

Forest Management Plan 2008-2012

Five Year Operating Plan Forest Management District 23



Final Draft

Submitted by:

NL Department Natural

Resources and the

Nunatsiavut Government



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Executive Summary

Forest management planning sessions were re-initiated within District 23 in 2008. The result of this process combined with information gathered during a previous public consultation process conducted by AMEC Earth and Environmental Ltd, resulted in this five year operating plan covering the time period from 2008-2012. This plan outlines the various management activities scheduled to take place in the district during the outlined planning period. Further refinements are made to operational activities in the annual work schedule, which is subject to further review.

District 23 is approximately 2.2 million hectares of boreal forest situated in Northern Labrador. The district is comprised of mainly of low volume stands and non-forested and non-productive area. Only approximately 2% of the district has a commercial productive forest, dominated by a black spruce/balsam fir mixed forest. This is the majority of commercial timber resources that exist on the North coast of Labrador. The district is generally bound by the Labrador Coast on the East, Groswater Bay and Lake Melville on the south, the Mulligan and Red Wine Rivers in the West and the Kanainktok Bay River and Bay in the north.

The majority of the residents in the district are of Inuit descent and since the signing of the Labrador Inuit Land Claims Agreement in 2005, the District contains three land classes, Labrador Inuit Lands, Labrador Inuit Settlement Area and Crown Lands.

Commercial activity has been relatively sporadic in the past, with several attempts since the 1940's to start commercial operations that have failed. The most recent is the operation of Postmill Lumber in Postville. Domestic activities remain fairly stable over time, since fuel wood is the main source of heat in the three communities and dimensional lumber is hard to get.

Public consultations were conducted and their ideas and values incorporated into this plan. Specifically, the following key district values were identified and addressed in the plan.

1. Species at risk
2. Cultural heritage values
3. Hunting and trapping
4. Non-timber values
5. Socio-economic values
6. Timber values
7. Potential developments
8. Value-added processing
9. Water resources

The calculated annual allowable cut for the district has been determined to be **15,700 m³** for a total five year harvest of **78,500 m³**. This will account for commercial and domestic harvests in the area. Access to a majority of the commercial timber will require the construction of up to 20

km of primary access road, which is anticipated to cost in well in excess of one million dollars. Due to the lack of disturbed area (fire or harvesting), silviculture efforts will focus on small local planting projects (75ha/year) and conducting regeneration surveys on previous harvest blocks to determine stocking and future opportunities.

Five harvest areas have been identified for harvesting over the next five years. These blocks contain a mix of black spruce and balsam fir species with at total a net volume of approximately **113,120 m³**. This is approximately 45% more volume than is required to support the proposed commercial operations, with a proposed annual harvest of **12,000 m³/year (60,000 m³ total)**. All commercial operations are scheduled to take place on Labrador Inuit Lands and will be governed by the environmental protection guidelines and any other policies or guidelines developed by the Nunatsiavut Government. Domestic harvests, which are expected to be less than **3,700 m³/year** will take place near the communities.

Research and monitoring will play an important role in this and future plans. They can be used to provide local data for future management decisions. Several surveys planned include pre-harvest surveys, regeneration surveys, utilization surveys and site disturbance surveys and they will be conducted during this plan. In addition, a new updated forest inventory area will be developed by the Newfoundland Forest Service during this planning period which will provide updated information to base future management decisions.

Approximately 90% of the district area was not used in the annual allowable cut calculation mainly due to the fact that there was no information on the area. This extensive area is providing preservation of ecological and local values as well as providing habitat for native animal species.

There is an increased risk of insect and/or disease outbreaks in the district due to the mature and over mature age classes of the forests in combination with the recent and forecasted changes in climate, especially in northern ecosystems. There has been evidence of insect outbreaks in southern and central Labrador with the most northern recorded near the Mulligan area. To reduce the risk of major forest fires, and insect and disease outbreaks, harvesting the oldest stands first will be promoted.

INTRODUCTION

While forest management planning began in the Province around 1995, this is only the second five-year forest management plan (FMP) developed for forest management district 23 (FMD23)(Postville area). Consultation and input from the various stakeholders are the basis of the planning process and guide forest management activities in the area. Their input will continue during and after the implementation of the management activities.

With the effective date of the Labrador Inuit Land Claims Agreement (LILCA) on December 1, 2005, Labrador Inuit celebrated the beginning of the Nunatsiavut Government. As a regional Aboriginal government in Newfoundland and Labrador, the Nunatsiavut Government has many of the responsibilities and rights of other governments, such as planning for sustainable economic development, protecting and preserving Inuit culture, implementing social programs on behalf of beneficiaries and the sustainable management of natural resources on Labrador Inuit Lands (LIL's) and the co-management with the Province within the Labrador Inuit Settlement Area (LISA) outside of LIL. Since the inception of this new government, Nunatsiavut government employees have been working on building structures to operate as a responsible, democratic government.

Labrador Inuit claim aboriginal rights and title to northern Labrador and northeastern Québec. The LILCA sets out details of land ownership, resource sharing, and self-government. It also provides for the establishment of the Labrador Inuit Settlement Area (LISA) totaling about 72,500 square kilometers (28,000 square miles) in northern Labrador and 48,690 square kilometers (18,800 square miles) of sea. Within the Settlement Area, Labrador Inuit will own 15,800 square kilometers (6,100 square miles) designated as Labrador Inuit Lands (LIL). Within the remainder of LISA, outside of Labrador Inuit land, Labrador Inuit have special rights related to traditional land use and resources. The LILCA also provides for the establishment of the Torngat Mountains National Park Reserve, consisting of about 9,600 square kilometers (3,700 square miles) of land within LISA (DIAND 2004). There are 5 communities (Nain, Hopedale, Postville, Makkovik & Rigolet) within the settlement area and over 5,500 beneficiaries.

Following the signing of the LILCA, various Departments were formed within the Nunatsiavut Government. They follow similar structures of the Federal and Provincial Governments. To ensure the proper and sustainable management of the lands and resources within the settlement area, a Department of Lands and Natural Resources (DLNR) was formed. The Department has a Minister and Deputy Minister along with four directors; lands, non-renewable resources, environment and renewable resources.

In response to the proposal by Post Mill Lumber (PML) (a subsidiary company of the Labrador Inuit Development Corporation (LIDC)) to start a commercial harvesting operation in the

Postville area, the former Labrador Inuit Association (LIA) contracted AMEC Earth and Environmental Services (AMEC) to prepare the first five year plan from 2003-2007 for FMD 23. Working with the many stakeholders including the Provincial Department of Natural Resources (DNR), Post Mill Lumber and with residents of the Town of Postville as well as carrying out an intensive data gathering exercise, the plan was completed by AMEC, registered by DNR and approved by the Department of Environment and Conservation in 2003.

As a result of co-operation between the Nunatsiavut Government, Department of Lands and Natural Resources and the Provincial Department of Natural Resources, along with the input of various stakeholders this *five-year forest management plan for FMD 23* was developed covering the period of January 1, 2008 – December 31, 2012. Furthermore, an *annual work schedule* and *past activity report* will also be prepared as part of the planning and reporting process.

This five year plan deals only with a portion of FMD23 specifically a block of contiguous timber near Postville and the Kaipokok River. It outlines in detail the proposed forest management activities that will take place and discusses their relationships on the landscape. These activities, which include; harvesting, silviculture, road construction, resource protection, education, monitoring & research are designed to ensure that the resources are utilized in a responsible and sustainable manner.

Under the Environmental Assessment Act, forest management plans are submitted to the Minister of the Provincial Department of Environment and Conservation and registered for environmental assessment and further public review.

The forest management activities in this plan are carefully planned with the vision:

“to create a plan that aims to minimize the impact on important cultural and ecosystem values and follow the principles of sustainability and environmental protection while maximizing economic benefits and opportunities for the sustainable development of forest based industries”.

DISTRICT DESCRIPTION – DISTRICT 23

Geographic Setting and Location

The Province of Newfoundland & Labrador is divided geographically into 24 Forest Management Districts (FMD's). Specifically, the Province has proclaimed Labrador to have six FMD's, for the purpose of forest management planning (Figure 2.1).

Forest Management District 23 is approximately 2.2 million hectares in size. Generally, the district is situated on the mid-Labrador coast and is generally bounded by the Labrador Coast on

the East, Groswater Bay and Lake Melville on the south, the Mulligan and Red Wine Rivers in the West and the Kanainktok Bay River and Bay in the north (Map 2.1). The legal description is provided in Appendix I.

Forest Management District 23 contains the majority of commercial timber along the north coast, furthermore, the Postville area and specifically the area along Kaipokok Bay contains the majority of commercial timber (Map 2.2). Since the signing of the LILCA there are three land classes identified within the Provincial FMD 23 (Map 2.3).

Culture Character & Condition

As previously indicated in the document, district 23 has a diverse blend of cultures, however is mostly populated by Labrador Inuit. Labrador Inuit have historically interacted with the land in district 23 through traditional activities such as, hunting, fishing, and trapping. They have strong cultural ties to their cultural heritage and to traditional Labrador ways of life. There is a small proportion of the population in the district are of non-aboriginal decent.

The district is divided into three land classes (Map 2.3)). As per the LILCA, the following (Table 2.1) is a breakdown and description of the land classes within FMD 23:

Table 2.1: Breakdown of land classes in FMD 23

Land Class	Area (km²)
Crown Land	6,632
Labrador Inuit Settlement Area	18,195 (including 5,804 km ² of LIL's)
Total area	24,827

Crown Land- Crown lands can be classed as lands that are under the administration, control and management the Provincial Government of Newfoundland & Labrador.

Labrador Inuit Settlement Area - LISA lands are administered, controlled and managed by the Provincial Government, however according to the Agreement, Inuit have special rights on this land and the Province has a special obligation to the Nunatsiavut Government to consult with them on land use and resource management issues including the establishment of two co-management boards. The Torngat Joint Fisheries Board and the Torngat Plants & Wildlife board were established to provide advice on managing the landbase including recommendations of harvest levels and restrictions.

Labrador Inuit Lands - LIL lands are lands identified within the LISA, that are under the administration, control and management of the Nunatsiavut Government.

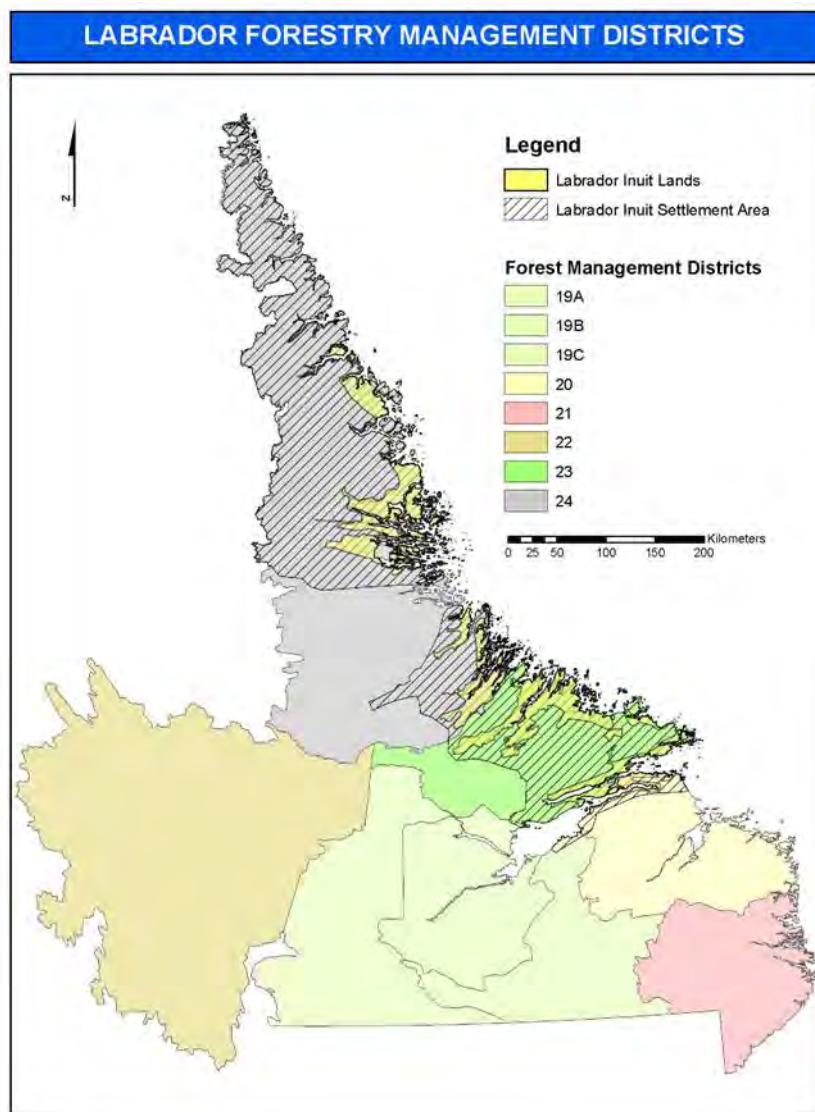


Figure 2.1: Forest Management Districts in Labrador.

Culturally Identified Areas

Cultural heritage is very important in Labrador and specifically within Nunatsiavut. In recognition of this, culturally significant areas, such as traditional tenure cabins and aullasimavet, traditional registered and un-registered traplines, identified archeological sites, camp sites and traditional hunting and gathering areas, were identified by gathering information from public meetings, meetings with operators, the traditional tenure process, previous data collected by AMEC, and discussions with elders within the communities.

This information was mapped as a shape file and a random point generator was used to represent use. The shape was then considered cultural area. This information was used during the layout of the commercial harvest block and proposed roads to ensure that impacts were minimized.

Classification Systems and Available Inventories

Based on similar characteristics (ie. vegetation type, climate, etc.) areas are classified into different land classifications. These classifications facilitate more effective decision making for managers on potential land use activities. Unfortunately, different land classifications or relative inventories are not available for most of Northern Labrador.

The Canadian Ecological Land Classification System is made up of seven levels of organization (scales) which are based on ecological principles. Eco-regions, which are characterized by distinctive ecological responses to climate as expressed by vegetation, soil, water and fauna and are described at a scale of 1:300,000 to 1:1,000,000, are available for Newfoundland and Labrador, particularly FMD23 (Map 2.4).

Ecological Landscape – Forest Ecosystem

An ecosystem may be defined as a group of organisms interacting with themselves and their environment. The forests in Labrador are part of the boreal forest ecosystem. Eight forest regions are identified in Canada: the boreal, subalpine, montane, coast, columbia, deciduous, great lakes, St. Lawrence and Acadian. Each region is conceived as a major geographic belt or zone, characterized by the vegetations physiographic and composition properties (Rowe 1972). The boreal forest covers the majority of forestland across Canada, forming a continuous belt from Newfoundland and Labrador to the Rocky Mountains and north to Alaska (Rowe 1972). In general, the boreal forest has been described as an interconnected web of life. Conifers form the matrix of the forest cover with the most prevalent species being black spruce, a pioneer invader in post fire situations. White spruce, balsam fir, larch and white birch also are present in this forest region, but are not as abundant as black spruce.

Ecoregions can be defined as areas with characteristic combinations of similar vegetation and soils are found on similar sites. There have been very little research done on the delineation of ecoregions within Labrador, however, Meades (1990) and Rowe (1972) have classified the boreal region into smaller ecoregions. District 23 overlaps with five of the described ecoregions (Map 2.4). These are described below.

High Sub-Arctic Tundra (Kingurutik – Fraser)

This ecoregion experiences summers that are considered short and cool, with a growing seasons of 80 to 120 days. Winters are long, severe and very cold. Closed black spruce forests, with some larch, occur of lower valley slopes. River terraces support open spruce forests with lichen dominated under stories. Shallow fens with frozen peat occupy small depressions in plateau surfaces.

Coastal Barrens (Okak – Battle Harbour)

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

Mid Sub-Arctic Forest (Michikamau)

Eskers and drumlin ridges are characteristic throughout. This ecoregion has a very continental, sub-arctic climate with cool, short summers and long, severe, cold winters. The growing season is approximately 100 to 120 days. Black spruce is the dominant tree species, and trembling aspen reaches its northern limit here. Open lichen woodlands are characteristic and extensive ribbed fen string-bog complexes bordered by black spruce sphagnum forest stands, dominate areas with little relief.

High Boreal Forest (Lake Melville)

This ecoregion encompasses the Churchill River Valley and the coastal plain surrounding Lake Melville. River terraces are composed of coarse-textured, alluvial soils, and uplands have shallow, well-drained soils. This region has the most favorable climate in Labrador. Summers are cool and winters cold. The growing season is 120 -140 days. The forests are closed-canopies 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 Sub-Arctic Forest (Mecatina River)

The main portion of this ecoregion is located in southern Labrador, with two separate areas 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- 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.

The Labrador multi-resource inventory compiled by Drieman Curtis Inc., highlights vegetation cover types for the District based on satellite imagery. The primary source of data for this database was from the 1:1,000,000 scale Landsat Thematic Mapper color composite transparencies. A total of 20 images were used to map the forested region of Labrador (north to 56°). The vegetation cover was delineated into several forest, disturbance and wetland types. The information was further digitized and is available for use in the GIS. Table 2.2 and map 2.2 summarize the results of the inventory.

Table 2.2: Vegetation cover types of District 23.

Vegetation Cover Type	Percentage of Total District Area (%)
Burn	8
Hardwood Scrub	1
Heavily Stocked Spruce/Fir Commercial Forest	1
Lichen Woodland	22
Moderately Stocked Spruce/Fir Commercial Forest	5
Non-Commercial Spruce Forest	39
Peatland	1
Tundra and Rock Barren	16
Water	7

The Province has its own forest cover type inventory for the island portion of the Province and some of Labrador. The inventory initially was a timber inventory but has evolved to a broader ecosystem inventory. Unfortunately, this cover type inventory does not currently exist for FMD 23 in particular around the Postville area. The previous plan (2003-2008) utilized global inventories with updated information of re-sampled plots within the study area. Since this, the Province has initiated an inventory program in the area in which a portion of the district has been flown for color aerial photography (Map 2.5). An interpreter will then delineate stand, wetland and other boundaries which are then converted into digital format. At this time, the data has been collected but the interpretation process has not been complete, so the data from the previous plan will be used for this planning period.

Land Use

The lands in Nunatsiavut have been used by the settled and transient Inuit for many years. Activities vary from the subsistence harvest of plants and animals for survival to small scale commercial harvesting providing supplementary income. The intensity and location of the activities were noted to change with the seasons (Brice-Bennett 1977).

Forest Management District 23 has three communities (Postville, Makkovik & Rigolet), each with populations of approximately 250 residents. Marine resources provide the principle economic base in most of the Nunatsiavut communities; however the Inuit community of Postville is also developing a history in the forest resource industry. In 1948 a portable sawmill operation was established at Salmon Brook, which later closed. Another attempt was made in the 1930's and again in 1946 however both failed within one year. In 1949 an operation moved to Shanty Brook on the south side of the bay and operated mostly during winter months. This operation provided employment to many men from Postville and other parts of the coast for ten years, after the Provincial Government had taken over it ceased once again. Residents once again turned to depend on the local resources for survival (Brice-Bennett 1977). Some of the more recent highlights of the forest industry are the re-establishment of a commercial operation in Postville; the export of pulpwood offshore to Newfoundland paper producers; the harvesting and processing of dimensional lumber; and value-added processing of core boxes for local exploration activities.

There was no history of commercial harvesting operations in the communities of Makkovik or Rigolet (Brice-Bennett 1977). This is likely because of the lack of commercially viable timber available near the communities. These communities relied more on the fisheries and winter trapping to provide foods and for trading for goods that were not available in the community. All three communities support domestic harvests for personal use and this activity is supported under the LILCA up to the level each beneficiary requires. Domestic harvest use is limited due to the number of households in the District. Although an exact domestic amount harvested each year is not known, it is estimated from available records, that in total, less than approximately 3500 m³ is harvested domestically each year.

Inuit believe in using all resources for survival. They have identified many uses of the forest such as for wood products (firewood and building materials), wildlife (big and small game and furs), non-timber forest products (mushrooms and berries) as well as identified opportunities for cultural, ceremonial and spiritual renewal. Although, this is hard to quantify, there is a significant importance to Inuit. These benefits are particularly important in areas where few employment opportunities exist (Brice-Bennett 1977).

In each community, infrastructure services (health care & education) provide significant employment opportunities. Furthermore, the Nunatsiavut Government provides many employment opportunities as well, by employing full-time, part-time and seasonal staff.

Ecological Character & Condition

As with most other FMD's, district 23 has its own unique ecological character. FMD 23 contains the only commercial areas of forestland of the two northern districts. It contains semi-

suitable forest growing conditions although it is situated within the sub-arctic zone. Spruce is the predominant tree within the district, forming about 70% of the total volume, while balsam fir forms the balance (Thomas 1994).

The Postville area has been relatively untouched aside from minimal commercial harvesting operations and local personal use. Large-scale forest insect infestations and disease have not been reported in the area, and no large-scale forest operation has ever been implemented. As fire is the main disturbance regime, black spruce regenerates very well in this region, accounting for two-thirds of the forest in Labrador. Wilton (1964) described the Postville area as an area of good forest. He characterized this area as slow growing balsam fir and black spruce forests of pulpwood size, occurring in a mixture on the less disturbed sites, while stands of black spruce sometimes with larch typified the poorer sites. The majority of the area is composed of slow growing spruce/fir stands with a crown closure ranging anywhere between 40 and 100%.

Forest floor conditions vary within the district. Near the coast, forested areas are few and far between with Empetrum barren the dominant vegetation type. Where there are forests, an understory of moss is common. Furthermore, in areas of repeated fires most areas have been turned into dwarf shrub barrens. Palsas and salt marshes are common on marine terraces and in low lying valleys near the coast (Roberts and Robertson 1986). These areas are unique, complex and sensitive ecosystems within themselves. Salt marshes are also identified as extremely important waterfowl staging and migration areas (Roberts and Robertson 1986). Further inland there is a mosaic of lichen dominated understories mixed with shallow peat fens, ribbed fen string-bog complexes and sphagnum bogs. According to the plot data collected by AMEC for the previous plan and as described in Brice-Bennett 1977, the most common ground vegetation found in the district (in no particular order) was Labrador tea, crowberry, ferns, speckled alder, blueberry, partridgeberry, bakeapple, horsetails, bunchberry, twisted stalk and caribou moss.

The land base of FMD 23 has been classified by Thomas (1994) into the categories shown in Table 2.3. Within the proposed boundaries of the Postville harvesting area approximately 137,567m³ of commercially viable timber is present based on the updated forest inventory conducted as part of this Plan. Unfortunately, permanent sampling plots are not available in the Postville area to give an accurate measure of growth or mean annual increment. Merchantable scrub was not included in the calculation of the annual allowable cut (AAC) although there are pockets of merchantable wood which may be marketable and utilized as part of this Plan.

Table 2.3: Land Classification in FMD 23 (taken from Thomas 1994).

Class	Area (nearest 1000 ha)
Productive Forest (>35m³/ha)	
Commercial	37,000
Low Volume	113,000

Non-Productive Forest (<35m³/ha)	
Scrub	1,440,000
Non-Forested	
Bog	180,000
Solid and Rock Barren	388,000
Water	69,000
Total	2,227,000

Meades 1990 describes in detail the dominant ecological features, forest floor conditions and typical associated wildlife within the ecoregions associated with the district.

A short cool growing season (limited to ~100 growing days) has also resulted in a slowing of biological processes, reduced water uptake and very slow tree growth. With the exception of some commercial harvesting, past large scale disturbances on the landscape have been limited to some smaller fires. Smaller disturbances such as the death of individual trees or groups of trees are more common. There is an indication in other parts of Labrador and the southern part of the district (near Mulligan) of insect infestations that have led to the death of trees.

“Because of the generally poorer growing conditions in Labrador, the forests are more suited to pulpwood harvesting. However, in some river valleys where growing conditions are more favorable, stands of large dimension saw log timber can be found” (Newfoundland Forest Service 1975). This is evident in and around the Postville Harvest Area, as deep wet valleys, at times, contained large diameter trees, sometimes reaching a diameter-at-breast height of 60cm.

The forest of Labrador has also been noted as the greatest concentration of high quality virgin timber remaining in eastern North America (Department of Forest Resources and Lands 1984). This resource has been relatively untouched by human influences, especially outside FMD 19. In FMD 23, for example, a few small mills began operation starting in the early 1900's, but were not viable due to reasons other than the valuable forest resource. Because the resource has been basically untouched, the forest condition has not been significantly altered from the natural condition of mature/over-mature forest with regenerating burned areas.

Fire is the main major disturbance type and is the predominant reason for alteration and regeneration of the forest condition. Large unchecked fires result in regions of Labrador having only two or three forest age-classes (Wilton 1964). i.e. recently burned, regenerating, and mature/over-mature. This is evident in the Postville harvest area of Kaipokok Bay. Other disturbance types, such as large scale harvesting, and insect infestation, has not occurred in the study area. Wind throw is evident, yet not as prevalent as fire, and normally only occurs in small patches.

FMD 23 is generally contiguous spruce/fir with the exception of some large burns in the Kaipokok area. One road is located to the west of the community of Postville. Past forest harvesting operations were conducted by manual felling and snowmobile hauling, which had minimal impact on the forest condition. More recent harvesting operations, (since the early 2000's), has seen the introduction of a more mechanized harvest, with the introduction of harvesting with a mechanical harvester and skidder. This may have caused additional disturbance to the forest floor (Figure 2.2).



Figure 2.2: Mechanical harvesting operation near Postville, Nunatsiavut (2008).

Ecological Protected Areas

Protected areas are important for the protection of ecological values and to ensure the sustainability of subsistence activities. Often, landscape, watershed and stand level scales are used as successive scales to filter and identify protected ecosystem functions within each level (Table 2.4).

Table 2.4: Ecological protected area levels

Level	Map Scale	Plan Terms	Sources	Examples of Protection
Landscape (course-filter)	1:500,000 to 1:250,000	District and Sub-district	Satellite information	Large areas not scheduled for harvest
Watershed (regular-filter)	1:50,000	Area of interest	Aerial photography	Entire watersheds, riparian buffers, major slopes
Stand (fine-filter)	1:20,000 to 1:5,000	Harvest block	Ground surveys	Wildlife dwellings, small streams.

Landscape protected areas are designed to protect large representative areas of major ecosystem and habitat types. In this plan, a large portion of the district is protected from commercial activities (Map 2.6).

At the next level, watershed features such as riparian buffers, core habitats are identified. In this plan, several portions and entire watersheds and water supplies are protected from commercial activities (Map 2.6).

The final filter occurs at the stand level and is normally identified following pre-operational field surveys at very small scales. Identifiable stand level protected features will include riparian buffers, waterfowl staging areas, wildlife dwellings, raptor nest buffers and isolated stands and slopes. Additional reduction in the net commercial forest area is applied during the annual allowable cut calculations for such area.

Biodiversity

Biodiversity is defined by the Canadian Biodiversity Strategy as: *“the variety of species, the genetic composition of species and communities, ecosystems and ecological structures, functions and processes at all levels”*. The Canadian Biodiversity Strategy is a combination of federal, provincial, and territorial ministers of Parks, Wildlife, Environment and Forestry that have united as a follow-up to the 1992 United Nations Convention on Biological Diversity.

The fundamental objectives of this plan aim to:

1. Conserve biodiversity on a national, global and specifically local scale by;

- a. Protecting a representative portion of each eco-region that exists in the District, in an effort to contribute to the overall Provincial goal 12% of the Provinces entire landbase.
 - b. Establish special management provisions, where needed, to protect biologically distinct unique features, with a goal for no loss of any rare flora or fauna species.
 - c. Maintain and conserve critical habitat for wildlife.
 - d. Limit the permanent net loss of forest area in the District through the implementation of a silviculture program and minimizing the amount of road constructed.
2. Promote the sustainable use of biological resources for local benefits by;
 - a. Maintaining water quality and flow rates within acceptable ranges.
 - b. Optimize the use of the landbase and maximize utilization to support commercial timber production.
 - c. Maximizing local employment benefits derived from the utilization of local resources.
 - d. Maintain or increase the amount and diversity of sustainable recreation activities.
 - e. Provide for sustainable domestic wood harvesting and traditional hunting and gathering activities.
3. Improve resource management capabilities within the District by;
 - a. Encouraging public involvement in forest management and planning.
 - b. Increase awareness and understanding of sustainable forest management among individuals.
 - c. Incorporate public opinion and traditional knowledge into forest management decisions and planning.
4. Develop local policies and legislation to support the conservation of biodiversity by;
 - a. Incorporating traditional knowledge into local policies and plans concerning the maintenance of ecosystems.

On a global scale there are over 50 million species of plants, vertebrates and invertebrates inhabiting the earth (Probst and Crow 1991). Amazingly, very few of these have been described and catalogued. One of the most highlighted threats facing humanity is the decline in biodiversity; however human activities are believed to accelerate the decline.

More locally, the preservation of the diverse ecosystem is of utmost importance to Inuit. As described throughout this document and in Brice-Bennett 1977, Inuit depend upon the diverse resources for survival.

The Canadian Council of Forest Ministers (CCFM) has produced several National Forest Strategies in response to the changing environment. The most recent document “A Vision for Canada’s Forests: 2008 and Beyond” outlines national goals to sustainable forest management as well as identifies partnerships including those with Aboriginals. Furthermore, the CCFM have

identified criteria and indicators for sustainable forest management in Canada, of which the first one identified is the maintenance of biodiversity.

Species Diversity

It is impossible to plan for the conservation of biodiversity on a species by species basis. There are simply too many species and information regarding all may be limited (Woodley and Forbes 1997). Because of this, four species were chosen as indicators of ecological integrity within the ecosystems surrounding the Postville area. They are marten, lynx, snowshoe hare, and caribou.

Marten (*Martes Americana*)

Pine Marten has been chosen as an indicator species due to its local importance as a furbearer. Many Postville residents trap marten during the winter season as a supplement to income and as a recreational/cultural activity.

Marten have often been used as an indicator species in other regions of Canada. Traditionally, Marten habitat has been classified as over-mature forest (i.e. >80 years old). Recent studies have concluded that marten respond to the structure available within a forest rather than actual stand age (Drew 1995). Vertical stem structure and coarse woody debris (CWD) appear to provide adequate security for marten. CWD also offers interstitial spaces beneath the snow during winter months for prey species such as voles, mice, and shrews. Therefore, new habitat guidelines have been developed by the provincial Wildlife Division of the Department of Environment and Conservation based on forest structure requirements instead of primarily forest age. These guidelines include recommendations such as minimum “leave” patch sizes of 20 hectares, retained basal tree areas of at least 18m²/hectare, and reservations of coarse woody debris.

Lynx (*Lynx Canadensis*)

Lynx has also been chosen due to its local importance as a furbearing animal which is trapped through the winter months.

Lynx prefer older regenerating stands (i.e. approximately 20 years old), and rarely select mature stands (Ruggiero et al. 2000). Thompson (1988) suggested that logging practices that leave numerous small stands of mature forest actually increase hare and lynx populations. He also suggested that planted and tended boreal sites are used less by hares and lynx than naturally regenerating sites. Other studies have shown that lynx benefit from the edge effect of harvesting (due to ease of hunting) and regularly crossed several hundred meter wide openings (Kesterson 1988 and Staples 1995 in Ruggiero et al. 2000). The key to managing a forest for lynx is to provide a temporal and spatial mosaic of forest age-class structure (Koehler and Brittel 1990). For example, both hare and lynx favour regenerating stands as they provide understory

protection and food. Lynx also require CWD or fallen trees as denning sites (Ruggiero et al. 2000; Koehler and Brittel 1990).

Snowshoe Hare (*Lepus americanus*)

Snowshoe hare was chosen as an indicator species as it is a prey item for many of the furbearer species and an animal that is snared by many residents of Postville. A significant negative change in the population of these animals may negatively affect the furbearers in the area and the hunting activities of Postville residents. Arctic hare (*Lepus arcticus*) occur primarily on barren upland regions (Pruitt 1967) were therefore not chosen as an indicator due to its relatively low interaction potential with forest harvesting.

Snowshoe hare inhabit conifer forests in various stages of successional growth but prefer areas of early successional growth. The snowshoe hare is known to thrive in cutovers and other areas that have vegetation in the early stages of development (Dodds 1960 as *taken from* Northland Associates 1986).

Upland game provides crucial prey for such predators as fox, lynx, marten, and raptors. Natural or cyclic fluctuations in small game animals are quite normal and are believed to be influenced by many factors such as habitat, levels of predators and weather conditions (DFRA 2001). During these periods of cyclic abundance, populations of upland game can build to very high numbers. The early succession stages of vegetation resulting from clear-cutting or road right-of-way clearing are favored feeding areas for hares, ptarmigan and ruffed grouse.

Caribou (*Rangifer tarandus*)

There has been little research conducted on specific habitat utilization of caribou within the Postville area. Northcott (1985) stated that caribou prefer both barren, open areas and areas of coniferous forests, where lichen are found providing an important food source. According to the Ecosystem Science Section of Gros Morne National Park (2001), caribou require a natural combination of open bogs and mature forest to provide alternate habitats and food sources. For example, during severe winters caribou will move into forested areas and undergo a switch in diet to forage primarily on arboreal lichens. Mature coniferous forest habitat plays an essential role in providing arboreal lichen as a food source, preventing access by hunters, and acts as shade and shelter during appropriate seasons.

Caribou that are located within the Postville area typically migrate through during winter and are much further north during the remainder of the year. Depending on seasonal conditions, their migration route may vary considerably. For example, in 2001/2002, caribou migrated to the west (i.e. Churchill Falls and Metchin River area) and stayed further north of Postville (i.e. the Nain area).

A study conducted in east central Newfoundland concluded that of 35 caribou monitored before and after forest harvesting, 12 stayed within similar distances of a clearcut, 15 moved further away, and 2 actually moved close to the clearcut. Initial avoidance of clearcuts appeared to be mainly a response to ongoing operations, and not to habitat suitability (Chubbs *et al.* 1993). Therefore timing of harvesting operations may need to be considered with respect to calving season or calving area.

Summary of Wildlife Criteria

An indicator can be defined as a measurable variable used to report on the status or trend of a value (Beaudette 1999). Wildlife species, particularly vertebrates, are often selected to serve as indicators of sustainable forest management.

As stated earlier, lynx and snowshoe hare (in fact most upland game) prefer a combination of mature and early successional stages of forest regeneration and benefit from forest openings and edge/regenerating habitat. Caribou do not calf in the area however use the Postville area as a winter migration route with the exact route dependant upon seasonal variations. They have also been shown to be somewhat uncertain about harvested areas.

In reviewing the habitat criteria of the above noted wildlife, Marten are most likely to be negatively affected by forest harvesting activities in the Postville area; therefore their criteria will be applied to any harvesting activities. In addition, if the effects of forest harvesting can be mitigated for Marten, it should also be reduced for other species identified as requiring mature/over-mature forested habitat. The Marten guidelines presented below are adopted on draft guidelines produced by the provincial Wildlife Division of the Department of Environment and Conservation:

- The basic unit of evaluation will be 40km²;
- 70% or greater of that unit must be suitable Pine Marten habitat (eg. 28km²);
- 40% or greater of the unit should have trees greater than 10m in height (eg. 16km²);
- the remaining portion of the 70% (30% or less) unit should have trees between 6 and 10m in height;
- 50% of the unit should be contiguous;
- minimum habitat patch sizes of 20ha;
- basal area requirement is 40m³/ha (-18m²/ha);
- hardwood stands (insect, blow down, fire) will be considered suitable habitat where crown closure is greater than 30%; and
- there will also have to be “proximity rules” and also consideration to shape.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect species diversity in the District and to help build support for habitat protection.

Actions:

1. *Protect wildlife habitat at all levels within the District.*
2. *Monitor and minimize impacts of forest activities on the four identified key indicator species.*
3. *Coordination between different agencies and the Nunatsiavut Government to assess local wildlife conditions and concerns.*
4. *On LISA, coordinate with beneficiaries to incorporate Traditional Knowledge into management activities.*

Ecosystem Diversity

There has not been specific information recorded throughout the harvest area regarding special species of flora or fauna, however, during the field surveys to revise the forest inventory by AMEC 2003, no unique species were discovered. The standard forest types within the Postville harvest area include softwood stands (the majority) with smaller areas represented by softwood-hardwood and hardwood-softwood stands. Although the entire Postville study/harvest area is over 200,000ha in size (Map 2.1), only 46,000ha are considered commercially productive softwood or hardwood stands. Of this productive land base, over 8,000ha (approximately 20%) has been protected as expanded buffer zones, trapping areas, areas of special concern, and areas identified as being valuable to the residents of Postville. The province of Newfoundland's Natural Areas Systems Plan recommends that a minimum of 12% of the provinces entire land base be protected (DFRA 2000). Considering only productive areas will be affected by forest harvesting, the amount of area protected in Postville currently exceeds the province's recommendation.

Hardwood stands account for very little of the Postville Harvest Area and many Postville residents felt these stands should be protected. Hardwood stands were identified in the community stakeholder consultations and have been zoned as "no commercial harvest" (Map 2.6). In addition, hardwood stands have no commercial value to the proposed mill and hence many of the hardwood areas would not be harvested

Genetic Diversity

Care must be taken to ensure that genetic features which exist within a district remain as they are, or changed for the better (Moore 1995). When possible, natural regeneration will be used as the primary stocking agent after fire and harvesting. If regeneration surveys indicate that areas will need to be planted, then the nearest tree nursery growing black spruce seedlings will be used. Areas will be planted to maintain similar stocking across the landscape.

DISTRICT VALUES

Species at Risk

There are various pieces of existing Federal and Provincial legislation and programs such as the Federal Habitat Stewardship Program, that promote the special protection of species at risk. Their main purpose is to prevent species from being extinct and if necessary outline necessary actions for their recovery. It is very critical to identify local species at risk within the district and to ensure that their habitats are protected from disturbances. In Labrador, there are eleven species that have been identified as at risk by the Provincial Department of Environment and Conservation, Wildlife Division (Table 3.1).

Table 3.1: Labrador species at Risk (www.env.gov.nl.ca/env/wildlife_at_risk.htm)

Species	Status (date)	Habitat & Traditional Knowledge
1. Barrows Golden-eye	Vulnerable (2002)	<i>Nests in Quebec and only a small portion of the population are thought to actually molt in Labrador.</i>
2. Eskimo Curlew	Endangered (2002)	<i>A small upland shore bird that utilizes coastal habitats. It was traditionally hunted on the coast for meat.</i>
3. Fernald's Milk Vetch	Vulnerable (2002)	<i>Known to occur only in southern Labrador, the species grows more strictly in calcium-rich soils where vegetation is sparse or has been removed by natural disturbance and a calcareous substrate is available.</i>
4. Harlequin Duck	Vulnerable (2002)	<i>Spend most of the year in coastal marine environments, but they move inland each spring to breed along fast-moving rivers. During the winter they occur along headlands where the surf breaks against rocks and ice build-up is minimal. They feed close to rock shorelines. They were a traditional food source for coastal people.</i>
5. Ivory Gull	Vulnerable (2002)	<i>Nests in the arctic and winters off the Atlantic coast. Does not seem to be any concern in this region.</i>
6. Peregrine Falcon	Threatened (2002)	<i>Nests are usually scrapes made on steep cliffs, usually near wetlands. The home range in which</i>

		<i>they hunt for food can extend as far as 27km from their nest. They prefer open habitat types such as Tundra, seacoasts, and high mountains, but may hunt over open forests.</i>
7. Polar Bear	Vulnerable (2002)	<i>Habitat consists of landfast ice and coastal pack ice. Appropriate denning and spring feeding areas are crucial components of habitat. Their movements are influenced by climate and ice conditions and by the presence of prey, especially Ringed seals.</i>
8. Short-Eared Owl	Vulnerable (2002)	<i>Nests mostly along coastal areas, but have been sighted inland. It nests in high grass or on the edge of a forest or bog area.</i>
9. Tundra Peregrine Falcon	Threatened (2002)	<i>Found throughout the Northern Tundra and in Labrador its thought that they nest as far south as the tree line.</i>
10. Wolverine	Endangered (2002)	<i>Frequently inhabit the tundra, especially where there are large herds of ungulates such as caribou.</i>
11. Woodland Caribou	Threatened (2002)	<i>Prefer mature forests which contain large quantities of lichen and are associated with marshes, bogs, lakes and rivers.</i>

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect species at risk in the district and to help build support for habitat protection.

Actions:

1. *Communicate and participate with Federal and Provincial Endangered Species Programs, including the Habitat Stewardship Program;*
2. *Identify sensitive habitats of species at risk and implement appropriate measures;*
3. *Communicate and work closely with any recovery team deemed necessary for the recovery of a species;*
4. *Monitor; review and support research activities where ever possible on species at risk.*
5. *On LISA, coordinate with beneficiaries to incorporate Traditional Knowledge into management activities and recovery programs.*

Cultural Heritage Values

The community of Postville depends heavily on the local natural resources. Interviews which were conducted in the town of Postville as well as public meetings were used to gather information on local land use, cultural areas of significance, and concerns regarding the proposed harvesting plan. The results of those interviews were consolidated with information gathered as part of the LINKAP Project (A collection of geographical data which were used as a digital atlas and included biological, mineral, cultural and political data)(AMEC 1999) and resource use described in “Our Footprints are everywhere” Brice-Bennett 1977, so that local resource values could be integrated into the Plan. This information has been used within the plan to:

1. Identify potential harvest blocks;
2. Explore potential harvest techniques;
3. Calculate the annual allowable cut;
4. Delineate appropriate buffers; and
5. Delineate access road locations.

Maintaining the traditional use of the forest, such as the trees, plants, fish and wildlife species and water quality, was a key message from the consultation process. It was also identified that the forest has historically provided an economic supplement through the commercial harvesting of timber and the production products from the forest for sale such as traditional snowshoes or paddles.

The main values that were identified and mapped during the consultations were:

1. Archeological and historical sites,
2. Homesteads and gravesites,
3. Traditional trapping areas
4. Cabin locations.

As part of the LILCA the Nunatsiavut Government is in the process of implementing a traditional tenure process in which traditionally used areas are identified and registered for cabins and trap lines. This process is ongoing, however information gathered to date was used in the current plan. Future plans will have more detailed information to incorporate.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect cultural heritage values in the district.

Actions:

1. *Protect cultural values by incorporation of traditional ecological knowledge into this and future plans.*
2. *All activities will be subject to Environmental Protection Guidelines and any other Guidelines implemented by the Nunatsiavut Government and the Provincial Government.*

3. *Continue to collect cultural knowledge from the District for incorporation into future plans.*

Hunting & Trapping

Wildlife in the district is very important to the local communities and must be protected for cultural, recreational, and spiritual values. Numerous species were identified through the public consultation process as being important. They are listed as follows;

1. Marten
2. Caribou
3. Upland Game (rabbit, grouse, partridge)
4. Black Bear
5. Furbearers (lynx, mink, otter)
6. Waterfowl (ducks and geese)
7. Fish and Fish Habitat (Atlantic salmon, brook trout, arctic char)

While the groups identified above are all deemed important to the community, several have been identified as being more susceptible to potential interaction with harvesting operations and hence have been used in determining the appropriate harvesting techniques. For example, groups such as waterfowl and fish/fish habitat have very little interaction with forest harvesting because their habitat requirements are protected by buffers on waterbodies, proper stream crossings, and proper harvesting methods (i.e. fuel storage, spill response). Research done in central Labrador on the effects of clear cutting on moose populations was conducted by Newbury et al. 2007. It was found that conversions of mature forests into early and mid-successional stages (ie. Clear-cut areas) is partially responsible for moose population increases and that the mosaic of food and cover produced by harvesting can benefit moose. This is particularly important in northern districts (FMD 23) where moose populations are thought to be low. Proposed surveys by the Department of Environment and Conservation, Wildlife Division and the Torngat Wildlife and Plant Board will further confirm moose populations in the north.

Traditionally, hunting and trapping has been an integral part of Inuit lifestyle for food, social and ceremonial purposes. The harvest is used for many aspect of daily life including food and clothing for families as well as the bones was used for tools. Many parts of the harvest are also used for many crafts. Trapping for commercial fur provides a supplementary income to some families.

During the life of this plan, it is anticipated that hunting and trapping activities can continue as normal. Traditional trapping and hunting grounds that were identified during the consultation process were taken into consideration when planning for harvest block locations to ensure minimum disturbance.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect hunting or trapping activities in the district.

Actions:

1. *Implementation of Environmental Protection Guidelines as identified by the Nunatsiavut Government and the Provincial Government.*
2. *Conduct annual meetings with commercial operators to discuss annual management activities. Wherever necessary, annual work schedules will be requested.*
3. *Continue to collect traditional hunting and trapping information within the District for incorporation into future plans.*

Non-Timber Forest Products

In addition to forest activities such as hunting and trapping, the forests also provide other non-timber forest products. Non-timber forest products are such products as medicines, extracts, foods, crafts and art that are derived from the forest such as barks, berries, roots, etc. Many of these products have cultural significance to Inuit. Not only do they provide products for food, social and ceremonial purposes, but in some cases they provide economic opportunities.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect the harvest of non-timber forest products in the district.

Actions:

1. *Continue to collect non-timber forest product information within the district for incorporation into future plans.*
2. *Harvesting of non-timber forest products will continue throughout the life of this plan by the careful planning of forest harvest blocks.*

Socio-economic Values

There are three permanent communities within FMD 23, they are Postville, Makkovik and Rigolet. In the past the Postville area has seen an increase in mining exploration and thus has seen an influx of people on a temporary basis to the area. In the past year, mining exploration has slowed and consequently so has the opportunity for employment in the area. One of the main employers in Postville is a forest based operation operated by the development arm of Nunatsiavut Government, Postmill Lumber. They have conducted a variety of activities such as exporting pulpwood, sawing lumber for local markets and producing core boxes for near by mineral exploration.

Numerous interviews and meetings were completed to address all socio-economic values identified by the community of Postville. Community associated benefits to the proposed

sawmill operation include an economically sustainable use of surrounding natural resources, employment of up to 20 individuals, and construction of a better-equipped mill incorporating associated equipment (Atlantic Consulting Economists 2000). The Plan also recognizes areas as important by the community for personal, recreational, spiritual, and wildlife reasons. The potential interaction between harvesting and these areas were raised and discussed and all information received was incorporated into the Plan. This plan has attempted to minimize disturbance to socio-economic valuable areas by incorporating local concerns, designating areas as “no commercial harvest zones”, implementing harvesting techniques that cause minimal impact, and increasing buffers to water bodies (Map 2.6).

While the harvesting activities described for this operation are small compared to other provincial forest harvesting operations, the residents of Postville realize that harvesting of trees can affect local forest/wildlife dynamics in a harvesting area to some degree and that harvesting may occur in areas currently used by some for personal purposes.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect socio-economic values in the district.

Actions:

1. *Identify opportunities to increase the number of local jobs related to the forest industry in the Postville area.*
2. *Consider and incorporate traditional knowledge into socio-economic issues.*

Timber Values

Domestic harvesting of wood for subsistence purposes is very important to Inuit. They traditionally have harvested wood to heat their homes, construct boats, komatiks and snowshoes to travel along with many other wooden items used on a daily basis. Subject to the LILCA, domestic harvesting activities will continue.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect the domestic harvest of timber in the district.

Actions:

1. *Conservation Officers based in communities will monitor the amount of domestic harvesting*
2. *The Nunatsiavut Director of Renewable Resources will explore the option of creating forest based legislation for forest activity.*

Potential Developments

Mineral deposits of various types have been identified in Northern Labrador. The most notable, being the presence of Uranium within the District. Many companies have spent much time and effort exploring the barren Labrador wilderness for signs of exportable Uranium deposits. To date this activity has provided short term employment to residents. In 2008, the Nunatsiavut Assembly implemented a ban on Uranium mining and milling for 3 years. This ban is still in place until 2011, after that it is not known if any further development will occur.

Agricultural opportunities remain underdeveloped in the district, with very little domestic and no commercial agriculture being practiced. This is mainly due to the climate and soil conditions not being conducive to such activities. The main agricultural activity noted is the harvesting of wild berries.

All communities in Nunatsiavut are isolated by road but do have regular air services by gravel airstrips. There is also regular marine transportation for passenger and freight in all communities during the shipping season (Late-June – Mid- November), depending upon ice conditions. As noted above there is no current road to connect the Nunatsiavut communities with central Labrador and it is not anticipated that one will be build within the life of this plan. If a road was to be constructed it may open up new areas of commercial timber. Furthermore, during the winter months groomed snowmobile trails are commonly used for transportation however it is not common for commercial goods and service to be moved this way. Groomed trails provide access to domestic harvest areas and also provide opportunities for adventure tourists.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect any potential developments in the district.

Actions:

1. *Monitor and participate in any consultations on potential new developments.*

Value-added Processing

It is viewed that the opportunity exists for further value-added processing in the District, thus creating local employment. The isolation of the communities in Nunatsiavut makes obtaining reasonably priced dimensional lumber and wood products hard. While markets need to be secured, there is adequate wood supply to run a small value-added operation.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect the value-added processing of forest products in the district.

Actions:

1. *Identify opportunities for local operator to expand operations to incorporate other value-added processing in the area.*

Water Resources

Water resources and a supply of clean water for residents are very important. Furthermore, healthy water resources contribute to a healthy ecosystem. Traditionally, water resources have provided food for Inuit as well as support for various commercial fisheries and have provided tourism and recreational opportunities. There are many rivers that support populations of salmon, trout and char species. There are three water supplies identified in the district for the communities of Postville, Makkovik and Rigolet. Water quality will be attempted to be maintained by the application of buffers on forest activities, as well as the protection of any protected water supplies from forest activities.

Throughout the life of this plan the following actions will attempt to ensure that the planned activities do not affect water resources or quality in the district.

Actions:

1. *Ensure forest resource activities are conducted in a manner to maintain clean drinking water supplies for the communities.*
2. *Ensure forest resource activities are conducted in a manner to protect the water quality of water bodies in the district.*

PAST ACTIVITIES

The previous plan as well as this plan only refers to a small portion of the FMD, specifically a contiguous block of commercial timber near the Town of Postville. Although the area discussed represents less than 10% of the district, it does encompass the majority of merchantable forest in the district.

Timber harvesting has been relatively unstable over the past years (Table 4.1). It is estimated that domestic harvesting, which is a significant traditional activity in the area, is relatively consistent and very low, although records are not available. Road construction and silviculture activity have been relatively unstable as well with very little records. An annual goal of planting 75 ha/year was proposed in the previous plan. Unfortunately, no planting activities were conducted during the plan (Map 4.1).

Table 4.1: Summary of timber harvested in FMD 23 from 1997-2009 (DNR 2008)

Year	Total AAC (m ³)	Commercial			Domestic
		Pulpwood (m ³)	Sawlogs (fbm)	Firewood (m ³)	Firewood (m ³)
1997		28	23600	0	Unknown
1998		0	56000	0	Unknown
1999		36	80000	0	Unknown
2000		23	2000	0	Unknown
2001		7.5	3500	0	Unknown
2002		12.5	5000	0	Unknown
2003	12000	3692	10300	0	Unknown
2004	12000	6100	5000	0	Unknown
2005	12000	9500	13000	0	Unknown
2006	12000	4767	5100	400	Unknown
2007	12000	Did Not Harvest			Unknown
2008	12000	Did Not Harvest			Unknown
2009	12000	Did Not Harvest			Unknown

PUBLIC CONSULTATION PROCESS

The importance of stakeholder and public involvement in the planning process was acknowledged by both the Nunatsiavut Government and the Department of Natural Resources. An important role exists for groups in identifying issues and contributing traditional ecological knowledge.

The previous work and forest management plan prepared by AMEC (2003-2007) entailed a comprehensive consultation process, which included workshops and public meetings to determine the long term personal, community, cultural and spiritual values in the area. Since a lot of the values identified extended the life of the plan and it became apparent after speaking with people in the area that they were still important, and they were carried over to this plan.

However, in addition to the information and values gathered by AMEC in the previous plan further information was gathered. Starting the summer of 2008, three general public meetings were held within the community of Postville. These sessions were open to the public and advertised within the community. Although overall participation was low by community members, the members who participated did contribute meaningful data to the planning process. Further to the public meetings, a one page forest management summary which included the area break-downs, outline of proposed activities, past and present annual allowable cut figures as well as future plans was distributed within the community by the Nunatsiavut Conservation Officer. In addition, proposed activity maps were posted in the Nunatsiavut Conservation Officers office

in Postville and notices were posted for welcoming concerned citizens to provide input into the maps. The Conservation Officer also took the maps and visited some of the elders in town to get their input into the proposed activities. All comments were considered during the preparation of this plan.

WOOD SUPPLY ANALYSIS

Normally a sustainable annual allowable cut (AAC) would be calculated based on the available forest inventory data for the district. As previously described, the resource inventory available for this plan is limited to a thirty year-old global inventory conducted for the Postville area as well as an updated the inventory through an intensive field-sampling program (conducted by AMEC for the previous plan). A combination of the available inventories was used as the base for the current AAC calculation.

Methodology

The maximum amount of wood that can be harvested annually while maintaining a sustainable timber supply and a landscape which supports traditional and cultural values for future generations is referred to as the annual allowable cut (AAC).

Since the necessary growth and yield data required to run linear models was not readily available, nor were the available models calibrated to the district, the AAC was calculated for FMD23 using an area and volume based formula (below).

$$\text{AAC (m}^3\text{/year)} = \frac{\text{Net Commercial Forest Area (ha)}}{\text{Rotation Age}} \times \frac{\text{Net Merchantable Volume (m}^3\text{)}}{\text{Hectare}}$$

Where:

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

Net Commercial Forest Area:

Forest Management District 23 is approximately 2.2 million hectares, of this area a very small portion around Kiapokok Bay is inventoried, and of the inventoried area approximately **45,952 ha** is considered commercial forest stands. The commercial forest stand area is further reduced by 40% to a **Net Commercial Forest Area** of **27,571 ha** to account for riparian and other buffers, steep slopes, etc. This is thought to be a conservative net commercial forest area.

Rotation Age:

The rotation age is the age at which the mean annual increment of merchantable volume has reached its peak and yields the most volume per unit per year. The **rotation age** for FMD 23 was estimated at **140 years**. This was based on rotation age estimated for other parts of Labrador (~110 to 120 years) and the natural stand yield curves developed for different ecoregions (DNR 2008, DNR 2007). Furthermore, USDA 1990 reports the average for black spruce stands on poor site classes in the boreal forest of Canada to be 132 years. Using this information and applying a cautionary approach, the rotation age was estimated.

Net Merchantable Volume:

Due to the absence of available data, the information used in the ground truthing plots conducted by AMEC in the last plan along with the global data was utilized (AMEC 2002). Merchantable volumes from plots were averaged to get an average of **108m³/ha**. This volume is further reduced by an estimated **26%** (Fire – 1%, Losses – 5%, Residual Stands – 6%, Cull – 14%) to account for retention, waste, cull and natural disturbances. This resulted in an estimated net merchantable volume of **80m³/ha**.

AAC Calculation

Using the above estimates the AAC was calculated to be:

$$\frac{27,571 \text{ ha}}{140 \text{ years}} \times \frac{80 \text{ m}^3}{\text{ha}} = 15,755 \text{ m}^3/\text{year}$$

Evaluation

The current calculated AAC of 15,700 m³/year is considered comparative to the AAC of 12,000 m³/year recommended by AMEC in the previous plan. Considering the previous AAC's was calculated using a linear model and the current a simple formula, the 20% difference is negligible. Furthermore, the previous AAC did not account for domestic harvest that is taking place in the district. The current AAC can account for management of both domestic and commercial harvest levels.

PROPOSED ACTIVITIES**Overview**

A summary of the proposed activities scheduled for this operating period (2010 – 2014) is detailed in appended Map 7.1

In general, commercial and domestic harvesting activities will take place during the planning period at the level of 15,700 m³/year. Commercial activities will be scheduled to occur in five identified operating blocks. The majority of the domestic harvesting will take place near the communities.

A small level of planting is scheduled for each year during the planning period and monitoring and research will focus on collecting base line data in various areas. An adequate road network is planned to assist the harvesting of the commercial portion of the AAC, however they will assist other activities such as fire suppression, silviculture and monitoring activities as well.

Allocation of Wood Supply

Considering the AAC for FMD23 was calculated in section 7.0 to be 15,700 m³/year, 78,500m³ of volume is estimated to be available over the next five year period (Table 7.1). An anticipated level of 60,000 m³ has been estimated for commercial use and 18500 m³ has been estimated for domestic use.

Table 7.1: Summary of anticipated harvesting activity in each year of the planning period.

Year	Commercial (m³)	Domestic (m³)	Total (m³)
2010	12,000	3,700	15,700
2011	12,000	3,700	15,700
2012	12,000	3,700	15,700
2013	12,000	3,700	15,700
2014	12,000	3,700	15,700
Total	60,000	18,500	78,500

Timber Operations

All timber harvesting operations will be subject to the Environmental Protection Guidelines (DNR 1998) as well as any other guidelines, conditions or policies put in place by the Nunatsiavut Government.

Commercial Operations

Commercial permits to harvest commercial timber on LIL's will be issued by the Nunatsiavut Government. These permits will be subject to policies and conditions implemented by the NG. All commercial operations will be scheduled to occur in one of 5 scheduled operating blocks (Map 7.2). A summary of the block volumes can be seen below in table 7.2.

Table 7.2: Summary of commercial harvest block volumes for 2010-2014.

Block Number	Gross bF/bS Vol. (m³) (@108m³/ha)	Net bF/bS Vol. (@80m³/ha)	Area (ha)
1	15,660	11,600	145
2	12,204	9,040	113
3	29,484	21,840	273
4	30,672	22,720	284
5	64,692	47,920	599
Total	152,712	113,120	1414

In total, a net volume of 113,120 m³ has been scheduled for harvest. This is approximately 45% more than is scheduled to be harvested in the planning period.

Utilization of the resources is very important. Although utilization surveys have not been done for operations in FMD 23, on average other operations in the Labrador Region have seen 26m³ of merchantable timber left on cutovers due to poor utilization practices. This is extremely high and can be substantially reduced with little effort by operators. Operations will be monitored following the standard procedure developed by the Newfoundland Forest Service and changes implemented as necessary to ensure maximum utilization.

Domestic Harvesting

Domestic harvesting of timber for fuelwood and sawlogs by Inuit for subsistence purposes will continue as outlined in the LILCA. During this planning period the NG will work on forestry legislation including permitting policies for non-beneficiaries of the area. As described in table 7.1, 18,500 m³ is available to for harvest by residents. It is anticipated that this volume is more than sufficient to cover any domestic harvesting. Domestic harvesting will take place near the communities.

Silviculture

Forest stands in FMD 23 have not been subject to large scale disturbances (fire or harvesting) in the past. Silviculture refers to the theory and practice of controlling the establishment, composition, growth and quality of forest stands to achieve the objectives of management (Smith, Larson, Kelty and Ashton, 1997). Furthermore, it is a general premise to:

1. Enhance forest stand values and improve benefits that can be derived from them;
2. Provide an effective means for managing a stand to provide desired benefits and sustainability of them;
3. Keeps the management appropriate to the biologic and physical limitations of a site, and;
4. Maintains or enhances productivity.

The main purpose for planting in district 23 would be to implement sustainable forestry practices in the area. Pre-commercial thinning of high density stands is not planned for this period due to the lack of suitable density stands in the area. It may be utilized as a management tool in future plans.

Areas harvested before the signing of the LILCA need to be surveyed for regeneration and assessed for planting opportunities. This work will be done by the Provinces Department of Natural Resources and furthermore any planting would fall under the Provincial program. It is anticipated that a target of only getting the areas surveyed for planting would be done in this operating period. Other areas harvested on LIL after the signing of the LILCA would be surveyed by the Nunatsiavut Government. An effort will be made to monitor the regeneration of domestic cutting areas as well to determine if any silviculture opportunities exist.

Due to lack of past large scale harvesting, only burn areas are currently available for planting. Previous planting efforts include a 20ha area at Guloo Point near Postville. As more harvesting takes place and it is determined through regeneration surveys that planting is required more area will be available.

Table 7.3 and Map 7.3 outline the proposed silviculture activities for the next five years. This is set as an attainable goal that can be reached. It is anticipated that a local planting program can be implemented creating local employment.

Table 7.3: Proposed silviculture area

Activity	Description	Proposed Area
Tree Planting	Planting container stock spruce seedlings, targeting good and medium sites.	~375 ha (~75 ha/year)

Primary Access Road Construction

Access roads are essential to access commercial timber resources and furthermore the success of a forest activities such as harvesting, fire suppression and silviculture, in the District. While some roads do currently exist, the road system is still considered underdeveloped to support a commercial forestry operation.

It is anticipated that 20 km of primary forest access road is required to access mature and over mature stands with in the commercial harvest blocks map 7.4.

Considering construction costs on the north coast of Labrador, it is estimated that well in excess of one million dollars would be required. Secondary roads are not identified in this plan and

operators would be responsible for constructing these to access scheduled operating blocks. Winter roads will be utilized to access sensitive areas (wet areas) and areas where it would not be feasible to invest in permanent roads due to the amount of timber present.

Decommissioning, or the removal and rehabilitation of the access road beds is not considered in this plan due to the lack of available road. It may need to be considered for future planning periods. All road construction will follow environmental standards and guidelines put in place by the Nunatsiavut Government.

Research and Monitoring

The availability of base line data in the district is relatively low. This base line data is key to making sound management decisions and in adaptive management. Since there is not a lot of available data, it is paramount that during this planning period an effort be made to improve management policies and practices through the incorporation of traditional knowledge and by learning from the outcomes from previous activities.

Although, there are no specific projects planned for this period, research topics could include pre-harvest surveys, utilization surveys, PSP and TSP measurements, ground disturbance surveys and post-cutover surveys. An effort will be made to get the new inventory data ready for use in future plans.

Public and Operator Education

A continued effort will be made to educate the public and operators on ecosystem management along with the consideration for traditional ecological knowledge from the area. Continued interaction with the public will result in better understanding of key management issues, decisions and the goals and objectives of management. During the planning period it is expected that the Nunatsiavut Government and Provincial staff will maintain good working relationships with the town councils, resource groups and development associations. An effort will be made by both groups to hold operator and public workshops on various management issues such as utilization, ground disturbance, and road construction as required.

ENVIRONMENTAL PROTECTION

Habitat Protection

Taylor *et al.* (1993) defined landscape connectivity as the degree to which the landscape facilitates or impedes movement among resource patches. Connectivity will have to be sustained to allow the movement of organisms throughout the Postville area. As an example, the Fundy Model Forest of New Brunswick is working towards the implementation and maintenance of

forested connections between harvested areas of a minimum width of 300 m and a maximum length of 3km to meet requirements of connectivity (Woodley and Forbes 1997).

Landscape ecology has yielded many models describing changing landscape patterns (Franklin and Forman 1987, Gardner et al. 1987, Gardner and O'Neill 1991, Gustovson and Parker 1992). Andren (1994) reviewed the effects of habitat fragmentation on birds and mammals in landscapes with different proportions of suitable habitat. He describes habitat fragmentation as having three components:

1. Loss of original habitat (ie. going from suitable to unsuitable habitat);
2. Reduction in patch size of original habitat; and
3. Increasing isolation of patches.

Several strategies can be implemented to help preserve the integrity and viability of various resource values. Areas designated as “no commercial harvest zones” are identified and buffer zones on water bodies (rivers, streams and ponds) are increased from those recommended in the Environmental Protection Guidelines (Appendix II). These buffers not only increase protection for aquatic habitat but also provided additional protection to identified areas of concern such as cabin locations and trapping areas. Some areas were deemed more important than other water bodies in the Postville harvest area as they are fished by the community for arctic char.

The protection and conservation of habitat is paramount in the district due to the significant traditional and cultural value of wildlife in the area. The over mature forests found in the area are great contributors to biodiversity due to their complex arrangement of structural and functional features. In recognition of this, an effort will be made to:

1. Discourage whole tree logging systems so that limbs and stems (coarse woody debris) will be left on the forest floor. This will ensure that the nutrients provided by decomposing coarse woody debris will remain on site, this is especially important on sites of poor quality (Titus et al. 1998)
2. Favor cut block patterns with green tree retention,
3. Retain snags on cutovers,
4. Follow patterns of natural disturbances such as irregular and feathered edges,
5. Maintain connectivity on the landscape through implementation of riparian areas, retention areas and wildlife corridors,
6. Identify any wildlife and nesting areas and apply buffers as necessary.

Furthermore, adapted from the Provincial Environmental Protection Guidelines (Appendix II) the following buffers will be applied for the protection of critical habitat, aquatic ecosystems and water quality:

1. Minimum requirement of 30m 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.
2. Minimum requirement of 50m forested buffer around Salmon pond, Bear Pond, Little Rapid Pond, and Lewis' Pond.
3. Minimum requirement of 150m forested buffer around Kaipokok Bay
4. Additional buffers can be applied where it can be determined that critical fish or wildlife habitat may be affected.
5. Where slope is >30%, no harvest forest buffer of (20m or 100m) = (1.5 x slope %) will be applied.
6. Minimum requirement of 50m no harvest forest buffer will be maintained around all identified black bear denning sites.
7. Minimum requirement of 800m buffer around bald eagle or osprey nests during nesting season (Mid March – End July) and 200m during the remainder of the year.

In an effort to move towards more sustainable forest management, many Provinces are working towards forest certification. Forest certification is a monitoring toolbox where sustainable forest management planning and practices can be measured and certified against a sustainable standard. There are four programs that exist in Canada all with common elements and each program has high thresholds that must be exceeded; these are above and beyond any other regulatory requirements that exist. Standards are set to circumstances that are present on the Canadian landscape such as lively hood of local communities or local aboriginal involvement. Some examples of what standards measure are:

1. conservation of biological diversity
2. maintenance of wildlife habitat and species diversity
3. protection and/or maintenance of special sites (biological and cultural)
4. maintenance of soil and water resources, including riparian areas next to streams and lakes
5. ensuring harvest levels are sustainable, and harvested areas are reforested
6. protection of forestlands from deforestation and conversion to other uses
7. no wood from illegal or unauthorized sources
8. Aboriginal rights and/or involvement
9. Public disclosure

Although, forest certification has not been attained for any district in Newfoundland and Labrador, District 19 (Upper Lake Melville), which is adjacent to District 23, is currently working towards ISO certification (Pers. Comm, Darren Jennings). They are working to identify significant environmental aspects (SEA's) and environmental work instructions (EWI's) for the district. This certification could act as a model for the management for the forests in the rest of the Province and be applied to other districts including FMD 23 (Postville).

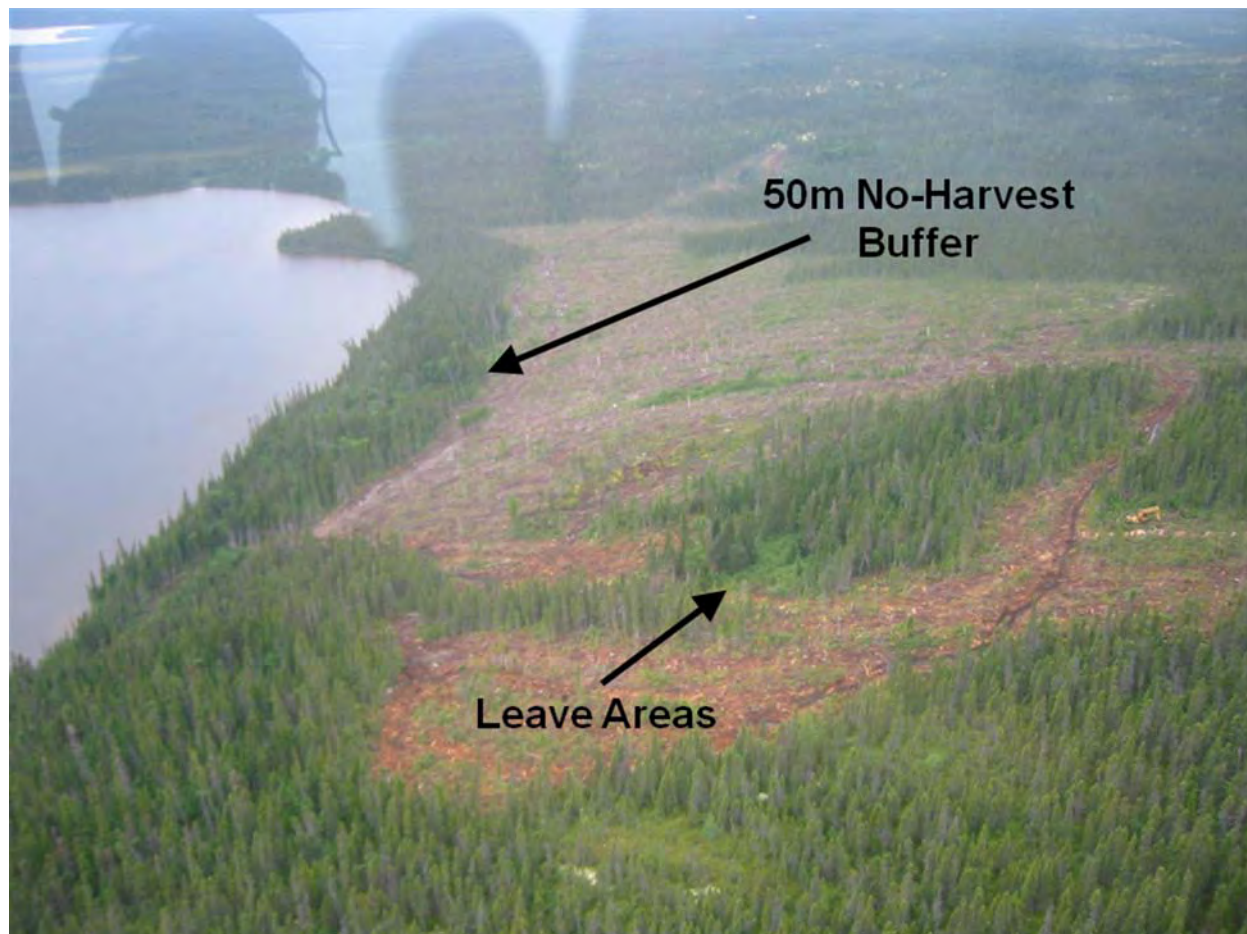


Figure 8.1: Example of previous Postville operation showing areas left for protection (Postville 2008)

Forest Fire Protection

Although forest fire activity in the district has been limited, there have been several forest fires (Map 8.1). In the past, fires were the most predominant disturbance in Labrador. A summary of total area burnt and average fire size from 1960-2005 is described in table 8.1

Table 8.1: FMD 23 summary of fire size by decade.

Decade	Total Area (ha)	Average Size (ha)
1960-1969	156 722	9 798
1970-1979	94 260	2 299
1980-1989	10 190	637
1990-1999	100 215	4 555

2000-2005	16 082	1 608
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In order to ensure that there are minimal losses of resources, an effective fire suppression program is necessary. Although, it is preferred to let fires burn naturally, fires that pose threat to human life, property and resources will be suppressed. Through an understanding between the Province and the Nunatsiavut Government, it is understood that fires that threaten communities will be suppressed by the Province, furthermore fires that occur on LIL's will only be suppressed with the approval of the Nunatsiavut Government unless it is deemed an emergency. All other fires will be suppressed by the Province. Furthermore, during this planning period, protection agreements between the Province and Nunatsiavut Government will require further attention.

The threat of fire will also be managed by harvesting and removing some of the fuel (older aged spruce and fir stands) near the community of Postville by both the commercial and domestic harvests. Although it is beyond the mandate of this document, each community is encouraged to have a fire management plan in place.

Insect and Disease Control

Forests are susceptible to attacks from insects and disease. Although insects and diseases are common in the rest of the Province, they were very un-common in Labrador with the exception of the past two years. Insect outbreaks of substantial size have been recorded in southern and central Labrador, including the implementation in 2008 of the first insect spray program in the area. Although there haven't been any substantial outbreaks in the Northern part of Labrador, it is likely that some may occur in the future due to the older age class and weaker forests and the recent and forecasted changes in climate, especially in Northern ecosystems. There have already been some areas recorded in the Mulligan area (map 8.2).

It is not anticipated that any large scale spray program using chemical or insect control agents will be required during this planning period. Any proposed program will be treated as a separate undertaking and will be subject to further public review.

Enforcement and Compliance

All forest activities within LIL will be monitored by NG Conservation Officers. Furthermore, activities on LISA outside of LIL will be co-monitored by the Provincial and Nunatsiavut Conservation Officers. The Province will monitor all other lands in FMD 23. They will ensure that activities are being carried out in accordance with applicable legislation, guidelines and objectives and goals of the land. This would monitoring such activities as; compliance with allocation, observance of no cutting buffer zones, proper road construction, utilization to name a few.

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Appendix I - Forest Management District 23 legal description

Kaipokak Bay

All that piece or parcel of land situate and being in Eastern Labrador in the Electoral Districts of Torngat Mountains and Lake Melville abutted and bounded as follows:

At a point 2 kilometres southeast of Shipiskan Lake, latitude 54° 36' 35" longitude 62° 12', where the Shipiskan River meets the Kanairiktok River;

Then proceeding generally east and northeast along the south shore of Kanairiktok River and Snegamook Lake to the eastern shore of Kanairiktok Bay on the Labrador Sea Coast;

Then following the Labrador Sea Coast in a generally southeast direction including all offshore islands, until it meets the northern boundary of Management District 20 at Grosswater Bay;

Then along the northern boundary of Management District 20 in a southwesterly direction along the south shore of Lake Melville to a point where Big River flows into Lake Melville and being a common boundary with Management District 19A, latitude 53° 31' longitude 59° 40';

Then following the Management District 19A boundary north and west until it meets a point where the Naskaupi River and the Red Wine River meet, latitude 53° 55' 30" longitude 60° 59' 30";

Then sharing a common boundary with Management District 19B following that boundary northwest along the Naskaupi River to Caribou Lake, latitude 54° 22' 25" longitude 62° 14' 17";
Then north along a common boundary with Management District 22 to the place of commencement.

Appendix II – Environmental Protection Guidelines for Ecologically based forest resource management (Stand level operations) (1998)

ENVIRONMENTAL PROTECTION GUIDELINES

“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).

This ecologically based approach to forest resource management requires that resource managers shift their focus from managing components of the ecosystem to managing the three-dimensional landscape ecosystems that produce them. Primary concern 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. This is the foundation for an ecologically based approach to forest management. It means that everyone attends to the conservation and sustainability of ecosystems instead of sharply focussing on the productivity of individual or competing resources which has been our traditional mode of operation.

The Newfoundland Forest Service is committed to the concept of forest ecosystem management which is captured in the twenty-year Forestry Development Plan (1996-2016) vision statement:

“To conserve and manage the ecosystems of the Province which sustain forests and wildlife populations and to provide for the utilization of these resources by the people of the Province under the principles of sustainable development, an ecologically-based management philosophy, and sound environmental practices”.

There are five strategic goals in the twenty-year Forestry Development Plan (1996-2016) which provide the foundation upon which ecologically based resource management will be developed.

1. Manage forest ecosystems so that their integrity, productive capacity, resiliency, and biodiversity are maintained.
2. Refine and develop management practices in an environmentally sound manner to reflect all resource values.

3. Develop public partnerships or networks to facilitate meaningful public involvement in resource management.
4. Promote adaptive ecosystem management and conduct research that focuses on ecosystem processes, functions, and ecosystem management principles.
5. Establish and enforce conservation and public safety laws with respect to managing ecosystems.

The environmental protection guidelines provide specific “on the ground” tasks for loggers and gives management direction to planners. Individually, the guidelines appear as specific rules; however, when implemented collectively they will facilitate ecologically-based forest resource management.

1.0 GENERAL GUIDELINES

These guidelines are generated from impacts described in the literature and from discussions with resource managers. As new information and management techniques become available the guidelines will be changed to reflect this improved information base. Consequently, the guidelines will be reviewed on an annual basis to incorporate any necessary changes. The “General Guidelines” apply to all forestry activities (i.e., silviculture, harvesting, road construction). These guidelines form Schedule IV of the Certificate of Managed Land. They are conditions of Crown commercial permits and they form the basis for the voluntary compliance program.

1.1 Planning

1. The location and type of all waterbody crossings must be submitted to the Department of Environment and Labour and the Department of Fisheries and Oceans. Certificates of Approval are required from both departments for waterbody crossings. A waterbody is defined as any water identified on the latest 1:50,000 topographic map. Appropriate protection is still required for streams greater than 1.0 m in width (at its narrowest point from the high water mark) not found on the 1:50,000 topographic map.
2. All waste disposal sites require a Certificate of Approval from the Minister of Government Services.
3. Excessive bulldozing is not permitted and no more than 10% of the total forest within an operating area can be disturbed. In situations where specific operating areas require more than 10% disturbance to capture available timber, the operator is required to rehabilitate

the area to reduce the total net disturbance to the 10% maximum. Where disturbance has been excessive, a rehabilitation plan will be developed with the Forest Service District Manager. Disturbance is defined as per the Ground Disturbance Survey Guidelines developed by the Newfoundland Forest Service.

4. When an archaeological site or artifact is found, the *Historical Resources Act* requires that all development temporarily cease in the area and the discovery be reported to the Historical Resources Division (709-729-2462).

The Historic Resources Division will respond immediately and will have mitigation measures in place within seven days as agreed to by the Historical Resources Division and the operator. Forestry activity can then continue.

The Historic Resources Division will be contacted during the preparation of five-year operating plans to determine the location of historic resources and appropriate mitigation measures will be designed. These measures will include such things as buffer zones and modified operations or surveys.

5. Should an oil or gas spill in excess of 70 litres occur, the operator must make every effort to first, contain, and second, clean up the spill after reporting the spill to the appropriate authorities:

**Government Services Centre
Spill Report Line
(709) 772-2083 or 1-800-563-2444**

6. The Parks and Natural Areas Division will be contacted during the preparation of five-year operating plans. Where operations are within one kilometre of provisional and ecological reserves, wilderness reserves or provincial parks, modified operations may be necessary.
7. In areas where caribou utilize arboreal lichens during the summer and/or winter, and terrestrial lichens during the summer, a minimum amount of lichen forest must be maintained for the caribou. Forestry activity will be designed in consultation with the Wildlife Division where this situation has been identified.
8. Areas identified as containing rare and/or unique flora (through literature review) are to be protected from forestry activity by avoiding these areas.
9. Where mature stands of timber for moose shelter and moose yards are required, they will be identified in consultation with Wildlife Division.
10. The impacts of forest operations on pine marten have been an ongoing issue. Until

appropriate guidelines are developed for pine marten habitat, forestry activities within high density pine marten areas and dispersion areas required for pine marten recovery will require consultation with the Wildlife Division.

11. During the preparation of five-year operating plans, areas identified as “Sensitive Wildlife Areas” in the Land Use Atlas require consultation with the Wildlife Division prior to any forestry activity.

1.2 Operations

1. A 20-metre, treed buffer zone shall be established around all water bodies that are identified on the latest 1:50,000 topographic maps and around water bodies greater than 1.0 metre in width that do not appear on the maps. Where the slope is greater than 30% there shall be a no-harvest buffer of $20\text{ m} + (1.5 \times \% \text{ slope})$. All equipment or machinery is prohibited from entering waterbodies; thus, structures must be created to cross over such waterbodies. Every reasonable effort will be made to identify intermittent streams and they will be subject to this buffer requirement. The District Manager of Forest Ecosystems is permitted to adjust the specified buffer requirements in the following circumstances:
 - < the no-cut, treed buffer can exceed the 20 meters for fish and wildlife habitat requirements.
 - < a 50-metre, 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.
 - < no forestry activity is to occur within 800 metres of a bald eagle or osprey nest during the nesting season (March 15 to July 31) and 200 metres during the remainder of the year. The location of any raptor nest site must be reported to the Wildlife Division.
 - < all hardwoods within 30 metres of a waterbody occupied by beaver are to be left standing.
 - < a minimum 30-metre, 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.
2. Heavy equipment and machinery are not permitted in any waterbody, on a wetland or a bog (unless frozen) without a Certificate of Approval from the Department of Environment and Labour and without contacting the DFO area habitat coordinator.

3. No heavy equipment or machinery is to be refuelled, serviced, or washed within 30 metres of a waterbody. Gasoline or lubricant depots must be placed 100 metres from the nearest waterbody. 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*. Fuel storage within Protected Water Supplies are more stringent. Please refer to “Guidelines for Forest Operations within Protected Water Supplies” for more information.
4. Used or waste oil shall be collected either in a tank or a closed container.
5. Above ground storage tanks shall be surrounded by a dyke. The dyked area will contain not less than 110% of the capacity of the tank. The base and walls of the dyke shall have a impermeable lining of clay, concrete, solid masonry or other material, 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.
6. Wherever possible, place slash on forwarded trails while forwarders are operating in an area. Skidding timber through any waterbody (as defined in Section 1.2.1) is prohibited.
7. Any forestry operation that directly or indirectly results in silt entering a waterbody must be dealt with immediately (A government official must be notified within 24 hours). Failure to comply will result in the operation being stopped.
8. Woody material of any kind (trees, slash, sawdust, slabs, etc.) is not permitted to enter a waterbody. Woody material on ice within the high water floodplain of any waterbody is prohibited.
9. To minimize erosion and sedimentation, waterbody crossings shall:
 - i) have stable approaches;
 - ii) be at right angles to the waterbody;
 - iii) be located where channels are well defined, unobstructed, and straight;
 - iv) be at a narrow point along the waterbody;
 - v) allow room for direct gentle approaches;
 - vi) have all mineral soil exposed during bridge construction and culvert installation seeded with grass.
10. Garbage is to be disposed of at an approved garbage disposal site. Prior to disposal it must be contained in a manner not to attract wildlife. All equipment is to be removed from the operating area where operations are completed.
11. Where safety is not an issue, a minimum average of 10 trees or snags per hectare

(average on a cut block) or a clump of trees is to be left on all sites (harvesting and silviculture). Preference will be given to trees over 50 cm dbh.

2.0 TIMBER HARVESTING GUIDELINES

2.1 Planning

1. There will be corridors to connect areas of forest that will not be harvested (isolated stands within cutovers are not considered forested areas). These corridors connect wildlife habitat, watersheds and minimize fragmentation. Acceptable corridor vegetation includes productive forest areas (all age classes) and softwood/hardwood scrub. These corridors do not have to be continuous (i.e., breaks in vegetation are permitted) and will be determined in the five-year operating plan and identified in the annual work schedule.
2. Complete utilization of harvested trees is required. (Complete utilization is harvesting trees to a top diameter of 8 cm and stumps to a height of 30 cm). The District Manager can modify the stump height requirement to accommodate snow conditions. Where markets exist, non-commercial tree species that are harvested should be brought to roadside. This will be determined in consultation with the District Manager.
3. Preplanning is required on all forest operations (Industry/Crown) at the request of the District Manager (for Industry) and the Section Head i/c Management Planning (for Crown). Preplanning will include:
 - boundaries of protected water supplies (if applicable);
 - existing and proposed access roads;
 - skid trails and landing locations;
 - areas sensitive to erosion;
 - buffer zones around water bodies;
 - approved stream crossings;
 - fuel storage locations;
 - wildlife corridors.
4. Harvesting is not permitted within caribou calving areas from May 15 - June 15 (calving period). Harvesting is not permitted within post-calving areas from June 15 to July 31. These areas will be identified by the Wildlife Division.
5. Harvest scheduling should be modified during the migration of wildlife (e.g., caribou) and during temporary wildlife concentrations (e.g., waterfowl staging). Wildlife biologists will identify the areas of concern, and in conjunction with district or company foresters, aid in the modification of forestry operations.

2.2 Operations

1. When skid trails and winter roads are to be constructed, soil disturbance and impacts on waterbodies are to be minimized. The operator will use culverts and/or log bridges depending on the conditions. The objective is to minimize erosion and sedimentation, to avoid restricting streamflow, and to ensure fish passage in fish-bearing streams. Erosion control measures (e.g., laying down brush mats and the construction of diversion ditches for water run-off) are to be maintained while the skid trail is in use. All temporary crossings are to be removed at the end of the operating season unless the District Manager agrees to extend the life of the crossing for more than one season.
2. A minimum 50-metre, no-cut buffer is to be left between operations within approved cabin development areas.

3.0 FOREST ACCESS ROADS GUIDELINES

3.1 Planning

Forest access roads, borrow pits and quarries shall avoid:

- i. wetlands, deltas, and floodplain or fluvial wetlands;
 - ii. terrain with high erodibility potential;
 - iii. known sensitive wildlife areas such as;
 - a) calving grounds, post calving areas, caribou migration routes, caribou rutting areas, and winter areas,
 - b) waterfowl breeding areas and colonial nesting sites,
 - c) established moose yards by one kilometre,
 - d) eagle and osprey nest sites,
 - e) where site conditions and engineering permits, main haul roads should be one kilometre from permanent water bodies and all other roads by not more than 100 metres,
 - f) endangered or endemic species or sub-species of flora or fauna and other areas to be determined by qualified authorities;
 - iv. known sensitive fish areas such as, spawning and rearing grounds;
 - v. historically significant areas such as, archaeological sites;
 - vi. existing reserves such as:
 - a. parks (municipal, provincial, national);
 - b. wilderness areas and ecological reserves;
 - c. rare and endangered plant sites and habitats.
2. With respect to borrow pits and quarries, the operator shall:

- i) minimize the number of new borrow areas opened for construction and/or maintenance;
 - ii) use existing borrow areas whenever practical;
 - iii) be in possession of a valid quarry permit from the Department of Mines and Energy prior to aggregate extraction activities;
 - iv) not locate pits and quarries in sensitive areas as identified by planning processes.
- 3. Forest access roads will not obstruct wildlife migration routes. The following guidelines will be followed to ensure the road is as un-obstructing as possible:
 - i) roads should be of low profile (less than 1 m above the surrounding terrain);
 - ii) slash and other debris shall be removed;
 - iii) the slope of ditches and road banks should not exceed 1½ horizontal to vertical.
- 4. Culverts and bridges 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 Labour and from the Department of Fisheries and Oceans. Culvert ends will be properly riprapped.
- 5. Where road construction is to occur around identified waterfowl breeding, moulting and staging areas, the Canadian Wildlife Service is to be consulted.
- 6. Road construction is not permitted within any buffer zone except with the permission of the District Manager.
- 7. When a skid trail is on steep ground and is no longer in use, cut-off ditches and push lanes must be created. The frequency will be determined by the District Manager.
- 8. When disturbance is over 10%, the conditions in 1.1.3 will apply.
- 9. There shall be no bulldozing of standing merchantable timber or poor utilization of merchantable softwoods and hardwoods during cutting of the right-of-way.
- 10. Excavations required for the construction of piers, abutments or multi-plate culverts shall be completed in the dry. (Where exceptions occur, consultation with District manager is required).
- 11. On a site specific basis, roads can be decommissioned and/or rehabilitated as directed by

the District Manager. Decommissioning is defined as barring access; rehabilitation means to re-vegetate the road.

3.2 **Operations**

1. A "no-grub" zone of 30 metres 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. Manual clearing at waterbody crossing sites should be used to remove or control vegetation. Right-of-way widths at waterbody crossings should be kept to a minimum.
2. Fill materials for road building must not be obtained from any waterbody or from within the floodplain of any waterbody.
3. Trees are to be felled away from all waterbodies, and slash and debris should be piled above the high water mark so that it cannot enter waterbodies during periods of peak flow.
4. Equipment activity in water crossing areas is to be kept to a minimum. Whenever possible, any work is to be carried out from dry stable areas.
5. Unnecessary side casting or backfilling in the vicinity of waterbodies is not permitted. Where topographical constraints dictate that the roadbed must be constructed adjacent to a waterbody, road slope stabilization is to 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 armour stone is recommended in such areas.
6. Side casting must be carried out in such a manner that sediment does not enter any waterbody.
7. Where borrow pit or quarry activity is likely to cause sediment-laden run-off to contaminate a waterbody, sediment control measures such as filter fabric berms or sedimentation ponds are to be installed. Contact is to be made with the District Manager prior to construction where such conditions exist.
8. Stabilize cut banks and fill slopes in the vicinity of waterbodies.
9. When using ditches, especially on long slopes, baffles and culverts are to be used at frequent intervals.
10. When constructing ditches near streams, the ditch itself is not to lead directly into the stream.
11. Keep ditches at the same gradient as the road.

12. In side hill and similar areas, install ditches on the uphill sides of roads to intercept seepage and run-off.
13. Borrow pits are to be located 50 metres from the nearest waterbody.

4.0 SILVICULTURAL PRACTICES AND FOREST REGENERATION GUIDELINES

4.1 Scarification

1. Select scarification methods best suited for preparing the area for planting and for minimizing ground disturbance.
2. Where slash is piled into windrows, ensure the windrows are placed where slash cannot be washed into streams at peak flooding conditions.
3. To minimize erosion, do not direct scarification equipment straight down slope.
4. 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.
5. Whenever possible, white pine regeneration will not be disturbed.

4.2 Planting

1. Landings will be stabilized through seeding (grass) or planting at time of plantation establishment.

4.3 Pre-commercial Thinning

1. Where possible, do not carry out pre-commercial thinning in important wildlife areas during the periods of birth and/or hatching. These areas and times will be identified by the Wildlife Division.
2. Where white pine regeneration is present, the District Manager will determine how the pine will be thinned.
3. Trees cut will not be felled into waterbodies.

5.0 FOREST PROTECTION GUIDELINES

1. A pesticide application licence must be obtained from the Department of Environment. This licence will determine planning and operational requirements.

6.0 GUIDELINES FOR FORESTRY OPERATIONS WITHIN PROTECTED WATER SUPPLY AREAS

The primary function of a protected water supply area is to provide the public with an adequate quantity of safe and good quality water on a permanent basis, to meet its present and future demands. Any other activity within water supply areas is considered secondary, and if permitted, must be strictly regulated and monitored to ensure that the water supply integrity is not threatened and the quality of the water is not impaired.

In Newfoundland, forestry operations are permitted in protected water supply areas on a limited and controlled basis provided the proposed operations have no, or minimal, water quality impairment potential.

The following permits and approvals are required prior to the beginning of forestry operations within a protected water supply area:

- 1) Approval of the forest operating plan by the Newfoundland Forest Service.
- 2) Approval of the forest operating plan by the provincial Department of Environment and Labour and issuance of a Certificate of Approval under *Section 10* of the *Department of Environment Act*.
- 3) Quarry permits from the provincial Department of Mines and Energy for all borrow areas and ballast pits on unalienated Crown lands and alienated Crown land (i.e., leased and licenced land).
- 4) Stream crossing permits under *Section 11* of the *Department of Environment Act* and from the federal Department of Fisheries and Oceans.
- 5) Other permits or approvals as required by natural resource management and regulatory agencies.

6.1 Planning

1. Prior to beginning any work, a forest operating plan must be prepared and approved by the Newfoundland Forest Service and the Department of Environment and Labour, and a

Certificate of Approval must be obtained under *Section 10* of the *Department of Environment Act* for site specific activities such as road construction, commercial harvesting, silvicultural operations, and other activities associated with forestry operations.

2. In addition to the information normally contained in a forest operating plan, the plan must include maps to show:
 - < the boundary of the protected water supply area;
 - < existing and proposed access roads;
 - < proposed harvesting areas;
 - < areas sensitive to erosion;
 - < buffer zones around water bodies;
 - < approved stream crossings;
 - < proposed landing and skid trail locations;
 - < proposed fuel storage locations;
 - < peatland and other wetlands;
 - < nearby communities;
 - < other relevant information.

The plan must also contain a written section describing the harvesting techniques to be used, the equipment required for the operation, and the schedule of the operation.

3. Locate roads to avoid all waterbodies and areas of sensitive terrain.
4. The forest operating plan must identify an Operations Manager who shall have the responsibility for ensuring that the special protection measures are followed. The Operations Manager is responsible for co-ordinating clean-up efforts in the event of a fuel or oil spill.

6.2 Forest Access Road Construction

1. A "no-grub" zone of 30 metres of undisturbed ground vegetation must be maintained around any waterbody crossing to minimize the damage to the lower vegetation and organic cover, thus reducing the erosion potential. Manual clearing at waterbody crossing sites should be used to remove or control vegetation. Right-of-way widths at waterbody crossings should be kept to a minimum.
2. Clear-cutting up to the perimeter of any waterbody is not permitted. In all areas where road construction approaches a waterbody, a buffer zone of undisturbed vegetation must be maintained on both sides of the right-of-way using the buffer zone criteria outlined in

section 6.6.

3. Fill materials for road building must not be obtained from any waterbody or from within the floodplain of any waterbody.
4. Provide adequately designed and constructed drainage ditches along forest roads to allow for good road drainage.
5. Take-off ditching can be used on both sides of the road, or in conjunction with culverts, to divert the ditch flow into the woods or into stable vegetated areas above the no-grub zones. Where take-off ditches are unstable or cannot be constructed, the use of check dams and settling basins in the ditches is required until the ditches become stabilized.
6. Trees are to be felled away from all waterbodies, and slash and debris should be piled above the high water mark so that it cannot enter waterbodies during periods of peak flow.
7. Equipment activity in water crossing areas shall be kept to a minimum. Any work will be carried out in dry, stable areas.
8. When working near sensitive areas such as streams or lakes, road building operations causing erosion or siltation are to be followed as per section 1.2.7.
9. Unnecessary side casting or backfilling 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 is to be undertaken at the toe of the fill where it enters water, an area where active erosion is likely. The placement of large riprap or armour stone is recommended in such areas. Contact is to be made with the District Manager prior to construction when such conditions occur.
10. Side casting must be carried out in such a manner that sediment does not enter any waterbody.
11. Maintenance support sites must be located outside the protected water supply area.

6.3 Forest Access Road Stream Crossings

1. Stream fording is prohibited in protected water supply areas.
2. All stream crossings, whether culverts or bridges, require written approval under *Section 11 of the Department of Environment Act*.

3. The operator must comply with all terms and conditions of a Certificate of Approval for stream crossings.

6.4 **Harvesting**

1. Harvesting or other heavy equipment will not be used on wetlands or bogs.
2. Steep areas with high potential for erosion should not be harvested.
3. Wherever possible, skid trails should run along contours and never cross wetlands and waterbodies.
4. Landings will be few in number with a maximum size of less than 0.25 ha. All landings should be located at least 100 metres from a waterbody.
5. In sensitive areas prone to erosion, equipment must have wide tires, or harvesting must occur during the winter when the ground is frozen.
6. Harvesting equipment shall not enter a buffer zone or any waterbody without permission of the District Manager.
7. The operator must implement erosion control and rehabilitation measures in areas where soils have been unduly disturbed by harvesting activity. In addition to general erosion control measures presented in other sections of these guidelines, the following should also be considered in protected water supply areas:
 - < undertake contour furrowing;
 - < construct diversion ditches to lessen the possibility of forming new drainage channels;
 - < seed or plant areas that are difficult to stabilize by other means;
 - < plough or rip prior to seeding any surfaces which have been compacted.

6.5 **Buffer Zones**

The Newfoundland Forest Service on unalienated Crown land and the appropriate company on leased, licenced, private or charter land will provide the operator with a map indicating the harvesting area and no-cut treed buffer zones, and will ensure that the operator is familiar with the boundaries.

No forestry activities are permitted within the following buffer zones.

Water Body	Width of Buffer Zone
1. Intake pond/lake/reservoir	A minimum of 150 m
2. River intake	A minimum of 150 m for 1 km upstream and 100 m downstream
3. Main river channel	A minimum of 75 m
4. Major tributaries/lakes/ponds	A minimum of 50 m
5. Other water bodies	A minimum of 30 m

6.6 Fuel/Oil Handling and Storage

Fuel storage and the operation of fuel storage equipment is regulated by the *Storage and Handling of Gasoline and Associated Products Regulations (1982)* under the Department of Environment and Lands Act. According to the regulations, the owner or operator of a fuel storage system must submit a Schedule "A" Storage Tank System Application to the Department of Environment. The applicant must be in receipt of a Certificate of Approval for the system before the system is used for fuel storage. Section 9 of the above Act states: "*No owner or operator shall directly or indirectly cause pollution of the soil or water by causing, suffering or permitting leakage or spillage of gasoline or associated products from a storage tank system or vehicle.*"

In addition to the above regulatory requirements, the following guidelines are to be followed:

1. Bulk fuel is to be stored outside the protected water supply area. If fuel must be stored in the protected area, it must be in the least sensitive area and be approved by the Water Resources Management Division of the Department of Environment and Labour.
2. Fuel must be stored in self-dyked, above-ground Jeep Tanks which have been approved by the Department of Environment and Labour.
3. A maximum of seven days fuel supply can be stored within a water supply area.
4. Refuelling must not take place within 100 metres of a waterbody.
5. Daily dipping of tanks and weekly reconciliations are mandatory. Visual inspection of the dykes and the surrounding area must be carried out daily and inspection records must be maintained.

6. Each unit must be fitted with a locking valve system for the elimination of water inside the outer tank. The valve must be closed and locked except to drain precipitation.
7. Each person involved with fuel handling must be cautioned that any spillage is to be cleaned up immediately.
8. Each person involved with fuel storage must exercise extreme caution when refuelling equipment.
9. All waste materials and waste oil on the site must be collected in enclosed containers and removed to an approved site at least weekly.
10. Contaminated soil or snow must be disposed of at an approved waste disposal site.
11. Any spill in excess of 70 litres must be reported immediately through the 24- hour Spill Report Number (709-772-2083) or the Government Services Centre (1-800-563-2444).
12. All self-dyked Jeep Tanks must be located at a minimum distance of 500 metres from any major waterbody.
13. A fuel or oil spill clean-up kit must be kept on site within the protected area to facilitate any clean-up in the event of a spill. This kit must include absorbent pads, loose absorbent materials such as dried peat, speedy-dry or sawdust, and a container such as an empty drum for recovering the fuel or oil. If there is a bulk fuel storage facility within the protected area, the clean-up kit must include the following list of fuel or oil spill clean-up equipment:

- < Fire pump and 100 metres of hose
- < Two hand operated fuel pumps
- < Six recovery containers such as empty drums
- < Four long handled shovels
- < Two pick axes
- < Ten metres of containment boom
- < Twenty-five absorbent pads
- < One hundred litres of loose absorbent material.

When any fuel spill occurs, stop the fuel flow immediately. This may entail repairing a leak, pumping out a tank, or shutting off a valve. If fuel or oil is spilled onto soil, dyking may be necessary. If fuel or oil enters water, absorbent booms or barriers such as fencing or netting with loose absorbent or straw must be used to contain the spill. If necessary, culverts may be blocked off by earth or wooden barriers to contain the fuel or oil provided the threat of flooding is addressed.

All recovered fuel or oil must be stored in containers. Contaminated soil must be removed and placed in containers for transport and disposal. Extensive soil removal may cause problems such as erosion and the subsequent siltation of waterbodies; therefore, the affected area must be backfilled and sloped and revegetated as required by the Department of Environment and Labour.

Recovered fuel or oil should be reused or collected by a waste oil company for recycling. Oily debris and contaminated soils must be disposed of at an approved waste disposal site with the approval of the disposal site owner or operator. Contact must be made with the appropriate regional office of the Department of Environment and Labour before disposal.

6.7 Support Service and Structures

1. Storage of any type of pesticide, chemical or other hazardous material is prohibited within a protected water supply area.
2. Dormitory camps, garages or any other structures are prohibited within a protected water supply area.
3. The establishment of new sawmills is not permitted in protected water supply areas.
4. Wherever possible, toilet facilities must be provided in all work areas.
5. Garbage cans must be located in all work areas and garbage is to be collected regularly and disposed of at an approved waste disposal site outside the protected area.

6.8 Silviculture

1. Chemicals are to be used within a protected water supply area only under the approval of the Division of Water Resources.
2. Scarification must be minimized and restricted to the trench or spot types.
3. If scarification leads to erosion or sedimentation of small streams or water bodies, scarification operations must be suspended and remedial measures must be taken.

6.9 Abandonment

When forestry operations in a protected water supply area have been completed, an abandonment plan for the area should be developed. This will involve input from the Newfoundland Forest Service, the Community involved, and the Water Resources Management Division of the Department of Environment and Labour. In general, the purpose of the plan is: (i) to ensure that the post-harvest conditions do not lead to water quality impairment, and (ii) to discourage activities or use of the area that could lead to water quality impairment.

An important question will be whether access roads will remain open. This will be decided on a case-by-case basis in consultation with the municipality, Water Resources Management Division and the operator. Issues such as the rehabilitation of cutover areas, landing sites, skid trails, and the abandonment of roads are to be discussed during the consultation process to control post-harvesting environmental impacts and activities.

The following are recommended precautionary measures if roads are to be closed to control post-harvesting access to the area:

- < Use water bars (trenches 8-10" deep dug across the road) to intercept and deflect surface roadside ditches rather than have it flow into a waterbody. Water bars can be placed 500 metres apart in gentle to moderate terrain (up to 10% slope), but should be no more than 150 metres apart in terrain greater than 10%. In most cases, it is sufficient to limit water bars to one kilometer on each side of a stream crossing.
- < Road-side ditches should flow into the woods or into stable, vegetation covered areas.
- < Stable bridge abutments and erosion protection works at crossings need not be removed.
- < Bridge decking, culverts and other easily removable structures should be transported out of the watershed area.
- < All disturbed areas of river banks will be stabilized and seeded.

6.10 Monitoring and Inspection

1. Forestry operations approved under Section 10 of the Department of Environment Act will be inspected from time to time by the staff of the Water Resources Management Division to ensure the operator's compliance with the environmental protection guidelines and the terms and conditions of the approvals.

2. In case of an oil spill, the sedimentation of a water body, or any other water quality impairment related issue, the operator might be required by the Department of Environment and Labour to undertake water quality monitoring to assess the extent of the damage and to select appropriate mitigative measures to correct the harmful conditions.
3. Any water quality impairment problem should be reported to the Water Resources Management Division.

7.0 PROCESSING FACILITIES AND SUPPORT SERVICES GUIDELINES

1. If possible, use previously disturbed sites (e.g., borrow pit).
2. Minimize the size of the area cleared for the establishment of any camp, processing or support structures. Wherever possible, these facilities should not be established within 100 metres of a waterbody.
3. All sumps containing effluent from a kitchen or washroom facility must be properly treated on a daily basis in compliance with Department of Health regulations.
4. Sewage disposal must be carried out in compliance with the Public Health Act.
5. A permit to occupy is required for Crown Land developments.
6. Facilities will not be located within known sensitive wildlife areas. These areas will be identified by the Wildlife Division.
7. A permit is required for a firearm.

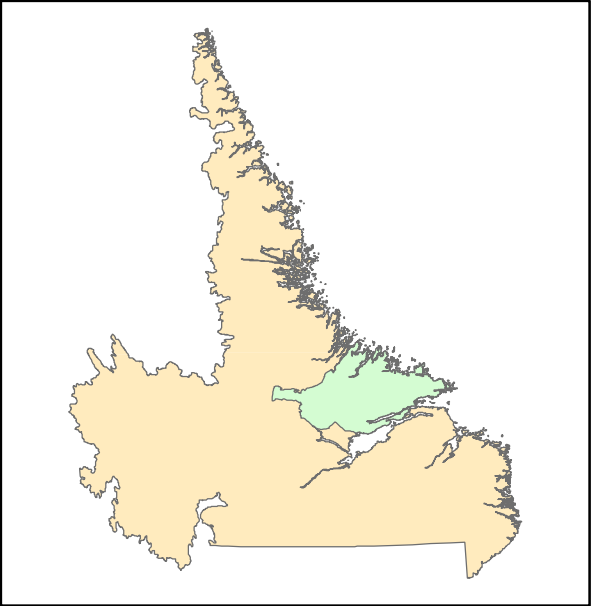
8.0 PLANNING AND MUNICIPAL AREA GUIDELINES

1. Timber harvesting, resource road construction, silviculture, processing facilities, and support services are developments under the Urban and Rural Planning Act. Where these activities occur within a planning area boundary or within 400 metres of a protected road, a development permit is required before any activity takes place.
2. Consultation with the planning agency (usually municipality, but also the Development Control Unit of the Department of Municipal and Provincial

Affairs) is to be made at the planning stage so that regulatory requirements can be made known and taken into account. This should occur three months before the desired commencement of the development and the permit obtained about one month before the development is to start.

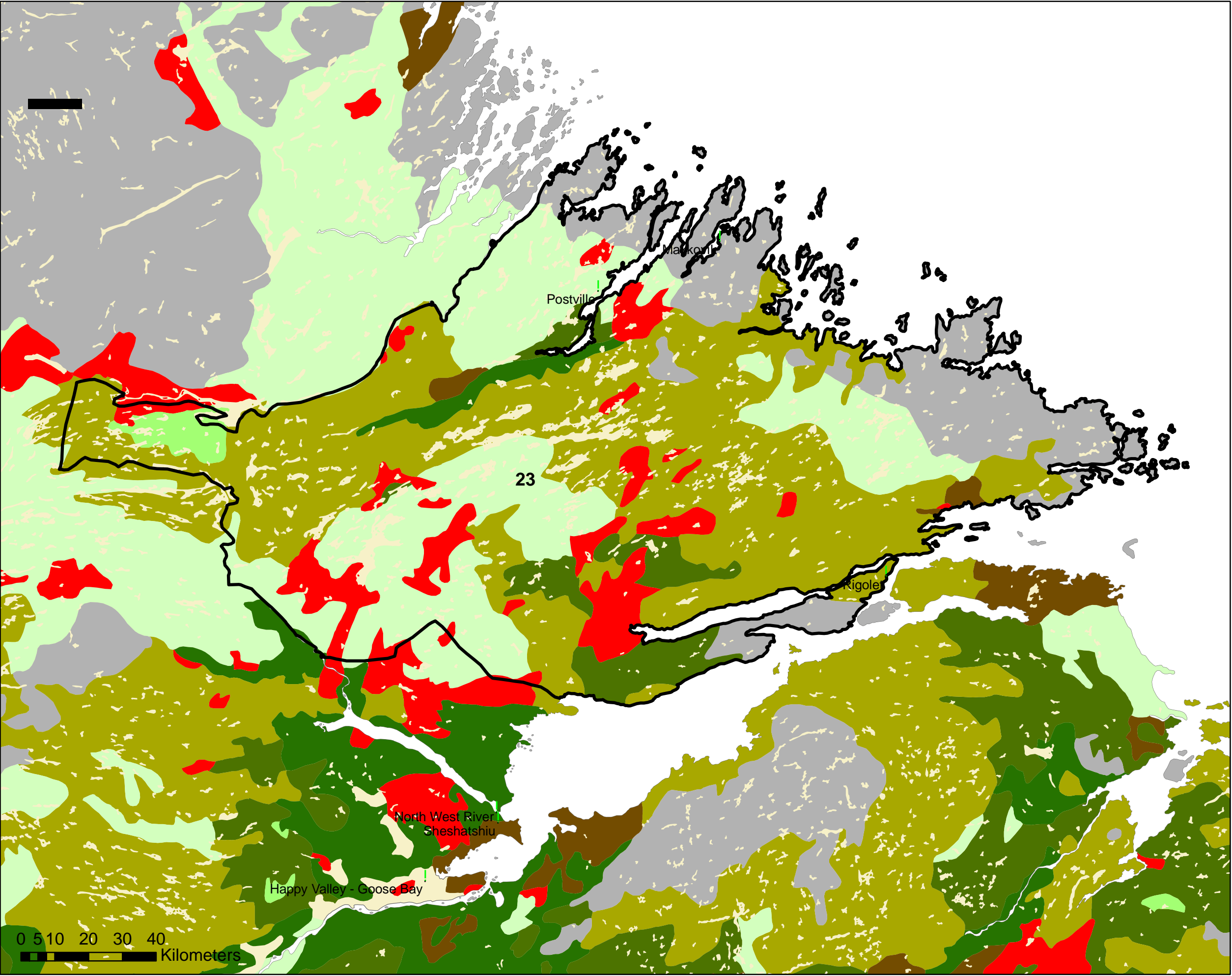
Map 2.1
District 23
5 Year Operating Plan
District Overview
1:1,100,000

- Legend**
-  District 23
 -  Waterbody
 -  Wetland
 -  Labrador
 -  North Atlantic



0 5 10 20 30 40 Kilometers

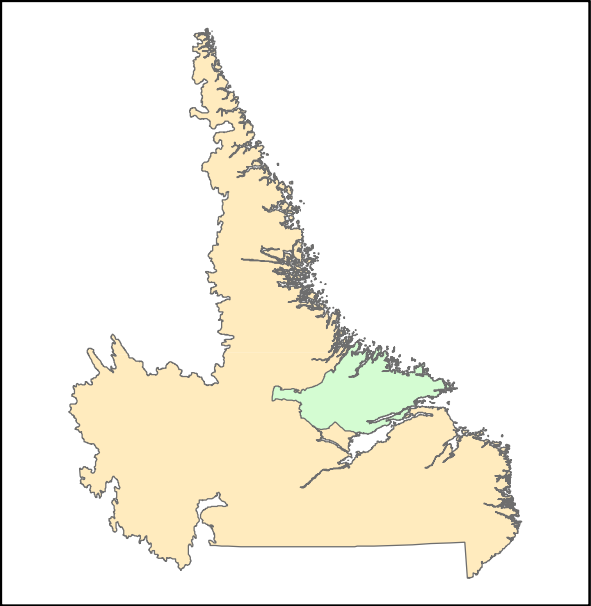
Map 2.2
District 23
5 Year Operating Plan
Forest Types
1:1,100,000



Legend

- Communities
- District 23
- Burn
- Hardwood Scrub
- Heavily Stocked Spruce/Fir Commercial Forest
- Lichen Woodland
- Moderately Stocked Spruce/Fir Commercial Forest
- Non-Commercial Black Spruce Forest
- Peatland
- Tundra and Rock Barren

Description	Area Sq Km
Burn	19,803,893
Hardwood Scrub	2,899,324
Heavily Stocked Spruce/Fir Commercial Forest	3,636,055
Lichen Woodland	54,314,320
Moderately Stocked Spruce/Fir Commercial Forest	12,645,742
Non-Commercial Black Spruce Forest	96,965,609
Peatland	1,733,945
Tundra and Rock Barren	39,784,683
Water	16,631,174

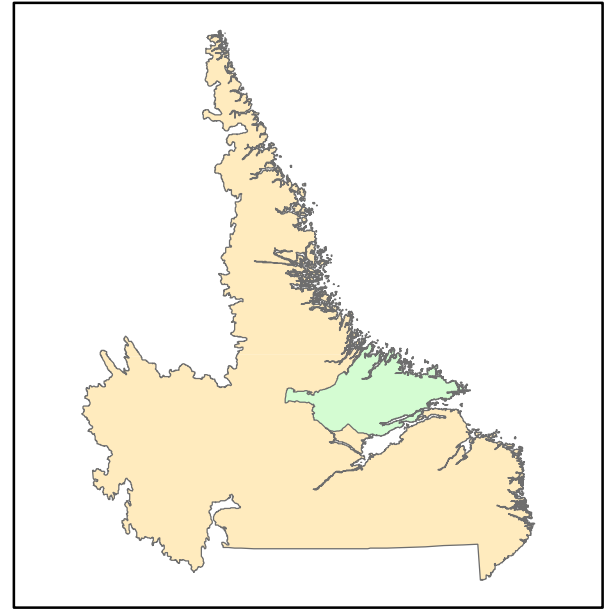


Map 2.3, District 23
5 Year Operating Plan
Land Classes
1:1,100,000

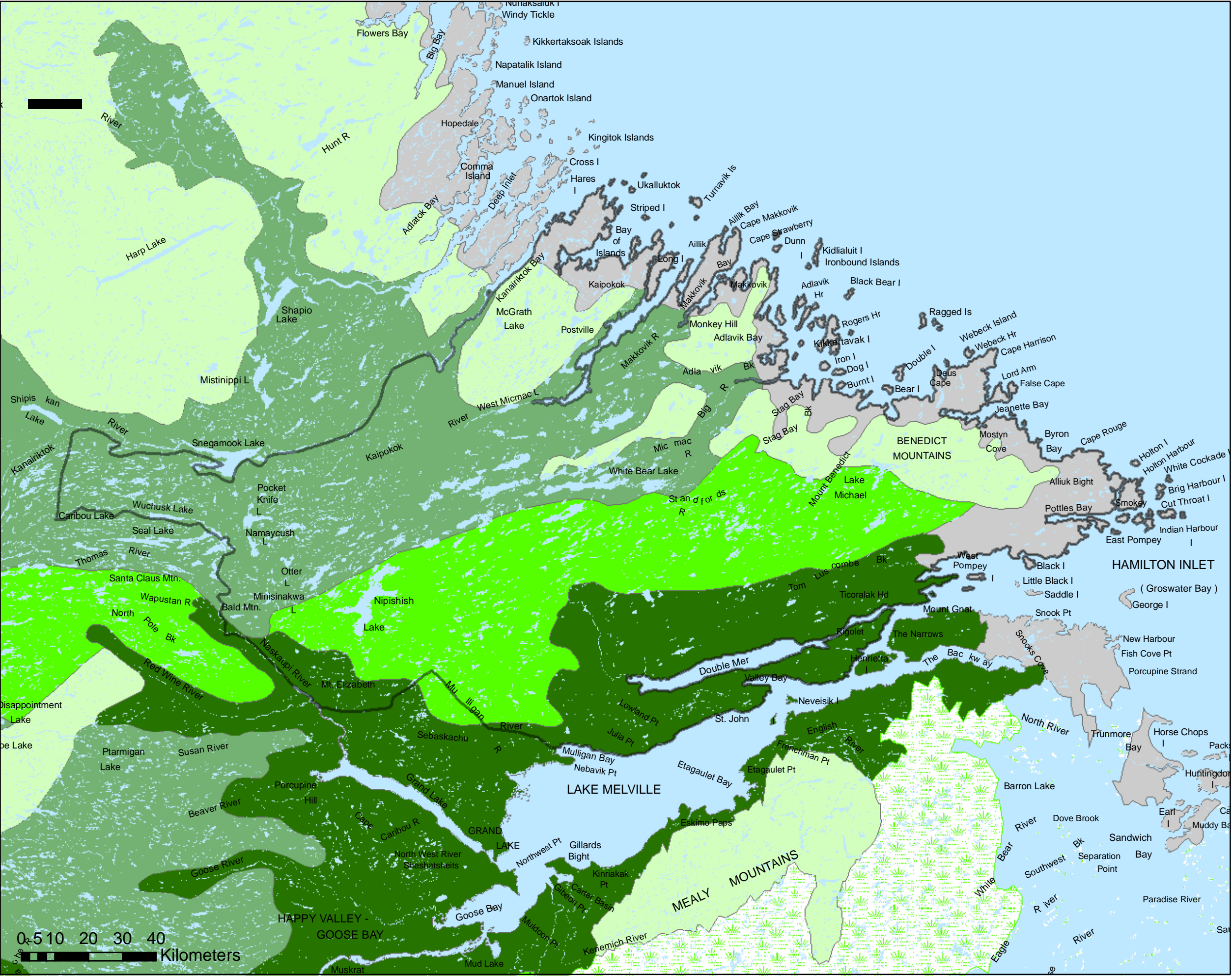
Legend

- LIL
- Waterbody
- LISA
- District 23
- Wetland
- Labrador
- NorthAtlantic

District 23		
Land Management	Area (Km ²)	Percentage Area
LIL	5806.6	18.9
LISA	18194.6	59.4
Crown	6632.1	21.7
Total	30630.2	100.0

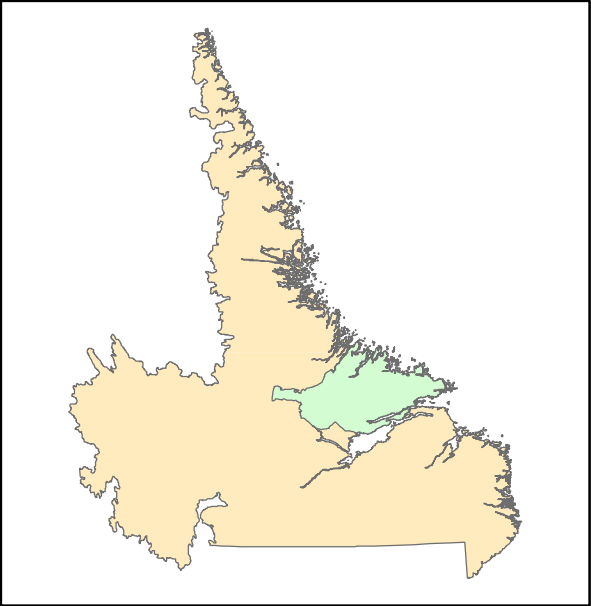


Map 2.4 District 23
5 Year Operating Plan
Ecoregions
1:1,100,000










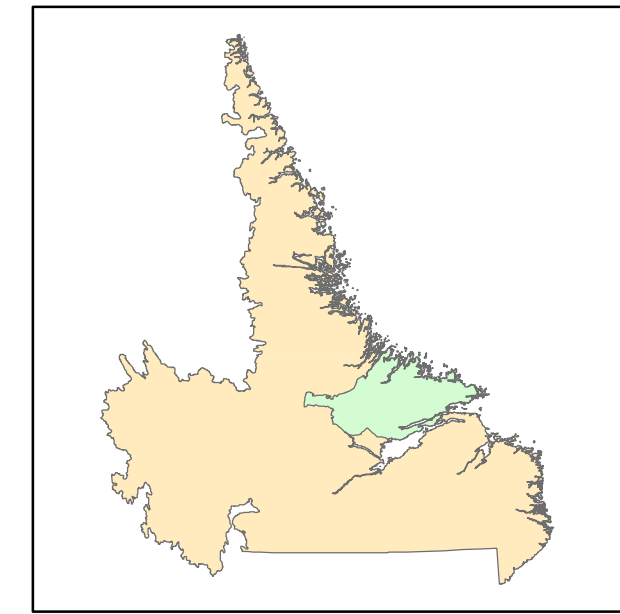
Legend

- District 23
- Waterbody
- Coastal Barrens (Okak-Battle Harbour)
- High Boreal Forest (Lake Melville)
- High Subarctic Tundra (Kingurutik-Fraser)
- Low Subarctic Forest (Mecatina River)
- Mid Subarctic Forest (Lake Michikamau)
- String Bog (Eagle River Plateau)
- Wetland
- NorthAtlantic

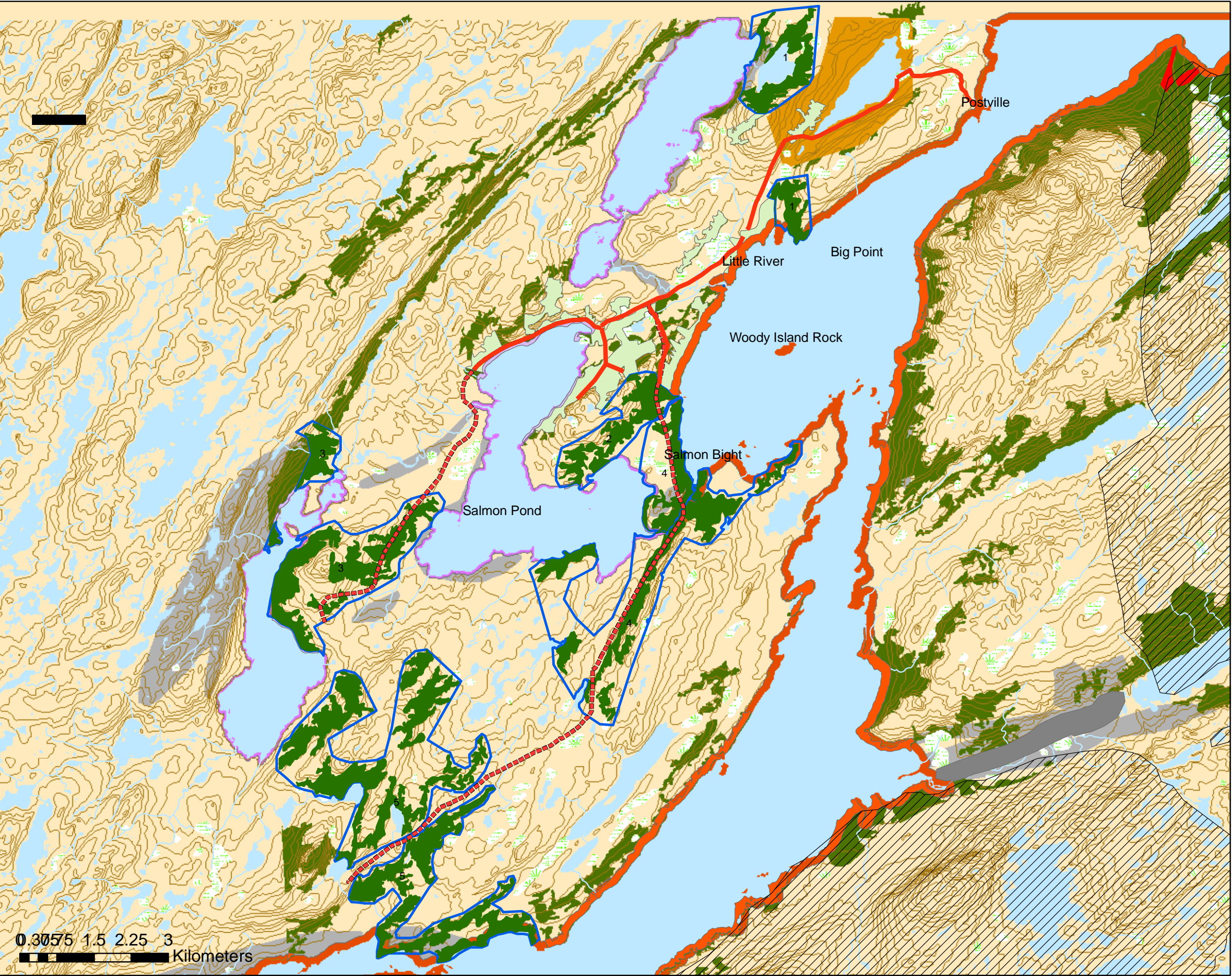


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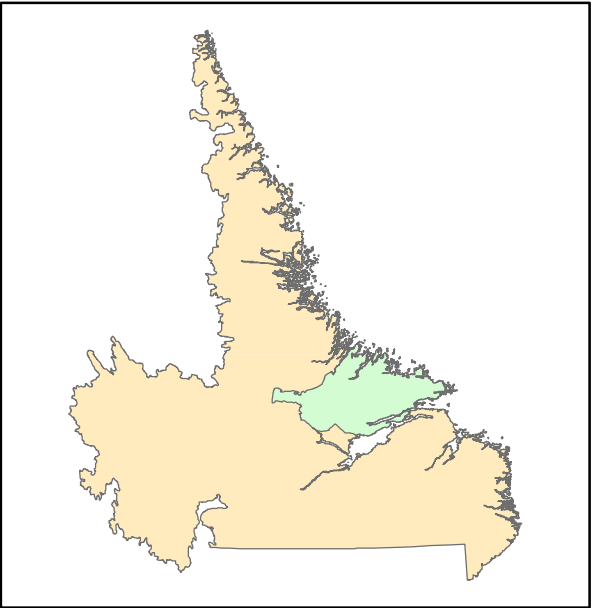
-  New Inventory Areas
-  River, Stream, Brook
-  District 23
-  Waterbody
-  Wetland
-  Labrador
-  North Atlantic



Map 2.6 District 23
5 Year Operating Plan
Protected Areas
1:75,000



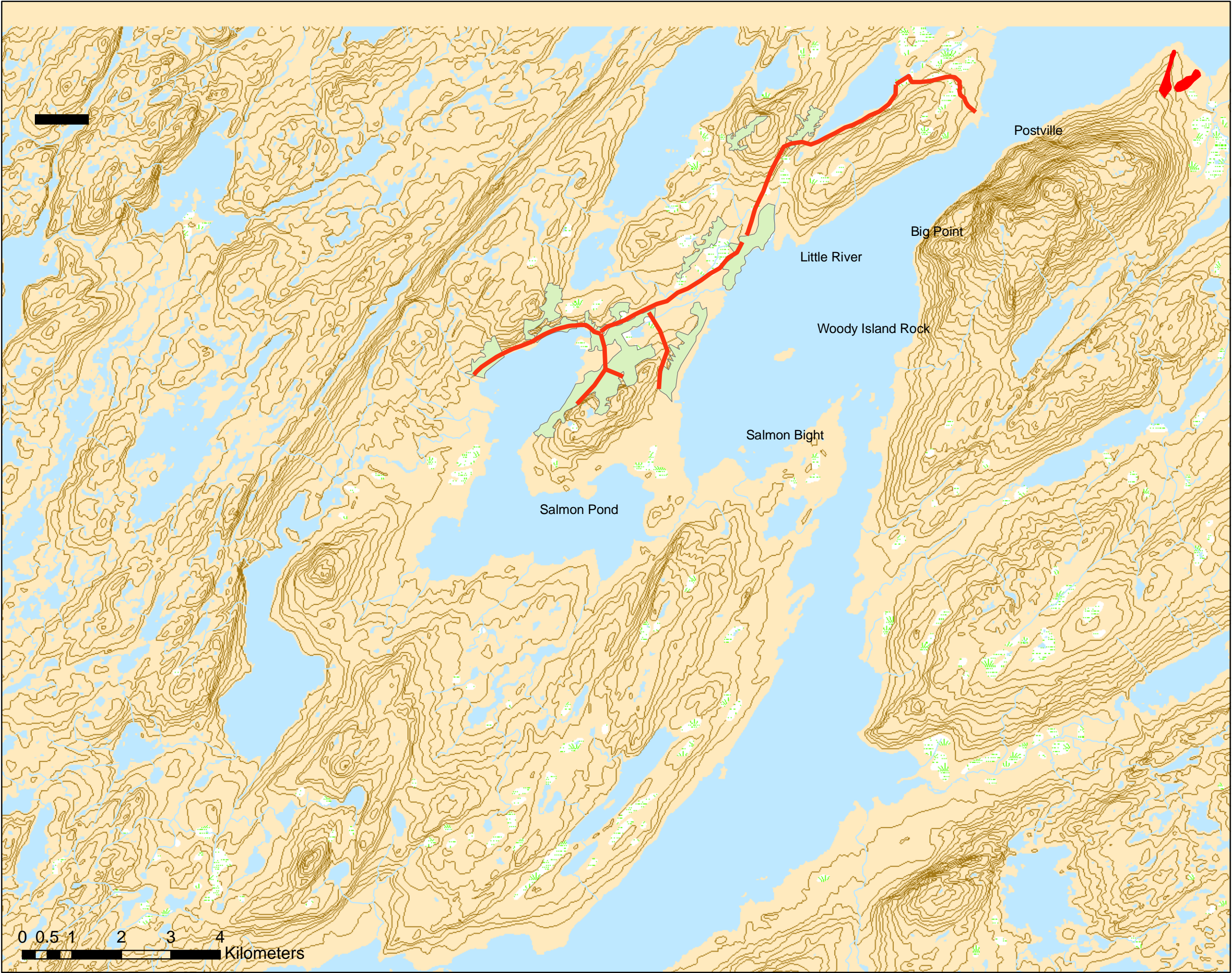
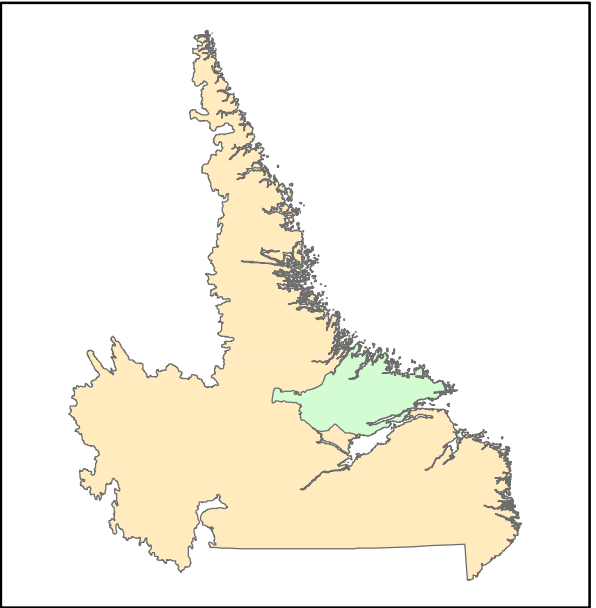
- Legend**
- Stream, Brook
 - Existing Road
 - Proposed Forest Roads
 - merchantable_blocks
 - Trapping Area
 - Proposed Harvesting Areas
 - Domestic Fuelwood
 - Past Silviculture Areas
 - Past Harvested Areas
 - Wetland
 - Waterbody
 - 50m Special Lake Buffer
 - Protected Water Supply
 - Merchantable Timber
 - 150m Buffer on Kaipokok
 - No Commercial Harvest
 - Labrador



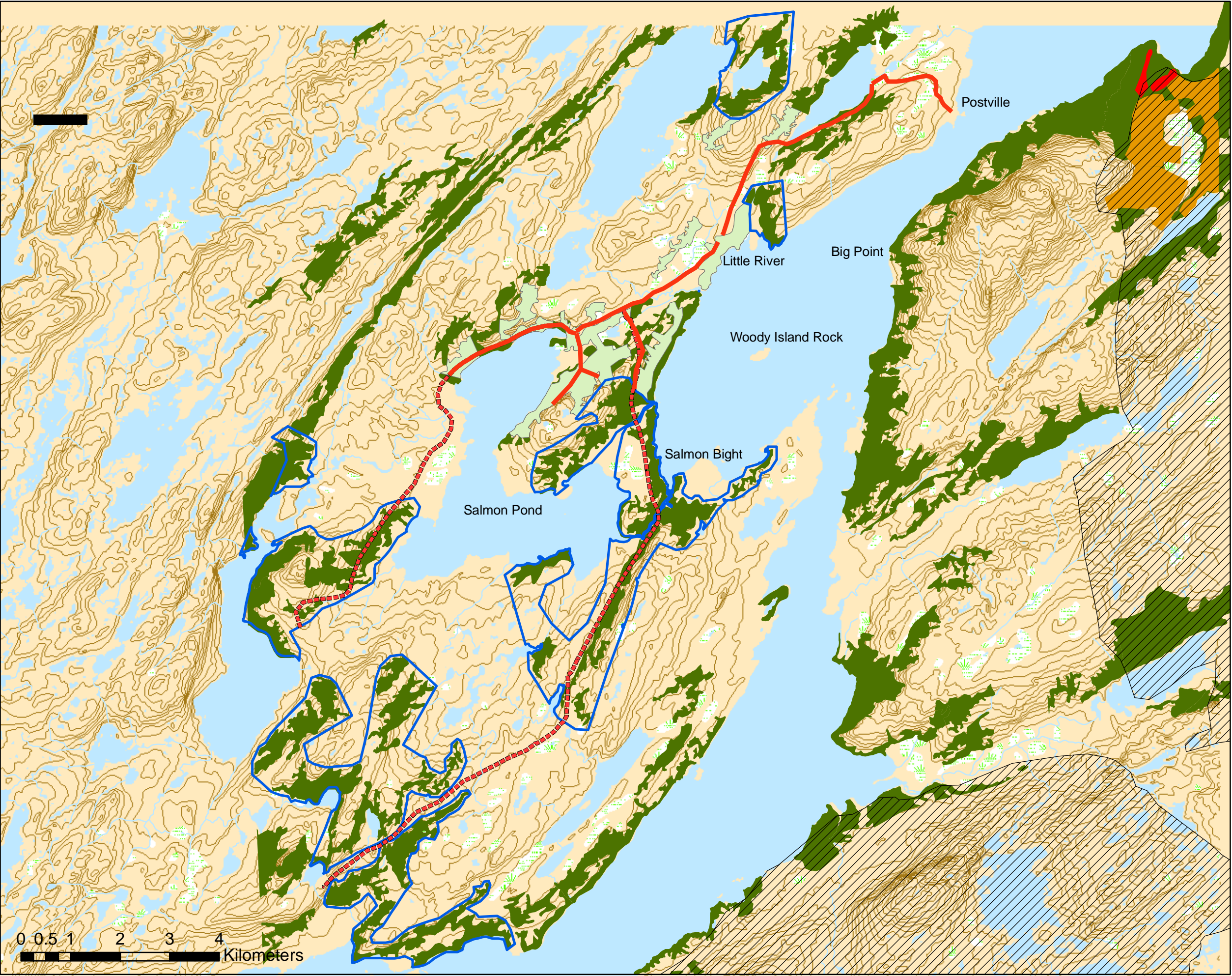
Map 4.1
District 23
5 Year Operating Plan
Past Activities
1:75,000

Legend

- Forest Roads
- Stream, Brook
- Past Harvested Areas
- Wetland
- Past Silviculture Areas
- Waterbody
- Labrador

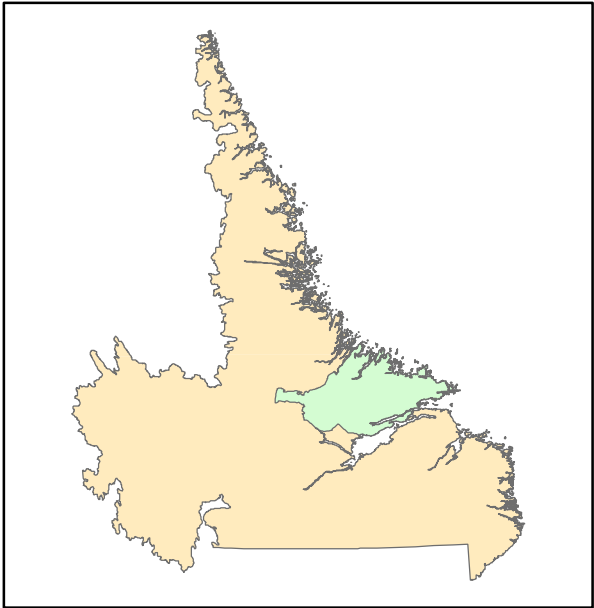


**Map 7.1, Postville
5 Year Operating Plan
Proposed Activities
1:75,000**



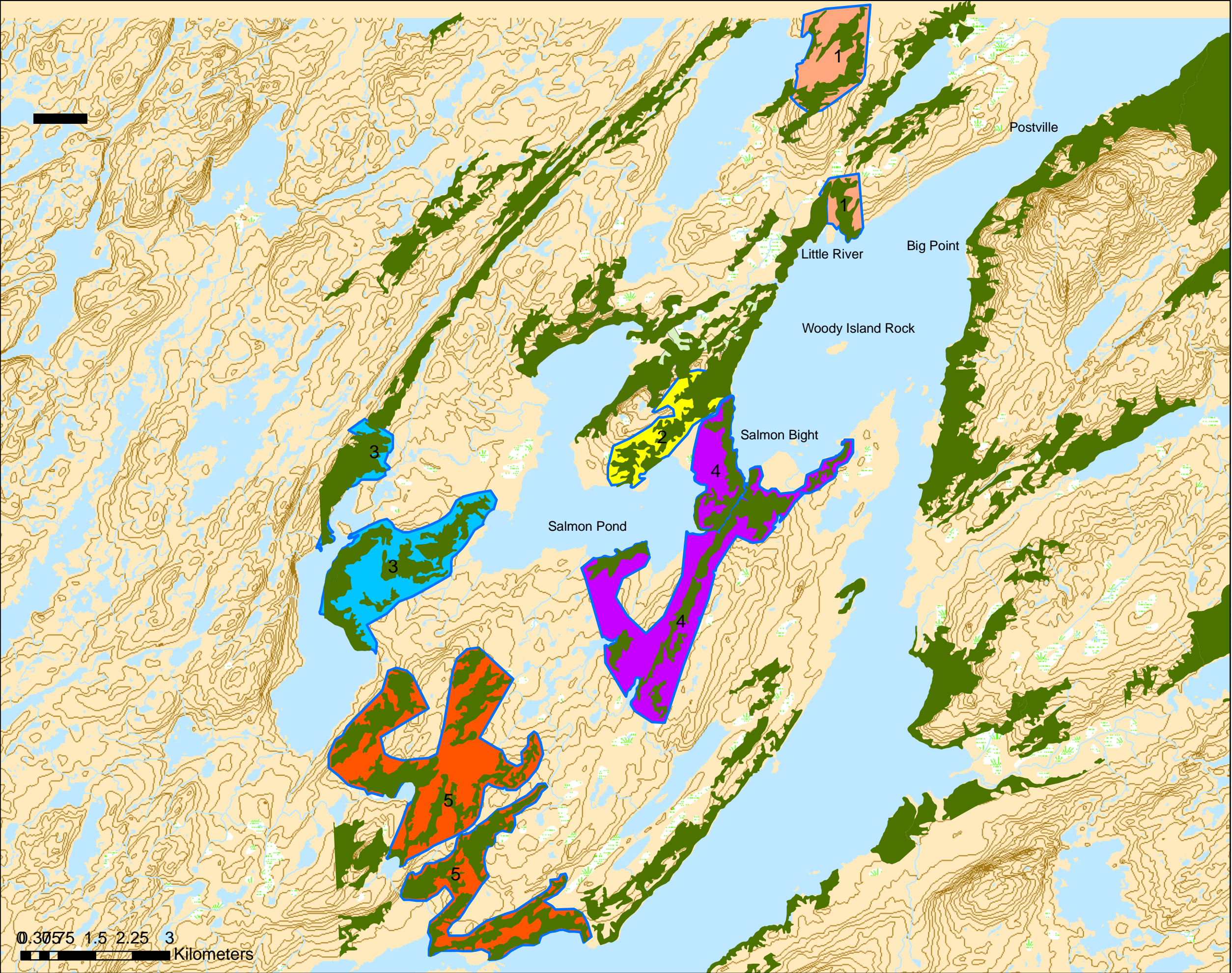
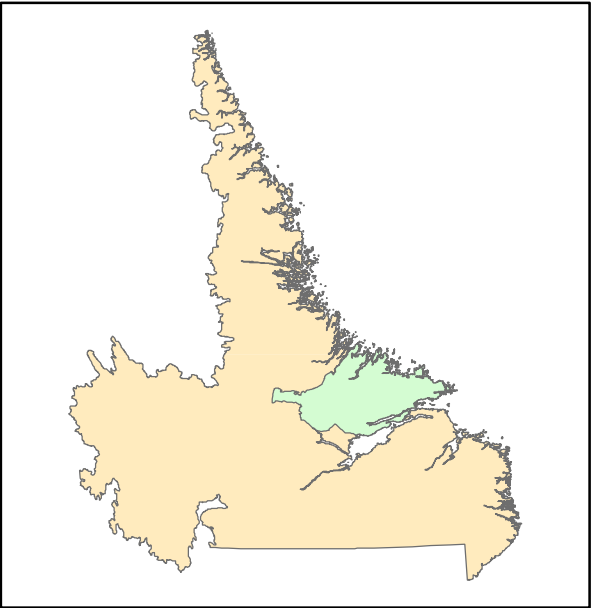
Legend

- Forest Roads
- Proposed Forest Roads
- Stream, Brook
- Past Silviculture Areas
- Proposed Silviculture Areas
- Proposed Harvesting Areas
- Past Harvested Areas
- Merchantible Timber
- Wetland
- Waterbody
- Labrador



Map 7.2
District 23
5 Year Operating Plan
Proposed Harvesting Areas
1:75,000

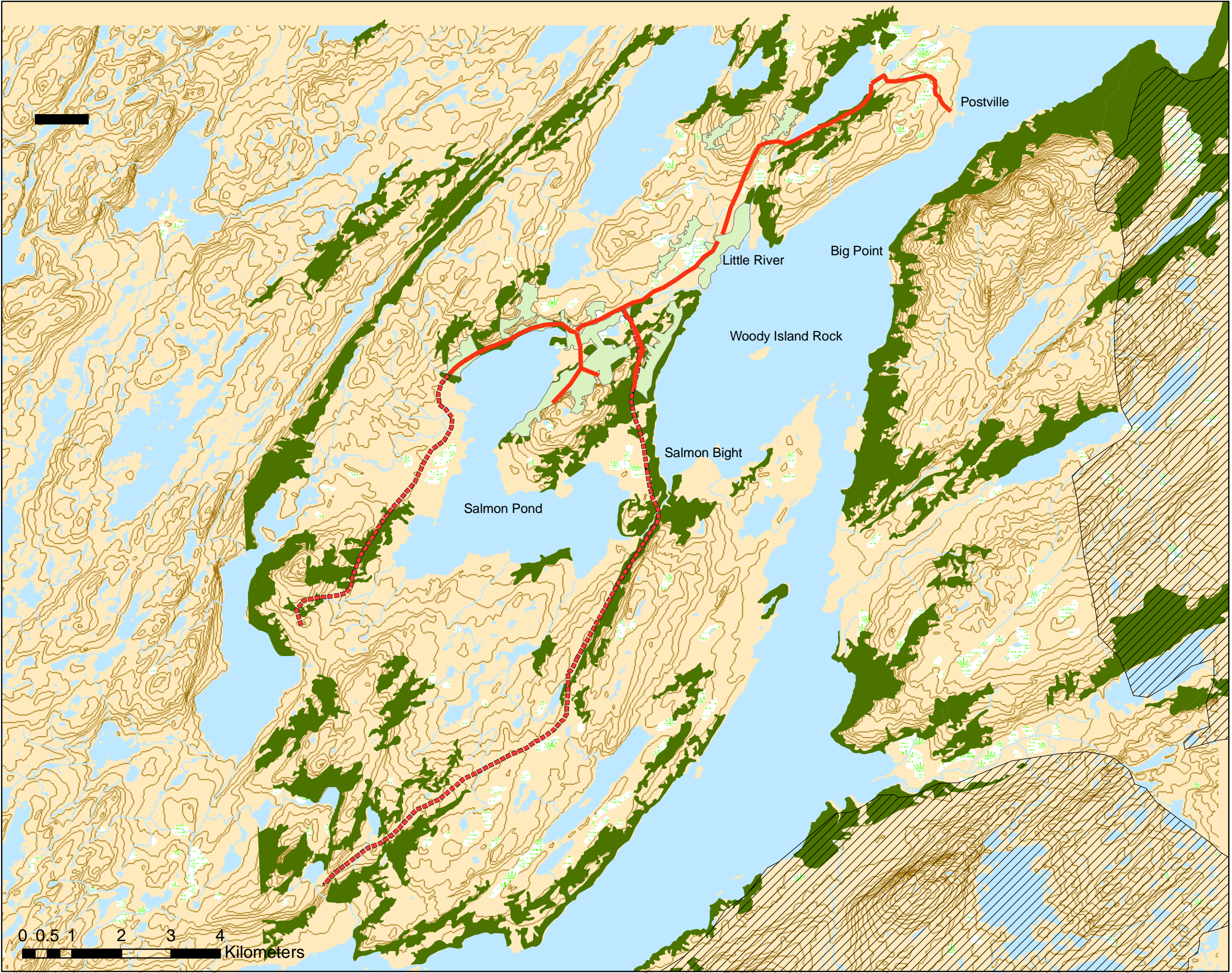
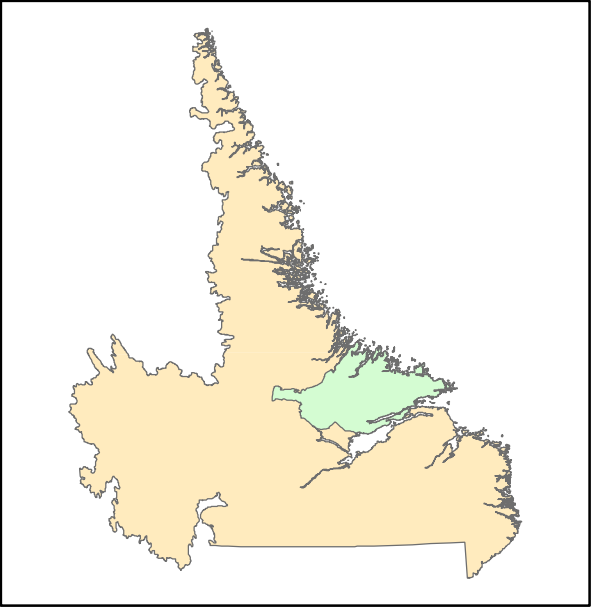
- Legend**
- Stream, Brook
 - Merchantable Timber
 - Harvest Block 1
 - Harvest Block 2
 - Harvest Block 3
 - Harvest Block 4
 - Harvest Block 5
 - Wetland
 - Waterbody
 - Labrador



Map 7.4
District 23
5 Year Operating Plan
Proposed Roads
1:75,000








Legend

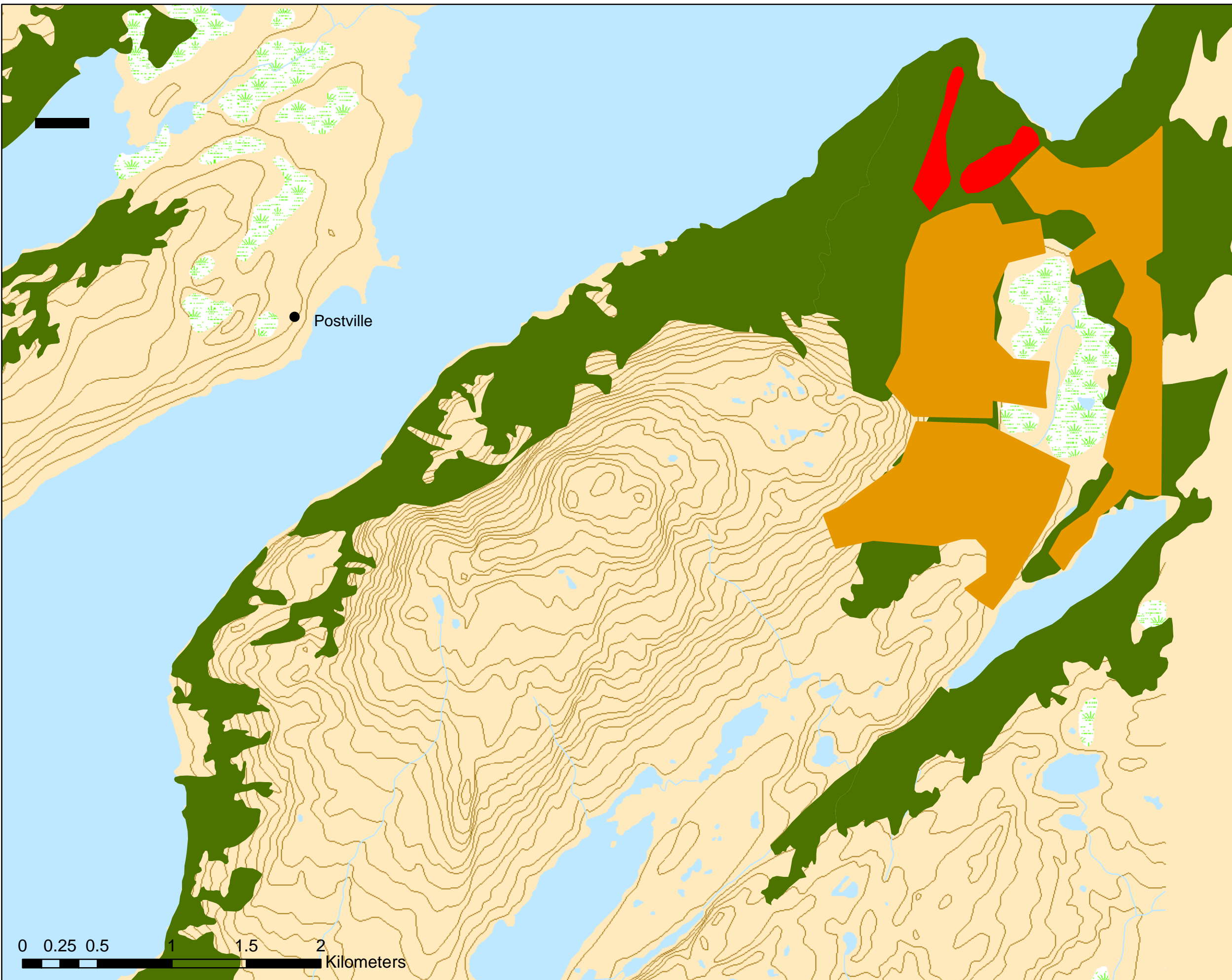
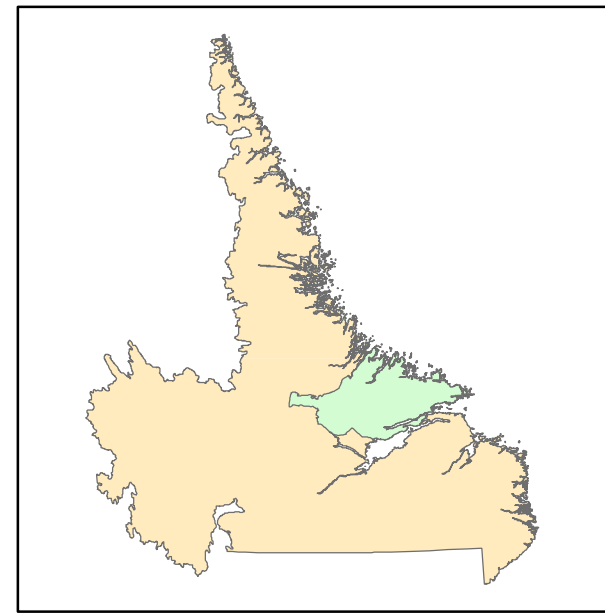
-  Forest Roads
-  Proposed Forest Roads
-  Stream, Brook
-  Past Harvested Areas
-  Merchantable Timber
-  Postville Fires
-  Wetland
-  Waterbody
-  Labrador



Map 7.3
District 23
5 Year Operating Plan
Proposed Silviculture
1:25,000

Legend

-  Stream, Brook
-  Proposed Silviculture Areas
-  Past Silviculture Areas
-  Merchantable Timber
-  Wetland
-  Waterbody
-  Labrador



0 0.25 0.5 1 1.5 2 Kilometers

District 23, Postville Fire Disturbance 1:1,100,000

Legend

Fires (1964 - 2005)

District 23

LIL

LISA

District 23

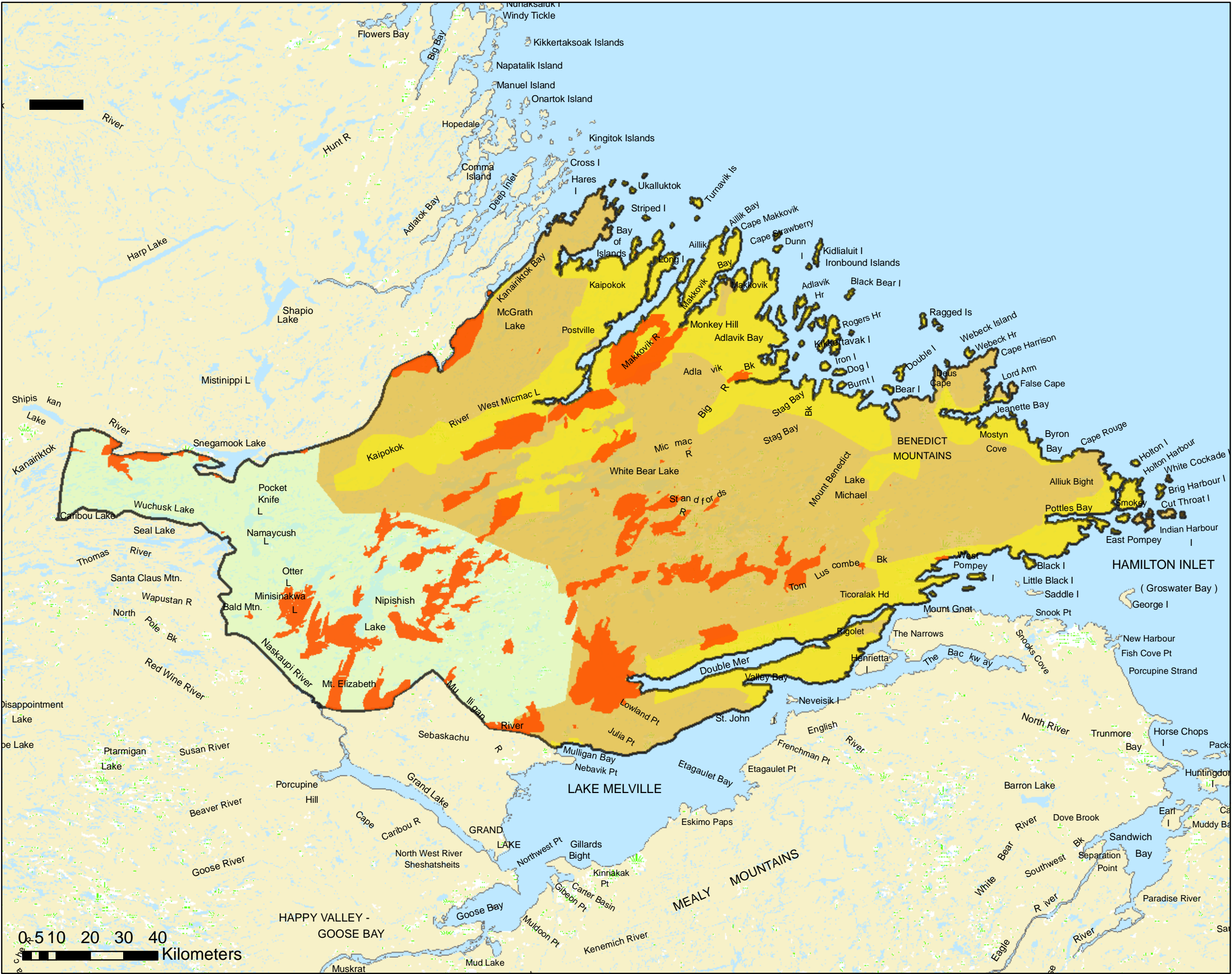
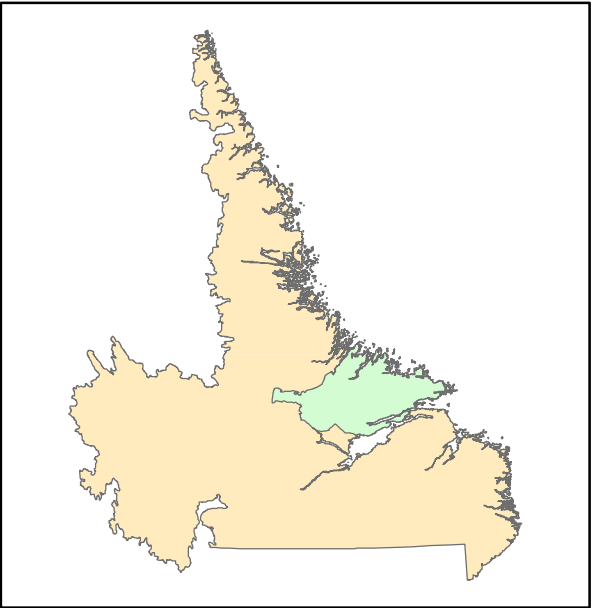
Waterbody

Wetland

Labrador



NorthAtlantic

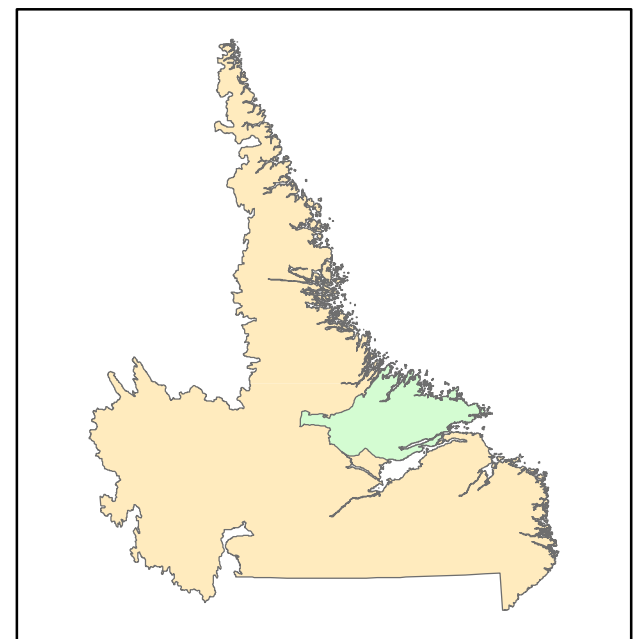
District 23 Fires		
Decade	Area (ha)	Average Size (ha)
1960 - 1969	156 772	9798
1970 - 1979	94 260	2299
1980 - 1989	10 190	637
1990 - 1999	100 215	4555
2000 - 2005	16082	1608



Map 8.2 District 23 5 Year Operating Plan Insect Disturbance 1:75,000

Legend

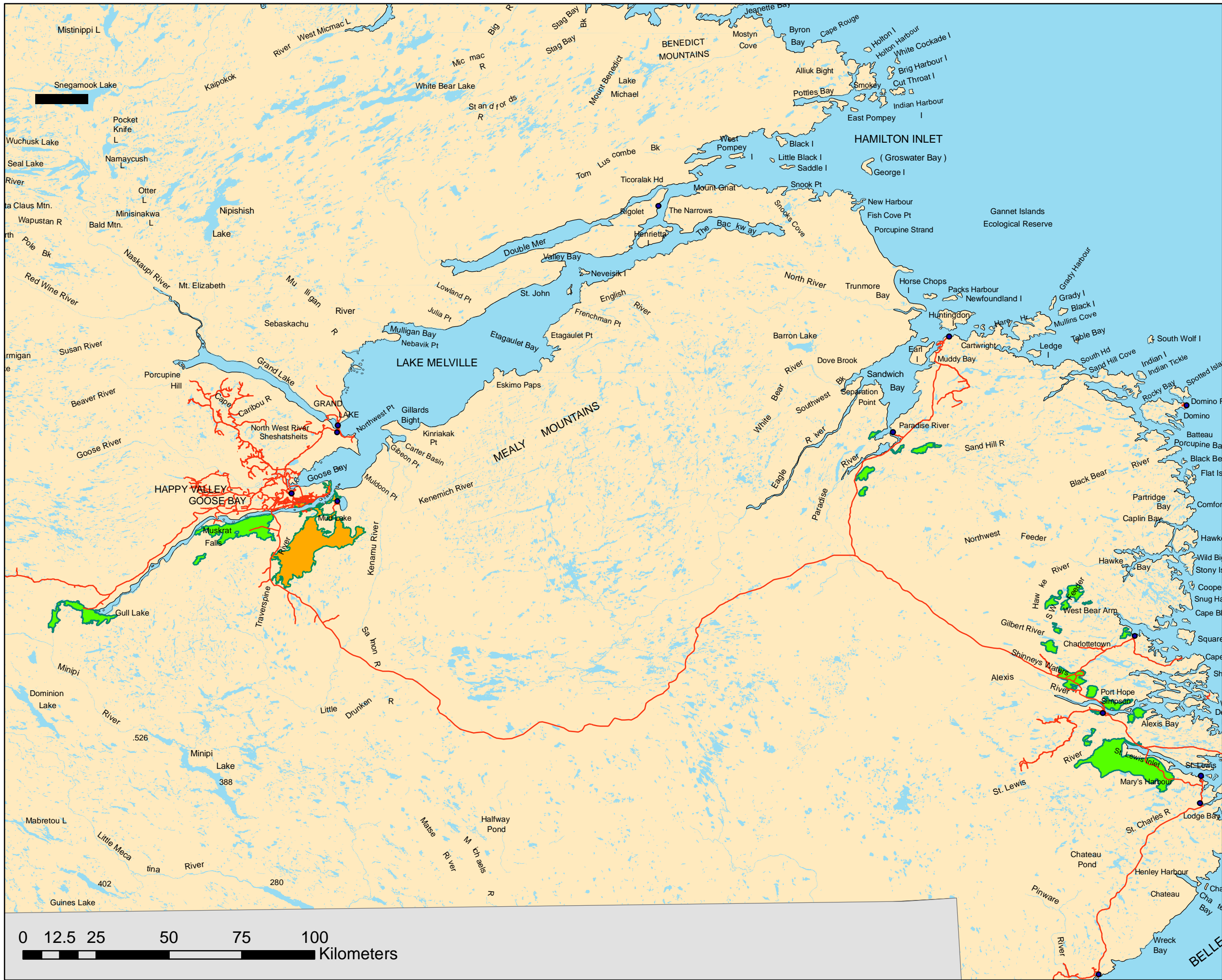
-  Communities
-  Roads
-  Hemlock Looper
-  Spruce Budworm
-  Labrador
-  Quebec
-  Waterbodies
-  North Atlantic



NUNATSIAVUT



Newfoundland
Labrador



0 12.5 25 50 75 100
Kilometers