

Dawson Forest Resources Management Plan

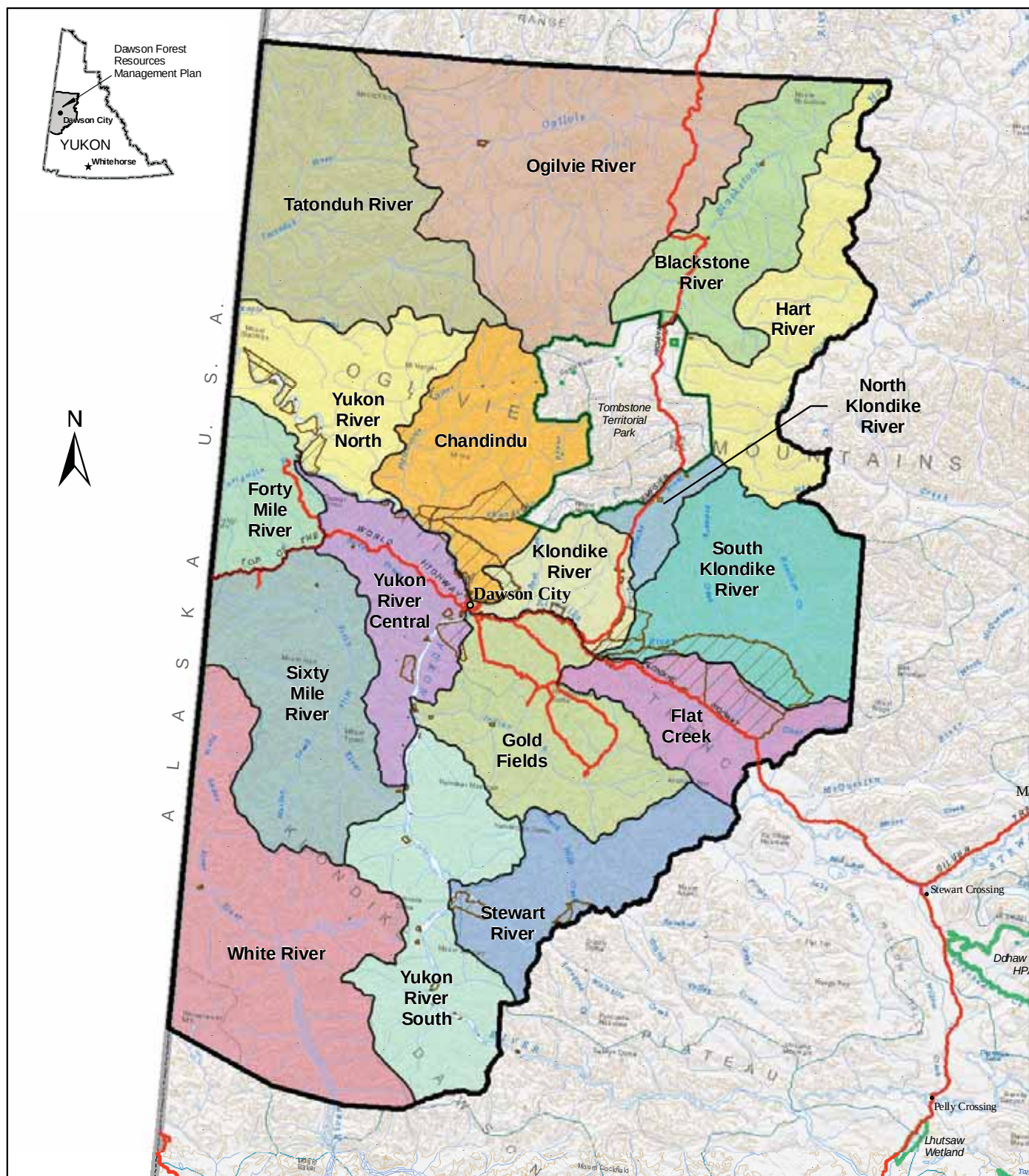


Draft for Review – October 2009



Prepared by the Dawson Forest Management Planning Team

MAP 1 LANDSCAPE UNITS



DAWSON FOREST RESOURCES MANAGEMENT PLAN	Legend - Dawson Forest Resources Management Plan - Landscape Units - Trondëk Hwëch'in Settlement Land - Parks and Protected Areas - Road	0 10 20 40 Km North American Datum 1983 UTM Zone 8N 1:1,500,000
Landscape Units		Yukon Energy, Mines and Resources Énergie, Mines et Ressources Forest Management Branch Yukon Territory
April 2009		

This draft of the *Dawson Forest Resources Management Plan* attempts to represent a range of interests and uses of forest resources in the forest management planning region. The plan attempts to provide opportunity for continued forest industry development while managing related conflicts.

The plan has been prepared by the Dawson Forest Management Planning Team, a joint planning committee with equal representatives from Tr'ondëk Hwëch'in and Government of Yukon. The plan covers both settlement and non-settlement land. The planning team consist of:

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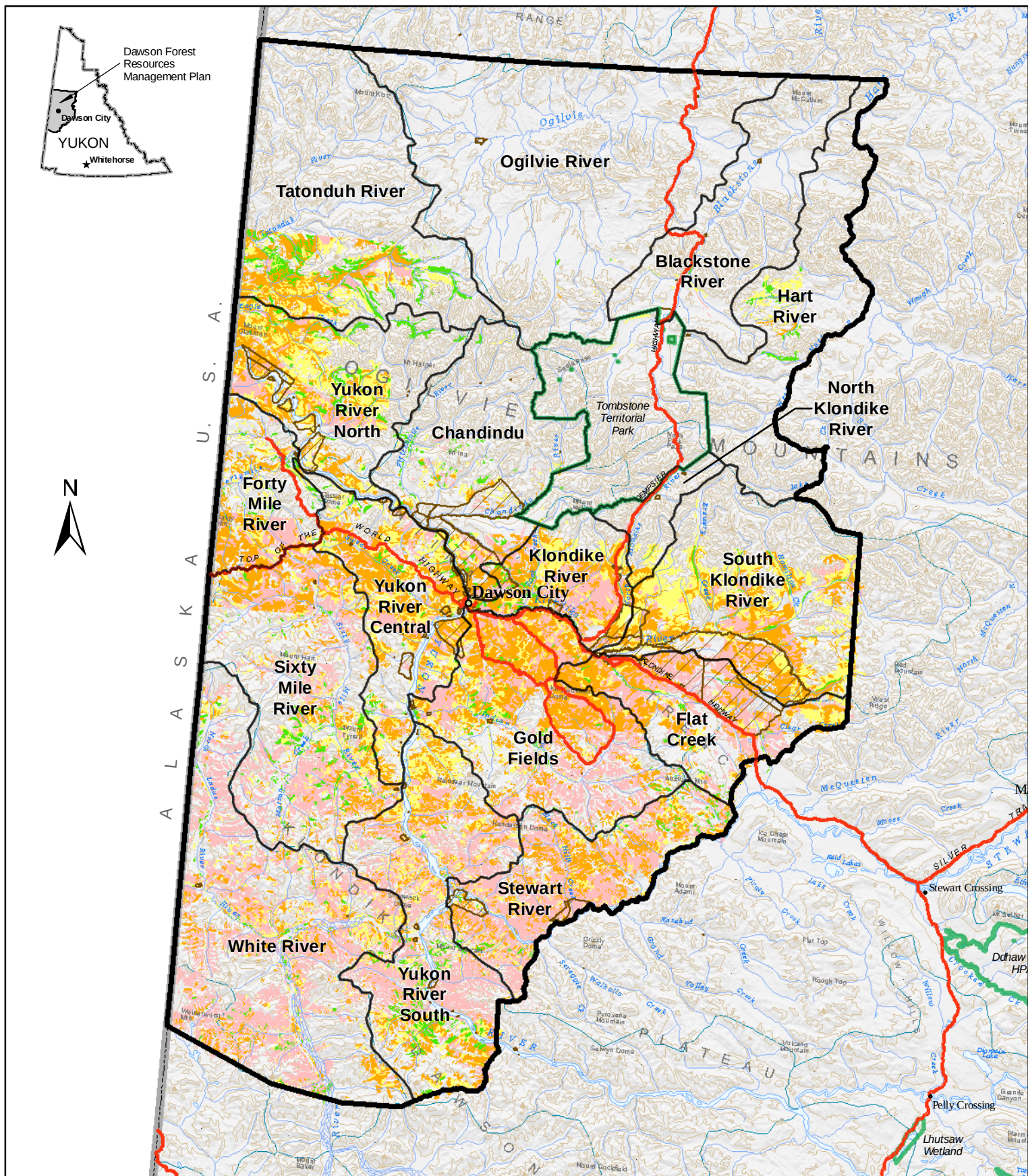
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Log home building by Arctic Inland. Photo: Arctic Inland





DAWSON FOREST RESOURCES MANAGEMENT PLAN

Seral Stage

April 2009

Seral Stage

- Early Seral (10 to 50yrs)
- Mid Seral (50 to 90)
- Mature Seral (90 to 130)
- Old Seral (130 yrs +)

Legend

- Dawson Forest Resources Management Plan
- Landscape Units
- Tr'ondëk Hwëch'in Settlement Land
- Parks and Protected Areas
- Road

0 10 20 40
Km

North American Datum 1983
UTM Zone 8N 1:1,500,000

Yukon
Energy, Mines and Resources
Énergie, Mines et Ressources

**Forest
Management
Branch
Yukon Territory**

DAWSON FOREST RESOURCES MANAGEMENT PLAN DRAFT FOR REVIEW

1. INTRODUCTION

1.1 PURPOSE

The purpose of the Dawson Forest Resources Management Plan (FRMP) is to provide a framework for the sustainable management of a forest-based economy in the Dawson forest planning region. This plan is intended to provide a clear framework and practical guidance for forest managers and planners to protect and integrate ecological, traditional, resource, heritage, and other community values. As stipulated in Chapter 17 of the Tr'ondëk Hwëch'in (TH) Final Agreement, the FRMP identifies and provides recommendations to address the issues, concerns, values, and interests as forest resource development progresses in the region.

The intended outcomes of the Dawson FRMP are to: 1) identify the key forest resource-related issues in the region; 2) identify the potential land base for forest development; 3) identify strategic directions for forest management; and 4) produce a framework of goals, objectives and indicators to guide forest resource development in the region and monitor the results.

In developing this plan, the Dawson Forest Management Planning Team has considered the values and views of the region's residents, the Tr'ondëk Hwëch'in, the Dawson District Renewable Resources Council (DDRRC), and the Yukon Government (YG), as well as Yukon non-governmental organizations and other stakeholders. Views and values regarding forest management, including forest harvesting, have been solicited through consultation and public meetings.

1.2 THE NEED AND THE CHALLENGE

Traditional economic activities have been and remain an important use of forest resources. Fishing, hunting, berry gathering, and small game trapping are important activities that require consideration in forest resources planning. In addition to resource values, forests in the Dawson region provide significant ecological and aesthetic values, cultural and heritage values, recreational values, and other non-timber values.

The 1898 Gold Rush brought an increase in small scale timber harvesting and milling, with cabin logs being cut and sold to the wave of prospectors arriving in Dawson City. Timber was also harvested for steamer fuelwood, mining and construction of houses and boats. With a current, annual harvest of approximately 3000 to 4000 m³, small scale forestry continues to contribute to the local Dawson economy.

Forestry is necessarily a small scale industry in the Dawson region as forest productivity is limited by the cold climate and short growing season. With careful management however, Dawson's forests can sustain a vibrant, small scale forest industry that provides timber for local markets, energy, economic opportunity, and employment for the region's residents over the long-term.

Forest resources planning brings with it the opportunity to support local economic development and to encourage investment in the Dawson region. Forest resources planning also responds to local interests in securing access to the forested land-base and facilitates longer term forest tenure.

1.3 PLANNING REGION AND TIME FRAME

The Dawson FRMP planning region is located in the north-central Yukon Territory. It includes all public and settlement (First Nation) forest lands within the Tr'ondëk Hwëch'in Traditional Territory, including a portion of those lands that overlap with the First Nation of Nacho Nyäk Dun (NND) Traditional Territory. The management responsibility and boundary of the FRMP is consistent with the Sharing Accord between the First Nation of Nacho Nyäk Dun and Tr'ondëk Hwëch'in signed July 26, 2006. The region covers approximately 34,000 km² of land, including forested areas, tundra, rivers, lakes, wetlands, rock, and human developments. This area includes most of the Y11 Forest Management Unit.

The FRMP has been developed with a 20-year planning horizon. It should be reviewed and updated whenever necessary to accommodate major and unforeseen changes in the forested landscape. A review should occur every 10 years. Revisions may also be necessary based on the results of monitoring. To provide for the long-term sustainability of the region's forests and the needs of future generations, the planning timeline for some values, such as timber resources, is two stand rotations (200 to 300 years).

A stand rotation is defined as one cycle of the predicted number of years between the start of a forest stand from seedlings to when that stand is harvested at a specified stage of maturity.

1.4 PLANNING REGION DESCRIPTION

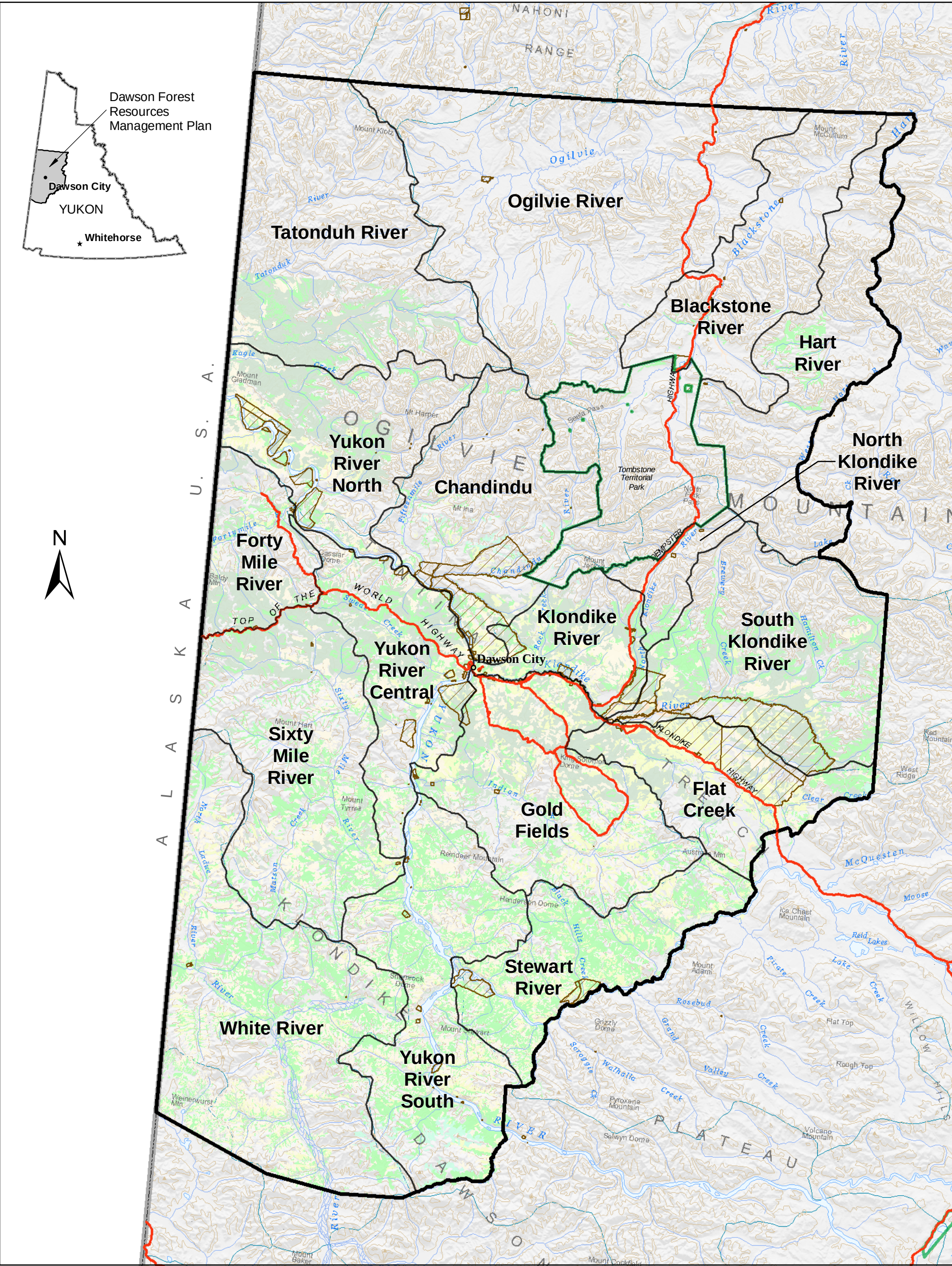
1.4.1 Land

The Dawson forest planning region encompasses diverse landscapes (Figure 1), including the mainly forested boreal cordillera ecozone in the south, and the mainly un-forested taiga cordillera ecozone in the north. Within the planning area, the boreal cordillera ecozone encompasses the Yukon Plateau-North, Yukon Plateau-South, and Klondike Plateau ecoregions. The taiga cordillera ecozone encompasses the Mackenzie Mountains and North Ogilvie Mountains ecoregions.

Yukon Plateau-North - The terrain in this ecoregion includes rolling uplands and nearly level tablelands dissected by deeply cut, broad, U-shaped valleys. The Tintina Trench, a straight, steep-sided valley ranging from five to 22 km wide, traverses the

Block harvested by Arctic Inland 1985. Photo: Government of Yukon





DAWSON FOREST RESOURCES MANAGEMENT PLAN	Forest Cover - Leading Species - Alpine Fir - Balsam Poplar - Black Spruce - Larch - Lodgepole Pine - Trembling Aspen - White Birch - White Spruce	Legend - Dawson Forest Resources Management Plan - Landscape Units - Tr'ondëk Hwëch'in Settlement Land - Parks and Protected Areas - Road	0102040 Km North American Datum 1983 UTM Zone 8N 1:1,000,000	Yukon Energy, Mines and Resources Énergie, Mines et Ressources Forest Management Branch Yukon Territory
Forest Cover by Leading Species				
April 2009				

ecoregion from southeast to northwest. White spruce in a matrix of dwarf willow, birch, shrubs, and occasionally lodgepole pine, forms extensive open forests, particularly in the northwestern portion of the ecoregion. Black spruce, scrub willow, birch, and mosses are found on poorly drained sites. Shrub birch occurs with scattered subalpine fir and white spruce in subalpine areas, whereas alpine vegetation consists of mountain avens, dwarf willow, low shrubs, and mosses.

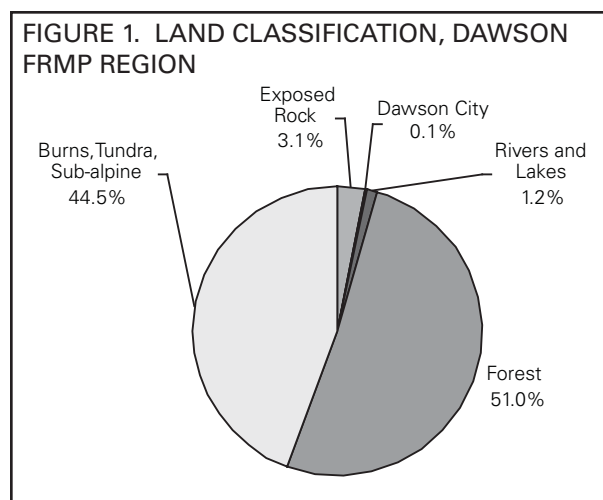
Yukon Plateau-Central - Only a portion of the planning region north of the Stewart River is located in this ecoregion. The ecoregion is composed of several groups of rolling hills and plateaus separated by deeply cut, broad valleys. White and black spruce form the most common forest types. Black spruce is usually dominant in wetter areas. Lodgepole pine frequently invades burnt-over areas and very dry sites. Alpine fir occasionally forms the treeline, but is sparse and is usually associated with white spruce, or occasionally with paper birch. Sedge tussocks and/or sphagnum are common in wetlands. Scrub birch and willow occur in subalpine sections that extend up to the treeline. A significant vegetative feature of this ecoregion is the presence of extensive grasslands on all low-elevation, south-facing slopes. The forests experience frequent natural fires, such that early seral communities are most common.

Klondike Plateau - This is the largest ecoregion represented in the planning area. The characteristic terrain features of this ecoregion include smooth, unglaciated, rolling plateau topography with moderate to deeply incised valleys, and large structural basins composed of level to undulating glaciated terrain. Open black and white spruce forests with aspen and occasionally lodgepole pine are most prevalent in the warmer boreal sections. Black spruce and paper birch prevail on slopes underlain by permafrost. Balsam poplar occurs along floodplains. Shrub birch and willow form extensive stands in subalpine sections from valley bottoms to well above the treeline.

Mackenzie Mountains - The ecoregion is characterized by rugged mountains, alpine tundra at upper elevations and subalpine open woodlands at lower elevations. Alpine vegetation consists of lichens, mountain avens, intermediate to dwarf birch, sedge, and cottongrass in wetter sites. Subalpine

vegetation consists of discontinuous open stands of stunted white spruce and occasional alpine fir in a matrix of willow, dwarf birch, and Labrador tea.

North Ogilvie Mountains - Except for a few higher mountain summits, the terrain in this ecoregion consists of flat-topped and rounded hills, which are eroded remnants of a former plain. Open white spruce grows in a matrix of dwarf birch and willow, with a ground cover of moss and lichen in more protected subalpine sections of this ecoregion. Paper birch can form extensive communities on lower-elevation and mid-slope terrain. Many of the mountain slopes, particularly steeply-sloping rock outcrops, are largely devoid of vegetation.



1.4.2 Hydrology

The majority of the FRMP region falls within the Yukon River watershed, with a small component extending into the Peel River watershed. With fewer lakes as compared to other regions of the Yukon, the Dawson planning region is characterized largely by its rivers. There are several navigable rivers in the region, the main ones being the Yukon, Klondike, Forty Mile, White and Stewart rivers. Wetlands are also a common landscape feature along rivers, plateaus and tundra flats.

1.4.3 Topography

Deep, narrow river valleys, plateaus, and higher mountain ranges characterize the topography of the region. As the easternmost portion of Beringia, much of the region escaped the last period of glaciation. This unglaciated terrain has experienced long periods of soil weathering, creating smooth ridge tops, deep, narrow valleys, and vast upland boulder fields. Outside of Beringia, the Cordilleran glaciation shaped the landforms, surficial geology and soils of the region over 10,000 years ago. The major valleys and low uplands were significantly eroded by this ice sheet.

The lowest elevations in the region are found in the V-shaped valleys of the Yukon, Klondike, Forty Mile, and Stewart rivers. Higher elevations are found in the Mackenzie and South Ogilvie mountains. The elevation ranges from 290 to 2,000 m above sea level in the Klondike and Yukon Plateau-North ecoregions, with local relief between 300 and 900 m. In the Mackenzie and South Ogilvie mountains, the elevation ranges from 400 to 2,750 m and relief is typically 750 to 1,500 m above sea level (Yukon Ecoregions Working Group, 2004).

1.4.4 Climate and Soils

The climate in the planning region is complex and varies depending on elevation, latitude, and the weather patterns created by the region's mountain ranges. For example, precipitation varies from 300 to 450 mm yearly around Dawson City, and reaches up to 750 mm per year in high elevation areas. In winter, temperature inversions can occur, with temperatures of minus 50 °C common in the major river valleys. The seasonal variation is extreme, with a short, hot summer season and long, cold winters.

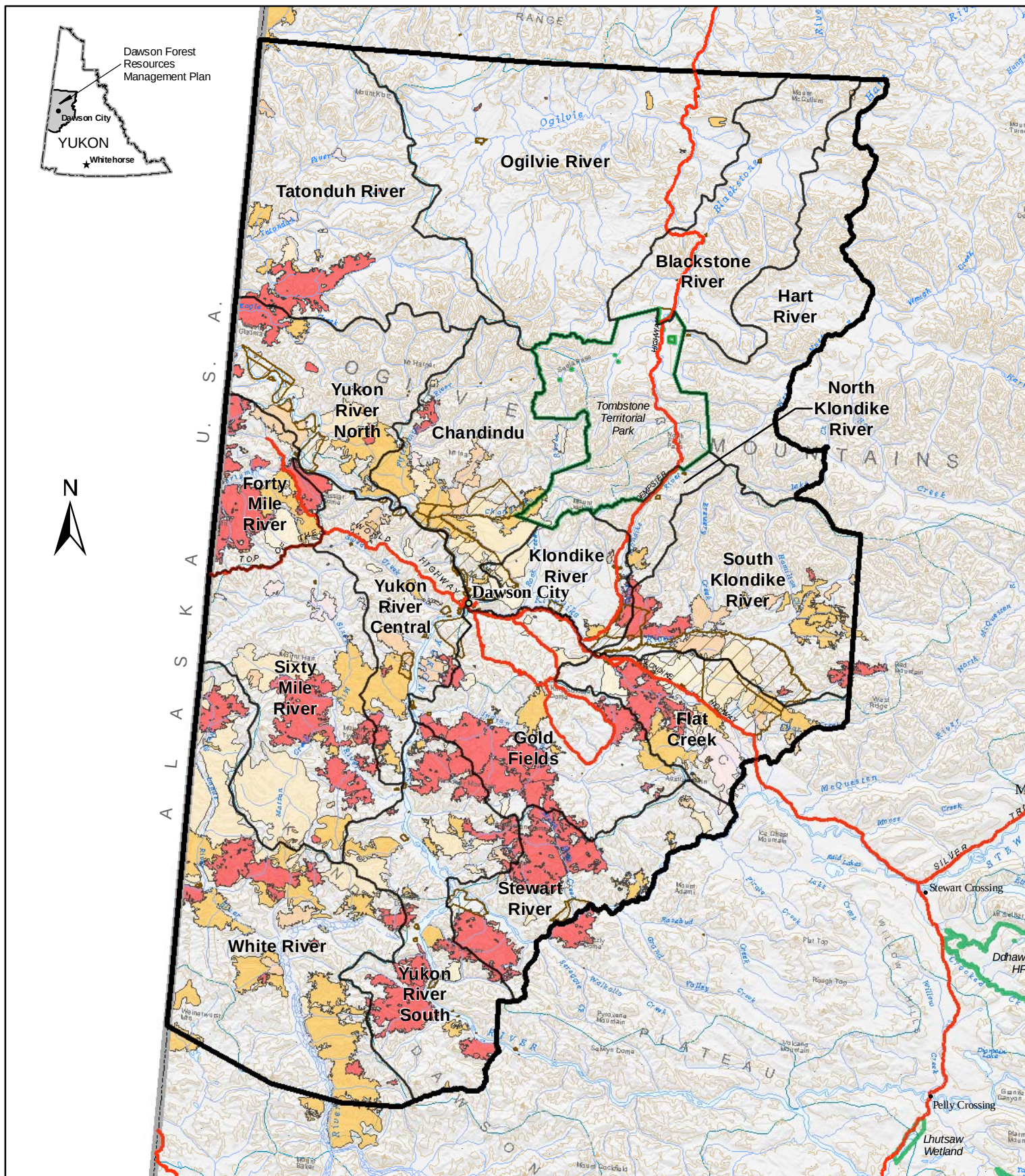
Dawson City, located on the Yukon River at an elevation of 317 m above sea level, has an average of 120 days of precipitation per year, consisting of an average of 164.5 cm of snowfall and 232.8 mm of rainfall. The annual, average temperature in Dawson is minus 5 °C, with a mean high of 15 °C and a mean low of minus 32 °C. The July mean high is 22 °C and the January mean low is minus 32 °C. The highest temperature ever recorded in Dawson was 35 °C (1950), and the lowest recorded temperature was minus 58 °C. Dawson City is frost free for approximately 91 days per year. Prevailing winds are from the north, with an average speed of 7 km/hour.

Permafrost is discontinuous but widespread in the region. Permafrost-free areas are found on well-drained upland slopes; discontinuous permafrost occurs on lower slopes and valleys. Soils on upper slopes are rocky, while soils on lower slopes are silty, rich in organic matter, and often capped with peat. In the river valleys, soils are gravelly or composed of silt and loam, with the latter supporting productive boreal forest stands (Yukon Ecoregions Working Group, 2004).

At the moment, it is unclear how climate change will affect forests in the Dawson planning region or the Yukon over the long-term. Across Canada, it is thought that boreal forest species may shift northward 300 to 500 km. Melting permafrost, glacial melting, increased forest fire frequency and increased spread of insect pests are several effects of warmer temperatures that are already evident. Extreme weather events and overall increased precipitation, with wetter winters and drier summers, are expected. With a shift in climate and corresponding shift in vegetation, increased spread of non-native and invasive species is also anticipated (Government of Yukon, Department of Environment, 2006).

1.4.5 Forests

The dominant tree species in the region are black spruce, white spruce and white birch (Figure 2). Black spruce dominates on wetter, poorly-drained sites. Mixed forests of white spruce, paper birch, trembling aspen, and balsam poplar are found on warmer sites and south-facing slopes. Black spruce stands are mixed with aspen and birch on sites where disturbance, such as fire, has occurred within about 100 years. Lodgepole pine is also occasionally found with black spruce, although this species is at the northernmost extent of its range in this region. Paper birch communities can be found on lower and mid-elevation slopes. Paper birch and trembling aspen are found with black spruce where disturbance, such as fire, has occurred within about 100 years. Balsam poplar stands grow along floodplains, and alpine fir is found occasionally at higher elevations.



DAWSON FOREST RESOURCES MANAGEMENT PLAN

Fire History

April 2009

Forest Fires: 1950 - 2005

- 1940 - 1949
- 1950 - 1959
- 1960 - 1969
- 1970 - 1979
- 1980 - 1989
- 1990 - 1999
- 2000 - 2005

Legend

- Dawson Forest Resources Management Plan
- Landscape Units
- Tr'ondëk Hwëch'in Settlement Land
- Parks and Protected Areas
- Road

0 10 20 40
Km

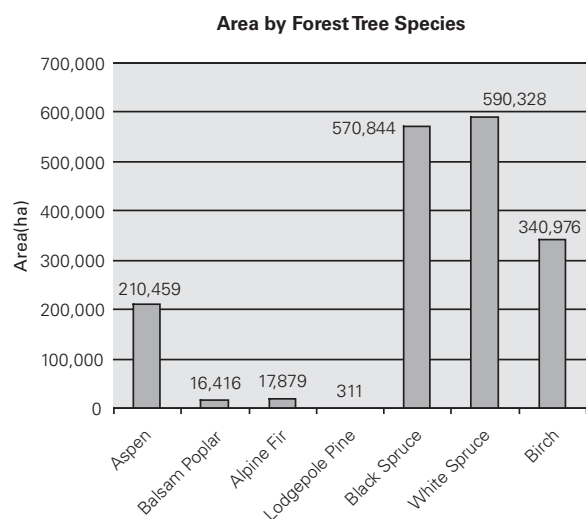
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Yukon

Energy, Mines and Resources
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Forest Management Branch
Yukon Territory

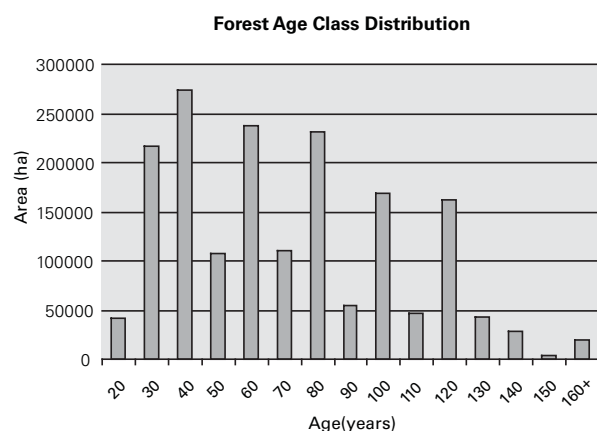
Figure 2. Forest Tree Species, Dawson FRMP Region



Forest fires are the most significant natural disturbance impacting forest composition in the region. The relatively limited area of older forest (over 130 years) results from frequent stand replacing wildfires that occur in the region, particularly in mature coniferous forest.

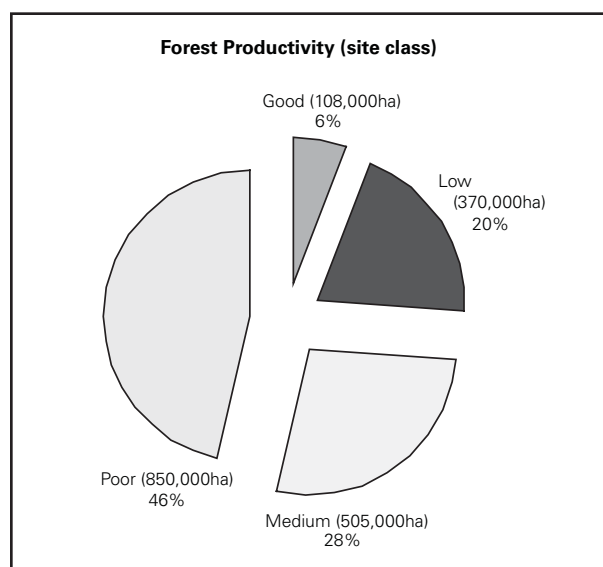
The fire history of the region is reflected in the mosaic of forests of different age classes across the landscape (Figure 3). The age class distribution shows the predominant age range between 30 and 120 years. The age classes covering the largest areas of the forested land base are between 30 and 50 years, with older age classes of forest covering successively smaller land areas.

Figure 3. Forest Age Class Distribution, Dawson FRMP Region



The forest productivity of the region is for the most part classified as poor (46%) or low (20%) (Figure 4). A small portion of the region (6%) is classified as having good productivity, and almost a third of the region (28%) is classified as having medium productivity. Trees on good sites are expected to reach heights of 20 to 25 m at maturity. Good sites are found mostly in riparian areas and south-facing upland slopes. Sites classed as having low productivity have limited capability for forest growth, either due to poor drainage, reduced nutrient availability or elevation.

Figure 4. Forest Productivity, Dawson FRMP Region



1.4.6 Forest Disturbances

1.4.6.1 Wildfire

Wildfires are integral to the ecology of boreal forests. Fire influences forest species composition, vegetation structure, stand productivity, and the regional mosaic of forest types. Fire is also responsible for nutrient cycling and replenishment of nutrients at cold sites, with ash returning significant nutrients to the forest floor. Additionally, the warming of soil and deepening of the permafrost active layer following fire contributes to regeneration (McCoy and Burn, 2005).

The fire regime in the FRMP region is characterized by relatively frequent, high intensity, stand replacing crown fires. Between 1952 and 2007, a total of 925 fires were recorded in the region, resulting in a total burned area of 1,224,340 ha. An average of 17 fires with an average size of 1,324 ha each was recorded each year. For the latter twenty-five years of this period, an average of 25 fires per year of a similar size were recorded, resulting in an average annual burned area of 33,015 ha (Table 1). This increase during the latter half of the period of record is likely due to improved detection methods. In the recorded wildfire event of 2004, this 25 year average was exceeded tenfold, with a total of 45 wildfires that burned 328,370 ha of forest (Milne, 2008).

The fire cycle provides one measure for describing the wildfire regime in the region. The term fire cycle refers to the projected length of time that it would take to burn an area equivalent to the planning region, or a sub-section of the planning region, once. The length of the fire cycle varies considerably in the major watersheds throughout the region, ranging from 82 years in the vicinity of Flat Creek to 526 years in the Tatonduk River watershed, and over 1,000 years in the North Klondike River watershed. On average, the forested portion of the region experiences a fire cycle of 170 years. Wildfire seldom occurs in the alpine tundra environments of the Hart, Ogilvie and Blackstone rivers, where the fuel load is minimal.

Elevation is a strong predictor of forest fire occurrence. Virtually all forest fires in the FRMP region occur below 1,200 m, with the highest percentage of fires occurring between 400 and 700 m (Figure 5). This relationship is largely a result of climatic, fuel conditions and vast amount of forest within this elevation. Elevations above 1,200 m are typically alpine tundra environments with lower

Drunken forest. Photo: Government of Yukon



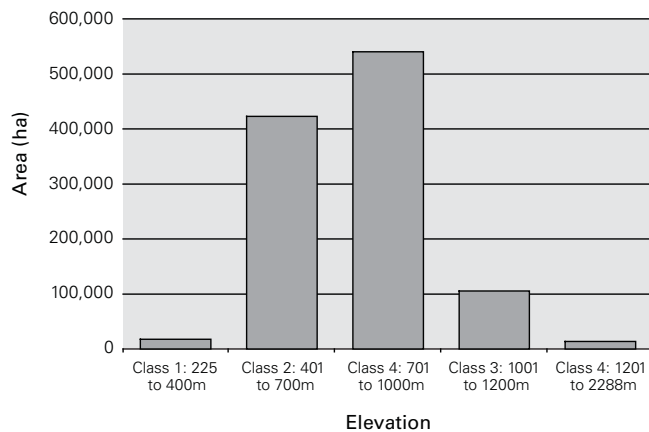
fuel loads and cooler temperatures. Elevations below 400 m often encompass river valleys and lower slopes where higher moisture levels reduce fire occurrence (Milne, 2008). This is also reflective of the amount of forest land between 400 and 1,000 m.

Seasonality is another defining feature of the fire regime in the region. From mid-June through mid-July, frequent lightening storms throughout the Tintina Trench account for many of the fires ignited during that period. In dry summer conditions, one thunderstorm system may lead to multiple fire starts in a single day. In contrast, human caused fires represent a small proportion of the wildfires in the region.

Table 1. Summary of Forest Fire History (1952-2007)

TIME PERIOD	Total Burned Area (ha)	Average Number of Fires per Year	Average Area Burned per Year (ha)	Average Fire Size (ha)	Maximum Fire Size (ha)
1952-2007	1,224,839	17	22,673	1,324	128,637
1982-2007	830,925	25	33,015	1,278	40,760

Figure 5. Historical Fire Occurrence by Elevation Class (1952-2007)



1.4.6.2 Other Disturbance Agents

In addition to large wildfires, small scale disturbances such as forest insects, disease, flooding, drought, and windthrow occur throughout the region.

Some forest pests have been active in the planning region. By now familiar to all residents of the Yukon, particularly to those between Carmacks and Dawson City, is the silvering of aspen leaves from the serpentine aspen leafminer. Larvae of this insect feed on the epidermal layer on the upper and lower surface of the leaves leaving only the silver leaf cuticle behind. In the area between Stewart Crossing and Mayo severe mining has occurred every year for 15 or more years, the trees have become stunted and lacking in vigour but as yet little or no mortality attributed to the leafminer has been observed or reported.

There have been reports of spruce mortality occurring in patches along the Yukon, Stewart and Indian rivers. Some trees at the mouth of the Indian River appeared at the time to be infested by spruce beetle (*Dendroctonus rufipennis*) and the spruce engraver beetle (*Ips pertabatus*). Upon further examination the cause of the mortality was more complex than simple small bark beetle infestation. It appears now that drought was the single cause of death for most of the trees. (Government of Yukon, Energy Mines and Resources, 2008). On going monitoring is planned for summer of 2009.

1.4.6.3 Human Disturbances

Linear disturbances include major highways, secondary roads, mining roads, and trails. The Yukon Ditch, a 44 km wooden flume, ditch

and pipe that at one time carried water to dredge operations in the Klondike drainage, is also a persistent linear feature. The industrial mining history of the region has left a significant mark on the landscape in the form of a vast expanse of tailings covering the South Klondike River valley. Portions of the Forty Mile and Sixty Mile rivers have also been dredged for gold. For the past 25 years considerable mining activity and disturbance has occurred in the Indian River drainage.

The first significant period of timber harvesting began during the Klondike Gold Rush of 1898. Timber was harvested and milled for cabins, fuelwood, mining and boat construction. Additional information on the history of the Dawson forest industry can be found in A History of Logging in the Yukon: 1896 – 1970, by Northern Design Consultants (1993). Urban development in Dawson City and the surrounding subdivisions is another human disturbance in the region.

1.4.7 Fish and Wildlife

1.4.7.1 Mammals

There are at least 29 species of small mammals and 19 species of large mammals in the region (Yukon Ecoregions Working Group, 2004). Small mammals include such species as lynx, beaver, marten, otter, wolverine, mink, ermine, fox, muskrat, coyote, snowshoe hare and porcupine. Large mammals include moose, caribou, sheep, grizzly bear, black bear, wolves and mule deer.

The winter ranges of two barren-ground caribou herds, the Porcupine herd and Forty Mile herd, extend within the planning area. The last census (2001) of the Porcupine caribou estimated the herd at 123,000 animals. The herd has been declined since 1989, and it is expected that the population has decreased since the 2001 census (Kienzler, 2007).

A 2007 census of the Forty Mile caribou herd estimated a population of 38,364 caribou. This represents a decline from a population of 40,000 in 2005 and 43,375 in 2003. At one time abundant throughout central and southern Yukon, the Forty Mile herd has been absent from its Yukon range for an extended period. Identified range areas in the Yukon include portions of the Forty Mile and Sixty Mile River watersheds, with the remainder of the herd's range extending into Alaska (Kienzler, 2007).

There are two woodland caribou herds in the region, the Hart River herd and the Clear Creek herd. A census of the Hart River caribou was carried out for the first time in 2006. The population was estimated at 2,200 individuals (plus or minus 25%) (Kienzler, 2007).

Moose density in the Dawson region varies greatly by habitat type, from an estimated low of 50 moose per 1,000 km² to as high as 235 moose per 1,000 km², with an average density estimated at 150 to 160 moose per 1,000 km². Areas with the highest moose densities include the Klondike, South Klondike, North Klondike, Flat Creek and Stewart River watersheds. Areas with moderately high moose densities include the Sixty Mile, Forty Mile, Hart and Yukon River watersheds. Moose population counts are carried out approximately every five years (Kienzler, 2007).

1.4.7.2 Birds

There are 165 bird species that occur regularly in the Dawson planning region (Sinclair, 2007). Of these, 33 are listed federally and 131 are listed territorially as migratory birds under the Canada/US Migratory Birds Convention. Seventy-seven of these species have been confirmed as breeding within the FRMP region. Twenty-seven of the 165 species are year-round residents, although not in all years, nor for all individuals of the species.

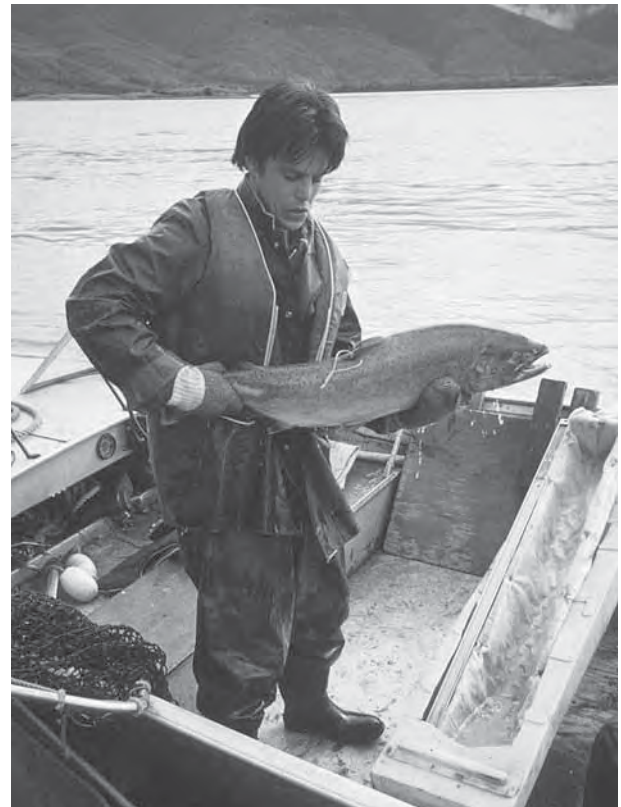
Among the year-round inhabitants are ptarmigan, owls, grouse, woodpeckers, gray jays and common ravens, as well as northern goshawk, golden eagle, gyrfalcon, black-capped chickadee, American dipper, bohemian waxwing, dark-eyed junco, snow bunting, gray-crowned rosy finch, pine grosbeak and white-winged crossbill (Sinclair, 2007). Raptor nesting surveys have shown key habitat areas along the Yukon, Stewart, White and Chandindu rivers, as well as the Dempster Highway corridor (Kienzler, 2007).

Several of the bird species present in the region are listed as at risk species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (See Section 4.7).

1.4.7.3 Fish

The majority of the FRMP region falls within the Yukon River watershed. However, the north-eastern portion of the region falls within upper Peel River drainage basin, specifically the upper watershed

Yukon River salmon. Photo: Government of Yukon



areas of three major tributaries to the Peel, Hart, Blackstone, and Ogilvie rivers.

Freshwater fish species found in the region include Arctic grayling, burbot, lake whitefish, broad whitefish, round whitefish, pygmy whitefish, least cisco, Arctic cisco, inconnu, northern pike, longnose sucker, lake chub, slimy sculpin, Arctic lamprey, and Dolly Varden (Peel drainage only).

In the portions of the Hart, Blackstone, and Ogilvie rivers within the region, the fish species diversity is lower. Species found in these watersheds may include Arctic grayling, Dolly Varden, burbot, round whitefish, pygmy whitefish, longnose sucker, lake chub, and slimy sculpin. Information regarding patterns of habitat use for all species is generally very limited in these watersheds.

Chinook, chum, and coho salmon species are present in the Yukon River watershed. In addition to the Yukon River mainstem providing a migratory route for all salmon species, Chinook salmon spawn in various tributaries to the Yukon River within the region. Such tributaries include Coal Creek, the Fifteen Mile River, the Chandindu River, the Klondike

River, and the Sixty Mile River. The most significant of these, in terms of numbers of chinook spawning, is the Klondike River. As well, the portions of the Stewart and White rivers within the region both provide migratory routes for chinook and chum salmon. Chum salmon spawning has also been reported in the Klondike River. While it is known that coho salmon migrate upstream past the Canadian border late in the fall season, no information is available regarding the locations at which they may spawn. As well, most small tributaries of sufficient flow to the Yukon River and other adult chinook salmon bearing waters provide important rearing habitat for juvenile chinook salmon. All streams within the Yukon River watershed should be considered to be potential juvenile chinook salmon rearing habitat (Anderton, 2007). Key areas of fish habitat include zones of groundwater discharge, potential over-wintering areas, and spawning areas.

1.4.8 The People

The current population of Dawson is approximately 1,300 (Statistics Canada, 2007). The residents of Dawson are a diverse group with a creative, independent spirit and a colourful history. Members of the Tr'ondëk Hwëch'in comprise almost a third of the population in Dawson. The TH signed their land claim and self-government agreements in 1998 and, since then, have been engaged in a wide range of initiatives, such as language and cultural programs, education and health programs, heritage management, housing development, fish and wildlife management, and land use planning. The Dänoj[^]Zho Cultural Centre, constructed and operated by the TH, is a focal point of TH culture on the Dawson waterfront and an important visitor attraction.

The site where Dawson City is located at the confluence of the Yukon and Klondike Rivers is called Tr'ochëk by the TH, and is the former site of a seasonal fishing village. The discovery of gold in 1896 on nearby creeks launched the Klondike Gold Rush, which established Dawson City at Tr'ochëk. The TH were then relocated downstream to Moosehide, which became a permanent settlement until the late 1950s.

Dawson City was staked out by Joe Ladue and named after George M. Dawson, Director of the Geological Survey of Canada, who explored the region in 1887. In 1898, at 40,000 people, this "Paris of the North" was the largest Canadian city west of Winnipeg with

Old mining site. Photo: Government of Yukon



telephone service, running water and steam heat. In 1902, Dawson was officially incorporated as a city. It also became the seat of the Territorial Government in 1898. Elaborate hotels, theatres and dance halls were erected, with Andrew Carnegie donating \$25,000 towards the building of a library in 1903. In the summer of 1899 the stampede for gold came to an end and 8,000 people left Dawson. By 1902, the population dwindled to less than 5,000.

Major mining operations took over most of the Klondike gold beds in the years following the Gold Rush, but production declined after an all-time high in 1911. Higher gold prices caused a minor boom in the 1930's, but the last dredge was shut down in 1966. The Yukon's economic centre shifted to Whitehorse, which became the capital in 1953. Whitehorse was more accessible than Dawson due to the construction of the Alaska Highway and the cessation of riverboat travel.

Today, tourism and gold mining are the major industries, both taking place during the summer months. Approximately 60,000 people visit Dawson City each year. Numerous gold rush era buildings throughout Dawson have been restored and a number of others are in various stages of rehabilitation. The majority of these projects are being completed by Parks Canada, Klondike National Historic Sites. Walking tours of historic sites are available to visitors from June to September each year. Restored buildings include the Palace Grand Theatre, Post Office, Dawson Daily News, Bank of British North America, Territorial Government Administration Building, Court House, Yukon Hotel, the Commissioner's

Residence, Robert Service Cabin, Macaulay House, the Black Residence and the CO's residence. Canada's oldest legalized gambling hall, bar and Can-Can show, "Diamond Tooth Gertie's Gambling Hall", operates during the summer tourist season.

Placer mining to recover gold takes place on the nearby creeks and rivers. Mining activity can be seen from the roads on Bonanza and Hunker creeks. Remnants of dredges can be seen throughout the Klondike. Parks Canada has restored Dredge #4 on Bonanza Creek.

Dawson is also the regional centre for highway maintenance, the Royal Canadian Mounted Police, Yukon Government Client Services, and Inspections and Mine Recording.

1.4.9 The Economy

1.4.9.1 Traditional Activities

Historically, the region's economy has been resource based. The Tr'ondëk Hwëch'in are Hän-speaking Gwich'in people whose traditional economy includes fishing, hunting and small game trapping, following a seasonal round. This seasonal round involves a summer salmon harvest, fall caribou hunt and winter hunting and trapping activities. Historically, the summer/fall salmon harvest was critical to the Hän economy. Activities were confined mainly to the Yukon River basin during the summer, with extensive upland and mountain travel in the winter. Fishing camps set up along the Yukon River also provided access to moose hunting sites and berry picking areas. The Klondike River valley was another important moose hunting site. At the end of the salmon season, family groups moved northeast into the Ogilvie Mountains or southeast into the Forty Mile watershed. The migrating Porcupine caribou herd was hunted in fall. The spring season involved fishing for Arctic grayling and whitefish in the upper Blackstone watershed and North Klondike River, and hunting migrating waterfowl.

The inland fur trade reached the region in the early 1800s. During the initial years of the fur trade, the Hän exchanged pelts with Upper Tanana middlemen who delivered them to Russian forts in Alaska. In the 1840s, the Hudson's Bay Company established a short-lived post at Fort Selkirk and a more established

First fish. Photo: ©Tr'ondëk Hwëch'in



post at Fort Yukon. The Fort Yukon post enabled the Hudson's Bay Company to establish a strong presence in the region.

Hunting, fishing and trapping remain important economic activities in the region. Numerous trapping concessions are located throughout the forest planning region. A First Nations food fishery, a small commercial fishery, a small domestic fishery and a recreational fishery continue to operate on the Yukon River and its tributaries, with chinook and chum salmon being the target species. There are currently three primary outfitters in the region- Reynolds Outfitting, Blackstone Outfitting, and Pete Jensen Outfitting. Midnight Sun Outfitting also operates in a small, northeasterly portion of the FRMP region.

1.4.9.2 Mining, Oil and Gas

Dawson's mining history began with the discovery of gold near the junction of the Yukon and Klondike Rivers in 1896 by an American prospector named George Washington Carmack, accompanied by his Tagish wife, Kate Carmack (Shaaw Tláa), and their two Tagish partners, Skookum Jim Mason (Keish) and Dawson Charlie (Káa goox). By 1898, over 40,000 people had arrived to mine the gold fields around Bonanza and Eldorado Creeks.

In 1905, following the Klondike Gold Rush, Dawson's gold mining industry took on a new form with the introduction of mechanized dredges. The Yukon Consolidated Gold Corporation dredged Bonanza Creek and the Klondike River valley until 1966, leaving behind the distinctive tailings formations now visible from the North Klondike Highway on the outskirts of Dawson City (Commonwealth Historic Resource Management Ltd., 2007).

Placer mining continues to contribute to the region's economy. At present, the Dawson region produces the vast majority of the Yukon's placer gold. Placer operations occur in the drainages of the Klondike, Indian, Forty Mile and Sixty Mile rivers, the Moosehorn Range, and the lower Stewart River. Most placer operations are small and family-run. Although recent trends show a slight decline in placer gold production, exploration is ongoing to identify potential new reserves as traditional mining areas are depleted (Lebargé, 2006)

Currently there are no large scale non-placer mining operations in the TH Traditional Territory. Quartz exploration continues in many areas with considerable potential for a future mine. There are numerous areas such as Brewery Creek, Henderson Creek, Frisco Creek, and Hunker Creek, with extensive quartz claims.

Oil and gas potential is limited in the Dawson FRMP region. Although the Ogilvie and Tatonduk River watersheds in the northernmost portion of the region overlap within a large sedimentary basin, no oil and gas tenures are documented within the planning region (Government of Yukon, Yukon Energy, Mines and Resources, 2007).

1.4.9.3 Tourism

Tourism is a large industry in the Dawson region, drawing over 60,000 visitors annually. Over half of these tourists come from the United States, about a quarter are Canadian, and almost 20% are overseas visitors, primarily from Europe and Australia. The majority of tourists are over 54 years of age, and a substantial number are between the ages of 18 and 54. Bus tours, recreational vehicles and passenger vehicles are the major modes of transportation for visitors to the Klondike region. Popular tourist activities include visiting historic sites and museums, attending arts and cultural events, and engaging in walking tours (Government of Yukon, Yukon Tourism and Culture, 2004).

Wilderness tourism is also a popular activity and growing sector in the Klondike region. Between 1999 and 2004, the number of wilderness tourism user days grew from 306 to 3,972; the number of clients grew from 169 to 1,023; and the number of operators grew from eight to 15. Major events like the Yukon Quest Sled Dog Race and the Yukon River Quest attract numerous visitors. Other popular wilderness tourism

activities include motorboat tours, snowmobiling, hiking, backpacking, canoeing, mountain biking and rafting. Key tourism features in the region include Tombstone Territorial Park, Forty Mile Historic Site, the Tintina Trench, the Dempster Highway, the Hart River winter road, historic gold fields, the Yukon River and its tributaries, and the fall migration of the Porcupine caribou herd across the Dempster Highway

1.4.9.4 Commercial Forest Sector

The demand for lumber during the Klondike Gold Rush created a period of significant timber harvesting in the Dawson region. Numerous contractors cut and sold cabin logs to the wave of prospectors arriving in Dawson City. Timber was also harvested for steamer fuelwood, mining and construction of houses and boats. Twelve sawmills were in operation in the Dawson area, milling wood for the local market, among them the Yukon Sawmill Company, Canadian Yukon Lumber Co., the Klondike Mining and Transportation Co. (Klondike Mill Company), and the Canadian Klondike Mining Company. In 1906, additional lumber was harvested by the Coal Creek Company for the Klondike Railroad and Yukon Ditch projects.

The steamboat industry also generated significant demand for fuelwood. Steamers traveling between Whitehorse and Dawson City required one to two cords of wood per hour. Fuelwood camps were set up along the river. Steamers would stop every four to five hours to refuel. Between 1898 and 1956, approximately 300,000 cords of wood were harvested along the Yukon River for consumption by sternwheelers (Northern Design Consultants, 1993).

Old mill by Arctic Inland. Photo: Arctic Inland





Currently, the largest forestry operator in the Dawson region is Arctic Inland Building Products. This company began its operations with a portable sawmill in 1975, and opened a permanent outlet in Dawson in 1980. With a current annual harvest of approximately 3,000 m³, Arctic Inland provides locally manufactured forest products and building materials to Dawson residents through its retail outlet, and exports timber products throughout northern Canada and Alaska (Arctic Inland Building Products, 2007). There are several other personal fuelwood suppliers in Dawson, with an estimated combined annual harvest of approximately 600 to 700 m³ (Dyce, 2008). From 1999 to 2008, an average of five roundwood permits and 10 commercial fuelwood permits were issued each year. In 2005 regeneration work commenced on the North Klondike with 50,000 seedlings planted. Today, there are scarification, natural regeneration and planting trials underway.

In addition to timber and fuelwood harvesting, harvesting and processing of non-timber forest products, such as birch syrup, also contribute to the forest-based economy.

Mushrooms are another commercial non-timber forest product that is occasionally harvested and sold, in the year following an exceptional wildfire event. Personal fuelwood collection and the harvest of other non-timber forest products, such as wild berries, are also common non-commercial uses of the forest land base.

1.4.9.5 Other Economic Sectors

Government and service industries form a component of the Dawson economy (Government of Yukon, Yukon Economic Development, 2007). Dawson City also has a growing arts community and new post-secondary education opportunities. In September 2007, the Klondike Institute of Arts and Culture (KIAC) School of Visual Arts launched an accredited program that provides students with the first years of a Bachelor of Fine Arts or Bachelor of Fine Arts in Design degree. Yukon College also operates a campus in Dawson, offering additional adult education programs (KIAC School of Visual Arts, 2007).

1.4.10 Special Places

There are special places in the Dawson region that require consideration in forest management planning. Tombstone Territorial Park is one such place. The Dawson region is also rich in heritage resources, reflecting Tr'ondëk Hwëch'in culture, history, and earlier cultural traditions, as well as the history of the 1896 Klondike Gold Rush, and the industrial mining era that followed.



1.4.10.1 Tombstone Territorial Park

Established in 2004 through the Tr'ondëk Hwëch'in Final Agreement, Tombstone Territorial Park encompasses over 2000 km² of diverse ecosystems and landforms. Natural features of the park include the southernmost extent of the Arctic tundra, unusual permafrost landforms, and scattered stands of boreal spruce forest. The steep peaks of Tombstone Mountain and the Tombstone range of the South Ogilvie Mountains form impressive views. Accessed from the Dempster Highway, 71 km north of the North Klondike Highway junction, Tombstone Territorial Park is an important wilderness tourism destination. Hiking, backpacking and wildlife viewing are popular activities in the park. Facilities in the park include a campground and interpretive centre. A new Tombstone Visitor Centre opened in 2009. Tombstone Territorial Park is managed jointly by the Tr'ondëk Hwëch'in First Nation and the Yukon Department of Environment, in accordance with the TH Final Agreement. A Management Plan for the park was completed in 2002 (Government of Yukon, Yukon Department of Environment, 2002).

1.4.10.2 Yukon Heritage and Archaeological Resources

Encompassing the eastern portion of Beringia, the Tr'ondëk Hwëch'in Traditional Territory (THTT) (including the area of overlap with the First Nation of Nacho Nyäk Dun) has been unglaciated and available for human occupation for the past 40,000 years. There are 260 identified archaeological resources within the THTT, with the oldest human artefact dating to over 11,000 years BP. Moosehide Village is the oldest intact archaeological site in the territory, and contains evidence of at least three different central Yukon cultures. Forty Mile, Tr'ochëk and Fort Reliance are three additional, significant archaeological resources of TH occupation in the last 2000 years. The four recognized cultural traditions reflected in the archaeological record include the Northern Cordilleran tradition (8,000-10,000 years BP), the Little Arm phase (5,000-7,000 years BP) and the Northern Archaic tradition (after 5,000 years BP). The latest phase is the Aishihik phase, and is characterized by the appearance of metallurgy, bone working technology and stone boiling culinary techniques. This phase is documented following the White River volcanic eruption (about 1,150 years BP), which blanketed much of the central and southern Yukon in a layer of ash that is still visible today.

Archaeological investigations in the THTT have been limited. Most of the identified archaeological resources have been found in proximity to bodies of water. Areas with high potential for additional archaeological resources include the shores of the Yukon River and its major tributaries. Landforms expected to have high potential for archaeological resources include hills, which were used as game lookouts, as well as elevated, well-drained terraces and river islands that offer habitation sites. The archaeological record mirrors traditional land use patterns associated with the summer salmon harvest on the Yukon River, the interception of caribou during their fall migration, and hunting of moose and caribou in their winter range (Thomas, 2007).

In addition to archaeological resources, the THTT area includes 1,191 registered historic features, representing 44 % of all documented historic sites

in the Yukon. The majority of these sites are located in Dawson City and the Klondike Gold Fields, and are associated with the 1898 Klondike Gold Rush and the gold mining era that followed. The sites include historic town sites, wood cutting camps, freight boat supply shops, mine sites, railroads, and large hydro-power facilities, such as the Yukon Ditch. Additional historic resources are associated with the transition of smaller TH camps to semi-permanent villages in the North Klondike and Blackstone uplands, a trend driven by the demand for game meat by the growing population in the Klondike. Trapping sites comprise an additional group of historic resources, which are dispersed widely across the landscape. Areas of high potential for historic resources not yet documented include major routes between historic communities and mines.

Harvest area. Photo: Government of Yukon



2. VISION FOR FOREST MANAGEMENT

2.1 VISION

This plan recognizes and supports the following vision as a guide to forest management in the planning region:

“ Our vision is for a healthy forest that provides environmental, economic, social, and cultural benefits for present and future generations.”

2.2 VISION STATEMENTS

The Dawson Forest Management Planning Team developed the following set of vision statements for the Dawson FRMP to encompass the dominant values and goals of the people of the region. These vision statements and Section 17.5.5 of the Tr'ondëk Hwëch'in Final Agreement are the foundation of the strategic directions of the plan.

1. The FRMP will recommend resource development that accommodates the management of traditional, ecological, resource, heritage, cultural, and other important values associated with the forested land base;
2. The FRMP will be developed based on principles of sustainable forest management;
3. The FRMP will contribute to the security, reliability and certainty needed to foster forest-based investment and development;
4. The FRMP will recognize and incorporate First Nation traditional knowledge and values with other baseline data sets in the planning process;
5. The FRMP will recognize, respect and incorporate the rights of all forest users;
6. The FRMP will be developed with the best available scientific, local and traditional knowledge, and lessons from past practices, both in the planning area and elsewhere.

Harvest area, Dempster Highway. Photo: Government of Yukon



There are three basic questions to test the potential success of a forest management plan. The questions use the example of a three-legged stool: if one leg is missing, the stool falls over. The three questions are:

- 1) Is the forest use ecologically sustainable?;*
- 2) Are the range of forest uses and actions socially acceptable?; and*
- 3) Are the forest uses economically viable? If the answer to all three questions is “yes”, the forest management plan meets the test of ecological, social and economic sustainability. (Insert diagram)*

3. FOREST PLANNING PROCESS

3.1 LEGISLATIVE CONTEXT

The Tr'ondëk Hwëch'in Final Agreement, in addition to establishing the basis for forest management planning in the region, establishes the rights and lands retained by TH citizens throughout the traditional territory. Effective July 16th, 1998, the authority and responsibility for forest planning and management on settlement lands, including the approval of forest management plans, rests with the First Nation (pursuant to Section 17.5.2 of the TH Final Agreement). The Tr'ondëk Hwëch'in and Nacho Nyäk Dun (NND) Final Agreements establish the basis for consultation regarding forest management planning in traditional territory overlap areas. The authority and responsibility for forest planning and management on public lands rests with the Forest Management Branch of the Yukon Government (pursuant to Section 17.5.1 of the TH Final Agreement, the Devolution Transfer Agreement and the Territorial Lands [Yukon] Act). Under the TH Final Agreement (Section 17.4.0), the Dawson District Renewable Resources Council (DDRRC) is also assigned responsibilities for forest management planning in the traditional territory.

Key legislation, regulations and policies affecting forest management and planning in the Dawson forest planning region include:

- Territorial Lands (Yukon) Act
- Yukon Timber Regulation
- Forest Resources Act
- Yukon Wildlife Act and Regulations
- Fisheries Act
- Environment Act
- Yukon Historic Resources Act
- Yukon Salmon Committee recommendations, guidelines, and regulations
- Yukon Environmental and Socio-economic Assessment Act (YESAA)
- Species at Risk Act
- Forest Protection Act
- Tr'ondëk Hwëch'in Land and Resources Act
- Tr'ondëk Hwëch'in Fish and Wildlife Act
- Other Tr'ondëk Hwëch'in legislation as appropriate

In the spring of 2003, the Yukon Government began the preparation of a forest policy framework to guide the development of the Yukon's first comprehensive forest legislation. In the fall of 2008, the Yukon Government passed the Forest Resources Act. The Act will be implemented once the required regulations are approved. This legislation is anticipated to be in place during the implementation of this FRMP. Upon completion of the forestry legislation and regulations, the current Yukon Timber Regulation will be replaced by the Act.

3.2 EXISTING PLANS

3.2.1 Official Community Plans

There are two community plans which provide guidance to forest resource management within the TH Traditional Territory:

- Sunnydale/West Dawson Official Community Plan
- Dawson City Official Community Plan.

3.2.2 Timber Harvest Plans

Historic forest harvesting areas which have been planned are covered under:

- South Klondike Resources Report
- 10 Mile Timber Harvest Plan
- Fuel Wood Development Plan (Flat Creek Hill)

3.3 PLANNING FRAMEWORK (YUKON GOVERNMENT PERSPECTIVE)

The recently developed Forest Resources Act identifies a hierarchy of forest management planning. This hierarchy consists of three main levels:

1. **Forest Resources Management Plan (FRMP):**
A FRMP is a strategic, overarching, landscape level plan intended to provide broad direction

on where and why forest resource management activities should be undertaken. The purpose of an FRMP is to identify forest resource values and sensitive areas, to identify management of forest resource zones, and to establish management intent. FRMP extend over large landbases, often greater than 1,000,000 ha in size.

2. **Timber Harvest Plan (THP):** A timber harvest plan is a development plan that identifies areas proposed for harvesting of forest resources. It also identifies strategies for reducing or eliminating environmental consequences and impacts on other resources identified in the FRMP. Timber Harvest Plans can extend over landscape units, or watersheds, ranging from 5000 ha to 100,000 ha in size.
3. **Site Plan:** A site plan is a site specific management plan. It identifies the specific area and attributes of the area proposed for harvesting, as well as the stand level management activities, methods and standards for harvesting to ensure the protection of the forest resource values on that harvest area. A site plan can also include a reforestation plan with proposed silviculture activities. A site plan extends over one to 500 ha in size.

Woodlot Plan: A woodlot plan is similar to a THP; however it is designed for a woodlot license area and may have an annual allowable cut specific to the woodlot license.

Harvesting locations, South Klondike. Photo: Government of Yukon



3.4 PLANNING PROCESS

3.4.1 Chronology of Key Steps

January 2004	In the absence of any regional forestry planning, a wood supply planning team was assembled to identify wood supply areas for vicinity of Dawson.
June to October 2005	Wood supply planning team identified the need for regional Forest Resources Management Plan.
January 2006	Tr'ondëk Hwëch'in and Yukon governments started discussions on a MOU to establish a regional forestry planning team.
May 2006	MOU signed and planning team established. Planning team began work on the plan.
May 2006 to present	Planning team meetings held in Dawson, hosted by DDRRC.
March 2009	Public open house held in Dawson
Fall 2009	Draft Plan presented to public for review.
Next Steps	Plan recommended to the Governments for approval.
	Implementation begins

3.4.2 Participation in Forest Resources Management Planning

3.4.2.1 Planning Team

The Dawson Forest Management Planning Team took the lead coordinating role in the development of the FRMP (MOU Respecting the Development of a Community Based Strategic Forest Management Plan, May 1, 2006). The Planning Team was made up of representatives of the Dawson District Renewable Resources Council, the Government of Yukon Department of Energy Mines and Resources, the Tr'ondëk Hwëch'in First Nation, and the local forest industry. These representatives coordinated the participation of their respective agencies in the development of the plan.

3.4.2.2 Community Participation

The Planning Team facilitated public participation in the planning process by hosting an open house, developing information materials, and providing formal opportunities for public consultation on the draft forest management plan.

3.4.2.3 Approval Bodies

The approval bodies for the FRMP are the Yukon and TH governments. The Government of Yukon is responsible for approval and implementation of the FRMP on public lands, while the TH is responsible for approval and implementation of the plan on settlement lands (Chapter 17.5 of the TH Final Agreement).

3.4.2.4 Overlapping Traditional Territories

A portion of the Dawson forest planning region overlaps with the First Nation of Nacho Nyäk Dun Traditional Territory (NNDTT). NND participation in the development of the FRMP was completed in accordance with the "Sharing Accord" signed July 26, 2006 between NND and TH First Nations. The Accord sets management responsibilities and identifies a contiguous boundary between the First Nations.

Under the NND Final Agreement, the Government of Yukon has an obligation to consult with NND on any matter in an overlapping area which may affect the rights of NND or implementation of the NND Final Agreement (Schedule B of the NND Final Agreement).

4. STRATEGIC DIRECTIONS FROM PLANNING AND LEGISLATIVE INITIATIVES

Planning and legislative initiatives that have an influence on forest resource management in the Dawson forest planning region are presented below as strategic considerations. The strategic directions presented in this chapter flow from these.

4.1 TR'ONDĚK HWĚCH'IN FINAL AGREEMENT

Strategic Considerations:

Section 17.5.0 of the TH Final Agreement provides direction for the development of a forest resources management plan for the Dawson forest planning region. The following sections of the TH Final Agreement provide direction on the content of forest management plans.

17.5.5 When developing Forest Resources Management plans, the Minister and the Yukon First Nations shall take into account the following:

17.5.5.1 The principle of sustainable use of Forest Resources;

17.5.5.2 The principle of an integrated and balanced approach to the management and protection of interest in and uses of Forest Resources in a watershed;

17.5.5.3 The principle of integrated Forest Resources Management on Settlement Land and non-Settlement Land;

17.5.5.4 The Forest Resource harvesting and management customs of Yukon Indian People;

17.5.5.5 Fish and Wildlife Harvesting rights and management plans as set out in Chapter 16 Fish and Wildlife;

17.5.5.6 The knowledge and experience both of the Yukon Indian People and scientific communities in Forest Resources Management and use; and

17.5.5.7 The principle of implementing the plan on a watershed basis.

Strategic Direction:

- Future forest management plans will be consistent with the terms of the TH and NND Final Agreements.

First Nations drummers. Photo: Government of Yukon



4.2 TR'ONDĚK HWĚCH'IN LAND AND RESOURCES ACT

Strategic Considerations:

The Tr'ondëk Hwëch'in Land and Resources Act governs land and resource use on TH settlement lands. The intent of the Act is to provide for the sustainable use of the land, to promote a healthy lifestyle for citizens, and to preserve the peaceful enjoyment of the land for citizens. The Act enables the Tr'ondëk Hwëch'in Council to designate land and resource management areas, and requires a land or resource management plan to be developed to direct use of such areas. The Act also permits TH members to continue traditional uses of the land, including personal fuelwood harvesting, gathering flora and fungi for food or medicine, and spiritual or ceremonial activities. Harmful alteration of the land, such as disturbance of burial sites and release of damaging chemicals, is also prohibited. Finally, the Act establishes a process by which Council can receive, and approve or deny, applications for land use and resource development.

Strategic Directions:

- *Forest management on settlement lands will be carried out in a manner that is consistent with the TH Land and Resources Act.*
- *Forest management shall respect the provisions of the TH Land and Resource Act for traditional use of settlement lands.*
- *Forest management planning shall aim to enhance the objectives of the TH Land and Resources Act on settlement lands.*

4.3 HERITAGE AND ARCHAEOLOGICAL RESOURCES

Strategic Considerations:

The Dawson forest planning region contains the vast majority of the Yukon's heritage sites and resources. There are numerous historic features and values associated with the Klondike Gold Rush and industrial mining activity in the Klondike and Yukon River valleys. The Dawson region is also rich in historic and archaeological resources reflecting Tr'ondëk Hwëch'in culture and earlier cultural

traditions. There are numerous traditional use sites in the Dawson forest planning region that must also be managed and protected. The Tr'ondëk Hwëch'in Final Agreement provides for Tr'ondëk Hwëch'in ownership and management of heritage resources pertaining to TH culture within the TH Traditional Territory, and outlines joint management planning for specific historic resources and routes. Conservation and management of all other designated historic resources is the responsibility of the Government of Yukon under the Yukon Historic Resources Act.

Strategic Direction:

- *Adhere to the provisions of the Tr'ondëk Hwëch'in Final Agreement and the Yukon Historic Resources Act in all future forest management plans with respect to management of heritage resources including archaeological and heritage sites.*

4.4 LAND USE PLANNING

4.4.1 Dawson Region

Strategic Considerations:

Under Chapter 11 of the TH Final Agreement, the First Nation, federal and Yukon governments are committed to creating a Regional Land Use Plan for the Dawson Planning Region. Chapter 11 of the TH Final Agreement speaks to the development of a regional land use plan:

Any regional land use planning process in the Yukon shall be linked to all other land and water planning and management process established by Governments minimizing where practical any overlap or redundancy between the land use planning process and those other planning processes (TH Final Agreement, Section 11.2.1.2).

Strategic Direction:

- *The principles, goals, objectives and directions of the FRMP shall provide the basic guidance for forest management and forest resources development in the region (Sections 11.4.5.8 and 17.6.1, TH Final Agreement), consistent with the general goals and principles of the Dawson Regional Land Use Plan.*



4.4.2 Peel Watershed Land Use Plan

Strategic Considerations:

Under the mandate of Chapter 11 of the Umbrella Final Agreement (UFA), the Peel Watershed Planning Commission (PWPC) is responsible for developing and recommending a regional land use plan for the Peel Watershed Planning Region. The Ogilvie, Blackstone, and Hart River portions of the FRMP overlap with the Peel Watershed planning region. Once the Peel Watershed Regional Land Use Plan is approved, the forest resources management plan may need to be amended to minimize overlap or redundancy, and ensure compatibility.

Strategic Direction:

- *The principles, goals, objectives and directions of the FRMP shall provide the basic guidance for forest management and forest resources development within areas of compatible use consistent with the approved Peel Watershed Regional Land Use Plan.*

4.5 TOMBSTONE TERRITORIAL PARK

Strategic Considerations:

Section 10.3.2.1 of the TH Final Agreement establishes Tombstone Territorial Park as a Special Management Area. Schedule A of the TH Final Agreement provides in Section 9.0, Forest Resources, states that the right of the Tr'ondëk Hwëch'in and Tr'ondëk Huch'in to harvest forest resources in the Park pursuant to Chapter 17 – Forest Resources shall be subject to the provisions of the Management Plan.

Strategic Directions:

- *Forest resource harvesting in the Tombstone Territorial Park will be consistent with the Tombstone Management Plan.*

4.6 PRIORITIES OF THE YUKON GOVERNMENT IN REGARDS TO FOREST MANAGEMENT

Strategic Considerations:

Responsibility for management of natural resources was devolved to the Government of Yukon, Department of Energy, Mines and Resources (EMR) on April 1, 2003. A number of the department's initiatives provide guidance to forest management and are designed to contribute to a better quality of life for Yukon residents through:

1. Responsible management of Yukon's natural resources.
2. Promoting investment in, and responsible development of, natural resources.
3. Providing strategic leadership on natural resource policy and planning to benefit Yukoners.

The Forest Management Branch of EMR is the regulatory agency responsible for management of forest resources on public land.

Strategic Direction:

- *Secure a forest land base, to be managed in a responsible manner, from which the Yukon public can expect a sustainable supply of wood, in order to foster development of a local forest-based economy that will return positive benefits to the people of Dawson and the Yukon.*

4.7 YUKON SALMON COMMITTEE

Strategic Considerations:

The Yukon Salmon Committee (YSC) is a public advisory body that is established under Chapter 16 of the UFA. The YSC works towards the preservation and enhancement of the Yukon's salmon stocks. The YSC is responsible for making recommendations to the Minister of Fisheries and Oceans and to Yukon First Nations on all matters that are related to salmon in the Yukon.

The main goal of the YSC is to preserve salmon stocks in the Yukon, and therefore maintain the role of salmon within the Yukon's ecosystems, economies and lifestyles. Specific principles and regulations have been identified to help ensure the conservation of salmon stocks in the Yukon.

Strategic Direction:

- *The regulations established to ensure the conservation of salmon stocks will be respected.*

4.8 SPECIES AT RISK, OF SPECIAL CONCERN AND LISTED UNDER THE YUKON WILDLIFE ACT

Strategic Considerations:

A number of species found in the Dawson region are either designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), listed under the federal Species at Risk Act (SARA), or are protected by the Yukon Wildlife Act (Table 2.). Little is known about the interaction of these species and forest management activities in the Dawson region. In southern jurisdictions direct and indirect impacts of forest harvesting have been shown to include disturbance, habitat loss, and increased access for predators and hunters.

- Peregrine falcon and trumpeter swans have shown sensitivity to human disturbance during breeding that may result in abandonment of nesting areas. However, trumpeter swans are a rare occurrence in the Dawson forest planning region, with breeding occurring mainly outside of the Yukon.
- The olive-sided flycatcher requires uneven canopy or forest openings for foraging and singing, and nests within the mid-story woodland canopy.
- The rusty blackbird is a riparian species, nesting in boreal forests dominated by conifer forest edges adjacent to lakes and bogs. It rarely enters the forest interior. This species is of significant conservation concern because 70% of the world-wide breeding population exists within Canada.
- Wolverine and grizzly bear populations are healthy in the planning region. However they are sensitive to roads associated with forest harvesting that increase hunting, trapping and vehicular collisions.

Table 2. Wildlife in the Dawson Forest Management Planning Region identified by the Species at Risk Act (SARA), COSEWIC, and/or the Yukon Wildlife Act.

Species	Status	Source
Peregrine falcon (anatum-tundrius complex)	Assessed as special concern 2007. Extended consultation on listing ended March 27, 2009.	COSEWIC (2007) Yukon Wildlife Act (2002)
Short-eared owl	Assessed by COSEWIC as special concern in 2008. Extended consultations underway; comment deadline March 19, 2010	COSEWIC (2008)
Common nighthawk	Assessed as threatened in 2007. Extended consultation on listing ended March 27, 2009.	COSEWIC (2007)
Olive-sided fly catcher	Assessed as threatened in 2007. Consultation on listing ended March 27, 2009.	COSEWIC (2007)
Rusty blackbird	Assessed as special concern 2006. Extended consultations on listing ended March 27, 2009.	COSEWIC (2006)
Wolverine, western population	Assessed as special concern 2003, but not listed at this time pending completion of further consultation Stable population in FRMP Region	COSEWIC (2004)
Grizzly bear, NW population	Assessed as special concern 2002. Not listed at this time, pending further consultation	COSEWIC (2009)
Woodland caribou Northern Mountain population	Assessed and listed as special concern 2002	SARA (2002) COSEWIC (2002)
Trumpeter swan	Specially Protected	Yukon Wildlife Act (2002)

- Woodland caribou within the Dawson forest planning region inhabit boreal forest and open mountain habitats. These herds are characterized as healthy and their range is quite remote. There is little likelihood of significant forest harvesting occurring within their key habitats.
- The common nighthawk and short-eared owl are not directly impacted by forestry activities. The short-eared owl requires broad expanses of open land with low vegetation for nesting and avoids closed canopy forests. The common nighthawk breeds in open habitats with little vegetation.

Strategic Directions:

- *Forest management planning shall review recovery and action plans for SARA listed species and COSEWIC status reports for guidance on forest management in the Dawson forest planning region.*
- *Forest Management planning shall review the Yukon Wildlife Act for guidance and management of species with Specially Protected Status in the Dawson forest planning region.*

5. STRATEGIC DIRECTIONS FROM KEY ISSUES

The Planning Team members identified the following as key issues that have an influence on forest resource management in the Dawson forest planning area. These issues are presented below as Strategic Considerations. The Strategic Directions presented in this chapter flow from these.

5.1 DIVERSIFY LOCAL ECONOMY

Forestry can continue to provide additional diversity to the economy of Dawson. A more diverse economy helps provide a wider safety net if downturns occur in the mining and tourism sectors. The forest management plan helps establish an investment climate through sustainable development of forest resources.

5.1.1 Forest Sector Development

Strategic Considerations:

Establishing a sustainable forest-based economy is a strategic component of regional economic stability. Investment in the forest sector is likely to occur if several factors are considered, including the identification of a forest land base, community support, and long-term access to forest resources.

Strategic Directions:

- *Establish a forest land base which will contribute certainty for investment in the forest sector.*
- *Support stable and secure access to forest resources as a foundation to a healthy forest industry.*
- *Support diversity as a community economic development strategy.*
- *Support tenure allocation procedures that provide opportunity for a variety of industry applications.*

5.1.1.1 Salvage of Burns, Insect Infestation or Disease

Strategic Considerations:

Wildfire, insect infestation and disease occur relatively often within the planning region. After a disturbance, timber begins to dry out rapidly which causes checking and reduces the value for sawlogs. After a short period of time the timber primarily becomes a fuelwood resource.

Of greater concern for operators is worker safety. When forest stands burn, tree and snags can become very unstable causing blow down. The blow down and unstable trees can make salvaging stands dangerous for loggers to work. This process is very unpredictable and usually occurs within 2 years. Therefore, it is important that saw timber is salvaged immediately following disturbance before the stand deteriorates and safety issues arise.

Strategic Directions:

- *Give planning priority to the salvage of saw timber after burns, insect infestation and disease. Assessment and planning for the areas, if determined to be salvageable, should occur within 30 days, followed by expression of interest for operators.*
- *Give planning priority and action to the sanitation harvesting of insect infestations or diseased areas to prevent detrimental impacts to forests resources.*

5.1.1.2 Harvest and Management of Riparian Areas

Strategic Considerations:

The planning region has a number of major rivers with many tributaries and associated wetlands that provide habitat for fish and wildlife. These waterways, wetlands and adjacent riparian areas are important in cycling nutrients, providing habitat for a diversity of plant and animal species, and acting as movement corridors for wildlife.

Additionally, considerable forest resource exists within and adjacent to riparian areas. Harvest management of these areas is necessary so they remain productive. Riparian areas are very productive and contain some of the best soils and forest growth in the region. When forest harvesting is done correctly these sites can be resilient to environmental damage. Riparian management zones require management so that the economic benefits of the riparian forest can be utilized and impact to other riparian resources minimized.

Strategic Directions:

- *Utilize riparian buffers guidelines and manage buffer harvesting adaptively.*
- *Further investigate riparian harvesting buffers and practices so that knowledge and forest practices can be developed that utilize the riparian resource without compromising other riparian area functions.*

5.1.1.3 Local Fuelwood Market**Strategic Considerations:**

Long winters in Dawson make heating homes expensive. Using fuel wood offsets this cost and offers attractive radiant heat. Each winter, around 3500 m³ or 1600 cords of fuelwood are used locally. Fuelwood is harvested by several commercial operators as well as residents for personal use. The major sources of fuelwood are dry wood from recent forest fires or from white birch stands surrounding Dawson. Harvesting of fuelwood by residents occurs during fall and winter and requires a permit. In addition, the Yukon Forest Resources Act will require commercial fuelwood operators to harvest under approved Timber Harvest Plans. It is important that opportunities to harvest fuelwood are maintained surrounding Dawson to meet local markets.

Strategic Directions:

- *Develop plans for accessible burns for fuelwood opportunities for both commercial and personal use fuelwood harvesters. Over time, develop fuelwood harvesting opportunities within Flat Creek, Dempster Highway and North Fork Road burns.*
- *Develop and maintain white birch harvesting areas surrounding Dawson. Key areas for potential white birch harvesting are Hunker Creek, Bonanza Creek and the Top of the World Highway.*
- *Manage the volume of white birch harvested so that over harvesting does not occur and opportunities remain for traditional uses of birch stands.*

5.1.1.4 Green Energy**Strategic Considerations:**

Energy from forest-based wood fibre can reduce the costs and impacts associated with burning of fossil fuels in northern communities. There is a wood supply that can be sustainably harvested and there are existing commercial applications to support a local

green energy market in Dawson. For example, solid wood boilers offset heating costs for some businesses in Dawson. The use of chips, sawdust and shavings as feed stock for central heating could be another application. This will help create a more diversified forest sector.

Strategic Directions:

- *Support the development of a green energy industry and tenure opportunities for the local forest industry that utilize wood fibre and reduces community dependence on burning fossil fuels.*

5.1.2 Education and Training**Strategic Considerations:**

Local employment, education and training opportunities are important to support the ability of Dawson region residents, including Tr'ondëk Hwëch'in First Nation members, to exercise their rights to use the forest land base. There is an opportunity for the TH to participate in the First Nations Forestry Program (FNFP) coordinated through Natural Resources Canada. The FNFP offers funding for projects that build the capacity of First Nations to sustainably manage forest resources and benefit from forest-based development opportunities. Developing educational and training opportunities, through the FNFP and other programs can build capacity for all Dawson region residents to participate in the forest sector.

Strategic Directions:

- *Support the development of local training and education opportunities for Dawson region residents, including the Tr'ondëk Hwëch'in, through programs such as the First Nations Forestry Program.*

5.2 BIODIVERSITY**Strategic Considerations:**

Coarse filter management of biodiversity assumes that management of many forest species can be addressed through landscape level biodiversity strategies. Such strategies include managing forest harvesting activity to reflect the natural disturbance pattern and seral stage distribution in which indigenous species have persisted. This approach requires attention to the timing and distribution of harvest, landscape

connectivity and riparian management. The following sections draw on the Dease-Liard Sustainable Resource Management Plan (Government of British Columbia, Ministry of Sustainable Resource Management, 2004).

5.2.1 Natural Disturbance Pattern

Strategic Considerations:

The approach of mimicking natural disturbance patterns in forest management is based on the assumption that organisms are well-adapted to naturally occurring disturbance regimes. In the Yukon, for example, forest ecosystems characterized by frequent stand replacing fires are also comprised of plant and animal species that have adapted to this regime. By managing forests in a manner that reflects the pattern of natural disturbance, the assumption is that potential impacts and risks to biodiversity and forest ecosystem integrity will be minimized.

Strategic Direction:

- *Aim to reflect natural disturbance regimes, or understand the consequences of, deviating from the patterns created by natural disturbances.*

5.2.2 Seral Stage Distribution

Strategic Considerations:

Seral stage objectives are set to provide limits to the degree of change in forest age distribution that is considered acceptable across the landscape. Identifying seral stage targets will help to ensure mature and old forest are sustained within natural occurring ranges within the planning region. Targets for the distribution of early, mature and old seral stages are based on natural seral stage distributions or landscape unit objectives. It is important to remember that areas not available for harvest contribute to achieving these targets. The current forest age class structure reflects a forest which is impacted by frequent wildfire.

Strategic Directions:

- *When assessing timber supply, do analysis of mature-old seral stage forests, so that they are not over harvested.*
- *Model seral stage targets during timber supply analysis for alluvial sites separately, so that mature-old seral stages are not over harvested.*

Klondike Plant. Photo: Government of Yukon



5.2.3 Timing and Distribution of Harvesting

Strategic Considerations:

The forested landscape in the planning region is characterized by relatively frequent, high intensity stand-replacing fires. This type of disturbance creates large contiguous stands where interior forest conditions occur. Other disturbance agents, such as windthrow, flooding, insect outbreaks, disease and lower intensity fires, can also create forest openings of varied sizes. Replicating large disturbances may reduce fragmentation, land use conflict, access issues, and minimize the need to enter other landscape units. Utilizing a variety of harvest patch sizes reflects the varied scale of natural disturbances in the boreal forest.

Strategic Directions:

- Utilize a variety of opening sizes consistent with the disturbance history.
- Consider concentrating logging in some areas, and leaving other areas undeveloped, as well as utilize existing access in order to reduce land use conflict caused by road access and human caused disturbance.

5.2.4 Landscape Connectivity

Strategic Considerations:

Landscape connectivity refers to the ability of a landscape to facilitate or impede the movement of species. Landscape connectivity has been defined as...

“the degree to which the structure of a landscape helps or hinders the movement of wildlife species. A landscape is well connected when an organism (or natural process) can readily move among habitat patches (Connectivity Planning Sub-Group, 2007)”.

Forest species have varied habitat requirements across the landscape and differing abilities to adapt to human and natural disturbances. Some species require continuous forest for movement, while others travel through large openings created by disturbance more easily. Natural landscapes are comprised of a mosaic of features, such as burned areas, mountains and lowlands, waterways, and riparian features. Seasonally, riparian areas often provide valuable landscape and site level corridors for wildlife movement for certain times of the year.

Strategic Direction:

- Utilize riparian areas, landscape features and natural disturbance patterns to manage connectivity across the landscape.

5.2.5 Climate Change

Strategic Considerations:

Climate change is expected to affect forests in the Dawson planning region in the coming decades. Anticipated changes include a shift in forest types northward 300 to 500 km and potentially increased spread of non-native and invasive species. Melting permafrost, glacial melting, increased forest fire frequency and increased spread of insect pests will also likely affect the natural disturbance regime and forest regeneration. Responding to climate change will require an adaptive management approach whereby forest management practices are modified to reflect geographic shifts in forest types and species. Regeneration strategies, in particular, will need to be adapted as climatic conditions potentially become more suitable for southern forest types and species.

Strategic Direction:

- Implement an adaptive management approach, whereby forest management and regeneration practices are modified in response new information.

5.2.6 Forest Management and Carbon Sequestration

Strategic Considerations:

The market for carbon trading and its relationship with forest management activities is in its infancy. However, it is commonly acknowledged that incremental forest management practice can play an important role in mitigating the impacts of climate change and that carbon management is moving rapidly from concept to practice in virtually all industrial sectors. New opportunities are emerging where managed forests can participate in a carbon market. The current federal government's plan proposes to create a national offset system that would allow large emitters to meet their emission targets by purchasing carbon offsets. Managed forests would be able to participate in the carbon market by either 1) reducing greenhouse gas emissions by offsetting the use of fossil fuels with biofuels or 2) by increasing

carbon sequestration through afforestation/ reforestation activities (which are now applicable under the Alberta GHG system and the California Climate Action Registry).

The Canadian Council of Forest Ministers is also working to develop a national forest management carbon framework. Through this framework, other forest management activities (in addition to those mentioned above) that create an incremental increase in carbon sequestration above a set baseline would be eligible as offset projects. This may include 1) activities that increase removals (fertilization, brush and weed control, site rehabilitation or conversion to faster growing species, etc.); 2) activities that reduce emissions (reducing site degradation, thinning, etc.); and 3) activities that reduce the risk of emissions (increased pest infestation and fire control, etc.). At this time, it is difficult to determine what opportunities forests within the Dawson FRMP present for participating in the carbon market.

Strategic Directions:

- *Assess carbon market risks and opportunities for forest management activities, fuelwood and biomass heating production in Dawson.*
- *Assess the feasibility of carrying out an operational scale forest carbon budget pilot project using the Canadian Forest Service's carbon budget model and the national forest carbon management offset quantification protocol.*
- *Obtain a realistic sense of the ease in which forest carbon budgets can be generated for forested land in the Dawson FRMP area.*
- *Assess the feasibility of carrying out a project according to the proposed national forest management carbon quantification framework.*
- *Assess the feasibility and desirability of setting and maintaining a base carbon sequestration level for the entire Dawson forest planning region as a whole.*

Silviculture mounding project. Photo: Government of Yukon



5.2.7 Soil and Permafrost Conditions

Strategic Considerations:

Soil and permafrost conditions in the Dawson forest planning region pose unique challenges with respect to forest regeneration. In areas of continuous and discontinuous permafrost, soil conditions are generally cold and wet. Natural regeneration of harvested areas is challenging in these conditions, particularly on sites where seedling germination is impeded by thick moss and organic layers.

Strategic Directions:

- Implement regeneration strategies unique to the Dawson forest planning region when conditions of cold soil, thick moss and organic layers are found. In some situations, scarification of the deep moss layers may be necessary to facilitate natural regeneration.
- Locate access away from permafrost areas.

5.2.8 Fire Management

Strategic Considerations:

The frequent, stand-replacing fires in the Dawson forest planning region form a dominant component of the natural disturbance regime and play an essential role in forest regeneration and forest ecosystem processes.

Strategic Directions:

- Recognize that wildfire is an integral component of the natural disturbance regime and should, where possible, be left to occur naturally.
- Recognize that areas surrounding communities are valuable resources that need to be protected from fire. Within these areas forest management activities should integrate wildland fire protection.

5.3 WILDLIFE OF CONSERVATION CONCERN

Management of wildlife and wildlife habitats is an important issue in the region. The following list of wildlife of concern is not comprehensive but is intended to provide strategic directions for focal or priority species. Combined with landscape level biodiversity strategies, this coarse filter approach is intended to manage habitat for these and other

species. Future planning at more detailed scales will identify more specific habitat and management considerations for other forest species whose habitat needs are not addressed at this broad scale.

Natural Disturbance Emulation and Habitat Management

"Habitats created through forest harvesting instead of natural processes such as wildfire can never completely duplicate those that occur naturally, and we have no assurances that they are optimal for any species. Nevertheless, we know that natural habitats prevailing until the modern era were at least adequate for all the species left for us to manage today, so maintaining the closest possible similarity between wild and managed landscapes is an inherently conservative approach."

Philip J. Burton, Sustainable Forest Management Network 2003

5.3.1 Woodland Caribou

Strategic Considerations:

The identification and protection of core winter range of the Hart River and Clear Creek caribou herds are the primary concerns of wildlife managers. In the planning region these ranges are largely without roads and experience limited human activity. The current population estimates for the Hart River and Clear Creek woodland caribou herds are 900 and 2200 respectively. The northern mountain population of woodland caribou are listed as a species of special concern under the Species at Risk Act. The emerging forest management challenge is to maintain the integrity of the key winter habitat and thus ensure the long-term survival of these herds. Core winter range is the area of highest density use by caribou during the late winter period. Core areas in combination with other variables are most critical to winter survival and long-term population persistence. There is little known forestry resource in the core winter range of these herds.

Strategic Directions:

- *Maintain the quality of core caribou winter range habitats by differing commercial harvesting of timber within the critical core caribou winter range for the period of the plan. Harvesting may be necessary for access or essential control of insect infestations, wildfire or diseases or in association with other land uses.*
- *Consult applicable caribou management plans as they are created and amended.*

5.3.2 Barren-ground Caribou

Two barren-ground caribou herds winter within the FRMP area – the Porcupine and the Forty Mile. The 2007 population estimate for the Forty Mile herd was 38,364 caribou. The Porcupine caribou herd has not been surveyed since 2001. According to Porcupine Caribou Management Board, the current population estimate is between 110,000 and 112,000 caribou.

The winter range for the Porcupine herd does not contain vast areas of economically viable forest resources. In the Yukon, the winter range is situated in the snow shadow region of the Ogilvie and Hart River basins. Historic use of forest resources within this region has been negligible. Identification of specific management recommendation is currently not needed.

As an outcome of the TH final agreement, a working group comprised of YG and TH representatives is preparing recommendations regarding habitat protection. There are small sections of the winter range which contain viable forest resources, however the extent and scale of forestry harvesting has and likely will remain quite small. Currently the herd's use of areas which contain forest resources is limited.

Strategic Directions:

- *Consider the availability, quality, and connectivity of lichen habitats within the core winter range of the Forty Mile herd when forest management activities and related guidelines are developed.*
- *Timber harvest planning should be consistent with forestry recommendation contained within the management plan for the Forty Mile caribou herd.*

5.3.3 Moose

Moose are associated with riparian habitats, especially floodplains and large wetlands. Generally, areas with a mosaic of habitat types are best for moose, including openings for browse and forested cover that provide security and snow interception in winter. Critical habitats are late winter and calving ranges. In general, logged landscapes see increases in moose populations.

For moose, the most significant risks are increased access within moose ranges that may either change the natural balance between local populations and predators or increase the rate of adult mortality through hunting pressure. Key winter ranges for moose are largely without roads and have only few human created linear corridors. Winter range and calving areas are a matrix of:

- Open canopied mixed coniferous/deciduous, pine or spruce leading stands
- A mixture of early and mature seral forest classes
- Lakes, wetlands and riparian features
- Burns and young seral forest
- Primarily lower elevations

Strategic Directions:

- *Manage timber harvesting and access in critical moose winter and calving areas to maintain important attributes of moose key winter and calving habitat (forage, snow interception, visual screening).*
- *Aggregate timber harvesting in time and space.*
- *Avoid harvest of critical key winter habitat of cover and forage in winter. Timber harvest planning should identify these important areas.*

5.3.4 Grizzly Bear

Habitat fragmentation by human activity is perhaps the greatest threat to grizzly bear populations. The density of roads has been demonstrated to be one of the key factors that reduce habitat suitability for grizzly bears. Access can influence bear populations by either increasing bear mortality or displacing bears from important habitats into lower quality, but safer, habitats. This can, in turn, influence the productivity and recruitment of bears.

Strategic Direction:

- *Manage access in the development of planning areas. Harvest blocks should be aggregated and widely distributed forest activities should be discouraged. The maintenance of habitat and landscape connectivity will help maintain grizzly bear movement. Areas without roads should be preserved in critical key grizzly bear habitat.*

5.3.5 Lynx

Trapping of lynx has a long history in the FRMP region. Often, high lynx populations are associated with landscapes with short fire cycles, similar to the region. Lynx are usually associated with habitats providing dense understory cover where snowshoe hares are abundant. Mature forest is used for travel, denning and resting. Lynx primarily use early seral habitats and to a lesser extent open areas and mature forest. The effects of logging appear to be generally beneficial to the quality of habitat for lynx. There usually is, however, a delay of 10 to 15 years after cutting before good populations of hares colonize these areas. Before this, lynx avoid open areas created by cutting. During the low population portion of the cycle, lynx may survive in areas of hare refugia that are characterized by dense cover of brushy forest understory.

Strategic Directions:

- *Maintain areas of snowshoe hare habitat.*
- *When developing harvest plans try to provide good habitat for hares that in turn should benefit lynx.*

5.3.6 Salmon and Other Freshwater Species

The Yukon River and its tributaries provide important fish habitat for a range of freshwater fish and salmon species. Chinook, chum, and coho salmon species are all present in the Yukon River watershed. Coal Creek and the Fifteen Mile, Chandindu, Klondike, and Sixty Mile rivers provide spawning habitats for chinook salmon. The Stewart, White and Klondike rivers provide migratory routes and spawning habitat for chinook and chum salmon. Less is known about coho distribution in the region. Salmon species in the region represent an important traditional food source for First Nations people.

Strategic Directions:

- *Maintain salmon and fresh water fish habitat through management of riparian forests.*
- *Ensure road construction and harvesting activities do not impact water quality.*

5.3.7 Forest Birds

Forest birds can be divided into three broad categories- those that prefer interior forest; those that prefer early seral forest, and; those that are edge specialists. Forest management often increases the amount of edge and early seral forest habitat. Therefore, bird species that prefer edge and early seral forest within managed forests often do well. Alternatively, interior forest species require more detailed management. Biodiversity objectives will provide coarse filter management of interior forest species. However nesting and home range use require site level planning.

It should be noted that there is currently legal uncertainty surrounding incidental take of migratory birds and their nests under the Migratory Birds Convention Act (MBCA). Although the development and implementation of a Forest Resources Management Plan is an important step in conserving populations of migratory birds, operators and proponents should practice due diligence in order to protect themselves from enforcement under the MBCA and Migratory Birds Regulations (MBR).

Strategic Directions:

- *Use a variety of cut block sizes and retention in timber harvest planning to provide habitat for interior forest, early seral and edge specialists.*
- *Manage seral stage, forest connectivity and timing of harvest to minimize conflict with breeding and nesting times (e.g. operating windows, seasonal shut-downs).*

5.4 PLACER MINING AND FORESTRY

Placer mining in riparian forests often overlaps with areas of higher timber value. Often the timber is not merchantable to salvage. However in some circumstances, it is desirable and economical for the forest industry to access the timber prior to being denuded by placer activity or where placer claims overlap viable forest resource. Misunderstandings can arise between placer miners and forest industry concerning rights to timber resources on placer claims. A placer claim holder has the right to harvest timber for purposes incidental and necessary to the operation of the claim. Placer claim holders do not have rights to sell a claim's forest resources. The Crown retains all rights to manage public forests on placer claims including administering forest licenses and issuing permits for harvesting timber which overlaps placer claims.

Strategic Directions:

- *Ensure that the higher value timber in riparian areas where placer mining activity is occurring is accessible and is being utilized by the forest industry or by other users.*
- *If possible, reduce or remove forest management guidelines and standards for riparian management if placer activity is planned or is occurring in the riparian management area so that forest industry operators can salvage the forest resource before it is impacted by placer activity.*
- *Ensure that clarity and proper approvals are sought from regulatory authorities pertaining to rights to harvest timber on mining claims.*

5.5 SALVAGING OF FOREST RESOURCE

Burning of forest resources often occurs during land use activities such as the installation of power lines, right of way clearing and any large scale land clearing. Often the resource is of marginal value or inaccessible to salvage. However, when economical to do so, an opportunity should be provided for salvaging the resource.

Strategic Direction:

- *Recommend all salvageable timber be utilized where demand exists and economical to do so.*

5.6 TOURISM AND VISUAL QUALITY MANAGEMENT

The Dawson region has numerous viewsapes and wilderness areas that contribute to tourism and recreational values. The visual and aesthetic quality of the landscape provides economic and social benefits. The Dempster Highway and North Klondike Highway corridors are high visitor use areas, with scenic views and wildlife viewing. Management of visual and aesthetic qualities in wilderness areas is another consideration. There are a number of trails and routes in the Dawson forest planning region, including the Yukon Quest Trail, the Whitehorse Dawson Overland Trail, the Hart River Winter Road from North Fork Pass, as well as canoe access routes to the Peel Region from the Dempster Highway. There are also a number of outfitting concessions.

There are opportunities to manage viewsapes and aesthetic values in high visitor use areas and wilderness routes by harvesting timber in a manner that utilizes natural breaks in the forest canopy and follows natural contours. Cooperation and constructive dialogue with tourism operators and outfitters will also help to identify and manage valued viewsapes and wilderness areas.

Strategic Directions:

- *Integrate management of valued viewsapes into planning along the Dempster and North Klondike highway corridors and major recreational and historic trails and routes.*
- *Design harvest blocks that simulate natural forest openings and blend into the landscape to reduce the visual impacts.*

5.7 ACCESS AND ACCESS MANAGEMENT

Strategic Considerations:

The primary objective of access management is to minimize environmental issues while providing access to forest resources. Access can be both positive and negative depending on the user. Improperly built or poorly engineered roads can be the single largest environmental impact associated with harvesting operations, especially at water crossings. Roads built to access natural resources often persist long past their intended purpose, causing other land use issues to arise.

Strategic Directions:

- *Incorporate access management into development planning. The primary objective is to minimize creation of long-term access.*
- *When possible utilize existing access and integrate with other forest land users (i.e. mining sector, tourism).*
- *Consider available methods of access control and management to minimize indirect negative impacts (i.e. gates, natural barriers, hunting restrictions).*

5.8 TRADITIONAL AND NON-TIMBER USES OF FOREST RESOURCES

Strategic Considerations:

Maintenance of traditional and non-timber uses of forest resources is an important component of forest management. Hunting, fishing and trapping are important traditional uses of forest resources. Forest planning should also support the continued harvesting and processing of non-timber forest products such as berries and mushrooms, as well as access to personal fuelwood and other forest resources.

Strategic Direction:

- *Identify opportunities for harvesting of non-timber forest resources during harvest planning. Support continued access and management of traditional and non-timber forest resources.*

Barricade, Dawson South Klondike Access. Photo: Government of Yukon



6. FOREST PLANNING AREAS

The FRMP region is sub-divided into smaller forest planning areas based on landscape features, forest cover type and general forest-related values. The smaller areas facilitate area-specific management planning. For the purposes of this FRMP, the term Landscape Unit (LU) is used to define these forest planning areas.

Landscape Units are based on watershed boundaries and modified by local access and development patterns. They usually contain similar management concerns and forest types. These units form the boundaries for detailed information gathering, monitoring and planning.

6.1 LANDSCAPE UNITS

The region was divided into 17 different LUs using physiographic boundaries, such as watershed sub-basin boundaries and forest productivity conditions. (see Map 1). These units are fundamental to more detailed planning and analysis as development and operational plans are prepared.

A strategic designation system is a fundamental component of sustainable regional economic development or conservation strategy, and is a key component of an integrated forest resource management framework (see Table 3).

South Klondike. Photo: Government of Yukon



Strategic forest land use zones that can be applied to the LUs include:

- 1) Hinterland Forest Zone (HFZ) – not included in timber supply analysis. In this zone, small scale harvesting for non-commercial purposes may be permitted. Commercial forest operations would be limited to associated resource developments. The zone contributes to biodiversity conservation for the entire planning region.
- 2) Forest Resource Management Zone (FRMZ) – the location where most forest management activities will occur.
- 3) Community Forest Development Zone (CFDZ). – includes municipal and other developed areas.

A draft Forest Resource Use Designation (FRUD) zoning system has been applied to the LUs in the Dawson FRMP region. Draft zoning is provided in Table 4. Once landscape zones are chosen for development, more detailed zoning will occur to identify the specific areas or drainages where additional planning will occur. For example, the Forest Resource Management Zone may be further divided into General, Conservation and Forest Resource Management Areas. Forest Resource Management Areas would be used to identify locations within the FRMZ that have forest resource potential and forest development interests.

The Regional Forest Use Designations are based partly on key concerns identified for each landscape unit. Thus, it is important to identify issues and attributes of key concern to the Planning Team and broader community in this FRMP.

A preliminary list of key values in each landscape unit is presented in Table 4. These features were identified through a review of existing information on the following subjects:

- Wildlife key habitat areas and critical habitat for species at risk
- Parks and protected areas
- Ungulate winter ranges
- Heritage resources including archaeological sites and traditional use areas (general and publicly available information)
- Historic trails and routes
- THFN settlement lands

Table 3. Description of Strategic Forest Land Use Zones

Strategic Forest Land Use Zone	Regional Forest Use Designation	Strategic Overview
Hinterland Forest Zone (HFZ).	Temporary Deferred Area (10 years)	• Forest Management areas with a high conservation focus. • Large amount of uncertainty in regards to forest economics and regional land use planning. • Conservation of identified wildlife, habitat or cultural values. • More detailed planning is required. These LU contain numerous forest resource values of high importance. • Contributes to coarse filter and fine filter objectives. • Temporary deferral, no commercial forest activity, only in circumstance for insect or fire mitigation, habitat treatment or in association with development of another resource sector (quartz mine). Access through LUs may be necessary. Personal use harvesting would be an acceptable forest land use.
Forest Resource Management Zone (FRMZ).	Forest Conservation Management Area	• Forest management areas with a higher conservation focus. • General forest management activities with area specific/special management guidelines for identified wildlife, habitat and cultural-recreational values. An example is wildlife key habitat.
	General Forest Management Area	• Areas without an identified forest resource development or forest resource development focus. • General forest management uses regulated by applicable agencies. • Specific management objectives for bio-diversity, wildlife. • Contributes to forest land base. An example is zones not scheduled for development. • May be part of long-term tenure. • Areas with forest resource management focus. • Areas with high forest economic value. • Priority areas for harvest development planning • Areas where long-term tenure may be provided and woodlots may be established.
Community Forest Development Zone (CFDZ)	Local Forest Planning Area (may contain FRM zone)	• Community development areas (i.e. rural residential, agriculture development). • Considered as local forest use/community forest. • Areas where long-term tenure may be provided and woodlots may be established.
	Municipal Area	• Municipal boundaries, under municipal planning. Not contributing to forest use.

- Wildfire history (1946-2005)
- Placer and quartz mining claims and operations
- Outfitter concessions
- Forest cover data (and analysis of timber values)
- Locations of highway corridors, communities and associated scenic values
- Wilderness tourism key areas

This preliminary list of key values in each landscape unit was presented to the Planning Team for review, revision, and discussion to determine which of these features present key forest planning concerns. These draft rankings were derived from community-identified resource values for each LU and the corresponding potential for resource conflict within the unit. From this assessment a priority for planning

was determined and a time frame for development. The areas identified as a low priority for planning are areas where low levels of forestry activities would occur because of cultural or other social values or access constraints.

For example, LUs with sensitive landscapes may be considered to have a high potential to be adversely affected by timber harvesting and therefore may be assigned a low priority for planning. Meaning the area is not a priority for development. LUs ranked low for development priority require a higher level of mitigation to protect resource values than LUs with higher activity rankings. It should be noted that all the mitigation measures required to protect these values will not be identified through the FRMP. When more indepth planning occurs, additional mitigations could occur.

South Klondike Access – debris used to limit access to harvest areas. Photo: Government of Yukon



Table 4. Description of Landscape Units.

LU name	Priority for Planning	Recommended time frame	Key Values	Strategic Forest Land Use Zone Designation
Tatonduk River	Low	Long-term	• Thinhorn sheep mineral licks, winter range, and migration corridors • Raptor nest sites • Reynolds outfitting concession • Trapping concessions • Non-renewable resource activities	HFZ
Ogilvie River	Low	Long-term	• Woodland caribou key habitat area • Winter traditional use area • Thinhorn sheep mineral licks, winter range and migration corridors • Blackstone outfitting concession • Trapping concession • Non-renewable resources activities	HFZ
Blackstone River	Low	Long-term	• Thinhorn sheep mineral licks, winter range, migration corridors, lambing and rutting areas • Raptor nest sites • Woodland caribou winter range • Winter traditional use area, including caribou camp • Scenic views and wildlife viewing from Dempster Highway corridor • Canoe access routes to Peel Region from Dempster Highway • Blackstone outfitting concession • Trapping concessions • Non-renewable resource activities	HFZ

Table 4. Description of Landscape Units (cont'd)

LU name	Priority for Planning	Recommended time frame	Key Values	Strategic Forest Land Use Zone Designation
Hart River	Low	Long-term	• Thinhorn sheep mineral licks, winter range, lambing and rutting areas • Raptor nest sites • Woodland caribou winter range • Hart River winter road from North Fork Pass is used by backpackers, mountain bikes, ATV and snowmobile users • Outfitting concessions • Trapping concessions • Non-renewable resource activities	HFZ
Chandindu	Medium	Long-term	• Woodland caribou winter range • Thinhorn sheep mineral licks, winter range, lambing and rutting areas • Raptor nest sites • Fall and winter traditional use areas • Large TH settlement land parcels bordering the Yukon River • Outfitting concession • Trapping concessions • Non-renewable resource activities	FRMZ
Forty Mile River	Medium	Short-term	• Barren-ground caribou winter range • Raptor nest sites • Forty Mile Historic Site • Trapping concessions • Non-renewable resource activities	FRMZ
Sixty Mile River	Medium	Short-term	• Significant wildfire disturbance in 2004 • Numerous placer and quartz mining claims • Barren-ground caribou winter range • Historic resources associated with Klondike Gold Rush and industrial mining activity • Potentially high timber values • Trapping concessions • Non-renewable resource activities	FRMZ

Table 4. Description of Landscape Units (cont'd)

LU name	Priority for Planning	Recommended time frame	Key Values	Strategic Forest Land Use Zone Designation
Yukon River North	Low	Long-term	• Quartz mining claims • Peregrine falcon and golden eagle key habitat on Yukon River • Thinhorn sheep mineral licks and winter range • Raptor nest sites • Barren-ground caribou winter range • Yukon River corridor is a high-value heritage resource area • TH settlement lands bordering the Yukon River • Yukon Quest trail • Outfitting concession • Trapping concessions • Non-renewable resource activities	HFZ
Yukon River Central	High	Short-term	• Peregrine falcon and golden eagle nest sites on Yukon River • Barren-ground caribou winter range • Yukon River corridor is a high-value heritage resource area • Slopes of West Dawson and the Top of the World Highway are highly visible from Dawson City and have scenic values • Several TH settlement land parcels bordering Yukon River • Potentially high timber values in this area • Outfitting concession • Yukon Quest trail • High value visitor use area • Trapping concessions • Non-renewable resource activities	FRMZ

Table 4. Description of Landscape Units (cont'd)

LU name	Priority for Planning	Recommended time frame	Key Values	Strategic Forest Land Use Zone Designation
Yukon River South	Medium	Long-term	• Yukon River corridor is a high-value heritage resource area • Significant wildfire disturbance in 2004 • Considerable placer claims and operations • Peregrine falcon and golden eagle key habitat on Yukon River • Barren-ground caribou winter range • Raptor nest sites • Trapping concessions • Non-renewable resource activities	HFZ
White River	Low	Long-term	• Quartz mining claims • Peregrine falcon and golden eagle key habitat on White River • Barren-ground caribou winter range • Trapping concessions • Non-renewable resource activities	HFZ
Stewart River	Low	Long-term	• Significant wildfire disturbance in 2004 • Placer claims and operations, and considerable quartz claims • Whitehorse-Dawson overland trail passes through the LU • TH settlement land parcels • Trapping concessions • Non-renewable resource activities	HFZ
Flat Creek	Medium	Short-term	• TH settlement lands comprise a significant portion of the LU • Beaver key habitat (year-round) • Waterfowl staging and breeding areas • Outfitting concession • Trapping concessions • Non-renewable resource activities	FRMZ

Table 4. Description of Landscape Units (cont'd)

LU name	Priority for Planning	Recommended time frame	Key Values	Strategic Forest Land Use Zone Designation
Gold Fields	High	Short-term	• Numerous historic resources • Whitehorse-Dawson overland trail passes through LU • Significant wildfire disturbance in 2004 • Numerous placer claims and operations; landscape has been significantly altered through industrial mining activity • Extensive quartz mining claims • Potentially high timber values in this area • Barren-ground caribou winter range • Raptor nest sites • Beaver key habitat (year-round) • Sharptail grouse key habitat (year-round) • Ungulate mineral licks • High visitor use area • Trapping concessions • Non-renewable resource activities	FRMZ
North Klondike River	Medium	Short-term	• Thinhorn sheep key habitat area • Woodland caribou (Hart River herd) and thinhorn sheep winter range • Scenic views and wildlife viewing from Dempster Highway • Raptor nest sites • Winter traditional use sites • TH settlement lands bordering North Klondike River • Outfitting concession • Trapping concessions • Non-renewable resource activities	HFZ

Table 4. Description of Landscape Units (cont'd)

LU name	Priority for Planning	Recommended time frame	Key Values	Strategic Forest Land Use Zone Designation
Klondike River	High	Short-term	• Scenic views and wildlife viewing from Dempster Highway • Klondike and Yukon river corridors are high-value heritage resource areas • Raptor nest sites and beaver key habitat (year-round) • Village sites (Moosehide and Tr'o-ju-wech'in) and Dawson-Moosehide Trail • Several TH settlement land parcels bordering the Klondike and North Klondike rivers • Numerous historic resources associated with Klondike Gold Rush and industrial mining activity • Slopes and slide behind Dawson City are highly visible and have scenic and cultural values • High visitor use area • Potentially high timber values in this area • Pete Jensen outfitting concession • Trapping concessions • Non-renewable resource activities	FRMZ
South Klondike River	Medium	Short-term	• Numerous placer mining claims and operations • Extensive quartz claims • Woodland caribou (Clear Creek herd) winter range • Beaver key habitat (winter range) • Fall hunting grounds • Large TH settlement land parcel bordering the South Klondike River • Potentially high timber values in this area • Outfitting concession • Trapping concessions • Non-renewable resource activities	FRMZ

7. FOREST MANAGEMENT GOALS, OBJECTIVES AND INDICATORS

The Canadian Council of Forest Ministers (CCFM) (2003) describes sustainable forest management criteria (expressed as goals and objectives in this FRMP) and indicators as follows:

“ [they] provide a science-based framework to define and measure Canada’s [or a region’s] progress in the sustainable management of its forests. The criteria [goals and objectives] represent forest values that Canadians [Dawson region residents, in this case] want to enhance or sustain, while the indicators identify scientific factors to assess the state of the forests and measure progress over time.”

Goals of Forest Management in the TH Traditional Territory

There are five goals for forest management in the TH Traditional Territory:

- A. Conserve biological diversity
- B. Maintain forest ecosystem health and productivity
- C. Conserve and maintain soil and water resources
- D. Maintain and enhance multiple socio-economic benefits
- E. Maintain and enhance community sustainability

These goals are consistent with the criteria of sustainable forest management defined nationally by the Canadian Council of Forest Ministers (2003), and internationally through the Montreal Process. The goals serve as a broad framework for forest management in the region.

The Montréal Process is the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests. It was formed in Geneva, Switzerland, in June 1994 to develop and implement internationally agreed criteria and indicators for the conservation and sustainable management of temperate and boreal forests. The member countries are Argentina, Australia, Canada, Chile, China, Japan, Republic of Korea, Mexico, New Zealand, Russian Federation, United States of America and Uruguay.

Objectives and Indicators of Forest Management in the Planning Region

For each of these five goals, there are a number of more specific objectives. These objectives further define the forest values that the community wishes to sustain and enhance in the region. Objectives set the future direction for forest management decisions and actions, and provide a basis for evaluating the outcomes of forest management.

For each objective presented in this plan there is a corresponding set of indicators. Indicators are used to monitor how well the outcomes of forest management fulfill the objectives stated in the FRMP. Indicators are used to answer the question, “Are we achieving the goals and objectives of our plan?” Indicators also allow forest managers and the community to identify aspects of forest management that need improvement. More importantly, they tell managers how the outcomes of forestry and forest-based activities will be evaluated by the community.

Indicators are a critical component of monitoring programs and a key tool in adaptive forest management. They are not meant to be used for enforcement purposes. If they are monitored regularly and supported by good information (including scientific, traditional and local knowledge), indicators can serve as early warning signs of forest management issues that require attention. Indicators requiring attention should help inform the adaptive management process and lead to new and improved management. The aim is to move indicators measured as “unacceptable” towards “acceptable”.

The indicators developed for this FRMP are to be applied at the landscape level, across the entire Dawson forest planning region. Some indicators are also focused on monitoring activities in timber harvest areas that have the potential to impact the landscape. To be effective, these indicators should be:

- **Meaningful** – They should relate clearly to a particular objective and provide significant information about the values embodied by an objective.
- **Measurable** – They should be based on available or easily obtainable data that can be repeatedly measured over time to observe trends.
- **Cost effective** – It should be financially and practically feasible to collect data to report on the indicator.
- **Understandable** – They should be readily understood by forest managers and the public.
- **Connected to forestry** – They should respond to forest management actions and practices;
- **Attributable** – It should be possible to attribute (show cause and effect) trends observed over time to forest management actions and explain why these trends are being observed.

The first step in reporting on the indicators will be to compile an Initial Status Report. The purpose of this document will serve as the baseline against which future conditions will be compared. Indicator reporting will be guided by adaptive management needs and financial and personnel resource availability.

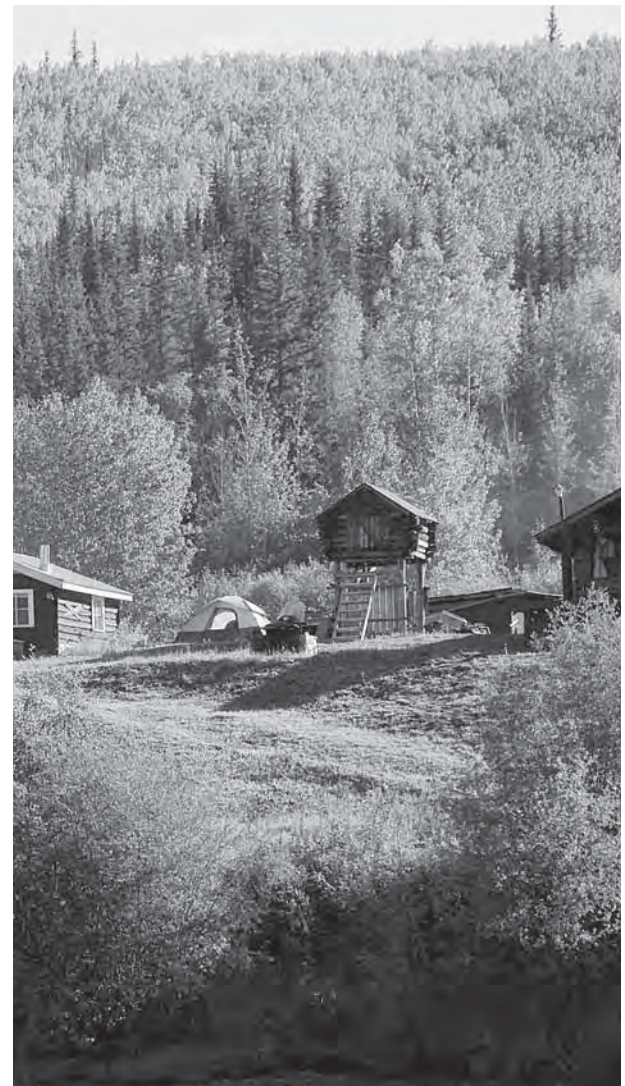
The list of indicators is not a comprehensive list, some maybe dropped and others added as new information and implementation occurs.

The indicators marked with an asterisk () may be easier to monitor in the near-term because they have established methodologies and/or monitoring data are readily available.*

7.1 GOAL A: CONSERVE BIOLOGICAL DIVERSITY

The Canadian Council of Forest Ministers (2003) defines biological diversity as the “variability among living organisms and the ecological complexes of which they are a part.” Conservation of biological diversity involves management and preservation of ecosystems to ensure their viability, resiliency and sustainability. Biological diversity exists at multiple scales, from the level of the landscape or ecosystem, to individual species, to the genetic diversity within and between species. This FRMP identifies three objectives for biodiversity conservation: 1) conserve ecosystem diversity; 2) conserve species diversity; and 3) conserve genetic diversity.

Moosehide. Photo: Government of Yukon





7.1.1 Objective A.1 - Conserve Ecosystem Diversity

Ecosystem diversity refers to the mosaic of forested and non-forested ecosystem types across the landscape. This mosaic is dynamic, changing over time in response to disturbance, such as fire. In the Dawson forest planning region, this patchwork of ecosystem types includes black and white spruce-dominated forests and mixed forests at lower to mid-elevations, scrub birch and willow communities at sub-alpine elevations, and alpine tundra at higher elevations. Wetlands are a common landscape feature along rivers, plateaus and tundra flats. The most productive forests are typically found in lowland and riparian areas and south-facing, upland slopes.

Conserving this mosaic of forested and non-forested ecosystem types across the landscape supports habitat and species diversity. Thus, it is valuable to assess and monitor any change in ecosystem diversity in response to natural disturbance and forest management.

The following indicators can be used to monitor any change in the range and extent of different forest and ecosystem types in the Dawson forest planning region in response to forest management:

- Forest area, by type and age class, in each landscape unit*
- Area of forest, by type and age class, in protected areas*
- Amount of timber harvest area or area burned within riparian and/or lowland forest in each landscape unit*

7.1.2 Objective A.2 - Conserve Species Diversity

Species diversity refers to the variety and abundance of species present within a given area. Maintaining the structural diversity and connectivity of forest habitats across the landscape is important for conserving species diversity. For example, lowland travel corridors are important for species with a broad range in the region, such as grizzly bears, and species that move between winter and summer habitats, such as moose. Larger patches of old growth forest are important to a range of species in the Dawson forest planning region, such as the golden-crowned kinglet, marten and lynx. Species at risk, species of conservation concern, and species of special interest to the community require

particular attention in forest management planning at the landscape and operational level.

The following indicators can be used to monitor management practices aimed at conserving species diversity:

- Area and patch size of old forest in each landscape unit*
- Conservation status of suitable habitats for forest-associated species at risk, species of conservation concern, and species of special interest to the community
- Retention of travel corridors for selected focal species within the forest development area

7.1.3 Objective A.3 - Conserve Genetic Diversity

Genetic diversity is the variation in genetic make-up within individual species and among different species. Conserving genetic diversity is critical to maintaining the ability of species to adapt to environmental change. In the forest management context, a reservoir of genetic diversity within and among tree species should be maintained to help ensure that the productivity and resilience of the forest is sustained over the long term.

Applying natural regeneration methods using seed stock from the surrounding forest is one way to conserve genetic diversity. If replanting is applied as a regeneration method, the genetic diversity and origin of the seed stock used are also important considerations.

In light of the anticipated effects of climate change on forests in the Dawson forest planning region and throughout the Yukon, an adaptive management approach to conserving genetic diversity will be needed. It is thought that boreal forest types may shift 300 to 500 km north in response to climate warming. Regeneration strategies will need to be monitored and adapted continuously to respond to the changes ahead.

The following indicators can be used to monitor the conservation of genetic diversity in the productive forest land base:

- Regeneration method applied in harvested areas*
- Genetic origin and diversity of seed used in reforestation

7.2 GOAL B: MAINTAIN FOREST ECOSYSTEM HEALTH AND PRODUCTIVITY

Maintaining forest ecosystem health and productivity is the second goal of this FRMP. The sustainable development of forest resources depends on the health and productivity of the ecosystem over the long term (Canadian Council of Forest Ministers, 2003). Healthy forests are more resilient to change and disturbance, and are more likely to provide continuous new growth. This FRMP identifies three objectives related to the goal of maintaining forest health and productivity: 1) maintain and enhance ecosystem condition and productivity; 2) support the ecosystem's ability to maintain natural processes; and 3) maintain and enhance ecosystem resilience.

7.2.1 Objective B.1 - Maintain and Enhance Ecosystem Condition and Productivity

Ecosystem condition and productivity refer to the health, vitality and rates of biological production in forest ecosystems. In the Dawson forest planning region, growing conditions are challenging and the area of forest land base with timber values is limited. To maintain long term productivity, it is important to monitor the total growing stock of merchantable timber in the region and the rate of forest regeneration in response to forest management. To assess potential threats to the health, productivity and vitality of forest ecosystems, it is also important to keep track of insect and disease outbreaks, and other signs of stress.

The following indicators can be used to monitor forest ecosystem condition and productivity:

Indicators:

- Total growing stock of merchantable and non-merchantable tree species*
- Amount of harvested areas successfully regenerated within the predetermined regeneration delay time*
- Incidence of forest health concerns, including biotic (e.g. insect and disease outbreaks) and abiotic (e.g. windthrow, drought stress) disturbances

7.2.2 Objective B.2 - Support the Ecosystem's Ability to Maintain Natural Processes

Natural ecosystem processes include the cycles of death and renewal, disturbance, regeneration and natural succession. Forest fires are the dominant disturbance type in the Dawson forest planning region and essential to natural succession in the region's boreal forest ecosystems. Forest harvesting that emulates the range of variation in natural disturbance levels can help to support the ecosystem's ability to maintain natural processes.

To facilitate this, the following indicators can be used to monitor levels of natural and human disturbance in the timber harvest area and across the landscape:

- Area of each landscape unit affected by forest harvesting relative to area affected by natural disturbance, such as fire*
- Number, patch size and cause of forest fires in each landscape unit*

7.2.3 Objective B.3 - Maintain and Enhance Ecosystem Resilience

Ecosystem resilience refers to the ability of an ecosystem to maintain its ecological integrity and productivity in the face of disturbance. Resilience is defined as the magnitude of disturbance that an ecosystem can withstand while still retaining essentially the same structure, function and feedbacks (Brand and Jax, 2007).

Maintaining the connectivity and integrity of forest habitats is important to supporting ecosystem resilience. Monitoring the density of forest roads and the sizes of cut blocks can serve as indicators of habitat connectivity and integrity. Monitoring trends in the area of productive forest can also help to assess the resilience of managed forest ecosystems.

The following indicators can be used to monitor the maintenance and enhancement of ecosystem resilience:

- Density of permanent, all-season forestry roads in each landscape unit*
- Size and distribution of cut patches*
- Area of productive land base in each landscape unit*
- Density of temporary, winter and seasonal roads

7.3 GOAL C: CONSERVE AND MAINTAIN SOIL AND WATER RESOURCES

Conserving and maintaining soil and water resources is the third goal of this FRMP. Soil and water resources are the foundation of ecological functioning and productivity in forest ecosystems. Road construction and other forestry practices have the potential to impact soil and water resources in a number of ways, such as through soil erosion and compaction, siltation of aquatic habitats, flooding, and increased water temperatures. Successful regeneration of harvested areas is important for maintaining soil moisture and nutrient levels, and in minimizing soil erosion, stream siltation and disruption of stream flow rates. This FRMP identifies two objectives related to this goal: 1) conserve and maintain soil resources; and 2) conserve and maintain water resources.

7.3.1 Objective C.1 - Conserve and Maintain Soil Resources

Soils are the living substrate that supports forest growth and the foundation of a healthy, productive, and resilient ecosystem. Conserving soil resources is critical to long-term forest ecosystem productivity. In the Dawson forest planning region, there is considerable variability in soil moisture and temperature conditions, resulting in part from the discontinuous but widespread permafrost found throughout the region. Potential disturbance to permafrost is an additional consideration in forestry activities because such disturbance may lead to slumping and erosion or to ponding of water, which may impact forest regeneration. Soil and permafrost disturbance can be minimized by harvesting during the winter over frozen ground.

Changes in soil conditions resulting from logging in the Dawson forest planning region can lead to the formation of duff layers and organic material at depths exceeding 30 cm. Under such deep duff and organic layers, decomposition rates are slow. As regeneration and succession occur in these conditions, the soil will cool and, over time, growth rates will decline. To facilitate forest regeneration, it may be necessary to break up or reduce duff layers in some sites.

In addition to minimizing disturbance, maintaining soil nutrients is another consideration for forest management. Post-harvest retention of woody debris

is also important, serving an important role in sustaining long-term soil productivity and providing wildlife habitat.

The following indicators can be used to monitor the conservation and maintenance of soil resources in timber harvest areas:

- Amount of timber harvest area with significant soil and/or permafrost disturbance (resulting in compaction, displacement, erosion, slumping, loss of organic matter, ponding, etc.)
- Ratio of winter to summer harvesting operations
- Volume of coarse woody debris in timber harvest area relative to natural forest

7.3.2 Objective C.2 - Conserve and Maintain Water Resources

Water conservation is important for sustaining potable water supplies for humans and wildlife, providing suitable aquatic habitats for many plant and animal species, and maintaining wetland ecosystems. By storing and filtering water, wetlands and riparian habitats in turn serve an important water conservation function, buffering terrestrial ecosystems from floods and preventing sediment from entering aquatic systems.

Maintaining the integrity of wetlands and riparian habitats is therefore an important forest management consideration. Forest development activities, such as construction of permanent stream crossings, and major stand-replacing disturbances, also have the potential to impact water resources through introduction of sediment into watercourses.

The following indicators can be used to monitor the conservation and maintenance of water resources in the Dawson forest planning region:

- Proportion of riparian areas included within timber harvest areas in each landscape unit*
- Number of permanent stream crossings on forest roads on major and minor watercourses in each landscape unit
- Proportion of watersheds with stand-replacing disturbance in the last 20 years*
- Water quality measures

7.4 GOAL D: MAINTAIN AND ENHANCE MULTIPLE SOCIO-ECONOMIC BENEFITS

The fourth goal of this FRMP is to maintain and enhance the multiple economic and social benefits that the forest provides. Forest ecosystems provide both commercial and non-commercial socio-economic benefits. Direct commercial benefits include timber and non-timber forest products. Non-commercial benefits include wildlife habitat, recreational opportunities, scenic values, wilderness experiences, ecological services, and spiritual benefits. The goal of maintaining socio-economic forest benefits encompasses the wide range of goods and services provided by forest ecosystems. This FRMP identifies two objectives related to this goal: 1) maintain and enhance sustainable social and economic benefits from timber resources; and 2) maintain and enhance social and economic benefits from non-timber resources.

7.4.1 Objective D.1 - Maintain and Enhance Sustainable Social, Cultural and Economic Benefits from Timber Resources

This FRMP aims to enhance the contribution of the region's forest resources to a sustainable, local economy.

Opportunities to gain economic benefits from forest resources include timber harvesting and other commercial forestry ventures. Local employment, the provision of timber products to local markets, and personal fuelwood collection are important social and economic benefits derived from the utilization of timber resources in the Dawson region.

The following indicators can be used to monitor the social, cultural and economic benefits derived from timber resources in the Dawson Forest Management Planning region:

Indicators:

- Proportion of local population employed in forestry-based activities*
- Number of locally-owned operations relative to total area of productive forest land base*
- Forest area by timber tenure*
- Percentage of harvested timber and fuelwood sold to local markets
- Product profile of harvested timber

- Volume of wood salvaged from forest harvesting for non-timber purposes, such as clearing for placer mining operations
- Annual harvest of timber products relative to the level of harvest deemed to be sustainable*

7.4.2 Objective D.2 - Maintain and Enhance Social, Cultural and Economic Benefits from Non-Timber Resources

This FRMP aims to enhance the social, cultural and economic benefits derived from the diversity of non-timber forest resources in the Dawson forest planning region. Examples of non-timber forest products and resources include meat, fish, fur, berries, medicinal products, tourism opportunities, scenic and recreational values, and hunting and fishing resources.

Many of these non-timber forest products (NTFPs) are harvested for personal use and subsistence purposes by Dawson region residents. However, the harvesting, processing and sale of some of these NTFPs also provide small business opportunities. To ensure that harvest and use of NTFPs is sustainable over the long-term, it is important to monitor harvest

First Nations traditional berry picking. Photo: Dorian Olsen by TH Heritage Department



volumes and trends in availability over time. The revenue generated from NTFPs and the percentage of these goods sold to local markets can also provide an indication of the locally-derived benefits of these resources.

Non-timber forest resources, such as wilderness tourism opportunities, scenic and recreational values, provide direct social and cultural benefits to Dawson region residents, and also generate economic opportunities. To sustain the tourism-related benefits derived from the forested land base, it is important to consider valued views and access routes in forest management planning. Monitoring the local employment and revenue generated by tourism can provide an indication of the benefits derived from this sector.

The following indicators can be used to monitor the maintenance of social, cultural, and economic benefits from non-timber forest resources in the Dawson forest planning region:

- Hunter/angling effort surveys*
- Diversity and availability of non-timber forest products, such as wood for snowshoe frames, berries etc., close to the City of Dawson
- Annual harvest volumes of non-timber forest products including fuelwood, wood for snowshoe frames, meat, fish, fur, berries, medicinal products, etc. relative to the level of harvest deemed to be sustainable
- Annual value of commercial non-timber forest products, such as birch syrup and mushrooms
- Proportion of non-timber forest products harvested that is sold to local markets
- Proportion of valued views that has been disturbed by harvesting or significantly affected by natural disturbances (fire, insects, storms)*
- Number of tourism operators in the region*
- Total revenue generated by tourism businesses in the region*

7.5 GOAL E: MAINTAIN AND ENHANCE COMMUNITY SUSTAINABILITY

The goal of developing forest resources to meet social needs was deemed fundamental to the development of the FRMP since the best interests of the present and future society need to be accounted for in the development of a regional plan. This FRMP identifies two objectives related to this goal: 1) respect the rights and strengthen the traditional use of forest resources by Tr'ondëk Hwëch'in citizens; and 2) respect the rights of forest resource users in general.

7.5.1 Objective E.1 - Respect the Rights and Strengthen the Traditional Use of Forest Resources by Tr'ondëk Hwëch'in Citizens

The FRMP aims to respect the rights of the Tr'ondëk Hwëch'in related to forest resources, as provided for in the TH Final Agreement. In addition, it

encourages and protects the cultural distinctiveness and social well-being of the Tr'ondëk Hwëch'in, including heritage resources and traditional use areas.

Economic development and capacity building is a key area of concern for present and future generations of Tr'ondëk Hwëch'in. The FRMP aims to enhance the participation of Tr'ondëk Hwëch'in members in forest resource development and provide a framework for forest management on settlement lands.

The following indicators can be used to monitor the degree to which forest management respects TH cultural and heritage values, and involves TH citizens:

- Status of known heritage resources, such as archaeological sites and heritage sites including traditional use areas within forest development areas*
- Level of participation in the First Nations Forestry Program

First Nations traditional harvesting. Photo: J.J. van Bibber, TH Heritage Department



- Financial resources available annually for training and capacity building in the forestry sector
- Number of TH members employed in the forestry sector
- Area of timber tenure on TH settlement land
- Status of traditional economic activity opportunities including fishing, hunting, and gathering

7.5.2 Objective E.2 - Respect Rights of Forest Resource Users in General

Forest resource users include First Nation and non-First Nation populations who live within the Dawson community and throughout the region. The key component of this objective is to respect community values, which contributes to both social and economic sustainability. This FRMP aims to support the rights of forest resource users to engage in commercial forestry activities and non-commercial forest uses. Providing community members with opportunities to participate in the forest management planning process is key to understanding and respecting community values in forest management. Local employment, education and training opportunities also support the ability of community members to exercise their rights to use the forest land base. As well, the area and extent of the forest land base that is accessible to the community for various uses and activities demonstrates the degree of access that forest users have to this land base.

The following indicators can be used to monitor the degree to which forest management respects the rights of forest resource users in general:

- Number and variety of opportunities for community participation in forest management planning
- Number of forestry-related education and training programs available and number of participants in these programs
- Area and extent of the forested land base that is accessible to the community for forestry-based and non-forestry based uses and activities*

8. PLAN IMPLEMENTATION, MONITORING AND REVIEW

The SFMP is a government approved plan – approved by the governments of the Tr’ondëk Hwëch’in and Yukon.

The plan is a working document that will be implemented by all relevant government departments and agencies through their management and regulatory activities. In the case of the Yukon Forest Management Branch and the TH, it will also be implemented through the guidance of the FRMP, Forest Resources Act and its regulations. Timber harvest plans and permits will take guidance from the forest management principles, goals, objectives and strategic directions described in this plan. The priorities identified for LUs in the FRMP will also guide future forest resource development.

The plan recognises the important contributions to be made to the effective implementation and monitoring of the plan, by the public, local residents, and THFN citizens, in partnership with DDRRC, Tr’ondëk Hwëch’in and Government of Yukon, Department of Energy, Mines and Resources.

The plan is a dynamic document that must be responsive to a changing environment and changing needs and values. It will require monitoring, and periodic review and revisions.

8.1 ROLES AND RESPONSIBILITIES

8.1.1 Planning Team

The responsibility for the development of this plan lay with a Planning Team that consisted of the representatives of the plan’s approval bodies – Government of Yukon (as represented by the Forest Management Branch), and the TH. The role of the Planning Team ends with the approval of the plan. However, the Planning Team may be reconvened to consider periodic amendments to the plan. These amendments will be based on changing circumstances, conditions and feedback.

8.1.2 Government of Yukon Forest Management Branch and Tr’ondëk Hwëch’in

The FMB and the Tr’ondëk Hwëch’in Lands and Resources Department are responsible for the following activities:

a) Plan Implementation

- Review existing or new plans to ensure consistency with this plan.
- Coordinate implementation on their respective landbase.
- Distribute copies of the plan to licensed resource users, lands and resource management staff, stakeholders, and the public.
- Manage resource use within existing or future legislation, regulations, and standards.
- Develop supporting policy for implementation of FRMP.
- Continue to work together on forest management and forest management planning on a government-to-government basis.

b) Plan Monitoring, Amendment and Review

- Facilitate the development of an effective and practical monitoring program.
- Collect and compile indicator information, revise the indicators as necessary, and raise issues that need to be addressed.
- Prepare a monitoring report that reviews and compiles indicator information and assess how well the plan is meeting its objectives. (The monitoring report shall indicate how the objectives and strategies in the FRMP are being met through specific forest management activities, subsequent planning processes and timber harvest plans and permits.)
- Determine timing of review of the plan.
- Strive to complete monitoring report within three years of approval of the FRMP.

8.1.3 Dawson District Renewable Resources Council

The DDRRC has responsibilities for activities identified in Chapter 17 of the UFA and for the following:

a) Plan Implementation

- Facilitate effective consultation of forest plans and information sharing throughout the planning region.

b) Plan Monitoring, Amendment and Review

- Recommend revisions to the plan to the FMB and Tr'ondëk Hwëch'in Lands and Resources Department.

8.2 DIRECTION FOR PLANNING AREA DEVELOPMENT

The FRMP establishes what issues and concerns, values and interests must be addressed as forest resource development moves forward in the region. The next two planning stages narrow the decisions and direction from the general goals and objectives of this plan to focus on priority planning areas and ultimately to candidate Timber Harvest Planning areas.

Plans are to be developed by the appropriate agencies consistent with legislation and regulations.

8.3 ADAPTIVE MANAGEMENT STRATEGY

Forest ecosystems are complex and dynamic and our ability to predict how they will respond to management actions is limited. Therefore, this plan prescribes an adaptive management framework. Adaptive management is a formal approach to learn from the responses of existing forest management actions, determine how to best improve current approaches, and therefore, improve overall management practices (Government of British Columbia, 1999).

The ability to predict how forest ecosystems respond to management actions is especially limited in the Yukon where forest harvesting activities and ecosystem response research has been fairly limited compared to other jurisdictions in Canada. Formal

and informal research has been undertaken by the Forest Management Branch to determine ecosystem responses to specific management. The research results have led to the development of forest harvesting guidelines and standards for Yukon. These provide a framework for best managing the Yukon forested environment based on the knowledge gained so far. However, there are knowledge gaps and, therefore, uncertainties on how to best manage forests in the Yukon.

Rather than produce a FRMP with concrete directions for management actions, which have been derived based on ecosystem response information gained so far, it is far more useful to implement a plan that incorporates an adaptive management strategy. Therefore, management actions will be modified and revised in response to new information as it is received.

A detailed description and framework for adaptive forest management is provided in the document titled *An Introductory Guide to Adaptive Management* prepared by the Forest Practices Branch, BC Ministry of Forests (Government of British Columbia, 1999). The guide provides an overview on adaptive management and describes the following six-step framework recommended for applying adaptive forest management.

Step 1: Assessing the Problem – includes defining the management concern, identify measurable objectives (indicators), forecast responses to management actions.

Step 2: Designing the Management Plan – includes both the management plan and a monitoring program to address gaps identified in Step 1.

Step 3: Implement the Management Plan – implementing the plan.

Step 4: Monitor – use indicators identified in Step 1 to test forecasts.

Step 5: Evaluate – compare responses measured in Step 4 with forecasts identified in Step 1.

Step 6: Adjust – adjust management actions, ecosystem objects, etc. to accommodate results evaluated in Step 5.

Repeat Process – as new understandings, problems or forest management questions arise.

8.3.1 Large Land Base Changes

Strategic Considerations:

Wildfire is the agent primarily responsible for unpredictable large land base changes in the Yukon. Depending on the extent and location, a fire can impact timber supply and non-timber values. Most often after a fire, there is a reduction in green wood harvest. The fire also creates opportunities by increasing the amount of fuelwood and provides the conditions for mushroom harvesting.

Changes in land use can impact the forest landbase as well. For instance, access to forest resources may be gained if a new road is constructed or access is limited to forest resources when a large wilderness park is identified. When timber supply analysis occurs, changes in forest land use and wildland fire impacts on timber supply should be addressed to assist the decisions on the annual allowable cut (AAC).

Other land uses and land use decisions, such as extensive construction activity or changes in government policy, could impact supply of forest resources.

Strategic Direction:

- *Forest managers should monitor other projects and government policy that will impact the demand for forest products.*

8.4 INTEGRATION WITH REGIONAL LAND USE PLANNING

Strategic Considerations:

Regional land use plans make recommendations for the use of land, water and other renewable and non-renewable resources. This planning is necessary to resolve land use and resource conflicts within the region. The plans ensure that use of lands and resources is consistent with social, cultural, economic and environmental values. The plans build upon the traditional knowledge and experience of the residents of each region. There is currently no land use plan for the Dawson region.

A land use plan may evaluate and develop guidelines for integrating land uses. This will include understanding the land and its uses and making land management decisions. Uses may include mining, tourism, recreation, hunting, trapping, fishing, agriculture, energy production, communication, protected areas and parks. Such a plan will address environmental, social and economic issues and will examine resource values and uses other than forestry. A land use plan may affect the available land base and access for development.

Ground view of 2000 harvest block. Photo: Government of Yukon



The parties responsible for the development of a land use plan in the Dawson region will seek guidance from the TH Final Agreement and Self-Government Agreements. If and when the process becomes active, the region covered by the planning process could include the area covered by this FRMP.

Strategic Direction:

- *It is imperative that the land use and the FRM plans be integrated and coordinated to ensure that land uses for forestry management and other resources are accounted for. The integration of any specify rules or conditions for land use or any guidelines together with forest management and timber harvest planning will be required to ensure that the desired future forest landscape conditions maintain multiple values.*

8.5 PRIORITIES FOR PLAN IMPLEMENTATION

In consideration of the Landscape Unit information (Section 6.0, above), the following forest management planning priorities and activities are recommended:

Strategic Directions:

- *Complete the determination of the AAC based upon this plan.*
- *Apportion the AAC.*
- *Select and distribute harvesting license or woodlot license opportunities.*

Machinery cutover by Arctic Inland. Photo: Government of Yukon



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Bill Bowie and spruce sapling. Photo: Government of Yukon



10. LIST OF ACRONYMS

AAC	Annual Allowable Cut	MBR	Migratory Birds Regulations
CCFM	Canadian Council of Forest Ministers	MOU	Memorandum of Understanding
CFDZ	Community Forest Development Zone	NND	Nacho Nyäk Dun
COSEWIC	Committee on the Status of Endangered Wildlife in Canada	NNDTT	Nacho Nyäk Dun Traditional Territory
CPAWS	Canadian Parks and Wilderness Society	NTFP	non-timber forest products
DDRRC	Dawson District Renewable Resource Council	PWPC	Peel Watershed Planning Commission
FMB	Forest Management Branch	SARA	Species at Risk Act
FMP	Forest Management Plan	TH	Tr'ondëk Hwëch'in
FNFP	First Nations Forestry Program	THA	Timber Harvest Agreement
FRMP	Forest Resources Management Plan	THFN	Tr'ondëk Hwëch'in First Nation
FRUD	Forest Use Designation System	THC	Tr'ondëk Hwëch'in Council
HFZ	Hinterland Forest Zone	TT	Traditional Territory
LU	Landscape Unit	UFA	Umbrella Final Agreement
MBCA	Migratory Birds Convention Act	YESAA	Yukon Environmental and Socio-economic Assessment Act
		YG	Yukon Government
		YSC	Yukon Salmon Committee

Arctic Inland new mill. Photo: Arctic Inland



11. GLOSSARY OF FOREST TERMS

Access management planning: Specific to the roading required to access the harvest planning area, and between harvest blocks within the area, and includes maintenance and deactivation.

Adaptive management: A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management practices on a continuing basis to ensure that management objectives are being met.

Allowable annual cut (AAC): The amount of timber that is permitted to be cut annually from a particular area. AAC is used as the basis for regulating harvest levels to ensure a sustainable supply of timber. Currently no regulatory mechanism is available in the Yukon to administer this.

Area regenerating: Includes areas that have been harvested recently (less than 10 years ago), and areas depleted by such natural disturbances as fire, insects and disease, where the stand does not meet stocking standards.

Available timber: Timber which is available for harvest after due recognition of constraints to protect the environment and other forest uses. (See operable timber)

Basic silviculture: Harvesting methods and silviculture operations including seed collecting, site preparation, artificial and natural regeneration, brushing, spacing and stand tending, and other operations that are for the purpose of establishing a free growing crop of trees of a commercially valuable species.

Biodiversity (biological diversity): The variety, distribution and abundance of different plants, animals and micro-organisms, the ecological functions and processes they perform and the genetic diversity they contain at a local, landscape or regional level of analysis.

Boreal forest: The most extensive of the three main forest zones in the world. (Others are tropical and temperate forest zones). The boreal forest is the northern circumpolar forest zone and characterized by winters that always have snow and where summers are short. This coniferous, tundra forest type consists

primarily of black and white spruce, balsam fir, and larch interspersed with broadleaf trees, usually birch and aspen.

Clearcutting (clearcut): An even-aged forest management silviculture method that involves the complete felling and removal of a stand of trees producing a fully exposed micro-climate for the development of a new even-aged stand.

Climate change: An alteration in measured quantities (e.g., precipitation, temperature, radiation, wind and cloudiness) within the climate system that departs significantly from previous average conditions and is seen to endure, bringing about corresponding changes in ecosystems and socioeconomic activity.

Coarse filter approach: A broad approach to maintaining biodiversity through the conservation of land areas and representative habitats with the assumption that the needs of most of the associated species, communities and ecological processes will be met at the large-scale. (See fine filter approach)

Coarse woody debris (CWD): Sound and rotting logs, branches and stumps that provide habitat for plants, animals and insects and a source of nutrients for soil development. The type and size of material designated as CWD varies among classification systems.

Composition: The proportion of each tree species in a stand expressed as a percentage of either the total number, crown closure, basal area or volume of all tree species in the stand.

Commercial forest: Forest land that is able to grow commercial timber within an acceptable time frame and is designated for such a purpose.

Critical habitat (from the federal Species at Risk Act): Specific areas within the geographic area occupied by a federally listed species on which physical and biological features are found that are essential to the conservation of the species. In conservation biology – part or all of an ecosystem occupied by wildlife species that is recognized as essential for the maintenance and long-term survival of the population.

Development plan: A specific plan outlining harvesting, road construction, protection, and silviculture activities over the short term (often five years) in accordance with the approved forest management plan.

Ecodistrict: A part of an ecoregion characterized by distinctive geologic, soil, water, fauna and land use.

Ecological land classification: A process of delineating and classifying ecologically distinctive areas based on geologic, landform, soil, vegetative, climatic, wildlife, water and human factors. This holistic approach to land classification can be applied incrementally, from site-specific ecosystems to very broad ecosystems. This system provides for seven levels of generalization: ecozones, ecoprovinces, ecoregions, ecodistricts, ecosections, ecosites and ecoelements.

Ecoregion: A part of an ecozone characterized by distinctive regional ecological factors, including climate, physical geography, vegetation, soil, water, fauna and land use.

Ecosystem: A dynamic system of plants, animals and other organisms, together with the non-living components of the environment, functioning as an interdependent unit.

Ecosystem integrity: The quality of a natural unmanaged or managed ecosystem in which the natural ecological processes sustain the function, composition and structure of the system.

Ecosystem management: The use of an ecological approach to achieve productive resource management by blending social, physical, economic and biological needs and values to provide healthy ecosystems.

Ecotourism: A type of tourism that focuses on nature-related experiences (e.g., backcountry travel).

Ecozone: An area of the Earth's surface that is representative of a broad-scale ecological unit characterized by particular abiotic (non-living) and biotic (living) factors.

Edge habitat: A loosely defined type of habitat that occurs at the boundary between two different habitat types. Typically, edge habitats share characteristics with both adjacent habitat types and have particular transitional characteristics that are important to wildlife.

Endangered species: Any species of plant or animal defined through the Species at Risk Act as being in danger of extinction throughout all or a significant portion of its range in the Federal registry.

Fine filter approach: An approach to maintaining biodiversity that is directed toward particular habitats or individual species that might fall through the coarse filter. These habitats may be critical in some way, and the species threatened or endangered.

Fire cycle: The projected length of time that it would take to burn an area equivalent to the planning region, or a sub-section of the planning region, once.

Forest: An ecosystem characterized by a more or less dense and continuous tree cover, often consisting of stands varying in composition, structure, age class and associated processes, and commonly including meadows, streams fish and wildlife.

Forest cover: Forest stands or cover types consisting of a plant community made up of trees and other woody vegetation, growing more or less closely together.

Forest cover map: A map showing relatively homogeneous forest stands or cover types, produced from the interpretation of aerial photos and information collected in field surveys. Commonly includes information on species, age class, height class, site and stocking level.

Forest ecology: The relationships between forest organisms and their environment.

Forest Ecosystem Network (FEN): A planned landscape zone that serves to maintain or restore the natural connectivity within a landscape unit.

Forest land: Land primarily intended for growing, or currently supporting, forest. It includes land not now forested (e.g. clear-cut lands and northern lands that are forested but not intended for any commercial forestry use) and plantations.

Forest management: The practical application of scientific, economic and social principles to the administration and working of a forest for specified objectives. Particularly, that branch of forestry concerned with the overall administrative, economic, legal and social aspects and with the essentially scientific and technical aspects, especially silviculture, protection and forest regulation.

Forestry practices: Any activity that is carried out on forest land to facilitate the use of forest resources, including, but not limited to, timber harvesting, road construction, silviculture, grazing, recreation, pest control and wildfire suppression.

Forest regions classification: A process of delineating large geographic areas according to landform and climate, associated with broad variations in overall forest composition.

Forest Resources Management Plan (FRMP): means a plan prepared as set out in Part 2 of the Forest Resources Act.

Forest type: A group of forest areas or stands whose similar composition (species, age, height and density) differentiates it from other such groups.

Fuelwood: Trees used for the production of firewood logs or other wood fuel.

Fragmentation: The process of transforming large continuous forest patches into one or more smaller patches surrounded by disturbed areas. This occurs naturally through such agents as fire, landslides, windthrow and insect attack. In managed forest, timber harvesting and related activities have been the dominant disturbance agents.

Geographic Information System (GIS): An organized collection of computer hardware, software and geographic data designed for capturing, storing, updating, manipulating, analyzing and displaying all forms of geographically referenced information.

Global warming: The rise in temperature of the Earth's atmosphere due to the greenhouse effect (the retention of the sun's energy by the atmosphere due to the build-up of CO₂ and other gases that are the bi-product of industrial activities).

Green tree retention: Harvesting that retains live trees of a specific species and size on the area to be cut to achieve a site-specific objective.

Habitat: The environment in which a population or individual lives; includes not only the place where a species is found, but also the particular characteristics of the place (e.g., climate or the availability of suitable food and shelter) that make it especially well suited to meet the life-cycle needs of that species.

Habitat management: Management of the forest to create environments that provide habitats (food, shelter) to meet the needs of particular organisms.

Harvesting: The practice of felling and removing trees or the removal of dead or damaged trees from an area.

Harvesting method: The mix of felling, bucking and yarding systems used in logging a stand of timber.

Harvest mitigation: In areas where logging can occur, the harvest mitigation provides direction on where and how the logging should be carried out, based on the identified values. Values can range from landscape to site-specific interests, such as private lands.

Harvest pattern: The spatial distribution of cutblocks and reserve areas across the forested landscape.

Harvesting or site prescription: Detailed plan on how, when and where timber will be harvested from an area.

Harvest schedule: A document listing the stands to be harvested by year or period, usually showing types and intensities of harvests for each stand, as well as a timetable for regenerating currently non-productive areas.

Harvesting system: The mix of felling, bucking and yarding systems used in logging a stand of timber.

Healthy ecosystem: An ecosystem in which structure and functions allow the maintenance of biodiversity, biotic integrity and ecological processes over time.

Integrated resource management: A holistic approach to resource management that entails the management of two or more resources (e.g. water, soil, timber, pasture, wildlife and recreation) and that integrates the values of the community into the design of policies or projects to use and sustain these resources in perpetuity.

Inventory (forest): A survey of a forest area to determine such data as area, condition, timber, volume and species for a specific purpose, such as planning, purchasing, evaluating, managing or harvesting.

Keystone species: A species that plays an important ecological role in determining the overall structure and dynamic relationships within a biotic community. A keystone species presence is essential to the integrity and stability of a particular ecosystem.

Landscape: Areas of land that are distinguished by differences in landforms, vegetation, land use and aesthetic characteristics.

Landscape units (LU): Landscape Units are based on watershed boundaries and modified by local access and development patterns. They usually contain similar management concerns and forest types. These units form the boundaries for detailed information gathering, monitoring and planning.

Management ignited prescribed fire: A means of controlling forest diseases, insects and excessive buildup of trees, and managing vegetation and habitat through the scheduling of burns around weather, fuel loads, season and ability to control fire. This type of management has currently not been used in Yukon.

Management plan: A detailed plan for a forested area. It contains inventory and other resource data. (See forest management)

Merchantable timber: A tree or stand that has attained sufficient size, quality and/or volume to make it suitable for harvesting.

Multiple forest use: A system of resource use where the forest resources in a given land unit serve more than one user.

Natural disturbance: Natural events that cause tree or forest renewal, i.e. due to fire, flooding, insect or disease attack. Natural disturbance regimes are a description of the dominant natural disturbance agents occurring in a large area such as a watershed or ecoregion.

Natural disturbance regimes: The historic patterns (frequency and extent) of fire, insects, wind, landslides and other natural processes in an area.

Natural regeneration: The renewal of a forest stand by natural seeding, sprouting, suckering or layering seeds may be deposited by wind, birds or mammals.

Net down: A zoning of the harvest planning area that helps to describe where logging can and cannot occur.

Non-commercial tree species: A tree species for which there is currently no market.

Non-forest land: Land not primarily intended for growing or supporting a forest.

Non-timber resource value: A value within the forest other than timber that includes, but is not limited to, biological diversity, fisheries, wildlife, minerals, water quality and quantity, recreation and tourism, cultural and heritage values and wilderness and aesthetic values.

Old-growth forest: Old growth is a forest that contains live and dead trees of various sizes, species, composition, and age class structure. Old-growth forests, as part of a slowly changing but dynamic ecosystem, include climax forests but not sub-climax or mid-seral forests. The age and structure of old growth varies significantly by forest type and from one biogeoclimatic zone to another.

Operability: The ease of operations determined by the complexity and sensitivity of the site conditions (slope, soil, timber, volumes, harvesting equipment, etc.) and the degree of disturbance expected.

Operable forest: That portion of the production forest that, under current market conditions, can be harvested at a profit.

Operable land: All lands that are not considered inoperable lands.

Operable timber: Available timber that can be economically logged with present harvesting methods after consideration of access, timber quality and market price.

Over-mature: Tree or stand that has passed the age of maturity where the rate of growth has diminished and the trees are weakened.

Patch cutting: The removal of all of the trees in a stand. The same as clearcutting, except that the area involved is smaller.

Partial cutting: Tree removal other than in a clearcut silviculture system; includes seed tree, variable retention, shelterwood and selection systems.

Pest: An organism capable of causing material damage. Forest pests include insects, tree diseases and noxious fungi.

Protected area: An area protected by legislation, regulation or land use policy to control the level of human occupancy or activities. Categories of protected areas include protected landscapes, national parks, multiple use management areas and nature (wildlife) reserves.

Public land: Public land that is managed by the territorial government.

Reforestation: The re-establishment of trees on denuded forest land by natural or artificial means, such as planting and seeding.

Regeneration: The continuous renewal of a forest stand. Natural regeneration occurs gradually with seeds from adjacent stands or with seeds brought in by wind, birds or animals. Artificial regeneration involves direct seeding or planting.

Retention harvesting: A silvicultural system designed to retain individual trees or groups of trees to maintain structural diversity over the area of the cutblock.

Riparian forest: At a large scale, it is the band of forest that has a significant influence on a stream ecosystem or is significantly affected by the stream. At a smaller scale, it is the forest at the immediate water's edge, where some specialized plants and animals form a distinct community.

Riparian zone / Buffer zone / Buffer strip: A strip of land maintained along a stream, lake, road, recreation site or different vegetative zone to mitigate the impacts of actions on adjacent lands, to enhance aesthetic values or as a best management practice.

Rotation: The planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified stage or maturity.

Seral community: Often referred to as seral stage, a seral community is an identifiable stage in the succession of plant species compositions, different ages of the dominant vegetation and by different micro-climate, soil and forest conditions. It is described from the time of disturbance until reaching relatively stable or climax community. The common seral communities are from pioneer stage, through various early and mid-seral stages, to late seral, subclimax and climax states.

Selection cutting: Annual or periodic cutting of trees in a stand in which the trees vary markedly in age. The objective is to recover the yield and maintain an uneven-aged stand structure, while creating the conditions necessary for tree growth and seedling establishment. Differs from selective cutting, in which the most valuable trees are harvested without regard for the condition of the residual stand.

Silviculture: The theory and practice of controlling the establishment, composition, growth and quality of forest stands.

Single tree selection: The selection of individual trees for harvesting.

Silvicultural prescription: Provides direction on block size and harvesting methods within the planning area. The prescription also identifies site limitations and reforestation planning.

Site Plan: A site plan is a site specific management plan. It identifies the specific area and attributes of the area proposed for harvesting, as well as the stand level management activities, methods and standards for harvesting to ensure the protection of the forest resource values on that harvest area. A site plan can also include a reforestation plan with proposed silviculture activities. A site plan extends over one to 500 ha in size

Stand: A community of trees possessing sufficient uniformity in composition, age, arrangement or condition to be distinguishable from the forest or other growth on adjoining areas, thus forming a silvicultural or management entity.

Even-aged stand: A stand in which the ages of most trees are within 20 years of each other or is comprised of no more than two age classes.

Mixed-wood stand: A stand containing both deciduous and coniferous species.

Uneven-aged stand: A stand in which the most of the trees differ by more than 20 years or is comprised of more than two age classes.

Stand age: Stand age is the average age of the dominant and co-dominant trees for the leading species.

Stand height: Tree height is estimated for the leading tree species in the canopy based upon an average of dominant and co-dominant tree heights.

Stand rotation: One cycle of the predicted number of years between the start of a forest stand from seedlings to when that stand is harvested at a specified stage of maturity.

Stand structure: Stand structure is the physical arrangement or pattern of organization within the forest stand.

Single-storied: An even-aged stand that exhibits a more or less uniform canopy height.

Two-storied: A stand with two distinct, homogeneous layers, each with at least 10 per cent crown closure, between which there is a height difference of at least 10 metres.

Complex: A stand characterized by trees of many ages or sizes occurring singly or in groups. Tree species are usually shade tolerant.

Sustainable forest management: Management that maintains or enhances the long term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations.

Timber Harvest Plan (THP): A timber harvest plan is a development plan that identifies areas proposed for harvesting of forest resources. It also identifies strategies for reducing or eliminating environmental consequences and impacts on other resources identified in the FRMP. Timber Harvest Plans can extend over landscape units, or watersheds, ranging from 5000 ha to 100,000 ha in size.

Thinning: A treatment that reduces tree density and competition between trees in a stand. Thinning concentrates growth on fewer, high-quality trees, provides periodic income and generally enhances

Understory: Trees growing under the main forest canopy.

Value-added product / Value-added production:

Adding value to a product by further processing it. Examples of value-added wood products include joinery stock, windows, doors, kitchen cabinets, flooring and mouldings. Value-added pulp and paper products include such items as packaging, diapers, coated papers, tissue, business papers and stationery and other consumer paper products.

Vulnerable species: A species that is considered at risk because it exists in low numbers or in restricted ranges, due to loss of habitat or other factors.

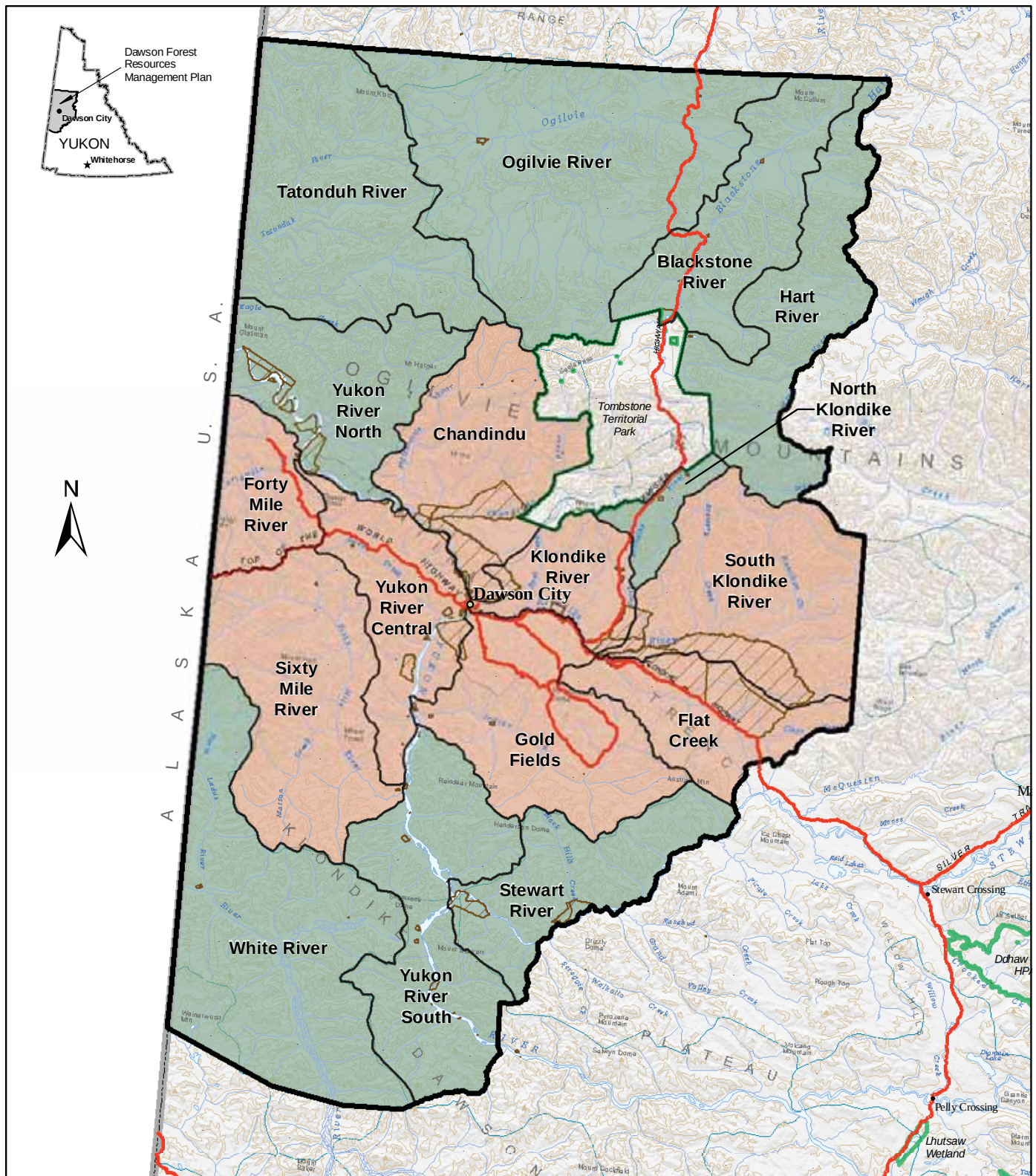
Watershed: An area of land that collects and discharges water into a single main stream through a series of smaller tributaries.

Wetland: An area where the soils are water-saturated for a sufficient length of time that excess water and resulting low oxygen levels are principle determinants of vegetation and soil development. A wetland is a swamp, marsh, bog or similar area that supports natural vegetation that is distinct for adjacent areas. Wetlands may or may not be treed. Shrub scars are included as wetlands. Shrub scars occur primarily in broad depressions and low-lying areas where forest development is limited by cold, periodically saturated soils.

Arctic Inland Skidder. Photo: Artic Inland



MAP 5 FOREST RESOURCES MANAGEMENT ZONING



DAWSON FOREST RESOURCES MANAGEMENT PLAN Forest Landscape Unit Zoning April 2009	Forest Landscape Unit Zoning - Forest Resource Management Zone - Hinterland Forest Zone Legend - Dawson Forest Resources Management Plan - Landscape Units - Tr'ondëk Hwëch'in Settlement Land - Parks and Protected Areas - Road	0 10 20 40 Km North American Datum 1983 UTM Zone 8N 1:1,500,000 Yukon Energy, Mines and Resources Énergie, Mines et Ressources Forest Management Branch Yukon Territory
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