FOREST MANAGEMENT
FIVE YEAR OPERATING PLAN
FOREST MANAGEMENT DISTRICT 20

2025-2029

Government of Newfoundland and Labrador
Department of Fisheries, Forestry and Agriculture
Forestry & Wildlife Branch

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EXECUTIVE SUMMARY

District 20 is 2.2 million hectares of boreal forest, situated on the south coast of Labrador. It is comprised of approximately 95% mature to over mature age classes of mainly dominant black spruce forest. Generally, it is bound to the north by Lake Melville, to the west by Etagaulet and Paradise Rivers, to the south by the Main and Hawke Rivers and to the east by the Labrador Coast.

Historically commercial activity in District 20 has been inconsistent and currently commercial operations are minimal. Domestic activities remain relatively consistent as residents of Cartwright, Paradise River and Black Tickle/Domino harvest fuelwood and sawlogs for domestic use.

The current inventory covers most of the non-isolated commercial forest in the district. The current annual allowable cut (AAC) for the district has been calculated to be 30,085 m^3 for a total harvest of 150,425 m^3 over the five year planning period. This AAC is unchanged from the previous five year plan and is only based on the commercial forest of the Southside operating area.

Extensive areas have been identified to preserve ecological, traditional, and local values. Approximately 91% of the total district land base was excluded from the determination of available wood supply. Consequently, this has resulted in vast areas in the district that are not considered for commercial or domestic harvest. These areas, which are identified at three scales; landscape, watershed, and stand, provide habitat for various native flora and fauna and act as scientific benchmarks.

Fifteen commercial operating blocks are proposed for harvest over the next five years. These blocks contain sufficient volumes to support commercial allocations of approximately 25,000 m^3/year. Additionally, an area between Cartwright and Paradise River remains a selective commercial harvest area. Domestic harvests, estimated to be approximately 4,285 m^3/year, will take place in several defined blocks located near the communities. In all cases, permit conditions and the Environmental Protection Guidelines will govern all operations.

Most of the commercial timber available for harvest is accessible by current road networks. If current levels of commercial activity significantly increase an additional 14.2 kilometers of forest access roads will need construction. Due to the lack of disturbed area, silviculture efforts will focus on monitoring and research activities. Protection will focus on maintaining forest health by monitoring and protecting people, property, and resources from forest fires.

Information and research including, surveys will be used to monitor past actions and provide hard data for future management decisions. Numerous surveys including pre-harvest surveys, regeneration surveys, utilization surveys, and site disturbance surveys will be conducted during this time period. District Conservation Officers will routinely monitor all activities to ensure compliance with various conditions, legislation, and guidelines.

1.0 INTRODUCTION

This Five Year Operating Plan reflects the legislated planning requirements of the Newfoundland Forest Service. In the past, there were five major planning documents: Provincial Sustainable Forest Management Strategy, District Strategy Document, Five Year Operating Plan, Annual Operating Plan, and Past Annual Report. The most recent planning framework has eliminated the District Strategy Document. Its former contents are now split between the Provincial Sustainable Forest Management Strategy and the Five Year Operating Plan. Sections that are Provincial in scope such as carbon, global warming and criteria and indicators are now included in the Provincial Sustainable Forest Management Strategy while sections that are more descriptive or depict local conditions such as values, forest characterization and ecosystem description are located in the Five Year Operating Plan. Linkages between strategies from the Provincial Sustainable Forest Management Strategy and on the ground activities in the Five Year Operating Plan will be provided where applicable.

The Forest Ecosystem Management planning process is based on the input of various stakeholders who participate via direct email contact and continue to provide input on activities throughout the life of the plan. The result is a process that provides flexibility over the planning period to adapt to changes in forest ecosystem processes, disturbance regimes, environmental and industrial changes, as well as public values. In addition to direct consultation, the Provincial Government has signed a Forest Management Consultation Agreement with NunatuKavut Community Council to facilitate their participation in the process. This agreement which is subject to annual appropriations outlines the consultation process on five year operating plans.

The five year operating plan provides details of various management activities that are scheduled to occur between January 01, 2025 and December 31, 2029. These activities, including harvesting, silviculture, road construction, ecosystem protection, and surveys and monitoring, are intended to maintain ecosystem health, ensure the sustainable management of resources, and minimize the environmental impact. Further refinements of the individual planning activities are set out in an Annual Operating Plan on a yearly basis and are subject to review.

This document will attempt to build on previous documents and on efforts of previous planning teams. Information will be updated or added as required if any new information is available. Sections from previous documents will be included if they are still relevant, even if they were not discussed by the current planning team.

In accordance with the Forestry Act, this document will be submitted by the Department to the Minister of the Department of Municipal Affairs and Environment to be registered for assessment under the Environment Protection Act and is subject to further public review.

2.0 LANDBASE DESCRIPTION

2.1 General

The planning zone consists of only one District and is a large area (approximately 2.2 million ha) of boreal forest situated on the South Coast of Labrador. Physical features vary a great deal over such a large landscape. The following descriptions apply generally to District 20.

2.1.1 Location

Forest Management District 20 (FMD20) is situated on the south coast of Labrador (Figure 2.1). It is generally bound to the North by Lake Melville, to the West by the Etagaulet and Paradise Rivers, to the South by the Main and Hawke rivers and to the East by the Labrador Coast.

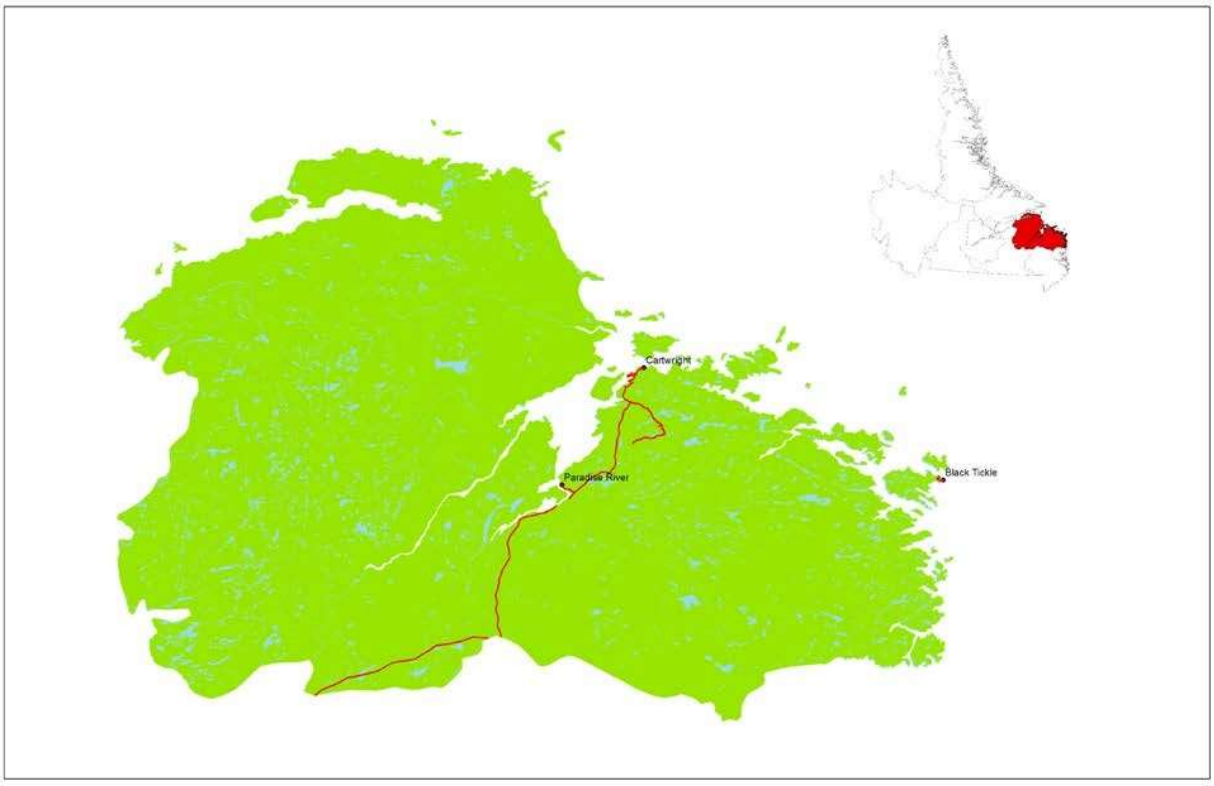

Figure 2.1 Forest Management District 20 boundary and communities.

2.1.2 History

Early accounts of commercial harvesting and sawmill operations in the Sandwich Bay area are vague. Several attempts were made to establish operations in the district. Traditionally timber was harvested for use in the local commercial salmon industry and for general building needs. around Sandwich Bay. Several operations were attempted in the area but were unsuccessful. Early attempts of establishing harvesting operations were susceptible to numerous problems; forest managers continue to struggle with similar issues today. Including: lack of infrastructure; transportation issues; lack of experienced labor; high logging costs and financial challenges.

2.1.3 Ownership

Although most of the land base in District 20 is Crown managed land, there is federal land around a north warning site, there is a proposed Mealy Mountain National Park, proposed Provincial Waterway Park, settled Aboriginal land claims agreements and Aboriginal land claims in progress (Figure 2.2).

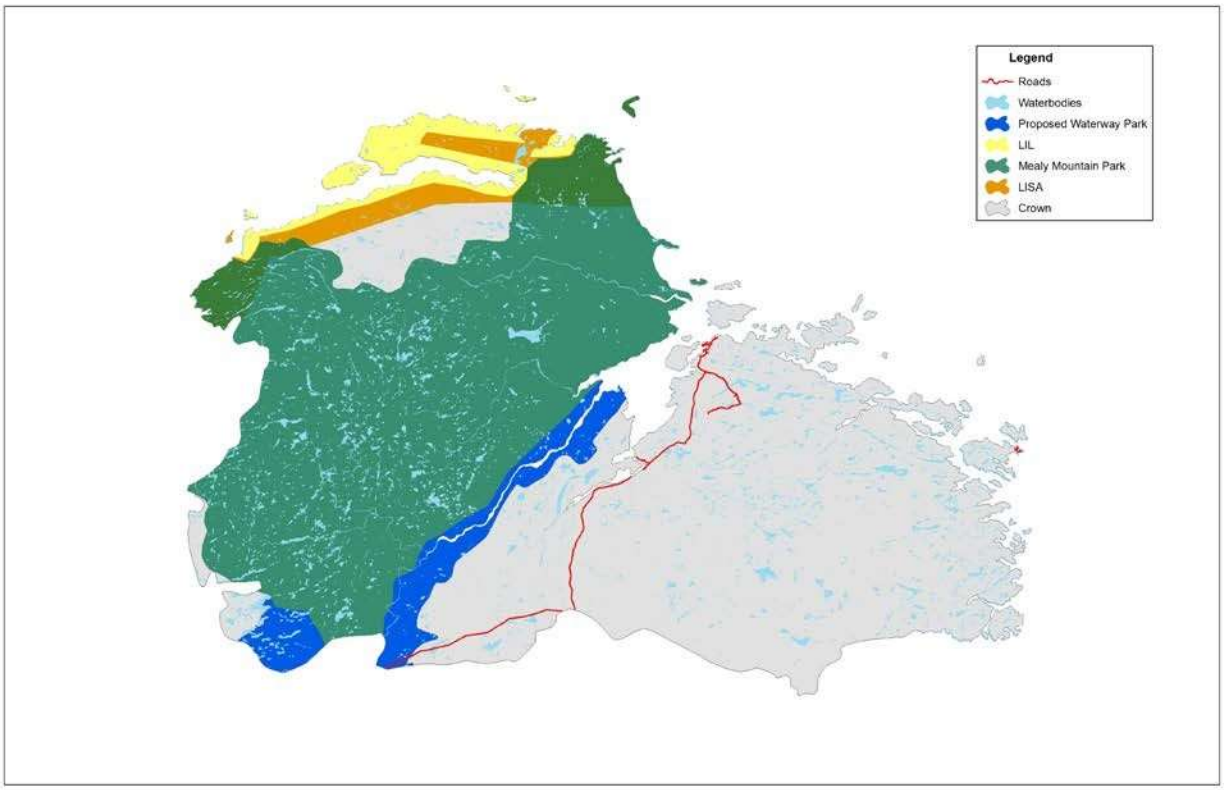

Figure 2.2 Managed land classes in District 20.

2.2 Physical Description

2.2.1 Topography and Hydrology

District 20 contains a diversity of terrain types. The area has generally rolling topography with the exception of the more rugged Mealy Mountain Range. Rolling hills are commonly between 100 and 200 meters, and rarely extend above 300 meters. The Mealy Mountain range reaches heights of more than 1,000 m (3,281 ft), with the highest peak being more than 1,180 m (3,871 ft). The District has an extensive coastline dominated by bedrock with scattered pocket beaches. Inland, the district is dominated by numerous lakes, rivers, and wetland areas.

2.2.2 Geology

Labrador occupies the eastern most section of the Canadian Shield which can be divided into five major geologic provinces. In general the underlying bedrock, which is mostly acidic with metamorphic gneiss, is characterized as the Grenville Province. It is comprised of mostly tough ancient Precambrian igneous and metamorphic rocks. Sedimentary rocks form local outcrops. Anorthosite, gabbro and quatrzofeldspathic gneiss are present with sedimentary and igneous rocks present in trough areas (Meades 1990).

2.2.3 Soils

Detailed information on soils in the area is sparse. The district was heavily glaciated in the past which has resulted in most of the bedrock being covered with a veneer (less than 1.5m) of glacial till or marine sediments. Till consists of a mixture of grain sizes from clay to boulders. There is a section in the northwestern area of the district where the depth of till approaches 1.5m along with some sand and gravel deposits.

2.2.4 Climate

The climate of Labrador is more Arctic than Atlantic. Because it is on the eastern side of the continent, it experiences strong seasonal contrasts in the characteristics and movement of air masses. The Labrador Sea is infested with floating pack ice and icebergs for eight months of the year. The masses of ice keep sea temperatures below 4^{o}C. An east wind off the Labrador Current is a cool wind in summer, often with light rain or drizzle. In winter, when the Atlantic air is relatively mild, the accompanying weather includes cloud and frequent snow flurries. Whenever easterly winds bring very moist air from the Atlantic, widespread fog occurs. Winters are very cold, with typical daytime temperatures for January between -10 and -15C, colder than Newfoundland and more like the frigidity of the southern Prairies. An occasional incursion of Atlantic air will result in brief periods of warming during the winter months. The summer season is brief and cool along the coast because of the cold Labrador Current. July average temperatures are from 8 to 10C along the coast but are 3 to 5C warmer in the interior. The pleasantness of the summer day along the coast is often determined by the wind direction, westerly winds bring clear, mild continental air, whereas easterlies, blowing off the Labrador Current, bring cold, cloudy, and moist weather. Southern Labrador is not unlike the moist northern shores of Newfoundland, with 1000 mm, as a typical yearly fall of precipitation. About 45% of this occurs as snow. Cartwright averages 440 cm of snow fall annually.

2.3 Ecological Characteristics

2.3.1 Ecosystem Description

An ecosystem is a community of interacting and interdependent plants, animals and microorganisms, together with the physical environment within which they exist. It is important to remember that within an ecosystem the interactions between the biotic and abiotic components are at least as important as the component themselves. Another critical characteristic of ecosystems is their overlapping boundaries. While each is definable in time and space, and distinguishable from adjacent ecosystems, each is intimately integrated with other local ecosystems. Additionally, each local ecosystem is nested within increasingly larger ecosystems. The scale at which an ecosystem is viewed is contingent on the species or abiotic characteristic under consideration. While planet Earth represents the ultimate global ecosystem, complex ecosystems also exist under fallen logs and rocks.

A forest ecosystem, as the term implies, is an ecosystem dominated by tree cover. At the coarsest level, the forest of District 20, form part of the boreal forest ecosystem. The boreal forest is a green belt which spans much of the northern hemisphere. It stretches from the Atlantic shores of Scandinavia through Russia, across Alaska, through the mid latitudes of Canada until it reaches the Atlantic Ocean again in Newfoundland and Labrador.

One of the distinguishing characteristics of the boreal forest is the phenomena of periodic, catastrophic stand replacement. Natural disturbances such as fire and insect outbreaks typically give rise to uniform, even aged forests dominated by a few tree species. The tree species which characterize the Canadian boreal forest include black spruce, white spruce, balsam fir, eastern larch, trembling aspen, white birch and jack pine. By far the dominant species in District 20 are black spruce and balsam fir.

Aquatic ecosystems of the boreal forest are heavily dependent on forest cover for temperature regulation, nutrient cycling and stream flow regulation. Consequently, forest harvesting activities adjacent to riparian areas are critical to sustainability of fish habitat and maintenance of fish migration routes. Suitability of various streams and ponds as waterfowl breeding, feeding and resting areas are also dependent on adjacent forest cover. Biological production in streams is based on a combination of internal and external nutrient and energy pathways. Stream side vegetation has a strong influence on both since they are so closely linked to surrounding terrestrial events. Small streams in forested areas receive much of their materials from the surrounding terrestrial ecosystem. For these reasons, maintenance of suitable riparian zones for protection of aquatic ecosystems, as well as providing wildlife travel corridors is a primary consideration of any forest management strategy.

2.3.2 Ecosystem Condition and Productivity

The need to maintain forests in a healthy and productive state enabling them to support the diversity of life that occurs within them is a reflection of ecosystem condition and productivity. The relationship of an interwoven complex of biological processes operating at both temporal and spatial scales determines how a forest will function. Measures of these processes indicate whether levels of energy transfer, nutrient cycling, recovery potential and species productivity are sufficient to ensure sustainability. The boreal forest is adapted to incidents of disturbance and stress for its rejuvenation. Mainly in District 20 natural succession and small disturbances from forest fire provide the opportunity for new stands to become established; however a proper balance of all processes is important to ensure maintenance of forest ecosystem condition and productivity.

2.3.3 Productivity

Productivity can simply be defined as the accrual of matter and energy in biomass. The boreal forests in Labrador are characterized, for the most part, by an even age structure being dominated by an over mature age class. The tree canopy is poorly developed in many parts of the district (<25% crown cover). Among the factors that limit stand density and thus crown cover are severe climatic conditions, soils with restricted or excessive drainage, and proximity to the coast. Disturbance, either natural or human, has had little impact on forest stands, except in the southern part of the district, where extensive fires occurred in 1958.

Closed canopy forests occur only on rich, moist, mid to lower slopes. They contain a mixture of spruce, fir and hardwood tree species and a well-developed ground layer of feather mosses (primarily *Pleurozium schreberi*). On coarse-textured soils (typical of river terraces and eskers), the dominant vegetation is lichen woodland, which is characterized by an open canopy of black spruce and a well-developed lichen layer. Most animal species found in forested areas of the district are typical of boreal forest regions across northern Canada.

The general characteristics of forest stands in District 20 (site class, age class, height class, crown closure, and working group) are described later in the forest profile section (2.4.2). These characteristics define the limits within which the commercial forest development must function. Stands greater than 160+ years, primarily even- aged, form the dominant age class structure in this forest, although an extensive fire disturbed area has yet to be classified. Most forest sites are classed as poor to medium. Silviculture intervention may enhance future productivity on some sites, but how such treatments will affect the long rotation period (120 years) of forest stands in southeastern Labrador is not fully understood at this time.

Extant biomass is an integrating measure of forest ecosystem condition. Biomass represents the mass of living organisms inherent in an ecosystem and the ecosystem serves as a repository for animal, plant and microbial biomass. Accordingly, biomass is a measure of forest ecosystem condition and productivity. It refers to the condition of the forest in terms of organic matter production of all species and types.

Indicators to measure forest ecosystem extant biomass during the planning period include:

- mean annual increment (m^3/ha/yr) by forest type and age class
- frequency and occurrence within selected indicator species

Aquatic ecosystems within forest ecosystems integrate the overall watershed condition and thus provide an important measure of forest ecosystem condition and productivity. Elevated nutrient levels and flow rates in forest streams sustained over a long period clearly indicate a major forest ecosystem malfunction. In these situations, water and nutrients that should be utilized in forest growth are moving rapidly into drainage systems. This threatens the sustainability of the forest as well as the aquatic systems through eutrophication and flooding of downstream areas.

Indicators to measure changes in water quality and quantity during the planning period include:

- water quality as measured by water chemistry, turbidity, and other parameters for selected waterways
- trends and timing of events in stream flows from forest catchments for selected waterways

Information collected on all indicators will be used to assess forest ecosystem condition and productivity change (if any) during the planning period based on the management actions of the plan as well as natural disturbances that will occur.

2.3.4 Resilience

Resilience is the capacity of a forest ecosystem to respond to a disturbance by resisting damage and recovering quickly. Healthy forest ecosystems maintain their resilience and adapt to periodic disturbances with little change. Properties of the forest ecosystem such as climate, soils, topography and flora often control the resilience of a forest.

2.3.5 Stability

Maintenance of natural genetic and ecosystem diversity across the landscape is an integral component to ensure species maintain viability through their capacity to evolve and adapt to change. Maintenance of the natural range of ecosystems and the ability of their components to react to external forces and processes provides the equilibrium required for maintenance of species diversity (CCFM 2000). The fundamental requirement for the conservation of biological diversity is the in-situ conservation of ecosystems and the natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings. The Sandwich Bay District's geographic location, topography and shallow soils make its forest ecosystems vulnerable to temperate extremes. These ecosystems are susceptible to development and comprehensive land use planning is required to ensure that biodiversity is maintained at the present level.

2.3.6 Disturbance Regimes and Successional Patterns

The primary natural disturbance factors attributed to boreal forests are fire and insects. Forest fires are frequent and extensive in Labrador and result in specific successional trends depending on the site type. More often than not, the spruce component is increased following fire, whereas other disturbance types such as insects and cutting often result in an increase in the fir component.

Human uses of the forest resources around Sandwich Bay have had little influence on the overall forest structure. Fuel wood cutting has been a common practice however is mostly localized around the communities. Small scale commercial harvesting has also occurred close to the community of Cartwright. Indicators can be used as measurable variables to report on disturbances, resilience and extant biomass for evaluation of maintenance and enhancement of forest ecosystem condition and productivity. Using the CCFM approach, (CCFM 2000) criteria and indicators will be selected to initiate measuring of these variables. Data for these indicators are considered attainable during the planning period.

Incidence of disturbance and stress refers to the frequency/severity of major biotic stresses. Depending on the particulars of the disturbance, stress negatively or positively affect forest condition over time.

Indicators for assessment of disturbance and stress on forest condition and productivity include:

- area and severity of fire damage
- area and severity of blow down
- area harvested

2.3.7 Biodiversity

Biodiversity is a term used to describe the variety of life on earth. A basic definition of biodiversity includes the variety of animals, plants and microorganisms that exist on our planet, the genetic variety within these species and the variety of ecosystems they inhabit. Some scientists estimate the total number of species on earth between two and 100 million, however, the best estimate is considered to be within the range of 10-30 million. This is remarkable considering only 1.4 million species have actually been given names. The largest concentration of biodiversity on the planet is found in the tropical areas of developing countries. Small areas of rainforest often contain species that are found nowhere else on earth. Mishandling even small tracts of land could lead to extinction of several species, one of which may hold the key for the prevention or cure of some disease. While the boreal forest does not have the extent of biodiversity that some of the equatorial regions possess, Canada does have just over 70,000 species of plants, animals, and microorganisms in its boreal and other forest regions. An equivalent number remain un-described or unreported by science. While the boreal forest has less diversity of large plants than many other forest regions, it has greater biological diversity in some microorganisms. For example, the boreal forest has fewer tree species than the tropical rainforest but 500 times as many mycorrhizal fungi. Despite the large number of organisms contained within the boreal forest, only five percent are plants and vertebrates. The other 95 percent remain largely unrecorded and unstudied. As a result, we need to conduct more surveys and studies and manage with caution so that species are not inadvertently wiped out. Biodiversity provides such essential services as climate control, oxygen production, and purification of freshwater supplies, carbon dioxide removal from the atmosphere, soil generation, and nutrient cycling for humans. Without the species that provide these processes, humanity would be unable to survive. There have been several international initiatives during the 1900's directed at developing strategies to protect Earth's biodiversity. Canada signed the United Nations Convention on Biological Diversity in 1992 at the Rio de Janeiro earth summit. All governments at both the federal and provincial level have agreed to meet these objectives through implementation of the 1995 Canadian Biodiversity Strategy: Canada's Response to the Convention on Biodiversity. The three components of biodiversity are species diversity, genetic diversity, and ecosystem diversity.

2.3.8 Species Diversity

Species diversity describes the overall range of species in a given area or ecosystem. Species are groups of animals, plants, and microorganisms capable of producing fertile offspring. An example would be all breeds of domesticated dogs are of the same species, while dogs and cats are members of different species. Species extinction is the most dramatic and recognizable form of reduced biodiversity; habitat loss the most drastic in terms of far reaching effect. The prevention of species extinction is a key factor in the conservation of biodiversity. Changes in species population levels indicate the potential for serious changes in ecosystem integrity.

2.3.9 Genetic Diversity

Genetic diversity describes the range of possible genetic characteristics found within and among different species. Hair and eye colour, weight and height, are examples of genetic diversity found in humans. Genetic diversity within species is the foundation of all biodiversity. Assessing genetic diversity does not mean tracking every gene in the zone's forest. Responsible planning should design and implement measures which maintain or enhance viable populations of all forest vegetation species, and which use the genetic diversity of commercially important species to a maximum benefit. The genetic diversity of commercially important species can also be managed to increase economic benefit from some portions of the landscape while allowing other portions to provide greater social and ecological values. Genetic diversity is the basis by which populations (flora and fauna) can adapt to changing environmental conditions.

2.3.10 Landscape Diversity

Ecosystem diversity describes the range of natural systems found throughout a region, a country, a continent or the planet. Wetlands and grasslands are examples of ecosystems in Canada. A complex and intricate mix of plants, animals, microorganisms and the soil, water, and air they occupy create virtually limitless ecosystems around the world. A forest interspersed with barrens, marshes, lakes and ponds provides for diversity across the landscape. To ensure biodiversity is maintained at all scales this plan ensures extensive areas have protection of ecological values.

2.4 Forest Characterization

2.4.1 Land Classification

A hierarchical framework of ecological land classifications has been recognized for some time in most jurisdictions as a means of stratifying the earth into progressively smaller areas of increasingly uniform ecological units. In Canada, the Canadian Ecological Land Classification System (Wiken, 1986) provides for seven levels of examination or organization based on ecological principles. This system of classification is better suited than a classical forest inventory for use in an ecological approach to forest management. The seven categories are listed and described in table 2.1.

Level	Description	Common Map Scale
ECOZONE	Areas of large land masses representing very generalized ecological units, based on the consideration that the earth's surface is interactive and continuously adjusting to the mix of biotic and abiotic factors that may be present at any given time (e.g. Boreal Shield).	1: 50 000 000
ECOPROVINCE	Areas of the earths surface characterized by major structural or surface forms, faunal realms, vegetation, hydrology, soil, and climatic zones (e.g. Labrador)	1: 10 000 000 1: 5 000 000
ECOREGION	A part of the ecoprovince characterized by distinctive ecological responses to climate as expressed by vegetation, soil, water, and fauna (e.g. Mid Boreal Forest – Paradise River)	1: 3 000 000 1: 1 000 000
ECODISTRICT	A part of ecoregion characterized by a distinctive pattern of relief, geology, geomorphology, vegetation, water, and fauna.	1: 500 000 1: 125 000
ECOSECTION	A part of the ecodistrict throughout which there is a recurring pattern of terrain, soil, vegetation, waterbodies, and fauna.	1: 250 000 1: 50 000
ECOSITE	A part of the ecosection having a relatively uniform parent material, soil, hydrology, and chronosequence of vegetation.	1: 250 000 1: 50 000
ECOELEMENT	A part of ecosite displaying uniform soil, topographical, vegetative, and hydrological characteristics.	1: 10 000 1: 2 500

Table 2.1 Canadian Ecological Land Classification System.

Not all the land in District 20 is classed as Crown lands in fact although in much smaller portions there are many land base classifications which are described further in Table 2.2.

		District 20			
	Land Base Classification	**Forested Area (ha)**	**Non-Forested (ha)**	**Total Area (ha)**	**% of Total District**
1	**Regulatory Alienations**				

		District 20			
	Land Base Classification	**Forested Area (ha)**	**Non-Forested (ha)**	**Total Area (ha)**	**% of Total District**
1.a	**Parks**				
1.a.1	Federal (MMNP)	**599,689**	**268,029**	**867,718**	**41.9**
1.a.2	Provincial (Proposed)	**73,476**	**23,482**	**96,958**	**4.7**
1.a.3	Private				
1.a.4	Aboriginal Land Claims (Inuit)	**39,922**	**26,952**	**66,874**	**3.0**
1.b	**Reserves**				
1.b.1	Ecological (Ganet Isl.)			**200**	**0.01**
1.b.2	Wilderness				
1.b.3	Others				
1.c	Agricultural Areas				
1.d.1	Cottage Development Areas				
1.d.2	Crown Lands Other				
1.d.3	Private Lands				
1.e.1	Wildlife Exclusions				
1.f.1	Permanent Sample Plots (PSP's)	**24**		**24**	**0.001**
1.f.2	Regulation Buffers Water (30m)			**39,138**	**1.9**
	Section Sub-Total				
2	**Non-Harvestable Inventory Types**				
2.a	Coniferous Scrub	**285,182**		**285,182**	**49.2**
2.b	Deciduous Scrub				
2.c	Vegetated Non-Forested				
2.d	Non-Vegetated				
2.e	Cleared Land				
2.f	Residential Land				
	Section Sub-Total				

3	**Water Features**				
3.a	Water Bodies				
3.a.1	Lakes/Ponds			**129,571**	**6.2**
3.a.2	Double Sided Rivers				
3.a.3	Salt Water				
	Section Sub-Total				
4	**Operational Alienations**				
4.a	Roads				
4.a.1	Right-of-way (Roads)				
4.a.2	Resource Roads (6m buffer)				
4.a.3	Protected Road Buffers				
4.a.4	Aesthetic Road Buffers				
		District 20			
	Land Base Classification	**Forested Area (ha)**	**Non-Forested (ha)**	**Total Area (ha)**	**% of Total District**
4.b	Stand Level				
4.b.1	Stand Remnants				
4.b.2	Islands				
4.b.3	Steep Slopes				
4.b.4	Isolated Stands				
4.b.5	Other Stand-Level Constraints				
4.b.6	Area Not Interpreted				
	Section Sub-Total				
5	Harvestable Land Base				
5.a	Crown				
5.a.1	Coniferous	**260,828**			**11.9**
5.a.2	Coniferous/Deciduous	**319,250**			**14.5**
5.a.3	Deciduous/Coniferous				
5.a.4	Deciduous				
5.a.5	Unclassified	**1,619,922**			**73.6**
	Section Sub-Total				
	Grand Total				

Table 2.2 Land base classifications in District 20.

2.4.1.1 Ecoregions and Subregions

With the evolution of an ecosystem approach to forest resource management, it would be advantageous to have a standard framework to classify combinations like general climate and regional physiography, as well as the other components of an ecosystem, into distinguishable regions. Damman defined ecoregions as areas where a comparable vegetation and soil can be

found on sites occupying similar topographic positions on the same parent material, provided that these sites have experienced a similar history of disturbance. Thus, an ecoregion cannot be defined in isolation from the physical landscape, but vegetation toposequence, vegetation structure, floristic composition and floristic distributions can provide the primary criteria (Damman, 1979).

According to Damman, Labrador has ten ecoregions. These ecoregions and subregions contain many of the same ecosystem variables. It is the dominance and variance of these variables (e.g., vegetation and climate) that determine their classification. District 20 contains five distinct ecoregions. They are: the mid boreal forest – Paradise River Ecoregion, Coastal Barrens-Okak/Battle Harbour Ecoregion, and string bog – Eagle River plateau Ecoregion (Figure 2.3). Of these, the mid boreal forest contains the largest portion in the district (Table 2.2).

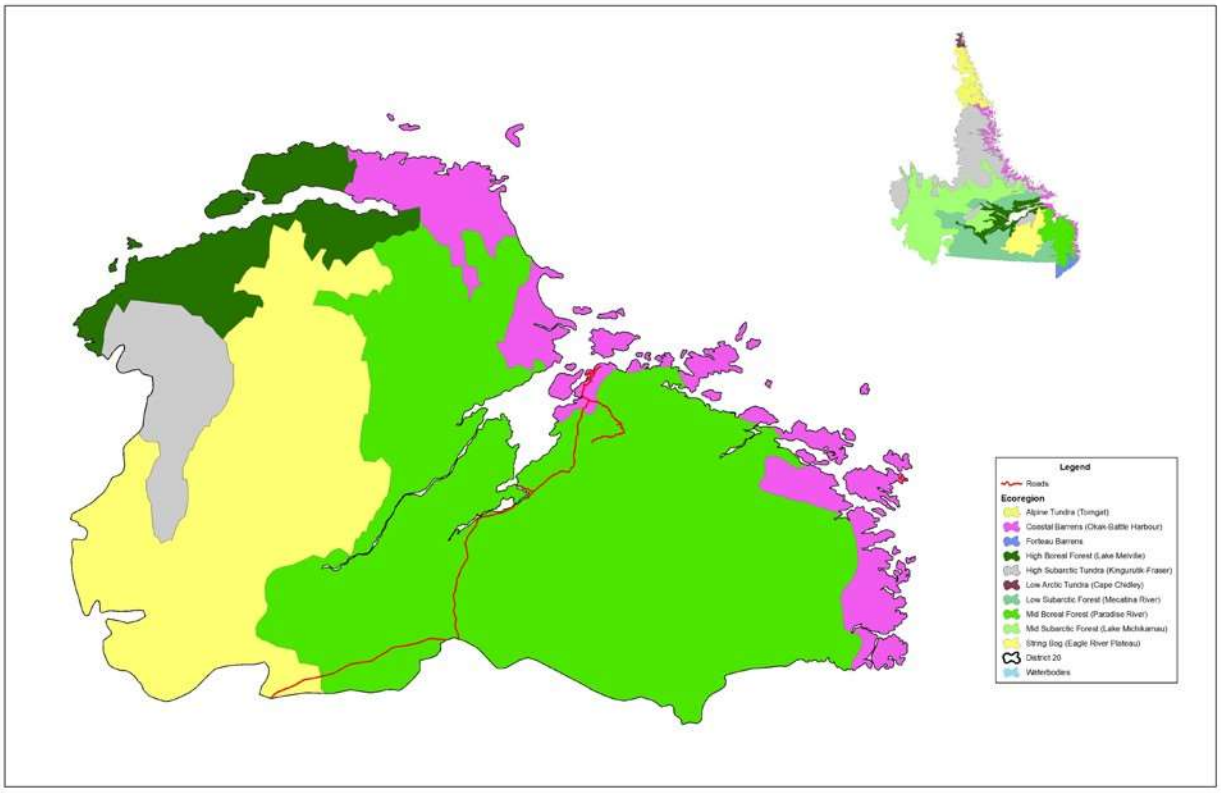

Figure 2.3 Ecoregions of District 20.

Mid Boreal Forest - Paradise River

This undulating, bedrock controlled landscape of southeastern Labrador has many rock outcrops and supports fairly productive, closed-crown forests. The climate is considered boreal and is moister and cooler than the Lake Melville area. Summers are cool to warm and winters are short and cold. The growing season is 120 to 140 days. Black spruce and balsam fir are the most common tree species, but hardwoods are commonly encountered. Raised bogs are characteristic of valleys in the area (FLR, 2014).

Coastal Barrens - Okak/Battle Harbour

This ecoregion extends from Napaktok Bay south to the Strait of Belle Isle. Much of the coast is characterized by long, sheltered inlets. The summers are cool to warm, and the growing season is 100 to 120 days. The winters are cold. Empetrum barren is the dominate vegetation type, with forest occurring in sheltered valleys. Most mid and lower slopes support a continuous spruce forest with a moss understory. Repeated fires have changed many forested areas to dwarf shrub barrens. Plateau bogs with frozen peat (palsas) and salt marshes on marine terraces are characteristic of the valleys in this ecoregion (FLR, 2014).

String Bog - Eagle River Plateau

The Eagle River Plateau comprises most of this ecoregion. This upland plateau is composed of extensive string bogs with numerous open pools surrounded by fen vegetation. Bog hummocks are dominated by scrub spruce, Labrador tea, and feathermoss. The peatland expanses are occasionally interrupted by only a few conspicuous eskers, which support open, lichen woodland. Alder thickets are common along river banks (FLR 2014).

High Boreal Forest – Lake Melville

This ecoregion encompasses the Churchill River Valley and the coastal plain surrounding Lake Melville. River terraces are composed of coarse-textured, alluvial soils, and uplands have shallow, well-drained soils. This region has the most favourable climate in Labrador. Summers are cool and winters cold. The growing season is 120 to 140 days. The forests are closedcanopied and highly productive. Richer slopes are dominated by balsam fir, white birch, and trembling aspen. Black spruce is present in most stands, but only dominates in upland areas and lichen woodlands, which occupy river terraces. Ribbed fens occur in upland depressions; plateau bogs occur on coastal plains (FLR 2014).

High Subarctic Tundra – Kingurutil/Fraser

The George River Plateau makes up the main (northern) portion of this ecoregion. Various mountainous outliers, including the Benedict Mountains, Wine River Mountains, Mealy Mountains, and the McPhadyen Plateau also belong to this region. Summers are short and cool, with a growing season of 80 to 120 days; winters are long, severe, and very cold. The upland vegetation is similar to the Low Arctic Tundra - Torngat ecoregion; however, the valleys support tree growth. Closed black spruce forests (with some larch) occur on lower valley slopes. River terraces support open spruce forests with a lichen dominated understory. Shallow fens with frozen peat occupy small depressions in plateau surfaces (FLR 2014).

	EcoRegions		
	Area (ha)		%
	in Labrador	in District 20	in District 20
Mid-Boreal Forest - Paradise River	2032737	1076121	51.9%
Coastal Barrens - Okak/Battle Harbour	1360628	217177	10.5%
High Boreal - Lake Melville	1728143	146158	25.4%
High Subarctic Tundra - Kingurutil/Fraser	6529479	106188	7.1%
String Bog - Eagle River Plateau	1822682	527422	5.1%
Grand Total	***13473669***	***2073066***	**100.0%**

Table 2.3 Ecoregions and their area and percentage within Labrador and the District.

2.4.2 Forest Profile

2.4.2.1 Species Composition

Black spruce (*Picea mariana*) is the most common tree species in the management district, based on volume (63%) and working group (approximately 41%). Balsam fir (*Abies balsamea*) constitutes 30% of the volume, while other softwoods and hardwoods make up the balance.

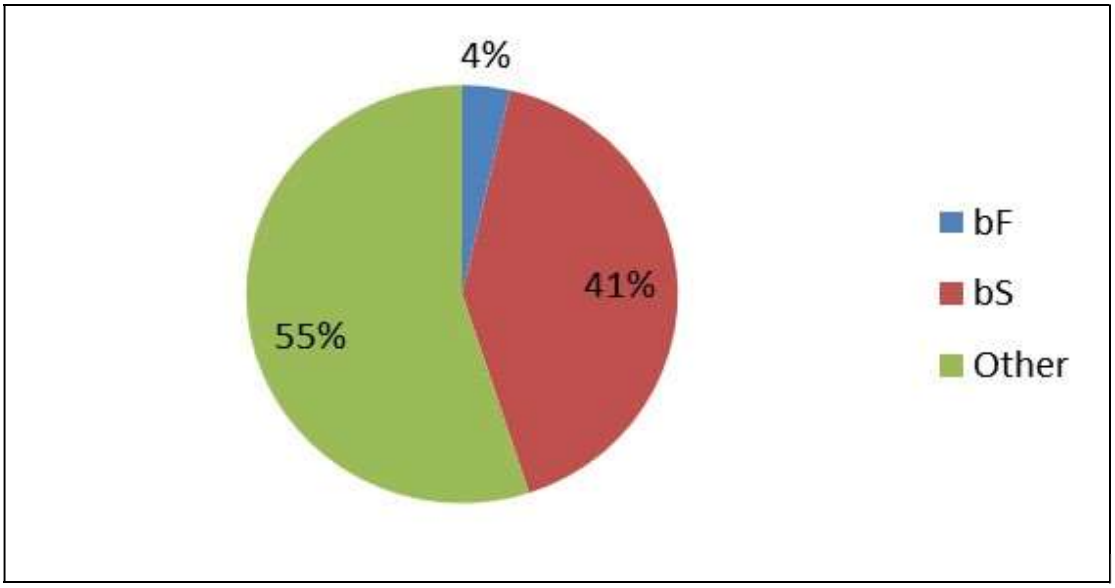

Figure 2.4 Species composition based on Working Group of D20.

2.4.2.2 Age Class

Individual tree ages in a stand can all be the same after disturbance such as fire or harvesting; however in most cases the ages vary. Forest managers describe stand ages in terms of age classes which generally encompass 20 years. The forests in District 20 have not been subjected to any large scale disturbance in recent years. Fires have been relatively small and isolated and

harvesting activity has been limited. This has resulted in a relatively old forest. As illustrated in Figure 2.5, approximately 95% of the forest is greater than 100 years of age. Forests in the 0-20 year age class account for less than 1% of the total.

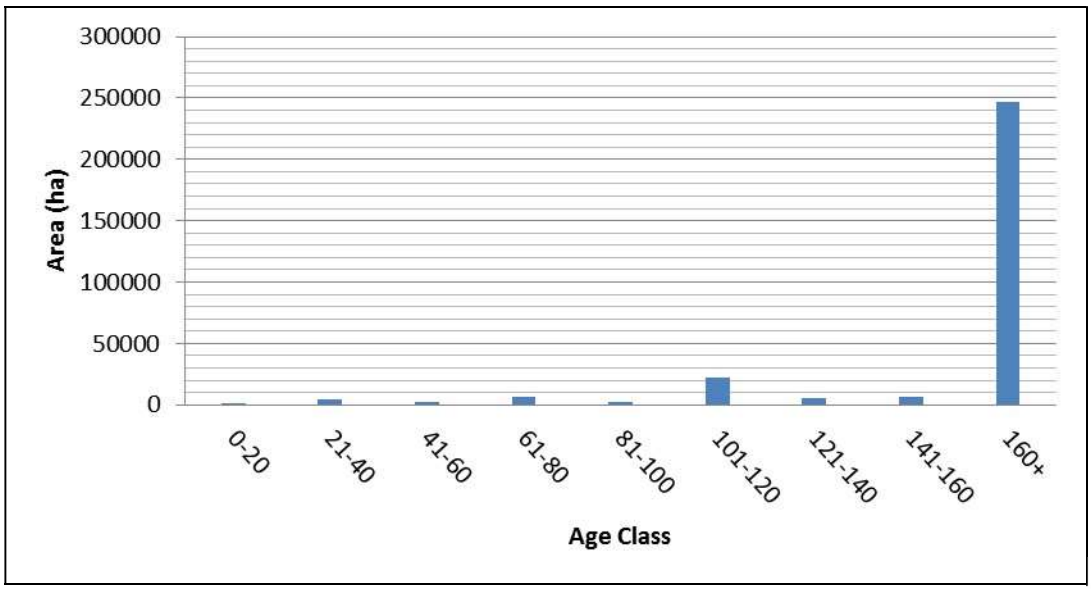

Figure 2.5 Summary of productive forest area (ha) by age class in FMD 20.

2.4.2.3 Site Class

Many factors determine site class of productive forest including soil moisture, fertility, slope and geographic orientation. In District 20 medium and poor sites are most dominant accounting for approximately 47% each on productive sites. The distribution of each site class is illustrated in Figure 2.6. Based upon its northern location it is estimated that the mean annual increment of a good site is 2.4 m^3/ha/yr, medium site 1.4 m^3/ha/yr and poor site 0.8 m^3/ha/yr. Site class often determines the limits of growth and along with the limits of existing harvesting and processing technologies this will define the limits within which commercial forest development can function in the District.

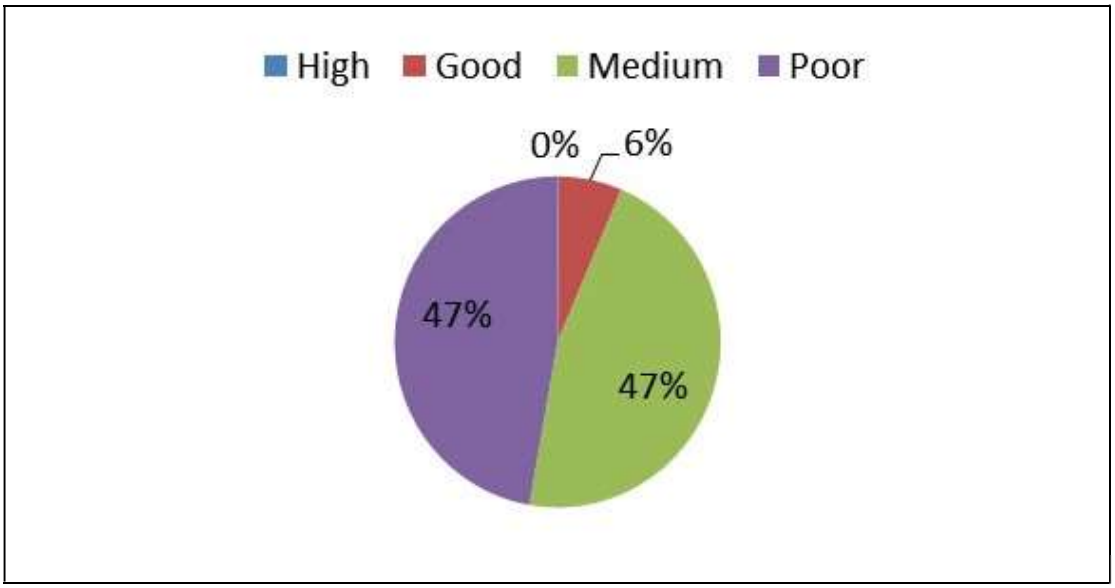

Figure 2.6 Summary of productive forest area (ha) by site class in FMD 20.

3.0 TIMBER SUPPLY ANALYSIS

3.1 Methodology

The annual allowable cut (AAC) is the maximum volume that can be harvested on an annual basis while maintaining a sustainable supply of timber and providing a landscape, which supports non-timber values for future generations. Since the necessary growth and yield data required to run linear wood supply models (such as Woodstock) are absent for the District, the AAC is calculated using a basic area/volume formula (Appendix II). The total AAC for the south side management area in District 20 is 30,085m^3/yr (Figure 2.7). This volume includes reductions (20%) to account for retention, waste and natural disturbances (Appendix II). Recently the overseas wood/fuel pellet market has been potentially identified as a growing opportunity for our forest industry in Labrador. Pellet plants can utilize timber which is typically non-merchantable for a pulp and paper operation. The result is the ability to recoup losses because of poor utilization and cull. In the event of such an industry it's possible the waste and cull reductions applied to the AAC (13%) could be considered for removal which would increase the AAC to 35,128 m^3/yr.

The 1992 forest inventory used in the determination of the AAC did not survey the entire district; however, it did survey the majority of the non-isolated commercial forest in district 20. Efforts will be made to inventory these areas prior to the next wood supply analysis. The 1992 inventory was incorporated into a Geographical Information System which was used in the development of this plan.

During this five year period, only a portion of the South side of Sandwich Bay is considered for harvesting (Figure 2.7). Consequently, the AAC calculation is based solely on this area. The South side operating area, in which all commercial harvesting is scheduled to take place, does not intersect

Nunatsiavut Land areas nor the Mealy Mountain National Park. In future operating periods, alternate sources of commercial timber may be explored. Current inventory data indicates that the North side of Sandwich Bay has the potential for commercial harvesting. The current operable land base excludes the Mealy Mountain National Park as well as the area between the Paradise and Eagle Rivers.

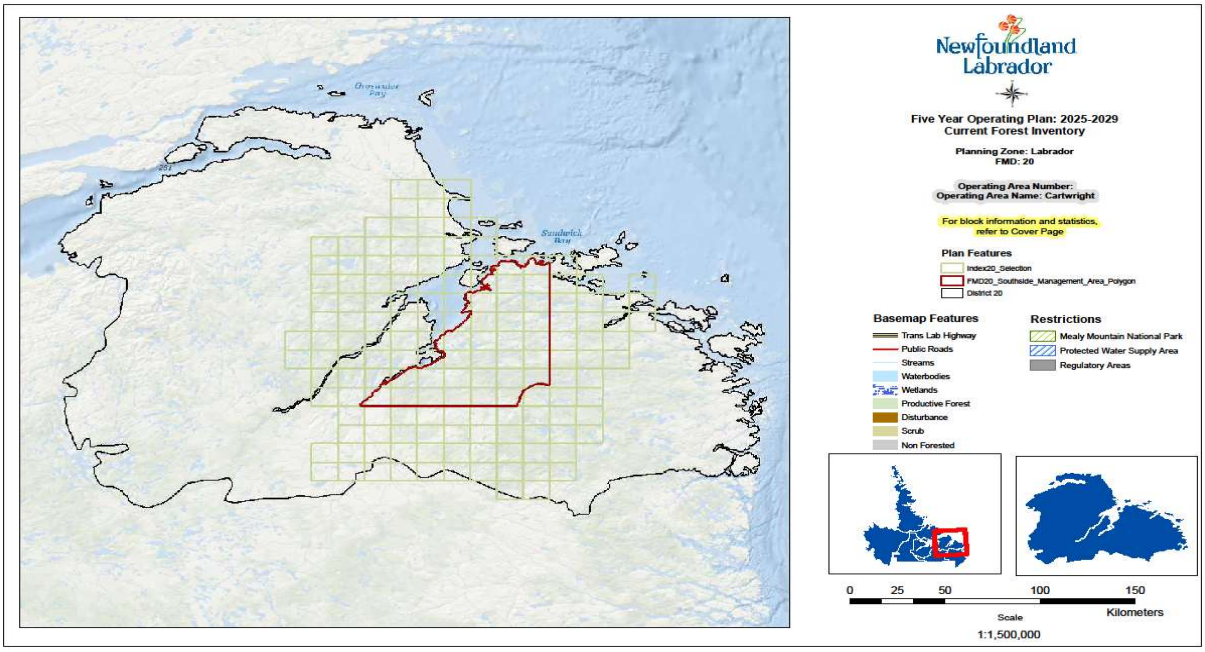

Figure 2.7 South side management are of District 20.

3.2 Forest Profile Dynamics

Due to the methodology used to calculate the annual allowable cut for District 20, changes or outputs of forest profile dynamics are not predicted.

3.3 AAC Adjustments

Due to the methodology used to calculate the annual allowable cut for District 20, annual allowable cut adjustments are not used.

3.4 GMV Volume Adjustments

During calculation of the net AAC the GMV (Gross Merchantable Volume) is further refined to account for retention, waste and natural disturbances. This number, referred to as the **Net Commercial Volume**, is then used in the AAC calculation. The expected net downs for District 20 were applied to account for the following losses:

Cull*	10%
Residual Stands	6%
Harvesting Losses	3%
Fire	1%
Total	**20%**

3.5 Spatial Blocking Adjustments

Due to the methodology used to calculate the annual allowable cut for District 20, spatial scheduling software is not used therefore spatial blocking adjustments are not required. Harvest blocks are identified in areas with stand volume meets minimum commercial volumes and road access is available or potentially available.

3.6 AAC Results & Outputs

The annual allowable cut (AAC) is the maximum volume that can be harvested on an annual basis while maintaining a sustainable supply of timber and providing a landscape, which supports non-timber values for future generations. Since the necessary growth and yield data required to run linear wood supply models (such as Woodstock) are absent for the district, the AAC was calculated using a basic area/volume formula (Appendix I). Based on the method used one output was derived as seen in Table 3.1 below.

Land Tenure		Zone	District #	Softwood Volume (m3/yr)			Hardwood Volume (m3/yr)		
				Core	Const.	Sub-Total	Core	Constrained	Sub-Total
Crown	LAB		20	30,085	0	30,085	0	0	0

Table 3.1 Results of timber supply analysis for District 20.

3.7 Harvest Profile

Due to the methodology used to calculate the annual allowable cut for District 20, harvest profiling is not determined. When identifying commercial harvest areas, areas that fit the stand, age, and height profile of the surrounding area were identified if possible.

4.0 RESOURCE VALUES

4.1 Values Structure

4.1.1 Hunting and Trapping

During the planning process stakeholders expressed concerns that increased road access would have negative impacts on the furbearer population in the interior when the Trans-Labrador Highway (TLH) was complete. Already residents have seen increased trapping pressure from individuals from other regions. The Department of Fisheries and Land Resources, Wildlife Division will monitor furbearer populations and resource pressure.

During this operational period domestic hunting and trapping opportunities will continue to exist. Domestic harvesting of wild meat (small game including ptarmigan, rabbit and grouse), fish, berries and mushrooms for subsistence and furs for sale are common. Current areas will allow these activities to continue within normal levels. Seasons and bag limits along with research requirements and regulations are prepared by the Department of Fisheries and Land Resources, Wildlife Division with public input on a yearly basis.

4.1.2 Cabin Development

During the planning process stakeholders expressed concerns that increased road access may facilitate increased cabin development. They requested that the construction of cabins near sensitive wildlife areas be discouraged. Currently Crown Lands have a no cabin development within 1 km of the TLH. Current environmental guidelines require a minimum of 50m treed buffer between operations and approved cabin development areas. As sensitive wildlife areas are identified, this concern can be addressed through the Crown Lands Referral process.

4.1.3 Historical Resources

Officials of the Historical Resources Division indicated that Muddy Bay Pond (Dykes River) is considered to have archeological potential. Activity in this area will be limited to domestic harvesting during winter months; therefore, it is anticipated that standard no cut buffers on these larger water bodies will provide adequate protection of potential archeological sites.

Schwartz (1997) classified the areas proposed for commercial harvesting as having "unknown archeological potential". The proposed harvesting areas are located on upland sites, which are considered to have lower risk of encountering historical artifacts. In the event that an archeological site or artifact is found, all operations will cease and the Historical Resources Division will be notified.

4.1.4 Trans-Labrador Highway

Currently the Trans-Labrador Highway (TLH) connects the communities of Cartwright and Paradise River to several other communities along the south coast and west to Happy Valley Goose Bay. A minimum of 100m no cutting buffer will be implemented for all domestic and commercial harvesting along the highway.

Harvesting activity may be visible from the route but in an effort to minimize the visual impact of these operations, the proposed harvesting areas have been modified. Skyline reserves will be maintained and roads will be located on the lower slope and buffered so as not to be seen from the highway.

In an effort to ensure the conservation and long term sustainability of all resources in this relatively new accessible landbase, enforcement and compliance will be important over the next planning period along the TLH.

4.2 Values Mitigations and Monitoring Requirements

During the 2024 planning process, a number of mitigations were developed that are designed to protect other ecosystem values, which are specific to the responsibility of DFLR. The table below outlines these issues and proposed mitigations.

Stakeholder				ISSUES RAISED DURING PLANNING PROCESS	Mitigation
DFFA – Agriculture				▪ No comments received	
DFFA – Mines Branch				• No comments received	
DMAE – Water Resources Mgmt Division				• Permit required for work in any waterbody (including culverts, bridges, fording, etc) • Permit required for work adjacent to or within Burdett's Pond Public Water Supply Area	Prior to any work in a waterbody, permits will be applied for. No activity scheduled to take place in the Burdett's Pond Public Water Supply Area. The area is also designated as a "No Cutting" area for harvesters.

DFFA – Wildlife Division				• Domestic harvest area for Black Tickle intersects with Mealy Mountain Caribou herd winter/spring range.	This is the only and closest possible domestic block for the residents of Black Tickle. Not viable to relocate the block. Agreed to add a condition on the permit indicating potential presence of caribou and advise harvesters to lessen disturbance should it become evident caribou are in the area.
DMAE – Land Use Planning				• No comments received	
Stakeholder				**ISSUES RAISED DURING PLANNING PROCESS**	**Mitigation**
Town Council(s)				• No comments received	
DTRC – Tourism Branch				• Commercial harvesting can detract from the natural forest view scapes.	FFA will work closely with Tourism branch to ensure view scapes are maintain where possible
DLAA – Labrador Affairs				• No comments received.	
DFFA - Aquaculture				• No conflict	
DECC – Water Resources				Requirement for approval from Dept. of Environment and Conservation for construction activities within 15m of any water body and for activities within protected water supply areas.	FFA will ensure that all rivers and waterbodies are buffered with minimum 30m buffers (and wider where commitment has been made). FFA will monitor all harvesting and road construction activities to ensure siltation does not occur. All water crossings will be carried out under permit from the Dept. of Fisheries and Oceans and Water Resources Division, Dept. of Environment and Conservation.

Table 4.1 Issues and proposed mitigations raised during 2024 planning process.

Several other issues were identified during previous planning processes, but not discussed at this one. FFA still considers these issues and their mitigations valid. The table below outlines the issue and proposed mitigation.

Issue	Proposed Mitigation
1) Ensuring proper waste disposal and litter control as a result of forest activities	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's. This contained within the aspects outlined with ISO 14001

2) Ensuring air quality management as a result of forest activities	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's.
3) Ensuring the use of pesticides is in compliance with Acts and Regulations	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's. No immediate plans for spray program.
4) Ensuring the storage and handling of gasoline and associated products are in compliance with regulations	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's. FFA encourages the Dept. of Environment and Conservation (DOEC) to become involved in forest activities and are welcome to inspect operations on a regular basis.
5) Ensuring activities within the MMNP and proposed ERWPP are conducted in consultation with PNAD	At this point, FFA has no plans to alter the activities outside of the approved 5 year management plan.
Issue	**Proposed Mitigation**
6) Ensuring activities are conducted in compliance with Occupational Health and Safety Act and Regulations	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's.
7) Requirement for a 100m buffer between sawmill operations and any water body and storing sawdust 150m from a water body and leveling it on a regular basis	FFA applies conditions to all permits it issues for sawmills in the Province.
8) Ensuring activities are conducted in compliance with Municipal Plans and Development Regulations	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's.
9) Ensuring that all water crossings are approved under the Navigable Waters Protection Act.	
10) Ensuring compliance with regulatory requirements of Environment Canada	FFA closely monitors all operations for compliance with regulations and commitments made in FMP's.

Table 4.2 Issues and proposed mitigations raised during previous planning processes that are still valid.

5.0 MANAGEMENT GOALS, OBJECTIVES AND STRATEGIES

5.1 Harvesting

5.2 Commercial

Commercial operations will be confined to the fifteen identified blocks in the plan and the selective-commercial reserve area. In general mechanical harvesters and conventional harvesting methods will be used in commercial areas. Selective operations will be done manually using chainsaw and will mainly operate during the winter months. It is anticipated that, with the exception of the selective-commercial reserve area, all commercial harvesting will be through the clearcut silvicultural system with the retention of non-merchantable and wildlife trees.

5.3 Domestic

Domestic harvesting is expected to continue at current levels (less than 4285 m3/year) consequently; approximately 21,425 m^3 is estimated to be sufficient to meet district domestic requirements for the next five years. The majority of domestic cutting will occur near one of the three communities in the district, Cartwright, Paradise River, and Black Tickle. Majority of the domestic wood harvested will be during winter months with snowmobile and chainsaw. This harvesting method will have little environmental effect and ground disturbance within the domestic areas.

5.4 Hardwoods

Local residents also use white birch (*Betula papyrifera*) for fuelwood and value added products such as snowshoes. For this, and other domestic uses, white birch within the defined domestic harvesting areas is available for harvest, providing all other conditions (ex. buffers) are adhered to. It is requested that straight stemmed trees with clear boles not be harvested for firewood and left standing for future value added opportunities.

5.5 Silviculture

Silviculture refers to the theory and practice of controlling the establishment, composition, growth and quality of forest stands to achieve the objectives of management (Smith, Larson, Kelty and Ashton 1997). Two of the most common techniques that are associated with this practice are planting and thinning.

Silviculture activities will focus on monitoring and research with the view of developing an effective silviculture strategy for this District. Possible areas for planting and thinning maybe identified and efforts will focus on the assessment of previous plantations.

Based upon past observations, it is anticipated that most areas when harvested will regenerate naturally within a five year establishment period, however recent hemlock looper infestations may warrant planting less prone spruce species in areas where balsam fir regeneration is inadequate. Harvested areas will be monitored for regeneration and detailed surveys will be conducted in areas where regeneration appears to be inadequate.

5.5.1 Forest Renewal

The silviculture program in District 20 will focus on monitoring and research. However, cutovers which do not regenerate as expected or burns may be identified for planting during the operating period. Further refinements to each project will be described in the Annual Work Schedules developed each year.

5.5.2 Forest Improvements

These areas may also become suitable areas for pre-commercial thinning, hardwood management, or require site preparation in the operating period covered by this plan. Further refinements to each project will be described in the Annual Work Schedules developed each year.

5.6 Forest Access Roads

The construction of an effective road network is essential to ensure the success of commercial operations in the area. To ensure this success**,** 14.2 kilometers in total of primary access road have been proposed for construction during this planning period. Based on current costs this will require a funding commitment well in excess of one million dollars.

Operational roads (secondary and tertiary) are not identified in the five year plan. However, they may be necessary in order to ensure that the timber scheduled for harvest can be fully accessed. Royalty reductions, as per regulations, will be offered as incentive for commercial operators to construct their own access roads. These roads must adhere to established construction and environmental standards and will be subject to approval by District staff and identified in annual plans. Considering the limited access that currently exists within the district, decommissioning (barring or rehabilitating of access roads) has not been scheduled for this planning period. It will be considered when it is in the interest of protecting sensitive wildlife or fish habitat. Road construction activity will be carried out as per the Environmental Protection Guidelines, which are provided in Appendix III. Certificates of approval must be obtained from the Department of Environment and Conservation for any stream crossing.

5.7 Forest Protection

5.7.1 Insect and Disease

Protection of the regions forests and related values continue to be a priority in Labrador. The hemlock looper insect control program has not been required since 2009 due to low insect

numbers. No treatments are planned for 2020 due to expected low numbers. Monitoring for insects will continue with aerial and ground reconnaissance being conducted. The spruce budworm has caused defoliation in the Goose Bay area but there is no evidence of damage in this district.

5.7.2 Fire

Resource protection, in particular fire suppression is necessary to protect Labrador's Forest resource and is considered an essential operational activity. Even though large fires are uncommon in the recent past within District 20, forest fire occurrence is unpredictable. We must be prepared to respond quickly to reduce the loss of valuable commercial, recreational and non-commercial values on the landscape.

To determine initial attack strategies the FMD 20 has been sub-divided into the following priority zones: 1) life, 2) property, 3) resources, 4) other.

5.7.3 Windthrow

Due to the old age class structure of the forests in District 20, areas of wind throw are highly likely. Areas of wind throw have been observed on small scales throughout the District however with changing climate conditions with increased wind speeds and occurrences, wind throw will be more prevalent in the District over the next five years. Identified commercial blocks have targeted some of the oldest stands first to try to salvage the wood before it can blow down. Should the District experience an excess of wind throw, additional measures will be considered. Existing measures for domestic permit holders include wind throw harvest outside of a domestic block with District Manager approval.

5.8 Information and Education

Public awareness and education is a continued priority for district. Staff will work with the regional office in educating the public on best management practices. Staff will take part in several activities to ensure good communication and relations between the department and communities.

Conservation Officers plan to be involved in public relation activities including: school visits; Labrador Expo; National Forestry and Wildlife Week; and career fairs. We also anticipate school visits to the district office for tours and information sessions. Throughout the life of this plan we hope to build on the success of these activities.

6.0 PROPOSED ACTIVITIES

An overview of proposed forest management activities scheduled for this five-year period (2020-2024) is presented in the appended maps (Appendix IV). Activities include: i) harvesting, ii) silviculture, iii) road construction.

The operational activity for this planning period is described in the following sections. A more detailed description of operations will be outlined in annual work schedules.

6.1 Harvesting

Over this planning period a total of 150,425 m^3 is proposed for commercial and domestic harvest.

A summary of the wood supply analysis is provided in Appendix II. A total of 129,000 m^3 has been allocated for commercial operations and 21,425 m^3 has been estimated for domestic use.

Operating Area					Volume Proposed		
					Softwood		
Number	Name	Tenure	Area (ha)	Number of Permits	Core	Const.	Sub-Total
20-2025-2029-CC20001		Crown	345		23,018		23,018
20-2025-2029-CC20002		Crown	124		9,348		9,348
20-2025-2029-CC20003		Crown	101		14,801		14,801
20-2025-2029-CC20004		Crown	148		15,376		15,376
20-2025-2029-CC20005		Crown	142		8,003		8,003
20-2025-2029-CC20006		Crown	89		10,982		10,982
20-2025-2029-CC20007		Crown	68		7,337		7,337
20-2025-2029-CC20008		Crown	60		7,210		7,210
20-2025-2029-CC20010		Crown	30		3,499		3,499
20-2025-2029-CC20011		Crown	123		17,895		17,895
20-2025-2029-CC20012		Crown	62		8,641		8,641
20-2025-2029-CC20013		Crown	138		15,237		15,237
20-2025-2029-CC20014		Crown	64		7,963		7,963
20-2025-2029-CC20015		Crown	151		14,437		14,437
20-2025-2029-CC20016		Crown	226		18,748		18,748
Totals			1,871		182,495		182,495

Table 6.1 Proposed commercial harvest activity 2025-2029

6.1.1 Commercial

Commercially 125,000 m^3 will be available for allocation, scheduled for harvest from fifteen blocks in the commercial operating area, identified south of Muddy Bay Pond (Dykes River). Appended in the maps are the locations of these areas (Appendix IV). A summary of the commercial harvesting blocks is provided in table 6.1.

The proposed commercial areas contain an estimated 182,495 m^3 Net Commercial Volume (NCV) of timber. This additional volume, 57,495 m^3 greater than what has been scheduled, will provide operational flexibility. This is to ensure that the Environmental Protection Guidelines are met and that any additional land removed from the harvesting areas as a result of the pre-harvest surveys for the annual operating plans can be accommodated. All harvesting operations are governed by the *Environmental Protection Guidelines* (EPG) which have been developed by the Department in consultation with various government departments and industry (Appendix III).

6.1.2 Selective-Commercial

For this five year period the Selective-Commercial area will be merged into a large domestic area incorporating the previous domestic areas of Bill Learning Pond and Paradise River. This approach was suggested through the public consultation process due to the low level of commercial harvesting in the Selective Commercial area. Commercial operators who have traditionally cut there will be able to continue without disruption due to their low volume permits (less than 200 cubic meters). This larger domestic area will better serve the fuelwood needs of both communities.

6.1.3 Domestic

The harvest of fuelwood, sawlogs and building materials for domestic use will be carried out under a permit in identified harvesting areas throughout the district. These areas are generally located in close proximity to communities such as Cartwright and Paradise River (Appendix IV). Residents of Black Tickle fulfill their domestic requirements in the Porcupine Bay area (Appendix IV). Small volumes are also harvested at various locations throughout the district by cabin owners. Twenty-one thousand four hundred and twenty five cubic meters (21,425 m^3) will be available for domestic harvesters over the five year period. Based on previous years permit sales, this should be more than enough to satisfy domestic demands. The Department will ensure that the number of permits issued for each domestic block do not exceed sustainable harvest levels. Requests for domestic harvesting blocks outside the approved domestic area, as indicated in the appended maps (Appendix IV), will require prior approval from District staff. They will be closely monitored and subject to review on an annual basis. Modifications to this practice may be recommended and enforced as required.

Domestic harvesting will not be permitted in the commercial areas, which is located south of Muddy Bay Pond (Dykes River) while commercial operations are present. However once commercial operations cease in an area, domestics may be allowed to harvest or clean up commercial areas. Over time this will reduce the pressure on the green tree resource and increase

the utilization. Through consultation, one domestic sawlog block, White Hills (Appendix IV) has been identified with access through the TLH and snowmobile for domestic harvesters who wish to harvest sawlogs. Certain conditions apply to harvesting within this block such as, maximum $10m^3$ total sawlogs per allocation, assigned in $5m^3$ blocks at any one time. Once allocation is reached, a Conservation Officer must inspect harvest activity and give approval for additional $5m^3$ to be harvested. These activities will require prior approval from district staff, and will be closely monitored and subjected to review by the local planning team on an annual basis. Modifications to these practices may be recommended as required.

Harvesting is also restricted in various buffers that have been established for roads (100m) and snowmobile trails (30m). A minimum of 125m no harvest buffer will be applied to all major waterbodies with an additional 50m of modified harvest, when required, to be determined in the field by District staff. Consensus was reached and major waterbodies were defined by local stakeholders during public consultation sessions. All other waterbodies identified on a 1:50,000 map or have a width greater than 1.0 meter will have a minimum no harvest buffer zone of 30m. In any instance, when field conditions require, additional buffer distance may be applied. Consensus was reached among local planning team members that the following exceptions should apply to domestic harvesting in buffers:

- some dead trees may be harvested
- some blow-downs can be salvaged
- special building materials (i.e. boat timbers) may be harvested provided good utilization is practiced

These activities will require prior approval from District staff, and will be closely monitored and subjected to review by the local planning team on an annual basis. Modifications to these practices may be recommended as required.

Black spruce, the common fuelwood species in FMD20, will account for 90% of the domestic fuelwood harvest. The remaining volume, balsam fir (*Abies balsamea*), will be sawn in local sawmills.

Operating Area				Estimated Number of Permits		Estimated Volume	
Number	Name	Tenure	Total Area (ha)	Commercial	Domestic	Softwood	Hardwood
20-2025-2029-CC20501	Cartwright	Crown	58,016	0	110	2,530	0
20-2025-2029CC20502	Paradise River	Crown	18,956	0	20	460	0
20-2025-2029-CC20505	Black Tickle	Crown	30,150	0	20	460	0
20-2025-2029CC20506	White Hills	Crown	109	0	20	460	0
		Total	**107,231**	**0**	**170**	**3,910**	**0**

Table 6.2 Proposed domestic harvest activity 2025-2029

6.2 Silviculture

Harvested stands (or portions of harvested stands) that are not regenerating will be scheduled for planting up to 100 ha per year (500 ha/5yr). The planted species will be determined on a site-specific basis but will be highly dependent on the pre-disturbance stand structure.

Research will focus on silviculture techniques that will enhance natural regeneration. Potential projects include:

(1) (2) Retention of groups of seed trees.
(3) Modification of harvesting patterns.
Investigation of various site preparation techniques.
(4) Species trials
(5) Past plantation assessment

A species trial within an old burn area, with poor to medium soils is proposed for the District. The project will be approximately 5 ha. in size, and will contain 5-7 different conifer species, depending on seedling availability at the time of planting. The trial will consist of approximately 100 seedlings per species, with 150-200 pine surrounding the trail to provide a wind break. It's possible that the windrow will be planted first, and the rest in the following years, to give the pine some time to establish.

6.3 Forest Access

Approximately 14.2 kilometers in total of Crown and operator built primary access road has been proposed for this planning period (Table 6.3). The current forest access road system originates from the DND access road, which connects the community of Cartwright to the North Warning Radar Site located on the White Hills. Proposed road construction will be an extension

of our forest access road system. This access will be required to maintain the proposed harvest schedule if large scale commercial operations are identified.

The location of the proposed primary road construction activity is illustrated on the 1:50,000 cover type and 1:50,000 topographic maps provided in the appended maps (Appendix IV). This road network will potentially provide access to approximately 182,000 m^3 (NCV) during the first four years of this plan. All roads constructed by the Department will be of class C-2 standard (Appendix VI).

Operating Area		Construction/ Reconstruction	Length (km)	Water Crossings	
Name	Number			Culverts	Bridges
Cartwright Forest Access Road	C-20-7 to C20-10	Construction	4.2	1	
	C-20-11 to C-20-16	Construction	10.0	3	

Table 6.3 Proposed primary access road construction and water crossings 2025-2029.

6.4 Forest Protection

6.4.1 Fire

Large fires have not been common in District 20 in recent years. Wildfire, however, is documented as a natural occurrence in the Labrador Region. Large fires have occurred in Southern Labrador (Port Hope Simpson); therefore an effective fire suppression program is necessary to ensure that losses to fire are minimized. Fires, which pose no threat to life, property or commercial resources, will be allowed to burn. The priority fire suppression zones within Labrador are outlined in the appended maps (Appendix IV).

The District Office in Cartwright currently has staff and equipment to provide initial suppression attacks. Two seasonal fire protection staff is stationed in Cartwright from mid May to September, complemented by three permanent District staff, all trained in forest fire suppression. The office is manned from 1200 to 1900 hours daily. After regular hours, the District Fire Duty Officer is responsible for receiving fire reports and dispatching staff and equipment. The Forest Management Centre located in North West River, assists in coordinating air support (tanker, helicopter) and can provide additional staff and equipment as required.

6.4.2 Insects and Disease

In addition to fire suppression, resource protection will focus on maintaining ecosystem health from forest insect damage. Recently a Hemlock Looper (*Lambdina fiscellaria*) outbreak has caused extensive damage to balsam fir – black spruce forest throughout neighboring District 21. This is the first known outbreak of Hemlock Looper in Labrador. Small, localized areas with severe damage have been identified in District 20 in the past.

Over mature stands increase the risk of insect and /or disease outbreaks. The five year harvest schedule targets oldest stands first in an attempt to reduce the potential risk for such outbreaks and also reduce the risk of major forest fires. Harvesting alone is not enough to control the population. Silviculture will focus on planting harvested sites with less susceptible species such as spruce. At the planning meetings stakeholders were made aware of the seriousness of this outbreak and our control options. No stakeholders raised concerns over treatment. Crews from the Insect and Disease branch at Headquarters in Corner Brook, with input from District staff, will monitor insect populations through aerial and ground reconnaissance. Information collected will assist managers in the development of adequate forest protection measures that can be presented to the local public for input and approval.

The Department and other organizations may be undertaking a number of studies to examine the affects and impact of a Hemlock Looper outbreak in the region. Researching the outbreak in Labrador is particularly of interest as it relates to the effects of climate change on forested ecosystems in northern areas. The current circumstances provide the opportunity to investigate and improve existing knowledge and fill information gaps to better monitor, forecast and manage Hemlock Looper outbreaks.

6.4.3 Windthrow

If the district experiences an excessive amount of windthrow, salvage areas will be considered and identified for both commercial and domestic harvesting. If required, amendments to the plan will be made to cover this activity.

6.4.4 Surveys

Surveys are important management tools that are necessary to evaluate past action and provide data on which to base future management decisions. Several surveys are scheduled for this upcoming planning period subject to adequate staffing and budgets.

Proposed harvesting areas will be surveyed for sensitive habitats such as the presence of raptor nesting sites, critical spawning areas and presence of aquatic furbearers. Detailed harvest sensitivity surveys (slope, groundwater condition, soil texture) may also be conducted to identify areas with high compaction and soil erosion hazard potential. A trial comparing the amount of coarse woody debris before and after logging may also be initiated.

Surveys will be conducted on areas that have been harvested in order to determine the quantity and quality of natural regeneration as per the Regeneration Assessment Procedures for Newfoundland and Labrador. Areas will normally be surveyed three to five years after harvesting to allow sufficient time for seedlings to establish.

Problems with improper utilization will be addressed through regular monitoring and enforcement by District Conservation Officers. Formal surveys, defined by Newfoundland &

Labrador Forest Service, will also be carried out in order to obtain baseline data or to resolve disputes.

While these surveys are necessary to measure the immediate impact of activities on the ecosystem, mechanisms to monitor change over the long term are also necessary. During the summer of 2001 approximately 30 PSP (permanent sample plots) were established in District 20 by the inventory branch of FLR. These permanent sample plots will be an important component of long-term monitoring. A five to ten year measurement cycle is expected in District 20. In addition to obtaining growth and yield information, data pertaining to site, coarse woody debris and the presence of small mammals and songbirds will be recorded and monitored over time. After two cycles of measurement, growth trends can be observed, and preliminary data analyzed. More measurements are required to ensure that more representative results are obtained. These results will prove helpful in future planning period.

These surveys, as defined in the Ground Disturbance Survey Guidelines developed by the Newfoundland and Labrador Forest Service, will be conducted following harvesting activities to ensure compliance with the site disturbance and erosions sections of the Environmental Protection Guidelines.

6.5 Activities in Protected Public Water Supply Areas

There will be no commercial or domestic harvesting scheduled or permitted in either of the protected water supply areas. Furthermore, these protected areas will be identified on domestic maps supplied to harvesters and identified and enforced as no cutting areas.

6.6 Information and Education

Public awareness and education is a high priority for the Department in District 20. Educating the public on best management practices is necessary and has proven beneficial. Staff will take part in several activities to ensure good communication and relations between the Department and communities, such activities include visiting the local schools for presentations, career fairs, forestry and wildlife week and to judge science fairs. Some promotional materials will be distributed during special occasions. Throughout the life of this plan we hope to build on the success of these activities.

7.0 PAST PLANNING ACTIVITIES

The previous five year forest management plan (2020-2024) was an overall success. Activities remained consistent over each year of the planning period. The underlying management objective was to support the sustainable development of the forest ecosystem ensuring the general well-being of all resources for present and future generations. The fundamental objective

of this was to provide maximum social and economic benefits from the forest ecosystem, while maintaining its integrity at all spatial scales.

7.1 Harvesting

7.1.1 Commercial Activity

The annual allowable cut (100,000 m^3) from the mid 1990's to early 2000 was recognized as an opportunity for commercial development. As a result the Sandwich Bay Timber Ltd. began operations in 1994 and by the fall of 1996 had shipped two barge loads of pulpwood, totaling 9795 m^3 (solid) to the Abitibi-Price mill located in Stephenville. Shortly after this operation ceased the Cottles Island Lumber Company began its commercial operation in Cartwright. The operation lasted for four months and approximately 7000 m^3 of timber was harvested. The majority of this timber was shipped the next summer and fall, via barge, to their mill located in Summerford, NL, for processing with plans to commission a sawmill in Cartwright the following year. These plans later fell through.

The forest industry in District 20 has remained relatively stable in the past five years. Commercial operations have remained minimal. Over the past five year planning period approximately 91 m^3 have been harvested from an available allocation of 125,000 m^3 (Table 7.1). The lack of commercial operations has decreased other forestry related activities including road construction and silviculture. Commercial harvest levels will remain consistent in the immediate future until viable markets for lower quality fiber (pulpwood, fuel wood, bioenergy materials etc.) or value-added products are identified. The current global market conditions have created a difficult environment for growth but overall, there is a positive outlook for the future. This is mainly due to the interest and dedication of many stakeholders and the Department.

District 20		Core				Operational Available				Non AAC Wood
		AAC	Commercial	Deviation	Total	AAC	Commercial	Deviation	Total	
Softwood	2019	25 000	30	24 970						
	2020	25 000	11	49 956						
	2021	25 000	14	74 945						
	2022	25 000	20	99 925						
	2023	25 000	16	124 909						
Sub-total		125000	91		0	0	0		0	
Hardwood	2019	0	N/A							
	2020	0	N/A							
	2021	0	N/A							
	2022	0	N/A							
	2023	0	N/A							
Sub-total		0	0		0	0	0		0	
Total		125000	91	124 909	0	0			0	

Table 7.1 Commercial harvest summary 2019-2023.

7.1.2 Domestic Activity

Domestic harvesting has remained consistent in the past five year period. The number of domestic permits issued averaged around 155 per year (@ 23 m^3 per permit). Fuel prices were relatively high over the past five years and as a result residents of communities in the district depended on fuelwood for home heating. Over the past five year period domestic harvesting has accounted for approximately 14,283 m^3 (Table 7.2).

Operating Area					Estimated Volume	
Number	Name	Tenure	Total Area (ha)	Number of Permits	Softwood	Hardwood
D-20-01	Cartwright	Crown	26,255	443	10,189	
D-20-02	Paradise River	Crown	9,750	62	1,426	
D-20-05	Black Tickle	Crown	30,150	62	1,426	
D-20-06	White Hills	Crown	109	0	0	
D-20-07	Table Bay	Crown	15,880	10	230	
D-20-08	Bill Learning Pond	Crown	4,081	44	1,012	
Total			**86,225**	**621**	**14,283**	

Table 7.2 Domestic harvest summary 2019-2023*

The majority of domestic harvesting occurred near the communities of Cartwright, Paradise River, and Reeds Brook (by residents of Black Tickle)(Appendix IV).

7.2 Silviculture

Silviculture has been limited because of a lack of large-scale disturbance (harvesting or natural disturbance). As a result, there were no planting projects conducted during 2010-2014.

7.3 Forest Access

The majority of road that exists in the district was constructed in 1987 by the Department of National Defense (DND) to provide access to the radar site located on White Hills, 24 kilometers southeast of Cartwright. From this road system, the Department of Natural Resources (FLR) has constructed approximately 8.5 km of class C-2 primary forest access road to accommodate commercial operations. In the past five years there was no new construction of road however there was grading and alder removal from approximately 9km of the existing road network along with some light maintenance work.

7.4 Natural Disturbances

7.4.1 Fire

Several forest fires were reported during the past five years. However, majority of these fires were small and required minimal suppression efforts. Majority of fires in the district was the result of lightning strikes. All fires were contained by District staff from Cartwright, as well as staff from Port Hope Simpson, Red Bay, and North West River, with some requiring water bomber and/or helicopter support from Goose Bay.

7.4.2 Insects

The levels of Hemlock Looper have dropped significantly since 2009, when the last area was treated for this insect. There has been spruce budworm damage reported in the Happy Valley - Goose Bay area, but no signs of this insect are evident in this district at this time. Crews from the Insect and Disease section at headquarters in Corner Brook, and local staff, will monitor insect populations through aerial and ground reconnaissance work.

8.0 RESEARCH

8.1 Research Initiatives

All stakeholders including FFA acknowledge the information gap, which exists in Labrador. Currently, little to no research has been conducted in the immediate area making management decisions cumbersome. In consultation with stakeholders, subject to funding, FFA plans to initiate several smaller research projects over the next five year period. These projects will provide relevant site-specific information, which can be used, for management decisions and processes during the next planning period.

Another important monitoring mechanism that is required under the current management planning process is the preparation of annual work schedules. These plans will be subject to review by the planning team and the general public. This will provide an opportunity for stakeholders to evaluate the plan progress and recommend necessary changes.

8.2 Environmental Management System

The Province has initiated the implementation of the ISO 14001 environmental management system (EMS) within crown lands of the Province. By doing so, the Department can demonstrate control and measure the impacts of programs and activities on the environment, with a goal to continue to minimize harmful effects, and improve environmental performance.

ISO 14001 is a series of internationally recognized standards on environmental management. It provides a structured framework for the development of an environmental management system

and a supporting audit program, which can be integrated within the existing legislation and policies of an organization. There are many anticipated benefits in following the ISO 14001 EMS model. Some include:

1. Improved awareness of the key environmental issues.

2. An increase in the effectiveness of operations.

3. Improved forest management.

4. Improve relationships between Industry, Governments and Aboriginal Peoples.

5. Improved market advantages.

6. Improved ability to meet compliance with environmental regulations.

7. Improved public image.

The EMS will apply to all forest management activities and to all Forestry Services Branch employees, commercial permit holders, research institutions and contractors carrying out regulated forest management activities within the Province. Activities would include; commercial timber harvesting, forest access road construction and maintenance, loading and transportation or wood and silviculture.

The application of the EMS will ensure that all activities implemented in the district are following the same set of guidelines to ensure protection of the environment. It also ensures that reporting and monitoring will be conducted by the same set of guidelines and done on a regular basis. Overall the EMS will ensure further compliance of the cultural, ecological and economic objectives identified in this plan.

The ISO 14001 EMS requires a lengthy information gathering and review period which was initiated during the last planning period. It also requires a third-party external audit for assessment and registration along with internal annual audits. Audits consist of documentation review, site visits and communications with employees. The third-party external auditor will make a final decision on performance.

8.3 Forest Certification

Following the implementation of the EMS, forest certification may be explored for the district and Province. Forest certification is a voluntary standard, or tool, audited by a third-party for forest managers who wish to improve their planning and practices by implementing measures or standards that go beyond regulations by considering ecological, social and economic values (www.certificationcanada.org). Certification is the best practical tool available that allows for the monitoring of applied criteria and indicators to ensure sustainability (Kneeshaw *et al*, 2000).

In Canada, there are three major forest certification systems:

1. Canadian Standards Association (CAN/CSA Z809)
2. Sustainable Forestry Initiative Program (SFI)
3. Forest Stewardship Council (FSC)

While the choice of which certification scheme will be explored for the Province has not been made, the benefits and costs associated with applying for and implementing forest certification in the district are still being evaluated.

8.4 Climate Change

FFA has been working with the Canadian Forest Service (CFS) over the past two years in an attempt to model the amount of carbon currently existing within our provincial forest. In addition, FFA will strive to quantify the potential carbon impacts associated with implementing the forest management activities outlined in our five-year operating plans. Considering the specialized training requirements and complexities involved, this process is slowly evolving.

FAA recognizes that new or changing ecological conditions have potential varying impacts on tree species. To help minimize negative effects, FFA supports the Atlantic Tree Improvement Council, which is focused on evaluating the genetic diversity within species and quantifying their ability to adopt to a changing environment. The results of this information are integrated into our provincial tree improvement program. To date, three planting trials have been established in this province, with replicas studies established in each of the three remaining Atlantic Provinces (Nova Scotia, Prince Edward Island and New Brunswick). Under this program, utilizing seedling stock from each province aims to measure species adaptability over time.

To help raise awareness of healthy forests and support urban forest initiatives, FFA implemented a program to distribute tree seedlings (free of charge) to residents across the province during national forestry week in 2021. With approximately 110,000 tree seedlings distributed, FFA considers this a successful program and anticipates it will continue in future years.

FFA is currently developing a 2 billion tree initiative program with Natural Resources Canada. This objective of this program is to restock naturally disturbed areas (fire, insect, & wind damage) which have not sufficiently regenerated. In addition, another objective of the program is to aid in the restoration of sensitive wildlife habitats and reduction of linear features through targeted tree planting initiatives. Implementation of this program will increase demand for seedlings from the provincial tree nursery at Wooddale. With anticipated increase in demand, the nursery has recognized the requirement to upgrade its seeder line and increase the number of cold frames on site. It is anticipated this 2 billion tree initiative will also result in engagement and partnership building with indigenous and community groups to develop and implement various tree planting programs.

9.0 PLAN ADMINISTRATION

9.1 Monitoring

The adaptive management approach will afford the opportunity for participants and stakeholders to continually improve the plan and set the stage for the next planning period.

Further refinement of the sixteen proposed commercial harvest blocks outlined in this plan will be administered through the development of an annual work schedule by January 1st of each year. In addition, a past annual report will be completed after March 31 of each year.

Finally, District Conservation Officers will routinely monitor harvesting, road construction and silviculture operations. This will ensure that activities are being carried out in a manner consistent with various legislation, guidelines and the objectives of the five year plan.

9.2 Amendments

Due to the dynamic nature of forest activities, amendments are often required because of changes in the forest, operational realities, imposition of addition requirements or guidelines, or some other unforeseen circumstance. These changes to the five year operating plan must be submitted as amendments and approved before they are implemented. There are two types of possible amendments for this plan, one that can be approved internally by the Forestry Services Branch and one that must be submitted to the Environmental Assessment Division for public review. Changes to this plan can be approved by the Forestry Services Branch if they are:

1. within one kilometer of an operating area described in the five year operating plan, an additional area for timber harvesting that is, in total, not more than 50 hectares in each year of the plan.
2. within a forest management district, additional areas for silviculture treatment of not more that 20 percent of the total operating area described in the five year operating plan over the five year term of the plan.
3. within an operating area described in the five year operating plan, not more than one kilometer, in total, of new primary forest access road in addition to existing and proposed primary forest access road in each year of the plan.
4. adjacent to an operating area described in the five year operating plan, not more than half a kilometer, in total, of new primary forest access road in each year of that plan.

Changes that are not covered by the above must be submitted for Environmental Assessment (EA) in the form of an amendment to the five year operating plan. Once approved through EA the amendment still has to be approved by the Ecosystem Management Division of the Forest Service. Amendments requiring submission through EA will be reviewed by the planning team.

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USDA (United States Department of Agriculture – Forest Service). 1990. Silvics of North America Vol. 1 Softwoods. USDA Handbook No. 654. Washington, DC.

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APPENDIX I

Annual allowable cut results

AAC (m3/year) = Net Commercial Forest Area (ha) X Rotation Age (yrs)
Net Merchantable Volume (m3) Hectare

Where:

- Net **Commercial Forest Area** is the net landbase of commercial forest.
- **Rotation Age** is the time period (in years) required to establish and grow trees to a condition of maturity following a disturbance.
- **Net Merchantable Volume** is the expected merchantable volume on a specified landbase taking into account losses for fire, waste and retention.

Net Commercial Forest Area Determination

Landbase	Area (ha)	Swd. Volume (m3)
Total Area (1992 inventory)	612,337	23,928,973
Total Area (southside management area)	174,640	9,005,661
Productive Forest	50,933	6,899,254
Commercial Forest	50,125	6,882,947
Un-alienated Commercial Forest	38,612	5,330,052
Net Commercial Forest	32,820	4,530,544

Definitions and assumptions:

Productive Forest Stands that are capable of producing 35 m3/yr at rotation.

Commercial Forest Stands (bF, bS, wS, sH) that contain a minimum softwood volume of 88 m^3/ha. Height class 3 and all 3P stands are not considered commercial.

Un-alienated Isolated stands and sensitive areas were not included in the AAC calculations.

Net Comm. Forest Total commercial forest with a 15% reduction applied to account for buffers, stands located on slopes >30% and other sensitive areas requiring protection.

Rotation Age Rotation age is the age at which the mean annual increment of merchantable volume reaches its peak and yields the most volume per unit area per year. Normal yield tables show that rotation age increases as site

quality decreases. They also show that the corresponding merchantable volume and mean annual increment decrease greatly from good to poor sites (USDA 1990).

Averages for black spruce stands of three site classes in the boreal forest of Canada are as follows:

	Good	Medium	Poor
Rotation Age (yrs)	95	113	132
Merchantable Volume (m^3/yr)	218	160	101
Mean Annual Increment (m3/ha)	2.3	1.4	0.8

Approximately 78% or more of the area in District 20 are black spruce stands. The proportion of site classes of forest stands is approximately 47% poor, 47% medium and 6% good. The average gross merchantable volume is approximately 140 m3/ha. Considering these figures a best estimation of the rotation age for District 20 is **120 years**.

Net Merchantable Volume Determination

The forest cover inventory used to derive the described landbase measures softwood and hardwood volumes per hectare of forestland. Analysis of 1:12,500 scale aerial photos identified height, species, age and productivity of the landbase. Ground truthing plots were used to verify this information and furthermore the resulting inventory has specific volume/hectare values for all forest cover types.

During the landbase net-down exercise the Commercial Volume and the commercial land base area are determined. The Gross volume/hectare is found by using the following formula:

$$\textbf{Gross Volume/ Hectare} = \frac{\textbf{Net Commercial Volume}}{\textbf{Net Commercial Area}}$$

This number (Gross Volume/hectare) is further refined to account for retention, waste and natural disturbances. This number, referred to as the **Net Commercial Volume**, is then used in the AAC calculation. The expected net downs for district 20 were applied to account for the following losses:

Cull*	10%
Residual Stands 6% Harvesting Losses 3%	
Fire	1%
Total	20%

* Due to lack of previous large scale harvesting operations, the exact percentage of cull in District 20 is unknown. Harvesting operations in the area will determine this percentage over time. Consideration will be given to recalculate the AAC if cull percentage difference is found to be greater than 5 % in the first year.

Estimations of the operable landbase and volume estimations for the Southside operating area are shown below.

	Gross Volume (m^3)	Gross Area (ha)	Commercial Volume (m^3)	Commercial Landbase Area (ha)
Southside Area	9,005,661	174,640	4,530,544	32,820

Gross Volume/Hectare = **Commercial Volume / Commercial Area**

4530544 m³ / 32820 ha

= **138.04 m³/ha**

Net Volume/Hectare = **138.04 m³/ha – 20%**
= **110 m³/ha**

AAC Calculation = **32820 ha / 120 years** **X** **110 m³ / hectare**

= **30,085 m³/year**

Government of Newfoundland and Labrador
Department of Fisheries and Land Resources

Appendix II

Environmental Protection Guidelines
for Forestry Operations in Newfoundland and Labrador

Most recent version located on Website at:

www.gov.nl.ca/ffa/programs-and-funding/forestry-programs-and-funding/managing

APPENDIX III

RESOURCE MATERIAL

Development Applications in Protected Public Water Supply Areas

http://www.env.gov.nl.ca/env/waterres/regulations/appforms/index.html

Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and

Labrador http://www.dfo-mpo.gc.ca/Library/240270.pdf

Guidance Document for the Management of Impacted Sites

http://www.env.gov.nl.ca/env/env_protection/ics/Guidance_Document_For_the_Management_of_Imp acted_Sites_V2.0_Feb_6_2014.pdf

FEDERAL LEGISLATION

Canada Fisheries Act

http://laws-lois.justice.gc.ca/eng/acts/F-

14/index.html Canada Navigable Waters

Protection Act

http://laws.justice.gc.ca/eng/acts/N-22/ Canada

Species at Risk Act

http://laws-lois.justice.gc.ca/eng/acts/s-15.3/

PROVINCIAL LEGISLATION

Newfoundland and Labrador Endangered Species Act

http://www.assembly.nl.ca/Legislation/sr/statutes/e10-1.htm

Newfoundland and Labrador Environmental Protection Act

http://www.assembly.nl.ca/legislation/sr/statutes/e14-2.htm

Newfoundland and Labrador Forestry Act

http://www.assembly.nl.ca/legislation/sr/statutes/f23.htm

Newfoundland and Labrador Historical Resources Act

http://www.assembly.nl.ca/legislation/sr/statutes/h04.htm

Newfoundland and Labrador Quarry Material Act, 1998

http://www.assembly.nl.ca/legislation/sr/statutes/q01-1.htm

Newfoundland and Labrador Urban and Rural Planning Act, 2000

http://assembly.nl.ca/Legislation/sr/statutes/u08 .htm Newfoundland and Labrador Wildlife Act

http://www.assembly.nl.ca/Legislation/sr/statutes/w08.htm

APPENDIX IV

Five Year Planning Maps & Operating Area Sheets

Operating Area Name:	Operating Area #: C-20-01
NFS Inventory Map #: 271-21	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carries out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-02
NFS Inventory Map #: 271-22	NTS Map # 13H11

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-03
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-04
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-05
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-06
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-07
NFS Inventory Map #: 270-14	NTS Map # 13H11

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 1.0 kilometers of new primary access road is required to access this harvest block. Majority of the road fill will come from the road right of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-08
NFS Inventory Map #: 270-14	NTS Map # 13H11

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 1.5 kilometers of new primary access road is required to access this harvest block. Majority of the road fill will come from the road right of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-10
NFS Inventory Map #: 270-14	NTS Map # 13H11

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. There is no new primary access road proposed to access this harvest block.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-11
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 1.0 kilometers of new primary road is required to access this harvest block. Majority of the road fill will come from the road of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-12
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 1.5 kilometers of new primary road is required to access this harvest block. Majority of the road fill will come from the road of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-13
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 3.0 kilometers of new primary road is required to access this harvest block. Majority of the road fill will come from the road of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-14
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 1.0 kilometers of new primary road is required to access this harvest block. Majority of the road fill will come from the road of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-15
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 2.0 kilometers of new primary road is required to access this harvest block. Majority of the road fill will come from the road of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.

Operating Area Name:	Operating Area #: C-20-16
NFS Inventory Map #: 271-11	NTS Map # 13H10

Description of Area: This area of Crown land is located south east of Cartwright and is accessed by the White Hills Forest Access Road. The terrain varies from hilly to rough. Merchantable forest stands are comprised of a mixture of black spruce and balsam fir.

Harvesting Activities: Commercial activities may include energy wood and sawlog harvesting with mechanical harvesters and chainsaws. Extraction may be by forwarders.

Silviculture Activities: Regeneration surveys will be carried out on cutovers 5 years after harvest to determine the need for planting and/or thinning. Suitable cutovers that are not regenerating properly will be targeted for those activities.

Forest Access Road Construction: There are 14.2 kilometers of forest access road proposed for construction from 2020-2024 to access stands for harvest. Approximately 3.0 kilometers of new primary access road is required to access this harvest block. Majority of the road fill will come from the road right of way.

Non-Timber Considerations and Mitigations: A 30 meter buffer will be maintained on both sides of all rivers, brooks, ponds or other water bodies that are shown on 1:50,000 topographic maps.

Due to mineral exploration in the White Hills area, shared access to site would be acceptable.

Provisions of the Environmental Protection Guidelines will be adhered to.