, is located to the west of the unit. To the south, the unit is bordered by an area of Traditional Territory overlap (Area B) between Tr'ondek Hwech'in and Vuntut Gwitchin First Nations.

An overview of significant resource values in LMU #11 identified during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #11 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

[21] Permit #s 0016-0017 expire on August 31st, 2013

Biophysical Setting

LMU #11 is mostly contained within the Eagle Plains Ecoregion; the western portion of the unit is located within the North Ogilvie Mountains Ecoregion. Three ecodistricts are present, including Fishing Branch River, Whitestone River, and Chance Creek in the western portion of the unit. The Whitestone, Miner, and Fishing Branch are prominent river features within the unit.

The unit is dominated by the taiga wooded bioclimate zone, and is underlain by sedimentary formations and continuous permafrost. Permafrost thickness of 89m in depth has been recorded where the Eagle Plains Ecoregion meets the North Ogilvie Mountains Ecoregion. The central and eastern portions of the unit are found within the plateau, while the western portion contains the Ogilvie Mountains.

Black spruce woodlands and earth hummocks dominate the central and eastern portion of the unit; alpine tundra vegetation dominates the western portion of the unit. Herb and shrub vegetation communities, growing under a variety of different soil moisture conditions, are also common. Riparian shrub along the major river valleys is also common. The wet herb habitats in the eastern portion of the unit, near the Whitestone River, are at risk from climate change impacts. The area has an active fire regime; the majority of the central portion of the unit south of Whitestone Village was burned in the 1990s.

LMU #11 is entirely within the Porcupine River watershed. Major third and fourth order watersheds include the Lower Porcupine River, Whitestone River, and the Miner River. parallels the western portion of the unit, while the Whitestone river parallels the eastern portion. The confluence of the Whitestone, Fishing Branch, and Miner rivers form the Porcupine River in the northern portion of the unit. Wetlands are present along each of these rivers. There are no large or intermediate sized lakes in the unit.

Ecological Values

LMU #11 contains significant habitat to support Porcupine caribou, moose, bears, furbearers, waterbirds, and fish populations, particularly in the vicinity of Whitestone Village, the area near the confluence of the Fishing Branch, Miner, and Whitestone rivers, and the Whitestone, Miner, and Porcupine river corridors.

Portions of LMU #11 receive concentrated caribou use. Porcupine caribou can be found in the area during the rutting and winter seasons. LMU #11 receives concentrated caribou use in the west-central portion of the unit during the rutting season. The central and southern (south of Whitestone River) portions of the unit receive concentrated caribou use during the winter season.

In LMU #11, the Porcupine, Whitestone, and Miner rivers are identified significant moose areas. These rivers also contain significant valley-bottom mixed-wood habitat for marten. The Porcupine River and vicinity of Whitestone Village are identified significant

areas for bears. The Porcupine, Whitestone, and Miner river corridors have identified or potential fish critical over-wintering habitat (North Yukon Planning Commission, 2004b, 2007a,b).

Significant wetland habitats are present along the Whitestone and Miner river corridors, and at the confluence of the Whitestone and Porcupine rivers.

Heritage and Cultural Values

LMU #11 contains a few important heritage and archaeological sites, including Whitestone Village. The identified sites are generally present in the northern portion of the unit near Whitestone Village and the confluence of the Fishing Branch, Miner, and Whitestone rivers. Two documented archaeological sites are present in the northern portion of LMU #11.

A large portion of the unit was a historically important subsistence harvest area, including the Whitestone and Miner river corridors. The area west of the Whitestone River is within the Whitestone/Chance Creek trapping area.

One Vuntut Gwitchin heritage route linking Whitestone Village to Johnson Creek Village, and Old Crow to Whitestone Village, is present in LMU #11. Two documented historical fish traps are located in LMU #11, one at the confluence of Chance Creek and Whitestone River, and the second near Whitestone Village along the Whitestone River.

Economic Interests

Subsistence harvest and cultural activities are current land uses in this unit, primarily around the Whitestone Village area and the confluence of the Fishing Branch, Miner, and Whitestone rivers. The activities include trapping and harvesting of fish and wildlife.

The Porcupine River is a potential summer wilderness tourism recreation corridor. Whitestone Village is an identified tourism node that may have future potential for visits. The majority of LMU #11 is contained within the Eagle Plains oil and gas basin. The basin has proven hydrocarbon potential, and oil and gas exploration are primary economic interests for Whitestone River. The southeastern portion of LMU #11 recently received industry interest in a call for postings put out by the Yukon Oil and Gas Management Branch (April 2007). Existing permit areas held by Northern Cross Yukon Ltd. are shown on Map 4. As of August 2007, there are portions of two Oil and Gas permits within LMU #11.

The unit has low mineral potential, relative to overall mineral potential for the region. A portion of the unit in the Nahoni Range and Cathedral Rocks area has high mineral potential. There is no access route into LMU #11 for resource exploration activities. The unit is in proximity to existing oil and gas permit and significant discovery license (SDL) areas in Eagle Plains which do have winter access routes. Five identified airstrips are present in the western portion of the unit, but the present status of the strips is unknown.

Land Administration

Unit #11 has no existing regional management plans.

Recommendations

Unit: (#11) Whitestone River

Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Potential impacts of activities can generally be mitigated by adhering to recommended operating practices.[22]

- Proposed as Zone III management area (moderate conservation / development focus)
  - ► Rationale: LMU #11 contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities generally occur in specific portions of the unit during specific seasons.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.375%	0.5%
Linear (access) density	0.375 km/km^2	0.5 km/km^2

- A management priority is to minimize potential impacts of exploration and development activities on current community use areas (e.g. areas used for hunting, fishing, trapping, travel, berry picking) within Whitestone Village area and confluence of Whitestone, Miner, and Fishing Branch rivers
- Work camp siting should not be located near the confluence of the Whitestone, Miner, and Fishing Branch rivers
- Land use activities should not compromise the integrity of Whitestone Village heritage site
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the following significant

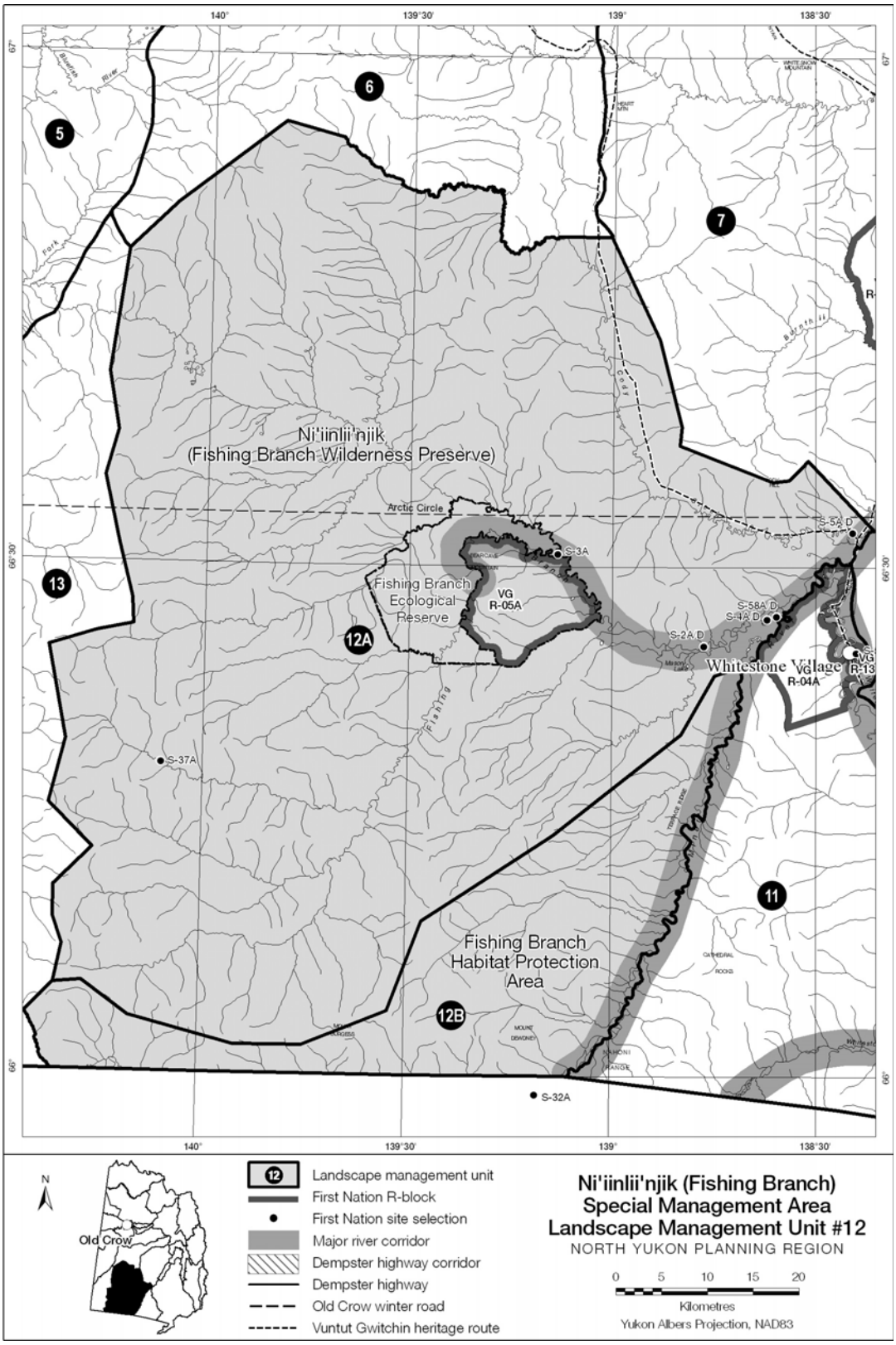
[22] This plan recommendation is consistent with the proposed zoning and management direction for Fishing Branch HPA (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a)

Porcupine caribou periods: a) rutting season in the west-central portion of unit, and b) winter season in the central and southern portions of unit

- In-stream water withdrawals should be avoided in identified or potential fish over-wintering habitats in the Porcupine, Whitestone, and Miner rivers. Surface disturbance adjacent to the river should also be minimized

- In-stream water withdrawals and surface disturbance adjacent to the following salmon spawning habitats should be avoided: a) Chum (Dog) habitat along the Porcupine and Whitestone rivers, and b) identified Chinook (King) habitat along the Porcupine, Whitestone, and Miner rivers

Figure 5.15. Landscape Management Unit #12 (Ni'iinlii'njik – Fishing Branch - SMA), Showing Sub-Units #12A-B.



Landscape Management Unit #12: Ni'iinlii'njik (Fishing Branch) SMA

Area: 6,504 km^2 (650,400 hectares) **Area (% of region):** 12%

Sub-unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#12A. Ni'iinlii'njik Protected Area	5,524 (10%)	PA	**VGFN VG R-05A, several S-sites, & YG Public Land** – Protected Area
#12B. Fishing Branch HPA	980 (2%)	IMA Zone III (proposed)	**YG Public Land** – Habitat Protection Area

Background

LMU #12, Ni'iinlii'njik (Fishing Branch) SMA, contains Fishing Branch (Ni'iinlii'njik) Special Management Area. The unit is separated into Fishing Branch Wilderness Preserve and Ecological Reserve in LMU #12A, and Fishing Branch Habitat Protection Area (HPA) in LMU #12B.

LMU #12A is a protected area. LMU #12B is managed to maintain cultural and ecological integrity, but is not withdrawn from resource exploration or development (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a,b).

LMU #12 is bordered to the north by Ahvee and Sharp Mountains (LMU #6) and Johnson Creek (LMU #7). The unit is bordered to the east by Eagle Plains (LMU #9) and Whitestone River (LMU #11). The area of Traditional Territory overlap (Area B) between Tr'ondek Hwech'in and Vuntut Gwitchin FNs is located to the south of LMU #12. The unit is bordered to the west by Kandik River (LMU #13).

An overview of significant resource values identified in LMU #12 during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #12 are found on NYPC's website (North Yukon Planning Commission, 2007a,b).

Biophysical Setting

The biophysical setting of LMU #12 has been well documented (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a,b).

Ecological, Heritage and Cultural Values & Economic Interests

Ni'iinlii'njik (Fishing Branch) Special Management Area (SMA) ecological, social/cultural, heritage, and economic resource values have been described and documented in the management plans referenced above.

Land Administration

Both sub-units within LMU #12 have existing management plans (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a,b).

Recommendations

Unit: (#12A) Ni'iinlii'njik Protected Area

Recommended Management Objective: See existing management plans for Ni'iinlii'njik Protected Area (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a,b)

No specific recommendations are required at this time. Ni'iinlii'njik management plans provide existing management direction.

Unit: (#12B) Fishing Branch HPA

Recommended Management Objective: See existing management plans for Ni'iinlii'njik (Fishing Branch) HPA (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a)

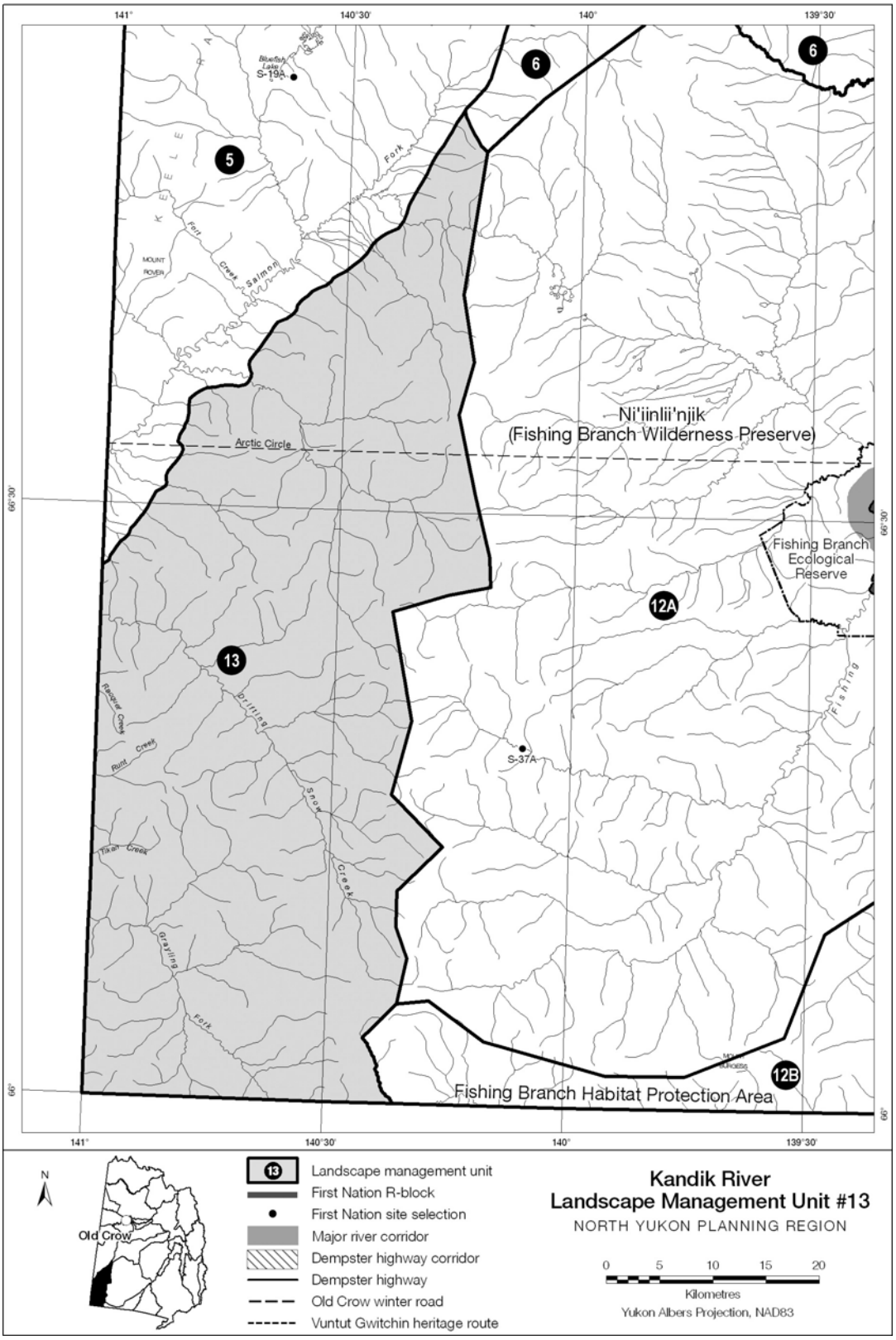
- Proposed as Zone III management area (moderate conservation / development focus)
  - ► Rationale: LMU #12B contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities generally occur in specific portions of the unit during specific seasons.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.375%	0.5%
Linear (access) density	0.375 km/km^2	0.5 km/km^2

- Amend Fishing Branch HPA plan (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a) at next Fishing Branch plan review period to include proposed zoning and thresholds above.

No other specific recommendations are required at this time. Ni'iinlii'njik (Fishing Branch) management plans provide existing management direction.

Figure 5.16. Landscape Management Unit #13 (Kandik River).



Landscape Management Unit #13: Kandik River

Area: 2,266 km^2 (226,600 hectares) **Area (% of region):** 4%

Unit	Area (km^2) / (% of region)	Category / zone	Existing Land Status
#13. Kandik River	2,266 (4%)	IMA Zone IV	**YG Public Land, and Rusty Springs & Alto active mineral claim blocks** – Undesignated Land

Background

LMU #13, Kandik River, is a very remote and poorly understood area. The unit is not used by residents of Old Crow. There are a few documented heritage and archaeological sites here, representing some of the oldest sites in the Yukon.

The unit is within the Kandik Basin area of oil and gas potential; however, the basin is poorly explored and understood at present, and has received no recent attention. Mineral potential is high relative to the rest of the region. The unit contains existing mineral claims (Rusty and Alto properties), and the only recognized mineral deposit in the region.

LMU #13 is bordered to the north by the Bluefish Lake – Keele Range (LMU #5). The unit is bordered to the east by Ni'iinlii'njik (Fishing Branch) SMA (LMU #12), including the Wilderness Preserve and HPA area of the SMA. The Alaska border is located to the west of the unit. To the south, the unit is bordered by an area of Traditional Territory overlap (Area B) between Tr'ondek Hwech'in and Vuntut Gwitchin First Nations.

An overview of significant resource values in LMU #13 identified during the planning exercise is provided in Maps 2-4. Additional maps and descriptions of all resource values identified for LMU #13 are found on the NYPC website (North Yukon Planning Commission, 2007a,b). The range of dates for various wildlife seasons discussed below is also referenced in the Resource Assessment Report.

Biophysical Setting

LMU #13 is found entirely within the North Ogilvie Mountains Ecoregion, in the Kandik River ecodistrict. Several small creeks flow through the unit, including Grayling Fork and Drifting Snow creeks. There are few prominent features in the unit.

The unit is contained primarily within the taiga wooded and taiga shrub bioclimate zones; the alpine bioclimate zone is present in the northern portion. The unit is underlain by sedimentary and carbonate bedrock, and continuous permafrost. Limestone dominates the

mountain ranges in the northern portion of the unit. Extensive deposits of colluvium and scree materials occur on the more mountainous ridges. The surface soils are characterized by thick accumulations of humus, as a result of the weathering of carbon from limestone. Moist or mesic herb and shrub vegetation communities are common. High elevation exposed, sparsely vegetated, or herb communities are common in the mountainous areas—these vegetation types are at risk from climate change impacts.

LMU #13 is within the Yukon River watershed. Major third and fourth order watersheds include the Salmon Fork, Grayling Fork, and Drifting Snow Creek. Small portions of the Fish Creek and Kandik River watersheds are also present in the unit. There are no major rivers or creeks flowing through the unit. There are few wetlands and no large or intermediate sized lakes.

Ecological Values

The ecological values of LMU #13 are not well documented. There are substantial local and scientific knowledge gaps with respect to the status and distribution of wildlife and fish species here.

A small fraction of LMU #13 receives concentrated Porcupine caribou use during the fall migration season, in the extreme northeast portion of the unit. A few individual satellite-collared caribou have been identified in LMU #13 during the fall migration, winter, and spring migration seasons. Most of the locations have been during the spring migration season, along the eastern boundary of the unit.

Local knowledge sources of information on wildlife and fish distributions, obtained from the Old Crow community workshops, identified no significant wildlife or fish habitats in LMU #13. However, community residents are generally not familiar with this area and do not travel here. There are no identified or potential fish over-wintering habitats in LMU #13.

A significant wetland habitat is present in the north-central portion of the unit, at the headwaters of a tributary to the Salmon Fork River.

Heritage and Cultural Values

LMU #13 contains three identified significant heritage and archaeological sites. The Poulton Station site is likely one of the oldest sites in the Yukon. Other sites of similar importance are likely to be present in the area. Old Crow residents did not identify any additional heritage and archaeological sites in this unit during community consultations.

The northern Ogilvie Mountains within LMU #13 contain numerous caves that likely have preserved evidence of past environments, fauna, and potentially human habitation. The heritage values of the unit are poorly understood.

Economic Interests

Subsistence harvest and cultural activities are not current land uses in this unit. There are currently no tourism interests identified in this area.

Most of LMU #13 is contained within the Kandik oil and gas basin. The basin is extremely remote, has a limited exploration history, and is expected to receive little exploration interest in the near future. LMU #13 received no industry interest in a recent call for postings put out by the Yukon Oil and Gas Management Branch (April 2007).

Mineral potential in LMU #13 is high relative to overall mineral potential for the region. Existing mineral claims (Rusty Springs and Alto properties) held by Eagle Plains Resources Ltd. in the northeast portion of the unit are shown on Map 4. The Alto iron deposit is the only currently recognized mineral deposit in the region. Eagle Plains Resources Ltd. has no immediate plans to perform additional work on these properties.

There is no all-season access into LMU #13 for resource exploration activities. In the Fishing Branch Management Plan, a specific provision permitted access under special provisions to the Rusty Springs mining property through the Wilderness Preserve, using the existing winter cat trail (Yukon Department of Environment and Vuntut Gwitchin Government, 2004a). However, the trail does not provide general access into the majority of the unit and has not been used in recent times.

Land Administration

Unit #13 has no existing regional management plans.

Recommendations

Unit: (#13) Kandik River

Recommended Management Objective: Managed to balance opportunities for land use while maintaining ecological integrity of valued resources. Impacts of activities can generally be mitigated by adhering to recommended operating practices.

- Proposed as Zone IV management area (lower conservation / higher development focus)
  - ► Rationale: LMU #13 contains important habitats that support a variety of valued wildlife and fish species. Concentrated wildlife and fish values are present in specific portions of the unit during specific seasons. Many of the occupied habitats are not as sensitive to physical disturbance, and there is a lower risk of direct and indirect impacts to wildlife and fish populations from land use activities.
  - ► Seasonal subsistence harvesting and cultural activities do not occur in the unit
  - ► There is relatively little overlap of resource interests and values in the unit and there appear to be few direct potential resource conflicts.
- Available for general land use subject to proposed thresholds:

Indicator	Thresholds	
	Cautionary	Critical
Surface disturbance	0.75%	1.0%
Linear (access) density	0.75 km/km^2	1.0 km/km^2

- Additional management direction and recommendations for the unit can be provided at next plan review if better information becomes available. There are substantial knowledge gaps for ecological, cultural, and economic resources in this unit
- The level of land use activities should be reduced when caribou are in the area. Specifically, activities should be reduced during the fall migration season in the northeast portion of the unit

6. Plan Implementation

The Yukon and Vuntut Gwitchin governments have primary responsibility for implementation of the Plan, with the NYPC, YESAB and potentially other groups also having a role.

The implementation of a land use plan is a crucial stage in the planning process. It is during plan implementation that the guiding principles, goals and objectives of the Plan are put into action. Implementation of the North Yukon Regional Land Use Plan can occur within the existing resource management structure of the Yukon.

NOTE: The implementation roles and responsibilities proposed in this section are based on NYPC's interpretation of various clauses under Chapters 11 and 12 of the VGFNFA. Possible plan implementation tasks and requirements that would follow the adoption and implementation of an approved regional land use plan flow from the VGFNFA, and the recommendations and management concepts proposed by this Draft Plan.

6.1 Implementation Responsibilities

6.1.1 Yukon Government and Vuntut Gwitchin Government

VGFNFA clauses 11.7.1 to 11.7.4 identify the roles of the Yukon Government and the Vuntut Gwitchin Government in plan implementation. Clauses 11.7.1 and 11.7.2 state that the Yukon Government and the Vuntut Gwitchin Government will endeavour to conform to the Plan when granting an interest in, or authorizing the use of, land, water and other resources. VGFNFA clauses 11.7.3 and 11.7.4 state that neither Government shall be required to "enact or amend Legislation to implement a land use plan…"

6.1.2 Government of Canada

The Federal Government's role in plan implementation is as per existing mandates and legislative requirements reported in Appendix 1 (e.g., *Fisheries Act*, *National Parks Act*, *Migratory Birds Convention Act*, *Species at Risk Act*, etc.).

6.1.3 Yukon Environmental & Socio-economic Assessment Board (YESAB)

VGFNFA clause 12.17.0 outlines YESAB's role in plan implementation. YESAB offices are to request a conformity check from the NYPC for all project proposals. In the event of a non-conforming project, the NYPC is to recommend ways in which a project proposal could be amended to conform to the Plan, if it believes options exist. An exception to this is small scale projects that qualify as variances (see Section 7 and Appendix 6).

Figure 6.1 provides an illustration of the relationship between the NYPC and the YESAB regarding project review. A potential component of this relationship is the development of a Regional Database, described below, and annual reporting of indicator status (see Section 6.2).

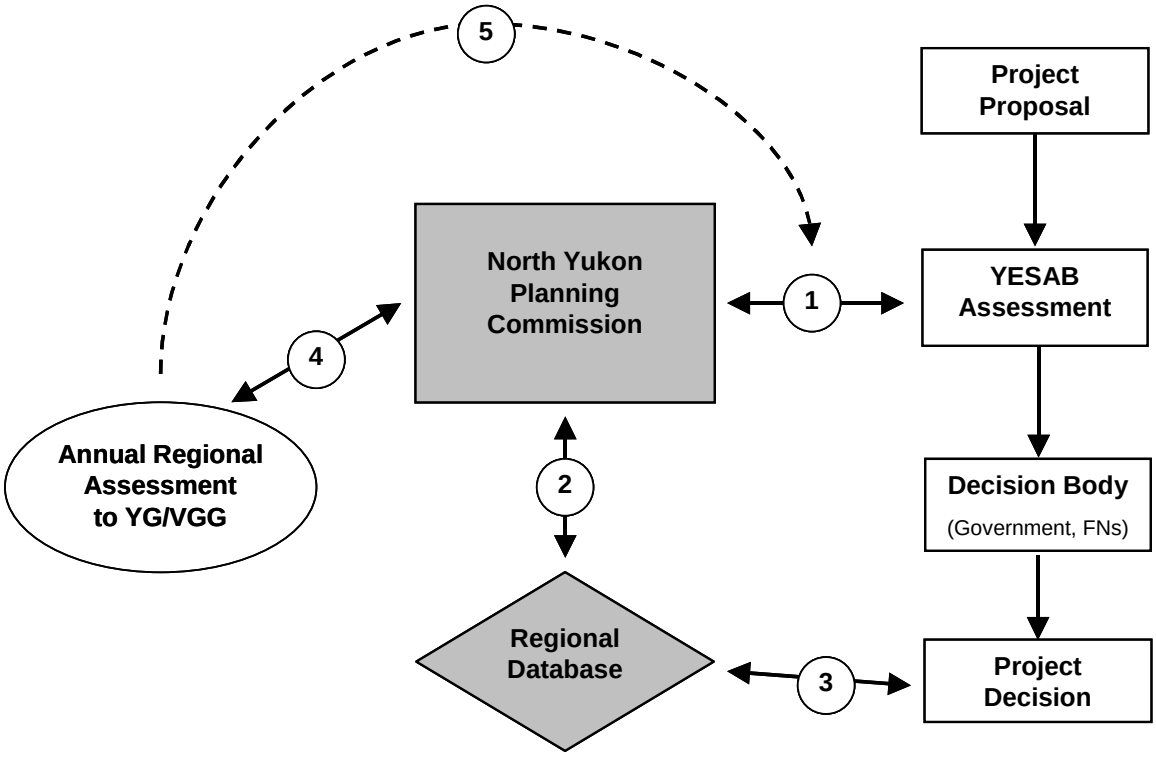
6.1.4 North Yukon Planning Commission

The role of the NYPC during implementation involves various potential responsibilities, three of which are identified in Chapters 11 and 12 of the VGFNFA:

1. **Plan monitoring**. NYPC may assist decision agencies to achieve compliance with the Plan. Monitoring ensures that the Plan is both viable and relevant, or in need of amendment (VGFNFA, 11.2.1.3 and 11.4.5.10);

2. **Provide for nonconforming uses and variances**. NYPC is required to conduct a conformity check on project submissions to YESAB, to determine whether the project is conforming or nonconforming with the Plan (VGFNFA, 11.2.1.6 and 12.17.1); and,

Link the Plan to other planning and management processes. There are a variety of other land and water planning and management processes in the planning region (e.g., Special Management Areas - see Section 2.9). A role for NYPC may be to assure, with assistance from other land managers, that the Plan continues to be in harmony with the other plans, and that duplication of responsibilities is avoided (VGFNFA, 11.2.1.2).



1. YESAB submits project to NYPC for conformity check
2. NYPC uses Regional Database[1] and other approved plan components[2] to determine if project conforms to Plan, and reports to YESAB
3. Project decision and relevant information entered into Regional Database
4. NYPC, with assistance of YG and VGG staff, performs Annual Regional Assessment, and submits to YG and VGG. YG, VGG and NYPC collectively determine if management action is required.
5. Results of Annual Regional Assessment and any resulting management actions contribute to future project conformity checks, facilitating Adaptive Management

Figure 6.1. Project Assessment and the North Yukon Regional Land Use Plan.

[1] The NYPC anticipates that the regional database would contain spatial information on landscape management units, land use designation (categories and zones), human-caused disturbances, and various other biophysical, economic, and heritage datasets compiled during Plan production. These various sources of information could be used to assist in assessing project conformity with the Plan.
[2] Other plan components include general management direction and best management practice recommendations

Other possible responsibilities NYPC is proposing include:

1. **Maintain the Regional Database**. During the planning process, the NYPC compiled an extensive database of resource information relevant to many different land use sectors. This database is not only valuable to future Plan Reviews but has broader applications for other land users, researchers and decision-makers. Already, this database has been beneficial to various government and non-government agencies.

   In cooperation with the Yukon Land Use Planning Council (YLUPC), the NYPC could continue to refine and periodically add new planning and resource information to the database as it becomes available. This exercise could help address existing information gaps and provide up-to-date information in preparation for the Plan Review. Appendix 2 contains a list of resource-related information compiled or created during the planning exercise.

2. **Enhance the planning analysis**. As data are compiled and its implications for planning are assessed, NYPC may be required to conduct additional planning analysis. This may involve more detailed resource analysis work, indicator development, threshold development/refinement, cumulative effects assessment, best-management practices, and sub-regional or district planning and preparations in support of Plan Review.

3. **Plan status update**: The NYPC could play a role in reviewing the effectiveness of the Plan in meeting its goals and objectives. A procedure detailing how this might occur could be prepared during the production of a plan implementation strategy. It is also anticipated that an evaluation of the success of the plan in meeting its goals and objectives would be undertaken during the Plan Review period (see Appendix 6, Section 6.3).

Specific roles and responsibilities of the NYPC during plan implementation are to be determined. Cost effective ways to allow NYPC to fulfill its ongoing implementation responsibilities will be determined during creation of the detailed implementation plan. An annual meeting of the Commission may be required, with an appropriate level of staff and agency support.

6.2 Proposed Implementation Activities

Table 6.1 provides an outline of the proposed general implementation tasks for Yukon Government, Vuntut Gwitchin Government, affected management agencies and NYPC. Implementation activities will be finalized upon development of a detailed implementation plan.

Two implementation tasks require additional explanation beyond that provided in Table 6.1:

Task 1: Detailed implementation strategy for the Plan

A detailed implementation strategy needs to be developed listing the activities of each responsible agency, timelines, costs and specific action items. The detailed implementation plan may be included as part of the Recommended Land Use Plan, or produced as a separate document following approval of the Plan. The implementation plan may be reviewed and updated, as needed, on an annual basis (i.e., associated with annual work plan/budget cycles). Detailed tasks that may require completion are referenced in the Action Items column of Table 6.1.

Task 2: Regional database development

Implementing the Results-based Management Framework component of the Plan requires the creation of a regional database that would serve three primary roles:

- Store information about the planning region that has been collected by the Commission. This information will require updating as knowledge about the region changes. This activity has been identified as an implementation task;

- Provide general information on the current state of the region with respect to Regional Sustainable Development Indicators (general information about the health of the region's economy, society and the environment – see Appendix 6, Table A6.1); and,

- Report the status of land use plan indicators (e.g., surface disturbance and linear density, and possible future indicators). This will involve refining the current understanding of existing levels of disturbance on the landscape and calculating the regeneration rate of this disturbance. The Regional Database would be updated periodically to reflect known changes to the land (e.g., fires).

Figure 6.1 shows the relationship between information in the Regional Database and the land use decision-making process. The proposed Regional Database, and the integration it would promote between agencies, would contribute to the Plan goal of integrated decision-making. Adaptive management would also be facilitated.

It is proposed that the Regional Database be created within a year of plan approval and updated annually by a committee with representatives from the Commission, Vuntut Gwitchin and Yukon governments. An annual report could then be produced to provide an assessment of the state of indicators relative to the Plan's agreed upon thresholds. If it appears that some thresholds are being approached, the Parties and Commission would decide on a potential course of management action for the upcoming year(s).

Table 6.1. Proposed General Implementation Tasks, Actions and Responsible Agencies.

Task	Actions	Priority and Timeline	Proposed Responsible Agency
Detailed Implementation Strategy			
1. **Prepare Detailed Implementation Strategy** for the North Yukon Regional Land Use Plan	• Completed either within the Recommended Land Use Plan or as a separate document following approval of the Plan	Priority # 1 1 - 6 months for development, upon approval of the Plan	YG, VGG, NYPC
Results-based Management Framework			
2. **Regional Database Development**: • Regional maps and information • Current state of region • Indicator tracking and status	• Regional Database linked to Yukon Planning Atlas for Regional Maps and core regional information, with ongoing information collection occurring • Annual update and evaluation of the status of indicators (e.g., surface disturbance and linear density) • Refine 'exemptions list' for surface or linear disturbance calculations • Refine current surface disturbance estimates • Determine reclamation rates for surface disturbances • Establish baseline conditions for Regional Sustainable Development Indicators (see Appendix 6)	Priority # 1 1 year for development Ongoing maintenance required	YLUPC/NYPC with YESAB and YG/VGG

Table 6.1 (Con't). Proposed General Implementation Tasks, Actions and Responsible Agencies.

Task	Actions	Priority and Timeline Est.	Proposed Responsible Agency
3. **Develop indicators of aquatic habitat integrity** for possible inclusion in next review of regional plan	• Research requirements as outlined in Section 6.3 below	Next plan review	NYPC/Fisheries and Oceans Canada/YG
4. **Assessment of Project Conformity**	• Develop detailed protocol for YESAB conformity check	Priority # 3	NYPC/YESAB
Major Land Issues			
5. **North Yukon Interim Land Withdrawal**	• To be determined (see Section 5 and Appendix 5)	TBD	YG in consultation with Canada, VGG, Inuvialuit and GTC
6. **Designate central Whitefish Wetlands and Porcupine Lakes (LMU #8A) as protected area**	• To be determined (see Section 5 and Appendix 4)	TBD	YG, VGG
7. **Amend Fishing Branch HPA Management Plan,** at next HPA plan review to include land use thresholds for stated indicators (see Section 5, LMU#12B)	• Amend Fishing Branch HPA management plan to include surface disturbance thresholds	Priority # 6 Next HPA plan review	Parties to Fishing Branch HPA Plan
8. **Manage Dempster Highway** in planning region with a 4 km (2km each side) transportation and infrastructure corridor, including the portion of the highway that borders VGFN R-08A and THFN R-49A (see Section 4.2.3.2.1)	• Manage Dempster Highway in planning region with 4km transportation corridor • If required, amend Dempster Highway Development Area Regulations	Priority # 5	YG, VGG and THFN
9. **Develop general terms and operating procedures for identified Vuntut Gwitchin Heritage Routes** as defined in VGFNFA Chapter 13, Section A (see Section 4.2.2.1.1)	• Develop general terms and operating procedures for VGFN identified heritage routes and sites	Priority # 5	Parties to Plan
Plan Variance and Amendment			
10. **Prepare Plan Variance and Amendment forms, protocols, and procedures**	• Develop standard form with necessary fields and procedures for requesting a Plan Variance or Plan Amendment	TBD	YLUPC/NYPC with YG/VGG

6.3 Research Priorities

Further research will expand our understanding of land use and improve our ability to mitigate land use impacts in the North Yukon Planning Region. Research will contribute to achieving regional management objectives and enhance implementation of the Plan. The following are future research priorities identified during the planning process.

Results-based Management Activities:

- Establish human surface disturbance reclamation rates and trajectories (see Section 3 and Appendix 3);
- Develop more detailed database of human disturbances and establish current reclamation status (see Section 3 and Appendix 3);
- Conduct additional research on disturbance thresholds for application toward the development of refined estimates of acceptable change, with emphasis on barren-ground caribou; and,
- Develop stream crossing index methodology that incorporates stream value and level of potential fisheries/aquatic risk.

Biophysical and Hydrology:

- Develop standardized definition of, and conduct more detailed mapping in, wetland complexes in the Integrated Management Area (e.g., Whitefish Wetlands, LMU #8, and Bluefish-Cadzow Lakes, LMU#2C);
- Conduct wetland research on hydrological processes and effects of permafrost degradation (see Sections 4.2.4.3.1 and 4.2.4.3.2);
- Refine and update North Yukon Landscape Types (Biophysical) Map as required (see Section 2.5);
- Conduct aggregate (gravel) resource assessment with focus on Eagle Plains and Dempster Highway corridor (see Section 4.2.3.6);
- Conduct hydrology studies in Eagle Plains region to establish winter water flow rates and potential water availability for industrial uses (see Section 4.2.3.4); and,
- Identify important fish over-wintering habitats in third and fourth-order watersheds in Eagle Plains (task is related to hydrology studies) (see Section 4.2.4.2).

7. Changing the Plan: Variance, Amendment and Review

The North Yukon Regional Land Use Plan is intended to be a 'living document' – the VGFNFA has created opportunities for subsequent revisions once it is approved. Changes to the Plan may be required when:

- new land management concepts emerge;
- new land and resource information becomes available;
- knowledge about land use impacts is advanced;
- land management values that the Plan is based upon change; or,
- demand for land and resources in the region changes.

There are three ways to allow land uses that vary from the Plan, as identified by the VGFNFA:

- **Plan Variance:** small, authorized projects and/or uses that do not conform to the Plan;
- **Plan Amendments**: alterations to the management strategies presented in the Plan; and,
- **Plan Review:** updating the Plan on an agreed-upon schedule, or whenever the Yukon and Vuntut Gwitchin governments agree a Plan Review is required.

The VGFNFA and YESAA legislation clearly describes the Plan Variance process, but are less clear on Plan Amendment and Plan Review processes. Appendix 6 explains in detail how Plan Variance, Amendments and Reviews may take place.

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8. References

Arctic Borderlands Ecological Knowledge Co-op (ABEKC). Summer temperatures – northern Yukon. Taiga Net website. Accessed October 9, 2007. URL: http://www.taiga.net/coop/indics/tempsum.html

Anderton, I. 2004. (*see below citation* for North Yukon Planning Commission, 2004b).

Berger, T.R. 1977. Chapter 5—The Northern Yukon. *In*: Northern frontier, northern homeland: the report of the Mackenzie Valley Pipeline Inquiry. Volume I. Ottawa: Minister of Supply and Services Canada. 18 pp.

Blood, D.A., and G.G Anweiler. 1984. National Wildlife Area proposals for the Yukon Territory. Canadian Wildlife Service draft report, Pacific and Yukon Region, BC.

Bradshaw, G.D. 2005. Mineral Potential of the North Yukon Planning Region. Internal Report. Prepared by the Yukon Geological Survey, Mineral Development Branch, Department of Energy, Mines and Resources. February, 2005.

British Columbia Integrated Land Management Bureau. Land and Resource Management Planning Orientation Module - Instructors Guide. Integrated Land Management Bureau website. Accessed October 10, 2007. URL: http://ilmbwww.gov.bc.ca/lup/training/plan/pd-mo-2.html

British Columbia Ministry of Sustainable Resource Management. 2004. Pre-tenure plans for oil and gas development in the Muskwa-Kechika Management Area. BC-MSRM, Victoria, BC, Canada. May, 2004. 169 pp.

British Columbia Oil and Gas Commission and Muskwa-Kechika Advisory Board. 2003. Volume II: Cumulative effects indicators, thresholds, and case studies. Prepared by Salmo Consulting Inc. & Diversified Environmental Services. March, 2003. 104 pp.

Cameron, R.D., Smith, W.T., White, R.G. & Griffith, B. 2005. Central Arctic caribou and petroleum development: distributional, nutritional, and reproductive implications. Arctic 58: 1-9.

Canadian Arctic Resources Committee, 1980. Environmentally significant areas of the Yukon Territory. John Theberge, J. Gordon Nelson, Terry Fenge (*eds*). Yukon Series Research Monograph 4, 143 pp. and Map.

Carroll, C., Noss, R.F., Paquet, P.C., 2001. Carnivores as focal species for conservation planning in the Rocky Mountain Region. Ecological Applications (11): 961–980.

Christensen, M. 2004. Stewardship report on the Short-eared Owl *Asio Flammeus* in the Yukon Territory. Yukon Department of Environment, NatureServe Yukon, Unpublished Report. 17 pp.

Cooley, D. 2001. Caribou and snowmachine track distribution flight. Yukon Department of Environment, Unpublished Report. 4 pp.

Council of Ministers Responsible for Transportation and Highway Safety. 2005. National Highway System Review Task Force Report (v. September 2005). Council of Ministers Responsible for Transportation and Highway Safety. Unpublished document. 52 pp.

Department of Indian Affairs and Northern Development. 1989. A review of international biological program sites in the Yukon – draft report. Prepared by D. Loeks, Loeks Resource Analysis. Whitehorse, YT, Canada. May, 1989. 23 pp.

Department of Indian Affairs and Northern Development. 1993. Vuntut Gwitchin First Nation Final Agreement. Department of Indian Affairs and Northern Development. Ottawa, ON, Canada. 414 pp.

Duinker, P.N. 2000. Criteria and indicators of sustainable forest management in Canada: progress and problems in integrating science and politics at the local level. – *In*: Franks, A., Laroussinie, O., & Karjalainer, T. (eds.). Criteria and indicators for sustainable forest management at the forest management unit level. European Forest Institute, Joensuu, Finland. EFI Proceedings 38/2001, pp. 7-26.

Dyer, S. J., O'Neill, J. P., Wasel, S.M., & Boutin, S. 2001. Avoidance of industrial development by woodland caribou. Journal of Wildlife Management 65: 531-542.

Environment Canada. Species at Risk, species profile: Grizzly Bear and Wolverine. EC website. Accessed June 19, 2007. URL:
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=639
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=172

Environment Canada. Species at Risk. EC website. Accessed June 19, 2007. URL:
http://www.sararegistry.gc.ca/search/default_e.cfm

Environment Canada, Northern Division. 2006. Developing and implementing thresholds in the Northwest Territories – a discussion paper. Prepared by Salmo Consulting Inc. Calgary, AB, Canada. 28 pp.

Environment Directorate, Northern Affairs Program. 2002. Development of a threshold approach for assessing industrial impacts on woodland caribou in Yukon. Prepared by Applied Ecosystem Management Limited. Whitehorse, YT, Canada. 64 pp.

Fekete and Associates Inc. and Vector Research (Fekete). 2006. North Yukon conceptual oil and gas development scenario and local benefits assessment. Unpublished report prepared for North Yukon Oil and Gas Working Group. Whitehorse, YT, Canada. March, 2006.

Fisheries and Oceans Canada. Fisheries and Oceans Canada – oceans and fish habitat. Streamlining referrals. Department of Fisheries and Oceans Canada website. Accessed April 28, 2007. URL: http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/streamlining-rationalisation_e.asp

Forman, R.T.T., Sperling, D., Bissonette, J.A., Clevenger, A.P., Cutshall, C.D., Dale, V.H., Fahrig, L., France, R., Goldman, C.R., Heanue, K., Jones, J.A., Swanson, F.J., Turrentine, T., Winter, T.C., 2003. Road ecology: Science and solutions. Island Press, Washington, D.C., USA.

Gartner Lee Ltd. 2005. North Yukon Regional Terrain Mapping (1:250,000 scale). Project documentation and regional terrain map (1:250,000 scale ArcGIS coverage). Prepared for North Yukon Planning Commission. March, 2005.

Government of Canada, Yukon Chamber of Commerce, and Yukon Government. Yukon Community Profiles, Old Crow, 2004. Yukon Community Profiles website. Accessed June 19, 2007. URL: http://www.yukoncommunities.yk.ca/communities/oldcrow/work/

Gray, D.R., and B.T. Alt. 2001. Resource description and analysis of Vuntut National Park of Canada. Parks Canada, Western Canada Service Centre. Final Report. 54 pp.

Gwich'in Land Use Planning Board. 1997. Proposed Community Protected Areas. Gwich'in Land Use Planning Board. Inuvik, NT, Canada. Unpublished Report. 148 pp.

Gwich'in Land Use Planning Board. 2003. Nành' Geenjit Gwitr'it Tigwaa'in, Working for the Land – The Gwich'in Land Use Plan (v. August 2003). Gwich'in Land Use Planning Board. Inuvik, NT, Canada. 166 pp.

Hannigan, P.K. 2001. Petroleum Resource Assessment of the Old Crow Basin, Yukon Territory, Canada. Yukon Economic Development, Oil and Gas Resources Branch.

Hannigan, P.K., Osadetz, K.G., Dixon, J. and Bird, T.D. 2000. Petroleum Resource Assessment of the Kandik Basin, Yukon Territory, Canada. Yukon Economic Development, Oil and Gas Resources Branch.

Henry, D. 2004. Track transects for monitoring changes in wolverine and other mustelid populations in the Old Crow Flats Third Annual Report (Winter of 2003-04). Parks Canada, Yukon Field Unit, Unpublished Report. 36 pp.

International Institute for Sustainable Development. IISD Definitions. IISD website. Accessed October, 2007. URL: http://www.iisd.org/

Kofinas, G. 1998. The cost of power sharing: Community involvement in Canadian Porcupine caribou co-management. Unpublished Ph.D. dissertation, University of British Columbia, Vancouver. 471 pp.

MacKenzie Delta-Beaufort Sea Regional Land Use Planning Commission. 1991. A community-based regional land use plan for the MacKenzie Delta-Beaufort Sea Region (v. October 1991). MacKenzie Delta-Beaufort Sea Regional Land Use Planning Commission. Inuvik, NT, Canada. 318 pp.

Mauer, F.J. 1998. Moose migration: northeastern Alaska to northwestern Yukon Territory, Canada. Alces 34(1): 75-81.

McNeil, P., Russell, D.E., Griffith, B., Gunn, A., and Kofinas, G.P. 2005. Where the wild things are: Seasonal variation in caribou distribution in relation to climate change. Rangifer Special Issue No. 16: 51-63.

Mining Environment Research Group. 2006. Flying in sheep country: how to minimize disturbance from aircraft. MERG Report 2002-6, Whitehorse, YT, Canada. 17 pp.

Muskwa-Kechika Pre-Tenure Planning Working Group. 2004. Pre-Tenure Plans for Oil and Gas Development in the Muskwa-Kechika Management Area (v. May 2004). Government of British Columbia, Ministry of Sustainable Resource Management, Victoria, BC, Canada. 169 pp.

National Wetlands Working Group. 1988. Wetlands of Canada. Ecological Land Classification Series no. 24. Sustainable Development Branch. Environment Canada, Ottawa, Ontario and Polyscience Publications Inc. Montreal, Quebec, Canada. 452 pp.

NatureServe International. NatureServe Conservation Status. NatureServe Explorer website. Accessed February 5, 2007. URL: http://www.natureserve.org/explorer/ranking.htm.

Nielsen, S.E, Bayne, E.M., Schieck,J., Herbers, J., and Boutin, S.A. A new method to estimate species and biodiversity intactness using empirically derived reference conditions. Biological Conservation. *Submitted April 2007*.

North Yukon Planning Commission (NYPC). 2003. General Terms of Reference for the North Yukon Planning Region. Unpublished document. NYPC, Whitehorse, YT, Canada. 16 pp.

North Yukon Planning Commission (NYPC). 2004a. North Yukon Planning Commission Precise Terms of Reference. Unpublished document. NYPC. Whitehorse, YT, Canada. 59 pp.

North Yukon Planning Commission. 2004b. Porcupine River watershed fisheries information summary report. Prepared by Isaac Anderton, Environmental Dynamics Inc. Whitehorse, YT, Canada. December, 2004. 48 pp.

North Yukon Planning Commission. 2007a. North Yukon Planning Region Resource Assessment Report. NYPC website (Publications). Accessed October 28, 2007. URL: http://www.nypc.planyukon.ca/index.php?option=com_docman&task=cat_view&gid=97&Itemid=338

North Yukon Planning Commission. 2007b. North Yukon Planning Region Resource Assessment Report - Maps. NYPC website (Publications). Accessed October 28, 2007. URL: http://www.nypc.planyukon.ca/index.php?option=com_docman&task=cat_view&gid=98&Itemid=338

North Yukon Planning Commission. 2007c. North Yukon Planning Region Land Use Scenarios Report. NYPC website (Publications). Accessed October, 2007. URL: http://www.nypc.planyukon.ca/index.php?option=com_docman&task=cat_view&gid=83&Itemid=338

North Yukon Planning Commission and Yukon Department of Environment. North Yukon Biophysical Mapping Project – Regional Ecosystems of the North Yukon Planning Region. Internal Report. Prepared by North Yukon Planning Commission and Yukon Department of Environment. Whitehorse, YT, Canada. *In prep.*

O'Donoghue, M. and J. Staniforth. 2004. Wildlife-Mammals. *In*: Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes, C.A.S. Smith, J.C. Meikle and C.F. Roots (eds.), Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, p. 42-45.

Osadetz, K.G., Chen, Z. and Bird, T.D., 2005. Petroleum Resource Assessment, Eagle Plain Basin and Environs, Yukon Territory, Canada. Yukon Geological Survey Open File 2005-2, Geological Survey of Canada Open File 4922, 88 pp.

Parks Canada, Vuntut Gwitchin First Nation, and North Yukon Renewable Resources Council. 2004. Vuntut National Park of Canada Management Plan. Parks Canada. Whitehorse, YT, Canada. 79 pp.

Peace-Moberly Tract Sustainable Resource Management Planning Table. 2006. The Peace Moberly Tract *Draft* Sustainable Resource Management Plan (v. July 2006).

Government of British Columbia, Saulteau First Nations, and West Moberly First Nations. Peace-Moberly Tract, BC, Canada. 84 pp.

Peel River Watershed Advisory Committee. 1996. Peel River Watershed Advisory Committee workshop on land and water management – workshop summary report. Prepared by D.D. MacDonald, MacDonald Environmental Sciences Ltd. March, 1996. 45 pp.

Petrula, M.J. 1994. Ecology of ducks nesting in interior Alaska. M.S. Thesis, University of Alaska, Fairbanks. 124 pp.

Porcupine Caribou Management Board. 2000. Porcupine Caribou Herd Management Plan – 2000/2001 to 2002/2003. PCMB, Whitehorse, YT, Canada. 28 pp.

Porcupine Caribou Management Board. Porcupine Caribou herd size. Taiga Net website. Accessed June 20, 2007. URL: http://www.taiga.net/pcmb/population.html

Ryder, J.L., P. McNeil, J. Hamm, W.A. Nixon, D.E. Russell, and S.R. Francis. 2007. An integrated assessment of Porcupine caribou seasonal distribution, movements, and habitat preferences for regional land use planning in Northern Yukon Territory, Canada. Rangifer Special Issue No. 17: 259-270.

Serreze, M. C., J. E. Walsh, F. S. Chapin, III, T. Osterkamp, M. Dyurgerov, V. Romanovsky, W. C. Oechel, J. Morison, T. Zhang, and R. G. Barry. 2000. Observational evidence of recent change in the northern high-latitude environment. Climatic Change 46: 159-207.

Sinclair, P., W. Nixon, C. Eckert, and N. Hughes. 2003. Birds of the Yukon Territory. UBC Press, Vancouver. 595 pp.

Smith, C.A.S., J.C. Meikle, and C.F. Roots. (editors), 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, 313 pp.

Teslin Strategic Forest Management Plan Planning Team. 2006. Teslin Strategic Forest Management Plan (v. 2006). Government of the Yukon, Teslin Tlingit Council, and Teslin Renewable Resource Council. Teslin, YT, Canada. 68 pp.

Tetlichi, R., Andre, M., MacLeod, A.M., Gordon, A.B., Gruben, C.A., Sharpe, M., Greenland, B., Allen, M., and Pascal, E. 2004. Arctic Borderlands Ecological Knowledge Co-op Community Reports, 2003-2004. Arctic Borderlands Ecological Knowledge Society. Whitehorse, YT, Canada. 70 pp.

Thomas, R.D. and Rampton, V.N. 1982a. Surficial geology and geomorphology - Lower Ogilvie River. Geological Survey of Canada. Map 9 - 1982. 1:100,000 scale.

Thomas, R.D. and Rampton, V.N. 1982b. Surficial geology and geomorphology – Moose Lake. Geological Survey of Canada. Map 10 - 1982. 1:100,000 scale.

Thomas, R.D. and Rampton, V.N. 1982c. Surficial geology and geomorphology – Rock River. Geological Survey of Canada. Map 11 - 1982. 1:100,000 scale.

United States Department of the Interior, Bureau of Land Management. 2005. Chapter 2—Alternatives. *In:* Northeast National Petroleum Reserve—Alaska final amended integrated activity plan/environmental impact statement. U.S. Department of the Interior, Bureau of Land Management. Anchorage, Alaska, USA. p 2-55.

Vuntut Gwitchin First Nation. 2000. Old Crow Physical Development Plan. Prepared by Inukshuk Planning & Development. Whitehorse, YT, Canada. February, 2000. 21 pp.

Vuntut Gwitchin First Nation. 2003. Old Crow Capital Plan, 2003-2008. Prepared by Inukshuk Planning & Development. Whitehorse, YT, Canada. February, 2003. 26 pp.

Vuntut Gwitchin First Nation, Government of Canada, and Yukon Territorial Government. 1998. Vuntut Gwitchin First Nation Economic Opportunities Plan. Unpublished document. VGFN. Old Crow, YT, Canada. 16 pp.

Wein, E.E. 1994. Yukon First Nations food and nutrition study. Report to the Champagne and Aishihik First Nations, the Teslin Tlingit Council, the Vuntut Gwitchin First Nation, Yukon Department of Health and the National Institute of Nutrition. National Institute of Nutrition Post-doctoral Fellow: 102.

Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch. 2007a. Best Management Practices for Historic Resources. Yukon Government Oil and Gas Best Management Practices website. Accessed April 28, 2007. URL: http://www.emr.gov.yk.ca/oilandgas/best_management_practices.html

Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch. 2007b. Best Management Practices for Seismic Exploration. Yukon Government Oil and Gas Best Management Practices website. Accessed April 28, 2007. URL: http://www.emr.gov.yk.ca/oilandgas/best_management_practices.html

Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch. 2007c. Best Management Practices for Wilderness Tourism. Yukon Government Oil and Gas Best Management Practices website. Accessed April 30, 2007. URL: http://www.emr.gov.yk.ca/oilandgas/best_management_practices.html

Yukon Department of Environment. 1996. Guidelines for Reclamation/Revegetation in the Yukon – Volume II. Kennedy, C.E. (ed.). Whitehorse, YT, Canada.

Yukon Department of Environment. Yukon Wildlife Key Area Inventory, 2005. Digital database and software produced by NatureServe Yukon, Fish and Wildlife Branch, Department of Environment, Government of Yukon, Whitehorse. Yukon Government website. Accessed April 29, 2007. URL: http://environmentyukon.gov.yk.ca/geomatics/data/wildlife-key-area.html

Yukon Department of Environment and Vuntut Gwitchin Government. 2004a. Ni'iinlii'Njik (Fishing Branch) Wilderness Preserve & Habitat Protection Area Management Plan. Fishing Branch Local Planning Team. 32 pp.

Yukon Department of Environment and Vuntut Gwitchin Government. 2004b. Ni'iinlii'Njik (Fishing Branch) Ecological Reserve and Settlement Land R-5A & S-3A1 Management Plan. Fishing Branch Local Planning Team. 42 pp.

Yukon Department of Environment and Vuntut Gwitchin Government. 2006. Old Crow Flats Special Management Area Management Plan. Old Crow Flats Technical Working Group and Management Committee. 54 pp.

Yukon Department of Health and Social Services & Yukon Bureau of Statistics. 2005. Yukon Bureau of Statistics Information Sheet #58.26. December, 2005. 4 pp.

Yukon Department of Renewable Resources. 1993. Yukon Parks system plan implementation project for the Porcupine-Peel landscape #7. Prepared by J.S. Peepre and Associates. March, 1993. 32 pp.

Yukon Department of Tourism and Culture, Heritage Resources Unit. Government of Yukon Historic Sites website. Accessed April 28, 2007. URL: http://www.yukonheritage.com/programs-historicsites.htm

Yukon Department of Tourism and Culture and Vuntut Gwitchin First Nation. 2002. Market Demand Assessment for Yukon's Far North. Prepared by D. Loeks, TransNorthern Management Consulting. Whitehorse, YT, Canada. January, 2002. 49 pp.

Yukon Department of Tourism and Culture and Vuntut Gwitchin First Nation. 2004. North Yukon Tourism Strategy. Prepared by TransNorthern Management Consulting. Whitehorse, YT, Canada. March, 2004. 47 pp.

Yukon Department of Tourism and Regional Planning and Yukon Department of Renewable Resources. 1989. Dempster Highway Corridor Human History and Heritage Resources. Unpublished report prepared by S. Greer, 1989. 54 pp.

Yukon Ecoregions Working Group. 2004. Eagle Plains. In: Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes, C.A.S. Smith, J.C. Meikle

and C.F. Roots (eds.), Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, pp. 131-138.

Yukon Environmental and Socio-economic Assessment Board. 2007. Flow Tests at Three Existing Well-Sites. YESAA Designated Office Evaluation Report, Project File Number 2006-0285. Dawson, YT, Canada. 101 pp.

Yukon Government, Vuntut Gwitchin First Nation, First Nation of Nacho Nyak Dun, and Tr'ondek Hwech'in First Nation. 2006. Northern Yukon Economic Development Partnership Agreement – Dempster corridor economic opportunities identification. Unpublished document. Yukon Government. Whitehorse, YT, Canada. 7 pp.

Yukon Government. 2001. Old Crow, Set. *In* Community Profiles. Yukon Government, Executive Council Office, Bureau of Statistics. May, 2001. p. 64-67.

Yukon Government. 2002. Yukon Protected Areas Strategy – Area of interest for Eagle Plains Ecoregion. Yukon Government Fact Sheet. 4 pp.

Yukon Land Use Planning Council. 2003. A recommendation regarding the General Terms of Reference for the North Yukon Planning Region. YLUPC Recommendation #2003-001. November 21, 2003. 16 pp.

Yukon Placer Implementation Steering Committee and the Yukon Placer Working Committee. 2005. An Integrated Regulatory Regime for Yukon Placer Mining (v. April 2005). Government of Yukon, Fisheries and Oceans Canada, Council of Yukon First Nations, and Klondike Placer Miners' Association. Whitehorse, YT, Canada. 42 pp.

Yukon Waterfowl Technical Committee. 1991. Yukon waterfowl management plan: 1991-95. Yukon Waterfowl Technical Committee. Whitehorse, YT, Canada. 21 pp.

Yukon Wetlands Technical Committee. 2005. (*see above citation* for Yukon Department of Environment, 2005).

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Appendix 1 – Legislation

The North Yukon Regional Land Use Plan will be implemented through policies, procedures and existing regulatory tools administered by government and associated bodies, such as YESAB. Existing legislation will be used to implement the Plan. The Plan may recommend changes to legislation, if valid reasons are provided. The following legislation affects the Plan.

1.1 Land Claim-Related Acts

An Act Approving Yukon Land Claim Final Agreements Act: Under this Act and by Order in Council, OIC #1994/230, the Vuntut Gwitchin First Nation Final Agreement was approved in 1994.

In the VGFNFA, *Chapter 11 – Land Use Planning* provides the mandate for this regional plan, and provides guidance to the planning process (see Section 1.2). Important references to regional planning are included in *Chapter 10 – Special Management Areas*; *Chapter 12 – Development Assessment*; *Chapter 13 – Heritage*; *Chapter 14 – Water*; *Chapter 16 – Fish and Wildlife*; and *Chapter 17 – Forest Resources*.

Western Arctic (Inuvialuit) Claims Settlement Act: identifies the interests of the Inuvialuit in the North Yukon Planning Region.

Gwich'in Land Claim Settlement Act**:** clarifies rights and interests of the Tetlit Gwich'in in the Secondary Use Area of the North Yukon Planning Region.

Yukon Environmental and Socio-economic Assessment Act: provides the regional plan with a link to the Development Assessment Process and project approvals.

1.2 Yukon Government

Acts and regulations administered by the Yukon Government, including the regulatory tools that could potentially be applied in the implementation of the Plan, are as follows (in alphabetical order):

Area Development Act
- *Dempster Highway Development Area Regulation*

Environment Act
- *Air Emissions Regulation*
- *Contaminated Sites Regulations*
- *Designated Materials Regulation*
- *Special Waste Regulations*
- *Spills Regulations*

Highways Act
- *Highway Regulations*

Historic Resources Act
- *Archaeological Sites Regulation*

Lands Act
- *Land Regulations*
- *Quarry Regulations*

Oil & Gas Act
- *Disposition Regulations*
- *Drilling and Production Regulations*
- *Geoscience Exploration Regulations*
- *Licence Administration Regulations*
- *Transfer Regulations*

Parks and Land Certainty Act

Placer Mining Act
- *Placer Mining Land Use Regulation*

Public Health and Safety Act
- *Camp Sanitation Regulations*
- *Public Campgrounds and Campsites Regulations*
- *Rubbish Disposal Regulations*

Quartz Mining Act
- *Quartz Mining Land Regulation*

Scientists and Explorers Act

Territorial Lands (Yukon) Act
- *Coal Regulation*
- *Dredging Regulation*
- *Land Use Regulation*
- *Territorial Lands Regulation*
- *Timber Regulation*

Waters Act
- *Waters Regulation*

Wilderness Tourism Licensing Act

Wildlife Act
- *Trapping Regulations*
- *Wildlife Regulations*
- *Wildlife Sanctuary Regulation*

Yukon River and Alsek River Basin Agreements Act

1.3 Federal Government

Legislation that may affect Plan implementation includes:

Canada Wildlife Act

Fisheries Act
- *Yukon Territory Fishery Regulations*
- *Metal Mining Effluent Regulation*

Migratory Birds Convention Act

Navigable Waters Protection Act

Species at Risk Act

Yukon Environmental and Socio-Economic Assessment Act

1.4 Vuntut Gwitchin Government

The main Vuntut Gwitchin legislation relating to North Yukon Regional Land Use Plan implementation will be:

Lands and Resources Act

Fish and Wildlife Act

Environmental Review Act

Decision Document Permit Enforcement Act

These Acts are currently being drafted. VGG may also mirror the Yukon *Oil & Gas Act* in the future. It is the intent of the VGG to register the approved regional Plan as an interest under their *Lands and Resources Act*. By registering the Plan as an expression of interest in the VGG land registry, the land management recommendations of the Plan for varying landscape management units will remain as guidelines and will aid VGG Land Management staff in making informed decisions when processing land use permits and leases. On VGFN settlement land, the approved regional Plan will become a legal document that reflects the values of VGFN citizens, and will be protected in the VGG land registry until otherwise changed.

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Appendix 2 – Technical Information

2.1 Reports

The Plan is supported by two major reports:

1. North Yukon Planning Region Resource Assessment Report

The North Yukon Planning Region Resource Assessment Report (NYPC 2007a,b) provides a detailed description and maps of identified ecological, social/cultural, and economic resources and interests in the planning region. Significant management issues are also highlighted. Much of the information summarized in the report was provided by government and non-government Plan Partners.

Technical material documented in the Resource Report was reviewed by contributing Plan Partners. An analysis and interpretation of scientific, local, and traditional sources of knowledge collected and compiled by NYPC from 2004-2007 is included in the report findings.

The report generally includes an overview of the region and its history, existing land administration, First Nations historical and current use of the region, heritage interests, regional economy and economic interests, existing land use impacts, a summary of the distribution of valued wildlife and fish species and their habitats, and key management issues. Conservation priorities and Sustainable Development considerations to maintain regional values and interests are discussed.

The resource assessment report was a primary source of information to support the development of the Plan. The detailed report and maps of resource values and interests are provided on the NYPC website, www.nypc.planyukon.ca (North Yukon Planning Commission, 2007a,b).

2. North Yukon Planning Region Land Use Scenarios Report

The North Yukon Planning Region Land Use Scenarios Report (NYPC 2007c) provides a summary of possible future land use scenarios and climate change impacts within the region. The purpose of the scenarios report was to collaboratively describe, evaluate, and project possible cumulative effects of land use activities on other valued ecological and cultural resources and interests within the region over the next 100 years. A variety of sector specialists and partners were engaged for scenario working sessions to discuss and describe plausible future developments in the region.

Future land use scenarios focus on oil and gas, tourism and mineral activities. NYPC and partners used the ALCES® computer model to explore the possible contribution of energy, tourism and mining sectors to regional landscape change and

economies. The model was used to assist decision-making by identifying potential resource use issues/conflicts and trade-offs that might occur under the various development and climate change projections.

Scenario outputs were reviewed with partners to compare the contribution of each sector to landscape change, and to evaluate key assumptions with respect to surface disturbance estimates, habitat responses, and the cumulative effect of land use activity on other interests within the North Yukon Planning Region. Scenarios were reviewed, refined, and re-evaluated by sector specialists to understand the potential consequences of various development activities.

Results of this exercise were an important source of information to assist in establishing the cumulative effects indicators and threshold values recommended in the Plan. Information summarized in the report was contributed and reviewed by sector specialists. The detailed report is provided on the North Yukon Planning Commission website, www.nypc.planyukon.ca (North Yukon Planning Commission, 2007c).

2.2 Technical Documentation

Ten main background technical reports have been prepared and/or consulted to assist in the development of the North Yukon Regional Land Use Plan. These include:

Anderton, I. 2004. **Porcupine River Watershed Fisheries Information Summary Report**. Unpublished report prepared by Environmental Dynamics Inc. (EDI) for North Yukon Planning Commission. EDI Project 04-YC-0026. (* report cited as North Yukon Planning Commission, 2004b in references)

Bradshaw, G.D. 2005. **Mineral Potential of the North Yukon Planning Region**. Internal Report. Prepared by Yukon Geological Survey, Mineral Development Branch, Department of Energy, Mines and Resources. February 2005.

Fekete and Associates Inc. and Vector Research (Fekete). 2006. **North Yukon Conceptual Oil and Gas Development Scenario and Local Benefits Assessment**. Unpublished report prepared for North Yukon Oil and Gas Working Group. Whitehorse, YT, Canada. March 2006.

Gartner Lee Ltd. 2005. **North Yukon Regional Terrain Mapping (1:250,000 scale).** Project documentation and regional terrain map (1:250,000 scale ArcGIS coverage). Prepared for North Yukon Planning Commission. March, 2005.

Hannigan, P.K., Osadetz, K.G., Dixon, J. and Bird, T.D. 2000. **Petroleum Resource Assessment of the Kandik Basin**, Yukon Territory, Canada. Yukon Economic Development, Oil and Gas Resources Branch.

Hannigan, P.K. 2001. **Petroleum Resource Assessment of the Old Crow Basin,** Yukon Territory, Canada. Yukon Economic Development, Oil and Gas Resources Branch.

North Yukon Planning Commission and Yukon Department of Environment. **North Yukon Biophysical Mapping Project – Regional Ecosystems of the North Yukon Planning Region**. Internal Report. Prepared by North Yukon Planning Commission and Yukon Department of Environment. Whitehorse, YT, Canada. *In prep.*

Ryder, J.L., McNeil, P., Hamm, J., Nixon, W.A., Russell, D.E., and Francis, S.R. 2007. **An Integrated Assessment of Porcupine Caribou Seasonal Distribution, Movements, and Habitat Preferences for Regional Land Use Planning in Northern Yukon Territory, Canada**. Rangifer Special Issue No. 17: 259-270.

Yukon Department of Tourism and Culture and Vuntut Gwitchin First Nation. 2004. **North Yukon Tourism Strategy.** Prepared by TransNorthern Management Consulting. Whitehorse, YT, Canada. March, 2004. 47 pp.

Yukon Department of Tourism and Culture and Vuntut Gwitchin First Nation. 2002. **Market Demand Assessment for Yukon's Far North.** Prepared by D. Loeks, TransNorthern Management Consulting. Whitehorse, YT, Canada. January, 2002. 49 pp.

2.3 Regional Information Database

Working in partnership with the Yukon and Vuntut Gwitchin governments, other agencies and groups, and the community of Old Crow, the NYPC assembled a regional information database for the North Yukon Planning Region (Table A2.1). The regional database provided the foundation for an integrated assessment of the region's resources to assist decision-making for the Plan.

The information also provides an important resource for use by a variety of land managers, assessment boards and decision makers. Maintenance and accessibility of this information to support effective decision-making during the plan implementation stage is an important consideration (see Section 6).

The Yukon Land Use Planning Council is establishing an on-line Data Atlas to facilitate on-going access to the Regional Database for the North Yukon Planning Region, and eventually other regions. The Data Atlas provides the means for visitors/users to interactively view, query, print and extract information. As resource and land use information is revised, it is anticipated that the Data Atlas will be updated as necessary.

Table A2.1. North Yukon Planning Region Regional Datasets Developed/utilized in Support of the Draft Plan. These Datasets are Considered as the 'Regional Database'.

Dataset	Description	Contributors
Regional Biophysical Classification	90m resolution raster map of regional landscape types (25m enhanced EOSD landcover, 90m soil moisture model and 1:250K bioclimate zones also available)	NYPC, Yukon Department of Environment, YLUPC, Yukon Biophysical Mapping Group, and EMR - Yukon Oil and Gas Management Branch
Regional Terrain Conditions	1:250K dataset of regional terrain conditions	Yukon Biophysical Mapping Group, and Gartner Lee Ltd.
Regional Ecoregions and Ecodistricts	Distinctive ecosystem units containing similar biophysical properties within region	Yukon Ecoregions Working Group, and Yukon Department of Environment
Wetland Key Areas	Identified wetland complexes of regional significance	Yukon Wetlands Technical Working Group
Wildlife Habitat Suitability	Seasonal wildlife habitat suitability mapping for caribou, moose, and marten (habitat classes based on biophysical map)	Old Crow land users, NYPC, Yukon Department of Environment, Canadian Wildlife Service, and YLUPC
Wildlife Key Areas	Yukon Environment identified important wildlife areas	Yukon Department of Environment
Important Wildlife Habitats	VGFN identified important areas for wildlife (local and traditional knowledge)	Old Crow land users
Porcupine Caribou Herd Seasonal Concentrated Use Areas and Migration Patterns	Concentrated and general habitat use areas and migration routes, by season, developed from satellite telemetry locations	Canadian Wildlife Service, NYPC, U.S. Geological Survey - Biological Resources Division, and YLUPC
Moose Historical Surveys	Synthesis of existing moose inventories/surveys and telemetry projects within region	Yukon Department of Environment, U.S. Fish and Wildlife Service, VGFN, and Access Consulting Group
Waterbird Habitat Potential	Regional waterbird habitat potential map	Ducks Unlimited Canada, NYPC, Canadian Wildlife Service, and YLUPC
Waterbird Historical Surveys	Synthesis of existing waterbird inventories and surveys within planning region	Ducks Unlimited Canada, and Canadian Wildlife Service
Bird Species – Habitat Associations	List of regional bird species and anticipated habitat associations (habitats from biophysical map)	Canadian Wildlife Service, and Yukon Department of Environment
Regional Plant List	List of regional plant species	Yukon Department of Environment
Regional Mammal List	List of regional mammals	Yukon Department of Environment
Important Fisheries Habitats	Observed and predicted fish distribution, including spawning and over-wintering habitats	Old Crow land users, DFO, Yukon Department of Environment, VGFN, and Environmental Dynamics Inc.

Table A2.1. (Cont'd). North Yukon Planning Region Regional Datasets Developed/utilized in Support of the Draft Plan. These Datasets are Considered as the 'Regional Database'.

Dataset	Description	Contributors
Traditional Land Use	Vuntut Gwitchin and Tetlit Gwich'in traditional land use – routes and general locations	Old Crow land users, VGFN, Mackenzie Valley Beaufort Sea LUP land use maps, and NYPC
Current Land Use	Current community land use – trails and general locations focus on Old Crow land users	Old Crow land users, VGFN, and NYPC
Historical, Archaeological, and Palaeontological sites	YTG archaeological sites database	Yukon Heritage Resources Branch
Human Disturbances (anthropogenic footprints)	1:50K linear features, well sites, airstrips, gravel pits and similar features	NYPC, Yukon Geomatics, and EMR - Yukon Oil and Gas Management Branch
Tourism Resources	Current and potential areas of tourism activity/interest	Yukon Department of Tourism and Culture, VGFN, and NYPC
Oil and Gas Potential	1:250K oil and gas basins and regional assessments	EMR - Yukon Geological Survey, Yukon Oil and Gas Management Branch, and Geological Survey of Canada
Mineral, Coal and Iron Potential	1:250K mineral, coal and iron potential	Yukon Geological Survey
Forest Resources	1:50K forest inventory for Old Crow area	EMR – Yukon Forest Management Branch

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Appendix 3 – Cumulative Effects Indicator Concepts, Land Use Modeling and Thresholds

This appendix provides the rationale for the selection of two cumulative effects indicators proposed for assessing the condition of valued ecological and cultural resources, and ecological integrity in general. Monitoring the proposed indicators provides one measure of the current state of the region or a specific landscape management unit, and may provide an early warning of possible risks to ecological resources, with emphasis on Porcupine Caribou. The current status of the indicators and proposed thresholds are reported here. The land use scenario modeling exercise (North Yukon Planning Commission 2007c) assisted in determining the proposed threshold levels, and highlights of these results are shown and discussed.

3.1 Cumulative Effects Indicator Concepts

3.1.1 Indicator Selection

Indicators are measurable signals used to assess the performance of a system, and are an important component of the North Yukon Regional Land Use Plan results-based management framework (see Section 3.3). The monitoring of indicators is required to determine if Plan goals and objectives are being met. As discussed in Section 1.5, goals and objectives for this Plan focus on ensuring that *Sustainable Development* is promoted. Measures to mitigate potential adverse cumulative effects of development activities on valued ecological and cultural resources are an important consideration, and a variety of recommendations and approaches to accomplish this are proposed in the Plan.

For the Draft Plan, two indicators were chosen for monitoring potential cumulative effects of land use activities: 1) **human-caused surface disturbance**, and 2) **linear (access) density**. The indicators generally provide reliable measures of cumulative effects to valued ecological resources. The estimated status of each indicator is reported for individual LMUs in the region.

3.1.1.1 Human-caused Surface Disturbance

Human-caused surface disturbance is defined as '*the physical disruption of soil or hydrology, or the clearing of trees and woody vegetation*'. This indicator is expressed as the proportion (%) of direct surface disturbance within a specific LMU or sub-unit. The amount of surface disturbance provides a measure of direct habitat-related impacts. This indicator may also be considered the direct human 'footprint' on a landscape that results from land use activities.

Some land use footprints are relatively permanent, such as highways or municipal infrastructure. Other land use footprints are non-permanent, and may exist on the

landscape for shorter periods of time. Examples include low impact seismic lines or winter trails. In the planning region, land use activities that do not contribute to the creation of new functional surface disturbances are considered to be:

- new linear features (seismic lines, trails, survey lines, etc.) ≤ 1.5m in width
- winter land use activities that occur on frozen waterbodies
- winter land use activities that occur in non-forested landscapes where the clearing of woody-vegetation is not required, and where activities do not result in soil disruption
- winter activities that utilize existing un-reclaimed human-caused disturbances.

3.1.1.2 Linear (Access) Density

Linear features are roads, trails, seismic lines, power transmission lines, and similar features; they are a type of human-caused surface disturbance that facilitates access into previously inaccessible areas. Linear features less than 1.5m in width are not considered to contribute greatly to increased access, and are therefore not counted or reported as new linear features for this indicator.

Linear (access) density is expressed in km/km^2. It is the total length of all linear features greater than 1.5m in width, per total area of the LMU or sub-unit. Linear (access) density is calculated based on the total area (km^2) of the entire LMU or sub-unit. Such a method provides adequate flexibility for land users and permits more intensive land use in specific areas.

Linear features fragment landscapes and facilitate increased access to areas, and may have several direct and indirect effects on wildlife and fish. Linear density provides a measure of landscape fragmentation, and may therefore also be used as an index of core habitat area (Figure A3.1). Core habitat refers to the area of a landscape that remains intact and unaffected by human features. Boreal caribou herds have been shown to be sensitive to increasing levels of linear density (Figure A3.1).

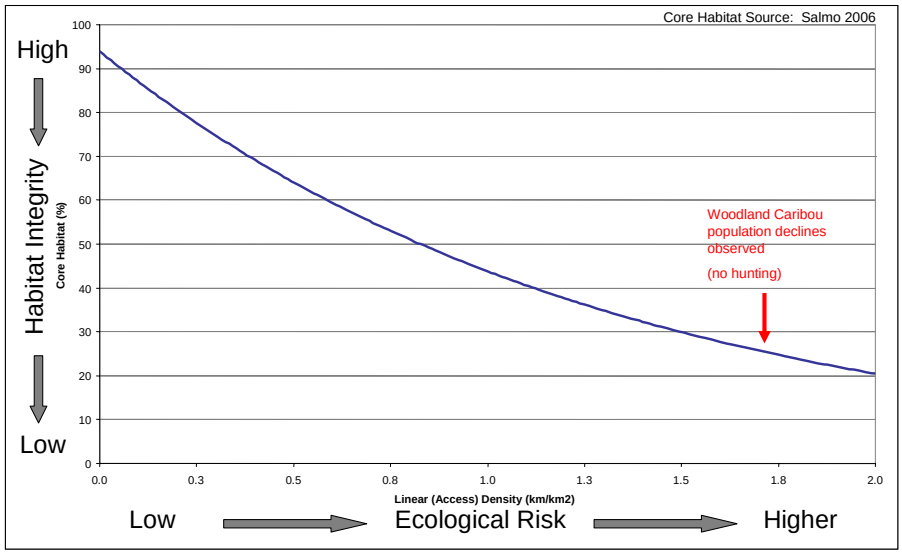

Figure A3.1. General Relationship between Linear (access) Density (km/km^2), Habitat Integrity, and Ecological Risk, as Determined from Research in Boreal Forested Landscapes. Figure Adapted from Environment Canada, Northern Division (2006).

3.1.1.3 Indicator Selection Criteria

The two cumulative effects indicators were selected based on the following criteria:

- They are readily measurable, and cost effective to track;
- The signals they provide are easily interpreted and understood;
- They can be actively managed through existing permitting and regulatory processes;
- They are common to most land use activities, and trigger permitting activities in the Development Assessment Process (YESAA); and,
- They have been demonstrated to be relevant to the assessment of ecological integrity (see below). The two indicators reflect the status and abundance of a number of different wildlife species, including caribou, the primary species of concern in the North Yukon Planning Region.

3.1.1.4 Direct and Indirect Cumulative Effects

The total effect of human features on ecological resources is a result of 'direct' (footprint) effects, and 'indirect' effects that result from avoidance or use of the features. Both of the stated indicators, human-caused surface disturbance and linear (access) density, are measures of direct disturbance to wildlife and fish habitats—they do not account for

'indirect' effects. Indirect effects of human footprints may include habitat-related effects such as zones of avoidance or reduced-use by wildlife around a feature, or population-related effects such as increased predation and mortality.

Indirect effects are dependent on the type of feature and the intensity of use of that feature. For example, a major highway with high levels of vehicle traffic generally has a much greater 'effect' on wildlife than a low impact seismic line with limited human use. In the North Yukon region, a recent finding suggests that Porcupine Caribou appear to use the Dempster Highway corridor less intensively out to a distance of 5 km, compared with adjacent areas (Cooley, 2001).

Indirect effects can be accounted for through land use/cumulative effects modeling by establishing different zones of influence around different feature types. Habitat effectiveness and resource selection functions are two possible approaches to accounting for the total direct and indirect effects of human land uses. Through cumulative effects modeling (NYPC 2007c), the Plan utilized habitat effectiveness as a measure of indirect effects by establishing zones of human influence around different feature types.

3.1.2 Cumulative Effects Indicators and Ecological Risk

A significant consequence of most land use activity is the creation of surface disturbance and linear features. A growing body of research suggests that the total amount of surface disturbance (human-caused footprint) and density of linear features (roads, trails, seismic lines, etc.) are related to overall ecological integrity of natural systems (Duinker, 2000; Dyer et al., 2001; Environment Directorate, Northern Affairs Program, 2002; Cameron et al., 2005). As the total amount of surface disturbance and linear features (linear density) increases, so do the risks to wildlife and fish populations, and overall ecological integrity (Figure A3.1).

Depending on the nature of the surface disturbance, temporary or permanent habitat loss will result. Increases in linear density may result in decreased core habitat area for focal wildlife species, a shift to introduced species such as white-tailed deer and coyote, restricted movement for migratory animals, increased human-caused mortality, and increased predation rates. A decreasing occurrence and abundance of many mammals, including caribou, has been correlated with increasing road density (Carroll et al., 2001; Forman et al., 2003). Figure A3.2 provides an example of the effect of road density on the probability of lynx occurrence.

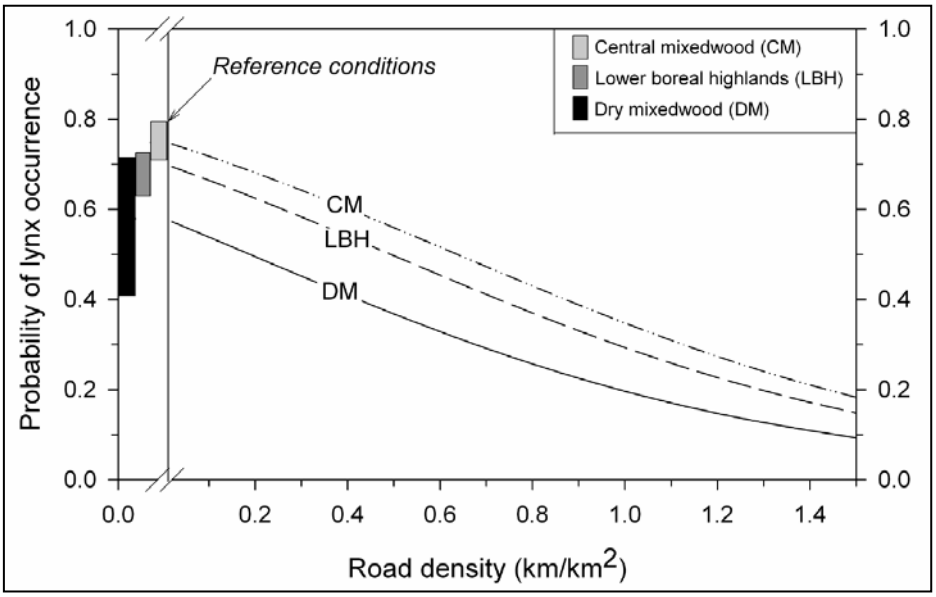

Figure A3.2. Probability of Lynx Occurrence Related to Road Density in the Mixed-wood Boreal Forest. Source: Nielsen et al. (Biological Conservation – S*ubmitted* April 2007).

3.2 Status of Cumulative Effects Indicators

Establishing 'how much' of the North Yukon Planning Region has been affected by human-caused surface disturbances, and the current state of those surface disturbances, is a key consideration. Reliable information is required to effectively report the condition of the chosen indicators and to establish thresholds for them. Determining the current status of the two cumulative effects indicators is also required to establish benchmarks against which future comparisons to thresholds can be made.

Detailed methods used to identify, map and determine the status of human-caused surface disturbances and linear features are provided in Section 4.2 of the North Yukon Resource Assessment Report (North Yukon Planning Commission 2007a,b). In consideration of the available sources of information, the status of human-caused surface disturbance and linear (access) density indicators should currently be viewed as estimates that represent the 'best available data'.

3.2.1 Estimates of Historical Indicator Status

Table A3.1 lists the amount of historical human-caused disturbance for LMUs within the Integrated Management Area. Most features and disturbances were created in a 20-year

period between 1960 and 1980. The Dempster Highway and the community of Old Crow are the only permanent features of significance – the majority of the human-caused footprints are seismic lines and winter trails, most of which can be considered non-permanent features.

Based on available information, it is estimated that in the year 1980, the region contained approximately 9,500 ha of human-caused surface disturbance (0.17% of region by area) and 10,200 km of linear features (0.18 km/km^2 of region by area). LMUs #7 (Johnson Creek), #8 (Whitefish Wetlands) and #9 (Eagle Plains), within the Eagle Plain oil and gas basin, contain the majority of the features.

3.2.2 Estimates of Current (Benchmark) Indicator Status

As described above, the majority of historical human footprints in the region were non-permanent seismic lines and winter trails created approximately 40-years ago. In the ensuing time, a proportion of the features have been reclaimed through natural regeneration or by natural disturbances (i.e., fire). Accounting for reclamation provides an adjusted estimate of the indicator status. The adjusted indicator status provides a more realistic estimate for the current condition of the two indicators, human-caused surface disturbance and linear (access) density, establishing a more refined benchmark that can be used for future comparisons.

Accounting for potential reclamation effects of historical human-caused footprints requires consideration of many factors, including functional habitat definitions. For the purposes of indicator status and monitoring in the North Yukon Planning Region, the definition of '**reclaimed**' is considered to be:

> *"a linear feature or other human-caused surface disturbance that in its current state, does not facilitate increased access or travel. In forested areas, a feature can be considered reclaimed when it contains woody vegetation (trees and shrubs) approximately 1.5m in height"*

It is important to note that this definition is not based on visual removal of the feature; human footprints may remain readily visible for decades due to differences between regenerating and mature vegetation conditions. A key consideration for this definition is related to access and ungulate management. In some studies, human-caused footprints, especially linear features, facilitate increased access (hunting) and predator movement/success (mortality). Both factors can contribute to increased mortality of caribou and moose, two of the focal species for this Plan. Considering the future anticipated land uses in the region (e.g., commercial forestry or agriculture is not viable), creating increased opportunities for motorized access and predator movement as a result of linear feature creation will likely be a larger management issue than direct habitat loss.

Determining the reclamation status of the historical human-caused footprints requires consideration of two major factors, 1) reclamation rate, and 2) reclamation trajectory. The

rate and vegetation succession stages (i.e. trajectory) are variable and influenced by a number of factors including intensity of the disturbance, size of the feature, intensity of use of the feature (access legacy), landscape type and natural disturbance history.

In summer of 2005 and 2006, a large amount of low level, oblique aerial photography was acquired in the Eagle Plains area (Figure A3.3). This permitted an assessment of the current re-generation status for some disturbed areas of the landscape. Also during this time, field studies coordinated through the Yukon Oil and Gas Management Branch were initiated in Eagle Plains to examine reclamation rates and trajectories of historical linear features.

Given these sources of available information, it was determined that, on average, a minimum of 20% of the historical features are in a state that can be considered reclaimed[1]. Many historical seismic lines, winter trails and well sites were created using methods that resulted in slow rates of recovery. However, a large number of features were also created using operating practices that have resulted in successful regeneration, especially on landscape types with adequate soil drainage.

Accounting for the estimated reclamation rate, Table A3.1 provides a summary of the adjusted current indicator status (benchmark) for LMUs within the Integrated Management Area. Considerations for specific LMUs include:

- LMUs #9 and #10B: the Dempster Highway footprint is considered permanent and has not been adjusted for reclamation.

- LMU #2A: the community of Old Crow footprint is considered permanent and has not been adjusted for reclamation (not shown in Table A3.1).

For the entire North Yukon Planning Region, the benchmark surface disturbance status is approximately 7,643 ha (0.14% of region by area), and linear (access) density is 0.15 km/km^2 (8,160 km of linear features). Benchmark surface disturbance and linear density levels in the Eagle Plains oil and gas area of interest are estimated to be 0.41% and 0.44 km/km^2, respectively. The community of Old Crow, the Dempster Highway, and current gravel pits combined account for approximately 1,600 ha of disturbance. In the region, the Dempster Highway is 200 km in length.

[1] See Section 4.2 of North Yukon Planning Commission (2007a, b) for detailed assumptions regarding reclamation status. A 20% reduction was applied to area and length of non-permanent features to account for natural re-vegetation. This reclamation is considered to be a conservative regional average and varies by landscape type and fire history.

Table A3.1. Surface Disturbance and Linear (access) Density Indicator Status for LMUs in IMA.

Landscape Management Unit	Area (km^2)	Area (% NYPR)	Indicator	Indicator Status Historical		Indicator Status Current (Benchmark)*	
				Amount	Metric	Amount	Metric
LMUs in Integrated Management Area Zone I							
(#2C) Bluefish – Cadzow Lake Wetlands	980	2	Surface Disturbance	72.8 ha	0.07 %	58.2 ha	0.06 %
			Linear (Access) Density	150.2 km	0.153 km/km^2	120.2 km	0.123 km/km^2
(#8B) Eagle – Bell River (Whitefish Wetlands)	1124	2	Surface Disturbance	355.0 ha	0.32 %	284.0 ha	0.25 %
			Linear (Access) Density	487.9 km	0.434 km/km^2	390.3 km	0.347 km/km^2
(#8C) Porcupine River (Whitefish Wetlands)	302	1	Surface Disturbance	122.5 ha	0.41 %	98.0 ha	0.32 %
			Linear (Access) Density	167.6 km	0.554 km/km^2	134.1 km	0.443 km/km^2
LMUs in Integrated Management Area Zone II							
(#4B) LaChute River	2048	4	Surface Disturbance	139.6 ha	0.07 %	111.7 ha	0.06 %
			Linear (Access) Density	199.7 km	0.097 km/km^2	159.8 km	0.078 km/km^2
(#10A) Southern Richardson Mountains	799	1	Surface Disturbance	130.6 ha	0.16 %	104.5 ha	0.13 %
			Linear (Access) Density	6.1 km	0.008 km/km^2	4.9 km	0.006 km/km^2
(#10B) Rock River – Mount Joyal	2374	4	Surface Disturbance	716.8 ha	0.30 %	607.4 ha	0.26 %
			Linear (Access) Density	283.2 km	0.119 km/km^2	246.2 km	0.104 km/km^2
LMUs in Integrated Management Area Zone III							
(#2B) Bluefish River – David Lord Creek	3083	6	Surface Disturbance	364.4 ha	0.12%	291.5 ha	0.10 %
			Linear (Access) Density	390.0 km	0.126 km/km^2	312.0 km	0.101 km/km^2
(#5) Bluefish Lake – Keele Range	2066	4	Surface Disturbance	2.21 ha	0.00%	1.8 ha	0.001 %
			Linear (Access) Density	7.4 km	0.004 km/km^2	5.9 km	0.003 km/km^2
(#6) Ahvee and Sharp Mountains	2714	5	Surface Disturbance	191.3 ha	0.07%	153.0 ha	0.06 %
			Linear (Access) Density	254.5 km	0.094 km/km^2	203.6 km	0.075 km/km^2
(#11) Whitestone River	1740	3	Surface Disturbance	653.5 ha	0.38%	522.8 ha	0.30 %
			Linear (Access) Density	796.3 km	0.458 km/km^2	637.0 km	0.366 km/km^2
(#12B) Fishing Branch HPA	980	2	Surface Disturbance	8.5 ha	0.01%	6.8 ha	0.007 %
			Linear (Access) Density	10.6 km	0.011 km/km^2	8.5 km	0.009 km/km^2

Table A3.1 (Cont'd). Surface Disturbance and Linear (access) Density Indicator Status for LMUs in IMA.

Landscape Management Unit	Area (km^2)	Area (% NYPR)	Indicator	Indicator Status		Indicator Status	
				Historical		Current (Benchmark)*	
				Amount	Metric	Amount	Metric
LMUs in Integrated Management Area Zone IV							
(#7) Johnson Creek	3230	6	Surface Disturbance	1,025.5 ha	0.32 %	820.4 ha	0.25 %
			Linear (Access) Density	1,298.7 km	0.402 km/km^2	1,039.0 km	0.322 km/km^2
(#9) Eagle Plains	6415	12	Surface Disturbance	4,038.7 ha	0.63 %	3,244.2 ha	0.51 %
			Linear (Access) Density	4,232.1 km	0.660 km/km^2	3,407.7 km	0.531 km/km^2
(#13) Kandik River	2266	4	Surface Disturbance	16.4 ha	0.01 %	13.1 ha	0.006 %
			Linear (Access) Density	12.9 km	0.006 km/km^2	10.3 km	0.005 km/km^2

* Historical amount with a 20% reduction to account for natural revegetation. Dempster Highway is considered permanent, so major road footprints are not considered to be reduced by natural revegetation. The entire Dempster Highway right-of-way, separating units #10A and #10B, is included in LMU #10B.

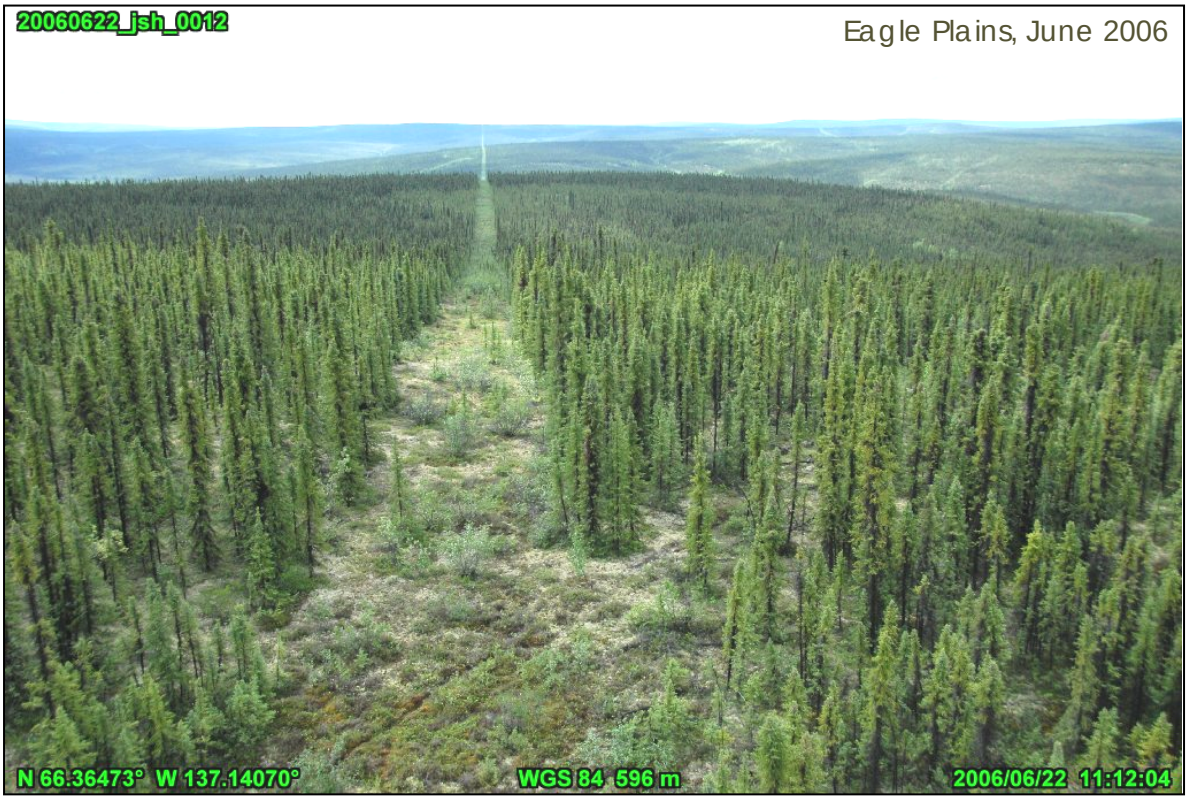

Figure A3.3. Example of Low-level Oblique Aerial Photography Available for Portions of North Yukon Planning Region. Un-reclaimed 1970 Seismic Line (Line 9X), Central Eagle Plains. Photo: J. Hawkings, Environment Canada, Canadian Wildlife Service.

3.3 Land Use Modeling

Understanding the future potential outcomes of land use decisions and activities is an important consideration for regional land use planning. The development of probable land use scenarios that can be forecast and examined is an effective method to evaluate alternative land use strategies. The North Yukon regional land use planning process utilized this approach to determine the effect of future potential land use activities on the status of the two cumulative effects indicators, and other relevant indicators. Detailed methods, assumptions and results for the land use modeling exercise are provided in the North Yukon Planning Region Land Use Scenarios Report (North Yukon Planning Commission, 2007c).

3.3.1 Methods

The ALCES® computer model was used to describe, project and evaluate potential cumulative effects of various land use activities on valued resources, for the foreseeable future. Through the assistance of domain experts, land use scenarios were developed to

explore the results of probable energy, tourism and mining activity on the regional landscape composition, wildlife habitat, and economy. Regional population and workforce were used as social indicators. Possible consequences of climate change on the North Yukon landscape and wildlife habitat were also examined.

Assumptions were made about the scope, sequence, extent and level of industrial activity. Landscape dynamics including vegetation change, fire regimes and wildlife habitat associations were also modeled. Relationships between land use, landscape change and wildlife habitat were evaluated. Generalized landscape descriptions, habitat suitability ranks, feature size estimates and amounts, reclamation rates, and rates of fire are all constraints to the model outcomes but were estimated based on the best available information.

Modeling was conducted for two study areas: 1) the entire planning region, and 2) Eagle Plain oil and gas basin. The Eagle Plain oil and gas basin was determined to be the only area of the planning region with the potential to incur significant levels of land use activity in the near future, and was therefore examined in greater detail. In the Eagle Plains oil and gas area of interest, the effects of different energy sector operating practices on landscape composition were examined.

3.3.2 Results

Table A3.2 lists cumulative effects indicator status outcomes for energy sector activity in the Eagle Plain oil and gas area of interest. Three general management practice scenarios are reported. The status of linear (access) density over the life of the potential Eagle Plain natural gas development scenario is shown in Figure A3.4.

Table A3.2. Maximum Cumulative Effects Indicator Values Estimated for Eagle Plain Oil and Gas Area of Interest, Based on Plausible Levels of Future Development.

Energy Sector Operating Practice	Cumulative Effects Indicator	
	Surface Disturbance (%)	Linear (Access) Density (km/km^2)
5m seismic & 1 well/pad	1.4 %	1.3 km/km^2
<3m seismic & 1 well/pad	1.0 %	0.9 km/km^2
<3m seismic & 4 wells/pad	0.5 %	0.7 km/km^2

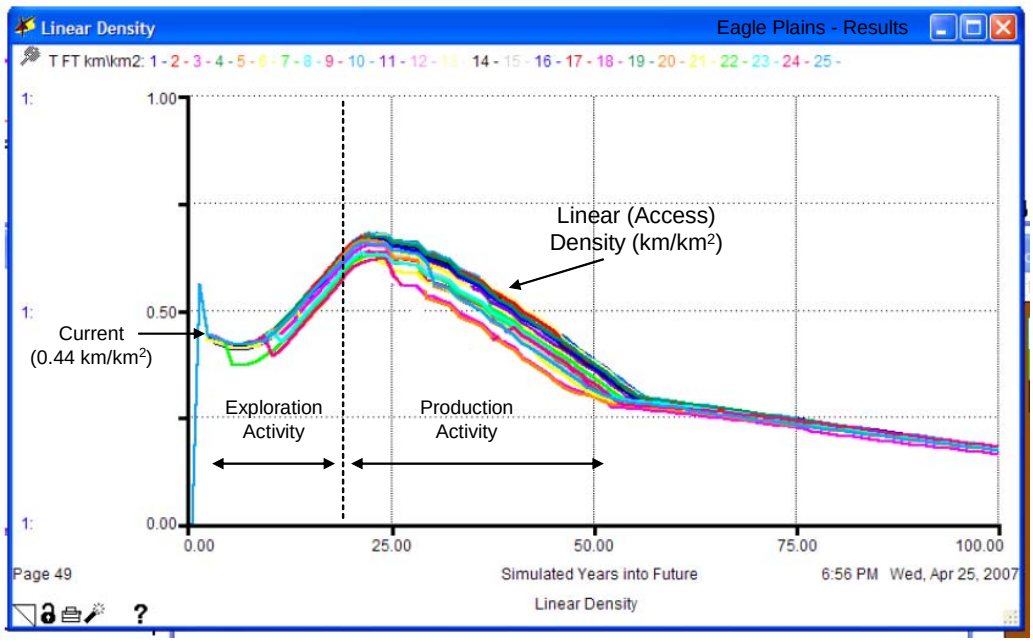

Figure A3.4. Linear (Access) Density Indicator Status over Life of Potential Eagle Plains Natural Gas Play. Result Based on <3m Wide Seismic Practices and 4 Wells/Pad Scenario.

3.3.2.1 Relationship of Modeling Results to Plan Objectives and Strategies

Section 1.5 lists Plan goals and objectives. Section 4 provides detailed strategies to achieve those objectives. Model results were considered during the development of Plan objectives and strategies. As illustrated in Table A3.2, operating practices have a large effect on the future status of the two cumulative effects indictors. Land use modeling results indicated that significant levels of economic activity could occur within specific LMUs without exceeding 1% surface disturbance or 1 km/km^2 linear density, provided that 'best operating practices' were adopted early and maintained throughout the life of the natural gas development.

Coordinated access, footprint reduction through multiple gas wells per pad, and reduced-width, low impact seismic all contribute to achieving the scenario outcome. Reclamation rate and trajectory were determined to have a major effect on the cumulative area disturbed and residence time of the area disturbed, by potential energy sector activity in Eagle Plains. Reducing the extent and duration of footprints will allow higher levels of land use activity to occur with lower levels of cumulative disturbance, resulting in lower levels of impacts to other land users and potentially focal wildlife species.

3.4 Cumulative Effects Thresholds

Section 3.3 describes the context and rationale for the proposed results-based management framework, of which cumulative effects indicators and thresholds are a component. The two proposed cumulative effects indicators for this Plan, human-caused surface disturbance and linear (access) density, represent the direct cumulative effect of multiple land use activities within a defined geographic area—in this case individual LMUs.

In the context of the results-based management framework, establishing thresholds, or limits of acceptable change for these indicators, is required to differentiate 'acceptable' and 'unacceptable' conditions. As described previously, there is a growing body of research and literature relating the cumulative effect of multiple land use activities to the condition of specific resources or valued ecosystem components. Generally, as levels of linear (access) density and habitat disturbance increase, so do the risks to valued ecological resources.

3.4.1 Establishing Thresholds

Thresholds incorporate a risk-management approach. Some LMUs have inherently higher ecological or social values than other areas. Some LMUs also contain habitats that are more sensitive to disturbance (i.e. wetlands, alpine areas) than others. LMUs containing highly valued and/or sensitive areas require a higher level of care to maintain their inherent ecological and social values. Other areas may have relatively lower ecological or social values, and may be considered acceptable for higher levels of development. Such areas may be considered important to achieving regional economic objectives.

Establishing thresholds for specific LMUs, based on their inherent values, is consistent with meeting the goal of *Sustainable Development* as defined in the VGFN Final Agreement, and provides the opportunity to 'customize' the level of conservation or development focus for a particular geographic area. This approach was also used to identify appropriate land use designation categories and zones for the different LMUs (see Section 3.2).

Establishing appropriate threshold values for the two cumulative effects indicators is challenging, and is in many respects a 'wicked problem' – a problem for which there is no single correct solution. Appropriate threshold values are as much a social consideration as an ecological consideration. The level of ecological risk and landscape change residents consider to be acceptable will differ depending on the region, and may also change over time as values and circumstances change.

An example of how thresholds might be applied, in a regional context, is provided in Figure A3.5. The relationship shown between linear density and core habitat is derived from a variety of data sources in boreal forested landscapes. Note that the example for Eagle Plains is for illustration purposes only; the estimates do not reflect a quantitative summary of existing data. It is also important to note that thresholds are necessarily based on an incomplete and uncertain body of scientific knowledge.

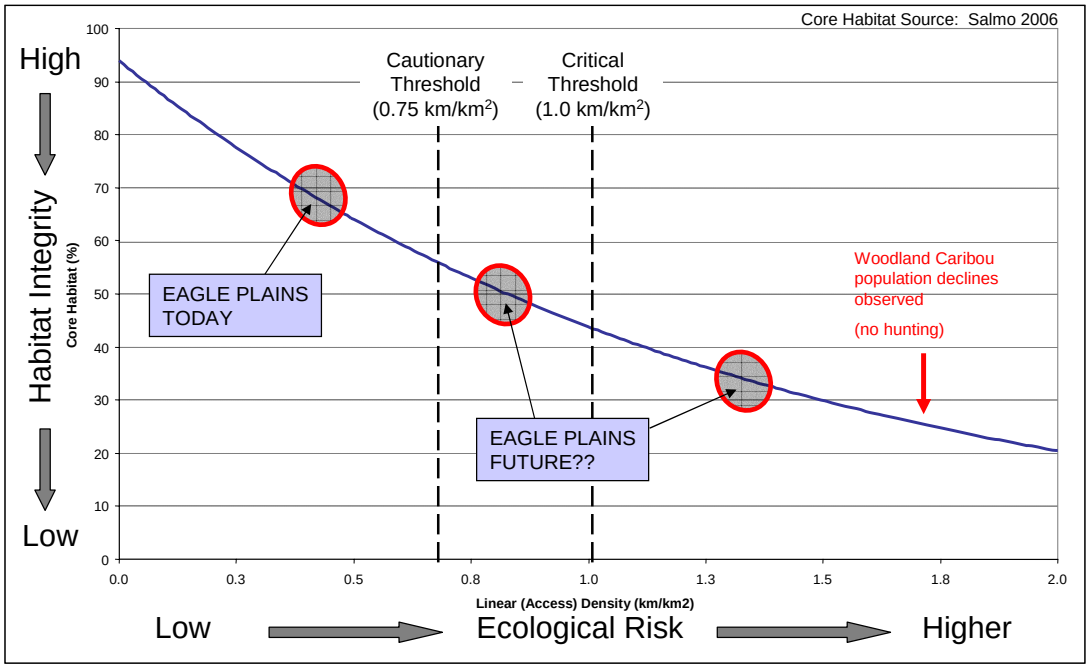

Figure A3.5. Results of Land Use Modeling Assist in Determining Appropriate Threshold Levels for Cumulative Effects Indicators Based on Acceptable Levels of Risk. The Eagle Plains Example is for Illustrative Purposes only.

Proposed threshold levels for the Integrated Management Area Zones I-IV are listed in Section 5, Table 5.3. Proposed critical threshold values for the IMA Zones were selected based on the following considerations:

- Threshold literature and research – caribou, the most important ecological resource in the region, are influenced to varying degrees by human features and activities. Current literature suggests that linear (access) densities between 1 - 2 km/km^2 represent habitat-related risks to boreal caribou populations (Figure A3.5);

- Social and cultural values of the Vuntut Gwitchin First Nation – VGFN places a high level of importance on the continued health of the land, water, wildlife, and fish in their traditional territory. The Vuntut Gwitchin are not willing to accept high levels of ecological risk associated with significant levels of unmanaged industrial development;

- *Sustainable Development* directive of the VGFN Final Agreement – in this context, thresholds establish the level of development and resultant impacts considered to be 'sustainable';

- Precautionary Principle of land use plan – the plan employs the precautionary principle to manage uncertain consequences of future activities and to manage change;

- Ecological values – the North Yukon is a sensitive environment. In comparison to other areas of Yukon, relatively low levels of land and wildlife impacts may have large consequences. Disturbed areas may persist for long periods. Maintenance of the ecological values is critical to maintaining VGFN culture and traditional economy; and,

- Economic potential and anticipated levels of land use – results of the land use modeling suggest that significant amounts of economic activity can occur, within the proposed threshold values (Figure A3.6).

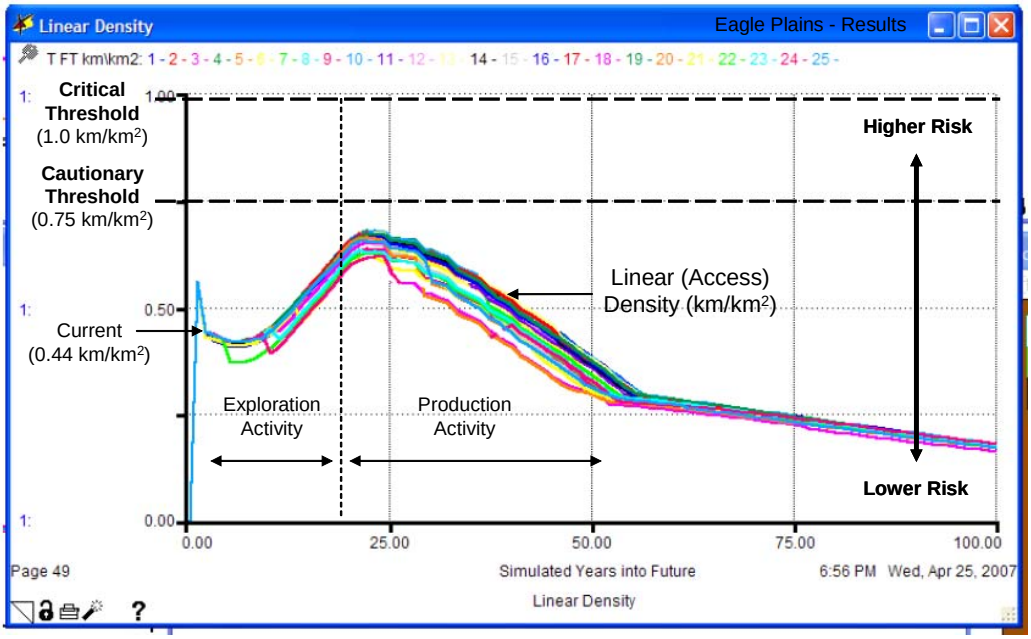

Figure A3.6. Effect of Potential Future Energy Sector Activity in Eagle Plain on Linear Density, Based on <3m Wide Seismic and 4 Wells/Pad Scenario. Proposed Cautionary and Critical Thresholds are Shown for Integrated Management Area Zone IV Areas.

3.4.2 Acceptable Levels of Disturbance

Acceptable levels of human-caused disturbance for LMUs within the Integrated Management Area are shown in Table A3.3. Disturbance limits are based on the comparison of proposed thresholds and current status of the cumulative effects indicators (i.e., the benchmark), accounting for the estimated reclamation status of historical features. The difference between the threshold and the current status of the indicator represents a limit of acceptable change. The thresholds shown here represent the 'critical' threshold for a given LMU.

3.4.3 Land Management and Cumulative Effects Thresholds

As discussed in Section 3.3.2, thresholds are not intended to be a direct limit or cap on land use activities. The purpose of thresholds is to promote proactive land management and decision-making. However, a general land management principle should be to maintain the level of the proposed cumulative effects indicators below the proposed critical threshold value. If a stated **cautionary threshold** is reached within a given LMU several management options should be considered:

- If not already implemented, implement strict access management plans/policies or strategies;
- Implement focused reclamation/restoration programs and activities; these could include proactive restoration of existing disturbed areas that are no longer required for future development, or reclamation of land of similar ecological value (no-net-loss solution);
- Enhance conservation measures in adjacent LMUs;
- Re-assess the relevance, utility, and practicality of the existing threshold using additional data or studies, and adjust accordingly. In this manner threshold values can be changed through an adaptive management process, if it can be demonstrated that adverse effects of increasing activities are unlikely;
- Apply risk-management approaches and models to affected resources to demonstrate that unacceptable changes will not occur from continued or increasing activities – such an approach may result in changed operating practices; and,
- Pursue other management strategies for affected resources if negative effects are being observed (e.g. species harvest limits, predator control, species recovery plans, etc.)

These and additional management options can be considered and discussed further during the Plan implementation period. Enhanced monitoring of valued resources is recommended when a cautionary threshold is reached.

LMU #10B, Rock River – Mount Joyal, has an estimated current footprint (benchmark) that exceeds the proposed threshold for the unit (Table A3.3). Most of the current footprint in the unit is a result of the Dempster Highway and existing features along the highway corridor (e.g., gravel pits). The Plan proposes a 2 km buffer either side of the Dempster Highway (4 km total) to be an area exempt from future footprint calculations (see Section 4.2.3.2.1).

If the Dempster Highway footprint exemption recommendation in the Plan is accepted and adopted, then the adjusted estimate for the current footprint in this unit would be well below the proposed threshold. See Section 5.3, LMU #10B, for additional management recommendations specific to this unit.

Table A3.3. Proposed Threshold Values and Acceptable Level of Human-caused Disturbance for LMUs in IMA.

Landscape Management Unit	Area (km^2)	Area (% NYPR)	Indicator	Indicator Status				
				Current		Threshold		Difference
				Amount	Metric	Amount	Metric	Amount
LMUs in Integrated Management Area Zone I								
(#2C) Bluefish – Cadzow Lake Wetlands	980	2	Surface Disturbance	58.2 ha	0.06 %	No functional disturbances		
			Linear (Access) Density	120.2 km	0.123 km/km^2			
(#8B) Eagle – Bell River (Whitefish Wetlands)	1124	2	Surface Disturbance	284.0 ha	0.25 %			
			Linear (Access) Density	390.3 km	0.347 km/km^2			
(#8C) Porcupine River (Whitefish Wetlands)	302	1	Surface Disturbance	98.0 ha	0.32 %			
			Linear (Access) Density	134.1 km	0.443 km/km^2			
LMUs in Integrated Management Area Zone II								
(#4B) LaChute River	2048	4	Surface Disturbance	111.7 ha	0.06 %	409.6 ha	0.20%	297.9 ha
			Linear (Access) Density	159.8 km	0.078 km/km^2	409.6 km	0.2 km/km^2	249.8 km
(#10A) Southern Richardson Mountains	799	1	Surface Disturbance	104.5 ha	0.13 %	159.8 ha	0.20%	55.3 ha
			Linear (Access) Density	4.9 km	0.006 km/km^2	159.8 km	0.2 km/km^2	154.9 km
(#10B) Rock River – Mount Joyal *	2374	4	Surface Disturbance	607.4 ha	0.26%	474.8 ha	0.20%	-132.6 ha
			Linear (Access) Density	246.2 km	0.104 km/km^2	474.8 km	0.2 km/km^2	228.6 km
LMUs in Integrated Management Area Zone III								
(#2B) Bluefish River – David Lord Creek	3083	6	Surface Disturbance	291.5 ha	0.10 %	1541.5 ha	0.50%	1250.0 ha
			Linear (Access) Density	312.0 km	0.101 km/km^2	1,541.5 km	0.5 km/km^2	1229.5 km
(#5) Bluefish Lake – Keele Range	2066	4	Surface Disturbance	1.8 ha	0.001 %	1,033.0 ha	0.50%	1031.2 ha
			Linear (Access) Density	5.9 km	0.003 km/km^2	1,033.0 km	0.5 km/km^2	1027.1 km
(#6) Ahvee and Sharp Mountains	2714	5	Surface Disturbance	153.0 ha	0.06 %	1,357.0 ha	0.50%	1204.0 ha
			Linear (Access) Density	203.6 km	0.075 km/km^2	1,357.0 km	0.5 km/km^2	1153.4 km
(#11) Whitestone River	1740	3	Surface Disturbance	522.8 ha	0.30 %	870.0 ha	0.50%	347.2 ha
			Linear (Access) Density	637.0 km	0.366 km/km^2	870.0 km	0.5 km/km^2	233.0 km
(#12B) Fishing Branch HPA	980	2	Surface Disturbance	6.8 ha	0.007 %	490.0 ha	0.50%	483.2 ha
			Linear (Access) Density	8.5 km	0.009 km/km^2	490.0 km	0.5 km/km^2	481.5 km

* (LMU #10B) Rock River – Mount Joyal: In the vicinity of the Richardson Mountains, the entire Dempster Highway permanent footprint is within LMU #10B. The Plan recommends a 4km future footprint exemption along the Dempster Highway, resulting in a level of disturbance well below the proposed threshold (see above)

Table A3.3 (Cont'd). Proposed Threshold Values and Acceptable Level of Human-caused Disturbance for LMUs in IMA.

Landscape Management Unit	Area (km^2)	Area (% NYPR)	Indicator	Indicator Status				
				Current		Threshold		Difference
				Amount	Metric	Amount	Metric	Amount
LMUs in Integrated Management Area Zone IV								
(#7) Johnson Creek	3230	6	Surface Disturbance	820.4 ha	0.25 %	3,230.0 ha	1.00%	2409.6 ha
			Linear (Access) Density	1,039.0 km	0.322 km/km^2	3,230.0 km	1.0 km/km^2	2191.0 km
(#9) Eagle Plains	6415	12	Surface Disturbance	3,244.2 ha	0.51 %	6,415.0 ha	1.00%	3170.8 ha
			Linear (Access) Density	3,407.7 km	0.531 km/km^2	6,415.0 km	1.0 km/km^2	3007.3 km
(#13) Kandik River	2266	4	Surface Disturbance	13.1 ha	0.006 %	2,266.0 ha	1.00%	2252.9 ha
			Linear (Access) Density	10.3 km	0.005 km/km^2	2,266.0 km	1.0 km/km^2	2255.7 km

Appendix 4 – Discussion of Protected Area Options for Whitefish Wetlands

During the planning process, NYPC determined that a Protected Area designation for a portion of the Whitefish Wetlands complex (LMU #8) should be considered, ensuring an adequate level of long-term protection for the wetland complex.

The Plan includes a Protected Area proposal for sub-unit LMU #8A, the central lakes portion of the complex. The Protected Area proposal is centered on Whitefish and Porcupine Lakes (see Section 5.2). This Appendix discusses Protected Area options considered for the Whitefish Wetlands during preparation of the Plan.

4.1 Issue

The Whitefish Wetlands complex is a regionally important and sensitive environment with significant ecological and cultural values. The wetland complex has the potential to be impacted by oil and gas and associated industrial land use activities. The Plan should consider appropriate measures to conserve the values of the wetland.

4.2 Current Status

Whitefish Wetlands contains both VGFN Settlement Land (VG R-02A and a number of S-sites) and Yukon Government public land. Whitefish Wetlands has been identified through previous conservation assessments as an area requiring a formal conservation designation. Whitefish Wetlands currently has no formal conservation designation.

4.3 Background

4.3.1 Setting

Whitefish Wetlands (LMU #8) is within the Eagle Plains Ecoregion and covers 1,894 km^2 (4%) of the North Yukon Planning Region. Whitefish Wetlands includes three sub-units, LMU #8A (Whitefish – Porcupine Lakes), LMU #8B (Eagle – Bell River) and LMU #8C (Porcupine River) (Figure A4.1). Portions of three VGFN land selections are located within LMU #8, VG R-02A, VG R-07A, and VG R-12A, as well as a number of S-sites. The Tetlit Gwich'in Secondary Use Area also encompasses a portion of LMU#8B to the east of the Eagle River.

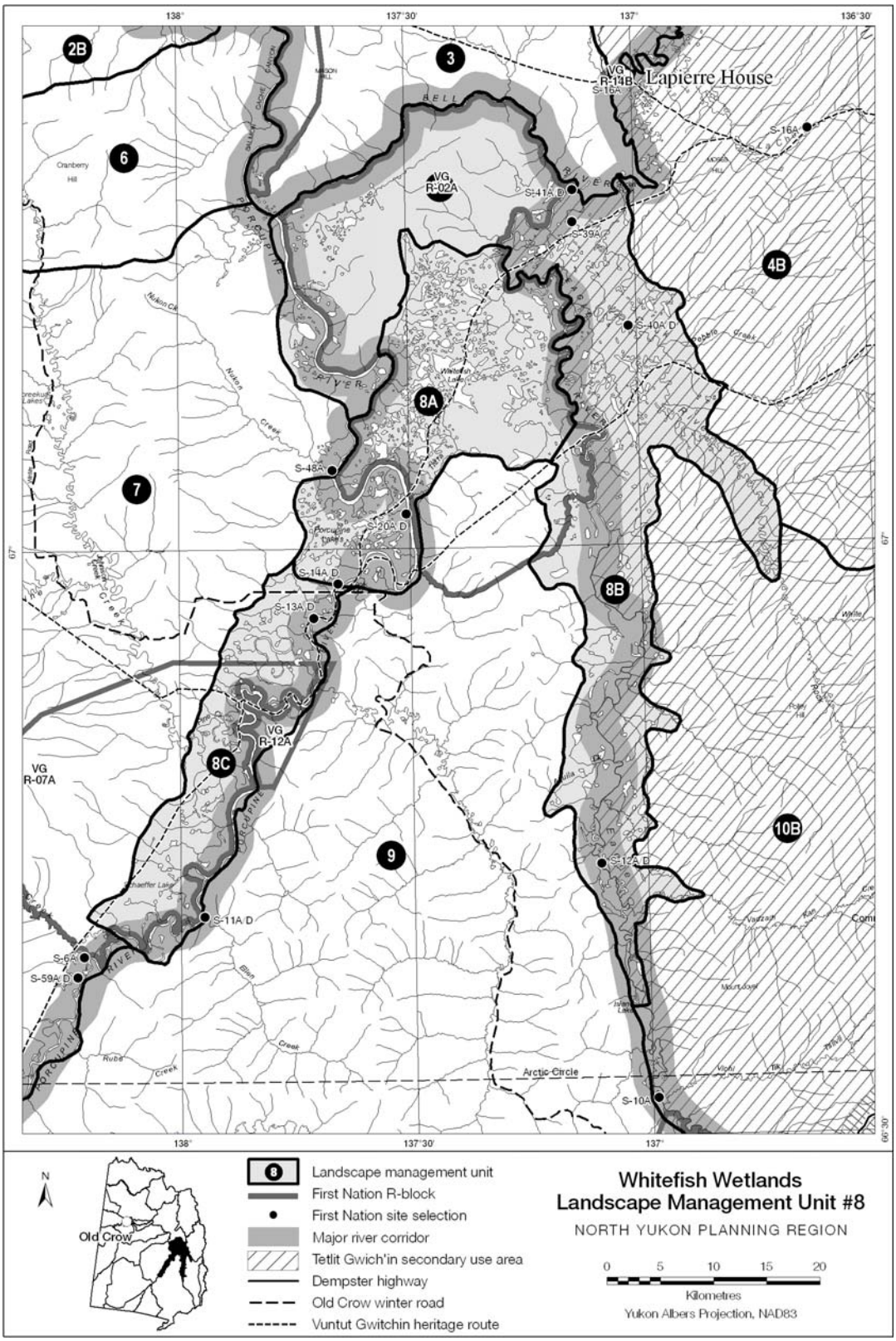

Figure A4.1. Whitefish Wetlands (LMU#8, with sub-units #8A, #8B and #8C). LMU #8 is shaded in grey.

4.3.2 Values

A full description of the ecological, cultural and economic values of LMU #8 is provided in Section 5. Maps 2 to 4 provide a summary of these values. Briefly, the wetland complex contains a diversity of habitats sensitive to disturbance, including open water, river/stream valleys, and off-channel wetland habitats and wetland vegetation types (Figures A4.2 and A4.3). Outside of Old Crow Flats, some of the highest concentrations of ecological values (fresh water fish, seasonal waterbirds and raptors, furbearers, bears, caribou and moose) occur within the area. Identified or potential fish critical over-wintering habitat is also present. Whitefish Wetlands also includes well-preserved ice age fossils.

The wetlands have received significant levels of First Nation traditional use and continue to be an important subsistence use area for both Vuntut Gwitchin and Tetlit Gwich'in. The wetlands are important for trapping, hunting, fishing, and other cultural activities. Whitefish Wetlands is a key area of conservation concern for residents and land users of the North Yukon Planning Region.

The primary non-renewable economic interest in Whitefish Wetlands is oil and gas resources. The wetlands are located entirely within the Eagle Plain oil and gas basin. Considered to be one of most prospective oil and gas basins in Yukon, Eagle Plain resource estimates predict a mean volume of 6.1 Tcf of natural gas and 437 MMbbls of oil, representing approximately 20% of Yukon's estimated total natural gas potential and 50% of the total oil potential.

In the 1960s and 1970s, central Eagle Plains, including Whitefish Wetlands, was the focus of substantial oil and gas exploration activity. Two wells were drilled in the central Whitefish Wetlands complex (I-05 and J-70) in 1972 and 1973, respectively. Both wells had significant gas shows but are now abandoned. Mineral potential is very low. Low levels of wilderness tourism and recreation activities are currently focused along the Eagle River. The Old Crow winter road crosses the Porcupine River at Anik Island in sub-unit #8C.

Fekete (2006) and North Yukon Planning Commission (2007a,c) describe potential oil and gas scenarios for the North Yukon Planning Region. While most activities are anticipated to focus on LMU #9, Eagle Plains (see Section 5), Fekete (2006) considers a portion of the Whitefish Wetlands complex to be within the most prospective area for Eagle Plain oil and gas potential.

Figure A4.2. LMU #8A (Whitefish – Porcupine Lakes), central portion of Whitefish Wetlands near Whitefish Lake. Old partially regenerated seismic line visible in foreground. Photo: J. Meikle, Yukon Government.

Figure A4.3. Southern portion of LMU #8B (Eagle – Bell Rivers). Eagle River lowland with off-channel open water and wetland habitats. Photo: J. Meikle, Yukon Government.

4.3.3 Previous Conservation Interests in Whitefish Wetlands

Four previous conservation assessments identified the Whitefish Wetlands complex as a significant ecological and cultural area. In the early 1980's, the Canadian Arctic Resources Committee (1980) considered this area worthy of special consideration as one of Yukon's environmentally significant areas. The wetlands were proposed for consideration as a National Wildlife Area in 1984 (Blood and Anwieler, 1984). In 1993, the Yukon Parks System Plan identified Whitefish Wetlands as one of four areas of interest in the planning region (Yukon Department of Renewable Resources, 1993). The Yukon wetlands technical committee (2005) have also identified Whitefish Wetlands as a regionally significant wetland complex.

As part of the VGFNFA, the VGFN selected Whitefish Wetlands for the purpose of conservation. The R-block of VG R-02A represents 11% of the total Vuntut Gwitchin land selections and encompasses the central Whitefish Wetlands complex, centered on Whitefish Lake. The wetlands complex currently has no formal conservation designation.

4.4 Management Issues and Considerations

The primary management issue in deciding land use designation options for the Whitefish Wetlands complex is how to provide an adequate level of conservation for the wetland and associated cultural values while maintaining opportunities to access adjacent lands for future oil and gas exploration and development. Land ownership must also be considered. Section 1.6 provides a detailed description of regional issues that are relevant to Whitefish Wetlands.

Oil and gas activity in Whitefish Wetlands, and induced land uses including all season roads and gravel extraction, has the potential to cause a variety of direct and indirect impacts to the hydrology and permafrost, to the wetland, lake and river/stream valley habitats, and to the fish and wildlife populations they support. Cultural and subsistence use of the area may also be affected by oil and gas activities. Wilderness tourism opportunities along the Eagle, Bell and Porcupine Major River Corridors may also be affected.

4.5 Land Use Designation Options

VG R-02A was selected for conservation purposes with the intent to protect the central Whitefish Lake wetland values and waters flowing into it. Based on the results of the conservation assessment, performed in support of the Draft Plan (North Yukon Planning Commission 2007a), the concentration of ecological values associated with Whitefish Wetlands are second only in the region to Old Crow Flats SMA. During creation of and consultation leading to the Draft Plan, VGFN Elders repeatedly stressed the significance

of the entire Whitefish Wetlands complex to regional wildlife and fish populations, regional water quality and Gwich'in culture and traditional economy.

In recognition of the values, the sensitivity of the land and water, and the management issues, NYPC is proposing that the entire Whitefish Wetlands complex, LMU #8, be managed with a strong conservation focus. As described in Section 5, sub-units #8B and #8C are recommended for Zone I land designation[1]. A Protected Area designation has been recommended for the central portion of the Whitefish Wetlands complex (shown as LMU #8A on Figure A4.1).

Three general Protected Area options for the central portion of Whitefish Wetlands are summarized in Table A4.1. Protected Area boundary delineation options for each are illustrated in Figures A4.4-A4.6. Management considerations for each option are discussed.

Table A4.1. Protected Area Options Summary for Whitefish Wetlands (LMU #8).

Option #	Area	Land Ownership	Description
1	868 km^2	VGFN (VG R-02A)	Figure A4.4. Protected Area designation for entire VGFN R-block (VG R-02A).
2	468 km^2	VGFN (VG R-02A, S-20A/D; 390 km^2) YG (78 km^2)	Figure A4.5. Protected Area designation for portion of VGFN R-block (VG R-02A) and Yukon Government land on west bank of Porcupine River (Porcupine Lakes). This option is also shown as LMU #8A in Figure A4.1.
3	400 km^2	VGFN (VG R-02A)	Figure A4.6. Protected Area designation for portion of VGFN R-block (VG R-02A).
4	xx km^2	xxx	Combination of Options #1, #2, #3 and other This 'option' is not discussed further in this section, but was considered during development of the Draft Plan

[1] Zone I management intent, as described in Section 3.2: Maintaining ecological integrity and functional habitats, while minimizing potential industrial land use impacts is a management priority. Land uses are allowed provided they do not result in creation of functional disturbances. All-season industrial infrastructure, aggregate extraction and establishment of permanent human settlements/structures are discouraged activities.

The Protected Area concepts discussed in this Appendix should be considered as part of the overall management strategy for the entire LMU #8, including the Zone I designation for sub-units #8B and #8C. It is important to note that none of the Protected Area options as presented would greatly impact the oil and gas scenario described by Fekete (2006) and North Yukon Planning Commission (2007a,c).

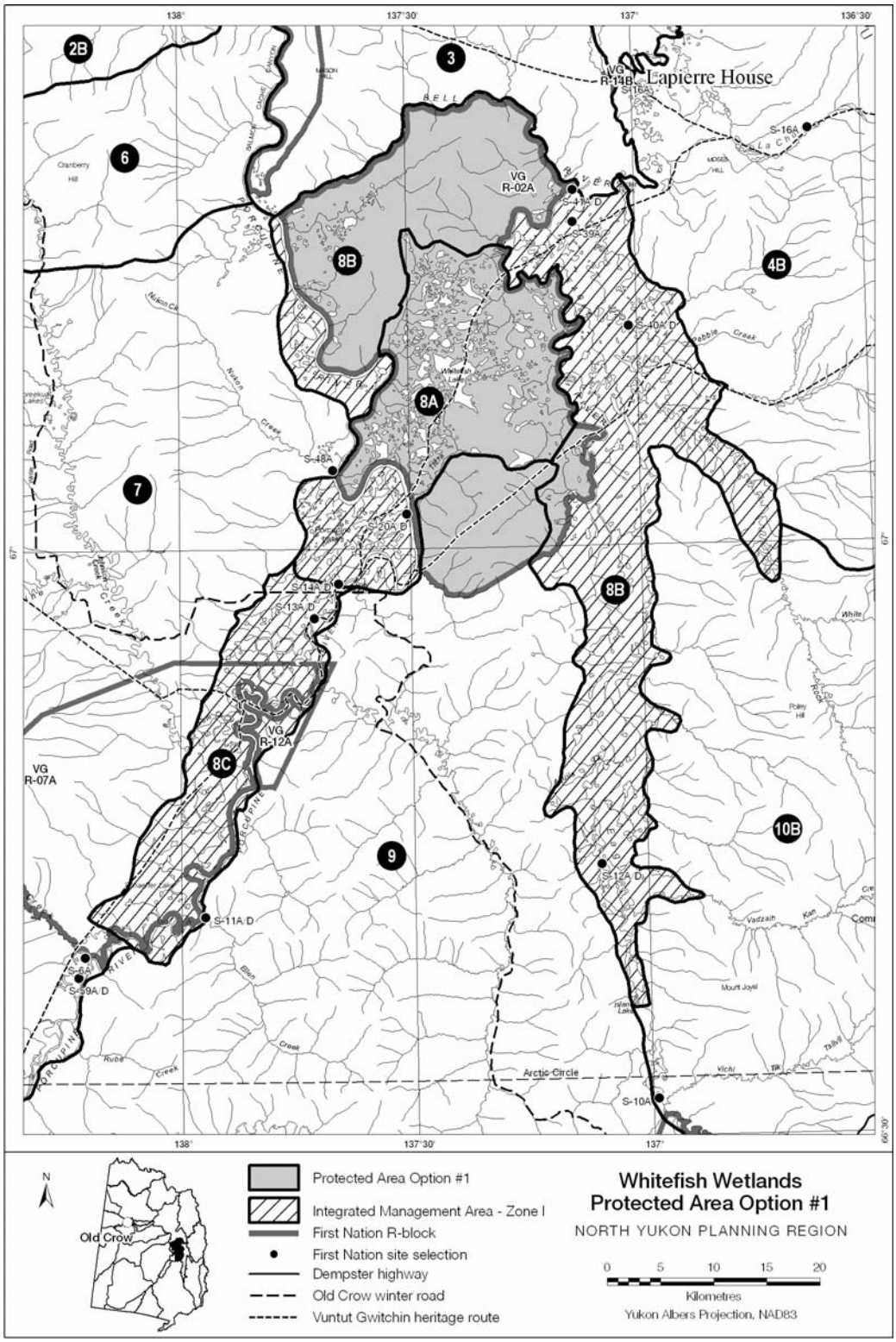

Figure A4.4. Whitefish Wetlands Protected Area Option #1. VGFN R-02A is shaded in light grey.

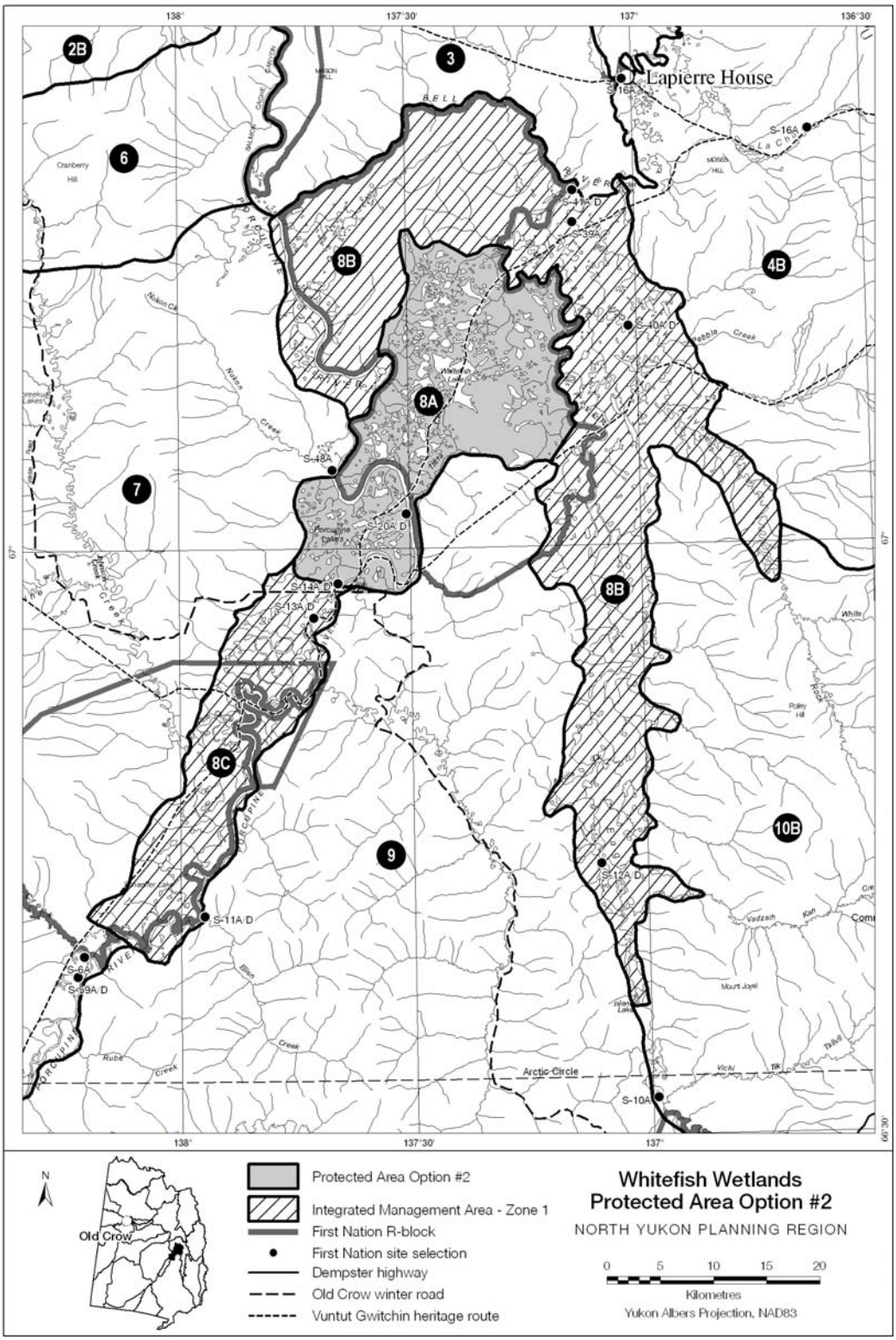

Figure A4.5. Whitefish Wetlands Protected Area Option #2.

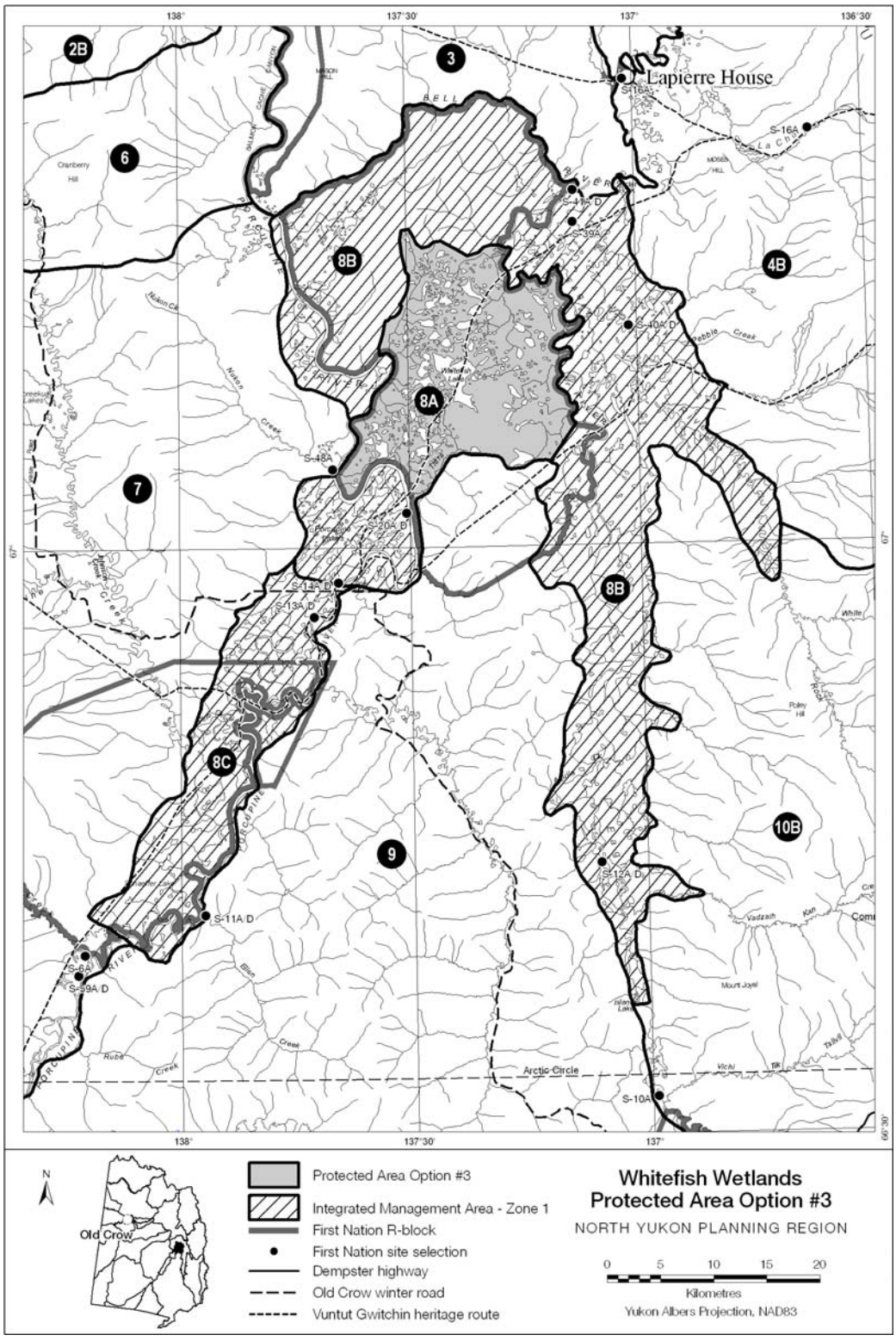

Figure A4.6. Whitefish Wetlands Protected Area Option #3.

Whitefish Wetlands Option #1:

Establish Protected Area land use designation for entire VGFN R-block (VG R-02A), 868 km^2 (Figure A4.4)

Analysis

- This option provides a high level of protection to the central Whitefish Lake wetlands and all surface waters flowing into the central wetland complex, ensuring long-term hydrologic processes and surface water inputs remain unaltered by potential human land use impacts;
- No Yukon Government public lands are included in this option (i.e., Porcupine Lakes);
- Yukon Government regulations and approval would not be required considerations for this option;
- Similar to Old Crow Flats SMA, VGFN lands legislation could be used to designate VG R-02A as a Protected Area;
- A potentially lengthy Special Management Area planning process would not be required (e.g., Fishing Branch HPA was 2-3 years);
- This option excludes approximately 5-7% of the Eagle Plain basin in North Yukon Planning Region from potential oil and gas exploration and development, but does not greatly impact the oil and gas scenario described by Fekete (2006);
- This option would impact VGFN's ability to receive resource royalties from potential oil and gas production within VG R-02A; and,
- This option does not impact the Old Crow winter road or access to the Porcupine River.

Whitefish Wetlands Option #2:

Establish Protected Area land use designation for entire LMU #8A as shown, including a portion of VGFN R-block (VG R-02A) and Yukon Government public land centred on Porcupine Lakes, 468 km^2 (Figure A4.5)

Analysis

- This option provides protection for the central wetland and lake values of Whitefish Lake, and adjacent Porcupine Lakes. This option does not provide full protection to the surface waters flowing into the central Whitefish wetland complex;

- VGFN settlement land (VG R-02A) and Yukon Government public lands are included in this option;

- VGFN and Yukon Government regulations and approval would be required considerations for this option;

- Similar to Old Crow Flats SMA, VGFN lands legislation could be used to designate the VG R-02A portion of the option as a Protected Area. Yukon Government regulations and approval would be required for the Porcupine Lakes portion of the proposal;

- A Special Management Area planning process would likely be required;

- This option would exclude approximately 3-4% of the Eagle Plain basin in North Yukon Planning Region from potential oil and gas exploration and development, but does not greatly impact the oil and gas scenario described by Fekete (2006);

- Representing less than 1% of the total oil and gas basin, approximately 80 km^2 of Yukon Government public lands (Porcupine Lakes) are affected by this option;

- This option provides for future oil and gas activities (and other land uses) on a portion of VG R-02A, should VGFN decide to do so at a future date, allowing for options to receive resource royalties; and,

- Access to the Porcupine River for the purpose of transportation or other land uses would not be impacted by this proposal. The southern boundary of this option, as shown on Figure A4.5, would provide for continued use of the existing Old Crow winter road routing along the Porcupine River.

Whitefish Wetlands Option #3:

Establish Protected Area within VGFN portion of core wetland complex (VG R-02A), excluding Porcupine Lakes, 400 km^2 (Figure A4.6)

Analysis

- This option provides protection for the central wetland and lake values of Whitefish Lake, but not for the adjacent Porcupine Lakes. This option does not provide full protection to the surface waters flowing into the central Whitefish wetland complex;

- No Yukon Government public lands are included in this option (i.e., Porcupine Lakes);

- Yukon Government regulations and approval would not be required considerations for this option;

- Similar to Old Crow Flats SMA, VGFN lands legislation could be used to designate a portion of VG R-02A as a Protected Area;

- A potentially lengthy Special Management Area planning process would not be required (e.g., Fishing Branch HPA was 2-3 years);

- This option would exclude approximately 2-3% of the Eagle Plain basin in North Yukon Planning Region from potential oil and gas exploration and development. No Yukon Government public lands are impacted by this proposal;

- This option provides for future oil and gas (and other land uses) on a portion of VG R-02A, should VGFN decide to do so at a future date, allowing for options to receive resource royalties;

- Access to the Porcupine River for the purpose of transportation or other land uses would not be affected by this option. The Old Crow winter road would not be impacted by this proposal.

4.6 Recommended Option

Based on a range of ecological, social and economic considerations, NYPC recommends Option #2.

Whitefish Wetlands Option #2:
Establish Protected Area designation for the central Whitefish Lakes within VG R-02A, and Porcupine Lakes on the west bank of Porcupine River (Porcupine Lakes)

Recommended option is shown as Figure A4.5, and as LMU #8A on Figure A4.1. This Protected Area proposal has been recommended as part of the Plan (see Section 5).

Rationale

The recommended Protected Area option fulfills several important criteria:

- **Adequate conservation measures and acceptable level of risk to valued resources**

  The recommended Protected Area designation provides full protection for the central wetland and lake values of the Whitefish Wetland complex. While not all surface waters flowing from the periphery of VG R-02A into the central Whitefish Lake wetland complex would be fully protected, potential land use risks to these surface waters can be minimized through effective planning and mitigation measures, and adherence to recommended operating practices.

The remaining Whitefish Wetland sub-units, #8B and #8C, recommended for Zone I land use designation, would allow for a limited amount of carefully managed oil and gas activities while providing an adequate level of conservation for the wetland values. Full protection of the central Whitefish Lakes complex is an important component of a risk-based management and conservation strategy for the entire Whitefish Wetlands complex (LMU #8), and surrounding LMUs with high oil and gas potential, LMU #7 (Johnson Creek) and LMU #9 (Eagle Plains).

- **Maintains access to lands and resources for future economic opportunities**

  The recommended Protected Area option provides the minimum area required to protect the central wetland and lake values of Whitefish Wetlands. The recommended option provides VGFN with future land use options within VG R-02A, should VGFN decide to promote land use activity in the unprotected portion of VG R-02A at a future date. The total area of protected Yukon Government public lands represents a very small fraction, less than 1%, of the Eagle Plain oil and gas basin (78 km^2).

  Protection of LMU #8A, in combination with the other tools and management approaches recommended by the Plan, represents an appropriate balance between adequate conservation of important wetland values and opportunities to access oil and gas resources in Eagle Plain.

- **Land use certainty**

  The recommended Protected Area option (LMU #8A) makes an important contribution towards achieving land use certainty in the North Yukon Planning Region as the status of Whitefish Wetlands will be formally recognized. The area was repeatedly identified during consultations with Old Crow Elders and community members as an important and actively used wetland.

- **Acceptance of increasing levels of land use**

  Acceptance of potential large-scale energy sector activity in Eagle Plains will not likely occur until residents of the region are confident that adequate conservation measures are in place for Whitefish Wetlands. Establishing a formal conservation designation for the most sensitive portion of the wetlands, and managing the entire complex with a conservation focus, may result in an increased level of acceptance and support for increasing land use activity in Eagle Plains.

4.7 Recommended Next Steps

1. NYPC will consult on its current recommendation. Following the Plan review period, NYPC will consider comments and perspectives received from the public and affected agencies. NYPC will then make a recommendation regarding the Whitefish Wetland Protected Area in the next iteration of the plan, the Recommended Land Use Plan. A decision by the Parties regarding a preferred Protected Area option for

Whitefish Wetlands should be made prior to the release of the Recommended Land Use Plan.

2. A detailed Protected Area boundary for any option should be determined and delineated during Plan implementation (see Section 6) with the following considerations:

   - Protect the central wetland and lake values of the Whitefish Lake complex;
   - Protect the important fish migration routes between the central Whitefish Lake complex, Porcupine Lakes and Porcupine River. Tizya Creek is noted of special significance;
   - To the greatest extent practicable, provide functional protection of hydrologic and wetland processes (maintain water flow patterns, quality and quantity) across the entire Whitefish Wetlands complex (LMU #8); and,
   - Maintain existing route for Old Crow winter road.

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Appendix 5 – Land Use Designation Options for North Yukon Interim Land Withdrawal

As part of the planning process, the Parties to the Plan, Yukon and Vuntut Gwitchin governments, requested that NYPC examine potential land use designation options for the northern portion of the planning region affected by the North Yukon Interim Land Withdrawal, excluding Old Crow Flats SMA (Figure A5.1, Map 1).

The area under consideration includes three proposed Land Management Units (LMUs): Old Crow-Rampart House (#2A), Driftwood River (#3) and Bell River (#4A) (Maps 5-7). This Appendix provides a discussion of land use designation options currently being examined for these units.

These land use designation options do not represent a recommendation by the Commission to lift the North Yukon Interim Land Withdrawal. Rather, they offer land use designations for consideration should the applicable authorities make the decision to lift the interim withdrawal at a future date.

5.1 Issue

The North Yukon Interim Land Withdrawal, established in 1978, removes the area described above from mineral and oil and gas disposition, and prevents exploration activities and other land uses that require the issuance of land title and permits. The withdrawal order affects approximately 13% (7,334 km^2) of the North Yukon Planning Region. As part of the North Yukon regional land use planning process, the Parties have requested that land use designation options for the Interim Land Withdrawal (LMUs #2A, 3 and 4A) be explored and recommended for future consideration.

5.1.1 Important Considerations

Similar to other areas of the planning region, providing an adequate level of conservation for the ecological and cultural values in the withdrawal area while providing for opportunities to access land and resources is a key consideration. Land claim consultation obligations, land ownership, management responsibilities, and adjacent First Nation land claim direction must also be fully considered in the evaluation of land use designation options. Section 1.6 of the Plan provides a detailed description of regional issues that are relevant to the North Yukon Interim Land Withdrawal.

- **Adjacent Land Status**. Existing management regimes in northern Yukon have a strong conservation focus. Any future land use designation options should consider adjacent land management status and objectives, specifically the Yukon North Slope management principles (Inuvialuit Final Agreement 12.(2)) and the adjacent Rat River Gwich'in Conservation Zone in NWT (Gwich'in Land Use Planning Board 2003).

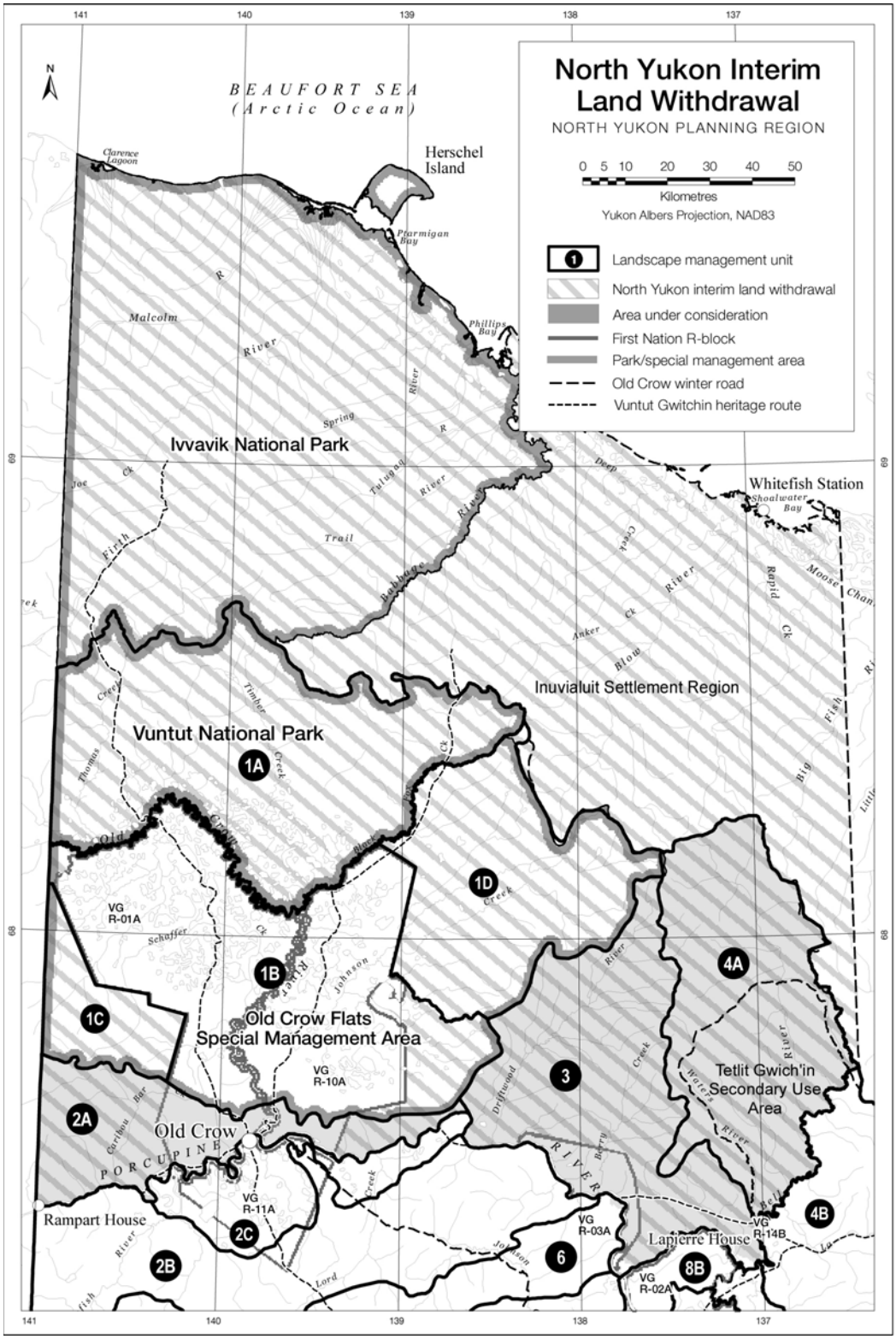


Figure A5.1. North Yukon Interim Land Withdrawal.

- **North Yukon Planning Region Land Status.** Not including the interim land withdrawal, the Plan recommends 54% of the region be designated as Integrated Management Area. Seventy-five percent of the IMA is recommended for a higher development focus (Zone III or IV). Thirty-two percent of the region has existing Protected Area status (Old Crow Flats SMA, Vuntut National Park, and Ni'iinlii'njik (Fishing Branch) Wilderness Preserve, Ecological Reserve and VG R-05A). The Plan recommends Protected Area status for an additional 1% (470 km^2) or the region (Whitefish Wetlands).

- **Land Administration.** A number of administrative boundaries affect the area, with LMU#4A (Bell River) being the most complex. Many different governments, groups and boards have management responsibilities and interests within the interim withdrawal.

- **Consultation**. As described in the North Yukon Planning Region General Terms of Reference (Yukon Land Use Planning Council, 2003), the Inuvialuit have special standing with respect to the Interim Land Withdrawal and other North Yukon Planning Region issues that may affect the Inuvialuit Settlement Region:

  GTOR Section 9.9. *Throughout the planning process the Commission will involve the Inuvialuit in the identification of regional planning issues and at all stages of the planning process where issues which may affect Inuvialuit interests on the North Slope are being discussed. If it is determined in the planning process that activities north of the Porcupine and Bell Rivers affect the interests of the Inuvialuit on the North Slope (Inuvialuit Settlement Region), they will be invited by the Commission to participate in the deliberations and decisions with respect to those activities.*

5.2 Current Situation

The North Yukon Interim Land Withdrawal was established during the Inuvialuit Final Agreement negotiations, and has been in place since 1978. The origin of the Interim Land Withdrawal began with the Berger Inquiry (Berger 1977). It was originally established under federal jurisdiction, and renewed during devolution. The interim land withdrawal applies to the northern portion of the planning region and has no time expiry (Figure A5.1 and Map 1). The withdrawal order removes this area from mineral and oil and gas disposition, and prevents exploration activities. Wildlife, tourism and recreation activities within the interim withdrawal are managed by several government and land claim boards.

5.3 Background

5.3.1 Setting

The focus of this discussion is LMUs #2A, #3 and #4A of the North Yukon Planning Region. The area under consideration is 7,334 km^2 (13% of region), including portions of three VGFN land selections, VG R-01A, VG R-10A and VG R-03A (Figure A5.1 and Map 1).

The North Yukon Interim Land Withdrawal applies to all Yukon lands north of the Porcupine River and west of the Bell River, including the Inuvialuit Settlement Region on the Yukon North Slope (Figure A5.1 and Map 1). In the North Yukon Planning Region, the interim land withdrawal affects LMU #1 (Old Crow Flats SMA), LMU #2A (Old Crow – Rampart House), LMU #3 (Driftwood River) and LMU #4A (Bell River). The withdrawal does not apply to VGFN settlement land and is of secondary importance in areas with existing National Park or Special Management Area status, as those areas are regulated by other management regimes (i.e., LMU #1, Vuntut National Park of Canada and Old Crow Flats SMA).

5.3.2 History

The origins of the interim land withdrawal began with the Berger Inquiry (Berger 1977) and negotiations leading to the settlement of the Inuvialuit Final Agreement. In Yukon, the Inuvialuit Final Agreement applies to the Yukon North Slope, which includes all lands north of the height of land dividing the watersheds of the Porcupine River and the Beaufort Sea and the nearshore islands. The Yukon North Slope is not part of the North Yukon Planning Region.

The intent of the interim land withdrawal was to allow for conservation planning, specifically for the purpose of setting aside lands required for the creation of National Parks, and the establishment of conservation areas. Porcupine Caribou Herd conservation figured prominently in its establishment.

The Inuvialuit Final Agreement was settled in 1984, and the Vuntut Gwitchin First Nation Final Agreement in 1993. Two national parks, Ivvavik and Vuntut, were created in the 1990s through co-management processes as part of the land claim agreements. Old Crow Flats SMA was created as part of the VGFN Final Agreement; a management plan for the SMA was approved in August 2006 (Vuntut Gwitchin Government and Yukon Environment, 2006).

5.3.3 Legislation

The North Yukon Interim Land Withdrawal was originally withdrawn from land disposition under the Territorial Lands Act in 1978. The withdrawal was renewed during

devolution in April 2003. Two territorial Orders in Council, OIC 2003/143 relating to surface access and disposition, and OIC 2005/53 relating to withdrawal from the *Placer and Quartz Mining Acts*, prohibit mineral exploration and development. Section 17 of the *Yukon Oil and Gas Act* also withdraws the area from oil and gas disposition.

5.3.4 Land and Resource Administration

Five governments have direct jurisdiction and interest in the current and future status of the North Yukon Interim Land Withdrawal. Yukon Government has land ownership and management responsibilities for areas outside of existing Parks, Special Management Areas and First Nation settlement land. Affected First Nations include the Vuntut Gwitchin, the Inuvialuit of the Yukon North Slope, and the Gwich'in Tribal Council in NWT. Three VGFN land selections occur in the area under consideration, VG R-01A, VG R-10A and VG R-03A. A portion of the Tetlit Gwich'in Secondary Use Area occurs in the Bell River unit (LMU #4A) and is used by residents of Aklavik and Ft. McPherson. The Government of Canada, through Parks Canada, Department of Fisheries and Oceans, and Environment Canada, Canadian Wildlife Service, have significant interests and management responsibilities in northern Yukon.

In addition to governments, land claim boards and committees including the Porcupine Caribou Management Board, the Wildlife Management Advisory Council (North Slope), North Yukon Renewable Resources Council, and Yukon Fish and Wildlife Management Board also have wildlife management interests and responsibilities.

5.4 Values Assessment

A full description of LMU #2A (Old Crow-Rampart House), #3 (Driftwood-Salmon Cache) and #4A (Bell River) is provided in Section 5 of the Plan. Maps 2 to 4 provide an overview of significant ecological, cultural and economic values and resource potential.

Briefly, outside of the major wetland complexes, LMU #2A, LMU #3 and LMU #4A contain some of the highest wildlife, fish, and cultural values in the planning region. These areas are of special significance to the Porcupine Caribou Herd; caribou can be found concentrated in these areas in all seasons, including spring calving. All units have identified or potential fish critical over-wintering habitat and salmon spawning habitat present in the major rivers and tributaries.

LMU #3 contains several important heritage resources, including Salmon Cache archaeological site and VGFN caribou fences. Lapierre House, a Yukon Historic Site, is located on the Bell River adjacent to LMU #4A. The Bell River in LMU #4A is an important First Nation and wilderness tourism summer travel corridor. LMU #4A contains significant alpine sheep populations and habitat and some of the highest moose densities in Yukon, concentrated within the river corridors. LMU #2A contains Old Crow and Rampart House Historic Site and experiences the highest level of multi-season community use in the planning region.

There is currently limited knowledge of the non-renewable resource potential in the three interim land withdrawal LMUs. Based on existing information, there appears to be limited potential for oil and gas and some potential for mineral resources, with the highest mineral potential areas located around Old Crow (Map 4). The Bell River-Summit Lake area has been noted as having high wilderness tourism potential, but due to its remoteness, currently receives a limited number of visitors. The community of Old Crow is taking steps to establish a carefully managed tourism industry based on the ecological and cultural values around the townsite. Outside of tourism interests, non-renewable economic interests in these LMUs are currently not well known.

5.4.1 Conservation Interests

In the North Yukon Planning Region, most of the Interim Land Withdrawal covers Old Crow Flats SMA, including Vuntut National Park of Canada (Figure A5.1). These areas have been recognized by numerous previous conservation proposals, as reflected by their current Protected Area/Special Management Area status.

Conservation interests within the interim land withdrawal outside of Old Crow Flats SMA have focused on the Bell River-Summit Lake-Rat River area of the northern Richardson Mountains (Figures A5.2 and A5.3). Three past conservation assessments led to the identification of Bell River-Summit Lake-Rat River as an area of conservation interest. In 1989, a review of International Biological Programme sites in Yukon was completed, reconfirming the significance of the Bell River-Summit Lake area (DIAND 1989). In 1993, the Yukon Parks System Plan identified Summit Lake as one of four areas of interest in the planning region (Yukon Department of Renewable Resources, 1993). In 1997, building on earlier work of the Mackenzie Delta Beaufort Sea Planning Commission, the Gwich'in Land Use Planning Board recognized the significance of Rat River and Summit Lake (Gwich'in Land Use Planning Board 1997). There is currently no formal conservation designation for this area.

5.4.2 Economic Interests

The area under withdrawal is not currently available for rights issuance or non-renewable resource land uses, potentially impacting future economic opportunities in the region. Given the long-term standing and uncertain status of the interim land withdrawal, there is a relatively low level of direct economic development interests in the area at present. The entire area, especially LMU #3 and #4A, is very remote. In Yukon, the Old Crow winter road provides the only surface access option. Non-renewable resource potential is generally considered to be low, but is based on limited information. Levels of tourism and recreation are currently low, with most interests focused on the Summit Lake area. First Nations traditional economic activities occur throughout the area under consideration.

Figure A5.2. Bell River corridor, Northern Richardson Mountains. Photo: V. Loewen, Yukon Government.

Figure A5.3. Summit Lake, Northern Richardson Mountains. Photo: V. Loewen, Yukon Government.

Two large-scale economic development interests require consideration:

Northern Richardson Mountains Transportation/Infrastructure Corridor

- Previous studies have suggested a conceptual transportation infrastructure corridor through the Northern Richardson Mountains, providing access to Yukon North Slope shipping opportunities at Kings Point (e.g., Access Consulting Group, 2003). However, it is the perspective of the Commission and recent port and rail assessments (KPMG and Gartner Lee Ltd., 2007) that port access at Kings Point on the Yukon North Slope is an unlikely scenario in the coming decades. The need for a potential infrastructure access corridor, connecting from the Dempster Highway and running north through the Bell River valley to the Yukon North Slope, would not be required.

Hydroelectric Potential

- In the 1960s, the Northern Canada Power Commission identified the Summit Lake-Bell River area as a potential large-scale hydroelectric site. This notation was based on a preliminary assessment, and the area has not received additional assessment since that time. Given remoteness and distance to major markets and transmission systems, it is unlikely that large-scale hydroelectric potential of Summit Lake – Bell River would be developed in the coming decades. The Rat River Gwich'in Conservation Zone in NWT prohibits infrastructure access to the Summit Lake area from NWT communities.

5.5 Land Use Designation Options for Future Consideration

Land use designation options currently being considered by NYPC for the interim land withdrawal are described below. Options are presented and discussed for individual landscape management units. All options have a high or moderate level of conservation focus. Each option was developed using the same resource assessment information, criteria and approaches applied to other areas of the planning region.

It is important to recognize that these options do not represent a recommendation by the Commission to lift the interim withdrawal. They offer land use designations for consideration should the applicable authorities make the decision to lift the interim withdrawal at a future date.

5.5.1 Old Crow – Rampart House (LMU #2A)

LMU #2A, 'Option A':
Integrated Management Area, Zone II

Analysis

- IMA Zone II designation would provide opportunities for carefully managed resource exploration and development activities in proximity to Old Crow.
- Land use thresholds and other recommendations of the Plan would provide guidance on acceptable levels, timing and locations of activities.
- Conservative land use thresholds (0.2% and 0.2km/km^2) would minimize potential long-term impacts of industrial activities.
- See Section 5 for additional recommendations specific to LMU #2A

Discussion

Establishing an IMA Zone II designation around Old Crow would allow for an increased level of economic activity in proximity to the community. Portions of two VGFN Category A land selections, R-01A and R-10A, ensure that the Vuntut Gwitchin Government would maintain control of any surface access or sub-surface rights. The Old Crow Community Area (proposed), extending out to a distance of 5 km on the north bank of the Porcupine River, would be within VG R-01A and R-10A.

Potential land use activities in this area would be wilderness and cultural tourism, mineral exploration/development and gravel extraction, with the long-term possibility of oil and gas-related activities. The Old Crow winter road provides winter access to this area from the Dempster Highway. Section 5.3 of the Plan lists a number of specific management considerations for this LMU, were the interim land withdrawal to be lifted at a future date.

LMU #2A, 'Option B':
Integrated Management Area, Zone III

Analysis

- IMA Zone III designation would provide opportunities for carefully managed resource exploration and development activities in proximity to Old Crow.
- Land use thresholds and other recommendations of the Plan would provide guidance on acceptable levels, timing and locations of activities.

- Moderately conservative land use thresholds (0.5% and 0.5km/km^2) would minimize long-term impacts of industrial activities but pose potentially higher risks to focal species and cultural resources and activities than Zone II designation.
- See Section 5 for additional recommendations specific to LMU #2A

Discussion

The same considerations presented for Option A of LMU #2A are relevant for this IMA Zone III land use designation option. Higher surface disturbance and linear density thresholds would potentially pose higher risks to focal species and cultural resources and activities than Zone II designation.

5.5.2 Driftwood River (LMU #3)

LMU #3:
Integrated Management Area, Zone II

Analysis

- IMA Zone II designation would provide opportunities for carefully managed resource exploration and development activities.
- Land use thresholds and other recommendations of the Plan would provide guidance on acceptable levels, timing and locations of activities.
- Conservative land use thresholds (0.2% and 0.2km/km^2) would minimize potential long-term impacts of industrial activities.
- See Section 5 for additional recommendations specific to LMU #3

Discussion

At this time, the Commission has not developed other land use designation options for the Driftwood River area. An IMA Zone II designation is considered to be consistent with appropriate conservation of the ecological and cultural values in the unit. Future potential land use activities in this unit are uncertain. Based on existing information, most of LMU #3 is considered to have low or very low oil and gas and mineral potential. Not including the Porcupine River Corridor, tourism and recreation potential is also considered to be low. The Old Crow winter road provides potential winter access to this area from the Dempster Highway.

5.5.3 Bell River (LMU #4A)

The land use designation concept for the Bell River unit (LMU #4A) is to create a Protected Area/conservation corridor extending from Summit Lake – Rat Pass southwest to Whitefish Wetlands (LMU #8). The proposed land use designation recommendations for Whitefish Wetlands (Protected Area and IMA Zone I) are consistent with this concept. A Protected Area designation centered on Summit Lake would compliment the existing Rat River Gwich'in Conservation Zone in NWT, and provide formal conservation designation for this important area within Yukon.

Figures A5.4 and A5.5 illustrate the current land use designation concepts for this area. NYPC has not performed detailed boundary delineation work for the options. 'Option A' and 'Option B' should currently be viewed as conceptual – they should not be interpreted as formal conservation area proposals. Map 51 of North Yukon Planning Region Resource Assessment Report (North Yukon Planning Commission, 2007b) illustrates previous conservation interests in the Summit Lake-Bell River area. Maps 2-4 of the Plan provide an overview of the significant ecological, cultural and economic values and resource potential to support this preliminary delineation of this area of conservation interest.

Both of the land use designation options discussed below would require modification of the proposed Plan LMU #4 boundaries (LMU #4A and #4B), but would still be considered as part of the Northern Richardson Mountains and Foothills landscape management unit.

LMU #4A, 'Option A':
Summit Lake Protected Area; Bell River Corridor Integrated Management Area, Zone I; Northern Richardson Mountains Integrated Management Area, Zone II

Analysis

- This option is shown in Figure A5.4
- The Summit Lake area has been identified through four conservation assessments, including NYPC, as one of most important ecological and cultural areas in the region.
- Protected Area designation is consistent with the adjacent NWT Rat River Gwich'in Conservation Zone.
- Zone I designation for Bell River recognizes concentrated wetland habitats in vicinity of Lapierre House, and provides linkage with IMA Zone I area of Whitefish Wetlands complex (LMU #8C, Eagle-Bell River).

- Zone II designation for remainder of unit provides opportunities for carefully managed resource exploration and development activities. In Zone II, land use thresholds and other recommendations of the Plan would provide guidance on acceptable levels, timing and locations of potential activities. Conservative land use thresholds (0.2% and 0.2km/km^2) would minimize potential long-term impacts of industrial activities.

- See Section 5 for additional recommendations specific to LMU #4 and the Summit Lake-Bell River corridor

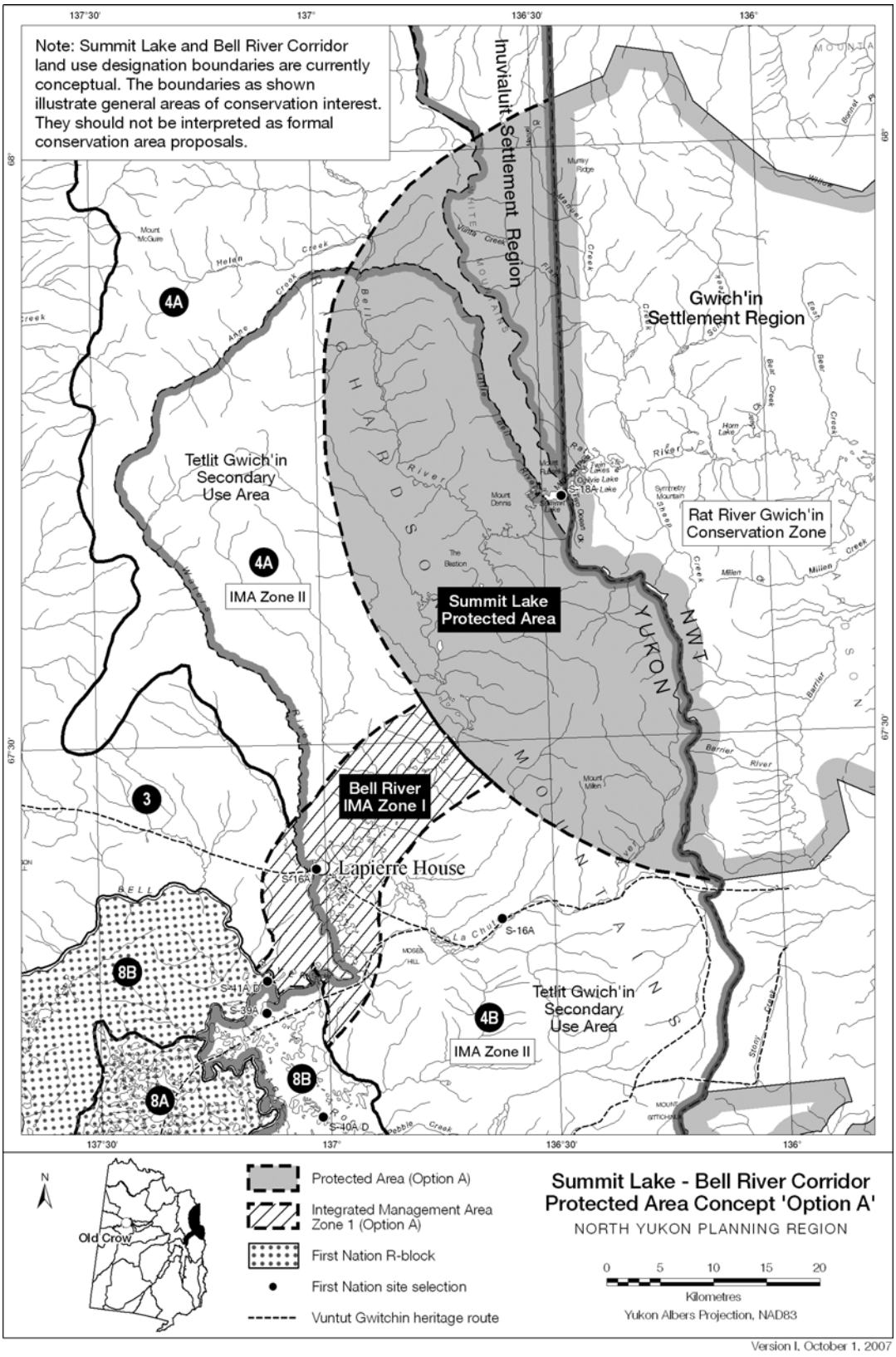


Figure A5.4. Option A – Summit Lake Protected Area Concept. The Illustration Represents a General Area of Interest for Discussion Purposes.

LMU #4A, 'Option B':
Summit Lake-Bell River corridor Protected Area; Northern Richardson Mountains Integrated Management Area, Zone II

Analysis

- This option is shown in Figure A5.5
- This option differs from LMU #4A 'Option A' in that the entire Summit Lake – Bell River corridor would be designated as Protected Area.
- As stated above, Zone II designation for remainder of the unit provides opportunities for carefully managed resource exploration and development activities.
- See Section 5 for additional recommendations specific to LMU #4 and the Summit Lake-Bell River corridor

Discussion

The two options presented attempt to provide a balance between long-term protection for a portion of the area, while providing opportunities for carefully managed access to land and resources. While balanced land use may be an important regional goal, conservation objectives should receive priority in the Summit Lake – Bell River area. Maintaining the long-term ecological integrity and cultural values of the Northern Richardson Mountains requires managing the entire area with a high level of conservation focus. This management intent is consistent with adjacent land management regimes.

Given the importance of this area to the Porcupine Caribou Herd, the abundance and diversity of large mammals, the known heritage and cultural values, the natural and un-impacted state of the land, and the wilderness tourism and recreation potential, a Summit Lake – Bell River conservation proposal should be considered during future land use designation discussions for LMU #4A.

Any formal conservation designation for the Summit Lake area would likely include both the Vuntut Gwitchin and Inuvialuit settlement areas, and the Tetlit Gwich'in Secondary Use Area (Figures A5.4 and A5.5). All of these administrative boundaries, plus the Yukon-NWT border, transect the area of interest.

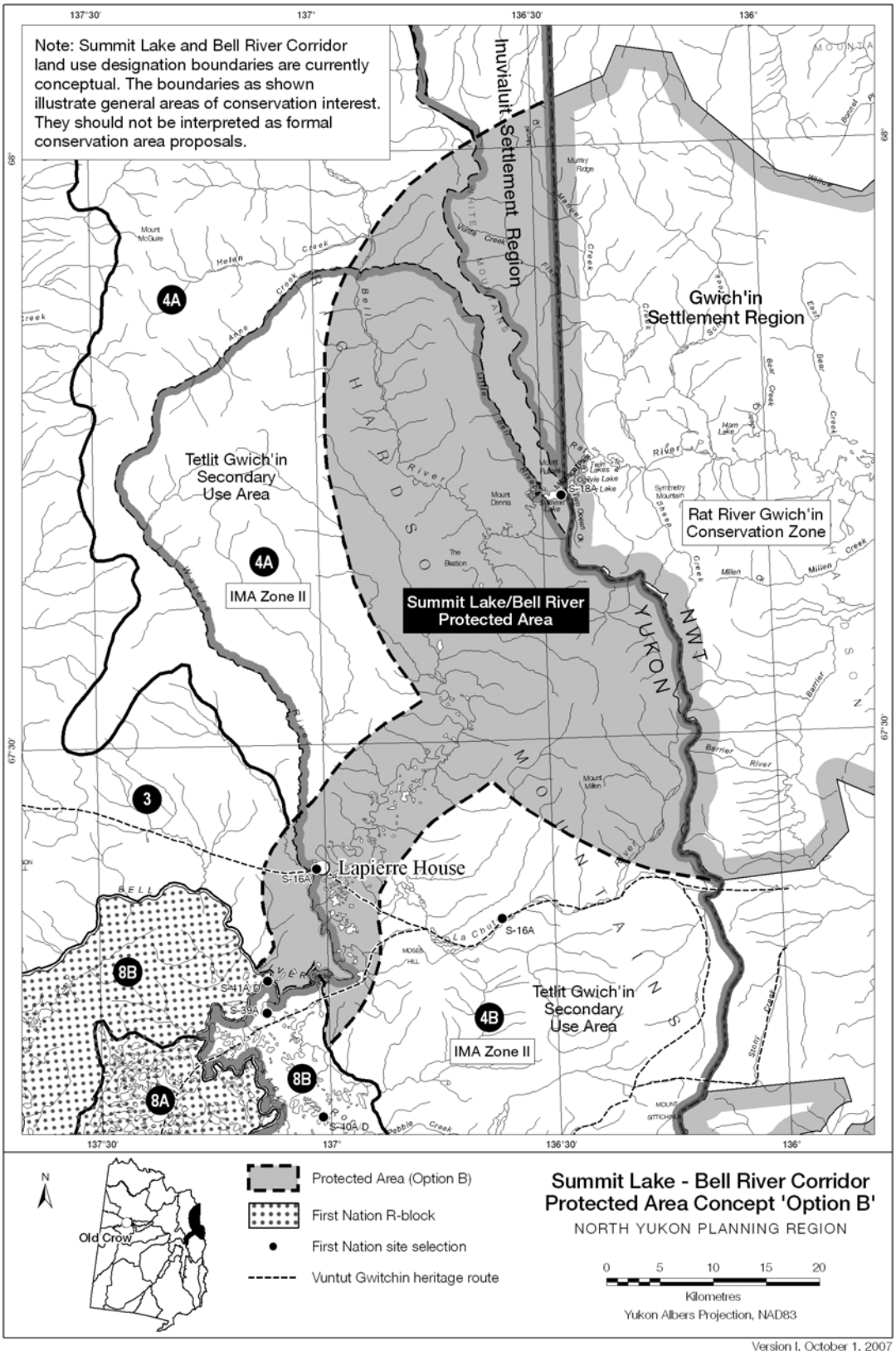


Figure A5.5. Option B – Summit Lake-Bell River Protected Area Concept. The Illustration Represents a General Area of Interest for Discussion Purposes.

5.6 Recommended Next Steps

5.6.1 Consultation

- During the Draft Plan public review period, NYPC will gather the perspectives of government, local land users, other stakeholders and the public on the land designation options being considered for the North Yukon Interim Land Withdrawal.

- NYPC will solicit comments and feedback from the Inuvialuit, consistent with the Commission's consultation requirements listed under Section 9.9 of the North Yukon Planning Region General Terms of Reference (Yukon Land Use Planning Council, 2003).

- NYPC will consider the comments received during the Draft Plan public review to determine recommended land use designations for the North Yukon Interim Land Withdrawal.

- It is important to recognize that any recommended land use designation does not represent a recommendation by the Commission to lift the interim withdrawal. It is provided for future consideration by the Parties. If a formal review of the status of the North Yukon Interim Land Withdrawal is to be initiated, it will be conducted by the applicable Parties through a separate process.

5.6.2 Additional Considerations

- The Draft North Yukon Regional Land Use Plan is introducing relatively new management concepts to the Yukon. The proposed land use designation system is new. The Plan also recommends a results-based management framework that incorporates cumulative effects management concepts, including land use thresholds. The Parties should consider an evaluation of the effectiveness of the proposed tools within the Integrated Management Area for the remainder of the North Yukon Planning Region, prior to applying them to all or portions of the North Yukon Interim Land Withdrawal.

- Heritage and cultural resource assessments conducted in support of the Plan focused on Old Crow information gathering. Where available, NYPC considered heritage and land use information from other affected First Nations, with special consideration of Tetlit Gwich'in information in the Secondary Use Area. At this time, the heritage, cultural and current land use information used to develop land use designation concepts for the Northern Richardson Mountains may not be complete.

Appendix 6 – Plan Variance, Amendment and Review

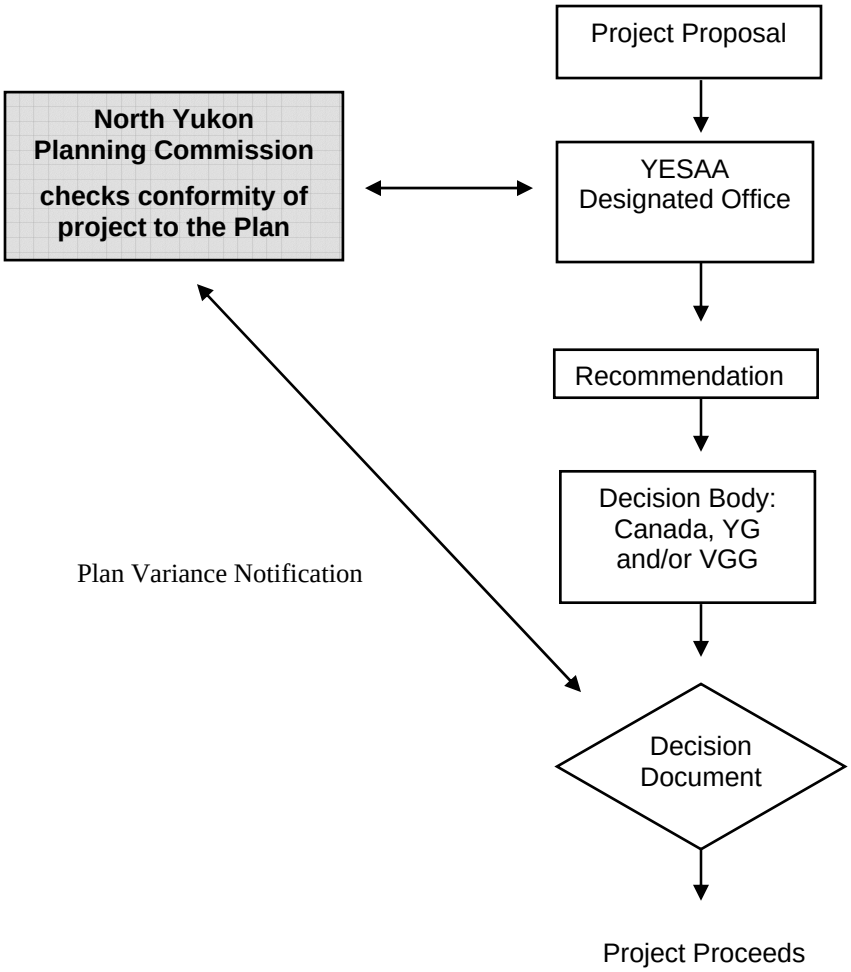
The VGFNFA provides opportunities for changes to the Plan once it is approved. VGFNFA and YESAA legislation clearly describe the Plan Variance process, but are less clear on Plan Amendment and Plan Review processes. This appendix considers potential mechanisms and approaches to changing the Plan.

6.1 Plan Variance

Plan Variances are for smaller individual projects that do not conform to the Plan and that are assessed through the Yukon Environmental and Socio-Economic Assessment (YESAA) process. Plan Variances are granted only to projects that are small enough to be processed through a YESAA Designated Office Evaluation. Figure A6.1 outlines the general process identified under section 12.17.0 of the VGFNFA.

The Commission's only role in the Plan Variance process is to identify that the proposed project is not in conformity with the Plan. Once this is done, the YESAA Designated Office is required to recommend ways in which the project could be made to conform to the Plan in its Recommendation Document (VGFNFA clause 12.17.3). It is the final responsibility of the Yukon or Vuntut Gwitchin governments to accept or reject the proposed Plan Variance and to notify the Commission as to their decision.

The Plan Variance Process



Note:
Larger projects associated with a YESAB Screening or Review would not be considered for Plan Variance. Instead, they would require a Plan Amendment if determined to not be in conformity with the Plan.

Estimated timeframe for Plan Variance decisions would follow those associated with the Designated Office Evaluation timelines (see YESAB Process Chart).

Figure A6.1. The Plan Variance Process.

6.2 Plan Amendment

A **Plan Amendment** is needed when a land management strategy or strategies in the Plan require revision or alteration. Three actions can occur with a Plan Amendment:

- Redefining (re-writing) a management strategy and associated action;
- Removing a management strategy and associated action; or,
- Adding a new management strategy and associated actions.

Plan Amendments may be required in the following situations:

- When repeat decisions by Yukon and/or the Vuntut Gwitchin governments allow a recurring Plan Variance;
- When a recommendation is submitted by the NYPC, Yukon or Vuntut Gwitchin governments. The submission could be as a result of public or stakeholder input, or derived from the ongoing monitoring, collection and analysis of regional information (see Section 6.1 of the Plan); or,
- When Yukon or Vuntut Gwitchin governments allow a large-scale, non-conforming project that is associated with a YESAB Executive Screening, YESAB Panel Review or similar project decision-making process (e.g. *Canadian Environmental Assessment Act*).

The process for amending the Plan is similar to that which was followed in creating the Plan (Figure A6.2). Proposed amendments are submitted to the NYPC. The NYPC is bound to make a recommendation on those amendments submitted by the Yukon Government (for public land) or the Vuntut Gwitchin Government (for VGFN settlement land) but is not bound to make a recommendation if the amendment was presented by the public or stakeholders.

The NYPC considers and prepares a recommendation on the amendment for submission to the Yukon or Vuntut Gwitchin governments. The Parties then approve, modify or reject the amendment.

There is a public and stakeholder notification procedure required with all Plan Amendments. The details of this step would be determined by the Commission and parties but involves, at a minimum, placing newspaper notifications, sending letters and e-mails to stakeholders, posting on websites and using other mass communication tools (e.g., radio).

The notification should include:

- A brief explanation of the amendment concept and process;
- The time, place and date of the Commission meeting at which the recommendation is to be considered; and,
- How comments can be submitted to the Commission.

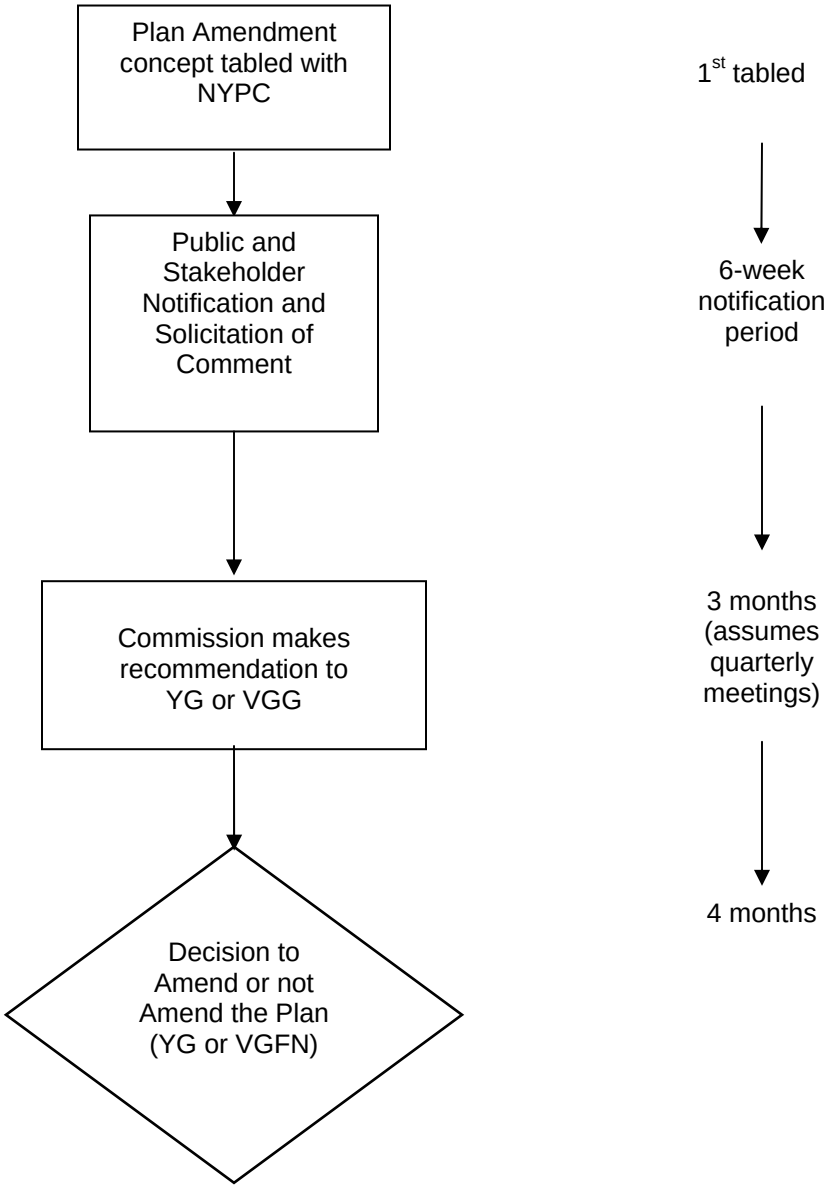


Figure A6.2. The Plan Amendment Process.

If the origin of the amendment is a project stemming from a YESAB Executive Committee screening or YESAB Panel Review, the amendment process will fall within the timeline established by the YESAA process (see YESAB process chart). Other amendments would require a minimum of two Commission meetings before a recommendation is made by the Commission to the Yukon or Vuntut Gwitchin governments.

6.3 Plan Review

Land use planning is a continuous cycle where an influx of up-to-date information and current issues are always being considered in the context of making long-term land management decisions. **Plan Reviews** are a comprehensive examination of the success of the Plan and involve modification of the Plan to reflect changing land status or conditions within the region. The NYPC anticipates that the Plan will be revisited and updated based on an agreed-upon schedule with the Parties, or whenever the Yukon and Vuntut Gwitchin governments agree a Plan review is required[1].

The Plan Review is an opportunity to make changes and evaluate the success of the Plan in meeting its goals and objectives. Major land decisions such as those regarding Protected Areas or Integrated Management Area land use designations may also require attention. Changes to the Plan should be expected, as the NYPC will periodically monitor land use information and issues throughout the life of the Plan. Completion of research priorities identified in Section 6.3 of the Plan can also improve the information base necessary to guide decision-making during Plan Review.

The Plan Review should assess:

- If the Plan met the principles, goals and objectives as outlined in Section 1 of the Plan;
- If the implementation actions were carried out and if there were successes, failures, or omissions;
- The number and nature of requests for Plan Variance and their potential implication to the Plan; and,
- The accuracy of information and forecasts used to develop the Plan.

It is recommended that an evaluation of the success of the Plan, and the general state of the region, should be conducted within the context of a Sustainable Development framework. Table A6.1 provides a list of relevant regional Sustainable Development Indicators for consideration during a Plan review. Relevant social and economic

[1] The time the plan is to be in effect (the 'life of the Plan') and a Plan Review schedule will be determined by the Parties during the Plan approval process

indicators are generally tracked through readily available statistics reported by existing agencies/reporting structures. Terrestrial and aquatic habitat-related regional indicators are not currently tracked but would be supported through annual indicator status tracking, in support of the proposed results-based management framework. Baseline conditions for these indicators should be established upon Plan approval (see Section 6.2).

As part of the Plan Review, there will be a consultation process. Communities, approval agencies, stakeholders and other groups will be solicited for feedback on the effectiveness of the Plan in meeting management objectives, addressing land use issues and meeting the terms of the VGFNFA.

In advance of the Plan Review, the Commission will outline its review process. The review process will take no longer than one year and the Approval Process will follow that of the original plan, as outlined in Section 11.6.0 of the VGFNFA.

Table A6.1. Proposed Regional Sustainable Development Indicators.

Indicator-Type	Indicator	Indicator Status	Description
Socio-Economic	**Old Crow Population**	270 people (2005 census)	Provides measure of Old Crow population trend – reflective of general social and economic conditions. Reported by Yukon Bureau of Statistics.
	Old Crow resident time-on-the-land	From ABEKC report	Provides measure of resident participation in subsistence economy and traditional pursuits. Reported by Arctic Borderlands Ecological Knowledge Co-op (ABEKC).
	Availability of Current Use Areas	From VGG Natural Resources Dept.	Provides measure of loss/gain of areas currently used for subsistence harvesting and cultural purposes due to other land use activities. Not currently reported but collected for North Yukon regional land use plan.
	Number of Old Crow residents receiving social assistance	From VGG Social Services	Provides measure of 'self-sufficiency' of individuals – reflective of general social and economic conditions. Reported by VGG Social Services.
	Median Household Income	$28,224 (120 households)	Provides measure of household monetary wealth / wage income. Reported by Canada Census.
	Median Individual Income for Women	$14,667 (105 females)	Provides measure of individual female (15 yrs and older) monetary wealth / wage income. Important to track female vs. male income levels to establish gender equity. Reported by Canada Census.
	Median Individual Income for Men	$15,232 (105 males)	Provides measure of individual male (15 yrs and older) monetary wealth / wage income. Reported by Canada Census.
Ecological	**Porcupine Caribou Herd population status**	Estimated at 100,000 animals	PCH is the most important ecological and social value to Vuntut Gwitchin residents. Barren ground population declines in neighbouring herds are being experienced. Reported by YG/US Fish and Wildlife Service/PCMB.
	Regional habitat integrity	From NY Resource Assessment Report	Regional assessment of terrestrial habitat conditions, including "hot spot" identification. Not currently reported – supported by annual Indicator Status tracking.
	Landscape Management Unit habitat integrity	From NY Resource Assessment Report	Assessment of terrestrial habitat conditions by LMU. Not currently reported – supported by annual Indicator Status tracking.
	Regional aquatic habitat integrity	From NY Resource Assessment Report	Regional assessment of aquatic habitat conditions, including "hot spot" identification. Not currently reported – supported by Future annual Indicator Status tracking.
	Landscape Management Unit (or watershed) aquatic habitat integrity	From NY Resource Assessment Report	Regional assessment of aquatic habitat conditions by LMU or watershed. Not currently collected – supported by Future annual Indicator Status tracking.