Forest Management Plan 2018-2022

Five Year Operating Plan
Forest Management District 19 (Central Labrador)

September ***

Submitted by:
Department of Fisheries and Land Resources & Innu Nation

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Introduction

On August 27, 2003, the Province of Newfoundland & Labrador and the Innu Nation signed an Interim Forest Agreement, succeeding the previous Forest Process Agreement. This agreement was designed to enable and facilitate effective communication, information sharing, and the resolution of issues between the Province and the Innu Nation concerning interim planning and management, the development of sustainable forestry practices, and ecosystem-based management plans. This forest ecosystem management plan for district 19 is an important result of that agreement.

From the onset, the planning team recognized that both stakeholder participants and local communities would be required to be involved in the development of this management plan. Accordingly, public participation was sought in general sessions which were open to all members of the public, as well as through specific consultations with Innu communities. Public participation was integral to the completion of the plan. This document is therefore a reflection of the dedication and contribution of the many people who participated in the numerous meetings, and presentations which were an essential part of the planning process.

This management plan follows an ecosystem-based planning approach, which requires a careful consideration of ecological, cultural and economic values. It is based on protecting, maintaining, or where necessary, restoring fully functioning ecosystems at different spatial scales over long time frames. Following this approach, the management plan specifically describes the district and identifies objectives and actions within three main themes, reflecting ecological, cultural, and economic landscapes. Additional information in the plan includes descriptions of past activities, the public consultation process, proposed activities, research and monitoring requirements and details on plan administration.

The Ecological Landscape

Forest management district 19 is 7.1 million hectares in size, an area which is just over twice the size of Vancouver Island. District 19 has been further subdivided into Sub-districts 19A, 19B, and 19C for management planning purposes. The focus of the activities outlined in this management plan will be in district 19A, an area of 2.2 million hectares located in Upper Lake Melville.

Considering that most of Labrador is only sparsely forested or not forested at all, district 19A contains the majority of Labrador's closed canopy forest. This heavy to moderately stocked spruce-fir forest is mixed within a diverse mosaic of vegetation types, such as open sphagnum forest, lichen woodlands, mixed hardwoods (birch, aspen and poplar), black spruce bogs, and a variety of other wetland types. Although frozen most of the year, a significant portion of the landscape (11.6%) is composed of water. The district's

numerous lakes, rivers, and streams play a critical role in shaping its ecological character. The result is a unique ecological landscape, highlighting an important relationship between climate, topography, hydrology, and vegetation.

District 19 ecosystems possess several important natural characteristics, such as cold climates, extensive riparian ecosystems, and slow nutrient cycling. These characteristics indicate some of the ecological limits which serve as the foundation for the development of ecosystem-based forest management and help to provide a general picture of the unique ecological character of district 19.

The district has experienced relatively little ecological impact from human industrial activities. The main impacts on the terrestrial landscape are concentrated on the northside of the Churchill River, including road developments, past timber harvesting activities, and human-caused forest fires. There have also been significant impacts associated with changing water levels and flow patterns resulting from the Upper Churchill hydroelectric development.

One of the key principles of ecosystem-based planning is the identification of an ecological protected areas network considering different levels of planning. For this plan, the protected areas network was designed to protect ecological functioning at three distinct levels or spatial scales: landscape, watershed, and stand by limiting large scale commercial forest harvesting activities in these areas. Each level functions as a "filter" to identify and protect the ecosystem structures and functions which are best reflected at these different map scales.

For example, woodland caribou are wide-ranging, migratory animals which require a variety of habitat types over the course of a year. Protection of caribou requires particular consideration of "coarse" landscape patterns at small map scales (1:250,000-1:500,000). Caribou are best protected at the landscape level. Other species (for example, marten) have much smaller ranges, and depend on finer-scale features. Accordingly, their habitat needs are considered at the watershed level (usually mapped at 1:50,000). At the finest level of detail, consideration is given at the stand level to protecting site-specific features, such as rare plant communities and fish-bearing streams (1:12,500 scale). Although each level focuses on protecting different features, all levels test for rare, threatened, and endangered species and ecosystem types.

The following specific ecological objectives have been identified and addressed in the management plan:

1) Species at Risk
2) Wildlife & Habitat Management
3) Ecosystem Health & Water Quality
4) Global Implications

Cultural Landscape

The cultural character of district 19 is a diverse blend of Aboriginal and non-aboriginal peoples. These groups have historically interacted with the land, plants, animals, and with each other. The district's unique climate, vegetation, wildlife, and other ecological characteristics have shaped the people who call this land home. For over two thousand years the people of Labrador have been "living off the land", and thus a fundamental requirement of protecting cultural heritage values means protecting the land itself.

The management plan recognizes the critical importance of protecting and respecting Aboriginal and non-aboriginal cultural heritage and land-use priorities across the district. A cultural protected areas strategy was developed to ensure that sensitive cultural areas and values are protected from large scale commercial forest harvesting activities under this plan. Subsequently, a cultural protected areas network was mapped and removed from the commercial timber harvesting land base.

The following specific cultural objectives have been identified and addressed in the management plan:

1) Cultural Heritage Values
2) Landscape Aesthetics
3) Hunting and Trapping
4) Non-Timber Forest Products (NTFP)
5) Socio-Economic Factors
6) Domestic Forest Products

Economic Landscape

The planning team recognizes that domestic harvesting, including hunting, trapping, berry gathering, and similar activities are a large and important part of the Labrador economy, as well as a vital and highly valued part of both Aboriginal and non-aboriginal ways of life in the district. However, for the purposes of analysis and description under the plan, most of these activities are considered to be part of the cultural landscape. The economic landscape presented here is intended to describe forest-based activities which have a direct market value either as products or as services. Such activities include but are not limited to timber harvesting, sawmilling, value-added wood production, outfitting, and guided or self-directed adventure or eco-tourism.

Forestry and tourism are among the primary forest-based industries in this region. Up until as recently as 2005, the timber harvesting and sawmilling industry employed approximately 60 people. At that time, none of the forest industry workforce was members of the Innu Nation, and 15 out of 30 people who reported to work in forestry and logging were women (2006 census). Considering that over 85% of the harvested timber was exported as round logs, there is significant potential for further development in the saw milling and value-added industries. With approximately 70 Labrador outfitter lodges offering fishing, hunting, and wilderness adventure trips, tourism and related spin-off industries are showing signs of significant growth.

The productive forest of district 19 is dominated by black spruce, which encompasses approximately 91% of the productive forest area. Balsam fir constitutes 5% of the area, while other softwoods and hardwoods make up the balance. The general characteristics of productive forest stands in district 19A can be summarized as stands in late seral stages (>140 years), between 10 - 15 meters in height, having 51-75% crown density and occupying predominately medium and poor quality sites.

The commercial use of the timber resource within district 19 has been relatively cyclic, with varying degrees of economic success. After Labrador Linerboard ceased large-scale (over 300,000m^3/year) operations in 1977, harvesting continued at much lower levels up to 1992 to supply the export market. There was a gradual increase in commercial harvesting activity from about 5000 m^3 in 1993 up to about 40,000 m^3 in 2000. This was undertaken mainly by local operators to supply both local and island mills, until the shutdown of the Abitibi Consolidated newsprint mill in Stephenville in 2005 and further the closure of the Abitibi-Bowater paper mill in Grand Falls-Windsor in 2009, where the majority of the district's fiber was shipped. Since then, large scale commercial harvesting operations in the district have ceased. It is possible that within the life of this plan a significant level of commercial harvesting will be re-initiated in the district.

Outside of the total protected areas network, ecosystem-based management areas are identified for commercial timber harvesting. The remaining forest land base available for timber harvesting has been divided into five different management classifications: domestic, selective-commercial, commercial, visual management, and conservation emphasis**.**

The rate of annual harvest or annual allowable cut (AAC) is an important calculation that defines the scale at which harvesting occurs over time. The district AAC is divided into two distinct management areas: north and south of the Churchill River ("North side" and "South side" respectively).

The calculations for the AAC incorporated a comprehensive protected areas strategy in which approximately 64% of the productive forest land base is alienated from commercial harvesting activities. In addition, a 28.6% area net-down, to account for more detailed air-photo analysis, and the designation of watershed and stand level ecological protected area networks created during operational planning was applied. Through this analysis the Northside AAC was calculated at **58,000m^3/year** and for the Southside at **142,000 m^3/year.**
The total AAC for district 19A of 200,000 m^3/year represents a significant reduction from the 2000 analysis, which set the AAC at 400,000 m^3/year however is consistent with the previous years analysis. The primary reason for this 50% reduction in the AAC is the major shift in planning emphasis under the Innu forest process agreement and the incorporation of public values and concerns which arose during the consultation process. This resulted in a significant change to how the timber management land base was determined. The incorporation of ecological and cultural priorities in conjunction with changes in stand level harvesting practices resulted in a significantly reduced commercial

harvesting area, thus allowing for a far greater level of ecological and cultural protection. Given that the annual timber harvest since the cessation of Linerboard activities in 1977 has been only a fraction of the AAC, the change in approach, resulting in a much reduced AAC, has been relatively manageable.

The following specific economic objectives have been identified and addressed in the management plan:

1) Forest Product Processing & Value Added
2) Timber Harvesting & Sustainability
3) Timber Resource Utilization
4) Forest Access Roads
5) Forest Resource Protection
6) Silviculture & Restoration
7) Tourism and Recreation
8) Future Economic Developments

Summary

- Mutually endorsed plan by Innu Nation and Department of Fisheries and Land Resources;
- Plan follows an innovative ecosystem-based planning approach, which requires a careful representation of ecological, cultural, and economic values;
- Planning process includes an ongoing public participation component representing stakeholders and local community participants;
- Plan identifies ecological protected areas networks at three different levels of planning, as well as a cultural protected areas network that ensures sensitive cultural areas and values are considered; Combined protected areas network encompasses over 50% of the district;
- Annual allowable cut (AAC) for the district is estimated at 200,000m^3/year. This is very similar to previous planning efforts.

Executive Summary (Innu-Aimun)

** TO BE TRANSLATED**

CHAPTER 1.0 INTRODUCTION

Forest ecosystem management planning began in Newfoundland and Labrador in 1995. The planning process is based on the input and consensus of the various stakeholders who participate in the public meetings and who will continue to provide input both during and after the implementation of the scheduled management activities.

On January 30, 2001, the Province of Newfoundland & Labrador and the Innu Nation signed an historic agreement. The Province recognized the significance of the unsettled Innu land claim in this district, and how decisions made under this plan could affect those interests. Accordingly, a Forest Process Agreement (FPA*)* was arranged to facilitate effective communication, information sharing, and resolution of issues between the Province and the Innu Nation concerning interim planning and management and to facilitate participation by the Innu Nation in the development of sustainable forestry practices and ecosystem-based management plans. Subsequent to the FPA, Interim Forest Agreements (IFA*)* were signed with the Innu Nation with the most recent one being signed in 2017, which included the establishment of a forest management committee (FMC). The main role of the FMC is to provide advice on the implementation of the forest management plan, facilitate involvement and to provide overall advice concerning the management of forest resources in the district. An additional (without prejudice) forest management consultation agreement with NunatuKavut Community Council has been signed to facilitate input into the 19A Five Year Operating Plan.

As a result of cooperation between the Innu Nation and the Department of Fisheries and Land Resources under the Interim Forest Agreements, and with the participation and contributions of the public through an innovative consultation process, this five year operating plan for forest management district 19 was developed covering the time period of 2018-2022.

This plan reflects new legislative changes in planning requirements for the Newfoundland Forest Service. Past documents included a twenty year strategy plan, Five year operating plan, annual work schedule and a past annual report. The new planning framework, as outlined in the draft sustainable forest management planning regulations, does not include the preparation of a twenty year strategy plan for each district; however its contents are split between the Provincial sustainable forest management strategy (strategy document) and the five year operating plan (plan).

In general, sections pertaining to issues that are Provincial in scope, such as carbon cycling, criteria and indicators and global warming, are addressed in the Provincial sustainable forest management strategy. Furthermore, sections that describe ecological character, such as district values, forest characterization and ecosystem descriptions, are contained in the management plan. An annual work schedule and past annual report will also be prepared as part of the new planning process.

This document also contains objectives and actions identified within the five year Northern Strategic Plan for Labrador prepared by the Department of Labrador and Aboriginal Affairs in April 2007 (www.laa.gov.nl.ca/laa).

This operating plan is the continuation of many years of planning effort within the District. The contributions of the numerous people who gave freely of their time and shared their knowledge and concerns within the planning sessions are reflected in this document and are acknowledged in Appendix I.

Vision Statement, Goals & Objectives

Collectively, the management plan and strategy document describe the ecosystem-based forest management approach, which the district has summarized with the following vision statement:

To create an ecosystem-based forest management plan for District 19 that protects ecological and cultural integrity, productive capacity, resiliency and biodiversity while advancing economic opportunities for the sustainable development of forest-based industries.

This vision will be achieved through an adaptive management strategy that works toward four goals. The plan also identifies specific objectives and associated actions, which are described in detail throughout this plan and summarized in Table 1.

Plan Goals

- Follow an ecosystem-based planning approach that requires careful and systematic consideration of ecological, cultural and economic values;
- Make use of all applicable ecological and cultural information and databases, recognize and identify gaps in this information, and make provisions throughout the life of the plan to fill those gaps;
- Ensure that ecological and cultural values are protected through a district protected areas network, which incorporates ecologically and culturally sensitive areas and representative ecotypes, and through environmentally appropriate forest management activities;
- Give full consideration to the values of the local citizens of the district and ensure that they are given adequate opportunity to participate in both in the development and implementation of the plan.

Table 1: Plan Objectives and Page References

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This management plan also provides details of various forest management activities that are scheduled to occur between January 1, 2018 and December 31, 2022. These activities, which include harvesting, silviculture, road construction, research, surveys/monitoring, and ecosystem protection, are designed to ensure that the forest resources are utilized in a responsible and sustainable manner. References are frequently made to the goals, objectives and actions outlined throughout this plan, which will serve as the overall framework for all management and planning activities described.

Under the Environmental Protection Act, five year operating plans are submitted to the Minister responsible for the Department of Municipal Affairs and Environment and registered for environmental assessment and further public review.

Ecosystem Based Plan Framework[1] & Guiding Principles

Ecosystem-based planning (EBP) is a relatively new approach to forest management in Canada. EBP is seen by many different sectors, including First Nations, Government, industry, and environmental non-governmental organizations as a balanced, "go forward" approach to forest management. The EBP framework has been endorsed internationally by the parties to the Convention for the Protection of Biodiversity.

An EBP approach requires a careful representation of ecological, cultural, and economic values. With respect to forest management, this balance provides adequate land bases for sustainable human use while ensuring that ecological processes and values are protected. It also helps create a balance between timber and non-timber values.

An EBP approach to forest management is founded upon protecting, maintaining, or where necessary restoring, fully functioning ecosystems at different spatial scales[1] over long timeframes. Disturbance and change are accepted as natural and important ecological processes, but disturbance and change need to occur within the range of natural disturbance characteristics and variation.

An EBP approach recognizes an important hierarchy in priority decision-making that is based on the acknowledgement that the maintenance of ecosystem health is the basis for sustaining cultures, which in turn is the basis for sustaining economies. In other words, if planning protects ecosystem functioning, then planning will ensure that human cultures are protected; and with healthy human cultures there will be healthy economies. Therefore, the first priority of an EBP approach is to protect the ecological functioning of the land and water of district 19, because these are the basis for human cultures and economies.

[1] The three distinct scales of planning utilized in this plan are the landscape (from satellite images), watershed (from air photos) and stand (from field data).

An EBP approach relies upon the following priority of decision-making:

- *First Priority*: Ecological Responsibility – All activities will respect, protect, maintain, and where necessary, restore fully functioning ecosystems at all levels of planning over long timeframes. An adequate protected land base will be provided in order to sustain biological richness and services.

- *Second Priority*: Cultural Responsibility – All activities will respect and protect Aboriginal and non-aboriginal cultural values. An adequate protected land base will be provided to meet cultural needs.

- *Third Priority*: Economic Responsibility – All activities will strive for economically sound practices and products. Local communities and organizations will assist in decision-making and provide key direction in realizing economic opportunities.

The EBP approach of "priority decision-making" ensures that ecological and cultural values are considered first, forming a protected land base framework. Outside of the protected land base, areas are identified for sustainable economic development and management decisions.

The plan is structured into three main themes, ecological, cultural, and economic landscapes. As expressed in the management visions and goals, this plan will strive to represent all values, and undertake a priority decision-making approach that is in line with the definition and principles of EBP outlined below.

Although there has been significant debate over the objectives and methods of EBP, a set of common themes and guiding principles were accepted within this Plan. In Grumbine's (1994) "*What is Ecosystem Management?"* the author reviewed more than 30 articles pertaining to EBP and identified 10 common themes. (Table 2)

Table 2. EBP Common Themes and Guiding Principles.

Common Theme	*FMD 19A Ecosystem-Based Planning Guiding Principles*
Ecological Integrity	1. Respect the ecological limits of various ecosystems to human disturbance. Natural biological diversity and natural disturbance regimes will be protected and maintained through historic range of variability in order to maintain natural forest functioning.
Hierarchical Context	2. Ensure that all plans and activities protect, maintain and where necessary restore forest functioning at the Landscape, Watershed, and Stand level scales.
Ecological Boundaries	3. Focus on the ecological features to retain and utilize ecological boundaries at all levels of planning.
Values	4. Aboriginal and non-aboriginal cultural values will be respected and protected.
Humans Embedded in Nature	5. Plan and carry out diverse, balanced activities to encourage ecological, social, and economic well-being and stability. The maintenance of ecosystem health is recognized as the basis for sustaining cultures and economies.
Adaptive Management	6. Apply the precautionary principle to all plans and activities utilizing monitoring, assessment, and adaptive management.
Data Collection	7. Research on ecosystem structure and function, sensitive habitats, disturbance regime dynamics, and impacts of timber harvesting will be carried out.
Interagency Cooperation	8. Ensure effective communication and cooperation channels are created between management organizations. Ensure all management organizations accept and support the listed guiding principles.
Organizational Change	9. Management organizations will strive to adapt past practices and operating structures in order to facilitate an EBP approach and build trust between other management organizations.
Monitoring	10. Review and evaluate the success of all forest activities in meeting the previous nine principles**.**

CHAPTER 2.0 DISTRICT DESCRIPTION - DISTRICT 19

Ecological Landscape

Geographic Setting and Location

Although currently described by the Forest Management Districts Proclamation under the Forestry Act (1996), Forest management districts were initially declared in this Province in 1974. Currently the province is divided into 24 forest management districts (FMD's), with 6 of those being in Labrador.

Forest management district 19 is 7.1 million hectares in size. Figure 1 and map 1 and 2 highlight the size and extent of district 19 and describe the associated vegetation classes with the district. The district is situated in central Labrador and generally bounded to the north by the Mulligan and Red Wine Rivers, to the east by the height of land that separates the Kenamu River watershed from those flowing into the Labrador Sea, to the south by the height of land that separates the Gulf Watershed from those flowing into the Labrador Sea, and to the west by a line at longitude 61° 45'. A legal description of this area is provided in Appendix II. District 19A falls within the boundaries of lands subject to comprehensive land claims negotiations between Innu Nation, the Government of Canada, and the Government of Newfoundland and Labrador.

District 19 has been further subdivided into Sub-districts 19A, 19B and 19C for management planning purposes. The focus of this management plan will be on district 19A- Goose Bay (Figure 1). Reasons for this include: limited access in districts 19B and 19C and little inventory data available outside of 19A.

FMD 19A covers an area of approximately 2,270,000 hectares. Four eco-regions are represented in the district as well as 27 primary watersheds including that of the Churchill River, which flows more or less diagonally through the middle of the district. Historically, the land and adjacent marine areas of the district have supplied various resources and benefits to Aboriginal, settled, and transient residents. The district is currently considered a crown management district as most land is classified as crown land, although portions may be allocated to various jurisdictions. It is important to note that significant portions of FMD 19 are currently subject to land claims negotiations with Innu Nation, which are ongoing.

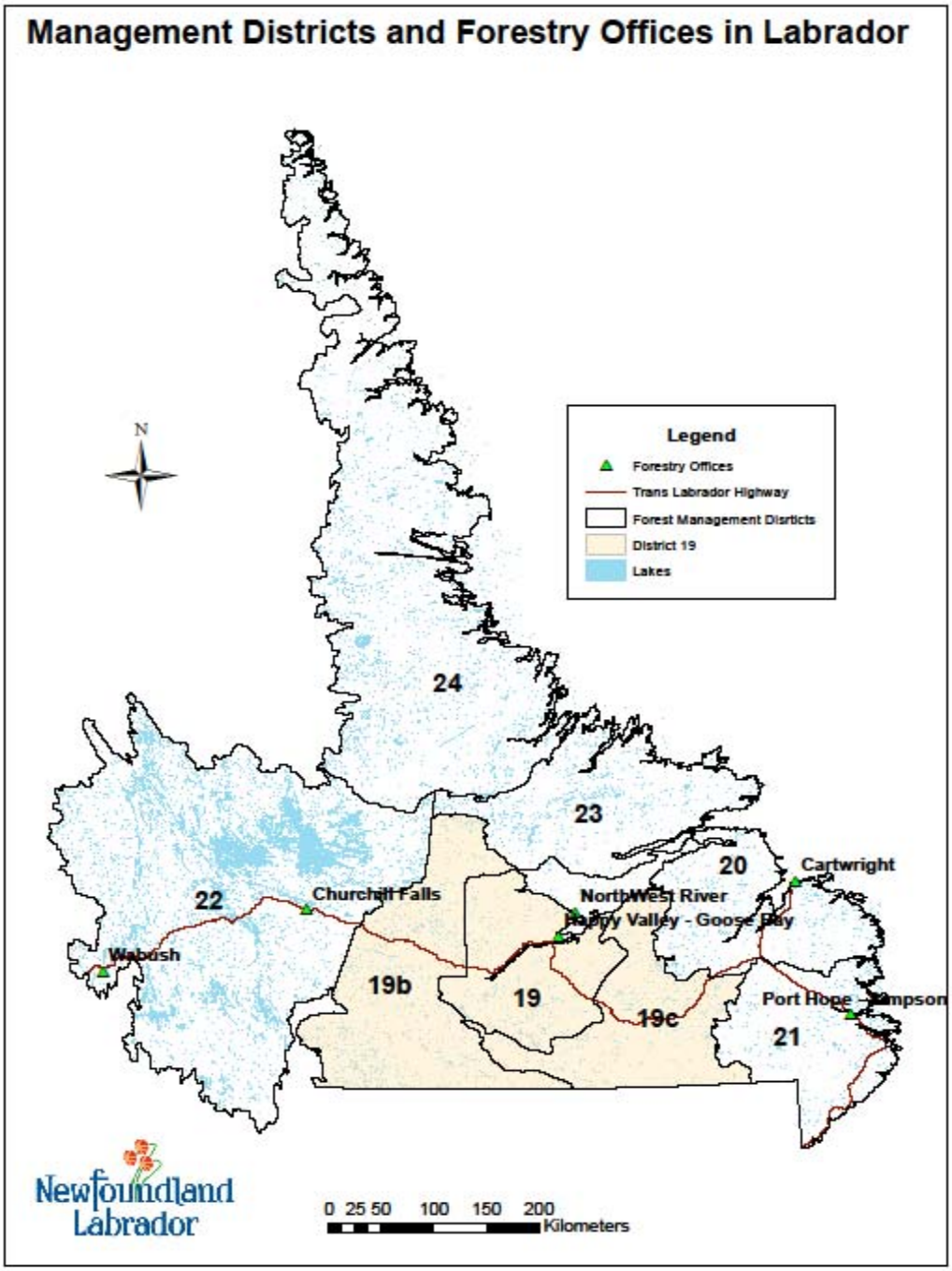


Figure 1: Forest Management District 19

Ecological Classification Systems and Relevant Inventories

In order to facilitate more effective decision making on potential land use activities, resource managers utilize ecological land classification systems. Not unlike classification systems used for other purposes, the intent of ecological land classification is to identify areas based on similar characteristics (vegetation type, climatic gradients, etc).

Ecological land classification assists managers to identify ecosystem patterns, assess potential resources, conduct environmental analyses, forecast future conditions, and manage and monitor resources. The ecological classification systems and relevant inventories utilized in this plan are listed below.

Canadian Ecological Land Classification System

The Canadian Ecological Land Classification System provides for seven levels of organization (scales) based on ecological principles (Table 3). The Canada Land Inventory and the Forest Regions of Canada (Rowe, 1972) are both examples of large scale ecological land classification systems that are widely used for Canada.

Table 3. The Canadian Ecological Land Classification System

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 earth's surface characterized by major structural or surface forms, faunal realms, vegetation, hydrology, soil and climatic zones (e.g. Island of Newfoundland)	1:10,000,000 1:5,000,000
ECOREGION	a part of the eco-province characterized by distinctive ecological responses to climate as expressed by vegetation, soil, water, and fauna (e.g. High Subarctic Tundra Eco-region)	1:3,000,000 1:1,000,000
ECODISTRICT	a part of the eco-region characterized by a distinctive pattern of relief, geology, geomorphology, vegetation, water, and fauna	1:500,000 1:250,000
ECOSECTION	a part of the eco-district throughout which there is a recurring pattern of terrain, soil, vegetation, water bodies, and fauna	1:125,000 1:50,000

Level	Description	Common Map Scale
ECOSITE	a part of the eco-section having a relatively uniform parent material, soil, hydrology, and chrono-sequence of vegetation	1:50,000 1:10,000
ECOELEMENT	a part of the eco-site displaying uniform soil, topographical, vegetative, and hydrological characteristics	1:10,000 1:2,500

Eco-regions have been mapped for Newfoundland and Labrador based on distinctive regional climates as expressed primarily by vegetation. Figure 2 shows the extent of these eco-regions in Labrador as well as the forest management district boundaries. There are four eco-regions represented in district 19A.

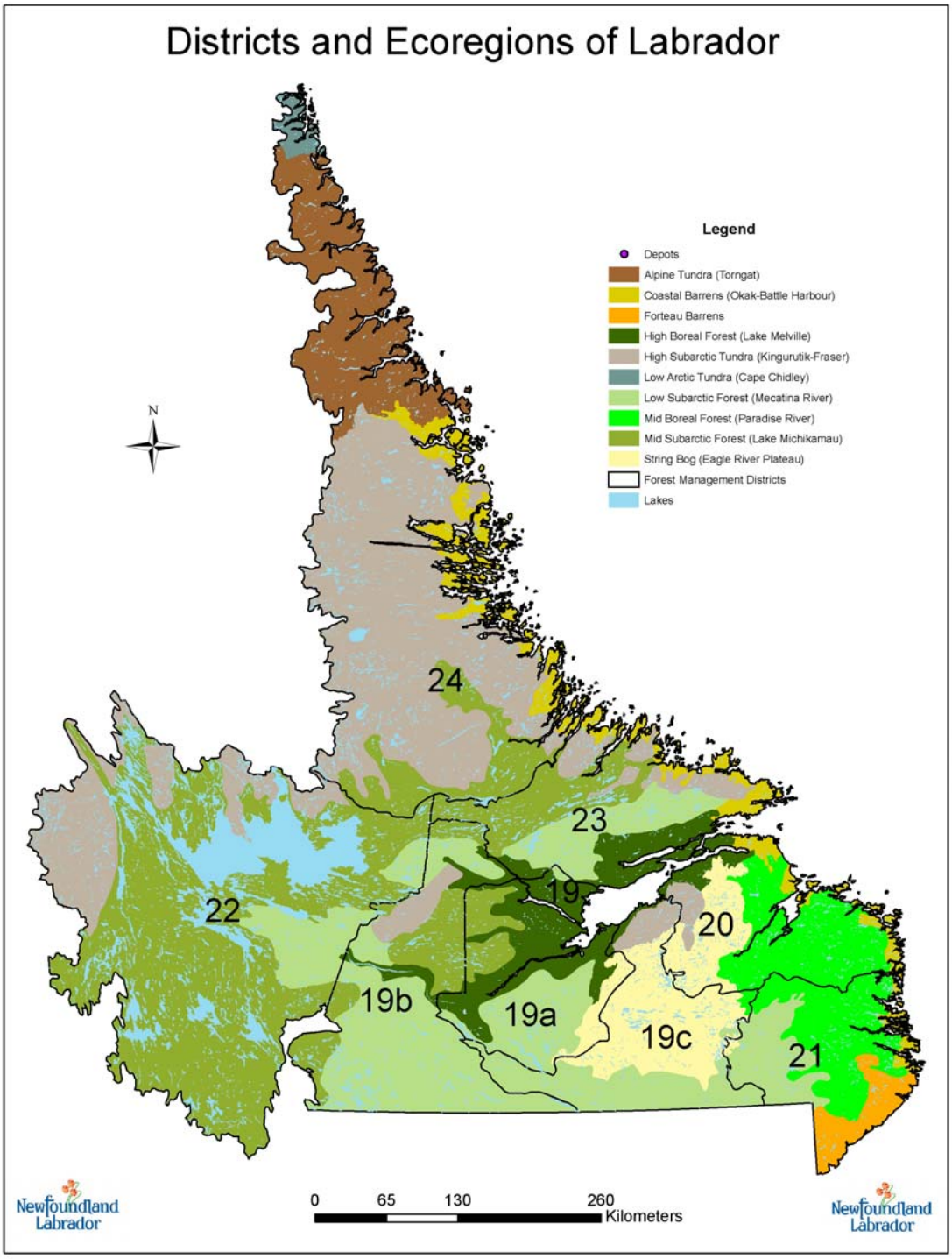


Figure 2: Eco-regions of Labrador

Mid Subarctic Forest – Michikamau

This eco-region encompasses the upland plateaus of central and western Labrador. Eskers and drumlin ridges are characteristic. This region has a very continental, subarctic climate with short, cool summers and long, severe, cold winters. The growing season is 100 to 120 days. Black spruce is the dominant trees species, except in the most northern areas, where white spruce dominates. Trembling aspen reaches its northern limit here and the only native population of jack pine occurs in this eco-region. Open lichen woodlands are characteristic of this eco-region. Extensive ribbed fen-string bog complexes, bordered by black spruce-sphagnum forest stands, dominate areas with little relief.

High Boreal Forest – Lake Melville

This eco-region 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 favorable climate in Labrador. Summers are cool and winters cold. The growing season is 120 to 140 days. The forests are closed-canopied 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.

Low Subarctic Forest – Mecatina River

The main portion of this eco-region is located in southern Labrador, with two separate areas to the north of Lake Melville and the Red Wine Mountains. Broad river valleys and rolling hills covered by shallow till, drumlins, and eskers are characteristic of the region. Summers are cool and winters are long. The growing season is 120 to 140 days. Somewhat open black spruce forests are the dominant vegetation, with crown densities greater than 75% on better sites. String bog-ribbed fen complexes cover extensive areas throughout the region.

String Bog – Eagle River Plateau

The Eagle River Plateau comprises most of this eco-region. 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 feather moss. The peat land expanses are occasionally interrupted by only a few conspicuous eskers, which support open, lichen woodland. Alder thickets are common along river banks.

More detail on climate, flora, and fauna is available in Meades (1990).

At the next scale down, ecodistricts have also been mapped for Labrador (Lopoukhine et.al, 1976) based on patterns of relief, geology, geomorphology, and associated regional

vegetation. Map 4 depicts the location and extent of these eco-districts within District 19A.

Labrador Multi-Resource Inventory (Drieman Curtis Inc.)

This inventory highlights vegetation cover types for District 19 based on satellite imagery. The primary data source for the compilation of this database was from 1:1,000,000 scale Landsat Thematic Mapper color composite transparencies. A total of 20 images have been used to map the forested region of Labrador (North to 56^0). Vegetation cover was delineated into several forest, disturbance, and wetland types. This information was digitized and is available for use in the GIS. Table 4, map 1 and 2 (Vegetation cover types for district 19 and 19A) highlights the results of this inventory.

Table 4. Vegetation Cover Types of District 19A.

Vegetation Cover Type	Percentage Of Type
Heavy Spruce/Fir Forest	12.8%
Moderate Spruce/Fir Forest	29.3%
Sparse Spruce/Sphagnum Forests	7.8%
Sparse Spruce/Lichen Woodlands	9.8%
Regenerating Forests	1.0%
Mixed Hardwood Forests	1.6%
Soil/Rock Barrens	2.3%
Recent Burns	3.3%
Lichen Scrub/Bog	9.2%
Bog/Wetlands	8.7%
Water Bodies	11.6%
Unclassified	2.6%
Total	**100.0%**

Biophysical Land Cover Types with Initial Forestry Potential Classification

This classification, developed by Silva Ecosystem Consultants, presents an initial interpretation of land cover types in FMD 19A, with an emphasis on forestry potential. It represents an attempt to delineate substantive forestry-oriented cover types in a very complex and variable landscape. This classification provides an initial analysis of those areas that may be suitable for timber production and is an important interpretation in the process of identifying protected, isolated, and forest management areas. Table 5 and map 3 high lights the result of this inventory.

Table 5. Detailed descriptions of initial biophysical land cover types cross-referencing Drieman, Site Class, and topography.

Land Cover Type	Map Code	Dominant Drieman Vegetation Classifications	Dominant Site Class	Dominant Topography/Landform[2]
Barren Uplands	BAR	Bog, sparse spruce (sphagnum), sparse spruce (lichen), barren	None, Poor	Bedrock plateau
Lichen woodland with very few trees	L	Lichen scrub	None, Poor	River terraces
Mixed scrub and bog with poor forest	SCR	Lichen scrub, bog, sparse spruce (lichen), sparse spruce (sphagnum)	None, Poor	Variable, typically with little relief
Wetlands	WL	Bog	None	Level
Wetlands with poor forest	WL/P	Bog, sparse spruce (sphagnum), moderate spruce/fir	None, Poor	Level with localized low relief
Wetlands with moderate forest	WL/ M	Bog, sparse spruce (sphagnum), moderate spruce/fir	None, Medium	Level with localized low relief
Poor forest on all terrain types	P	Moderate spruce/fir, sparse spruce (sphagnum), sparse spruce (lichen)	Poor, None, Medium	Variable
Moderate forest on Eagle plateau	M-PL	Moderate spruce/fir, bog, sparse spruce	Medium, Poor	Plateau
Moderate forest on very rugged terrain	M-R	Moderate spruce/fir, heavy spruce/fir, bog	Medium, Poor, Good	Rugged bedrock-controlled uplands
Moderate forest on undulating terrain	M-U	Moderate spruce/fir, heavy spruce/fir, bog	Medium, Poor, Good	Gentle, undulating uplands
Moderate forest with large lakes	M-LL	Moderate spruce/fir, heavy spruce/fir, bog	Medium, Poor, Good	Rolling uplands
Other Moderate forest	M	Moderate spruce/fir, heavy spruce/fir	Medium, Poor, Good	Variable, but generally uplands with significant relief
Full Forest	F	Heavy spruce/fir	Good, Medium	Moderate valley slopes

[2] General description only, based upon topographic maps and interpretation of 1:50 000 aerial photographs.

Forest Cover Type Inventory

The Province began its first complete inventory program over thirty-five years ago. It encompassed the entire Island portion of Newfoundland and all of Labrador as far north as the 56th parallel. The program evolved over the years from a timber inventory to a broader ecosystem inventory, but the underlying focus of providing sound statistical information to ensure sustainable management has remained.

The current Forest Inventory Program in the Province is mainly funded as a Government program under the Forestry and Wildlife Division. The program is carried out on a continuous cycle with a target of 10 % of the Province being re-inventoried each year. The inventory process is as follows:

- Color aerial photographs are flown by fixed wing aircraft each year in selected locations throughout the Province. Each photograph partially overlaps the coverage of the previous photo so that interpreters can view ground features in 3-dimensions (3-D). To facilitate this 3-D viewing, an interpreter uses a stereoscope or specialized computer equipment which allows him/her to define the height, species, age, and productivity of the forests. The information derived from photographs is verified and supplemented by measuring a series of ground plots. These ground plots also supply information on wildlife habitat and abundance, timber volumes, soils, ground vegetation, etc.

- The next step in the inventory process is converting the boundaries and information created by the interpreter on the photographs into digital format. This is done by cartographic technicians who trace the boundaries with an electronic mouse and store the information in a Geographic Information System (GIS).

- After the information has been digitized, planners use it to produce theme maps of forest landscapes for planning and other information needs. The information is also used with computer models to determine the annual allowable cuts (AACs) and impacts of fiber management practices on other resource values.

The most current cover-type inventory database for district 19A was digitized between 1990 and 1991 from aerial photos that were taken between 1987 and 1989. Map 4 and map 5 highlight some of the applications from this inventory. DFLR is currently in the process of updating this database with a portion of the district that has been recently flown.

Other Classifications

Several other classifications have also been developed at various times, scales, locations and for various purposes in Labrador (Hustich, 1949; Allington, 1958; Hare, 1959; Wilton, 1965; Bajzak, 1973; and Bajzak & Roberts, 1984).

Ecological Character & Condition

Describing the character and condition of district 19 ecosystems is the first task in preparing an ecosystem-based forest management plan. The district ecosystems form the basis on which all other activities will depend, therefore understanding the past (character) and present (condition) of these ecosystems is vital in planning for the future.

The ecological character refers to how the natural ecosystem functioned prior to, or in the absence of human industrial activities. Ecological condition describes the impacts to ecosystem functioning, as a result of human industrial activities.

Character

As described in the various ecological classifications and inventories outlined in the section above, district 19A has a unique ecological character. Central to this character are the vast, diverse, and relatively undisturbed tracts of boreal forest.

Considering that most of Labrador is only sparsely forested or not forested at all, district 19A contains a majority of Labrador's closed canopy forest. This heavy to moderately stocked spruce-fir forest is mixed within a diverse mosaic of vegetation types such as open sphagnum forest, lichen woodlands, mixed hardwoods (birch, aspen, and poplar), black spruce bogs and a variety of other wetland types (map 2 and table 4).

Although frozen most of the year, a significant portion of the landscape (11.6%) is composed of water. The district's numerous lakes, rivers, and streams play a critical role in shaping its ecological character. The result is a unique landscape that highlights an important relationship between climate, topography, hydrology, and vegetation.

Ecosystem diversity is the variety and pattern of animal and vegetation species, communities, and ecosystems across the district. Maintenance and protection of the variety and quality of ecosystems is therefore necessary for the preservation of all species. At the eco-region level, diversity is reflected in Damman's classification as determined by soil parent material, topography, and climate. The identified eco-regions have a variety of different plant and animal communities as well as many differences in dominant ecological features.

There are 4 eco-regions represented within district 19A. Within each eco-region, the dominant ecological features and typical associated wildlife (Meades 1990) are:

ECO-REGION 5: MID-SUBARCTIC FOREST – MICHIKAMAU

- Frequent fire contributes to dominance of open lichen woodlands
- Sphagnum – black spruce forests common
- Northern limit of trembling aspen
- Ribbed fens cover extensive areas

Land Mammals

Barren Habitats:
Caribou, Arctic Fox

Forest and Shrub Habitats:
Moose, Caribou, Lynx, Porcupine, Woodchuck, Marten, Mink, Fisher, Red Squirrel, Flying Squirrel, Snowshoe Hare, Heather Vole, Red-backed Vole, Pygmy Shrew, Masked Shrew, Star-nosed Mole, Little Brown Bat, Woodland Jumping Mouse

Wetland Habitats:
Meadow Vole, Meadow Jumping Mouse, Northern Bog Lemming

Ubiquitous:
Black Bear, Red Fox, Wolf, Least Weasel, Ermine

Aquatic Habitats:
Beaver, Muskrat, River Otter, Water Shrew

Amphibians
American Toad, Wood Frog, Blue-spotted Salamander (2 sightings), Two-lined Salamander (1 sighting)

Characteristic Birds

Barren Habitats:
Water Pipit

Forest Habitats:
Bald Eagle, Osprey, Red-tailed Hawk, Northern Flicker, Merlin, Great Horned Owl, Spruce Grouse, Blackpoll Warbler, Tree Swallow, Swainson's Thrush, Hermit Thrush, Dark-eyed Junco, Northern Hawk-Owl, Three-toed Woodpecker, Black-backed Woodpecker

Shrubby or Thicket Habitats:
Tree Sparrow, White-throated Sparrow

Wetland Habitats – marshes, peatlands:
Common Snipe, Short-eared Owl, Lincoln's Sparrow, Rusty Blackbird, Greater Yellowlegs

Aquatic Habitats – freshwater:
Canada Goose, Common Merganser, Spotter Sandpiper, Solitary Sandpiper, Green – Winged Teal, Belted Kingfisher, Least Sandpiper

ECO-REGION 6: HIGH BOREAL FOREST – LAKE MELVILLE

- Very productive closed-crown forest dominates
- Balsam fir, black spruce, white birch, and trembling aspen all common
- Lichen Woodlands dominated in lower river terraces
- Ribbed Fens occupy upland depressions

Land Mammals

Barren Habitats:
Caribou, Bog Lemming, Arctic Fox

Forest and Shrub Habitats:
Moose, Caribou, Lynx, Porcupine, Woodchuck, Marten, Mink, Red Squirrel, Flying Squirrel, Snowshoe Hare, Heather Vole, Black-backed Vole, Pygmy Shrew, Masked Shrew, Star-nosed Mole, Little Brown Bat, Woodland Jumping Mouse

Wetland Habitats:
Meadow Vole, Meadow Jumping Mouse

Ubiquitous:
Black Bear, Red Fox, Wolf, Least Weasel, Ermine

Aquatic Habitats:
Beaver, Muskrat, River Otter, Water Shrew

Amphibians
American Toad, Wood Frog, Northern Leopard Frog, Mink Frog, Blue-spotted Salamander (2 sightings), Two-lined Salamander (1 sighting)

Characteristic Birds

Forest Habitats:
Bald Eagle, Osprey, Red-tailed Hawk, Goshawk, Merlin, Great Horned Owl, Spruce Grouse, Ruffed Grouse, Boreal Flicker, Tree Swallow, Swainson's Thrush, Hermit Thrush, Dark-eyed Junco, Tennessee Warbler, Blackpoll Warbler, Pine Siskin, Yellow-bellied Sapsucker, Three-toed Woodpecker, Black-backed Woodpecker, Yellow-bellied Flycatcher

Shrubby or Thicket Habitats:
Yellow Warbler, Tree Sparrow, White-throated Sparrow

Wetland Habitats – marshes, peatlands:
Common Snipe
Aquatic Habitats – freshwater:

Canada Goose, Belted Kingfisher, Spotter Sandpiper, Solitary Sandpiper, Semipalmated Plover, Semipalmated Sandpiper

Aquatic Habitats – saltwater:
Gulls, Common Tern, Harlequin Duck

ECO-REGION 8: LOW SUBARCTIC FOREST – MECATINA RIVER

- Fairly open black spruce forest dominates
- Balsam fir only occurs on moist slopes
- Lichen woodland confined to sandy terraces and other dry sites
- Sphagnum – black spruce forests occupy wet, low areas
- Ribbed fens and string bogs cover extensive areas

Land Mammals

Barren Habitats:
Caribou, Bog Lemming, Arctic Fox

Forest and Shrub Habitats:
Moose, Caribou, Lynx, Porcupine, Woodchuck, Marten, Mink, Red Squirrel, Flying Squirrel, Snowshoe Hare, Heather Vole, Red-backed Vole, Rock Vole, Pygmy Shrew, Masked Shrew, Star-nosed Mole, Woodland Jumping Mouse

Wetland Habitats:
Meadow Vole, Meadow Jumping Mouse

Ubiquitous:
Black Bear, Red Fox, Wolf, Least Weasel, Ermine

Aquatic Habitats:
Beaver, Muskrat, River Otter, Water Shrew

Amphibians

None observed in this ecoregion

Characteristic Birds

Forest Habitats:
Great Horned Owl, Northern Hawk-Owl, Spruce Grouse, Ruffed Grouse, Tree Swallow, Swainson's Thrush, Dark-eyed Junco, Boreal Owl, Northern Flicker

Shrubby or Thicket Habitats:
Alder Flycatcher, White-throated Sparrow

Wetland Habitats – marshes, peatlands:
Common Snipe, Lincoln's Sparrow, Greater Yellowlegs, Rusty Blackbird

Aquatic Habitats – freshwater:
Green Winged Teal, Belted Kingfisher, Spotter Sandpiper, Least Sandpiper

ECO-REGION 9: STRING BOG – EAGLE RIVER PLATEAU

- Extensive string bogs dominate
- Open pools are surrounded by fen lawn vegetation dominated by sedges (*Carex limosa* and *Carex oligosperma*) and peatmoss (*Sphagnum lindbergii*)
- strands of scrubby Black Spruce forest containing Labrador Tea, and *Pleurozium schreberi* feathermoss, occur on hummocks in bog
- Lichen Woodland occurs on eskers and areas of coarse till
- Alder Swamps common along rivers

Land Mammals

Barren Habitats:
Caribou, Bog Lemming, Arctic Fox

Forest and Shrub Habitats:
Moose, Caribou, Lynx, Porcupine, Woodchuck, Marten, Mink, Red Squirrel, Flying Squirrel, Snowshoe Hare, Heather Vole, Red-backed Vole, Star-nosed Mole, Masked Shrew, Pygmy Shrew, Little Brown Bat, Woodland Jumping Mouse

Wetland Habitats:
Meadow Jumping Mouse

Ubiquitous:
Black Bear, Red Fox, Wolf, Least Weasel, Ermine

Aquatic Habitats:
Beaver, Muskrat, River Otter, Water Shrew

Characteristic Birds

Forest Habitats:
Bald Eagle, Osprey, Merlin, Spruce Grouse, Hermit Thrush, Swainson's Thrush, Hermit Thrush, Dark-eyed Junco, Tree Swallow, Northern Flicker, Black-backed Woodpecker, Three-toed Woodpecker, Yellow-bellied Flycatcher

Shrubby or Thicket Habitats:
Yellow Warbler, Tree Sparrow

Wetland Habitats – marshes, peatlands:

Northern Harrier, Short-eared Owl, Common Snipe, Greater Yellowlegs, Rusty Blackbird, Lincoln's Sparrow

Aquatic Habitats – freshwater:

Belted Kingfisher, Spotted Sandpiper, Least Sandpiper, White-rumped Sandpiper

Some important natural characteristics of district 19 ecosystems are listed below (Hammond 1993). These characteristics indicate some of the ecological limits that serve as the foundation for the development of ecosystem-based forest management and provide a general picture of the unique ecological character of district 19:

1. **Climate:** District 19 forests are limited by cold climate. The growing season in district 19 lasts about 100 days. The cold climate and short growing season lead to a slowing of biological processes, reduced water uptake, and very slow tree growth.

2. **Disturbances:** Disturbance regimes commonly operate at a vast range of spatial scales, from single trees to large-landscapes. The death of individual trees, or small groups of trees, is the most common disturbance type. This continual low-level disturbance maintains the old, uneven-aged, semi-closed, and multi-layered canopy forests in district 19. Fire disturbances vary greatly, burning some areas at relatively low intensity, while occasionally burning some areas at high intensity. Fire is relatively infrequent and patchy, with fire return intervals in the order of 200 to 500 years. Fire, however, plays key roles in nutrient cycling, and in diversifying habitat types and landscape patterns.

3. **Riparian ecosystems:** Extensive networks of riparian ecosystems, often dominated by wetland complexes, are present throughout the landscape. Riparian ecosystems are very sensitive to disturbance, are biological "hot spots," and are key landscape linkages. Riparian ecosystems concentrate and retain nutrients; they also control water, sediment, and nutrient flows into streams – important factors for fish and other aquatic organisms. Riparian ecosystems support unique ecosystem types that provide important plant communities and wildlife habitats.

4. **Soil Drainage:** Outside of riparian ecosystems, there are many areas, characterized by poor drainage or with a high water table. "Micro-bogs" not mapped at higher scales, exist throughout forest stands. These wet forested areas are sensitive to disturbance as there is a risk of paludification in many wet forested areas when trees are removed and the soil impacted. Conversely, there are large areas in district 19 with coarse-textured soils that have rapid drainage and moisture deficit problems.

5. **Soil Nutrients:** District 19 has many areas with nutrient-poor soils that are coarse textured or shallow. Lichen woodlands composed of sparse black spruce are common on these sites, although dense tree cover may eventually develop on these sites over time.

6. **Nutrient Cycling:** District 19 forests have slow nutrient cycling and low nutrient availability because of the young, acidic, poorly developed, and cold soils. Many soil animals, like earthworms and millipedes, that are decomposers in warmer soils cannot survive in the cold, acidic soils that are characteristic of Labrador. In the absence of soil animals to perform the initial breakdown of organic matter, slower-working microorganisms, primarily fungi, are largely responsible for decay. As a result, organic matter tends to accumulate more quickly than it decomposes.

7. **Soil Fungi Relationships:** Mychorrhizae are a symbiotic relationship between soil fungi and tree roots, where the fungi provides water, nutrients, and other benefits to the tree, while the tree provides sugars and carbohydrates from photosynthesis to the fungi. This relationship is very important for nutrient cycling, water uptake, and tree growth. Mychorrhizae are diverse and site-specific, and seem to require the continuous presence of residual host trees. Due to the cold climate and slow nutrient cycling of district 19 forests, mychorrhizal fungi are the main mechanism for decomposition of organic matter, and transfer of nutrients to trees and other plants. Different species of mychorrhizal fungi appear to be associated with different species of trees at various ages.

8. **Successional Stages:** The early successional shrub or deciduous phase following a disturbance in district 19 is important. The initial return of alder, birch, poplar and willow species play an important role in providing for biodiversity, soil nutrients, and wildlife and may allow mychorrhizae to survive after disturbances.

9. **Patchy Landscape Patterns:** Due to the difficult growing conditions, complex moisture gradients, and diverse disturbance regimes, district 19's landscape is heterogeneous and patchy. There are extensive areas of non-forest and open-canopied forest interspersed with patchy semi-closed canopy (commercial) forest.
10. **Wildlife Habitat:** The patchy and diverse landscape of district 19 provides for a variety of wildlife habitats and species (see wildlife section). The semi-closed canopy forests of district 19 are key wildlife habitats for many species such as woodland caribou, marten, etc., which depend on semi-closed canopy forests for part of their life cycles.

11. **Genetic Variability:** District 19 has few tree species, but significant genetic variability within tree species. Due to the difficult growing conditions on

many sites, local genotypes are a natural adaptation for successful regeneration.

12. **Forest Regeneration**: In district 19 natural tree regeneration following disturbances is generally robust on good quality sites, but can be sparse on moisture extreme (too wet or too dry), nutrient poor or intensely burned sites. Layering of residual trees of black spruce is common, and an important evolutionary tool in difficult regeneration conditions.

Condition

Ecologically, the district has experienced relatively little impact from human industrial activities. The main impacts on the terrestrial landscape are concentrated on the north side of the Churchill River, and include: road developments, past timber harvesting activities, and human caused forest fires. There have also been significant impacts associated with changing water levels and flow patterns resulting from the upper Churchill hydroelectric development. Map 6 describes the terrestrial disturbance history.

Ecological Protected Areas Strategy

One of the key principles of ecosystem-based planning is the identification of an ecological protected areas network (EPAN) at different levels of planning. For this plan the ecological protected areas strategy focused on three distinct levels: landscape, watershed, and stand.

Each level functions as a “filter” to identify and protect ecosystem structure and function from large scale commercial forest activities at different map scales. Although each level focuses on protecting different features, all levels test for rare, threatened, and endangered species as well as ecosystem types. Table 6 describes each level and gives examples of protected features. Figure 3 depicts the protected areas networks for district 19 and how they fit within each other.

Table 6: Ecological Protected Area Strategy Levels.

Level	Map Scale	Plan Terms	Sources	Examples of Protection
Landscape (Coarse filter)	1:500,000 To 1:250,000	District and Sub-District	Satellite information Caribou telemetry	Large Core Reserves for species such as caribou. Linkages to ensure landscape connectivity
Watershed (Regular filter)	1:50,000	Management Unit	Aerial Photography and high resolution satellite imagery.	Riparian buffers and major slopes, core habitats, areas with unique ecological features.
Stand (Fine filter)	1: 20,000 To 1: 5,000	Block and Harvest Unit	Ground Surveys	Wildlife dwellings, small streams, bog, isolated slopes, and important micro-habitats

Landscape Level EPAN

The landscape level EPAN was initially designed by Silva Ecosystem Consultants and is based upon the principles of landscape ecology and conservation biology. The objective for the development of the EPAN at the landscape scale was to designate both unique and representative core reserve areas in order to ensure broad connectivity linkages in the landscape. This "coarse filter" is intended to allow for the representation of major ecosystem types and habitats.

The EPAN's were designed at the 1:500,000 map scale for all of district 19 and the 1:250,000 map scale for district 19A. As shown on maps 7 & 8, the district 19A EPAN is designed to "nest" within the district 19 EPAN, with several of the 19 PAN components forming the framework of the 19A PAN. A similar exercise is anticipated for districts 19B and 19C in future planning efforts.

The Drieman vegetation inventory (map 2), eco-district mapping (map 4), Landsat satellite imagery, and Caribou telemetry location information were used as the primary data sources for the EPAN design. The detailed design methodology and descriptions of core reserves and linkages for district 19 and 19A is found in Appendix III.

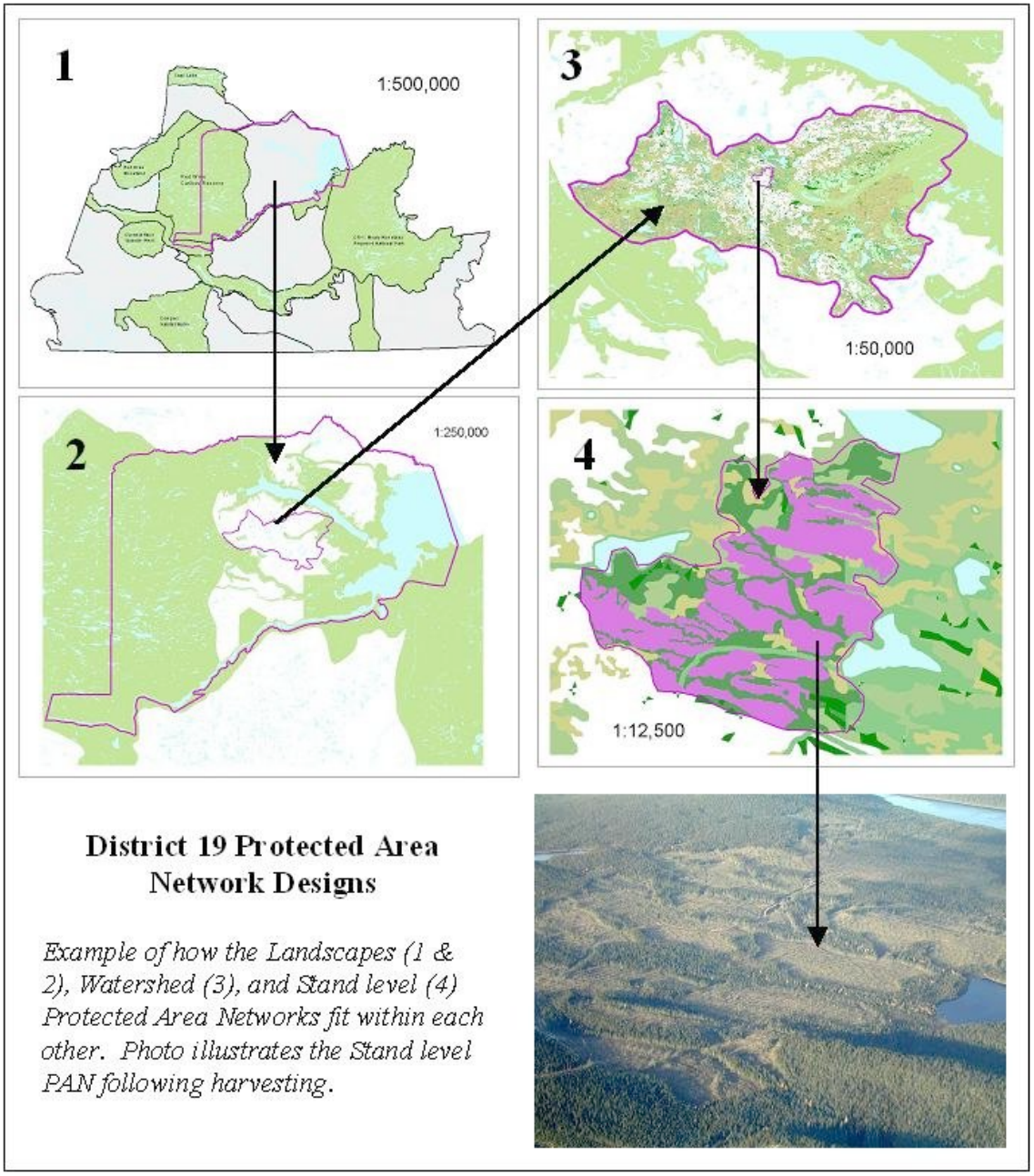


Figure 3: District 19 Protected Area Networks

Watershed Level EPAN

At the watershed level a more detailed analysis can take place utilizing aerial photography, Geographic Information System (GIS)-based forest resource inventories, and wildlife information. The watershed level EPAN will primarily result from the following features being "filtered" from the harvest planning land base:

- Scrub and other non-commercial forest areas
- Ecologically sensitive areas
- Isolated commercial forests stands
- Riparian buffers
- Areas dominated by steep slopes

To ensure the EPAN is based on design, and not default, a conceptual EPAN will be created for each watershed. Additional areas that require protection will be assessed on a case-by-case basis and be defined in the stand level EPAN's prior to harvesting operations.

Stand Level EPAN

Stand level EPAN's will be established following on-the-ground forest surveys and application of the district 19 environmental protection guidelines (Appendix IV). Stand level EPAN's function as the "fine filter" in the protected area strategy. Features such as wildlife dwellings and habitat, isolated slopes, small stream and bog buffers, and priority protection areas form the framework for the stand level EPAN. Areas outside of a stand level EPAN may become harvest units. It is estimated that up to 30% of the timber management land base may be put aside within stand level EPAN's. Stand level EPAN's will be described on maps accompanying the annual work schedule.

Ecological Objectives & Actions

Objective 1: ***Species at Risk***

To recognize the critical importance of identifying species at risk within the district and to ensure disturbance to their habitats is minimized.

In December 2001 the Province of Newfoundland and Labrador passed the *Endangered Species Act* that gives special protection to species at risk. Similarly, the Government of Canada proclaimed the *Species at Risk Act* (SARA) in June 2003. This Act is part of a strategy for the protection of wildlife species at risk. Its main purpose is to prevent wildlife species from becoming extinct, and to secure the necessary actions for their recovery. The SARA applies to all federal lands in Canada; all wildlife species listed as being at risk; and their critical habitat.

In Labrador a total of ten species have been listed, with four considered "at risk" and thus requiring the creation of a recovery team. The species, status, and habitat information for species at risk in Labrador is displayed below in Table 7.

Species that are particularly important for district 19 are the Woodland Caribou and the Harlequin Duck. The core habitat areas of the Red Wine Woodland Caribou herd occur within the district and there has been a sharp population decline since the late 1980's. Currently a Woodland Caribou Recovery Team is working on a plan to stabilize the population and assist this herd in recovery. Although the Harlequin Duck has been down-listed from endangered to special concern status, it remains an important species because of the habitat requirement on many of the district's rivers.

The following actions will be attempted to meet this objective and ensure plan activities do not adversely affect species at risk and help to build support for habitat protection:

1. *Sensitive habitats of species at risk will be included, where identified, within the district's ecological protected areas networks;*
2. *Further refinement of the Red Wine Caribou Core Reserve as part of the district ecological protected areas network as additional information becomes available;*
3. *The parties responsible for the implementation of the plan will communicate regularly and work closely with the Woodland Caribou Recovery Team.*
4. *The parties responsible for the implementation of the Plan will communicate and collaborate with Federal and Provincial Endangered Species Programs;*
5. *The parties responsible for the implementation of the Plan will monitor, review, and support research activities on species at risk that occur within the District.*

Table 7: Labrador Species at Risk

Species	Status	Habitat & Traditional Knowledge
Wolverine	**Endangered**	*Wolverines most frequently inhabit the tundra, especially where there are large herds of ungulates, such as Caribou. Innu hunters report once hunting Wolverine in the Grand Lake Area.*
Eskimo Curlew	**Endangered**	*A small upland shore bird that utilizes coastal habitat generally not found in this District. Traditionally the curlew was hunted on the coast for meat.*
Wood Land Caribou	***Threatened***	*Woodland caribou prefer mature forests which contain large quantities of lichen and are associated with marshes, bogs, lakes and rivers. In mountainous environments, they are found in alpine prairies and valleys. Woodland caribou have traditionally been extremely important to the Innu.*
Peregrine Falcon	***Vulnerable***	*Nests are usually scrapes made on steep cliffs, usually near wetlands. The home range in which the peregrines hunt for food can extend to 27 km from the nest; peregrines prefer open habitats such as tundra, seacoasts and high mountains, but will also hunt over open forest. Traditionally, peregrines were acknowledged for their small game-bird hunting abilities. Sightings in this District include the Redwine Mountains.*
Harlequin Duck	**Vulnerable**	*Harlequin Ducks spend most of the year in coastal marine environments, but they move inland each spring to breed along fast-flowing turbulent rivers. During the winter, the Harlequin Duck occurs along headlands where the surf breaks against rocks and ice build-up is minimal. These ducks feed close to rocky shorelines or rock skerries. The ducks were traditionally an important food source for the Innu, due to their presence in the region's rivers, and their close proximity to Innu camps.*
Barrows Golden-eye	**Vulnerable**	*Nests in Quebec, only a small part of the population actually molts in Labrador.*
Ivory Gull	**Endangered**	*Nests in the artic and winters off the Atlantic coast. Do not seem to be any concerns in this region.*
Short Eared Owl	**Vulnerable**	*Nests mostly along coastal areas, but have been sighted inland. It nests in high grass or on the edge of a forest or boggy areas.*
Polar Bear	**Vulnerable**	*The main habitat used by Polar Bears consists of landfast ice and coastal pack ice. Appropriate denning areas and spring feeding areas are crucial components of the habitat. The animal's movements are influenced by climate and ice conditions, and by the presence of prey, especially Ringed Seals.*
Fernald's Milk Vetch	**Vulnerable**	*Known to occur only in southern Labrador. The species grows strictly in calcium-rich soils where vegetation is sparse or has been removed by natural disturbance, and a calcareous substrate is available.*

Objective 2: ***Wildlife & Habitat Management***

To ensure all species of wildlife and their associated habitats are maintained throughout the district; to coordinate with other Aboriginal, non-aboriginal and Government wildlife management initiatives.

District 19 has a robust and diverse range of wildlife species. Various land mammals, amphibians and bird species flourish in the wide range of habitats this district provides. For a detailed breakdown of the district's wildlife species and associated habitats, refer to the ecological character and condition section.

Management of big game species (moose, caribou and black bear) in the province is accomplished by a planning process in which a Big Game Management Plan is prepared annually by the Wildlife Division (WD) of the Department of Fisheries and Land Resources. Through this process, concerns of the public, as well as Departmental field staff, are taken into consideration. Each year the WD reviews all relevant data, such as recent census work, information provided on license returns, and jawbone or skull data, and makes decisions on types and numbers of licenses of each species in each management area. Similar processes are undertaken for management of small game and furbearers. Management of these species in district 19 will continue to be addressed through this process.

While management of habitat for migratory birds is the responsibility of the provincial government, the management of the species themselves is a federal responsibility and is done within the framework of the Convention for the Protection of Migratory Birds. The Convention recognizes that migratory birds, and particularly waterfowl, can only be conserved and managed by the cooperative efforts of all provincial, state, and federal governments through which the birds move.

The following actions will be attempted to meet this objective:

1. *Protection of key landscape level wildlife habitats in the district ecological protected areas network;*
2. *Protection of stand level wildlife habitats through the stand level ecological protected areas networks;*
3. *Protection of identified wildlife dwellings and nests through the application of the district 19 environmental protection guidelines (Appendix IV);*
4. *Coordinate with Government agencies such as Wildlife Division to assess wildlife conditions and concerns;*
5. *Coordinate with Aboriginal elders and hunters to assess wildlife conditions and concerns.*

Objective 3: ***Ecosystem Health & Water Quality***

To ensure the health and integrity of the district's ecosystems and water quality is maintained during management activities

Ecosystem can be defined as a complex interacting system that includes all plants, animals and their environment within a particular area. *Health* can be described as the overall condition of an organism at a given time. A healthy organism is often characterized by its freedom from disease or abnormality. Because of the difficulties in establishing boundaries for ecosystems, defining ecosystem health has been subject to widespread debate both within and among various disciplines.

Ecosystem distress syndrome is characterized by reduction in vigor, resilience, organization, ecosystem services, and management options. An ecological system is healthy and free from distress syndrome if it is stable and sustainable, if it is active and maintains its organization and autonomy over time, and if it is resilient to stress. Ecosystem health is thus closely linked to the idea of sustainability, which is seen to be a comprehensive, multi-scale, dynamic measure of system resilience, organization, and vigor (Costanza et.al. 1992). A healthy ecosystem has the capacity across the landscape for renewal, for recovery from a wide range of disturbances and retention of its resiliency, while meeting current and future needs of people for desired levels of values, uses, products, and services (USFS, 1997).

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 affects forest conditions over 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.

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.

The following actions will be attempted to meet this objective:

1. *During the management planning period, the following indicators will be measured for assessment of disturbance and stress on forest condition and productivity:*
    a. *area and severity of fire disturbances;*
    b. *area and severity of small-scale disturbances such as blow-down;*
    c. *area and severity of timber harvesting.*
2. *Indicators to measure forest ecosystem extant biomass during the planning period include:*
    a. *mean annual increment (m^3/ha/yr.) by forest type and age class;*
    b. *frequency and occurrence within selected indicator species;*
    c. *coarse woody debris surveys.*
3. *Work with the Water Resources Division to try to develop a feasible means to measure changes in water quality and quantity during the planning period are:*
    a. *water quality as measured by water chemistry, turbidity, contaminates, and other parameters for selected waterways;*
    b. *trends and timing of events in stream flows from forest catchments for selected waterway.*
4. *Conservation of ecosystem health and water quality through application of ecological protection guidelines (Appendix IV).*

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.

Objective 4: *Global Implications*

To recognize and respect the global importance of the district's intact boreal forest; to assist in the implementation of Canada's obligations under international agreements (biodiversity, climate change, etc.)

From the creation of regional employment, to the development of national parks, to the international marketing of forest products, it is clear that this plan will have impacts that reach beyond the local communities. The planning team recognizes that this plan will not exist in isolation, and that activities proposed in the plan need to be evaluated in terms of their interaction with national and global interests.

"Frontier forests" are defined as the world's remaining large intact natural forest ecosystems – undisturbed industrially and large enough to maintain all of their biodiversity. The planning team recognizes that Labrador's forests represent some the last frontier forests left in the world. This situation creates unique opportunities, as well as imposing unique obligations for planning. The values of Labrador's forests are also recognized as an important part of the Labradorian identity and heritage. Planning participants from Aboriginal and non-aboriginal communities alike highlighted the need for protection of intact forests as an important objective in the plan.

The Government of Canada has been a key participant in several important international agreements such as:

- Paris Climate Accord
- Convention On Biodiversity
- Migratory Bird Act
- North American Free Trade Agreement

These agreements spell out and set guidelines for how the international community can work together on environmental and economic issues.

The following actions will be attempted to meet this objective:

1. *The core reserves developed under the district ecological protected areas network will reflect the value of intact frontier forests by aiming to protect representative ecosystems at the district scale from commercial forest harvesting activities.*
2. *Over the course of this Plan, consideration will be given to newly ratified international agreements as well as Canada's obligations under existing agreements.*

3. *The Innu Nation and the Department of Natural Resources will engage other partners in research on the role of FMD 19 forests in global carbon storage and cycling and explore its development potential within the context of the plan.*
4. *The Innu Nation and the Department of Natural Resources will support efforts to protect endangered species and their habitats under federal and provincial endangered species legislation.*

Cultural Landscape

Cultural Character & Condition

Character

The cultural character of district 19 is a diverse blend of Aboriginal and non-aboriginal peoples. These groups have historically interacted with the land, plants, animals, and with each other. The district's unique climate, vegetation, wildlife, and other ecological characteristics (described in Section 1) have shaped the people who call this land home. Like ecosystems, cultural processes are also dynamic and continuously changing, but have meaningful patterns which emerge over time.

Much of the district was still covered with glaciers 10000 years ago, when the archaeological record begins to provide evidence of human occupation in Labrador. Excavations of these "Maritime Archaic" Indian sites show tools and other materials which suggest that the people of that time were adapted to a life which relied on both the forests and the sea. Several tool types from this period were crafted from Ramah chert, a stone unique to Labrador. The distribution patterns of these tools have provided evidence that a complex network of trade and communications existed as far south as New England and as far west as James Bay (Mailhot, 1997). The later pre-contact Indian groups, notably the Intermediate Indian and Point Revenge peoples, maintained a seasonal adaptation to both forest and coastal regions which continues to typify the traditional uses of these areas by the Innu people today: nomadic hunting in small family groups in the interior during the fall through the spring, and gathering in larger groups on the coast for fishing and other coastal harvesting activities during the summer months (Fitzhugh, 1972).

Inuit have also had a long history in the region. Early Dorset Tunit occupation of Hamilton Inlet and Groswater Bay has been established and dated to approximately 2200 years before present. Dorset/Tunit culture was highly reliant on maritime resources, harvesting seal, walrus, and seabirds extensively. Later migrations of Thule Inuit from the north supplanted the Tunit culture approximately 800 years ago. The Thule Inuit, the ancestors of the Labrador Inuit of today, moved into the Hamilton Inlet area by 1500 AD, and by 1600 AD, had established permanent settlements (Brice-Bennett, 1977).

The European history in the district begins with the arrival of the Vikings, 1000 years before present. Approximately 600 years later, English explorer John Davis met Innu and Inuit peoples on his travels along the Labrador coast in 1586 and 1587. These were brief incursions. Significant interaction with Europeans did not begin until the 1700's, when European whalers and merchants established a presence in Hamilton Inlet, but as historical evidence shows, Innu and Inuit trade with Europeans started in the early 1500's. In fact, when French merchant Louis Fornel set out to establish the very first fur trading post at North West River in 1743, the Innu he met already had axes, knives and even French caps (Mailhot, 1997).

Travel and trade has been a fundamental cultural characteristic of all the district's cultural groups. The numerous lakes, rivers, and the rich forest ecosystems that surround them formed the foundation for a vibrant traditional economy. Trapping became the economic mainstay, and trade goods from around the world soon became an important part of Innu and Inuit life. Upper Lake Melville became an important crossroads, and North West River and Sheshatshiu became the hub of a complex social and trading network that continues to exist today.

The establishment of the fur trade in the district was also the birth of Labrador's settler peoples. These descendants of European and mixed race peoples established permanent residence in Labrador in order to carry on the fur trade, and fishing enterprises were at the heart of the settler way of life. Like neighboring Innu and Inuit peoples, the newcomers had to quickly learn how to adapt to the land to ensure their survival. Unlike the nomadic Innu peoples, settlers tended to be more stationary. They developed trap-lines and gardens, and established small but permanent communities.

However, the European presence had a marked and negative effect on the Innu and Inuit cultures. The introduction of trade goods and the incorporation of the Innu and Inuit into the fur trade created new dependencies, such as ammunition, axes, alcohol and tobacco, and occasionally resulted in starvation when supplies failed to last a hard winter season. Contagious diseases, including the Spanish Flu epidemic of 1918-19, decimated the Innu and Inuit populations.

While there were early attempts at a modern industrial economy in the region, most notably an early logging enterprise established at Mud Lake in 1901, the harsh climate and remoteness of the region destined most such efforts to fail. However, the district changed forever with the establishment of the air base at Goose Bay in 1941. The fur trade economy was replaced by wage labor associated with the base. Subsequently, the construction of iron ore mines in Labrador City and Wabush in the 1950s and the Churchill Falls hydroelectric mega-project in the 1960s and 70s brought incredible change, not only to the people of Labrador, but to the land itself. These large-scale industrial developments sharply increased the region's population and facilitated the infrastructure to open the land to further development. In a short period of time, Happy Valley-Goose Bay replaced North West River as the regional administrative and service centre.

In response to these new challenges, Innu and Inuit began to organize themselves politically in the mid-1970s. Both groups filed land claims with the governments of Canada and Newfoundland, and began their long struggle for self-determination. The Labrador Metis Nation was also formed in the early 1980s.

Condition

The current cultural condition of district 19 remains as complex and dynamic as ever. Local communities maintain strong ties to their cultural heritages and to the traditional Labrador ways of life, while looking to the future for new opportunities and

developments. Labrador culture continues to be vibrant and distinct, and Labradorians maintain a fierce pride in their self-reliant history.

On January 22, 2005 representatives from the Labrador Inuit Association (LIA), Government of Canada and Government of Newfoundland and Labrador signed the Labrador Inuit Land Claims Agreement. This agreement provides approximately 5,300 Labrador Inuit and Kablunangajuit (individuals of partial Inuit ancestry) with defined rights in and to territory in northern Labrador. The agreement outlines details of land ownership, resource sharing and self-government. The agreement provides for the establishment of the Labrador Inuit Settlement Area (LISA) totaling approximately 72,500 square kilometers of land in northern Labrador, including approximately 15,800 square kilometers of Inuit-owned lands, known as Labrador Inuit Lands (LIL). Included in the settlement area is an adjacent Ocean Zone of 48,690 square kilometers and provision for the establishment of the Torngat Mountains National Park Reserve, consisting of approximately 9,600 square kilometers (Labrador Inuit Land Claims Agreement, 2004).

Under this agreement, LISA lands outside of LIL are managed by the Provincial Minister of the Department of Fisheries and Land Resources under Provincial laws in consultation with the Nunatsiavut Government. Furthermore, The Torngat Joint Fisheries Board and the Torngat Wildlife and Plants Co-Management Boards (consisting of various Governmental representatives) have been assembled to provide advice on managing the land base including the recommendations of harvest levels and restrictions (Labrador Inuit Land Claims Agreement, 2004).

Furthermore under the Labrador Inuit Land Claims Agreement, an area described as "Schedule 12E", which is approximately 829,558 ha in size, is identified. Under this agreement, Inuit who ordinarily reside in Labrador but outside of the LISA along with Inuit who reside in LISA and LIL can harvest within this area as well. The Provincial Minister of the Department of Fisheries and Land Resources is responsible for forest management activities in this area, including setting the harvest levels and any restrictions. Provincial timber cutting permits are required in this area; however, they are available from Forestry offices and are free of charge to Inuit people. There is very little area of LISA or LIL lands located in district 19a. The bulk of Schedule 12E however is located in central Labrador in the Lake Melville area and completely within district 19a (map 9) (Labrador Inuit Land Claims Agreement, 2004). The five year average for permits being issued in this area is 42 permits for an average volume issued on 930 cubic meters.

Innu have made significant progress in resolving land claims and asserting traditional rights over lands and resources. The conclusion of final land claims agreements between the governments of Canada, Newfoundland and Labrador and the Innu Nation is expected to occur over the life of this plan.

Cultural Protected Areas Strategy

District 19 has a diverse blend of Aboriginal and non-aboriginal communities, all of which hold a strong importance to cultural heritage. For over eight thousand years Innu have been "living off the land" and thus a fundamental requirement of the protection of cultural heritage values is protection of the land itself.

Innu believe the foundations of Innu culture and the natural economy are the ecosystems of *Nitassinan*, "our land". Innu believe that "everything depends on everything," an insight that inter-related forest ecosystems support wildlife, fish, plants, fresh water, and air. From Innu perspective, protecting the natural composition, structure, and function of forest ecosystems is the highest priority.

The Department of Fisheries and Land Resources acknowledges the impact that cultural and community values can have on forest management decisions (and vice versa) and further recognizes that these values are vital to both Aboriginal and non-aboriginal communities alike. While sound environmental practices are paramount, both protection (for ecological and cultural values) and economic activities are required to sustain the communities in the district.

This plan recognizes the critical importance of protecting and respecting Aboriginal and non-aboriginal cultural heritage and land-use priorities across the district. A cultural protected areas strategy was developed to ensure that sensitive cultural areas and values are protected under this plan. The planning team identified these areas and values through:

- Public participation and consultation processes with local communities;
- Discussions with non-Innu heritage, community, and recreational organizations;
- Analysis of Innu land use and occupancy data and maps;
- Discussions with Innu land use experts.

The identified sensitive cultural areas and values were mapped at 1:250,000 and analyzed in order to derive a district 19A cultural protected areas network (map 10). The primary themes considered in the development of the cultural use network included:

- Cultural heritage values
- Landscape aesthetics
- Domestic forest harvesting activities
- Hunting, trapping, and gathering
- Tourism & recreation
- Traditional travel routes
- Camp locations
- Small-scale selective harvesting activities
- Crown land reserves

Cultural Landscape: Objectives & Actions

Objective 5: *Cultural Heritage Values*

To identify, respect, and protect the diverse range of Aboriginal and non-aboriginal cultural heritage values across the district.

Participants in the public planning sessions agreed that the future of all Labradorians is inextricably linked to the future of Labrador's forests, which are both home and the foundation of the natural economy.

Traditionally and today, Labrador people use many parts of the forest, including trees and other plants, fish, wildlife, and water. Fir and spruce branches are used for shelter and flooring, and spruce and fir are cut for firewood and sawlogs. The forest also provides materials for traditional tools and equipment: canoes and paddles, toboggans, sleds, snowshoes, fishing poles and floats, and frames for tanning. The traditional Labrador diet of meat and fish, supplemented by edible forest plants, requires natural, healthy forests. Many traditional medicines such as Labrador tea, balsam resin, and beaver castor also come directly from the forest. Participants also recognize that commercial harvesting is also culturally significant to the communities in this district, with a history dating back nearly 100 years.

The following cultural heritage values were identified and mapped by planning participants as high priorities for protection:

- Archaeological sites
- Homesteads and gravesites
- Edible and medicinal plant picking areas (berries, mushrooms, etc.)
- Traditional and active trap lines
- Hunting areas
- Wildlife habitats (eg moose yards) and game trails
- Fishing areas
- Traditional and active tenting areas
- Cabin areas
- Boating and canoeing routes
- Travel routes and their associated view sheds
- Major river valleys and shorelines
- Areas adjacent to Grand Lake
- Traditional domestic timber and firewood harvest areas (to preclude commercial harvesting)
- Recreational activity areas
- Scenic values along the Trans-Labrador Highway.

The following actions will be attempted to meet this objective:

1. *The district protected areas network (maps 7,8,10,11) will ensure protection from large scale commercial forestry activities for a number of identified cultural heritage values, such as major river valleys and shorelines, at the large landscape scale;*
2. *All forestry-related activities (eg access roads and timber harvesting activities) will comply with the district 19 environmental protection guidelines (Appendix IV);*
3. *The planning team will continue to solicit input from individuals and interest groups and will continue to build a database on culturally significant areas for input into future management plans.*

Objective 6: ***Landscape Aesthetics***

To recognize the cultural and economic importance of landscape aesthetics in the district and strive to protect, maintain, or enhance landscape aesthetics where possible.

Landscape aesthetics refers to the visual quality and appreciation of the land. During public sessions, significant concern was expressed regarding the impacts of timber harvesting on landscape aesthetics, particularly in tourism and recreation areas, as well as traditional travel routes and scenic viewscapes.

Through the public and community consultation process the following locations were highlighted as priority areas for maintenance of aesthetic qualities.

- Grand Lake
- Churchill River
- Shores of Lake Melville
- Trans Labrador Highway
- Sunday Hill
- Labrador Winter Trails
- Birch Brook Nordic Ski Area
- Muskrat Falls
- Outfitter Lodges and Cabins
- Traditional travel and tenting areas

Other areas may be identified as priorities for maintaining or protecting landscape aesthetics through further public consultations or in response to requests from tourism operators or other interests in the district.

The following actions will be attempted to meet this objective:

1. *Utilizing GIS software, derive a map and refine viewshed[3] boundaries of the following identified priority areas:*

    a. ***Grand Lake (map 10):*** *The identified core viewshed is protected from all harvesting activities. Fringes of the viewshed will permit timber harvesting with a priority consideration given to visual quality objectives.*
    b. ***Mulligan Bay Trail (map 10):*** *The majority of this viewshed will be protected from commercial harvest and designated as a Domestic Reserve Area[4]. Other portions of the viewshed will permit timber harvesting. Harvesting activities will consider visual quality objectives and modify accordingly.*

[3] *Viewshed* is the total area visible from a specific location, such as a lake, lookout or road.
[4] *Domestic Reserve Area* is an area that is limited to domestic only harvesting activites.

c. ***Trans Labrador Highway:*** *Significant portions of this viewshed are protected under a Crown Lands Reserve. Other portions of the viewshed will permit timber harvesting.*

d. Trans-Labrador highway Phase III (map 12): *The viewshed has been identified and harvesting is permitted while applying visual quality objectives to harvest areas.*

2. *Where ever possible, harvesting activities will consider visual quality objectives (Appendix V) and will be conducted accordingly. Visual management guidelines have been drafted and will be monitored and reviewed during this planning period.*
3. *Identify a no harvest buffer of 30m along all roads (with the exception of forest access roads) and recreational trails;*
4. *A minimum 50-metre, no-cut buffer is to be left between operations and approved cabins. Planners will consult with cabin owners and make best efforts to modify operations in order to achieve an outcome acceptable to the parties involved.*
5. *The parties responsible for the implementation of the plan will establish a process to respond to future requests for visual management or protection of landscape aesthetics in areas within the district which are subject to timber harvesting.*

Objective 7: ***Hunting and Trapping***

To identify, respect, and protect both Aboriginal and non-aboriginal hunting and trapping activities within the district.

Both commercial and domestic hunting and trapping opportunities are available and expected to continue during this operating plan. Hunting and trapping for subsistence purposes is an important part of the lives of many residents of the communities in this district. Limited commercial hunting activities are associated with wild meat and the harvest of fur bearing animals. Domestic harvesting of wild fish and game as well as trapping and gathering is a far more significant activity within the district. Domestic concerns within a local context concentrate on moose, small game, fish, and waterfowl. For Innu, hunting barren ground caribou, partridge, porcupine, geese, and duck remains an integral part of their lifestyle and an important food source. Additionally, there is a significant harvest of small animals (rabbit, ptarmigan, and grouse) and plant products (berries, mushrooms) associated with the northern boreal ecosystem.

During this planning period, current wildlife harvest allocations will be continued (to be modified through stakeholder input on an annual basis) and benefits (resource utilized) should remain within normal cyclic levels. Activities are concentrated on normal management practices (seasons/limits) and research requirements. Parameters and regulations associated with various aspects of hunting, fishing and trapping are made available on an annual basis.

While trapping of furbearers as a sole source livelihood is no longer very common, hunting of big game and small game, as well as upland and migratory birds still remains a very common subsistence activity for all cultures.

The following actions will be attempted to meet this objective:

1. *To ensure protection of wildlife habitat, environmental protection guidelines (Appendix IV) will be strictly adhered to;*
2. *Annual work schedules will be provided to the Wildlife Division to ensure compliance with their management activities;*
3. *The planning team will continue to solicit and gather information from local trappers pertaining to the locations of their activities.*

Objective 8: ***Non-Timber Forest Products (NTFP)***

To recognize and identify the economic potential and cultural importance of NTFP in the district and to ensure appropriate areas are reserved for NTFP harvesting activities.

Non-timber forest products refer to all non-timber products and services that are collected from the land base. NTFP have been given a special designation because of the recognized emphasis placed on timber resources during forest management.

Derived from various trees, plants, and animals, NTFP are used in medicines, extracts, foods, crafts, and art. They often include uses of barks, saps, foliage, roots, berries, and shrubs. These products tend to be harvested from a wide range of site types including both undisturbed and disturbed (harvested and/or burned) areas and in many areas of the district. Permitting is generally not required for harvesting of these products.

NTFP are both an integral part of the regional culture and a future opportunity for appropriate economic developments. They also represent significant cultural and spiritual values for Aboriginal people. NTFP represent an interesting juncture where the local cultures utilize the forest and interact with other management values, especially issues of timber management, road access and recreational activities. Further, the availability of and access to NTFP are good indicators of the subsistence activities of Aboriginal and non-aboriginal people.

The following actions will be attempted to meet this objective:

1. *Create and maintain ecological and cultural protected areas networks (map 8&10) in which NTFP harvesting will continue to be permitted while commercial timber harvesting is excluded;*
2. *Maintain domestic reserves (map 10), in which only domestic timber and non-timber harvesting is permitted;*
3. *Support the development of a database of potential NTFP, processing ideas and market information for the district.*
4. *Continue to gather NTFP harvester data including identification of harvesting areas and mitigate impacts where possible.*

Objective 9: ***Socio-Economic Factors***

To identify critical socio-economic factors in the district and work towards enhancing local employment from forest-based industries.

In considering the implications that potential forest management developments might have on the cultural landscape of district 19a it is important to understand some of the socio-economic projections of the region.

There are currently four communities within the region that have a collective population of approximately 9,500 as described on Table 8.

Table 8: Communities in District 19A with respective populations.

Community	Population (2011 Census)
Happy Valley – Goose Bay	8100
Sheshatshiu	1020
Northwest River	540
Mud Lake	548*

*All data based off 2016 Canadian Census, Mudlake's population appears to be overstated and is actually be closer to 50 individuals.

Although some of these communities have seen population decline over the past census period, the population is generally young and vibrant. This represents an urgent need for future training and youth employment opportunities within the region.

The major sources of employment in the region include military base services, government services of four levels of Government (Federal, Provincial, Municipal and Aboriginal), education services, and the retail/wholesale trade. The majority of employment opportunities and industries are based in the town of Happy Valley-Goose Bay.

The main forest-based industries in this region include forestry and tourism. Past forest harvesting and saw milling operations employed approximately 60 people. In 2015 in partnership with the federal government Aboriginal Forestry Initiative, the Innu Nation purchased a small band-saw mill for use in the community for various projects. The province contributed by providing training in safety and operation of the mill to a number of interested individuals. Considering that in the past, over 85% of harvested timber was exported as round logs, there is significant potential for development in the sawmilling and value-added sectors.

With approximately 80 Labrador outfitter lodges offering fishing, hunting, and wilderness adventure trips, the tourism and related spin-off industries are showing signs of significant growth.

In 2006 the Labrador North Chamber of Commerce released a report detailing the local labor market profile including training and skill development.

The following actions will be attempted to meet this objective:

1. *Identify specific initiatives and targets to increase the number of local jobs per cubic meter of timber harvested within the district;*
2. *Give priority to proposals for economically viable forest-based activities which contribute to increased employment and/or skills-development, diversification within the local forest sector, and which propose secondary processing within the district. This priority will be considered in any new harvesting permit allocations;*
3. *Identify initiatives and targets to increase the participation by Aboriginal peoples, specifically Innu members, within the forest sector;*
4. *Support specific initiatives and targets to increase the level of participation of women within the forest sector.*
5. *Provide input where ever possible into the gender equity study commissioned by the Provincial Government. Results and recommendations should be available during this planning period.*
6. *Participate in women's' initiatives within the district including working with local women's' groups to discuss forest management initiatives.*
7. *Strive to incorporate socio-economic factors and targets into research and monitoring;*
8. *The results of any socio-economic research and monitoring will be reported on an annual basis in the districts past annual report.*

Objective 10: Domestic Forest Products

To ensure that the sustainability of resources which provide for domestic forest products are not to be compromised under any circumstances. Acknowledge the cultural significance of domestic forest products and related activities to both Aboriginal and non-aboriginal people.

Many residents of the district are highly dependent on both timber and non-timber forest products to sustain themselves. Locally harvested wood is used to construct and heat homes, to make boats, snowshoes, komatiks, and many other things made from wood that people use on a daily basis. Traditionally, domestic wood requirements in the district have not exceeded 7,000 m^3 per annum. The standard permit conditions for domestic wood harvesters are outlined in Appendix VI.

Figure 4 illustrates domestic permit issuance during the planning period of the previous 5 year plan. Since 2013, the average number of domestic permits issued has been 131permits per year (with a corresponding allocation of about 2825 m^3/yr). It is expected that this level of harvesting will continue throughout this Plan. There is a trend of decreasing permits being issued due to the availability of wood harvested from the Lower Churchill Project (Domestic permit is not required to avail of this wood). We anticipate an increase in permits when this wood begins to deteriorate and is no longer suitable for fuelwood or sawlogs.

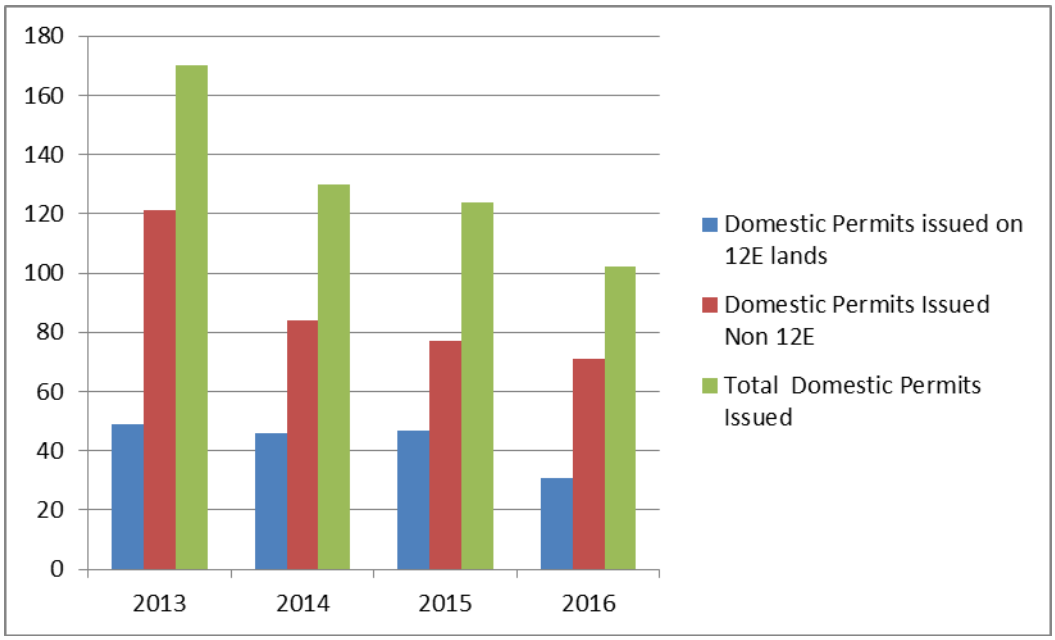


Figure 4. Domestic permit issuance in District 19A from 2013 – 2016.

The following actions will be attempted to meet this objective:

1. *Domestic fiber requirements will be met and will be monitored and evaluated at the end of each permit season;*
2. *Domestic timber harvesting reserves (Traditional domestic harvesting areas) will be excluded from commercial harvesting activities (map 10);*
3. *Domestic timber harvesting will be permitted in inactive commercial harvesting areas.*
4. *Any site preparation or burnt areas will be identified on domestic maps to increase domestic presence in these areas.*
5. *A set of best management practices for domestic harvesters have been developed and will be distributed with all domestic permits. This brochure outlines domestic harvesters responsibility with respect to the ISO 14001 Environmental Management System.*
6. *The parties responsible for implementing this plan will strive to hold at least one workshop for domestic harvesters to answer questions and receive input per each year of the plan.*

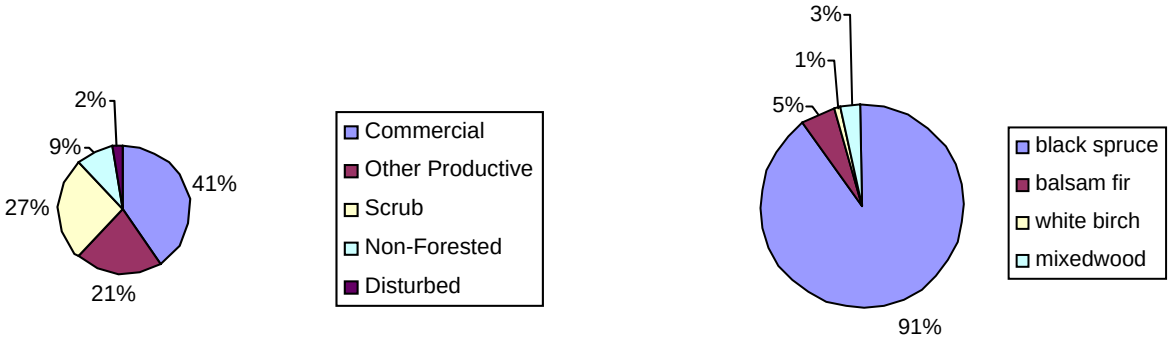
Economic Landscape

Timber Resource Character & Condition

The boreal forests of Labrador are characterized by old, semi-closed canopy forests. Among the factors that limit stand density and thus crown cover are severe climatic conditions, soils with restricted or excessive drainage, and a relatively short growing season.

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. On coarse-textured soils (typical of river terraces and eskers), the dominant forest type is lichen woodland, which is characterized by an open canopy of black spruce and a well-developed lichen layer.

Black spruce is the most common tree species in the management district (approximately 91% of productive forest area). Balsam fir constitutes 5% of the area, while other softwoods and hardwoods make up the balance. The general characteristics of productive forest stands in district 19a (land class and working group from the Fisheries and Land Resources forest inventory) are illustrated in figures 5 & 6. These characteristics define the limits within which commercial forest development must occur. Stands greater than 140 years form the dominant age class structure in this forest. Silvicultural intervention may enhance future productivity on some sites, but how such treatments will affect forest stands in this district has yet to be quantified.



Figures 5 & 6: Land classes (LEFT) and productive species (RIGHT) distribution in Forest Management District 19A.

Continual low-level disturbances have maintained the old, semi-closed, multi-layered canopy forests in district 19. Fires have been a significant ecological disturbance in this district, but vary greatly, burning some areas at relatively low intensity, while occasionally burning some areas at high intensity. Fire is relatively infrequent and patchy, with fire return intervals in the order of 200 to 500 years.

A varied history of commercial timber harvesting has had a lesser impact, accounting for approximately 18,000 ha (9%) of the productive land base for the North side of the district (Figure 6a). Map 6 describes the total disturbance history. This disturbance history, coupled with harsh environmental factors, has led to a skewed age class (the age class distribution for productive forests is illustrated in Figure 7). Approximately 4 % of the district's commercial forested land base is in immature age classes with 77% in over mature age classes.

Figures 7 to 10 outline the height class distribution, crown closure and site quality for productive forest stands in district 19A. As the figures show, a majority of the productive stands are between 10 – 15 meters in height, have 51-75% crown density and occupy medium and poor quality sites. These characters, combined with those outlined in the section on ecological character and condition, as well as the limits of existing harvesting and processing technologies will define the limits within which commercial forest development must function. Map 13 shows the location of this commercial forest.

	Year	Core					Operational – Available				
		AAC	Harvested		Remaining		AAC	Harvested		Remaining	
			m3	*%*	*m3*	*%*		*m3*	*%*	*m3*	*%*
Softwood	2013	200,000	2114	1	197,886	***99***					
	2014	200,000	50004	25	347,882	***174***					
	2015	200,000	6896	3	540,986	***271***					
	2016	200,000	1050	1	739,936	***370***					
	2017	200,000	NA	NA	NA	***NA***					
	Year	Core					Operational – Available				
		AAC	Harvested		Remaining		AAC	Harvested		Remaining	
			m3	*%*	*m3*	*%*		*m3*	*%*	*m3*	*%*
Hardwood	1										
	2										
	3										
	4										
	5										

Figure 6a. Volume of commercially harvested timber (m^3) in district 19A from 2013-2016.

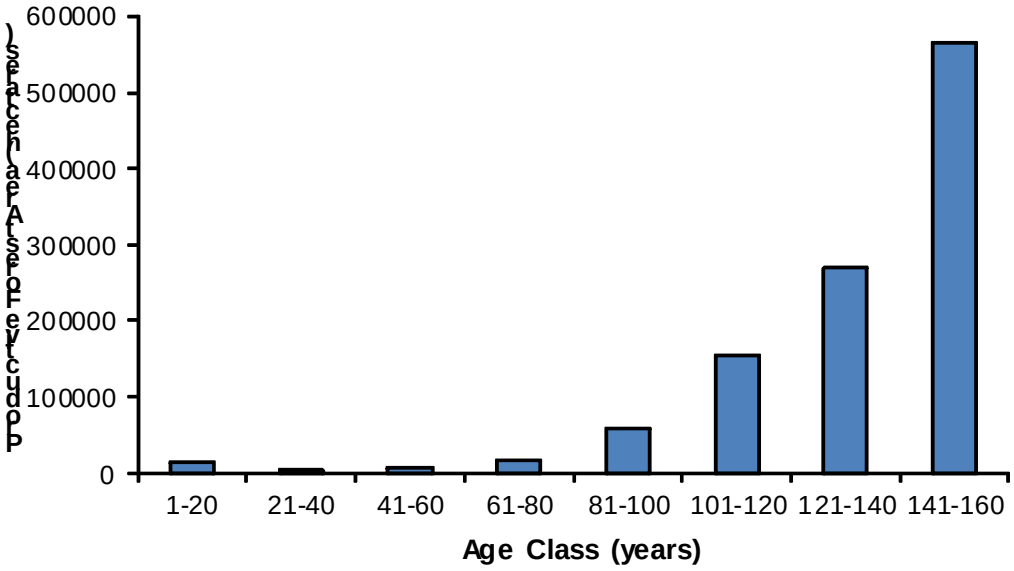


Figure 7: Age class distribution on productive sites in district 19A.

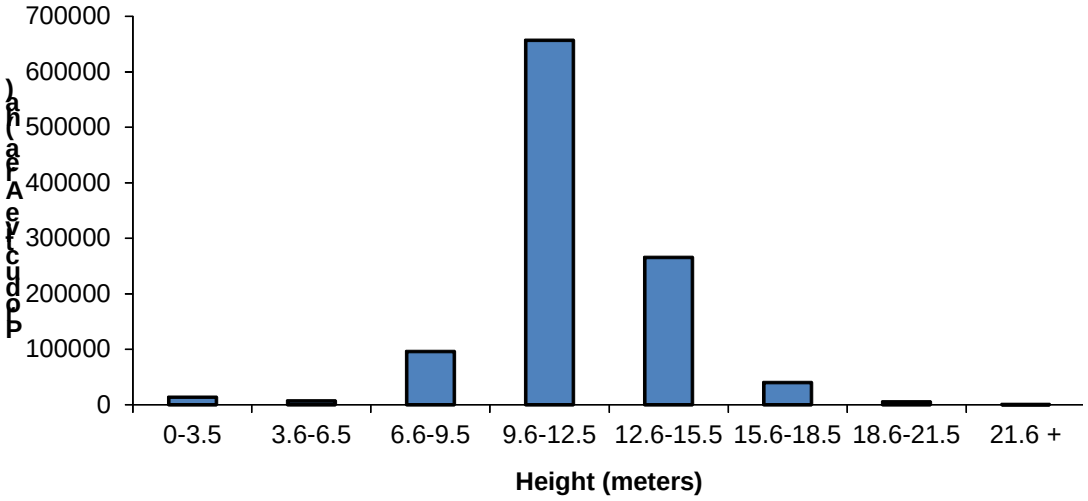


Figure 8. Height class distribution on productive sites in district 19A.

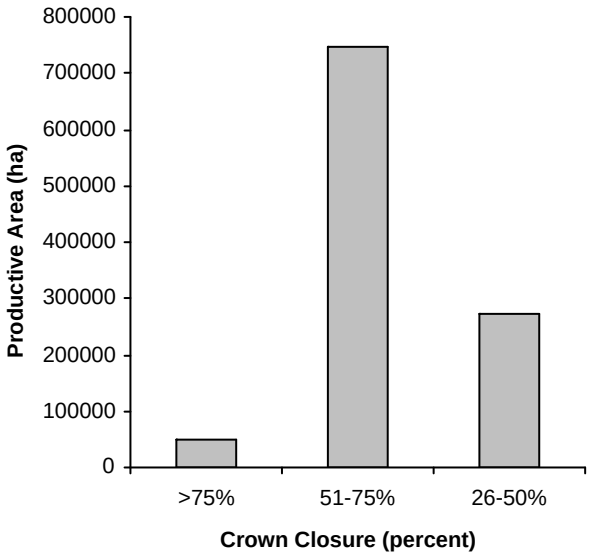


Figure 9. Crown closure distribution on productive sites in district 19A.

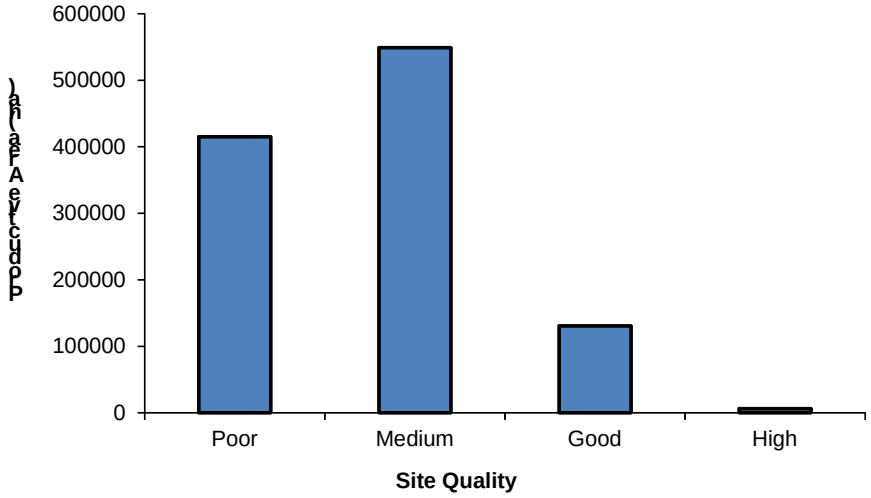


Figure 10. Site quality distribution on productive sites in district 19A.

The commercial use of the forest resource has been relatively cyclic, with varying degrees of economic success. After Labrador Linerboard ceased operations in 1977, harvesting continued at much lower levels up to 1992 to supply the export market. There was a gradual increase in commercial harvesting activity from about 5000 m^3 in 1993 up to about 40,000 m^3 in 2000. This was undertaken mainly by local operators to supply both local and island mills. With the closure of the Stephenville newsprint mill in 2005 and the Grand Falls-Windsor mill in 2009, the timber harvest sector collapsed and currently the annual harvest is less than 2000 m3 of forestry industry related timber, there is however a considerable amount of timber harvested for projects such as mining and

mineral exploration, road construction and hydroelectricity developments that is not included in this amount.

Forest Management Classifications

An ecosystem-based planning approach requires careful consideration and appropriate balance of ecological, cultural, and economic values. This balance not only provides for the designation of ecosystem-based management areas and protected areas for human and non-human uses of the forest, but also provides balance between timber and non-timber values. In addition, the planning approach of priority decision-making ensures that ecological and cultural values are considered first, forming a protected areas framework. Outside of the protected areas framework, ecosystem-based management areas are identified for commercial timber harvesting and other extractive resource-based activities.

The resulting land base framework is described on maps 7,8,10 & 11. These maps highlight the total land base within the planning area that will be designated as "alienated" from commercial forest harvesting activities and the forested land base that is available for timber harvesting. The land base analysis was generated through a priority decision-making approach and several technical exercises. Appendix VII explains the detailed methodology and process involved to derive this land base analysis and calculate the AAC.

Classifications

The forest land base available for timber harvesting has been divided into five different management classifications and is depicted on map 13*:*

1. **Domestic Reserves:** Areas provided for domestic harvest permits only.

2. **Selective-Commercial Reserve:** Area provided for small-scale commercial operations that utilize a selective harvest approach (see the example of *Selective Commercial Harvest Permit* conditions in Appendix VII).

3. **Commercial:** Areas provided for commercial harvesting permits. Domestic and Selective-commercial harvesting will also be permitted in these areas. All commercial harvesting activities will comply with the *District 19 Environmental Protection Guidelines* defined in Appendix IV.

4. **Visual Management**: Areas provided for all harvesting activities, but subject to visual management objectives (Appendix V).

5. **Conservation Emphasis:** Area provided to apply a conservation emphasis management regime, using a Landscape Design approach. Protection for Innu cultural values will be an important part of the Landscape Design approach.

Forest Product Processing and Marketing

The Province's forest products sector previously consisted of the newsprint industry, the lumber industry, and a small number of value-added industries. These industries utilized approximately 2.5 million m^3 of timber, and provided more than 3500 person years of direct employment resulting in 12,000 or more direct and indirect part-time and full-time jobs.

The sawmill industry in district 19A varies from year to year with regards to commercially licensed sawmills. In the past they ranged in output size from a few thousand board feet per year to the largest one at over 1 million board feet (fbm). Sawmill production since 2013 in this district is illustrated in figure 11. Since the closure of the Abitibi-Consolidated Newsprint Mill in Stephenville and Grand Falls-Windsor, the two largest of the commercially licensed mills (combined capacity has the potential to reach in excess 10,000,000 fbm per year) within district 19 have closed down. This is mostly due to the fact that the timber operations which supplied their raw materials also have ceased operations.

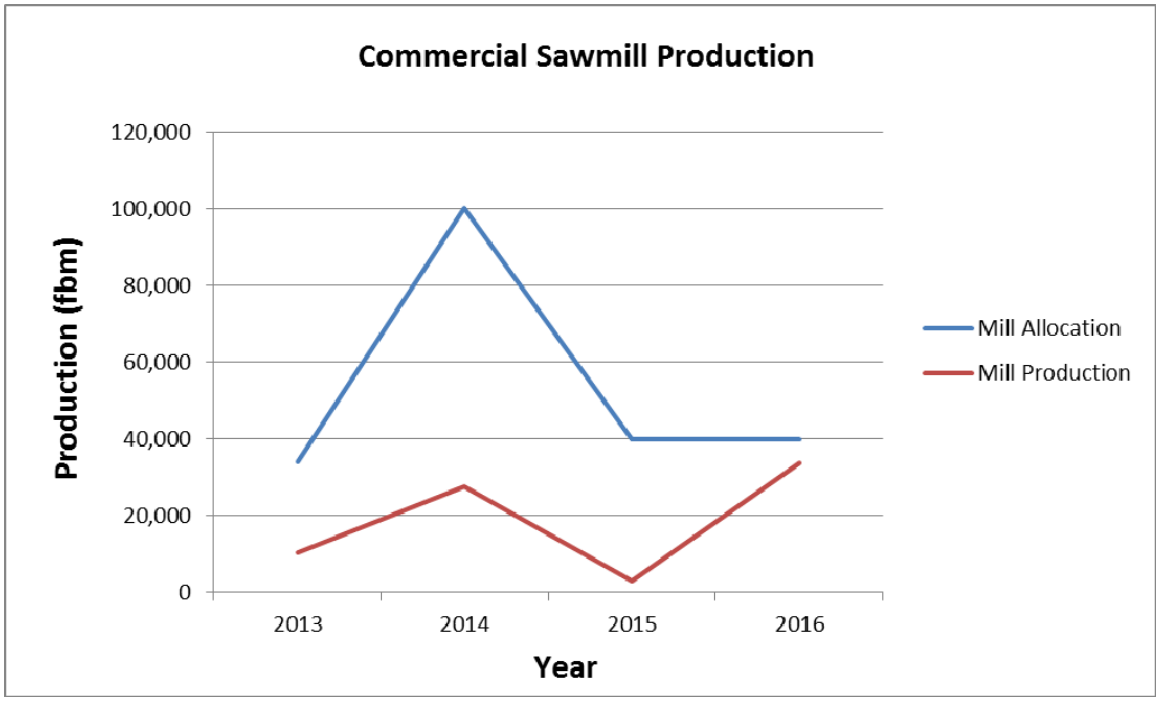


Figure 11. Commercial sawmill production in district 19A (2013-2016).

Transporting forest products to outside markets has always been challenging for commercial operators in this district. There is no rail link to the area, marine shipments are only possible for six months of the year and the current road link is considered

expensive to operate on. While the completion of the Trans-Labrador Highway may eliminate some of these problems, improvements in the abilities of local processors to carry inventories and increase the value of their production would also help to overcome these marketing issues. It is clearly understood that local stakeholders wish to see local benefits from the forest resource maximized.

Economic Objectives & Actions

Objective 11: ***Forest Product Processing & Value Added Industry***

To acknowledge the importance of developing a viable forest product processing and value added industry within the district and highlight options that will support, promote, and facilitate forest product processing and value added industries within the district.

The process of describing where and how timber harvesting will take place in the district has been an important consideration in this plan. Effectively, after trees are harvested, de-limbed and cut to appropriate dimensions, the tree has become a forest product. The next critical issue is to then decide what to do with these forest products. Historically the vast majority of forest products (over 85% of the harvested volume) were shipped out of the region in raw log form for processing elsewhere. The 15% that remained was divided up among the local competing sawmills, all of which consistently ran at under-capacity. This situation is an issue that public participants feel extremely passionate about, and they have made strong demands for change.

Local forest product processing and the development of value-added industries are considered a viable solution to this dilemma. Forest product processing refers to primary manufacturing of raw logs into traditional lumber products. Value added refers to any use of timber that generates more economic value than dimension lumber alone. Value added is a secondary manufacturing process that leads to a higher value product such as; flooring, paneling, musical instruments, furniture and cabinets, log homes, gardening products, moldings, solid doors, pre-engineered wood products etc. Value added industries may include several manufacturing processes, such as kiln drying, shaping, wood treatments, packaging and storage.

Considering the available wood supply for this district, forest product processing and value added represents a significant economic opportunity to this region. However, several challenges need to be overcome in developing this industry.

The following actions will be attempted to meet this objective:

Although the details of manufacturing forest products are outside of the scope of this plan, the following options will be evaluated in order to develop an action plan which will support, promote, and facilitate forest product processing and value added industries within the district:

1. *Continue to participate in and provide support to feasibility studies on local processing and value-added facilities;*
2. *Continue to study the feasibility of providing support in the form of rotating loans in order to enable local saw-milling facilities to purchase wood in advance of harvesting (this would ensure adequate cash-flow for both harvesting operations and sawmill facilities);*

3. *Support the establishment of a wood purchasing agency or cooperative to operate a sort yard, in order to create a viable market for local harvesting and value-added operations;*
4. *Ensure any new harvesting allocations are tied to investment in local capacity building for harvesting and processing.*

Objective 12: ***Timber Harvesting & Sustainability***

Ensure that all timber harvesting activities are ecologically responsible and sustainable.

Timber harvesting represents one of the key components of this forest management plan. Timber harvesting occurs at a variety of scales in this district, from small-scale domestic harvesters with chainsaws and pickup trucks, to commercial operators using mechanical harvesters. Regardless of the scale, harvesting activities will follow specific standards to ensure ecological responsibility and sustainability.

As discussed in several other sections of this plan, timber harvesting can have an impact on other forest values if not properly managed. Past harvesting activities in this district have resulted in a variety of lessons learned, some of which include:

- Pre-operational planning is required in order to identify sensitive features before harvesting commences.
- Moist or wet timber management areas require harvesting activities to take place in the winter season.
- Reduction of harvest block size is required to provide for stand level protected areas networks.
- Watershed level planning is required to avoid concentration of harvest blocks and to design conceptual protected area networks.
- The quality of forest sites harvested must reflect the proportion in which they occur in the management areas to avoid high-grading the best timber sites.

Public and operator education on ecosystem management will continue to be promoted within the district. This will likely result in the better understanding of key management decisions made by managers and their relationships with the goals and objectives of forest management. Training is also an essential part of the environmental management system under ISO 14001.

The following actions will be attempted to meet this objective:

1. *Timber harvesting operations will be subject to the district 19 environmental protection guidelines (Appendix IV).*
2. *Pre-operational planning is required to identify sensitive features before harvesting commences;*
3. *Moist or wet timber management areas require harvesting activities to take place in the winter season;*
4. *Type of timber harvesting operation will be constrained to specific management zones, as defined in map13*
5. *Forest site quality proportions will be determined for each management area and harvesting activities will reflect these proportions;*
6. *Proposed harvest areas will be driven by area available for harvest, not expected volume yields;*

7. *Harvest blocks will be designed using natural features as boundaries. These features will limit the size and shape of harvest blocks.*
8. *Strive to deliver presentations to school groups, and conduct operator workshops on various management issues including utilization, ground disturbance and road construction as necessary.*

Objective 13: ***Timber Resource Utilization***

To minimize merchantable wood wastage during timber harvesting operations, while providing for adequate retention of forest structure for natural habitat and ecosystem function requirements

Good utilization is about minimizing wood wastage in the forest. Surveys of tops, stumps, cull, felled trees, pieces left, or standing trees are conducted to find the net volume left in a cutting area after harvest. Although this coarse woody debris and other material left on site after harvest provides for natural habitat and ecosystem function requirements, it is very important to reduce the amount of merchantable timber left on the ground following harvest.

With reference to standing trees, it is important to leave snags and other trees on the site for nesting and perching sites and to maintain forest structure. Seed trees and other leave trees should not be left haphazardly in a cutting area but rather within a planned distribution or in patches which would give the greatest benefit for current wildlife use, as well as for regeneration and future development of the site. Standing trees retained after harvesting should not be considered in utilization surveys. Proper design of harvest units on the landscape and identification of trees to be left within harvest units will help guide utilization of areas.

Utilization surveys will continue in the district in order to quantify timber volumes left after harvest, but surveys will be expanded to take into account other attributes, particularly as they relate to habitat and other conditions following harvest. Public information and education (regarding wood species, gains in heating value from seasoning of wood, burning techniques, as well as the condition of the resource and desired condition of blocks following harvest) need to be expanded to improve utilization of the resource now and into the future.

The following actions will be attempted to meet this objective:

1. *A general harvest strategy of harvesting the oldest forest stands first will be followed;*
2. *Immature stands will not be harvested;*
3. *In an effort to refine the wood supply analysis, regular utilization surveys will be conducted and closely monitored;*
4. *Operators will be expected to utilize all merchantable portions of trees;*
5. *Sawlogs must be utilized as sawlogs and cut to the maximum length possible.*

Objective 14: ***Forest Access Roads***

To develop a forest access road strategy for the district that balances the short and long-term access needs with other ecological and cultural objectives.

Forest access roads are required for timber harvesting operations, silviculture, research projects, domestic harvesting, and general public use. The Department of Fisheries and Land Resources (DFLR) constructs four classes of access roads (see Appendix IX for standards) and the environmental protection plan of 1994 provides explicit guidelines for forest road construction. Further, the FMD 19 environmental protection guidelines (Appendix IV) outline specifications for forest access road construction and maintenance.

Forest harvesting by commercial operators (and subsequent silviculture work) has generally been concentrated in areas accessed by the existing network of forest access roads. Operational roads have been constructed from existing access roads. The existing network of forest access roads is shown on map 14.

It is recognized that new road networks will have to be constructed to accommodate harvesting operations and other forest management activities. It is also expected that public highways and roads for agriculture and cottage development, as well as private roads, will continue to be planned and built through areas of productive forest in the district.

The following actions will be attempted to meet this objective:

1. *All roads will be constructed to approved environmental standards (as stated in Appendices IV and VIII);*
2. *In areas where there are no ecological protection issues or public objections to road construction, and where desirable from a timber supply management point of view (i.e. silviculture), roads will be maintained;*
3. *Where there are sensitivities, access from a main road would be restricted while forest operations in the areas are ongoing. After forest operations in the area are completed (either temporarily or permanently), access to the road would be denied to vehicular traffic by decommissioning (i.e., the removal of bridges and culverts or by the addition of barriers);*
4. *No main forest resource road would run on a continuous course parallel within 2 kilometers to the main channel of a scheduled salmon river.*
5. *Temporary extraction routes less than 2 km in length will be constructed by commercial operators to a standard that is environmentally acceptable and, provided they have no further utility (i.e. for harvesting or silviculture), they will be decommissioned immediately after satisfactory inspection of the harvesting areas;*

6. *In order to minimize ground disturbance, extraction routes will be pre-planned in each operating block, and will target stable terrain. Where this disturbance exceeds 10%, reclamation of the trail has to be undertaken by the operator;*
7. *Permanent road construction should be conducted during the summer months or generally dry periods. Road use should be similarly restricted. In particular, road use and construction should be restricted during periods of road weakness, fire hazard or wildlife vulnerability.*

Objective 15: ***Forest Resource Protection***

To develop mechanisms for forest resource protection against disturbance, such as fire and insect outbreaks, which consider the risks to human life, property, commercial timber, and ecological health.

On a large scale, ecosystems require protection to ensure their representation and to ensure that land use activities do not negatively impact on them. On a smaller scale, mechanisms for resource protection must also be considered in order to safeguard human life, property, commercial timber supplies, and other factors. In this context, the term "resource protection" is usually used to describe fire control and pest control activities.

Over the years, the DFLR has greatly improved its ability to suppress wildfires in the province. The provincial government took the lead role in forest fire management and suppression in 1975, making significant purchases of new equipment, technology, and aircraft. The department operates five CL-415. This equipment is used for initial attack along with ground crews who are scattered throughout the province in twenty-six depots (six in Labrador). Fire co-ordination is handled by a regional duty officer for each region who oversees the initial attacks and deploys equipment as required. There is a modern Provincial forest fire equipment and maintenance facility in Gander (i.e., the Forest Protection Centre) and in 1996 a state-of-the art hose drying, testing, and repair facility was opened adjacent to the Forest Protection Centre.

Healthy forests have an increased resistance to insects and disease. Forest management techniques will be used as far as possible to maintain healthy forests and thus reduce the risk and severity of insect epidemics.

The following actions will be attempted to meet this objective:

1. *Fire protection activities in district 19 will be coordinated from the district office in Northwest River;*
2. *All reported fires will be evaluated according to their risk to human life, property, ecological value, and commercial resources. Map15 outlines the fire suppression priority map for this district;*
3. *The timber harvesting strategy (to harvest the oldest stands first) will be promoted to reduce the proportion of senescent or weakened trees in the forest;*
4. *A fire protection strategy will be developed for the four communities (HV-GB, Mud Lake, North West River & Sheshatshiu) in the district which will include provisions for physical fire breaks where necessary;*
5. *Where planting is conducted, use of native species which are less susceptible to major defoliators will offer the forest a greater degree of protection;*
6. *Protection of fish, wildlife, water, and other forest resource values in forestry operations will be accomplished through adherence to the ecological protected areas strategy, the environmental protection plan, and any revisions made to it;*
7. *Protection of the forest land base will also be ensured through refusal of crown lands applications for non-compatible use and through delineation or recommendation of areas for reserve status;*

8. *Natural cycles will be encouraged where possible, with light touch (minimal impact) practices utilized in locations specified for silviculture.*
9. *The precautionary principle will be applied, and monitoring will be conducted to improve knowledge of ecosystem impacts on large areas as a consequence of various types of developments.*

Objective 16: *Silviculture & Restoration*

To develop a silviculture & restoration strategy, which fits the unique ecological characteristics of the district and strives to re-establish pre-disturbance species distributions to disturbed or degraded sites.

The study of silvics deals with the principles underlying the growth and development of single trees and of the forest as a biological unit. The practice of silviculture applies the knowledge of silvics to maintain and enhance the utility of forest stands for any given purpose (Smith, 1986). It is defined by Forestry Canada as "the theory and practice of controlling the establishment, composition, growth and quality of forest stands to achieve the biological and economic objectives of forest management." Further, silviculture methods can also be utilized for restoration of degraded sites such as borrows pits, stream banks, roadways, or skid trails.

However, a recent Senate subcommittee report on the boreal forest found that adequate silviculture methods have not been developed for the northern boreal forest, and that current research suggests intensive silviculture, such as planting, has had little success due to the ecological limits of the boreal forest.

The Province of Newfoundland and Labrador has a silviculture program consisting of two related components: operational treatments and research and development (Appendix IX). Under this Plan these activities will be monitored and adapted as new information on effective silviculture methods for this district and the boreal forest become available.

The following actions will be attempted to meet this objective:

1. *Regeneration surveys will be conducted at various intervals on harvested and disturbed areas to assess silviculture requirements, ecosystem productivity, and site disturbance. Natural regeneration is preferred and will be promoted throughout the harvesting and silviculture strategies;*
2. *Planted species will attempt to re-establish pre-disturbance species distribution;*
3. *Seedlings will be grown from local seed sources;*
4. *Pre Commercial Thinning will attempt to re-establish pre-disturbance species distribution;*
5. *Research will focus on growth and yield in both treated and non-treated stands so that a more refined wood supply analysis can be produced.*
6. *Effects on wildlife from silviculture activities will be monitored and assessed.*

Objective 17: ***Tourism and Recreation***

To acknowledge the economic and cultural importance of tourism and recreation in the district. All forest-based activities will consider mutual impacts and aim to coordinate economic and cultural benefits.

The tourism industry in Newfoundland and Labrador makes a significant contribution to the provincial economy. The industry employs over 40,000 people, both directly and indirectly, and represents more than $850 million annually to the economy of Newfoundland and Labrador (HNL, 2011). The non-resident tourism market has been steadily growing in recent years and this trend is expected to continue. The Lake Melville area is considered to be an emerging destination within this market and has the potential to realize significant development in the tourism industry.

As is the case in other parts of the province (Labrador in particular), the appeal of the tourism industry in this district is based on our natural resources. Non-resident visitors to the area have generally been drawn by world-class opportunities in fishing, hunting, wilderness adventure, and winter sports. Potential increases to these markets will likely emerge as a result of increased access, an increase in tourism-related opportunities (e.g. Mealy Mountains National Park Reserve) and an increase in development of other non-related industries. Operational activities in this plan will aim to minimize the impact on the resources on which these tourism opportunities are dependent.

Outdoor recreational activities for local residents also often take the form of the tourism opportunities outlined above. While snowmobiling, skiing (Nordic and alpine), and snowshoeing are common pastimes in the winter, boating, camping, and hiking are common in the spring and summer. It should be noted that domestic hunting and fishing, while properly classified as a subsistence harvesting activity, rather than a recreational activity, is a significant outdoor activity for a majority of local residents in this district. Many local residents also maintain and spend a considerable amount of time throughout the year at private cabins in the area.

The conceptual framework of this plan is concerned with the availability and protection of opportunities and locations rather than specific activities. In this context, two distinct and occasionally antagonistic segments are the principle focus, namely tourism and recreational cabins.

Tourism

This plan is concerned with the rural - wilderness end of the recreational opportunity spectrum (ROS), considering the perception of wilderness most people have when they visualize Labrador.

Expected developments during the planning period include:

- Tourist facilities (hunting/fishing/ecotourism); remotely or in a wilderness setting;
- Snowmobile trails; completion of the Labrador Winter Trail and secondary trails, rural/wilderness setting, seasonal buffers;
- Trans Labrador Highway visual impact corridor; completion of parts of this system expected to increase use in central/western Labrador for general tourist travel; Additional infrastructure along travel corridor is also expected.

For the above activities, maintaining a valued sense of place (homeland/wilderness), providing sufficient protection (infrastructure/people), ensuring an appropriate land use mix, and providing a pleasing visual/aesthetic experience are the major expectations from this plan.

Recreational Cabins

Recreational cabins (domestic - remote sites) have a significant impact on various ecosystems within the District. This is best described as a cumulative, rather than site-specific impact which interacts with other land use activities and resource uses. Cabin impacts are long-term and generally increase with time, attracting additional development. Furthermore, cabin development usually follows other activities, such as timber harvesting and road construction.

During this planning period up to three hundred (300) additional cabin sites may be requested. From a planning perspective, while most of these applications are likely to involve infilling, which gives rise to density concerns, some may involve new sites, which can also result in land use conflicts with other users, as well as density and sensitivity concerns. Further sites can be expected to involve critical areas with potential for serious adverse ecological impacts. In some cases, these concerns will be brought forward to the appropriate agency with recommendations for refusal or specific mitigation conditions.

The following actions will be attempted to meet this objective:

1. *The planning team will continue to work with local stakeholders and operators to delineate areas which have high tourism and recreational use or potential use;*
2. *Critical viewsheds will be explored for high potential areas (e.g., Grand Lake, Trans-Labrador Highway, Snowmobile Trail), and commercial forestry activities within these areas will be limited or designed to minimize the impact to visual sensitivity;*
3. *Where commercial forestry activities are planned in areas adjacent to recreational areas, efforts will be made to execute those operations during "low season" (i.e. summer operations in close proximity to winter activities and vice versa);*

4. *Firm establishment of the proposed Mealy Mountain National Park boundaries (and options for connectivity with this Plan's Protected Areas Network) will continue to be supported by the planning team;*
5. *Visual sensitivity will be evaluated around cabin development areas and harvesting activities will be planned to minimize this impact. A minimum 50 meter "no harvest" buffer will also be maintained around registered cabins.*
6. *30 m buffer will be maintained on all groomed snowmobile trails.*

Objective 18: ***Future Economic Developments***

To recognize the importance of potential economic developments in the region and consider how all developments will interact with the goals, objectives, and principles of this plan.

Several significant economic developments are proposed for the central Labrador region. Proposed developments which may influence forest activities in district 19 including:

- Lower Churchill Hydroelectric Project
- Construction of a road link to the North Coast
- Uranium mining
- Mealy Mountain Developments
- Agriculture expansion

These proposed economic developments are independent of this plan. However, due to the fact that economic developments within a region are interlinked, developments in other sectors will have an influence on the forest-based economic developments described in this plan. Therefore, future developments need to be considered in relation to the goals and objectives outlined in this plan.

The following actions will be attempted to meet this objective:

1. *Organizations responsible for the implementation of this plan will provide input as requested at regional economic forums or seminars, and to boards or agencies regarding the goals and objectives of the plan;*
2. *Organizations responsible for this plan will provide comments and information to any environmental assessments within the context of the plan;*
3. *Impacts of potential economic developments will be assessed within the ecological, cultural, and economic frameworks of this plan;*
4. *The plan will be adapted, where necessary, to accommodate other approved economic developments.*

CHAPTER 3.0 PAST ACTIVITES

Overview

There were a number of developments in forest management during the recent past. Some of the most significant included:

- The continued involvement of Innu Nation, and collaboration between DFLR and Innu Nation in forest management planning and monitoring in the district through a provincially funded Forest Process Agreement.
- Ongoing of the District 19 Forest Management Committee, implementing co-management of the District through an Interim Forest Agreement.
- The shutdown of Abitibi-Consolidated's Pulp & Paper Mill in Grand Falls-Windsor, NL.
- The discontinuation of commercial harvesting activities in the Goose Bay area.
- The acquisition of updated inventory information and Geographic Information Systems (GIS) technology and staff by the DFLR and Innu Nation.

Timber harvesting activities steadily increased until the shutdown of the Abitibi Consolidated Newsprint Mill in Stephenville in 2005 and the Newsprint mill in Grand Falls-Windsor in 2009, where the majority of the district's fiber was shipped. Table 9 and map 16 provide some specifics with respect to these activities. Domestic timber harvesting continued to be an important activity for local communities, with harvest levels remaining at a consistent level. Other forest management activities such as silviculture, fire suppression, road construction, research, and inventory updates continued, although in most cases at modest levels, in anticipation of the completion of this operating plan.

Table 9. Summary of timber harvesting, silviculture and road construction activities in FMD 19A from 2013-2016.

Year	Area Harvested (ha)	Area Silviculturally Treated (ha)	Roads Constructed (km)
2013-2014	**<25**	**0**	**0**
2014-2015	**<25**	**0**	**0**
2015-2016	**<25**	**0**	**0**
2016-2017	**<25**	**0**	**0**
Total	**<100**	**0**	**0**

Within an operational context:

- A significant effort was made on forest management planning, including an improved public participation process, increased research and monitoring efforts and completion of an operating plan for district 19A;
- The application of a set of environmental protection guidelines unique to district 19;
- Silviculture activities remained relatively consistent at 110 ha/year, primarily as the result of a reduced harvest level and an increased reliance on natural regeneration. In fact, most of the planting efforts have been concentrated in non-regenerating burn areas.
- Forest access road activity concentrated on upgrading previously constructed roads by replacing bridges, alder removal and with some new construction.
- Increased focus on monitoring, as well as research and development.
- Registration of all Crown Land based forestry activity under ISO 14001 – Environmental Management System.

Routine survey work was carried out on an annual basis with a focus on regeneration, utilization, and data base maintenance. The annual work schedules and reports on past operations provide additional information and detail on activities carried out during the past five-year period. These reports are on file at the forest management district office in North West River.

CHAPTER 4.0 PUBLIC PARTICIPATION PROCESS

Innu Nation and the DFLR recognize the value of ongoing stakeholder and public involvement in the planning process. There is an important role for groups and individuals to play in identifying issues, contributing information, and evaluating interim results of the analyses that will be developed in the planning process. The planning team recognized that both stakeholder participants and Innu communities were required to be involved in the development of this plan. Accordingly, the public participation process for district 19 was composed mainly of general public sessions with Innu community consultation.

Innu Community Consultations

The Innu Nation Forest Guardians and planning staff gathered comments from members on forestry related issues. Often, strategic issues such as large-scale protection and operating procedures as well as more pointed on-the-ground issues are discussed in the community. Ongoing research and the monitoring efforts of the Forest Guardians are also given regularly to the community and aim to:

- Describe the Innu Nation programs developed under the Forest Process Agreement and the Interim Forest Agreement;
- Provide an opportunity to ask questions and identify concerns or issues Innu communities may have with respect to forest management planning and forest-based activities;
- Explain and receive feedback on the work completed by the Forest Guardians, Technician and Planner;
- Highlight issues, concerns and potential solutions of past, present and future logging operations;
- Consult communities on ecological and cultural areas for protection;
- Translate presentations and progress of the General Public Sessions.
- Review Draft Management Plan Results.

General Public Sessions

The general public sessions began in June 2017 and were held in the communities of Happy-Valley Goose Bay and North West River. These sessions were open to the public and was advertised via local newspapers, the public were welcome to join the team at any time. This round of planning consisted of an “open-house” style meeting where various maps, drafts and tables were presented for interested people or groups to examine and provide feedback. Where specific concerns and priorities became evident through the feedback process, additional meetings could be scheduled to address these concerns.

A draft of the plan was posted online for general public review and comment.

CHAPTER 5.0 PROPOSED ACTIVITIES

Overview

The activities proposed for this operational period are outlined on maps 17 & 18. These include: (i) commercial and domestic harvest areas, (ii) access infrastructure - roads/bridges and (iii) silviculture activities.

To ensure the sustainability of timber harvesting activities, the District was further subdivided into two planning areas (North of Churchill River and South of Churchill River). A total commercial harvest of 290,000 m^3 is proposed north of the Churchill River, while a total harvest of 710,000 m^3 is currently scheduled south of the Churchill River. To facilitate this level of harvest, construction of approximately 61 km of forest access road will be required from both the Crown and the commercial operators. Silviculture activities will focus on planting and research and monitoring activities.

Domestic harvesting is expected to continue at modest levels (less than 7000 m^3 per year). 35,000m^3 of timber is scheduled for domestic harvesting under this operating plan.

Routine surveying and monitoring work will include regeneration, site disturbance, utilization and volume recovery, wildlife surveys, and basic database upgrading and monitoring. Research activities will focus on alternative harvesting, ecosystem productivity, and monitoring various criteria and indicators as outlined in the Strategy Plan.

Finally, the existing fire management program will be maintained during this operational period.

Allocation of Timber Supply

The district AAC is divided into two distinct management areas: north and south of the Churchill River (“Northside” and “Southside,” respectively).

Table 10: Breakdown of District 19A Annual Allowable Cut

Management Class	AAC Contribution (m3/year)	% of A AC
Commercial Areas	55,000	27%
Domestic Reserves	3,000	2%
Northside Total	**58,000**	**29%**
Commercial Areas	127,500	64%
Domestic Reserves	10,500	5%
Selective Reserves	4,000	2%
Southside Total	**142,000**	**71%**
District 19A Total	**200,000**	**100%**

Within the Northside and Southside areas, management units have been designated according to road system, ecological boundaries, and management classification. Map 11 describes the location of the management units within district 19A, and Appendix XI summarizes management units by contribution to the district commercial land base. The proportion of commercial land base indicated for each management unit serves as a guide for timber supply sustainability in each unit, not as a prescriptive partition.

As described in Table 10, the total AAC for district 19A is **200,000 m^3**. This represents a significant reduction from the 2000 analysis, which set the AAC at 400,000 m^3 however consistent with the previous analysis. The primary reason for this 50% reduction in the AAC was due to the major shift in planning emphasis under the Forest Process Agreement and through the incorporation of public values and concerns raised during the consultation process. This resulted in a significant change to how the timber management land base was determined. The incorporation of ecological and cultural priorities in conjunction with changes in stand level harvesting practices resulted in a significantly reduced commercial harvesting area, but far greater ecological and cultural protection. The current AAC is very similar to the previous (2013-17) analysis since similar ecological and cultural priorities were still applicable. Further explanation of how the wood supply was calculated can be found in Appendix VII.

The annual rate of harvest of Annual Allowable Cut (AAC) is the maximum sustainable timber volume that can be harvested on an annual basis, while providing for a landscape that supports non-timber values for future generations.

Under this operating plan, the district AAC is divided into two distinct management areas: north and south of the Churchill River, or “Northside” and “Southside,” respectively (Figure 12).

As described in Table 10, the AAC figure for the Southside is estimated at 142,000 m^3. This figure is considered provisional and will likely change in future plans pending resolution of various unresolved land use issues. The operable land base used to calculate the AAC for the Southside in this plan excludes the Mealy Mountains/Akamiupishku National Park Area Boundary and the adjacent Core Reserve B (Kenamu River Valley).

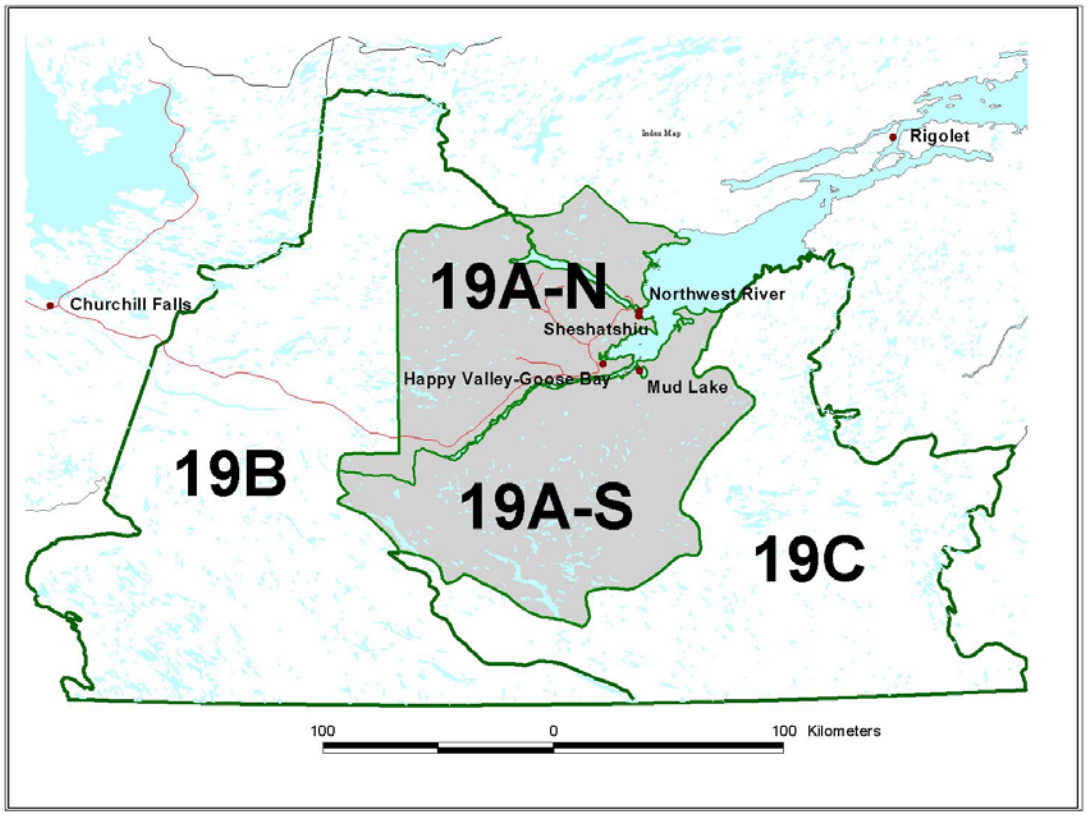


Figure 12. Location of Northside and Southside allocation areas.

Under this operating plan, timber harvesting allocations are made available to operators under three different types of harvest permits:

1. **Commercial:** Large-scale operations with both sawlog and pulpwood market requirements. Represents approximately 85% of total harvest allocation (see commercial harvest permit conditions in Appendix XIII).
2. **Selective-Commercial:** Small-scale commercial operations that utilize a selective harvest approach. Requires primarily sawlog and construction timber with high value-added potential. Represents 3% of total harvest allocation.

3. **Domestic:** Primarily fuelwood and some sawlog requirements with a focus on harvesting in domestic reserves and burn-wood areas. Represents 12% of total harvest allocation.

Table 11 summaries the district's harvest allocations by permit type and management area over the five-year operating period. As table 11 indicates, 1,000,000 m^3 of timber is scheduled for harvest over the next five years. A total of 260,000 m^3 has been allocated for Northside Commercial operations, 690,000 m^3 for Southside operations, 15,000 m^3 for Selective-Commercial, and 35,000 m^3 for Domestic use.

Table 11. District 19A Harvest Allocations by Permit Type and Management Area.

Year	Commercial (m^3)		Selective* (m^3)		Domestic (m^3)		Total (m^3)	
	Northside	Southside	Northside	Southside	Northside	Southside	Northside	Southside
2018	52,000	138,000	1,000	2,000	5,000	2,000	58,000	142,000
2019	52,000	138,000	1,000	2,000	5,000	2,000	58,000	142,000
2020	52,000	138,000	1,000	2,000	5,000	2,000	58,000	142,000
2021	52,000	138,000	1,000	2,000	5,000	2,000	58,000	142,000
2022	52,000	138,000	1,000	2,000	5,000	2,000	58,000	142,000
Total	260,000	690,000	5,000	10,000	25,000	10,000	290,000	710,000

Eleven north side commercial harvest blocks, and twenty-nine south side commercial harvest blocks have been proposed for harvesting over this operating period. The locations of these areas are outlined on 1:50,000 topographic (maps 19-27) and 1:12,500 cover type maps (maps 28-68) and are provided in the appended maps. A summary of the commercial harvest blocks is provided in Table 12.

As is described in Table 12, the proposed commercial harvest blocks contain an estimated 1,223,947 m^3, 223,947 m^3 more than the scheduled commercial allocation (including selective-commercial allocations). This additional volume is an accepted margin of error that may provide for operational flexibility if certain harvest blocks do not yield expected volume returns after pre-harvest assessments are completed, particularly in research areas. Volume returns for every harvest block will be monitored and reviewed on an annual basis.

Table 12. Summary of northside and southside Commercial Harvest Blocks for 2018 - 2022.

Operating Area				Net Softwood Volume m^3					Hardwood Volume m^3				
				Core	Operational Constrainted	Sub-total	Non AAC wood		Core	Operational Constrainted	Sub-total	Non AAC Wood	
Number	Name	Tenure	Area (ha)*				Operational	Regulatory				Operational	Regulatory
North Side													
CC19007	MU1	Crown	172	22,353		22,353							
CC19002	MU1	Crown	368	44,795		44,795							
CC19003	MU1	Crown	359	51,320		51,320							
Subtotal			**899**	**118,468**		**118,468**							
CC19004	MU2	Crown	281	34,581		34,581							
CC19005	MU2	Crown	352	51,179		51,179							
CC19006	MU2	Crown	315	45,399		45,399							
CC19008	MU2	Crown	313	44,848		44,848							
CC19009	MU2	Crown	246	39,797		39,797							
Subtotal			**1,507**	**215,804**		**215,804**							
CC19010	MU3	Crown	199	26,253		26,253							
CC19034	MU3	Crown	427	55,133		55,133							
CC19029	MU3	Crown	467	56,557		56,557							
Subtotal			**1,093**	**137,943**		**137,943**							
North Side Total			**3,499**	**472,215**		**472,215**							
South Side													
CC19041	MU4	Crown	249	33,543		33543							
CC19036	MU4	Crown	312	44,362		44362							
CC19035	MU4	Crown	82	10,953		10953							
CC19039	MU4	Crown	117	17,042		17042							
CC19040	MU4	Crown	221	36,902		36902							
CC19037	MU4	Crown	221	32,126		32126							
CC19038	MU4	Crown	284	42,825		42825							
CC19031	MU4	Crown	180	20,501		20501							
CC19032	MU4	Crown	138	17,942		17942							
CC19033	MU4	Crown	311	41,435		41435							
CC19011	MU4	Crown	159	25,623		25623							
CC19012	MU4	Crown	164	21,300		21300							
CC19013	MU4	Crown	233	29,329		29329							
Subtotal			**2,671**	**373,883**		**373,883**							
CC19014	MU5	Crown	132	20,254		20,254							
CC19015	MU5	Crown	289	36,082		36,082							
CC19016	MU5	Crown	288	34,047		34,047							
CC19017	MU5	Crown	346	41,756		41,756							
CC19018	MU5	Crown	332	41,142		41,142							
CC19019	MU5	Crown	115	18,268		18,268							
CC19020	MU5	Crown	75	13,469		13,469							
CC19021	MU5	Crown	145	15,452		15,452							
CC19022	MU5	Crown	126	15,041		15,041							
CC19023	MU5	Crown	135	17,792		17,792							
CC19024	MU5	Crown	114	13,776		13,776							
CC19025	MU5	Crown	302	33,285		33,285							
CC19026	MU5	Crown	209	24,218		24,218							
CC19027	MU5	Crown	177	19,827		19,827							
CC19028	MU5	Crown	182	24,492		24,492							
CC19030	MU5	Crown	58	8,948		8,948							
Sub-Total			**3,025**	**377,849**		**377,849**							
South Side Total			**5,696**	**751,732**		**751,732**							
District Total			**9,195**	**1,223,947**		**1,223,947**							

Proposed Hydro-electric Development at Gull Island and Muskrat Falls

Newfoundland and Labrador Hydro (Nalcor) is in the process of building a hydro-electric generating stations on the Churchill River at Muskrat Falls which would generate 824 MW. A second development is proposed at Gull Island which would generate 2000 MW. Partial clearing of the reservoir has taken place and was deemed necessary to mitigate environmental impacts associated with flooding as well as reduce interference from debris. Clearing has been done in a very intensive way, over a short period of time (less than 5 years).

During the preparation and implementation of this plan, multiple meetings between DFLR and NL Hydro were and will be held in order to explore the synergies between the two projects as well as any possible cumulative impacts. DFLR will continue to exchange information with NL Hydro through the life of this plan.

To date, a large scale commercial utilization solution for the wood generated from the reservoir clearing has not come to fruition. The DFLR has had some success in directing domestic harvesters to various wood storage yards to utilize this wood for their domestic needs.

Timber Harvesting Operations

All harvesting operations will be subject to the district 19A environmental protection guidelines (Appendix IV), the relevant requirements outlined in this plan and specific permit conditions.

The environmental protection guidelines were developed through a review of current scientific literature, management/operational knowledge and experience, and input from local stakeholders. The environmental protection guidelines may be revised over the planning period to reflect new research findings and adaptive management decisions. Paramount considerations will be determinations concerning clear-cut opening size, green tree retention requirements, and further definition of sensitive areas (i.e., time of cuts/season, buffer size/requirement, etc.). Any revisions to the environmental protection guidelines will be reflected in the annual work schedules to be developed under this operating plan.

Commercial

Commercial operations will be confined to the harvest blocks identified in this operating plan. Since only a portion of the operational constraints can be mapped and alienated using existing GIS databases, further site-specific modifications to commercial harvest blocks are anticipated to account for terrain, slopes, streams, and other factors. Based on past experience, a reduction of approximately 30% of the projected merchantable area of a harvest block is anticipated during the pre-operational planning and layout of each

harvest block. This net-down has already been incorporated into the proposed harvest block areas described in Table 12.

Commercial operations will generally utilize mechanical harvesters and conventional harvesting methods, such as clear-cutting with variable retention. Whole tree harvesting will not be permitted under this plan. In general, commercial stands are composed of both large diameter and small diameter timber. Cull expectations normally fall within 10% of standing volumes, although significant variation may occur. Waste and utilization surveys will monitor cull on a yearly basis.

Selective-Commercial

Selective-commercial operations are permitted within commercial management zones and within the selective-commercial reserve that has been created as a component of the district protected areas network along the south side of the Churchill River (map 10). Selective-commercial operations will generally utilize manual chainsaws and harvest timber selectively during the winter months. Access road construction will not be required for these operations, as harvest areas will be accessed by snowmobile. Specific harvest areas will be assigned to selective-commercial operators. All timber cut must be fully utilized and will be subject to normal utilization standards.

Domestic

The harvest of fuelwood, sawlogs, and building materials for domestic use will be carried out under a domestic harvest permit primarily in the domestic harvest reserves. These reserves are generally located in close proximity to the communities of Goose Bay, North West River, Sheshatshiu, and Mud Lake. The locations of these domestic harvest reserves are illustrated in map 10. Domestic harvesting is also anticipated outside of reserve areas, such as the small volumes harvested at various locations throughout the District by cabin owners and subsistence harvesters. The district is divided by watersheds into domestic harvest areas (map 70).

Domestic permit allocations have, over the years, remained relatively stable. Due to the nature of these small-scale activities, general blocks/locations have been identified for operations outside of identified reserves. Regular monitoring will occur, with cumulative efforts detailed on an annual basis.

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. Silviculture methods can also be utilized for restoration of degraded sites such as burn-overs, borrow pits, stream banks, roadways, or skid trails. Two of the most common techniques associated with this practice are tree seedling planting and pre-commercial thinning.

Research and monitoring in this district shows that a majority of the areas harvested will regenerate naturally within a five year period. Harvested areas will be monitored for regeneration, and detailed surveys will be conducted in areas where regeneration appears to be inadequate. Harvested stands (or portions of harvested stands) that are not adequately regenerating will be scheduled for planting. The planted species will be determined on site-specific basis but will be highly dependent on the pre-disturbance stand structure. Cone collections within the district will continue to provide a local planting stock. Only local native tree species will be considered for planting. Planting trials will also be established which aim to correlate successional patterns with both planted species and density.

Under the current 5-year planning frame work, DFLR is planning a shift in focus on container planting operations from a full planting scenario (at regular spacing/densities) to a micro-site planting approach. Micro-site planting simply means determining the spot on site best able to meet the individual tree seedlings requirements. Tree seedlings, like any living organism, have certain requirements to grow and develop properly. The closer the actual planting spot (a.k.a. micro-site) comes to providing those requirements, the better off the trees will be.

Conditions to be considered in the selection of proper micro-sites will include: air, light, freedom from competition and physical damage from other plants, moisture, nutrients, temperature, drainage, and porosity. When a condition on a micro-site is lacking to the point where it limits seedling survival and growth, it is known as a growth limiting factor (GLF). Selection of micro-sites on wildfire planting operations will avoid GLF's where possible. The proposed micro-site approach will place a reduced emphasis on regular spacing of planted trees, and will focus more on micro-sites as they naturally occur, thereby resulting in a more natural and aesthetically pleasing second growth forest.

Table 13 summarizes the details of the anticipated silviculture operations. These operations will focus on the remediation of future commercial harvest blocks, as they become available, along with several burn-overs, highlighted in maps 6, 17, & 18. These activities are supported by the regional tree nursery, which is scheduled to operate during this period.

Table 13. Proposed Silviculture Activities.

Activity	Details	Hectares
Tree Planting	Utilizing spruce species.	~ 750 ha (150ha/yr).

Primary Access Road Construction

Harvesting (particularly wood and certain non-wood products) depends to a significant degree on forest access roads. These corridors are long-term (15 or more years) when constructed by the Province, and short-term (5 years) or annual when operator-built. Current road construction guidelines and regulations are compiled with input from various agencies. The proposed forest access road network for this management plan is illustrated in map 71.

Operational roads (winter and summer) have not been identified in this plan, however they are necessary in order to ensure that the timber scheduled for harvest is fully accessed. Royalty reductions can be offered as per Timber Royalty Regulations under the Forestry Act as an incentive for commercial contractors to construct their own access roads. Such roads must adhere to established construction and environmental standards, and will be subject to review and approval by district planners.

Considering the limited access that currently exists within the district, decommissioning of major access roads (barring or rehabilitating of access roads) has not been scheduled for this planning period. The decommissioning of operational roads within harvest blocks will be carried out once the planned activities are completed. 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 IV, and as per objectives described earlier. Approval must be obtained from the Provincial Department of Municipal Affairs and Environment and the Federal Department of Fisheries and Oceans for any type of stream crossing. Fourteen stream crossings are anticipated on the south side and fourteen crossings are anticipated on the north side over the next five years. These stream crossings may vary once the in-field work is completed.

Routine maintenance of the road system is the final component of the access program. No regular abandonment practices are anticipated during this planning period.

Environmental Protection

The protection of aquatic and terrestrial habitats, biodiversity and overall ecosystem health has been identified as a management objective of district 19a.

Forest Fire Protection

Wildfire is a natural occurrence in the Labrador Region, with large fires having occurred within district 19. An effective fire protection program is necessary to ensure local communities are safe and that commercial timber losses are minimized.

Within the framework outlined in the Provincial strategy plan and regional fire management strategies, active forest fire control operations will be carried out as required. Although natural cycles (rates/extent) are preferred, suppression will occur in priority areas outlined on map 15. This includes human protection, property protection, and protection of valuable resources. Considering the capacity of wildfires to cover large areas, flexibility for control purposes is required with respect to priority zones and suppression actions.

The district office in Northwest River currently has adequate staff and equipment to provide initial suppression during the scheduled fire season (usually from May to September). The office is staffed from 0800 to 1930 hours daily with extended hours during periods of extreme fire weather indices. After regular hours, the district fire duty officer is responsible for receiving fire reports and dispatching staff and equipment. This office, in consultation with the regional fire duty officer, also coordinates air support (tanker, helicopter) and provides additional staff and equipment to other districts in Labrador as required.

Insect and Disease Control

Large scale disturbances, particularly insect or disease outbreaks, have not been common in the district. Consequently, there were no spray programs in the past. Observations in the last five years have indicated that significant areas are being affected by spruce bark beetle, hemlock looper and spruce budworm outbreaks. Spray programs were required in the past to control populations of hemlock looper and spruce budworm (map 6). Should a spray program be required, it will be registered as a separate undertaking (as per EA regulations) with the EA Division of the Department of Municipal Affairs and Environment for environmental assessment and further public review.

During routine field work, staff will focus on the forest condition in an effort to detect any significant insect or disease infestations as early as possible. All significant infestations will be reported to the Provincial coordinator and appropriate action discussed with District and Regional staff. Furthermore, actions outlined in objective 15 will be followed.

Habitat Protection

Old age-class forests provide important habitat for a variety of plant and animal species. Examples range from various lichens to economically important fur-bearers such as American Marten (*Martes americana*). As illustrated in the section above, large forested areas have been excluded from the district's commercial forest areas as protected area networks and core reserves. Approximately 69 percent of the productive forest land base was not included in the annual allowable cut (AAC) calculation. These areas will provide habitat protection at the landscape, watershed, and stand levels, as well as provide important benchmarks for scientific study and long-term monitoring of ecosystem health.

Within commercial operating areas, riparian buffers are important for the protection of aquatic ecosystems and the maintenance of water quality and quantity in general. Riparian buffers are recognized as key features of watershed and stand scale protected area networks. They provide shade, act as filters against excessive sedimentation, and stabilize soils when properly planned. Riparian buffers also serve as important travel corridors and habitat for wildlife. Current guidelines require a minimum 20 meter treed buffer to be maintained on all permanent water bodies, and 10-12 meter no-travel buffers be maintained around smaller intermittent streams. Guidelines also permit for an increased buffer when required (i.e. steep slopes, sensitive spawning areas, etc.). In the case of larger rivers, a minimum of 100 meters will be maintained. Waterfowl staging areas will require a 30-meter buffer. The harvesting of hardwoods within 30 meters of a water body occupied by a beaver will not be permitted.

Coarse woody debris, which includes both standing snags and downed woody material, is important to a variety of plant and animal species. In recognition of its value, logging systems that leave limbs and tops on the harvesting site will be favored. Guidelines also require that a minimum of 10 snags per hectare remain after an area has been logged. In order to provide a future source of coarse woody debris, efforts will be made to retain green trees in harvested areas. Clusters of trees will be preferred over single trees, and where possible, snags will be maintained in association with green tree retention.

During pre-operational planning, surveys will be completed to determine locations of raptor nesting sites or black bear dens within the proposed harvest blocks. In the event that an active raptor nest is identified in a proposed harvesting block, the environmental protection guidelines require an 800-meter buffer be maintained during the nesting season. Once the young have left the nest, a 200-meter buffer is required. A 50-meter buffer will be maintained on any black bear denning sites that are found within the proposed operating areas.

Specific activities which may affect habitat quality are monitored on a periodic but regular schedule: factors such as land use change, cabin developments, and insect populations are evaluated annually with the objective of identifying trends or providing data for forecasting future conditions.

Several monitoring programs are presently conducted in the local area by government agencies, research organizations and by volunteer or citizen groups. These programs range from intensive river valley ecosystem research to breeding bird and raptor surveys, amphibian monitoring efforts, and feeder watch programs. These programs generate data, which will be incorporated into district monitoring reports. An evaluation of the results of these programs in relation to the goals and objectives of the plan will be undertaken in order to identify existing data sources. Any gaps will be identified as priorities for directed future research.

Enforcement and Compliance

Compliance monitoring is generally carried out on a routine schedule during pertinent activities. This includes: harvest operations (timber), road construction, and silviculture activities. Routine inspections and patrols include documentation, reports, results, and corrective or other actions. District Conservation Officers and Innu Nation Forest Guardians will routinely monitor harvesting, road construction, and silviculture operations. This will ensure that all management activities are being carried out in a manner consistent with various legislation, objectives and the environmental protection guidelines of the district.

Surveys & Monitoring

Surveys are important and necessary management tools which must be used in order to evaluate past action and provide data on which to base future management decisions. A number of surveys are scheduled for this planning period, but are subject to the availability of adequate staffing and funding.

Pre-Operational Surveys

Proposed harvesting areas will be surveyed for sensitive habitats such as the presence of raptor nesting sites, critical spawning areas, and aquatic furbearers. Detailed harvest sensitivity surveys (slope, drainage) will also be conducted to identify areas with high soil erosion hazard potential. Results of pre-operational surveys will be used to inform harvest unit layouts as described in the environmental protection guidelines.

Utilization Surveys

Problems with improper utilization will be addressed through regular monitoring by District Conservation Officers and Innu Nation Forest Guardians. Formal surveys 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. The establishment and re-sampling of permanent sample plots would be an important component of long- term monitoring. 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.

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

Site Disturbance Surveys
These surveys, as defined in the ground disturbance survey guidelines developed by the Newfoundland & Labrador Forest Service, will be conducted following harvesting activities to ensure compliance with the site disturbance and erosion sections of the environmental protection guidelines.

CHAPTER 6.0 RESEARCH AND MONITORING

Ecological Research & Monitoring

As discussed in Chapter 2, an ecosystem-based planning approach to forest management is founded upon protecting, maintaining, or where necessary, restoring fully functioning ecosystems over a range of spatial scales over long timeframes. In order to realize this goal, specific ecological criteria and indicators need to be developed, and an active research and monitoring program must be in place.

From 1996 to 1998 several public stakeholder meetings in this district focused on this issue. As a result of this work, there was general consensus to adopt a criteria and indicators system as outlined by the Canadian Council of Forest Ministers (CCFM). This system has evolved from several international efforts that were initiated to develop criteria and indicators for sustainable forest management following the 1992 United Nations Conference on Environment and Development.

These criteria and indicators move beyond a narrowly defined focus on the productivity of timber and other commercial forest products to incorporate ecological and social dimensions of sustainability. For example, the broad forest values developed as criteria under the Montreal Process for the conservation and sustainable management of boreal and temperate forests includes the following priorities (see Appendix XIII for detailed descriptions):

1. Conservation of biological diversity;
2. Maintenance of the productive capacity of forest ecosystems;
3. Maintenance of forest ecosystem health and vitality;
4. Conservation and maintenance of soil and water resources;
5. Maintenance of forest contribution to global carbon cycles;
6. Maintenance and enhancement of long-term multiple socio-economic benefits to meet societal needs;
7. Effective legal, institutional, and economic frameworks for forest conservation and sustainable management.

Further, the developments of national and international standards in the form of forest certification systems are also an important indicator for this plan.

Actions:

The parties responsible for the implementation of this plan will undertake an ecological research and monitoring program through collaboration and consultation with local stakeholders, research organizations, and other institutions. The parties responsible for creating this plan have identified several “go forward” planning issues that require further research, monitoring and action to resolve.

Work undertaken by the parties responsible for implementing the ecological research and monitoring program will attempt accomplish the following priorities during the life of this plan:

- *Work towards completing the landscape level EPAN for the remainder of FMD 19, with an emphasis on areas south of the Churchill River;*
- *Consult and collaborate with Parks Canada and the Mealy Mountains/Akamiuapishk National Park Steering Committee on the implementation of the Mealy Mountains/Akamiuapishk National Park;*
- *Research and monitor ecological components of the criteria and indicators set out by the CCFM (Appendix XIII);*
- *Research, monitor and participate in new criteria and indicator programs;*
- *Design and implement a monitoring strategy to ensure that the district protected area strategy maintains viable populations of key indicator species for each of the three scales;*
- *Research and monitor stream, river, and lake water quality, and aquatic indicator species such as fish;*
- *Continue to refine and develop at the landscape and watershed level an ecosystem classification system based on high-resolution satellite imagery and change detection;*
- *Continue to develop a site level ecosystem classification system based on indicator plants, soil nutrients, Innu knowledge and moisture regimes;*
- *Research and monitor natural disturbance regimes at multiple spatial scales;*
- *Research and monitor the effectiveness of the ecological protected areas networks at all spatial scales to protect and maintain ecological structure and function;*
- *Research and monitor specific ecological impacts of timber harvesting as identified in annual work schedules such as forest regeneration, site disturbance, and alternative logging methods;*
- *Research and monitor forest stand dynamics over time. Particular attention will be given to ecosystem productivity, composition, structure, and function;*
- *Report annually on the status of "go-forward" planning issues, research, and monitoring results.*

Cultural Research & Monitoring

As discussed in the section above, an active research and monitoring program must be put in place, and specific criteria and indicators need to be developed in order to achieve the ecological objectives and goals of this plan. A similar framework must also be developed and implemented for research and monitoring with respect to cultural objectives and goals.

Although the Canadian Council of Forest Ministers criteria and indicators program addresses some cultural values, additional indicators are required to address the cultural values encompassed in this plan. The Centre for International Forestry Research (CIFOR) has developed a set of criteria and indicators for sustainable forest management specifically focusing on Aboriginal and rural communities which place a high cultural value on forests. Similarly, several of the FSC principles and criteria encompass a broad social spectrum with particular attention paid to the rights of indigenous peoples. A summary of the CIFOR criteria and indicators for human well-being and the FSC Principles & Criteria are provided in Appendix XII.

Actions:

The Parties responsible for the implementation of this plan will participate in a cultural research and monitoring program through collaboration and consultation with local stakeholders, research organizations, and other institutions. The research and monitoring program will strive to address the following priorities:

- *Research and monitor cultural components of the criteria and indicators programs set out by FSC and CIFOR (Appendix XIII);*
- *Research, monitor and participate in cultural criteria and indicator developments such as those outlined in the various certification standards;*
- *Research on non-Aboriginal land use and occupancy information and mapping;*
- *Assess cultural protection measures of the plan with Aboriginal and non-aboriginal communities;*
- *Aboriginal and non-aboriginal assessments of stand level timber harvesting practices;*
- *Impacts of timber management activities on Aboriginal and non-aboriginal cultural values;*
- *The results of the cultural research and monitoring program will be reported annually.*

Economic Research & Monitoring

Specific criteria and indicators and an active research and monitoring framework must be applied for the economic objectives and goals identified in this plan. There are several overlaps between ecological, cultural, and economic research and monitoring components. For the purpose of this plan, components which have a direct link to economic activities, such as timber harvesting, management zoning, and annual rate of harvest are addressed in this section.

Actions:

The parties responsible for the implementation of this plan will undertake an economic research and monitoring program through collaboration and consultation with local stakeholders, research organizations and other institutions. Further, it is recognized that the parties responsible for creating this plan have identified several "go forward" planning issues that require further research and monitoring to resolve. In doing so, this research and monitoring program will strive to address the following priorities:

- *Research, monitor and review the following "go forward" issues:*

  a) *Ecological and operational implications of harvesting in proximity to the lower Goose River linkage;*
  b) *Ecological and operational implications and patterns associated with harvesting poor sites;*
  c) *Review isolation analysis with air-photo interpretation on a management unit basis;*
  d) *Buffer size and function for riparian features;*
  e) *Percentage of area required for stand level EPAN's;.*
  f) *Percentage of volume required for block retention;*
  g) *Utilization, cull, and waste levels;*
  h) *Derived ecosystem productivity and growth and yield information for regenerating stands.*

- *Research and monitor economic components of the criteria and indicators programs set out by CCFM (Appendix XIII);*
- *Participate and provide input into economic criteria and indicator development for boreal certification;*
- *Research and monitor economic productivity of all forest-based industries;*
- *Research and monitor training and employment opportunities / developments in all forest-based industries;*
- *Monitor timber harvest block volumes and areas against estimations;*
- *Create a processing and value added committee to research, monitor, and provide recommendations to the planning team on how to maximize local utilization of timber resources;*

- *Create a database of potential forest product developments and market information;*
- *Reporting annually on the status of research and monitoring programs and results.*

Research and monitoring of operational activities is a key aspect of adaptive management and a feature of this planning process. Subject to availability of funding, this operating plan will adhere to the various research and monitoring actions as described in the strategy plan. As such, several research projects are anticipated to occur within this operating period. Portions of harvest block 8 will be utilized as a long-term research block to facilitate some of these projects

Some of the initial research topics that will be targeted within this operating period include:

- Modified harvesting systems (strip, patch and shelter-wood);
- Assessment of cultural values protection;
- Natural disturbance regimes;
- Ecosystem classification systems;
- Impacts of timber harvesting (ecological, cultural and economic);
- Forest Stand dynamics;
- Visual dynamics of forest harvesting;
- Community needs (social and economic);
- Ecosystem productivity (growth and yield).

The Provincial strategy plan identifies criteria and indicator requirements which will necessitate an expanded research and monitoring program. Such a program may study impact trends, indicators of ecosystem health, and general environmental parameters. Various parameters, protocols, and other aspects of a forest management committee monitoring program will be tested and evaluated for implementation over the course of this five year planning period. This information will be evaluated and formal forest management committee monitoring programs will be designed for implementation over the following planning period.

Environmental Management System

As a ”go forward” issue identified in the previous district 19a forest management plan (2003-2007) to report and monitor results of programs, the district 19a forest management committee initiated the implementation of the ISO 14001 environmental management system within crown lands in district 19a. The Province has since adopted this initiative for all crown lands in 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 (EMS) 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 applies to all forest management activities and to all Department of Fisheries and Land Resources (DFLR) employees, Innu Nation environmental guardians, commercial permit holders, research institutions and contractors carrying out regulated forest management activities within district 19a and 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 ensures 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. All crown forests in district 19a and the Province are currently registered under the ISO 14001 EMS.

Forest Certification

Following the implementation of the EMS, forest certification will 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:

- Canadian Standards Association (CAN/CSA Z809)
- Sustainable Forestry Initiative Program (SFI)
- Forest Stewardship Council (FSC)

While the choice of which certification scheme will be explored for district 19 has not been made, the planning team will continue to evaluate the benefits and costs associated with applying for and implementing forest certification in the district.

CHAPTER 7.0 PLAN ADMINISTRATION

Monitoring

A citizens' monitoring committee will be established to evaluate the results of the activities planned in this document. The Department of Fisheries and Land Resources will determine representation on this monitoring committee. The main focus of the committee will be to monitor activities and evaluate the overall progress towards the long-term goals outlined in this document and the Provincial sustainable forest management strategy and to make recommendations to the department where necessary. The department will prepare an annual work schedule for each operating year, which will be presented and discussed with the monitoring committee.

Amendments

Proposed harvest blocks outlined in this operating plan will be further refined through the annual work schedule (AWS) which shall commence on January 1st of each year. On December 31st of each year a past annual report (PAR), which audits and details annual progress, will also be produced. Under this reporting structure potential problems can be identified, and through adaptive management, any necessary changes can be made to subsequent annual work schedules. Any amendments to this plan will be processed through the Forest Ecosystem Management Division in Corner Brook and, where appropriate, amendments will be registered with the Environmental Assessment (EA) Division of the Department of Municipal Affairs and Environment. Amendments that require EA registration will be subject to environmental assessment and further public review. Any amendments that do not require EA registration will be approved or rejected by the District Ecosystem Manager in consultation with the Forest Ecosystem Management Division.

CHAPTER 8.0 IDENTIFIED CONFLICTS AND PROPOSED MITIGATIONS

The following table outlines descriptions of how the issues raised during reviews and public consultation will be addressed.

#	Issue	Proposed Mitigation	Site Specific Mitigation (FMD 19)
1	EA registration	Registration is required under Section 30(2) of the Environmental Assessment Regulations, 2003	Crown D19 operating plan for 2018-2022 will be registered for Environmental Assessment once planning team consultations are completed and document is finalized.

2	Buffers	• Maintain standard buffers on waterbodies. • Minimum 15m buffer on high water mark of all bodies of water showing on 1:50,000 maps.	In the proposed 5 year operating plan (2018-2022), riparian buffers and water resources were considered important by stakeholders and are critical in the protection and conservation of aquatic ecosystems and the maintenance of water quality in general. Stake holders reached consensus for riparian buffers to be applied as follows: • Minimum requirement of 20m forest buffer around all water bodies identified on latest 1:50,000 topographic maps and on all water bodies that are 1.0m in width or greater. • Minimum requirement of 100m forested buffer around major waterbodies with an additional buffering of modified harvest when required. • Additional buffers can be applied where it can be determined that critical fish or wildlife habitat may be affected • Where slope >30%, no harvest forest buffer of (30m or 150m) + (1.5x slope%) will be applied. There are no planned forest activities to take place within any of the protected water supplies in the District. Furthermore, the Environmental Protection Guidelines (EPG) listed in the 2010-2014 Forest Management Plan (FMP) will be applied to harvesting and road construction activities.

3	Service NL permits and approvals	Prior to the start of any development, proponent should contact the Regional Service NL office to discuss relevant permits and or approvals that may be required.	Prior to EA registration and development, DFLR officials will discuss the plan with Service NL to determine any permits or approvals that may be required
4	Unprotected and protected water supplies for the Towns of Goose Bay and North West River are located in domestic harvest areas	Domestic harvesting within unprotected and protected water supplies should be discussed with the community prior to approval of permits in the area.	There is no commercial harvesting or other forest activities planned in either protected or unprotected water supplies within the District. Protected and unprotected water supplies will be identified on domestic harvest maps as NO CUTTING areas.
5	Issued Crown titles	Prior to commencement of harvesting operations or the issuance of cutting permits, follow up with Crown Lands to obtain land use updates and locations of issued Crown land titles and remote cottages.	Current environmental guidelines require a 50 meter treed buffer between existing approved cabin development areas and any forest operation. These guidelines are currently under review. We are not anticipating any cutting on private land. DFLR can provide Crown Lands with copies or the annual work schedule on an annual basis to determine any outstanding conflicts.
6	Amendments	Any silviculture or road proposals deemed to be required in the future but not included at this time should be submitted through the ILUC process for more detailed review	Any additional silviculture or road proposals will be submitted for ILUC review and if required for further review under the EA process.
7	Domestic harvest in Town boundaries	Domestic harvesting within town boundaries may require permits from the town prior to development.	Prior to EA registration and development, DFLR officials will discuss the plan with the Town of Goose Bay and North West River to determine any permits or approvals that may be required.

8	Activities in protected routes	Route 500 & 510 are protected and while forestry uses are permitted, permits may be required from Service NL prior to beginning development in building control lines which extend 400m from the center of the highways.	All commercial harvest blocks have been planned to occur outside of the 400m protected buffer of the trans-labrador highway.
9	Aboriginal consultation	Consultation with Innu Nation, NunatuKavut and Nunatsiavut Government is required on this plan due to land claim rights and asserted claims.	Currently working within forest consultation agreement with Innu Nation and NunatuKavut on the planning process. No activities area scheduled within the LISA.
10	Intrusion onto Hydro ROW	There not be any intrusion onto any Hydro ROW of access trail/road.	Could be some overlap with proposed transmission link for Muskrat Falls project with south side commercial harvest blocks.
11	Domestic harvesting in NASP sites	Proposed domestic blocks overlap Grand Lake land parcel and requests that overlapping portions of proposed domestic harvest blocks be removed.	Grand Lake NASP site will be identified on domestic harvest maps as NO CUTTING areas.
12	Red Wine Caribou Habitat	Eight of the proposed commercial harvest blocks intersect with the Red Wine Mountains caribou core areas and require a harvesting restriction during the period of May 15-September 30. 43 of the proposed domestic cut blocks intersect Red Wine Mountains caribou core areas and recommend that harvesting not occur during the period of May 15 – September 30.	Core area received in May 2012 from wildlife division has slightly shifted with incorporation of most recent collar data. According to most recent data analysis, from Wildlife Division, there is no conflict with any of the proposed commercial harvest blocks or proposed roads.

13	Easter Habitat Joint Venture Management Units	Proposed domestic cutting blocks intersect with HVGB eastern Habitat Joint Venture Management Units and there should be no development within these management units. Furthermore mitigations for domestic cut blocks that intersect with the HVGB stewardship zone should be discussed with the Town of HVGB.	Management Units will be identified on domestic harvest maps as NO CUTTING areas. The Town of HVGB will be notified of any commercial harvesting within stewardship zone. Domestic harvesting is very light especially during winter and will have little impact with in the stewardship zone.
14	Road construction in RWCH area	Recommendation of temporary cessation of road building activities during the period of May 15 – Sept. 30	Core area received in May 2012 from wildlife division has slightly shifted with incorporation of most recent collar data. According to most recent data analysis, from Wildlife Division, there is no conflict with any of the proposed commercial harvest blocks or proposed roads.
15	Silviculture	Apply environmental protection guidelines to all proposed areas	EPG's are applied.

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APPENDIX I – Acknowledgements

The preparation of an ecosystem-based forest management plan for a district as complex as district 19 would not have been possible without the contributions from the following people (in no particular order):

Colin Carroll Darren Jennings Bryn Wood Chris Griffin	Richard Nuna Guy Playfair Bruce Hewlett Frank Phillips Glorina Tee

The planning team also wishes to acknowledge the dedication of the members of the public stakeholders group and Innu Nation members who participated to our public process and provided essential input. Without their contributions, this plan would not be as successful.

APPENDIX II – Legal Description of District 19A (Goose Bay)

Forest Management District 19A
Goose Bay

All that piece or parcel of land situated and being in the Goose Bay – Happy Valley area in the Electoral District of Lake Melville abutted and bound as follows:

Commencing at Nebavik Point, latitude 53° 48’ longitude 59° 48’, on the south side of Mulligan Bay;

Then in a generally northwesterly direction along the south side of Mulligan Bay and Mulligan River, South Branch, to its headwaters at a point, latitude 53° 59’ longitude 60° 29’, on the south end of a small lake;

Then on a bearing of 221 for approximately 5.5 kilometers to a point, latitude 53° 56’ 30’’ longitude 60° 32’ 30’’, on the North End of a small pond on the headwaters of a branch of Crooked River;

Then along this branch of Crooked River to a point, latitude 53° 55’ 30’ longitude 60° 46’, to where it meets Crooked River;

Then on a bearing of 270 for approximately 14.8 kilometers to a point where the Red Wine River flows into the Naskaupi River, latitude 53° 55’ 30’ longitude 60° 59’ 30’’;

Then along the south shore of Red Wine River, south branch, to a point, latitude 53° 48’ longitude 61° 45’, on the south end of a small lake at its headwaters;

Then on a bearing of 180° for approximately 87.8 kilometers to a point, latitude 53° 00’ longitude 61° 45’, on a small hill;

Then on a bearing of 270° for 23.8 kilometers to a point, latitude 53° 00’ longitude 62° 06’, on the northwest end of a string bog;

Then along a bearing of 194 for approximately 10.6 kilometers to a mouth of a tributary of the Churchill River, latitude 52° 54’ 30’’ longitude 62° 09’;

Then east along the bank of this tributary, east branch, to a point, latitude 52° 50’ longitude 62° 04’, on the northeast end of a small lake;

Then following a bearing of 229° for approximately 8.9 kilometers to the south side of a small lake, latitude 52° 47’ longitude 62° 10’, on the height of land;

Then following the height of land that separates the gulf watershed from the Labrador Sea watershed in a generally easterly direction to a small marsh, latitude 52° 38’ longitude 59° 55’;

Then is a generally northerly direction along the height of land that separates the Kenamu River Watershed from those flowing into the Labrador Sea, to a small lake, latitude 53° 18’ longitude 59° 34’;

The following a bearing of 360° for approximately 1 kilometer until it intersects with the Kenemich River, latitude 23° 18’ 30’’ longitude 59° 34’

Then following the Kenemich River on the north bank to the first major branch, latitude 53° 21; longitude 59° 46’;

Then along a bearing of 19° 30’ for approximately 20 kilometers to the mouth of Big River, latitude 53° 51’ longitude 59° 40’, east of Kinriakak Point;

Then following a bearing of 343° for approximately 32 kilometers across Lake Melville to the point of commencement including all islands;

All bearings are given true north.

APPENDIX III – Descriptions of the Ecological Protected Network Areas

One of the key principles of ecosystem-based planning is the identification of an ecological protected area network (PAN) at different levels of planning. For this plan, the ecological protected areas strategy focused on three distinct scales: landscape, watershed, and stand
At the landscape scale, the ecological PAN's were designed at the 1:500,000 map scale for all of district 19 and the 1:250,000 map scale for district 19A. As shown on maps 7 & 8, the district 19A EPAN is designed to 'nest' within the district 19A EPAN, with several of the 19 PAN components forming the network of the 19A PAN. A similar exercise is anticipated for districts 19B and 19C in future planning efforts.

The landscape scale ecological protected area networks were designed by Silva Ecosystem Consultants. The PAN designs were based on the principles of landscape ecology and conservation biology. The objective for the development of the PAN was to designate both unique and representative core reserve areas, and to begin to design broad connectivity linkages in the landscape, as a "course filter" to allow for the persistence of all ecosystems and habitats. While smaller scale forestry activities or other activities may occur, these areas are only protected from large scale commercial forestry activities.

A summary of the component descriptions and general methodology utilized by Silva in the creation of the landscape scale PANs is listed below. Please note that the landscape scale PANs do not incorporate cultural land use information or protected areas at the watershed and standard levels.

1. District 19 Ecological Protected Area Network (1:500,00 Scale)

The primary data sources for district 19 PAN designed was the Drieman vegetation inventory, the Lopoukhine ELC mapping (see Chapter 1), un-classified Landsat imagery and woodland caribou spatial data.

The area that was the most difficult to address was the extensive area dominated by bogs, lichen forest, and varied shrub in the west half of district 19. In the end, it was elected to delineate a set of areas of unique features identified using the available data sources (Core Reserves #2,3,4, and 5),. These areas exist within the matrix that is dominated by bogs, shrubs, and lichen forest, but deserve identification as ecologically unique features and special habitat areas. Further linkages through the matrix need to be designed to connect unique areas, when more information is available.

It was also recognized that there were subtle differences, unique areas, and unique patterns in what is referred to as the matrix. Based on the information that was available it was difficult to differentiate between these areas. If and when a further, more detailed level of protected areas planning occurs for the western half of district 19, there will be additional information required and gathered to support a more detailed PAN that reflects

the diversity of the landscape. In other words, the area defined as the matrix contains a significant degree of heterogeneity and clumped differentiation.

PAN Component Descriptions

The district 19 PAN is composed of 4 core reserves, a Red Wine Caribou Reserve, and 3 linkages.

Core Reserve #1: Mealy Mountains Proposed National Park
The Mealy Mountains Park covers a very wide range of ecosystem types in district 19. ranging from rugged bedrock to uplands to extensive low lands, and includes significant portions of the Eagle Plains and of the relatively productive semi-closed and closed canopy spruce-fir forests in the Kenamu River valley. It provides a large and varied core area in the eastern portion of District 19. It also includes the vast majority of the range of the Mealy Mountains Caribou herd in district 19. At this scale, and at the stage of initial PAN development, its proposed boundaries were acceptable as the limit of CR-1.

A section of the Core Reserve is included in the District 19A PAN

Core Reserve #2: Seal Lake
This area consists of Lopoukhine's ecoregion L4 and L5 at the far north end of district 19. This is an area of deeply striated geology with parallel ridges of sedimentary rock, long narrow lakes and an unusual degree of deciduous vegetation cover. This area is quite unique in all of district 19, and cannot be understood without considering it as embedded in a large landscape that lies north of district 19.

Core Reserve #3: Churchill River Uplands-West
This core reserve consists of Lopoukhine's ecodistrict R-4. It is an outlier of the Domagaya Lake ecoregion that is located to the southwest, adjacent to the Quebec border. This ecodistrict is a slightly elevated area of shallow soils over hummocky bedrock topography. It comprises the northern headwaters of the Mecatina River, and is also at the junction of many smaller local watersheds. It is also adjacent to the Churchill River linkage. It contains a very complex pattern of vegetation, including many of the most westerly stands of semi-closed canopy forest in district 19. It is a unique sub-type in the western portion of district 19.

Core Reserve #4: Complex Habitat Matrix-Southwest
Core Reserve #4 is a large area of mixed, moderately dense coniferous forest with non-commercial scrub forest, bog, and lichen forest along the southern edge of district 19. This area was selected for inclusion in the protected areas network because it has a very high level of biodiversity based on the vegetation types, and it provides a wide range of habitat for many species in a relatively small area. The conjunction of open water, riparian ecosystems, wetlands, scrub forest, and closed canopy provides the most range found in southern Labrador in one continuous unit. This includes all of Lopoukhine eco-district S-5 and a portion of the S-3, S-4 and S-6 eco-districts.

This area also provides good connectivity from the central district 19 area down towards the Quebec-Labrador border. The reserve extends along the border for approximately 40 km, providing ample opportunities for cross boarder and inter-agency coordination to ensure the maintenance of reasonable movement routes from Labrador into the forests of Quebec, and vice versa. Most recently, Quebec released a working paper, Plan Nord, which outlines commitment by the Government of Quebec for environmental protection. As of May 2011, protected areas have been identified along the Quebec-Labrador border of which it appear that there is some correlation with Core Reserve #4. Further discussion with Quebec could take place during this plan.

Core Reserve #6: Red Wine Caribou Reserve
The Red Wine Caribou Reserve is an initial interpretation of the core habitat area for the Red Wine Caribou herd based upon spatial data provided by the Department Environment and Conservation, Wildlife Division. Additional spatial data was obtained from Schaefer at al. (2001). As additional caribou data becomes available, the boundaries of this reserve will need to be refined.

The endangered Red Wine caribou herd was given special consideration in the PAN design, since wide-range woodland caribou are especially sensitive to habitat fragmentation and loss. Woodland caribou are generally considered “umbrella” species: if we ensure sufficient woodland caribou habitat, then we simultaneously ensure sufficient habitat for many other species.

The Red Wine caribou reserve is located in a large, highly variable lichen scrub and bog dominated area referred to in the discussion above as part of the matrix in the western portion of district 19. The caribou reserve effectively serves to connect the more heavily forested areas to the east and south with the Red Wine Mountains and areas to the northwest.

A section of the core reserve is included in the district 19A PAN.

Linkage #1: Churchill River
This major linkage was designed to provide connectivity through the key central portion of district 19 along the Churchill River valley. This valley includes the unique and unusual rich ecosystem and vegetation types on the slopes and floodplain bordering the Churchill River.

The linkage begins at Lake Melville at the boundary of the Mealy Mountains Proposed National Park. The linkage runs along the south side of the Churchill from the Proposed National Park to a point just north of the junction of the Churchill and Minipi Rivers. The linkage in this area varies from over 15 km wide, to about 3 km wide, depending on biophysical features. The widest points of the linkage are designed to encompass substantial wetland complexes, sandy lichen barrens, and other areas of high biological diversity.

West of the Minipi River, the Churchill River linkage occupies both sides of the

Churchill River valley. The linkage boundary in this stretch follows a very significant Lopoukhine ecoregion boundary. The linkage through this area occupies moderately steep slopes, falling into the main Churchill River valley, and the vegetation and ecosystems on these slopes. Vegetation in the area ranges from closed canopy coniferous forest to lichen forest and varied shrub.

The purpose of the linkage is to provide connectivity on a central axis through district 19, and to protect the unique habitats found in the Churchill River valley. While this valley occupies a very small portion of the total area of district 19, the deeply incised valley and steep north – and south-facing slopes result in a series of ecotypes that are unique in the district 19 area. They are likely critical habitat for many species.

A section of this linkage is included in the district 19A PAN. A domestic harvesting reserve and a selective-commercial harvesting area within a portion of the 19A section have been incorporated into the linkage. These special management areas aim to ensure local community members have some small scale access to forest resources, while maintaining the ecological integrity of the linkage.

Linkage #2: Dominion Lake-Minipi Lake
This broad linkage ranges from 15 to 20 km in width and connects the Mealy Mountains Proposed National Park to the Churchill River valley. It encompasses the southern portions of district 19A form the Kenamu watershed to the Minipi watershed and then to the Dominion watershed and finally, to the Churchill River linkage.

The purpose of the linkage is to provide a second east-west connecting route, this time through varied, relatively gentle terrain. The linkage also encompasses several large lakes and associated river systems, and provides a very diverse range of habitats. To an extent, this linkage duplicates the function of the Churchill River linkage, but it is located 75 kilometers to the south over much of its length, and in a significantly different set of eco-types. The southern boundary of the eastern two-thirds of this linkage follows the watershed divide between the Kenamu and Minipi watersheds, and the major watersheds that flow south into the province of Quebec.

A large section of this Linkage is included in the district 19A PAN.

Linkage #3: Eagle Plains-Quebec
This is a north-south linkage which joins the Mealy Mountains Proposed National Park with the Quebec-Labrador border, running straight north-south. This linkage is designed mainly to provide connectivity, but also to encompass representative portions of two of Lopoukhine's ecodistricts-V-2 and V-7-and a portion of district X-2. The linkage was designed to encompass portions of these major eco-regions to mirror the biodiversity in the area. V-2 is occupied largely by closed canopy to moderate closed canopy commercial forest, whereas V-7 is dominated by more open wetlands.

The linkage swells to over 20 km in width as it nears the Quebec border, to capture an area dominated by old fires and deciduous forests, which are unique in the southern

landscape of district 19. The linkage passes through an area for which there is no Drieman vegetation inventory data. The linkage in the reach will need to be modified when vegetation data becomes available, so as to encompass specific areas of unique biodiversity and other habitat types.

2. District 19A Ecological Protected Area Network (1:250,000 Scale)

The district 19 ecological PAN description explains the rationale for the PAN at the large landscape scale (1:500,000) and highlights the components that have been transferred to the district 19A PAN. The majority of the designated protected areas and linkages in district 19A are in fact the result of PAN design at the district 19 level. The district 19 PAN already includes many of the rare and representative ecosystems in district 19A. However, representation and connectivity both within and beyond district 19A are significantly improved by the addition of the three components of the district 19A PAN.

Component Descriptions

The district 19A PAN is composed of two additional core reserves and one additional linkage.

Core Reserve A: Kenamu River
The Kenamu River watershed includes a vast range of biophysical land cover types as well as many rare forest types. The lower reaches of the Kenamu River are already included in the proposed study area of the Mealy Mountains Proposed National Park (Core Reserve 1). This reserve focuses on protecting the middle reaches of the river's watershed, which includes many complex lower elevation areas that are not well suited to forest operations.

Core Reserve B: Naskaupi River-Susan River
At the northern end of district 19A, a number of major rivers flow into the west end of Grand Lake. These rivers – the Naskaupi, Crooked, Red Wine and Susan Rivers – drain extensive areas to the north and west. The lower reaches of these river systems contain regionally rare semi-closed canopied forests that rapidly disappear as one moves up stream and/or out of the river valleys. From a landscape perspective, forestry operations are not ecologically viable in such situations.

Logging along the Grand Lake road now heavily fragments the area south of Grand Lake. This reserve, extending from the north shore of the Susan River and east to the Crooked River valley, is required to ensure representation of viable core habitat areas in the northern portion of district 19A.

Core Reserve C: Waterfowl Reserve
This thin reserve begins on the shores of Lake Melville northwest of Northwest River and continues up to Sebaskachu bay. The reserve protects the sensitive shoreline and coastal islands, which form important waterfowl habitat. This small reserve contains a mixture of

forest and wetland habitats with many fresh/salt water estuaries.

Linkage A: Goose River-North
This linkage connects the extensive scrub and barrens of the Red Wine Caribou Reserve to the Goose Bay wetlands, following the northern portion of the deeply incised Goose River valley. The Goose River valley's forested slopes provides key habitat and a distinct natural connectivity corridor in the landscape of north-central FMD 19A. This linkage preserves some connectivity in the most heavily fragmented portion of FMD 19A. The Grand Lake Area to the north, the area south of Goose River extending to the Churchill River, are the two areas that have been extensively logged over the past 30 years.

APPENDIX IV – Environmental Protection Guidelines

Environmental Protection Guidelines

For Ecologically & Culturally Based Forest Management In District 19

(Standard Level Operations)

September 25, 2002

> ***"Forests are interconnected webs which focus on sustaining the whole, not the production of any one part or commodity. Trees, the most obvious part of a forest, are critical structural members of a forest framework. However, trees are only a small portion of the structure needed for a fully functioning forest." (Hammond, 1991)***

An ecologically based approach to forest management requires that forest managers shift their focus from managing resource components of the ecosystem to managing the three-dimensional ecological landscapes that produce them. The primary concern then becomes the maintenance of landscapes and waterways as complete ecosystems, because the only way to assure the sustained benefit of forest values, now and in the future, is to keep them and all their parts in a healthy state.

Similarly, the foundations of Aboriginal culture and the traditional Labrador economy are the natural ecosystems of what the Innu call *Nitassinan.* These ecosystems support and maintain all wildlife, fish, plants, and fresh water. Throughout much of Nitassinan, forests are the dominant ecosystem. Hence there is a strong need for forest planning, policy, and environmental protection guidelines that ensure the protection and careful use of the district's forest landscapes and stands.

Innu Nation and the Department of Natural Resources (DFLR) are committed to the concept of ecosystem-based forest management. This commitment is captured in the district 19 plan vision statement:

> ***"To create an ecosystem-based forest management plan for district 19 that protects ecological and cultural integrity, productive capacity, resiliency and biodiversity while advancing economic opportunities for the sustainable development of forest-based industries."***

The district 19 plan and the Provincial strategy plan provides the strategic goals, objectives, and guiding principles for how to achieve this vision, and provides the basis from which these environmental protection guidelines were developed.

The environmental protection guidelines provide specific "on the ground" standards for harvesting operators. They form a framework for monitoring compliance and give management direction to forest planners. These guidelines are intended for stand level operations, although occasionally reference may be made to watershed or landscape level planning issues. Individually, the guidelines appear as specific rules; however, when implemented collectively they aim to facilitate ecologically based and culturally appropriate forest management.

These guidelines were developed by the DFLR and Innu Nation through consideration of scientific literature, discussions with resource managers, and in consultation with members of the Innu Nation and the general public. In implementing the district 19

forest management plan, the DFLR and Innu Nation will continue to oversee management issues, and as new information and management techniques become available; these guidelines will be adapted accordingly. These guidelines will be formally reviewed and revised on an annual basis to incorporate any necessary changes.

These guidelines are conditions of Crown commercial harvesting permits, and they are the basis for monitoring operator compliance.

1.0 Pre-Operational Planning and Monitoring Requirements

1.1 Harvesting Blocks

a) Harvest blocks will be identified in the five year plan and annual work schedules.
b) Where planned harvest blocks are within one kilometer of existing or proposed ecological reserves, wilderness reserves, provincial parks, or important viewsheds, modified operations may be necessary.
c) Harvest blocks will delineate riparian buffers and ecologically sensitive sites that are defined and mapped at the watershed level (1:50,000).
d) Adjacency guidelines* will be applied to provide for connectivity at the watershed level, wildlife corridors, avoid concentration of harvest blocks and maintain a component of older age class forest through time.
e) Harvest blocks will be generally 100-400 ha in size. Following surveys and assessments, harvest blocks will be divided up into harvest units and connected by stand-level ecological protected area networks.

1.2 Harvest Block Survey & Assessment

a) Each harvest block will be assessed in the field to describe and map ecosystem types and terrain features such as localized steep slopes[2], streams (permanent, intermittent and ephemeral), bogs, wildlife dwellings/habitats, scrub patches and small gap disturbances that are not mapped at the watershed level.
b) These features (environmental, topographic, forest conditions, etc.) within the harvest block may restrict or require harvest modifications as per operational standards[3].

1.3 Stand Level Ecological Protected Area Network (EPAN)

*Represents an issue that will be resolved on a "go forward" basis. Unresolved issues will be monitored, researched and ultimately resolved by the parties implementing these guidelines.
[2] Defined as slopes greater than 30%.
[3] Operational standards are defined in section 2.

a) Based on the field assessment, a stand level ecological protected area network (EPAN) will be developed according to identified ecosystem types and terrain features.
b) The EPAN will function to protect ecological structures and features as well as to provide connectivity at the stand and watershed level.
c) The EPAN will account for approximately 30% of the total Harvest Block. The remaining area outside of the EPAN will be incorporated into harvest units. Leave areas will be maintained during the current management period.

1.4 Harvest Unit Size and Shape

a) Harvest unit size and shape will be defined by the ecosystem features present, EPAN, and the harvest block boundaries.
b) Harvest units will follow natural topographic features and curved edges, feathered where possible.
c) Clear-cut openings within harvest units will have varied dimensions and maximum cover-to-cover distances in any direction of <300 m.
d) Harvest unit's openings will be designed to maximized edge-edge radios.

1.5 Silviculture Prescriptions

a) A silviculture prescription will be completed for each harvesting block.
b) Silviculture prescriptions will include ecological site description; logging method; areas of ecologically sensitivity; criteria for selecting permanent reserve trees, patches or strips; locations of skid roads/yarding routes, temporary bridges; any silviculture treatments following cutting.
c) Silviculture prescriptions must be prepared prior to officially committing logging blocks to timber cutters and commencing logging.
d) Silviculture prescriptions need to include a series of appropriate maps at appropriate scales.
e) Each silviculture prescription will contain appropriate timber volume information based on global inventories and operational cruise data, if available.

1.6 Timber Volume Information

a) Timber volumes in each harvest unit will be stratified by species and quality (at a minimum% or estimated volumes of sawlogs and pulp if an operational timber cruise has been completed), and this information will be provided as part of the silviculture prescription for each harvest unit.
b) Accessible stands of quality sawlogs will be generally reserved for value-added production. General harvest allocation will reflect a proportionate

degree of good and poor areas (harvest perspective) to maintain an adequate balance of harvest opportunities.

c) This data should be derived from an operational timber cruise, but in absence of cruise data, data may be derived from DFLR forest inventory data. Timber volumes will be subject to the following working net-down factors[4].

Volume Net-down	**Percent**
Residuals and Retention	6.0%
Cull	10.0%
Waste and Breakage	3.0%
Other	1.0%
Total	**20.0%**

1.7 Monitoring & Review

a) Provisions for monitoring and audits must be made by the operator in accordance with an approved monitoring and audit system* before harvesting operations are carried out.

b) Monitoring and audits will use these environmental protection guidelines as a basis for assessing operator compliance.

1.8 Cultural Values Protection

a) A minimum 50-meter, no-cut buffer is to be left between operations and approved cabins. Planners will consult with cabin owners and make best efforts to modify operations in order to achieve an outcome acceptable to the parties involved.

b) All harvesting in visually sensitive areas (as identified in the Provincial strategic plan or in five-year operating plans) will adhere to the district visual management guidelines.*

c) The historic resources division will be contracted for review of all five year operating plans to advise on the location of any known historic resources or areas of high potential for historic resources, and appropriate mitigation measures

[4] These working net-down factors will be refined over time, and are subject to further research, monitoring and review.

2.0 Operational Harvesting Standards:

2.1 Riparian buffers

a) Riparian buffers will be based on the ecological sensitivity of the riparian ecosystem.
b) A minimum buffer distance shall be established on both sides of every water body and around the perimeter of every wetland.
c) The buffer width must include the riparian zone and riparian zone of influence (the riparian ecosystem), with particular attention paid to inclusion of shallow and wet soils.
d) Where the slope is greater than 30% there shall be a minimum no-harvest buffer of 20 m + (1.5m x % slope).
e) All equipment or machinery is prohibited from entering any water body, therefore structures must be created to cross over such water bodies.
f) Buffers must be marked in the field prior to logging, and no cutting is permitted in the riparian buffer, unless the buffer meets specific requirements[5].
g) Riparian buffers will exceed the minimum buffer distances for identified fish and wildlife habitat requirements.
h) Minimum buffer distances are as follows:

Major Rivers	100m
Salmon Rivers & Lakes	100m
Lakes*	20 m
Bogs & Wetlands	20m
Permanent Streams*	20m
Intermittent Streams	12m[4]*
Ephemeral Streams	10m[4]*

2.2 Wildlife Dwellings, Corridors, & Habitat Buffers

a) A 50-meter, no-cut, treed buffer will be maintained around known black bear denning sites (winter) or those encountered during harvesting. These den sites must be reported to the Wildlife Division.
b) No forestry activity is to occur within 800 meters of a bald eagle or osprey nest during the nesting season (May 15 to September 15) or for any active nest, and 200 meters during the remainder of the year. The location of any raptor nest site must be reported to the Wildlife Division.
c) All hardwoods within 30 meters of a water body occupied by beaver are to be left standing.

[5] A selective harvest may be permitted under certain conditions within buffers for intermittent and ephemeral streams*.

d) A minimum 30-meter, no-cut, treed buffer will be maintained from the high water mark in waterfowl breeding, moulting, and staging areas. These sites will be identified by the Canadian Wildlife Service and/or the Wildlife Division.

e) Where moose shelter and moose yards are identified, they will be designated for protection in consultation with Wildlife Division.

f) Harvesting is not permitted within caribou calving areas.

g) Harvest scheduling will be modified during the migration of wildlife (e.g., incursion of George River caribou into the Grand Lake area) and during temporary wildlife concentrations (e.g., waterfowl staging). Wildlife Biologists will identify the areas of concern, and in conjunction with district planners, determine the requirements for any suspension or modification of forestry operations.

h) During the preparation of five-year operating plans, areas identified as "Sensitive Wildlife Areas" will require consultation with the Wildlife Division prior to any allocations in or adjacent to those areas for purposes of forestry activity.

i) In addition to the guidelines listed above, special considerations will apply to the following species (*Guidelines to be developed)*:

-Marten
-Woodland Caribou
-Porcupine

2.3 Ecologically Sensitive Sites

a) At the stand level, ecologically sensitive sites must be mapped and protected from harvesting. Ecologically sensitive sites will include:

-Riparian buffers
-Wildlife dwelling & habitat buffers
-Steep slopes
-Scrub patches
-Very moist sites
-Shallow soils
-Young regenerating stands

2.4 Priority Protection Areas

a) Priority protection areas are designated to highlight stand and ecosystem types that are currently rare in district 19.

b) Although these stands are given a priority for protection, portions of these stands may be included for harvesting where justified.
c) Priority protection areas will include, but are not limited to:

-Areas identified as containing rare and/or unique flora (though field identification and/or literature review).
-White spruce stands and trees*
-Hardwood stands and trees

2.5 Retention Requirements

a) A percentage* of the standing volume must be reserved from cutting in each harvest unit to provide for the maintenance of ecosystem structures, functions, and aesthetics.
b) The standing volume will be retained for protection of stand micro-features including rock outcrops/ridges, scrub patches, intermittent/ephemeral streams, advanced regeneration, snags, hardwood species, and to provide connectivity between features.
c) Retention patches and leave trees must be well distributed throughout each harvest unit and include sufficient stand integrity.
d) A minimum average of 10 live trees over 50 cm dbh and snags per hectare (average on a cut block) well distributed as groups of trees of sufficient integrity to withstand wind throw is to be left on all sites (harvesting and silviculture).

2.6 Skid Roads

a) Skid roads must be pre-located in harvest units so that sensitive sites and features are not damaged.
b) Soil disturbance from skid roads and operations adjacent to skid roads (e.g. landings) is to be minimized (less than 10% of the block area).
c) Soils prone to rutting (moist to wet) must be avoided during non-winter conditions. All roads must avoid or, where avoidance is not feasible, minimize crossing ecologically sensitive areas.
d) Skidding bridges and/or culverts must be used to protect all wet areas and water courses, including ephemeral streams and seeps during operations.
e) Erosion control measures (e.g. laying down brush mats and construction diversion ditches for water run-off) are to be maintained while the skid road is in use.
f) When a skid road is on steep ground and is no longer in use, cut-off ditches and push lanes must be created. The frequency of ditches will be determined by district planners.

2.7 Site Disturbance & Erosion

a) Excessive bulldozing is not permitted and no more than 10% of the total forest within an operating area can be disturbed (including roads and landings).
b) Where disturbance exceeds 10%, a rehabilitation plan will be developed by the district planners and carried out by the operator.
c) Disturbance is defined as per the ground disturbance survey guidelines developed by the Newfoundland Forest Service.
d) Any forestry operation that directly or indirectly results in silt entering a water body must be dealt with immediately (a government official must be notified within 24 hours). Failure to comply will result in the operation being stopped, and may result in charges being laid against the operator under applicable legislation.

2.8 Archaeological Feature Protection

a) When an archaeological site or artifact is found, work on the site must immediately stop. The discovery must be immediately reported to the Historic Resources Division.
b) The Historic Resources Division, in consultation any affected Aboriginal groups will determine what measures are to be taken with respect to any discovery of historic resources on a harvesting block.

2.9 Fuelling, Spills, & Wastes

a) All waste disposal sites require a Certificate of Approval from the Minister of Government Services and Lands.
b) Should an oil or gas spill in excess of 70 liters occur, the operator must make every effort to firs contain and second clean up the spill and must immediately report the spill to the Spill Report Line at 1-800-563-2444.
c) No heavy equipment or machinery is to be refueled, serviced, or washed within 30 meters of a water body.
d) Gasoline or lubricant depots must be located no less than 100 meters from the nearest water body.
e) All fuel-storage tanks (including JEEP tanks) must be registered with the Department of Government Services and Lands and installed in accordance with the Storage and Handling of Gasoline and Associated Products Regulations.
f) Used or waste oil shall be collected either in a tank or a closed container.
g) Above ground storage tanks shall be surrounded by a dyke. The diked area will contain not less than 110% of the capacity of the tank. The base and walls of the dyke shall have an impermeable

lining of clay, concrete, solid masonry, or other material which has been designed, constructed, and maintained to be liquid tight to a permeability of 25L/M2/d. There shall be a method to eliminate water accumulations inside the dyke.

h) Garbage is to be disposed of at an approved garbage disposal site. Prior to disposal it must be contained in a manner which will not attract wildlife. All equipment is to be removed from the operating area where operations are completed.

2.10 Utilization

a) Complete utilization of harvested trees is required. Complete utilization is harvesting of trees to a top diameter of 8 cm and stumps to a height of 30 cm (see Utilization Guidelines).

b) The district planners can modify the stump height requirement to accommodate snow conditions.

3.0 Forest Access Roads

3.1 Minimum Standards

a) All forest access roads will adhere to the minimum standards and guidelines described in:

The DFLR Forest Resources Road Operating Manual. Department of Fisheries & Oceans Resource Road Construction – Fish Habitat Protection Guidelines.

3.2 Forest Access Road Locations

a) All proposed forest access roads must be surveyed and assessed before construction commences.

b) All proposed forest access roads locations must be identified in five year operating plans.

c) The Canadian Wildlife Service is to be consulted when road construction is to occur around identified waterfowl breeding, molting, and staging areas.

d) Road construction is not permitted within any buffer zone except with the permission of the district planners.

e) All forest access roads, borrow pits, and quarries must avoid:

-Wetlands, deltas, and floodplain or fluvial wetlands;
-Terrain with high erodibility potential;
-Known sensitive wildlife areas such as calving grounds, calving areas, caribou migration routes, caribou rutting areas and winter areas, waterfowl breeding areas and colonial nesting sites, bear

dens, established moose yards, eagle and osprey nest sites, etc.;
-Known sensitive fish habitat, such as spawning and rearing grounds;
-Culturally significant areas such as archaeological sites;
-Existing reserves such as parks (municipal, provincial, or national), wilderness areas and ecological reserves, or rare, threatened, and endangered plant sites and habitats.

3.3 Borrow Pits & Quarries

a) Operators will be required to minimize the number of new borrow areas opened for construction and/or maintenance.
b) Existing borrow areas will be utilized whenever practical.
c) Pits and quarries require a valid quarry permit from the Department of Mines and Energy prior to aggregate extraction activities.
d) Pits and quarries shall not be located in sensitive areas.
e) Where borrow pit or quarry activity is likely to result in sediment-laden runoff contaminating a water body, sediment control measures such as filter fabric berms or sedimentation ponds are to be installed. The district planners must approve any mitigation methods prior to aggregate extraction where such conditions exist.
f) Borrow pits are to be located no less than 50 meters from the nearest water body.
g) Operators are required to rehabilitate borrow pits and quarries after use to an acceptable standard as determined by the district planners.

3.4 Bridges, Culverts & Ditching

a) Bailey bridges and arched open bottom culverts will be preferred to round “closed-bottom” culverts for all stream crossings.
b) Any proposed locations for bridge or culvert installations will be reviewed and approved, with any appropriate modifications, by monitors in the field prior to construction.
c) All bridges and culverts are to be installed in accordance with the manufacturer’s specifications and the specifications attached to the Certificates of Approval received from the Department of Environment and Conservation and from the Department of Fisheries and Oceans. Culvert ends will be properly riprapped.
d) Excavations required for the construction of piers, abutments, or multi-plate culverts will be completed in dry conditions according to DFO standards.
e) Baffles and check culverts are to be placed at frequent intervals in any ditches constructed on slopes.

f) Ditches near streams will be designed so that any discharge is not directed into the stream.
g) Ditches will be constructed at the same or smaller gradient as the road.
h) In side hill and similar areas, ditches will be constructed on the uphill sides of roads to intercept seepage and run-off.

3.5 Water Body Crossings & Vicinity

a) The proposed location together with stream reach survey information must be submitted to the Department of Environment and Department of Fisheries and Oceans for all proposed water body crossings. Stream reach surveys will be conducted according to the Department of Fisheries and Oceans "Standard Methods Guide of Freshwater Stream Surveys in Newfoundland and Labrador".
b) Permits or letters of approval are required from the Department of Environment and the Department of Fisheries and Oceans for all water body crossings.
c) Heavy equipment and machinery are not permitted in any water body. Whenever possible, any in-stream work is to be carried out from dry stable areas.
d) A "no-grub" zone of 30 meters of undisturbed ground vegetation must be maintained around any water body crossing to minimize the damage to the lower vegetation and organic cover, thus reducing erosion potential.
e) Manual clearing at water body crossing sites should be used to remove or control vegetation.
f) Right-of-way widths at water body crossings should be kept to a minimum.
g) Fill materials for road building must not be obtained from any water body or from within the floodplain of any water body.
h) Trees are to be felled away from all water bodies, and slash and debris should be piled above the high water mark so that it cannot enter water bodies during periods of peak flow.
i) Unnecessary side casting or back ditching in the vicinity of water bodies is not permitted. Where topographical constraints dictate that the roadbed must be constructed adjacent to a water body, road slope stabilization must be undertaken at the toe of the fill where it enters the water (an area where active erosion is likely). The placement of large riprap or armor stone is recommended in such areas.
j) Side casting must be carried out in such a manner that sediment does not enter any water body.
k) All cut banks and fill slopes in the vicinity of water bodies shall be stabilized.

l) To minimize erosion and sedimentation, water body crossings shall:
-have stable approaches;
-be at right angles to the water body;
-be located where channels are well defined, unobstructed, and straight;
-be at a narrow point along the water body;
-allow room for direct gentle approaches;
-preserve vegetation to the greatest extent possible;
-stabilize any soil exposed during bridge construction or culvert installation according to an approved method.

3.6 Decommissioning

a) On a site specific basis, roads can be decommissioned and/or rehabilitated as directed the district planners. Decommissioning is defined as barring access; rehabilitation means to re-vegetate the road.
b) All closed bottom culvert structures shall be removed on road decommissioning, unless otherwise directed by the Department of Fisheries and Oceans.

4.0 Silviculture Operations

4.1 Scarification

a) Select scarification methods best suited for preparing the area for planting and for minimizing ground disturbance.
b) Where slash is piled into windrows, ensure the windrows are placed where slash cannot be washed into streams at peak flooding conditions.
c) To minimize erosion, do not direct scarification equipment straight down slope.
d) Where safety is not an issue, a minimum average of 10 cavity trees or snags per hectare, or a clump of trees, will be left on all sites.
e) Whenever possible, natural regeneration will not be disturbed.

4.2 Planting

a) Only local native species will be planted.
b) Landings will be stabilized by planting tree seedlings, alder, and willows at the time of plantation establishment.

4.3 Pre-Commercial Thinning

a) Pre-commercial thinning activities will not be undertaken in sensitive wildlife areas during sensitive periods. These locations and times will be identified by the Wildlife Division.
b) Where white spruce regeneration is present, the district planners will determine how the spruce will be thinned.
c) Trees cut will not be felled into water bodies.
d) Pre-commercial thinning will not occur in riparian buffers or along roadsides.

APPENDIX V - Visual Management Guidelines

Various viewsheds have been identified within the plan with various objectives. For example the Grand Lake view shed is the only viewshed identified that has been protected from harvesting and excluded from the landbase. Other view sheds include the TLH and Mulligan Bay snowmobile trail in which various portions have been protected from harvesting. However there are portions of the viewsheds that have been identified and will be scheduled for harvest and may be visible from the TLH route. The viewshed can be used as a tool for managers to reduce the visual impact of harvesting.

In all cases the viewsheds have been refined by observer points and distance from the actual area of interest. For example, the viewshed developed for phase III of the TLH was refined to only include points that are visible from more than 5 observer points and within 20km's of the highway. This viewshed is depicted in map 12.

Since not all areas of viewshed are protected from harvesting, planners are working on a set of guidelines to be applied to harvest blocks which are scheduled for harvest within the identified viewsheds. These guidelines can be seen as a "go forward" issue which will be further developed over the life of this plan. Since this is a new concept, guidelines identified will be applied on a trial basis and further refined as necessary.

Draft visual management guidelines are as follows:

1. No harvesting within 100m of the TLH.
2. Arrange operating blocks to minimize visual impacts.
3. Maintain skyline reserves and leave areas to conceal harvested areas.
4. Locate roads on lower slopes and use buffers where necessary to reduce visibility.
5. Where ever possible, schedule operations within the viewshed during winter months, to limit ground disturbance.
6. Pay closer attention to planning by Department staff, Innu Guardians and operators to strategically locate skid trails to limit ground disturbance.
7. Areas harvested within the viewshed should be priority for regeneration surveys and if necessary selected silviculture treatments.

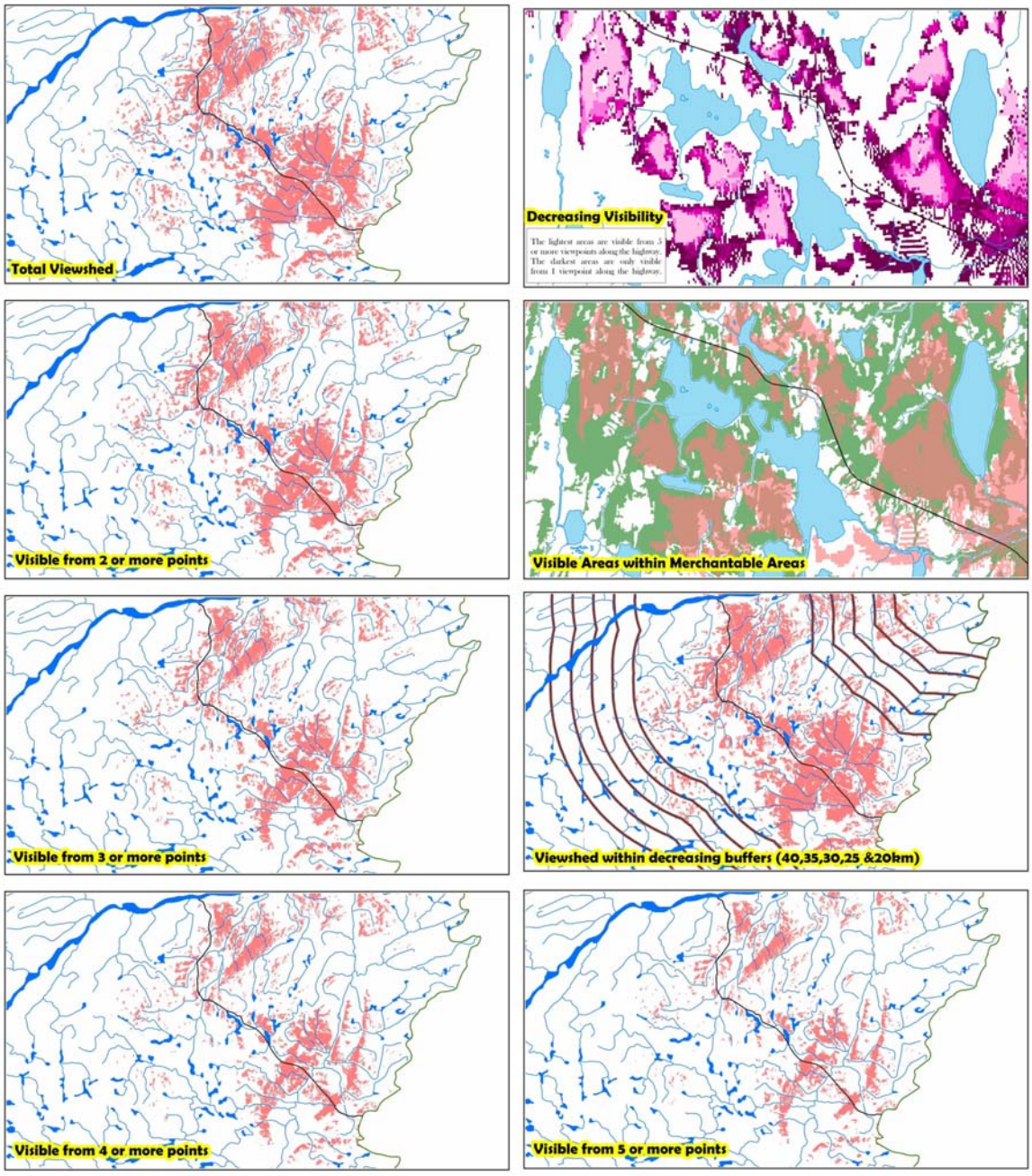

Figure 13: Trans-Labrador Highway Phase III viewshed analysis.

APPENDIX VI - Forest Management District 19
Domestic Cutting Permit Conditions

Revised June 30, 2007

1. The permittee must record, in a legible manner with a permanent marker or lumber crayon, the permit number on the butt end of every wood pile regardless of pile size or location.

2. Permittee must have permit, map and conditions in his/her possession when cutting and/or hauling timber.

3. (a) Permittee shall utilize all portions of all trees cut to a top diameter of 8 centimetres and stump heights shall not exceed 15 centimetres.

(b) All conditions under section 3(a) must be done when each tree is cut and before cutting another tree.

4. A helper can cut or transport timber, but must be accompanied by the permit holder (exceptions made only under special conditions, with prior approval from Forestry official). Wood is to be delivered to permit holders principal residence.

5. All waste material (garbage) associated with this activity shall be removed and disposed of at an approved waste disposal site.

6. Unless otherwise indicated or approved by the District Office there shall be:

a. No cutting, piling or storage of timber within 100 metres of any stream, brook or other body of water unless authorized by the District Office.

b. No cutting, within 30 metres of forest access roads.

c. No cutting, within 30 metres of designated groomed snowmobile trails.

d. The cutting of burnt timber within the no cut areas on attached map is permitted with the following restrictions:

I) No cutting within 250 meters of the Birch Brook Nordic Cross Country Ski Trails.

II) The crossing or use of ski trails for travelling to and from cutting areas and/or hauling wood is not permitted.

III) No cutting on private or recreational property.

e. No cutting, on islands.

7. Unless otherwise indicated, all sawlog sized timber cut which is suitable for sawlogs must be utilized as sawlogs.

8. Permittee shall not cut or in any way damage immature or silviculturally treated timber.

9. Unless otherwise indicated, all timber cut shall be removed from the cutting area to a roadway while cutting is in progress.

10. During the forest fire season, this permit is invalid unless accompanied by an operating permit.

These conditions are a summary only. Complete regulations and acts are available at the Forestry Office in North West River or at the Regional Office in Happy Valley.

For further information please phone 497-8485, North West River or 896-3405, Happy Valley.

APPENDIX VII- Wood Supply Analysis

A major forest ecosystem value identified by stakeholders is the actual fiber which can be harvested to further produce commercial forest products, such as dimensional lumber or wood for domestic use. To ensure the sustainability of the forest over time, we cannot harvest more fiber than is produced in one year's growth of the entire forest. This annual rate of harvest is commonly referred to as the annual allowable cut (AAC).

AAC's are calculated for the Province on a district by district basis often taking unique district values into consideration. The AAC for FMD 19a was calculated using the Spatially Explicit Landscape Event Simulator (SELES). SELES is a spatially and temporally explicit landscape modeling tool that allows the development of landscape models. Since SELES was conceived specifically for the development of landscape models, model development in SELES is considerably simpler that development using more generalized programming languages. SELES is currently being used for ecological landscape modeling and timber supply analysis in Canada, the U.S, Europe and South America.

The D19a Landscape Model (D19aLM), developed with SELES, uses specific geographic information about the district to represent the initial forest structure such as forest type, topography, etc. Along with this, it uses a series of landscape events (or behaviors such as fires, harvesting, and succession), which are based on local information and defined by the model developer, to simulate changes in forest structure over time.

The AAC is calculated by using the best available data at that time; however the AAC is recalculated every five years and may be calculated sooner if certain forest conditions warrant. The inventory data available and used for the calculations was previously described in chapter 2.

The land base available for harvest (or net operable area) is a major factor in the AAC calculation. Based upon the most up-to-date data, a classification of the net operable area was done using a geographic information system (GIS). In this analysis, the land base is divided into commercial and non-commercial forest types. The commercial forest is defined as forest stands that contain a minimum softwood volume of 90 m3/ha. Therefore stands less that 9m in height (height class < 4) and less that 75% crown closure (density = 3) on poor sites (43P stands) are not considered commercial forest.

From this commercial forest land base various area reductions were applied utilizing the GIS to account for:

- Ecological and cultural protected areas networks
- Isolated stands and ecologically sensitive terrain
- 20m forested buffers on rivers, lakes, major streams and bogs
- Areas dominated by slopes greater than 30%

The remaining operable commercial forest land base was then mapped and considered available for timber management activities. The operable commercial forest land base is shown on map 13.

Furthermore, approximately 30% of the operable commercial land base is excluded to account for finer level protected area networks composed of sensitive ecosystem types and terrain features such as localized steep slopes, small streams (permanent, intermittent and ephemeral), micro-bogs, wildlife dwellings and habitat, scrub patches and small gap disturbances that are not mapped, but identified during field surveys. The result is the net operable commercial forest. Table A describes the district 19a land base and highlights the protection net-downs.

Table A: FMD 19a land base and net-downs.

Land base	North side (ha)	South side (ha)	Total (ha)
Total District 19a area (*Less ~70% for non-forest ecosystems and non-commercial forest stands)*	1,041,643	1,186,256	2,227,899
Commercial Forest *(Less ~50% for protected area networks and other reductions)*	166,166	512,305	678,471
Operable Commercial Forest *(Less 28.6% for finer level protected area networks)*	91,153	233,585	324,738
Net Operable Commercial Forest	65,083	166,780	231,863

As part of the wood supply analysis, several scenarios, applying various variations of the protected area networks were assessed. As suspected, simulations revealed that as the protected area networks were shifted the AAC was affected and in this case decreased. This is mostly due to the fact that in some scenarios the operable commercial land base was further reduced due to the shift in protection.

Total Protected	AAC	Change	Analysis notes

Area (ha) *(% of district)*	(m^3/year)		
~1,318,000 *(64%)*	210,937	0	No fire model, 400 yr. simulation
~1,318,000 *(64%)*	202.938	-7,999	Fire model included, 400 yr. simulation
~1,322,000 (*64%*)	195,311	-7,627	No fire model, 400 year simulation
~1,322,000 (*64%*)	191,312	-3,999	Fire model included, 400 yr. simulation

To appropriately assess the wood supply clear objectives and constraints were identified within the program. They were:

1. Feasible harvest target: The annual harvest target must be achievable in all periods.
2. Level long-term growing stock: A stable long-term growing stock is a key indicator of sustainable timber supply. If this is declining, harvests are higher that can be supported over the long run, and if it is increasing, there may be more harvest opportunities that can be exploited. A variation of +/-1% is tolerated between the growing stock mid-way through simulation and growing stock at the end of simulation.
3. Time period: The AAC would be forecasted over a 400 year period.

Furthermore, numerous scenarios were assessed using SELES under the previous management plans constraints which compared the protection of ecological and cultural protected area networks with and without non-spatial fine-scale protection (Fall 2006). Planners agreed that since there was very little new information that could be applied at this time, that the spatial assessment including fine levels of protection would most appropriately reflect the district's current situation.

The results of the actual AAC calculation for district 19a were 202,938 m^3/year. However, to apply a precautionary approach the AAC was reduced to 200,000 m^3/year account for uncertainties in the land base. This results in the operational AAC for district 19a to be 200,000 m^3/year.

It was also acknowledged that since the Red Wine Caribou recovery team is still working on identifying and further refining core and recovery habitat, that for the purposes of the AAC analysis temporary a Red Wine reserve (~1 million ha) based on an analysis of collar data would be used for this analysis. Further to this all operations are planned to take place outside of where the majority of the caribou collar points indicate their existence. Identification of the Red Wine recovery and core habitat is expected to be refined during the life of this plan and the plan will be amended if necessary.

APPENDIX VIII – Resource Access Road – Classification Standards and Specifications

Road Class				
	A	**B**	**C-2 C C-1**	**D**
Deign Load and Speed	(Loaded tractor trailer) @55 kph. @50 kph.		(Loaded tandem [pallet]) 30 kph.	Single axle 3 metric tonnes or less @25 kph.
Road width, drop off to drop off	9.0 m	7.5 m	6.0 m 5.0 m 4.0 m	3.5 m – 4.5 m
Max. grade	6%	8%	10%	15%
R.O.W. width	30 m	23 – 30 m	20 m	15 – 20 m
Min. sight dist.	150 m	120 m	90 m	45 m
Max. change of grade (blind hill limitations)	0.6 m in 20 m	0.8 m in 20 m	1.0 m in 20 m	--------
Min. depth of ditch	1.0 m	--------	0.6 m	0.3 m
Surface material (type and depth)	Min. 15 cm of AASHO class A-1-b or better	Granular, no stones larger than 10 cm in the top 30 cm	Granular, no stones larger than 15 cm in the top 30 cm	Granular, no stones larger than 15 cm in surface
Design Load	(Loaded tractor trailer) @55 kph. @50 kph.		(Loaded tandem [pallet]) 30 kph.	Single axle 3 tonnes or less @25 kph.
Fill Slope	2 : 1	1 ½ : 1	1 ½ : 1	--------
Cut Slope	2 : 1	1 ½ : 1	1 ½ : 1	--------

APPENDIX IX – Silviculture Program Information

Operational Treatments

Operational treatments can be divided into one or more of three categories. Forest renewal treatments are aimed at establishing new forests on sites that fail to regenerate adequately on their own following disturbance. Treatments that fall under this category include planting, seeding and site preparation. Forest improvement treatments are aimed at improving the productivity of otherwise adequate forest sites. The most common treatment falling under this category is thinning (pre-commercial (PCT), commercial (CT) and diameter limit (DLT)). Stand reclamation treatments are aimed at the replacement of degraded forests that occupy productive forest sites.

In order to fulfill the mandate of the Provinces silviculture program, DFLR's Labrador Region currently employs a Silviculturist and a Silviculture Technician. The Department also operates a Tree Nursery in Goose Bay that employs a Nursery Manager, Nursery Supervisor and 5 seasonal Silviculture Workers.

Summary of silviculture activities (ha of area treated) in district 19 (1982-2011)

Year	Planting (ha)	PCT (ha)	Site Preparation (ha)	Stand Reclamation (ha)
1982	15	--	--	--
1983	65	--	--	--
1984	56	--	--	--
1985	100	--	100	--
1986	65	--	--	--
1987	130	104	62	--
1988	130	--	12	--
1989	140	--	200	--
1990	94	--	--	--
1991	68	--	--	17
1992	144	50	--	25
1993	111	--	103	72
1994	130	--	56	53
1995	105	75	12	--
1996	114	--	--	--
1997	111	14	--	25
1998	67	22	--	15
1999	90	--	--	--
2000	90	--	--	--
2001	90	--	--	--
2002	40	50	--	--
2003	158	--	--	--

Year	Planting (ha)	PCT (ha)	Site Preparation (ha)	Stand Reclamation (ha)
2004	146	49	--	--
2005	113	75	--	--
2006	177	80	--	--
2007	170	50	--	--
2008	110	--	--	--
2009	--	42	--	--
2010	106	--	--	--
2011	105	--	--	--

Silviculture Research and Development

The silviculture and research section of the Forest Ecosystem Management Division is responsible for conducting applied research on silviculture and tree improvement issues on behalf of DFLR. To meet this mandate, the section employs a Research Silviculturist and technical support. As well, from time to time, silviculture and tree improvement research is initiated and conducted by Regional and Nursery staff in consultation with the Research Silviculturist. The types of silviculture research activities carried out by the Department fall within four broad categories:

Reforestation Research: These research activities revolve around tree seedling planting and involve such issues as planting technique, site preparation, vegetation control and early seeding growth enhancement. As an example, the Department has trials in place to evaluate the benefits of seedling fertilization at the time of planting.

Forest Improvement Research: Research in this area typically revolves around the response of juvenile forests to various improvement activities such as density control, fertilization and intermediate harvesting (ex. commercial thinning). As an example, the Department has in place a series of trials to look at the response of various forest stand types to commercial thinning.

Tree Improvement Research: The Department has in place a program to improve the genetic quality of the seedlings that we grow for reforestation. In this way, we hope to enhance the yield from our forest plantations. In support of this effort, research trials are established to test the genetically enhanced seedlings, thereby providing us with the information required to select those trees which are truly superior. Additionally, tree improvement research includes testing to determine what tree species grow best under various circumstances.

Nursery Research: Nursery orientated silviculture research primarily involves the effort to produce the best quality seedling at the most reasonable coast. An example of this type of research would be assessment of the performance of seedlings grown in a variety of container types.

APPENDIX X - Public Participation Process Summary

Nine public planning team meetings were held in total in district 19 throughout various communities. Meetings were held on a regular basis at the following dates and locations:

1.	January 10, 2012	Happy Valley – Goose Bay, NL	18 participants
2.	January 31, 2012	Happy Valley – Goose Bay, NL	14 participants
3.	February 21, 2012	Happy Valley – Goose Bay, NL	13 participants
4.	March 6, 2012	Happy Valley – Goose Bay, NL	13 participants
5.	March 20, 2012	Happy Valley – Goose Bay, NL	17 participants
6.	April 3, 2012	North West River, NL	9 participants
7.	April 17, 2012	Happy Valley – Goose Bay, NL	19 participants
8.	May 29, 2012	Happy Valley – Goose Bay, NL	12 participants
9.	July 19, 2012	Happy Valley – Goose Bay, NL	7 participants

Innu Community Consultation Summary

The Innu Nation Forest Guardians and planning staff gathered comments from members on forestry related issues. Often, strategic issues such as large-scale protection and operating procedures as well as more pointed on-the-ground issues are discussed in the community. Ongoing research and the monitoring efforts of the Forest Guardians are also given regularly to the community.

Summary of ongoing concerns and comments are:

- If trees in buffers are falling down because of the wind, the buffers need to be bigger.
- Hunting along beginning of Churchill Falls highway for porcupine – the Jack Pine plantations are a favorite source of food for porcupine and it changes the taste of the meat. Do not like Jack Pine planted.
- There are important camping areas around lakes south of Mista Shipu. The forest around these lakes should be protected from cutting.
- People use the 4-mile road for picking berries and getting firewood. This road should be upgraded and give access to more firewood.
- The impact of forestry on wildlife should be studied; for example food species such as porcupine, partridge and rabbit
- It is good that the Forest Guardians are watching.
- Everyone in the community should be kept informed of what is happening in forestry, and what employment or development possibilities emerge

General Public Participation Summary

Overall thirty two participants participated in this public process and offered input into the plan. The represented various organizations including Municipal, Provincial, Federal and Aboriginal Governments, research institutions, Universities, concerned citizens,

industry, special interest groups and development associations. The minutes from these meetings can be obtained by contacting the Regional Office of the Department of Natural Resources at 709-896-3405.

The public sessions were organized so that the maximum participation from stakeholders could be achieved. The opening meeting acted as a bridging information session to inform the public of the process and timelines. The following session acted as a organizational session where a list of forest issues were prioritized and discussed by the group.. This feedback was then used to schedule future consultation sessions. The list of issues is summarized below:

- Water resources in forestry
- Water quality and quantity issues
- Research initiatives
- Environmental Management Systems for Crown lands
- Forest pests and damage
- Silviculture
- Forest industry
- Domestic Harvesting
- Forest fire suppression
- Value added and small scale industry
- Agriculture
- Protected areas
- Domestic harvesting
- Commercial harvesting and processing
- AAC levels
- Forest access roads
- Monitoring committee

APPENDIX XI –
Management Units by Contribution to District Land base

Operable land bases & timber volume estimates

Unit	Gross Area[1] (ha)	Gross Volume[2] (m^3)	Gross Volume/ha[3]	Net Area[4] (ha)	Net Volume/ha[5]
MU1	31,875	3,608,441	113	28,870	120
MU2	45,622	5,294,851	116	43,328	120
MU 3	36,541	4,038,884	111	33,452	116
HVGB	7,816	817,358	105	6,192	119
Northside Total	121,854	13,759,534		111,842	
MU 4	63,692	7,492,248	118	61,670	125
MU 5	81,849	9,474,341	116	77,961	119
MU 6	119,983	12,572,164	105	113,174	108
MU 7	50,146	4,606,619	92	41,594	100
MU 8	21,734	2,578,873	119	20,586	123
Southside Total	337,4047	36,724,245		314,985	
District Total	459,258	50,483,779	111	426,827	117

1 Total area of management units.
2 Gross volume of all stands with associated softwood volume reported.
3 Average gross volume of all stands with associated softwood volume.
4 Total net area of all stands within a management unit which have a softwood volume of 60m^3/ha or greater.
5 Average net volume of all stands within a management unit which have a softwood volume of 60 m3/ha or greater.

APPENDIX XII – Harvest Permit Conditions

Commercial Permit Conditions (revised May 25, 2007)

The permit holder and operations are subject to the Forestry Act and Regulations.

2. The permit holder must follow the attached Environmental Protection Guidelines when conducting forestry operations.

3. Permit holder is responsible for obtaining an operating permit to operate during the fire season. A commercial cutting permit is invalid during fire season, unless accompanied by an operating permit.

4. White spruce trees are to be reserved from harvesting.

5. All timber cut shall be scaled by a certified scaler at location indicated on permit (unless otherwise stated).

6. Operations carried out under this permit shall utilize trees as per the following: (unless otherwise indicated on permit).
   a) All merchantable trees in cutting area greater than 9 cm dbh (diameter breast height) must be felled and removed from cutting area except those designated as leave trees or leave areas by the Dept. of Forest Resources and Agrifoods.
   b) All trees must be utilized to a top diameter of 8 cm.
   c) All stumps must be as low as possible and not exceed 15cm in any case.
   d) All timber suitable for sawlogs must be utilized as sawlogs.
   e) Hardwoods, advanced growth, regeneration and snags shall not be cut.

7. Unless otherwise indicated or approved by the District Office there shall be:

   a) No cutting, piling or storage of timber within 100 meters of any stream, brook or other body of water unless authorized by the District Office.
   b) No cutting, within 30 meters of designated trails (groomed trails, etc.)
   c) No cutting, on islands.
   d) No bulldozing of trees.
   e) No activities in silvicultural or no cutting areas
   f) All waste material (garbage) associated with forest operations shall be removed and disposed of at an approved waste disposal site.
   g) No person or company shall construct a forest road or bulldoze skid trails, timber landings or similar types of work associated with timber harvesting operations, without the approval of the Minister or his designate, in writing prior to the commencement of construction.

1. The permittee shall not cross, operate in or disturb streams or water bodies unless

written permission has been obtained from the Dept. of Fisheries and Oceans and the Water Quality Division of the Dept. of Environment and Labor.

9. The permittee will be responsible for any damage to access roads that is found attributable to their operation

10. The permittee must record, in a legible manner with a permanent marker or lumber crayon, the permit number on the ends of every wood pile regardless of pile size or location.

11. Timber cut on this permit can only be sold to a person holding a timber purchase license

1. If operations are not commenced within three (3) months, this permit will be suspended.

These conditions are a summary only, complete regulations and act are available at the address below.

Box 429, North West River, LB A0P 1M0 497-8479/8481

APPENDIX XIII – Criteria and Indicators Programs

CRITERIA AND INDICATORS
of Sustainable Forest Management in Canada
Canadian Council of Forest Ministers (CCFM) framework

1. Conservation of Biological Diversity

The variability among living organisms from all sources and the ecological complexes of which they are a part – biodiversity encompasses organization at levels ranging from complete ecosystems to the chemical structures that are the basis of heredity. Maintenance of natural genetic and ecosystem diversity across the landscape is the key to ensuring that 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 the maintenance of species diversity. Diversity is therefore inseparable from the generation and maintenance of ecological patterns. Impacts are evaluated through vulnerability assessments which may, in turn, suggest change in the ways forests are managed, or even dictate that action be taken with respect to the restoration of biodiversity.

1.1 Ecosystem Diversity

Ecosystem diversity is the variety and pattern of communities and ecosystems. Maintenance of the variety and quality of the earth's ecosystems is necessary for the preservation of species. Without sufficient quantities of their natural habitats, species become vulnerable.

1.1.1 Percentage and extent, in area, of forest types relative to historical condition and to total forest area;
1.1.2 Percentage and extent of area by forest type and age class (ref. 2.2.1);
1.1.3 Area, percentage and representativeness of forest types in protected areas;
1.1.4 Level of fragmentation and connected ness of forest ecosystem components.

1.2 Species Diversity

The greatest and most readily recognizable form of bio-depletion lies with species extinction. Slowing down the rate of species extinction due to anthropogenic factors is a key objective of the conservation of biodiversity. Changes in species population levels may also provide an early warning of changes in ecosystem integrity.

1.2.1 Number of known forest-dependent species classified as extinct, threatened, endangered, rare, or vulnerable relative to total number of known forest-dependent species;
1.2.2 Population levels and changes over time of selected species and species guilds;
1.2.3 Number of known forest-dependent species that occupy only a small portion of

their former range.

1.3 Genetic Diversity

Genetic diversity, or the variation of genes within a species, is the ultimate source of biodiversity at all levels. It is the material upon which the agents of evolution act. Loss of variation may have negative consequences for fitness and prevent adaptive change in populations.

1.3.1 Implementation of an in situ/ex situ genetic conservation strategy for commercial and endangered forest vegetation species as defined by the Canadian Biodiversity Strategy (Federal-Provincial-Territorial Biodiversity Working Group. 1994. Draft Canadian Biodiversity Strategy for Discussion. Biodiversity Convention Office, Hull, Quebec. 69 p.) and as established by Categories I-VI of the IUCN Guidelines (IUCN Commission on National Parks and Protected Areas with the assistance of the World Monitoring Centre. IUCN – The World Conservation Union, Gland, Switzerland. X + 261 pp.)

2. Maintenance and Enhancement of Forest Ecosystem Condition and Productivity

This refers to the health, vitality, and rates of biological production in forest ecosystems. The sustainable development of a system is dependent upon normal functioning over the long term. In a living system, normal functioning implies appropriate levels of health, vitality, and productivity of its components.

Forest condition is a measure of relative freedom from stress (health) and relative level of physical/biological energy (vitality) within a forest ecosystem. When integrated, they provide a measure of ecosystem functioning. Forest productivity refers to rates of flora and fauna production, which depend on the degree to which nutrients, water, and solar energy and absorbed and transferred within the ecosystem. Sustainable productivity within a forest ecosystem is dependent upon the ability of the ecosystem's components and their populations to recover from or adapt to disturbances.

2.1 Incidence of disturbance and stress (biotic and abiotic)

This element refers to the levels of are pollutants and the frequency/severity of major biotic and abiotic stresses. Together these are a dynamic complex which, depending on the particulars of the disturbances/stress, may negatively or positively affect forest condition over time.

2.1.1 Area and severity of insect attack;
2.1.2 Area and severity of disease infestation;
2.1.3 Area and severity of fire damage;
2.1.4 Rates of pollutant deposition
2.4.5 Ozone concentrations in forested regions;

2.1.6 Crown transparency in percentage by class;
2.1.7 Area and severity of occurrence of exotic species detrimental forest condition;
2.1.8 Climate change as measured by temperature sums.

2.2 Ecosystem resilience

Ecosystem resilience reflects the persistence of ecosystems and their capacity to absorb change and disturbance while maintaining the same productivity and the same relationships among populations. The focus is on the potential for populations to recover from very low levels by having adequate regenerative capacity and a balanced distribution of forest types and age classes.

2.2.1 Percentage and extent of area by forest type and age class (ref. 1.1.2);
2.2.2 Percentage of area successfully naturally regenerated and artificially regenerated.

2.3 Extant biomass (biota)

Extant biomass is an integrating measure of forest ecosystem condition. It refers to the condition of the forest in terms of biomass production of all species and types and includes the ability of ecosystems to support rare species.

2.3.1 Mean annual increment by forest type and age class;
2.3.2 Frequency of occurrence within selected indicator species (vegetation, birds, mammals, fish).

3. Conservation of Soil and Water Resources

This refers to the maintenance of soil and water quantity and quality. Soil and water are essential components of the forest ecosystem. The soil and water conservation criterion refers to measures that maintain the quantity and quality of soil and water within and leaving forested ecosystems. The primary focus for soil conservation is the maintenance of the living substrate for forest stands, whereas water conservation centers on the provision of potable water for human and wildlife use and the provision of suitable aquatic environments for plants and animals.

3.1 Physical environmental factors

Physical environmental factors include both soil and water resources. Soil environmental factors refer to the area of productive forest soil where the physical ability of the soil to sustain forest growth has been changed. Proposed measures include the area where land use changes take soil out of forest production or where activities have reduced organic matter levels, compacted soil or led to soil loss through erosion. These reduce the ability of the soil to support forest productivity. Aquatic factors refer to both physical and chemical properties: for example, flow patterns, water temperature, aeration, sediment load, and chemistry which provide for aquatic plant and animal life. Changes in aquatic environments can negatively affect aquatic life.

3.1.1 Percentage of harvested area having significant soil compaction, displacement, erosion, puddling, loss of organic matter, etc.;
3.1.2 Area of forest converted to non-forest land use, for example, urbanization (ref. 4.2.1);
3.1.3 Water quality as measured by water chemistry, turbidity, etc.;
3.1.4 Trends and timing of events in stream flows from forest catchments;
3.1.5 Changes in distribution and abundance of aquatic fauna.

3.2 Policy and protection forest factors

In order to ensure that terrestrial and aquatic ecosystems are maintained, it is important that policies are in place which provide for specific management practices or the protection of sensitive sites. Sensitive site conditions include riparian zones, wet soils, infertile soils, steep slopes, and shallow soils over bedrock. With respect to aquatic systems, policies that address stream crossings, watershed management, and riparian areas will assist in maintaining water flow patterns, water levels, and water quality.

3.2.1 Percentage of forest managed primarily for soil and water protection;
3.2.2 Percentage of forest area having road construction and stream crossing guidelines in place;
3.2.3 Area, percentage and representativeness of forest types in protected areas (ref. 1.1.4).

4. Forest Ecosystem Contributions to Global Ecological Cycles

This refers to the impact of the forest and forest activities on global ecosystem functions. Global ecological cycles are a complex of self-regulating processes responsible for recycling the earth's limited supply of water, carbon, nitrogen, and other life-sustaining elements. The world's forests are critically dependent upon, and make substantial contributions to, these global processes. Global ecological cycles are negatively impacted by fossil fuel combustion and associated toxic emissions. Forests make a major positive contribution to global cycles through the uptake and storage of carbon. The longevity, large area of standing crops and conservative decomposition rates characteristic of forest ecosystems make them particularly well adapted to long-term positive carbon balance. Conversely, conversion of forest lands to low biomass, short-lived standing crops with rapid turnover rates, or the permanent removal of forest cover, degrades the land's capacity to absorb and store carbon. For these reasons forest management should promote sustained utilization and rejuvenation for forest ecosystems and protect them from widespread destruction by fire, pests and conversion to alternate land uses. Further, forest management should promote the manufacture of products that can act as long-term carbon pools and that have a low fossil fuel demand in their production.

4.1 Contributions to global carbon budget

Global ecological cycles are negatively affected by the accelerated release of CO2 into

the atmosphere. Carbon budgets that estimate the balance between carbon fixation and carbon release from natural forests and forest products provide a sensitive indicator of the nation's contribution to atmospheric carbon enrichment.

4.1.1 Tree biomass volumes;
4.1.2 Vegetation (non-tree) biomass estimates;
4.1.3 Percentage of canopy cover;
4.1.4 Percentage of biomass volume by general forest type;
4.1.5 Soil carbon pools;
4.1.6 Soil carbon pool decay rates;
4.1.7 Area of forest depletion;
4.1.8 Forest wood product life cycles;
4.1.9 Forest sector CO2 emissions.

4.2 Forest land conversion

Carbon budgets are sensitive to forest land conversions because replacement ecosystems usually have higher carbon turnover rates and lower storage capacity than forested lands. Irreversible forest removals have particularly negative and long-term impact on carbon budgets.

4.2.1 Area of forest permanently converted to non-forest land use (for example, urbanization) (ref. 3.1.2).
4.2.2 Semi-permanent or temporary loss or gain of forest ecosystems (for example, grasslands, agriculture).

4.3 Forest sector CO2 conservation

Forest sector CO2 conservation is used to track the industry's relative dependence, through time, on fossil fuels for conversion of raw materials to manufactured products.

4.3.1 Fossil fuel emissions;
4.3.2 Fossil carbon products emissions;
4.3.3 Percentage of forest sector energy usage from renewable sources relative to total sector energy requirement.

4.4 Forest sector policy factors

The commitment of governments to sustaining global ecological cycles can be gauged through evaluation of forest sector policies.

4.4.1 Recycling rate of forest wood products manufactured and used in Canada;
4.4.2 Participation in the climate change conventions;
4.4.3 Economic incentives for bioenergy use;
4.4.4 Existence of forest inventories;
4.4.5 Existence of laws and regulations on forest land management.

4.5 Contributions to hydrological cycles

Hydrological cycles are a vital component of global ecological cycles. Changes of water surface area within forest landscapes provide a synoptic indicator of potential impacts of forest practice on hydrological cycles.

4.5.1 Surface area of water within forested areas.

5. Multiple Benefits to Society

This is about sustaining the flow of benefits from the forest for current and future generations. Forests provide a mix of benefits to society including commercial wood products, commercial and non-market goods and services, and environmental and option values. Sustainable development requires that the forest continue to provide these goods and services over the long term. The forest products industry is Canada's largest earner of foreign exchange. It provided 311,000 direct jobs and an equivalent number of indirect jobs in 1993. Many of these jobs are situated throughout rural areas of Canada where alternative economic opportunities are limited. Many rural communities are entirely or largely dependent on the forest sector for their economic well-being.

In addition to the significant commercial benefits derived, Canada's forests support a wide range of other activities that provide benefits including tourism, wildlife, recreational use of the forest, aesthetics, and wilderness values. Although not always measurable in monetary terms, these activities are also highly valued by Canadians and provide significant benefits to Canadian society.

5.1 Productive capacity

In order to ensure that resources are conserved while still maintaining a satisfactory flow of benefits, efforts must be made to ensure that extraction is not allowed to exceed the long-term productive capacity of the resource base to provide a wide range of goods and services. Excessive rates of extraction are unsustainable and inconsistent with the concept of sustainable forest development.

5.1.1 Annual removal of forest products relative to the volume of removals determined to be sustainable;
5.1.2 Distribution of, and changes in, the land base available for timber production;
5.1.3 Animal population trends for selected species of economic importance;
5.1.4 Management and development expenditures;
5.1.5 Availability of habitat for selected wildlife species of economic importance.

5.2 Competitiveness of resource industries (timber/non-timber related)

The sustainable development concept recognizes the direct linkage between environment and economy. In order to ensure that economic benefits continue to flow to Canadians, it is vital that a fair and competitive investment climate be maintained within the forest

sector. A competitive rate of return is essential if Canada's various forest-based industries are to attract the necessary capital for maintaining their capacity to create jobs and incomes for Canadians.

5.2.1 Net profitability;
5.2.2 Trends in global market share;
5.2.3 Trends in research and development expenditures in forest products and processing technologies.

5.3 Contribution to the national economy (timber/non-timber sectors)

Another important consideration for this criterion is the question of the distribution of wealth. Sustainable development involves more than simply maximizing economic development. It also requires consideration of the way in which wealth from development is distributed to society. Wealth from forest use flows to Canadians through the market economy (which can be measured with economic indicators such as gross domestic product and employment) and through the subsistence economy (involving income in-kind from the extraction and use of fuel wood; building materials; meat, fish, and fur products; medicinals; etc.).

5.3.1 Contribution to gross domestic product (GDP) of timber and non-timber sectors of the forest economy;
5.3.2 Total employment in all forest-related sectors;
5.3.3 Utilization of forests for non-market goods and services, including forest land use for subsistence purposes;
5.3.4 Economic value of non-market goods and services.

5.4 Non-timber values (including option values)

A wide range of non-timber values are associated with forests including recreation values, tourism values, existence values, and option values. As Canadian society becomes more affluent and the Canadian economy evolves to a more urban industry-based/service-oriented economy, the importance of non-timber values may be expected to increase.

5.4.1 Availability and use of recreational opportunities;
5.4.2 Total expenditures by individuals on related to non-timber use;
5.4.3 Membership and expenditures in forest recreation-oriented organizations and clubs;
5.4.4 Area and percentage of protected forest by degree of protection.

6. Accepting Society's Responsibility for Sustainable Development

This means making fair, equitable, and effective resource management choices. The concept of sustainable development transcends biological, ecological, and economic benchmarks. Ultimately it is about people. It is about society's values, the quality of life

of members of society, both individually and collectively, and the effectiveness with which we have organized ourselves as a society to ensure that we are managing the relationship between ourselves and our resources in a way that is in the best interests of present and future generations. Thus, this criterion concerns the effectiveness of institutions in managing resources in ways that accurately reflect social values, the responsiveness of institutions to change as social values change, how we deal with the special and unique needs of particular cultural and/or socio-economic communities, and the extent to which the allocation of our scarce resources can be considered to be fair, equitable, balanced, and just.

6.1 Aboriginal and treaty rights

Existing Aboriginal and treaty rights are recognized and affirmed in the Canadian Constitution. In order to ensure that duly established Aboriginal and treaty rights are respected, they should be considered in the context of sustainable forest management. Various levels of government in Canada will aim to meet their legal obligations with respect to duly established Aboriginal and treaty rights in accordance with policy and legislation in their respective jurisdictions. When discussed in relation to renewable resources, such Aboriginal and treaty rights generally relate to hunting, fishing and trapping, and in some cases, gathering.

Forest management and planning processes should be designed, as far as possible, with input from involved Aboriginal communities, as well as other affected groups and communities. Final plans should reflect the options considered and actions taken with respect to duly established Aboriginal and treaty rights.

6.1.1 Extent to which forest planning and management processes consider and meet legal obligations with respect to duly established Aboriginal and treaty rights.

6.2 Participation by Aboriginal communities in sustainable forest management

The cultural and spiritual connection between Aboriginal communities and forests is acknowledged. Increased cooperation between Aboriginal communities and all forest stakeholders is important to achieving the goals of sustainable forest management. Governments will work cooperatively with Aboriginal communities within the policy and legislation of their respective jurisdictions in order to achieve the goals of sustainable forest management.

6.2.1 Extent of Aboriginal participation in forest-based economic opportunities;
6.2.2 Extent to which forest management planning takes into account the protection of unique or significant Aboriginal social, cultural or spiritual sites;
6.2.3 Number of Aboriginal communities with a significant forestry component in the economic base and the diversity of forest use at the community level;
6.2.4 Area of forest land available for subsistence purposes;
6.2.5 Area of Indian reserve forest lands under integrated management plans.

6.3 Sustainability of forest communities

Sustainability can be viewed at a variety of scales. One important level for assessing sustainable development is at the community level. Unsustainable resource practices have the potential to result in high social costs concentrated among residents of rural communities. Decision-making processes that are removed from communities, or that do not consider social costs associated with community instability, do not contribute too sustainable development.

6.3.1 Number of communities with a significant forestry component in the economic base;
6.3.2 Index of the diversity of the local industrial base;
6.3.3 Diversity of forest use at the community level;
6.3.4 Number of communities with stewardship or co-management responsibilities.

6.4 Fair and effective decision-making

Decision-making is often complicated by cultural differences, conflicting economic interests, and differences in exposure to risks. Decision-making processes are embedded within the various institutions that have been established to manage and allocate forest resources. The extent to which these institutions effectively incorporate the full range of social values in decisions and the responsiveness of institutions to change in values over time are a determining factor in monitoring our progress toward sustainable development.

6.4.1 Degree of public participation in the design of decision-making processes;
6.4.2 Degree of public participation in decision-making processes;
6.4.3 Degree of public participation in implementation of decisions and monitoring of progress toward sustainable forest management.

6.5 Informed decision-making

Part of society's responsibility to sustainable development is a commitment to improve our collective understanding of ecosystems and the relationship between the environment and the economy. At the individual level it is important that we make an effort to learn and understand each other's perspectives relative to resource use and forest values and that individuals make an effort to become fully informed about the issues. Each and every member of society has an obligation and responsibility to understand the issues, express their position, and understand and respect the positions of others.

6.5.1 Percentage of area covered by multi-attribute resource inventories;
6.5.2 Investments in forest-based research and development and information;
6.5.3 Total effective expenditure on public forestry education;
6.5.4 Percentage of forest area under completed management plans/programs/guidelines which have included public participation;
6.5.5 Expenditure on international forestry;
6.5.6 Mutual learning mechanisms and processes.

Forest Stewardship Council Principles and Criteria

It is widely accepted that forest resources and associated lands should be managed to meet the social, economic, ecological, cultural, and spiritual needs of present and future generations. Furthermore, growing public awareness of forest destruction and degradation has led consumers to demand that their purchases of wood and other forest products will not contribute to this destruction but rather help to secure forest resources for the future. In response to these demands, certification, and self-certification programs of wood products have proliferated in the marketplace.

The Forest Stewardship Council (FSC) is an international body which accredits certification organizations in order to guarantee the authenticity of their claims. In all cases the process of certification will be initiated voluntarily by forest owners and managers who request the services of a certification organization. The goal of FSC is to promote environmentally responsible, socially beneficial, and economically viable management of the world's forests, by establishing a worldwide standard of recognized and respected Principles of Forest Stewardship.

PRINCIPLE #1: COMPLIANCE WITH LAWS AND FSC PRINICPLES

Forest management shall respect all applicable laws of the county in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

1.1 Forest management shall respect all national and local laws and administrative requirements.
1.2 All applicable and legally prescribed fees, royalties, taxes, and other charges shall be paid.
1.3 In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected.
1.4 Conflicts between laws, regulations, and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case by case basis, by the certifiers and the involved or affected parties.
1.5 Forest management areas should be protected from illegal harvesting, settlement, and other unauthorized activities.
1.6 Forest managers shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria.

PRINCIPLE #2: TENURE AND USE RIGHTS AND REPSONSIBILITIES

Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented, and legally established.

2.1 Clear evidence of long-term forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated.

2.2 Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.

2.3 Appropriate mechanisms shall be employed resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS

The legal and customary rights of indigenous peoples to own, use, and manage their lands, territories, and resources shall be recognized and respected.

3.1 Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.

3.2 Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples.

3.3 Sites of special cultural, ecological, economic, or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized and protected by forest managers.

3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence.

PRINCIPLE #4: COMMUNITY RELATIONS AND WORKER'S RIGHTS

Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.

4.1 The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services.

4.2 Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families.

4.3 The rights of workers to organize and voluntarily negotiate with their employers shall be guaranteed as outlined in Conventions 87 and 98 of the International Labour Organization (ILO).

4.4 Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage.

PRINCIPLE #5: BENEFITS FROM THE FOREST

Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.

5.2 Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.

5.3 Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.

5.4 Forest management should strive to strengthen and diversity the local economy, avoiding dependence on a single forest product.

5.5 Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.

5.6 The rate of harvest of forest products shall not exceed levels which can be permanently sustained.

PRINCIPLE #6: ENVIRONMENT IMPACT

Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity or the forest.

6.1 Assessment of environmental impacts shall be completed – appropriate to the scale, intensity of forest management and the uniqueness of the affected resources -and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.

6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.

6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:

a) Forest regeneration and succession.
b) Genetic, species, and ecosystem diversity.
c) Natural cycles that affect the productivity of the forest ecosystem.

6.4 Representative samples of existing ecosystems within the landscape shall be

protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.

6.5 Written guidelines shall be prepared and implemented to: control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.

6.6 Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivative remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.

6.7 Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.

6.8 Use of biological control agents shall be documented, minimized, monitored and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.

6.9 The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.

6.10 Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion:

a) Entails a very limited portion of the forest management unit; and

b) does not occur on high conservation value forest areas; and

c) will enable clear, substantial, additional, secure, long term conservation benefits across the forest management unit.

PRINCIPLE #7: MANAGEMENT PLAN

A management plan appropriate to the scale and intensity of the operations – shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated.

7.1 The management plan and supporting documents shall provide;

a) Management objectives;

b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands;

c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories;

d) Rationale for rate of annual harvest and species selection;

e) Provisions for monitoring of forest growth and dynamics;

f) Environmental safeguards based on environmental assessments;

g) Plans for the identification and protection of rare, threatened and endangered

species;
h) Maps describing the forest resource base including protected areas, planned management activities and land ownership;
i) Description and justification of harvesting techniques and equipment to be used.

7.2 The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.

7.4 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.

PRINCIPLE #8: MONITORING AND ASSESSMENT

Monitoring shall be conducted – appropriate to the scale and intensity of forest management – to assess the condition of the forest, yields of forest products, chain of custody, management activities, and their social and environmental impacts.

8.1 The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations as well as the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change.

8.2 Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators:
a) Yield of all forest products harvested;
b) Growth rates, regeneration and condition of the forest;
c) Composition and observed changes in the flora and fauna;
d) Environmental and social impacts of harvesting and other operations;
e) Costs, productivity, and efficiency of forest management.

8.3 Documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as the “chain or custody”.

8.4 The results of monitoring shall be incorporated into the implementation and revision of the management plan.

8.5 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring indicators, including those listed in Criterion 8.2.

PRINCIPLE #9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS

Management activities in high conservation value forests shall maintain or enhance the attributes which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

9.1 Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.

9.2 The consultative portions of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof.

9.3 The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.

9.4 Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.

PRINCIPLE # 10: PLANTATIONS

Plantations shall be planned and managed in accordance with Principles and Criteria 1-9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

10.1 The management objectives of the plantation, including natural forest conservation and restoration objectives, shall be explicitly stated in the management plan, and clearly demonstrated in the implementation of the plan.

10.2 The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods, shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocks shall be consistent with the patterns of forest stands found within the natural landscape.

10.3 Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.

10.4 The selection of species for planting shall be based on their overall suitability for the site and their appropriateness to the management objectives. In order to enhance the conservation of biological diversity, native species are preferred over exotic species in the establishment of plantations and restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.

10.5 A proportion of the overall forest management area, appropriate to the scale of the plantation and to be determined in regional standards, shall be managed so as to restore the site to a natural forest cover.

10.6 Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail

construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.

10.7 Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.

10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species should be planted on a large scale until local trails and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.

10.9 Plantations established in areas converted from natural forests after November 1994 normally shall not qualify for certification. Certification may be allowed in circumstances where sufficient evidence is submitted to the certification body that the manager/owner is not responsible directly or indirectly of such conversion.