



FOREST MANAGEMENT
FIVE YEAR OPERATING PLAN
FOREST MANAGEMENT DISTRICT 21

2017-2021

Government of Newfoundland and Labrador
Department of Fisheries, Forestry and Agrifoods
Forest Service

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1.0 INTRODUCTION

Forest ecosystem management planning began in Newfoundland and Labrador around 1995. The process is based on participation of the various stakeholders who provide input into public meetings during the development of the plans and after the scheduled activities take place.

The result of the planning process in District 21 (FMD21) is the *Five Year Operating Plan for Forest Management District 21* (operating plan). The participants are acknowledged for the time and effort put into the process in the District.

The operating plan provides details of various management activities scheduled to occur between January 01, 2017 and December 31, 2021. Various activities include harvesting, silviculture, road construction, protection and research which are carried out to meet the goals and objectives of the operating plan and the Provincial Sustainable Forest Management Strategy (2014-2024)(PSFMS). The PSFMS document outlines the broad framework with goals and objectives for the Province while further refinements of the individual planning activities are compiled into an annual work schedule.

In accordance with the *Forestry Act (1990)*, this document will be submitted by the Minister of Fisheries, Forestry and Agrifoods to be registered for assessment under the *Environmental Protection Act* and is subject to further public review.

2.0 LANDBASE DESCRIPTION

2.1 General

The planning zone consists of only one District and is a large area (approximately 1.9 million ha) of boreal forest situated on the South Coast of Labrador. Physical features vary a great deal over such a large landscape. The following descriptions apply generally to District 21.

2.1.1 LOCATION

Forest Management District 21 (FMD21) is bounded to the north by Hawke Bay and Hawke Brook with the boundary following a general westerly direction along the District 20 boundary until it meets the Paradise River, to the west along the Paradise and St. Pauls Rivers and the Quebec – Labrador border to the Strait of Belle Isle, to the east and south by the Labrador Sea including all islands to Hawke Bay (Figure 2.1). A legal description of this area is provided in Appendix I.

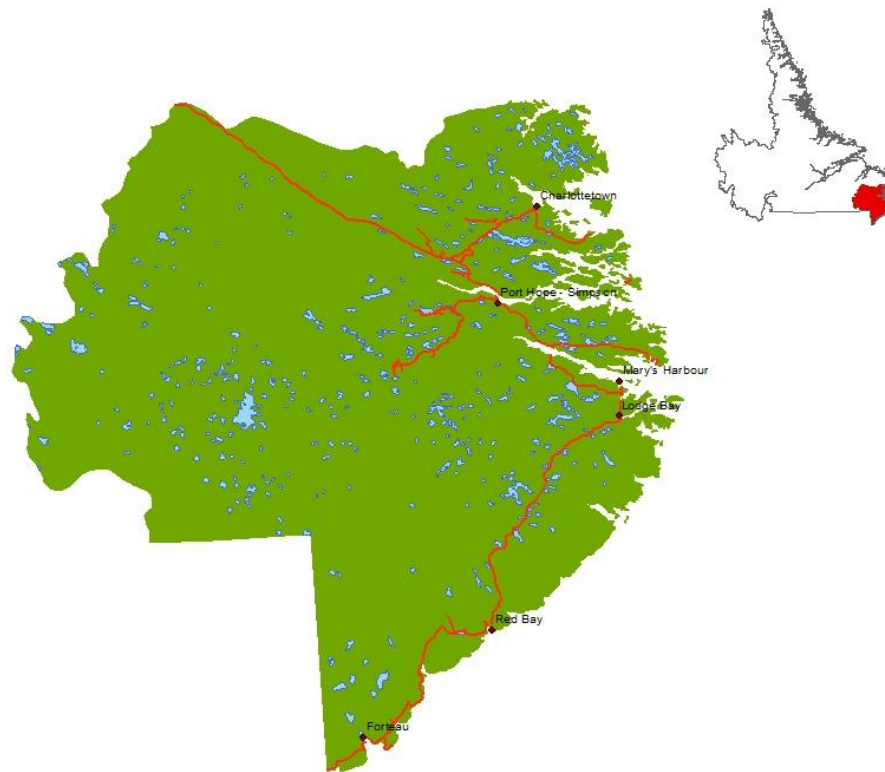


Figure 2.1 Forest Management District 21 Boundary and communities.

2.1.2 HISTORY

There is a significant history of natural resource use in the management district particularly in timber harvesting near the Port Hope Simpson area. The fishery has supplemented the traditional economic base of many other areas in the management district.

Oral accounts and early written records indicate that settled and transient peoples have conventionally used certain areas of the district. Activity has varied in intensity and location according to the seasonal abundance of local resources. The most concentrated activities were centered around the forest and on marine resources during the summer, with more dispersed efforts occurring during the other seasons.

European contact and settlement perpetuated this pattern of concentrated seasonal resource use, followed by an extended period of low-density activity. The most significant change in resource use caused by European intervention was the increased scale of the harvest and the exportation of resources out of the region. Up until today, communities within the District continue to follow this pattern of raw resource exploration.

Early accounts of commercial harvesting and sawmill operations in the district, in particular the Port Hope Simpson area, extend over 70 years. In 1934, the King of England sent Sir John Hope Simpson to Labrador to start a new forest industry. He landed in the area known today as Port Hope Simpson. The operation, named the Labrador Development Corporation, was managed by J.L. Williams out of England. Commercial operations continued for 8 to 9 years and ceased shortly after the Second World War broke out in 1942. Commercial operations remained dormant for almost 18 years thereafter, with the exception of a few smaller operations. Around 1960, Bowaters, a company from Newfoundland, arrived in Port Hope Simpson and operated until 1970 with horses and tractors. Succeeding Bowaters, commercial operations were again dormant until the early 1990's when commercial operations began to increase. With the announcement of the closure of the Abitibi mill in Newfoundland in 2005 commercial operations once again began to cease however, some of these smaller operators are still in business today. Commercial operations over the years have not been without their challenges, such as lack of infrastructure, transportation issues, lack of experienced labor, and high logging costs.

District 21 has sixteen communities with populations ranging in size from 100 – 550 residents (Statistics Canada Census, 2011). These communities share similar characteristics and were initially developed as support centers for resource extraction. Some neighboring out ports were gradually absorbed as transportation facilities centralized during recent years, however two out port communities still remain active today (Williams Harbour & Norman Bay). Forest and marine resources continue to provide the principal economic base for most of the communities, with shellfish being the main marine species and previously the export of pulpwood and processing of dimensional lumber were the main forest operations. Processing plants and small sawmills are located in several communities. Other resource activities, such as agriculture (berry picking) and fur harvesting, provide supplementary income to many residents.

The lifestyle of Labrador residents includes the use of several resources of the district. The forest provides a source of wood products (fuelwood and building materials), wildlife (game and furs), non-timber forest products such as mushrooms and berries and opportunities for spiritual renewal and recreation. Forested regions in close proximity to communities are the most heavily utilized areas for these activities. The knowledge that resources provide for basic human needs is available locally and promotes a sense of self- sufficiency that is particularly important in areas with severe climate and few employment opportunities.

Within each community, infrastructure services provide significant secondary employment, including health care, education, protection and public service sector jobs. Many levels of Government maintain offices in the management district. In particular, the Forest Service maintains two satellite offices at Port Hope Simpson and in the Labrador Straits that employ both permanent and seasonal staff.

Several tourist sport-fishing camps have existed for many years in the district. Potential for increased activity in the tourism industry may be significant with completion of the Trans-Labrador Highway, particularly once the Mealy Mountain National Park Reserve is finalized.

Wildlife resource use (hunting and trapping) is an integral part of the Labrador lifestyle. Hunting activities usually involve wild food sources, such as moose and small game animals. Commercial fur harvesting activities are concentrated along major watersheds and coastal areas. The value of these activities cannot be measured accurately, but from an economic viewpoint, they are considered of supplementary benefit.

Economic measurements for non-consumptive forest values, such as culture and spiritual renewal, are difficult to determine. Although they cannot be quantified, spiritual and cultural benefits have an intrinsic value that is of significant importance to district residents.

Timber utilization includes the use of fuelwood and supplementary building materials by many residents. Although currently of minor economic importance, these activities contribute significantly to the self-sufficient attitude common in remote locations. Commercial timber utilization has decreased significantly; however has considerable potential for revitalization and expansion for local processing.

2.1.3 OWNERSHIP

The majority of the land base in District 21 is Crown managed land; however there are Aboriginal land claims asserted in the area as well.

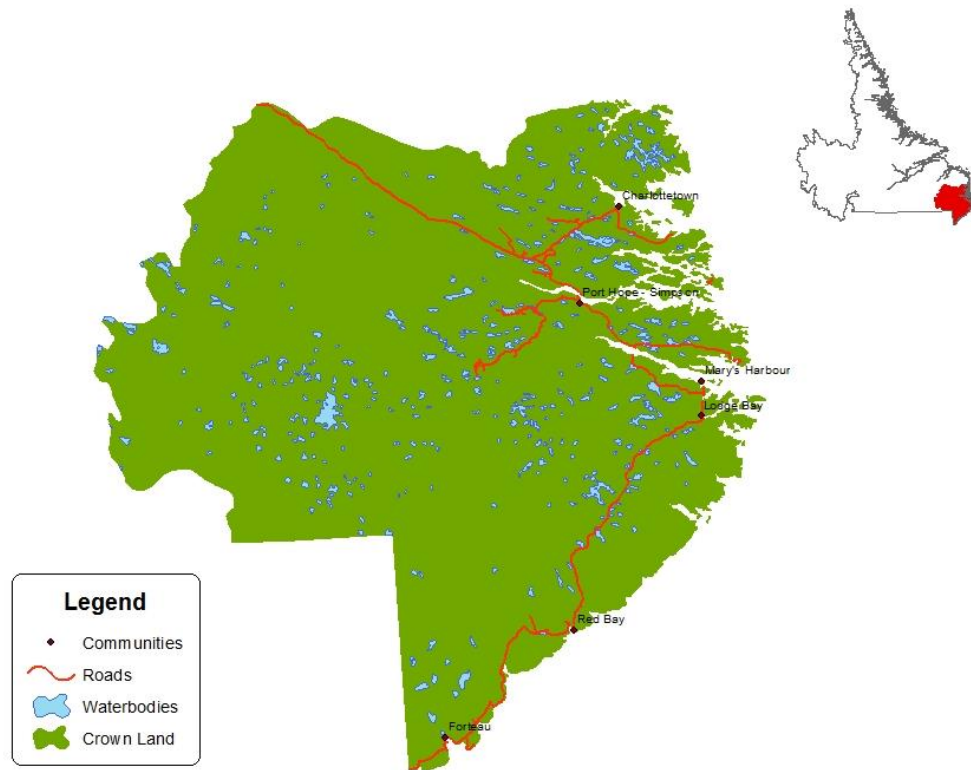


Figure 2.2 Managed land Classes in District 21.

2.2 Physical Description

2.2.1 TOPOGRAPHY AND HYDROLOGY

Generally most of District 21 consists of an undulating landscape including upland topography and coastal plains. As well, the area is represented by flat to rolling upland plateaus with a few eskers and shallow river valleys traversing the plateau. Coastal areas include exposed headlands with sheltered inlets and numerous islands (Meades 1990).

2.2.2 GEOLOGY

Sedimentary rocks form local outcrops. The bedrock is found to be acidic with metamorphic gneiss. Anorthosite, gabbro and quartzofeldspathic gneiss are present with sedimentary and igneous rocks present in trough areas (Meades 1990).

2.2.3 SOILS

Detailed information on soils in the area is sparse. The District was heavily glaciated in the past which has resulted in the majority of the bedrock being covered with a veneer (less than 1.5m) of glaciofluvial deposits including eskers and river terraces (Notzl, Greene & Riley 2013). Till consists of a mixture of grain sizes from clay to boulders.

2.2.4 CLIMATE

Climate conditions generally range from high / low sub arctic to boreal. Mostly cooler summers prevail with cold winters. With an average annual temperature of -0.2°C , growing season is moderate just exceeding 140 days. Precipitation is in the range of 800 mm to 900 mm annually (Meades 1990). Areas of permafrost are discontinuous and scattered throughout the District.

2.3 Ecological Characteristics

2.3.1 ECOSYSTEM DESCRIPTION

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

A forest ecosystem, as the term implies, is an ecosystem dominated by tree cover. At the coarsest level, the forest of District 21, form part of the boreal forest ecosystem. The boreal forest is a green belt which spans much of the northern hemisphere. It stretches from the Atlantic shores of Scandinavia through Russia, across Alaska, through the mid latitudes of Canada until it reaches the Atlantic Ocean again in Newfoundland and Labrador.

One of the distinguishing characteristics of the boreal forest is the phenomena of periodic, catastrophic stand replacement. Natural disturbances such as fire and insect outbreaks typically give rise to uniform, even aged forests dominated by a few tree species. The tree species which characterize the Canadian boreal forest include black spruce, white spruce, balsam fir, eastern larch, trembling aspen, white birch and jack pine. By far the dominant species in District 21 are black spruce and balsam fir.

Aquatic ecosystems of the boreal forest are heavily dependent on forest cover for temperature regulation, nutrient cycling and stream flow regulation. Consequently, forest harvesting activities adjacent to riparian areas are critical to sustainability of fish habitat and maintenance

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

Boreal forest, barren and marine ecosystems are all represented in the management district. On a national scale the major terrestrial ecosystems have been divided into ecozones and forest regions. Forest Management District 21 is almost totally contained within the boreal shield ecozone with a very small portion of the District represented by the taiga shield ecozone (Lopoukhine et al. 1977) of the boreal forest region (Rowe 1972). On a regional scale, Labrador is divided into 10 ecoregions, which are discussed in subsequent sections. The ecoregions that occur in Labrador are illustrated in Figure 2.3.

An ecoregion can be defined as an area within which the ecological relationship between species and habitat is essentially the same (Damman 1983). Damman's important work in insular Newfoundland illustrated that vegetation could be used effectively to delineate regional climatic differences. Within each climatic region, sites with similar topography, drainage and parent materials exhibit similar vegetation patterns (Damman 1983). Thus following cutting or other disturbances, successional patterns can be predicted accurately, once the ecological relationships of the region are understood. The ecoregions of Labrador, illustrated in Figure 2.3, were described by Meades (1989) using the same approach as Damman (1983). Portions of five ecoregions, briefly described below and by area in Table 2.1, occur in Forest Ecosystem Management District 21. More detailed descriptions of the ecoregions of Labrador and the Island can be found in Meades (1990).

The most significant ecoregion represented is the mid-boreal forest ecoregion. As well, it contains six major drainage basins and portions of several others. Historically, the land and adjacent marine areas of the district have supplied various resources and benefits to settled and transient residents. The district is considered a Crown management district since most land is classified as Crown Land, although very small portions may be allocated to various jurisdictions (i.e. municipal areas, etc.). Finally, a portion of the northern part of the district is currently subject to aboriginal land claim negotiations which have not yet been resolved.

Work was done in Labrador by Damman (1983) and subsequently by Meades (1989) which resulted in the delineation of 10 ecoregions. The national *Eco-climatic Regions of Canada* (Ecoregion Working Group 1989) does not fully agree with Damman's (1983) and Meades' (1989) maps. This is due partly to the scale of the national map, which does not allow portrayal of smaller units and also to inaccuracies in transferal from the original maps (Meades 1990). As work progresses, each level of the region will be more clearly defined. This information will be included in revisions of the plan, as it becomes available.

Coastal Barrens - Okak/Battle Harbour

This ecoregion extends from Napaktok Bay south to the Strait of Belle Isle. Much of the coast is characterized by long, sheltered inlets. The summers are cool to warm and the growing season is 100 to 120 days. The winters are very 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 under story. Repeated fires have changed many forested areas to dwarf shrub barrens. Plateau bogs with frozen peat (palsas) and salt marshes on marine terraces are characteristic of the valleys in this ecoregion.

Mid Boreal Forest – Paradise River

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

Low Subarctic 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 to 140 days. Somewhat open black spruce forests are the dominant vegetation, with crown densities greater than 75% on better sites. String bog-ribbed fen complexes cover extensive areas throughout the region.

String Bog - Eagle River Plateau

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

Forteau Barrens

This ecoregion is located at the southeastern most tip of Labrador, adjacent to the Strait of Belle Isle. Low hills are covered with scrub spruce, crowberry barren and slope bogs. Strong winds and frequent storms occur because of the ecoregions proximity to the Strait of Belle Isle. The growing season is 100 to 120 days. Tree growth is limited by a combination of wind, wet

soils and a history of repeated burns. Black spruce and larch can reach 10 to 12cm only along rivers, where soils are better drained.

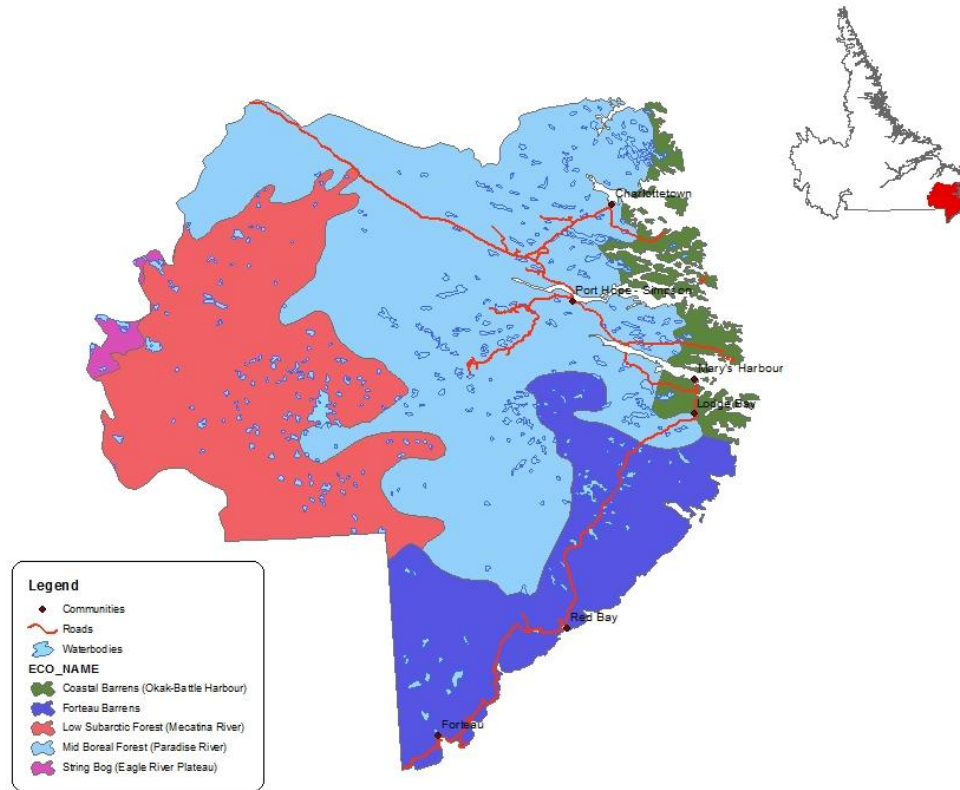


Figure 2.3 Ecoregions of District 21

Table 2.1 Ecoregions and their area and percentage within Labrador and the District.

	EcoRegions		
	Area (ha) in Labrador	Area (ha) in District 21	% in District 21
Coastal Barrens - Okak/Battle Harbour River	1,360,506	95,179	7
Mid-Boreal Forest - Paradise	2,032,728	931,398	46
Low Subarctic Forest – Mecatina River	5,151,407	527,302	10
String Bog - Eagle River Plateau	1,822,682	17,333	1
Forteau Barrens	362,029	362,029	100

2.3.2 ECOSYSTEM CONDITION AND PRODUCTIVITY

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

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

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

2.3.2.1 Productivity

Productivity can simply be defined as the accrual of matter and energy in biomass. The boreal forests in Labrador are characterized, for the most part, by an even age structure being dominated by an over mature age class. The tree canopy is poorly developed in many parts of the district (<25% crown cover). Among the factors that limit stand density and thus crown cover are severe climatic conditions, soils with restricted or excessive drainage, and proximity to the coast.

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

The general characteristics of forest stands in District 21 (site class, age class, height class, crown closure, and working group) are described later in the forest profile section (2.4.2). These characters define the limits within which the commercial forest development must function. Stands greater than 160+ years, primarily even- aged, form the dominant age class structure in this forest, although an extensive fire disturbed area has yet to be classified. Most forest sites are classed as poor to medium. Silviculture intervention may enhance future productivity on some sites, but how such treatments will affect the long rotation period (120 years) of forest stands in southeastern Labrador is not fully understood at this time.

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

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

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

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

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

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

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

2.3.2.2 Resilience

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

2.3.2.3 Stability

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

2.3.2.4 Disturbance Regimes and Successional Patterns

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

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

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

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

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

2.3.3 BIODIVERSITY

Biodiversity comprises the diversity of plants, animals and other living organisms in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems, as well as the proximate and ultimate functional processes that link them. This means maintaining the variety of species (animals and plants) and the ecosystems that sustain them. Globally there are in the order of 5 to 50 million species of organisms inhabiting the earth (Probst and Crow 1991) with 1-2 percent consisting of higher plants, 0.2 percent being vertebrates and the rest being invertebrates. Remarkably, less than 2 million have been described and catalogued. Two thirds of Canada's estimated 300,000 wildlife species live in the forest.

The decline of biodiversity is one of the most serious environmental threats now facing humanity. This decline is thought to be aggravated by deforestation globally. As a result of human activities, ecosystem, species and genetic diversity are being eroded at a rate that far exceeds natural processes (Natural Resources Canada, 1995). This accelerating decline in diversity threatens the ecological, economic, spiritual, recreational and cultural benefits that we currently derive from the earth's living resources. The diversity of life on earth is essential to the survival of humanity.

Globally, governments addressed biodiversity at the United Nations Conference on the Environment and Development at Rio de Janeiro in 1992. The convention on biological diversity was signed by many countries, including Canada. Canada was the first industrialized country to ratify the agreement. The Canadian Biodiversity Strategy has been developed as a guide to implement the convention on Biological Diversity.

The National Forest Strategy was prepared in response to the changing management direction of Canada's forest. The strategy has objectives to develop working definitions of biodiversity, and to establish a system for reporting nationally on the state of biodiversity, complete a national network of protected areas, formulate forest management strategies to ensure the continuation of old growth forests as a natural heritage, and protect genetic, species and habitat diversity.

The Canadian Council of Forest Ministers (CCFM) released criteria and indicators for defining sustainable forest management in 1995. The first criterion is maintenance of biodiversity and a series of indicators to measure progress on biodiversity. The CCFM report forms the basis for the biodiversity indicators suggested in this strategy.

Maintenance of natural genetic and ecosystem diversity across the landscape is an integral component to ensure species maintain viability through their capacity to evolve and adapt to change. Maintenance of the natural range of ecosystems and the ability of their components to react to external forces and processes provides the equilibrium required for maintenance of species diversity (CCFM 2000). The fundamental requirement for the conservation of biological diversity is the in-situ conservation of ecosystems and the natural habitats and the

maintenance and recovery of viable populations of species in their natural surroundings. Forest Management District 21's geographic location, topography and shallow soils make its forest ecosystems vulnerable to temperate extremes. These ecosystems are susceptible to development and comprehensive land use planning is required to ensure that biodiversity is maintained at the present level.

2.3.3.1 Species Diversity

The most readily recognizable form of reduced biodiversity is species extinction. Slowing down species extinction is key to the conservation of biodiversity. This involves the identification of species at risk and implementing efforts to conserve their habitats. The Province of Newfoundland and Labrador has as an *Endangered Species Act* which ensures the conservation of recovery and critical habitat for species. Changes in species population levels provide early warning indicators of changes in ecosystem integrity and species diversity.

A variety of mammals, characteristic of boreal and tundra ecosystems, inhabit Forest Management District 21. Large ungulates (caribou and moose) are present in low densities. Large predators, such as black bears and wolves, and a great variety of smaller mammals and avifauna are also present. Polar bears are occasional seasonal visitors to coastal areas. Ten species in Labrador are listed by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) in the endangered, threatened and special concern categories. Four of these species require recovery teams under current legislation.

It is anticipated that the proposed cutting activities, during the proposed five year period, will have little or no direct impacts on existing populations of endangered, threatened or special concern species presence in the district, mainly because of the lack of suitable habitat, associated with those species, in the proposed operating areas. However, if a species identified as at risk is identified within an operating area, all operations will cease immediately and mitigations discussed with appropriate agencies. Recognizable potential impacts (particularly to harlequin ducks in rivers that run through forested areas) are: (1) possible siltation as a consequence of operational activities and (2) increased hunting pressure due to improved access. The potential risk from operational activities can be mitigated or eliminated by following environmental guidelines, respecting recommended buffers along watercourses, and avoiding areas where harlequin ducks have been sited until after the nesting season.

Major furbearing species such as lynx, fox, otter, marten, mink, weasel (2 species), beaver and muskrat occur in low to moderate numbers throughout the management district. Other represented mammals include squirrels (2 species) porcupine, hares (2 species) and various other rodents and insectivores. More than 140 avifaunal species occur in the district including raptors such as the bald eagle, rough-legged hawk, and merlin, as well as ducks, geese and upland game birds.

The management and/or protection of threatened and endangered species will be considered in concert with other management strategies. For each of the species which require different

ages and conditions of forest, their specific habitat requirements will be incorporated into management strategies.

2.3.3.2 Genetic Diversity

Genetic diversity within a species is the foundation of all biodiversity. Assessing genetic diversity does not mean attempting to track every gene in the District 21 forests. It means designating and implementing practical measures that can maintain viable populations of all forest vegetation species, and can utilize the genetic diversity of commercially important species to maximum benefit. Genetic diversity is the fundamental basis for the ability of populations (flora and fauna) to adapt to changing environmental conditions, therefore underlying both species and ecosystem diversity. These gene pools represent the years of natural selection for adaptation to local conditions.

The boreal forests in District 21 have evolved over time as even-aged in response to disturbances such as fire and wind storms. This must be taken into consideration when determining the effects of forest management (including harvesting) on genetic diversity. The spatial patterns of clear felling should mimic natural disturbance across the landscape so that natural processes can continue. During the course of this plan, various cutting designs and patterns will be implemented with the necessary monitoring and evaluation. Exact harvest patterns (which should mimic natural disturbances) within the operating areas will be identified in the annual work schedules.

The management actions of tree planting and pre-commercial thinning may also affect genetic diversity. However, most forest sites in district regenerate from seed sources already on or near the site. Sites which will be selected for planting are those where there is an insufficient stocking of tree species to form a viable second growth forest to replace the one that was disturbed. During any planting efforts will be made to plant native species from local seed sources on sites where they would be found naturally. The current practice, however, is to leave a representative proportion of all those woody tree species that are present in the stand before treatment.

2.3.3.3 Landscape Diversity

In Labrador, the predominant forest structure is over mature; this is also true for District 21. In addition, much of the forested area of the District is currently inaccessible. As a result, this forest stand structure and function can be maintained. Old growth forests are valued for their contributions to habitat and biodiversity in the area.

Riparian areas are characterized by a transition from aquatic to upland vegetation. The width of a riparian area varies depending on the steepness of slopes, the soil properties and the permanence of the water body. Riparian areas cover only a small portion of the land in a

watershed, but because they are often more diverse and productive than upland areas, these habitats are critical to wildlife and fish, and are important reservoirs of biodiversity.

Studies have shown that many wildlife species are more abundant in riparian areas. Some species are entirely dependent on riparian habitats, while others use them for a portion of their life requirements such as feeding or reproduction. The attraction that wildlife has to riparian areas is largely based on the presence of water and its effects on plant characteristics and interrelationships.

Maintaining a healthy riparian area for wildlife habitat is critical. Riparian vegetation not only provides important wildlife habitat, but it also stabilizes stream banks, thereby reducing erosion. The long-term stewardship of riparian habitat for the purpose of maintaining biodiversity ensures wildlife habitat, control of stream temperature, maintenance of plant and animal genetic variety and a legacy for future generations.

Ecosystem diversity is the variety and pattern of communities and ecosystems. Maintenance of the variety and quality of ecosystems is necessary for the preservation of species. At the ecoregion level, diversity is reflected in Damman's classification as determined by soil parent material, topography and climate. Different ecoregions have different plant communities and differences in processes.

It has been documented that a system of protected areas is a vital component of any biodiversity strategy. In agreement with the Canadian Forest Accord, National Forest Strategy, and Canadian Biodiversity Strategy, each ecoregion in the province is proposed to have a representative area in reserve status. At present, designated ecological reserves and protected watersheds cover less than 1 % of the district land base (Table 4).

2.4 Forest Characterization

The boreal forests in Labrador are characterized, for the most part, by an even age structure being dominated by an over mature age class. The tree canopy is poorly developed in many parts of the district (<25% crown cover). Among the factors that limit stand density and thus crown cover are severe climatic conditions, soils with restricted or excessive drainage, and proximity to the coast. Disturbances, either natural or human, have had impact on forest stands, particularly in the northern part of the district, where extensive fires occurred in 1958 and 1975.

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

The general characteristics of forest stands in District 21 (site class, age class, and working group) define the limits within which the commercial forest development must function.

Although dominated by over-mature black spruce types, the management district contains a wide variety of forest types and ages (from juvenile to over mature stands) and other vegetation types (bogs, fens, marshes, scrub swamps, barrens and alpine tundra). These vegetation types provide habitat for various populations of many wildlife species including moose, caribou and a variety of large predators and small animal species.

Human uses of the forest resources in the District have had some influence on the overall forest structure. Fuelwood cutting has been a common practice however is mostly localized around the communities. Moderate to large scale commercial harvesting operations have also occurred close to the communities of Charlottetown and Port Hope Simpson. Indicators can be used as measurable variables to report on disturbances, resilience and extant biomass for evaluation of maintenance and enhancement of forest ecosystem condition and productivity. Using the CCFM approach, criteria and indicators will be selected to initiate measuring of these variables (CCFM 2000). Data for these indicators are considered attainable during the planning period.

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

2.4.1 LAND CLASSIFICATION

A hierarchical framework of ecological land classification has been recognized for some time in most jurisdictions as a means of stratifying the earth into progressively smaller areas of increasingly uniform ecological units. In Canada, the Canadian Ecological Land Classification System has been adopted and provides for seven levels of organization based on ecological principles (Table 2.2).

Table 2.2 Canadian Ecological Land Classification System.

Level	Description	Common Map Scale
ECOZONE	areas of large land masses representing very generalized ecological units, based on consideration that the earth's surface is interactive and continuously adjusting to the mix of biotic and abiotic factors that may be present at any given time (e.g. Boreal Shield)	1:50 000 000
ECOPROVINCE	areas of the earth's surface	1:10 000 000

	characterized by major structural or surface forms, faunal realms, vegetation, hydrology, soil and climatic zones (e.g. Island of Newfoundland)	1:5 000 000
ECOREGION	a part of the ecoprovince characterized by distinctive ecological responses to climate as expressed by vegetation, soil, water and fauna (e.g. High Sub arctic Tundra Ecoregion)	1:3 000 000 1:1 000 000
ECODISTRICT	a part of the ecoregion characterized by a distinctive pattern of relief, geology, geomorphology, vegetation, water and fauna	1:500 000 1:125 000
ECOSECTION	a part of the ecodistrict throughout which there is a recurring pattern of terrain, soil, vegetation, water bodies and fauna	1:250 000 1:50 000
ECOSITE	a part of the ecosection having a relatively uniform parent material, soil, hydrology, and chronosequence of vegetation	1:250 000 1:50 000
ECOELEMENT	a part of the ecosite displaying uniform soil, topographical, vegetative and hydrological characteristics	1:10 000 1:2 500

Table 2.3 Land base classification in District 21.

		District 21			
	Land Base Classification	Forested Area (ha)	Non-Forested (ha)	Total Area (ha)	% of Total District
1	Regulatory Alienations				
1.a	Parks				
1.a.1	Federal	N/A	N/A	N/A	N/A
1.a.2	Provincial	N/A	N/A	68	<1
1.a.3	Private	N/A	N/A	N/A	N/A
1.a.4	Aboriginal Land Claims	N/A	N/A	N/A	N/A

		District 21			
	Land Base Classification	Forested Area (ha)	Non-Forested (ha)	Total Area (ha)	% of Total District
1.b	Reserves				
1.b.1	Ecological	N/A	N/A	N/A	N/A
1.b.2	Wilderness	N/A	N/A	N/A	N/A
1.b.3	Others	N/A	N/A	N/A	N/A
1.c	Agricultural Areas (AOI)	N/A	N/A	213	<1
1.d.1	Cottage Development Areas	N/A	N/A	72	<1
1.d.2	Crown Lands Other	N/A	N/A	N/A	N/A
1.d.3	Private Lands	N/A	N/A	N/A	N/A
1.e.1	Wildlife Exclusions	N/A	N/A	N/A	N/A
1.f.1	Permanent Sample Plots (PSP's)	60	N/A	60	<1
1.f.2	Regulation Buffers Water (30m)	N/A	N/A	N/A	N/A
	Section Sub-Total	60	0	413	<1
2	Non-Harvestable Inventory Types				
2.a	Coniferous Scrub	N/A	N/A	N/A	N/A
2.b	Deciduous Scrub	N/A	N/A	N/A	N/A
2.c	Vegetated Non-Forested	N/A	50,695	50,695	3
2.d	Non-Vegetated	N/A	33,031	33,031	2
2.e	Cleared Land	N/A	129	129	0
2.f	Residential Land	N/A	87	87	0
	Section Sub-Total	0	83,942	83,942	4
3	Water Features				
3.a	Water Bodies				
3.a.1	Lakes/Ponds	N/A	50,336	50,336	3
3.a.2	Double Sided Rivers	N/A	N/A	N/A	N/A
3.a.3	Salt Water	N/A	N/A	N/A	N/A
	Section Sub-Total	0	50,336	50,336	3
4	Operational Alienations				
4.a	Roads				
4.a.1	Right-of-way (Roads)	N/A	53	53	<1
4.a.2	Resource Roads (6m buffer)	N/A	N/A	N/A	N/A
4.a.3	Protected Road Buffers	N/A	N/A	22,043	1
4.a.4	Aesthetic Road Buffers	N/A	N/A	N/A	N/A
4.b	Stand Level				
4.b.1	Stand Remnants	N/A	N/A	N/A	N/A
4.b.2	Islands	N/A	N/A	N/A	N/A
4.b.3	Steep Slopes	N/A	18,500	18,500	1
4.b.4	Isolated Stands	N/A	N/A	N/A	N/A
4.b.5	Other Stand-Level	N/A	N/A	N/A	N/A

			District 21			
	Land Base Classification		Forested Area (ha)	Non-Forested (ha)	Total Area (ha)	% of Total District
		Constraints				
4.b.6		Area Not Interpreted	N/A	1,670,455	1,670,455	87
	Section Sub-Total		0	1,689,008	1,711,051	89
5	Harvestable Land Base					
5.a	Crown					
5.a.1		Coniferous	100,082	N/A	100,082	5
5.a.2		Coniferous/Deciduous	9,862	N/A	9,862	<1
5.a.3		Deciduous/Coniferous	N/A	N/A	N/A	N/A
5.a.4		Deciduous	N/A	N/A	N/A	N/A
5.a.5		Unclassified	1,823,407	N/A	1,823,407	94
	Section Sub-Total		1,933,351	0	1,933,351	100
	Grand Total		1,933,411	1,823,286	3,779,093	

*Limited information available for District 21

2.4.1.1 Available Inventory and Information

The Labrador Multi-Resource Inventory (Dreiman Curtis Inc.) consists of landsat satellite imagery, at the 1:1,000,000 scale, which was interpreted to classify various vegetation cover types for Labrador. Several different vegetation, disturbance and wetland classification types were identified. This information was mapped and digitized for use on the GIS system. Table 2.4 summarizes the vegetation cover types and the percentage of area represented by each in District 21. Visual representation of the cover types are depicted in Map 1.

Table 2.4 Vegetation Cover Types of Forest Management District 21.

Vegetation Cover Type	Percentage of Type
Heavy Spruce/Fir Forest	4.6%
Moderate Spruce/Fir Forest	16.7%
Sparse Spruce/Sphagnum Forest	17.2%
Sparse Spruce/Lichen Forest	8.5%
Regenerating Forests	2.2%
Mixed Hardwood Forests	2.2%
Soil/Rock Barren	11.7%
Recent Burns	4.8%
Lichen Scrub/Bog	5.8%
Bog/Wetlands	8.3%
Water Bodies	5.6%
Unclassified	12.4%
Total	100%

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

The forest inventory program is carried out on a continuous cycle with approximately 10 % of the Province being inventoried in each year. The inventory process is as follows:

- Color aerial photographs are flown by fixed wing aircraft each year in selected locations throughout the Province. Each photograph partially overlaps the coverage of the previous photo so that interpreters can view ground features in 3-dimensions (3-D). To facilitate this 3-D viewing, an interpreter uses a stereoscope which allows him/her to define the height, species, age, and productivity of the forests. The information derived from photographs is verified and supplemented by measuring a series of ground plots. These ground plots also supply information on wildlife habitat and abundance, timber volumes, soils, ground vegetation, etc.
- The next step in the inventory process is converting the boundaries and information created by the interpreter on the photographs into digital format. This is done by cartographic technicians who trace the boundaries with an electronic mouse and store the information in a Geographic Information System (GIS).
- After the information has been loaded into the GIS, planners use it to produce theme maps of forest landscapes for planning and other information needs. The information is also used with computer models to determine the Annual Allowable Cuts (AAC's) and impacts of fiber management practices on other resource values.

Inventories currently used for planning in District 21 were flown during the late 1980's and further digitized for use with the GIS during the mid 1990's. It was not until around 1995 that GIS technology was available for use at the Cartwright District Office and for planning purposes.

It should be noted that the 1992 forest inventory did not survey the entire district; it did however survey the majority of the non-isolated commercial forest in the district. At that time, the Trans-Labrador Highway (TLH) was not proposed and therefore access to the majority of the district was unrealistic. Since then, the construction of the TLH has accessed new commercial timber resources of which the inventory has not been completed to date. Activities outlined in this operating plan are based on the current inventoried area only.

During the summer of 2006 a significant portion of the un-inventoried section of the District was flown and aerial photographs taken. As described earlier in the document, these photographs have been interpreted and digitized for use as forest cover type information. It is expected to provide minimal additional accessible annual allowable cut increase, due to its location on the landscape.

2.4.2 FOREST PROFILE

2.4.2.1 Species Composition

Black spruce (*Picea mariana*) is the most common tree species in the management district, based on volume (approximately 57%) and working group (approximately 54%). Balsam fir (*Abies balsamea*) constitutes approximately 35% of the volume, while other softwood and hardwood species make up the balance (Figure 2.4).

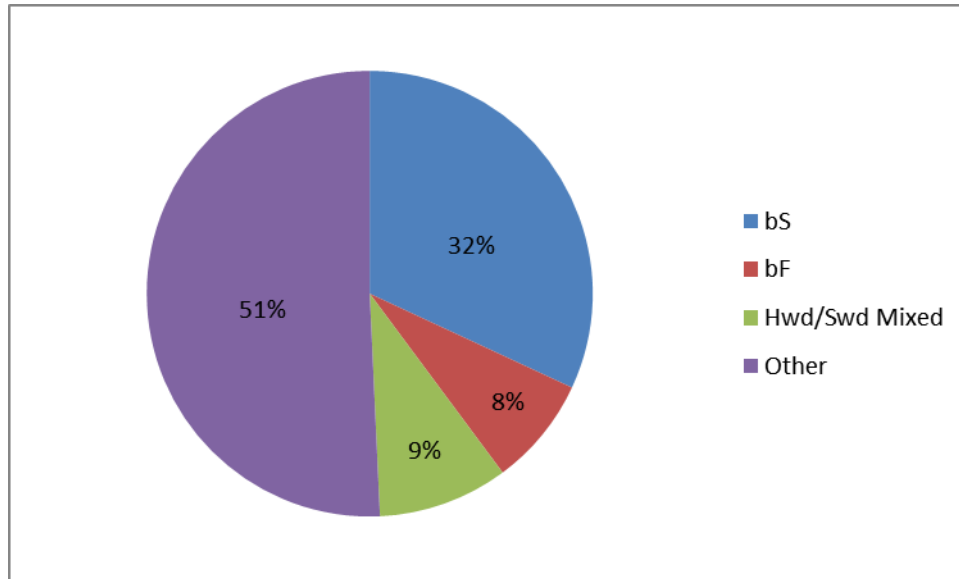


Figure 2.4 Working group distribution on productive sites in District 21.

2.4.2.2 Age Class

Primarily even-aged stands greater than 160+ years old, form the dominant age class structure in this forest, although an extensive area has yet to be classified. Most forest sites are classed as poor to medium (Figure 2.5). Silviculture intervention may enhance future productivity on some sites, but how such treatments will affect the long rotation period (120 years) of forest stands in southeastern Labrador is not fully understood at this time.

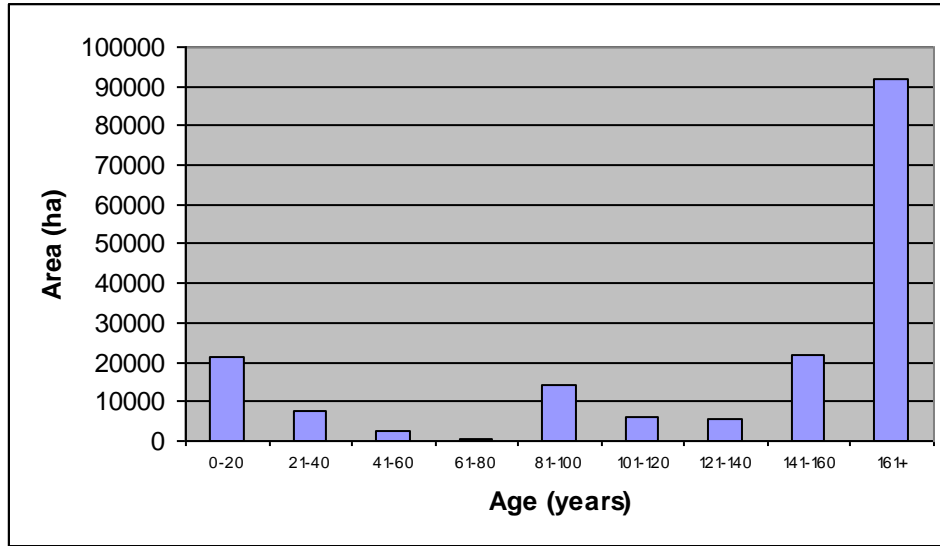


Figure 2.5 Age class distribution on productive sites in District 21.

2.4.2.3 Site Class

Many factors determine site class of productive forest including soil moisture, fertility, slope and geographic orientation. In District 21 medium and poor sites are most dominant accounting for approximately 83% total on productive sites. The distribution of each site class is illustrated in Figure 2.6. Based upon its northern location it is estimated that the mean annual increment of a good site is 2.4 m³/ha/yr, medium site 1.4 m³/ha/yr and poor site 0.8 m³/ha/yr. Site class often determines the limits of growth and along with the limits of existing harvesting and processing technologies this will define the limits within which commercial forest development can function in the District.

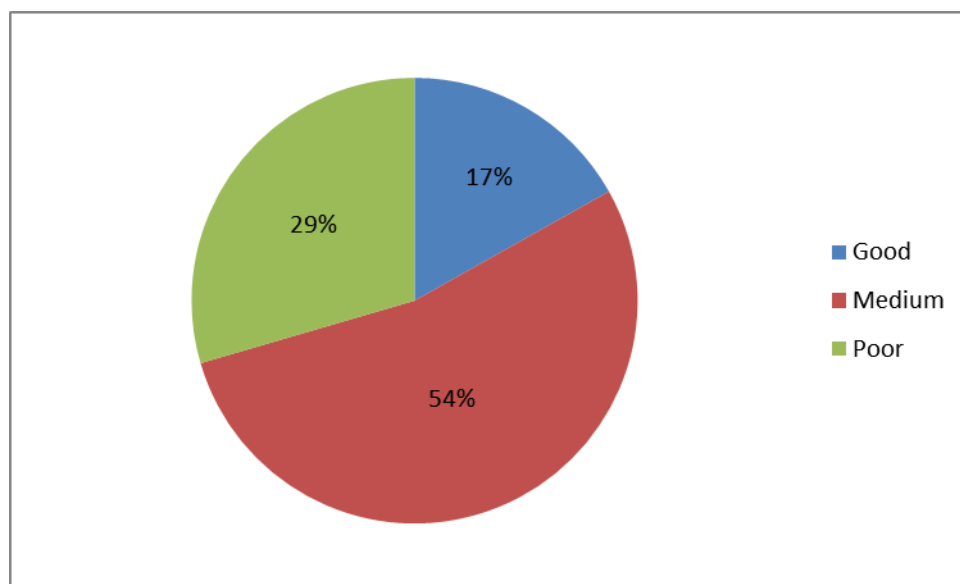


Figure 2.6 Site class distribution on productive sites in District 21.

3.0 PAST PLANNING ACTIVITIES

The previous five year forest management plan (2012-2016) was an overall success. Activities remained consistent over each year of the planning period. The underlying management objective was to support the sustainable development of the forest ecosystem ensuring the general well-being of all resources for present and future generations. The fundamental objective of this was to provide maximum social and economic benefits from the forest ecosystem, while maintaining its integrity at all spatial scales.

3.1 Harvesting

3.1.1 COMMERCIAL ACTIVITY

With the down turn of the forest industry globally and the closure of two newsprint mills in the Province, commercial activities have since decreased in the District. Since then, commercial timber harvesting activities have been relatively stable at lower level over the past five years (Table 3.1)

Table 3.1 Commercial harvest summary 2012-2016

District 21		Core				Operational (Available)				Non- AAC wood
		AAC	Commercial	Deviation	Total	AAC	Comm.	Dev.	Total	
Softwood	2016	48,600	43*	48,557	239,905					
	2015	48,600	742	47,858	191,348					
	2014	48,600	731	47,869	143,490					
	2013	48,600	618	47,982	95,621					
	2012	48,600	961	47,639	47,639					
Sub-Total		243,000	3,052	191,348	239,905					
Hardwood	2016	0	N/A	N/A						
	2015	0	N/A	N/A						
	2014	0	N/A	N/A						
	2013	0	N/A	N/A						
	2012	0	N/A	N/A						
Sub-Total		0	N/A	N/A						
Total		243,000	3,052	191,348						

* Harvested to date.

3.1.2 DOMESTIC ACTIVITY

Domestic harvesting, which has been identified by local residents as a significant activity in the area, has been relatively consistent over the last five years with a five year (2012-2016) average

of approximately 550 permits (@ 23m³/permit)(Table 3.2). The majority of the domestic harvesting in the past took place near the communities.

Table 3.2 Domestic harvest summary 2012-2016

Operating Area					Estimated Volume	
Number	Name	Tenure	Total Area (ha)	Number of Permits	Softwood	Hardwood
D-21-01	CT1	Crown	7,087	134	3,082	0
D-21-02	CT2	Crown	6,553	63	1,449	0
D-21-03	CT3	Crown	3,755	243	5,589	0
D-21-04	CT4	Crown	13,681	28	644	0
D-21-05	CT5	Crown	10,215	34	782	0
D-21-06	AG2	Crown	9,681	148	3,404	0
D-21-07	PHS1	Crown	24,510	364	8,372	0
D-21-08	PHS2	Crown	14,785	3	69	0
D-21-09	SLR1	Crown	49,277	301	6,923	0
D-21-10	SLR2	Crown	32,082	79	1,817	0
D-21-11	MH1	Crown	45,821	355	8,165	0
D-21-12	LB1	Crown	22,101	159	3,657	0
D-21-13	Forteau	Crown	24,574	215	4,935	0
D-21-14	Dog Pond	Crown	28,206	17	391	0
D-21-15	St. Pauls River	Crown	37,862	0	0	0
D-21-16	Lanse Au Loup	Crown	31,268	197	4,784	0
D-21-17	Trout River	Crown	16,622	104	2,392	0
D-21-18	Western Waters	Crown	16,923	41	935	0
D-21-19	County Cat Jib	Crown	6,592	18	414	0
D-21-20	Will Marchs Brook	Crown	19,245	4	92	0
D-21-21	Cocoa Brook	Crown	19,075	1	23	0
D-21-22	Western Hills	Crown	51,371	0	0	0
D-21-23	Eastern Hills	Crown	35,505	4	92	0
D-21-24	Upper Pinware Ponds	Crown	23,275	0	0	0
D-21-25	Lower Pinware Ponds	Crown	27,751	0	0	0
D-21-26	Big Neck	Crown	3,510	1	23	0
D-21-27	Rodgers Pond	Crown	7,821	5	115	0
D-21-28	Pinware River Forest Access Road	Crown	1,983	15	345	0
D-21-29	Black Bay	Crown	18,723	117	2,691	0
D-21-30	Barge Bay	Crown	19,283	48	1,104	0
D-21-31	Green Bay	Crown	23,059	7	161	0
D-21-32	Chateau Pond	Crown	16,873	16	368	0
D-21-33	Temple Bay	Crown	52,903	9	207	0
D-21-34	Elices Brook	Crown	10,258	5	115	0
Total				2,735	63,140	0

3.2 Silviculture

Silviculture has been limited because of a lack of large scale disturbance (harvesting or natural disturbance). As a result, there were no planting projects conducted during 2012-2016

3.3 Forest Access

Majority of the forest access road that exists in the District was constructed in the past through Government funding to provide access to previous commercial harvest blocks. In the past five years there was no new construction of road however there have been grading, alder removal and bridge removal in areas (Table 3.3).

Table 3.3 Forest access road activity summary

Activity Type	Road Name	Year	Tenure	Road Class/Type	Length (km)	
Roads	Construction					
	Sub-total					
	Re-construction					
	Sub-total					
	Repairs (grading, alder removal, ditching)	Charlottetown Access Rd	2012	crown	C-2	10.3
		Wing Road	2012	crown	C-2	1.5
		Discovery I Rd	2012	crown	C-2	2.3
		Discovery II Rd	2012	crown	C-2	9.8
		Norralls Pond Rd	2014	crown	D	11
	Sub-total				34.9	
	Decommissioning	Pinware River Rd	2015	crown	D	
		Pinware River Rd	2015	crown		Gate Removal
	Roads-total					
Bridges	Installation	Port Hope Simpson Access Rd	2013	crown	Wood with concrete abutments	2 Installations
	Sub-total					2
	Repairs					
	Sub-total					
	Removals	Port Hope Simpson Access Rd	2013	crown	Wood	2 removals
		Pinware River Rd	2015	crown	Wood	2 removals
Bridge Total					4	

3.4 Natural Disturbances

3.4.1 FIRE

Fourteen forest fires were reported during the past five years. The majority of these fires were small (<1.0 ha) and required minimal suppression efforts, however there was one larger fire near Charlottetown that warranted ICS coordinated suppression efforts. Majority of the fires in the district were as a result of lightning strikes. All fires were contained with minimal losses.

3.4.2 INSECTS

The levels of Hemlock Looper have dropped significantly since 2009, when the last area was treated for this insect. There have been Spruce Budworm damage reported in neighboring District 19, with isolated small patches of dead standing Hemlock Looper wood exists throughout the district. This wood has deteriorated to such an extent that it is no longer viable for commercial purposes. Crews from the Insect and Disease section at the Forest Service Headquarters in Corner Brook and local staff monitored insect populations through aerial and ground reconnaissance work and in 2014 local staff started monitoring insect traps.

4.0 TIMBER SUPPLY ANALYSIS

4.1 Methodology

The annual allowable cut (AAC) is the maximum volume that can be harvested on an annual basis while maintaining a sustainable supply of timber and providing a landscape, which supports non-timber values for future generations. Since the necessary growth and yield data required to run linear wood supply models (such as WOODSTOCK) are not yet calibrated for the District, the AAC was calculated using the following area/volume formula.

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

Where:

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

Net Commercial Forest Area Determination

Landbase	Area (ha)	Softwood Volume (m ³)
Total District Area	1,933,290	N/A
Total Area (1992 inventory)	508,267	N/A
Productive Forest	177,393	15,598,406
Commercial Forest	109,458	13,526,618
Un-Alienated Commercial Forest	83,036	9,651,830

Planning Units	Un-Alienated Commercial Forest (ha)	Softwood Volume (m ³)	Gross Volume (m ³ /ha)	AAC Net Volume (m ³ /ha) (-26%)
Charlottetown	10,519	1,301,574	124	92
Alexis to Gilberts	32,790	4,070,642	124	92
Port Hope Simpson	33,790	4,207,261	125	93
Mary's Harbour	5,937	725,413	122	90

Planning Units	Net Commercial Forest (ha) (-30%)	Estimated Total Softwood Volume (m ³)
Charlottetown	7,363	1,301,574
Alexis to Gilberts	22,953	4,070,642
Port Hope Simpson	23,653	4,207,261
Mary's Harbour	4,155	725,413

Definitions and Assumptions:

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

Commercial Forest Stands (bF, bS, wS, sH) that contain a minimum softwood volume of 90 m³/ha. Stands less than 9m in height (Height class 4) and less than 75% crown closure on poor sites (3P stands) are not considered commercial.

Un-alienated Com. Forest Isolated stands and sensitive areas were not included in the AAC calculations. Area reductions were applied to the landbase using the GIS to account for:

- 20m forested buffers on rivers, lakes streams
- 100m forested buffers on scheduled rivers
- Stands located on slopes > 30%
- 30m forested buffer on groomed snowmobile trails.
- 100 m forested buffer on Trans-Labrador Highway.
- Town buffers/water supplies
- Parks and reserves

Net Com. Forest Total commercial forest with a 30% reduction applied to account for finer stand level features that require protection such as:

- Additional buffers as required on small streams
- Localized steep slopes
- Wildlife dwellings/habitat.
- Buffering of raptor nests
- Cabin development areas

Rotation Age

Rotation age is the age at which the mean annual increment of merchantable volume reached its peak and yields the most volume per unit area per year. Normal yield tables show that rotation age increases as site quality decreases. They also show that the corresponding merchantable volume and mean annual increment decreases greatly from good to poor sites (USDA 1990). Averages for black spruce stands of three site classes in the boreal forest of Canada are as follows:

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

Approximately 51% or more of the area inventoried in District 21 are black spruce stands. The proportion of site classes of forest stands is approximately 29% poor, 54% medium, and 17% good. The average gross merchantable volume is approximately 120 m³/ha. Considering these figures a best estimate of the rotation age for District 21 is **120 years**.

Furthermore, in areas which had sufficient data, yield curves for the predominant strata of Labrador were constructed. Since stand break up data is missing, it was assumed that the forest does not break up, but continues under a gap replacement system. Yield curves were constructed were classed by strata and eco-region, high boreal forest, mid boreal forest and sub-arctic boreal forest. Further descriptions of the eco-region classification system are in the strategy document. Yield curves were assigned to stands based on working group (bS or bF), site class (good, medium, poor) and density class (1,2,3).

The majority of the inventoried area in District 21 falls within the mid boreal forest eco-region. The approximate rotation age for each graph was estimated and a weighted average based upon the amount of area in each stratum on the landbase was calculated. According to the available data the rotation age is approximately 108 years. This is a considerable amount lower than the rotation age used to calculate the AAC. Yield curves generated from TSP data for this eco-region support that on average the gross mean volume of a 120 year old stand is greater than the estimated (Appendix II).

Net Merchantable Volume Determination

The forest cover inventory used to derive the described landbase measures softwood and hardwood volumes per hectare of forestland. Analysis of 1:12,500 scale aerial photos identified height, species, age and productivity of the landbase. Ground truthing plots were used to verify this information and furthermore the resulting inventory has specific volume/hectare values for all forest cover types. During the landbase net-down exercise the commercial volume and the commercial landbase area are determined. The gross volume/hectare is found by using the following formula:

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

Annual Allowable Allocation Deductions

Utilization (cull/harvesting losses)	28%
Residual Stands	6%
<u>Fire</u>	<u>1%</u>
Total	35%

AAC Calculations:

Charlottetown:

$$\frac{7363 \text{ ha}}{120 \text{ yrs}} \times 92 \text{ m}^3/\text{ha} = 5,645 \text{ m}^3/\text{year}$$

Alexis to Gilberts:

$$\frac{23953 \text{ ha}}{120 \text{ yrs}} \times 92 \text{ m}^3/\text{ha} = 17,597 \text{ m}^3/\text{year}$$

Port Hope Simpson:

$$\frac{23653 \text{ ha}}{120 \text{ yrs}} \times 93 \text{ m}^3/\text{ha} = 18,331 \text{ m}^3/\text{year}$$

Mary's Harbour:

$$\frac{4155 \text{ ha}}{120 \text{ yrs}} \times 90 \text{ m}^3/\text{ha} = 3,116 \text{ m}^3/\text{year}$$

4.2 Forest Profile Dynamics

Due to the methodology used to calculate the annual allowable cut for District 21, changes or outputs of forest profile dynamics are not predicted.

4.3 AAC Adjustments

Due to the methodology used to calculate the annual allowable cut for District 21, annual allowable cut adjustments are not used.

4.4 GMV Volume Adjustments

During calculation of the net AAC the GMV (Gross Merchantable Volume) is further refined to account for retention, waste, cull and natural disturbances. This number, referred to as the Net Commercial Volume, is then used in the AAC and AAA calculations. The expected net downs for District 21 were applied to account for the following losses for each calculation:

Cull	14%
Residual Stands	6%
Harvesting Losses	5%
<u>Fire</u>	<u>1%</u>
Total	26%

4.5 Spatial Blocking Adjustments

Due to the methodology used to calculate the annual allowable cut for District 21, spatial scheduling software is not used therefore spatial blocking adjustments are not required. Harvest blocks are identified in areas where stand volume meets minimum commercial volumes and road access is available or potentially available.

4.6 AAC Results and Outputs

The annual allowable cut (AAC) is the maximum volume that can be harvested on an annual basis while maintaining a sustainable supply of timber and providing a landscape, which supports non-timber values for future generations. Since the necessary growth and yield data required to run linear wood supply models (such as Woodstock) are absent for the district, the AAC was calculated using a basic area/volume formula. Based on the method used one output was derived as seen in table 4.1.

Table 4.1 Results of timber supply analysis in District 21.

Land Tenure		District #	Planning Unit	Softwood Volume (m3/yr)			Hardwood Volume (m3/yr)		
				Core	Const.	Sub-Total	Core	Constrained	Sub-Total
Crown	LAB	21	Charlottetown	5,600	0	5,600	0	0	0

	Alexis to Gilberts	17,600	0	17,600	0	0	0
	Port Hope Simpson	18,300	0	18,300	0	0	0
	Marys Harbour	3,100	0	3,100	0	0	0
	Pinware	4,000	0	4,000	0	0	0
	Total	48,600	0	48,600	0	0	0

4.6.1 HARVEST PROFILE

Due to the methodology used to calculate the annual allowable cut for District 21, harvest profiling is not determined. When identifying commercial harvest areas, areas that fit the stand age, and height profile of the surrounding areas were identified if possible.

5.0 RESOURCE VALUES

5.1 Values Structure

5.1.1 AESTHETIC VALUES

Scheduled commercial harvesting activity may be visible from the TLH route or certain places along snowmobile trails. The arrangement of the operating areas should minimize the visual impact of these operations. Skyline reserves will be maintained and roads will be located on the lower slopes and buffered to reduce visibility wherever possible. Preliminary work has been done to start identifying the view shed of the TLH. The view shed has been produced for the majority of the proposed commercial areas in this five year plan and is considered a tool for managers to minimize visual effect of harvesting along the TLH. A digital elevation model (DEM) of a section of the district including the Charlottetown branch road and a section of the highway from north of Port Hope Simpson towards Cartwright approximately 12 km past the Charlottetown Branch road was derived from 1:50 000 contours of the area. Using ArcGIS software, many observer points along this section of the TLH were analyzed and the areas that were visible from the line of sight points were combined to form the view shed (Map 2).

The view shed identified for a portion of the TLH is approximately 43,254 ha in total size. An analysis of the effect that removing this view shed from the landbase was completed and revealed that if removed approximately 8500 ha of net commercial forest would be removed from the landbase resulting in a decrease in the Districts AAC, of approximately 8,600 m³/year. It was agreed that the view shed would not be excluded from the landbase analysis for the AAC calculation for this reason.

Wherever possible, the following guidelines for operations will be applied within the view shed:

- Through operational planning, operations scheduled within the outlined view shed should be done during winter months, to limit ground disturbance and to protect advance regeneration.
- Closer operational planning by the Department and operators, within the view shed should occur to strategically locate skid trails to limit ground disturbance and their view from the TLH.
- Areas harvested within the view shed should be priority for regeneration surveys and for scheduled silvicultural prescriptions, in particular planting.

Currently there are no commercial operating areas that identified on or near snowmobile trails groomed by the Labrador Winter Trails. There are several domestic blocks which are accessible by groomed trails; however, since domestic harvesting is on such a small scale and often a selective harvesting process, the visual impacts are anticipated to be negligible. Officers will monitor domestic operations along groomed trails.

5.1.2 HUNTING AND TRAPPING

During this planning period, domestic hunting and trapping opportunities will continue as permitted under domestic permit. Domestic harvesting of wild meat (small game), fish, berries and mushrooms for subsistence and furs for sale are common in the district. Current areas will allow for these activities to continue with in normal levels. Seasons and bag limits along with research requirements and regulations are prepared by the Department of Environment and Climate Change.

5.1.3 NON-TIMBER FOREST PRODUCTS

Other non-timber forest products, which are often consumed domestically or used frequently for crafts, are harvested in the area. Common forest products include the harvesting of other berries such as red berries, blue berries and squash berries and various types of fungi. These products are harvested from both natural and disturbed areas in the district. Possible economic opportunities exist in the sale of these products. It is expected that these activities will continue to be permitted in the area.

5.1.4 PARKS AND NATURAL AREA RESERVES

Significant natural features, habitat types and landscapes are represented across the Province as part of the Provincial Parks system. These parks provide areas for conservation, research benchmarks, recreation and educational opportunities and ecotourism in the Province.

Pinware River Provincial Park

Pinware River Provincial Park was designated in 1974. Located in the Forteau Barrens ecoregion, this 68 hectare park is the only Provincial Park in the District. The park area is

composed of diverse vegetation types, pristine waters and wildlife. The park provides outdoor experiences such as camping, picknicking fishing and hiking opportunities.

There are no commercial harvesting operations planned in this five year operating plan neither within the Pinware Provincial Park nor near the boundary of the park. There will also be no domestic harvesting within the park boundaries which will be clearly identified on domestic harvesting maps. The Department will work with the Parks Division to determine if a no cutting buffer around the park is necessary during this planning period.

Gilbert Bay Marine Protected Area (GBMPA)

After many years of research, the Department of Fisheries and Oceans designated Gilbert Bay as a marine protected area in October of 2005. The bay itself is 47 km² in size and supports various marine resources such as shellfish, fish, marine mammals and aquatic plants. The bay also supports populations of migratory bird species. The most noted resource it supports is a resident population of reddish-brown cod fish that have been proven to be genetically distinct from other Labrador cod. Various conservation measures have been implemented in the GBMPA to protect the unique ecosystem. These measures apply to the bay itself and it is not anticipated that any activities planned in this management plan will impact the unique ecosystem due to the fact that all anticipated activities are scheduled to occur on land and far enough away from the bay.

5.1.5 POTENTIAL DEVELOPMENTS

Various locations in the district were sites of traditional aboriginal activity and initial European contact. Although historical resources may be of significant value in the area, lack of data prevents a more comprehensive assessment of this resource.

The possibility exists for large and small scale hydro development along with potential for wind power generation within the district. Plans or proposals have yet to be developed that will determine the full potential of this resource. However, these hydro developments are not anticipated during the 5 year planning period.

Agricultural activities are under developed in the district. Although some commercial and home gardening is practiced, climate and soil conditions are not conducive to an extensive agricultural effort. The harvesting of wild berries, particularly bake apples (*Rubus chamaemorus*) is a well-established practice that can generate considerable revenue in good years. This activity is usually confined to the coastal tundra or the boreal forest & barren zone (Boreal Forest Section B31; Rowe, 1972).

Rare earth mineral deposits of various types have also been identified and are being explored in the District. Sufficient data is not available to provide a complete economic assessment of these finds, although surveys continue to be carried out. Unless significant deposits are

located, it is not expected that any mining will occur during the 5 year period of this management plan.

Formal planning for management of other resources in the management district has not been conducted previously. However, it can be assumed that potential may exist for development in such areas as:

- Value-added and non-timber forest products
- Recreation and tourism, including cottage development, private recreation and commercial tourist development
- Waterway developments, including fisheries enhancement projects and large or small scale hydro development sites.

Various other recognized and potential resources may exist in the management district. However, few facts are available relative to their location, extent, value and economic potential. Recognized values and resources existing in forested lands of the district include:

- Tourism and recreational opportunities
- Timber resources
- Wildlife habitat and resources
- Aesthetic values
- Fish habitat and resources
- Non-timber forest products (berries, medicinals, mushrooms)
- Mineral resources
- Subsistence (food)
- Water resources (watersheds)
- Historic resources
- Hydro potential
- Cover value (protection of land from soil erosion)

5.1.6 RECREATIONAL CABIN DEVELOPMENT

Recreational cabin development is expected within the district during the outlined operating period at fairly modest levels. Although it's not apparent in the current situation, it is possible that cabin development areas may expand, in response to the increased construction of resource access roads. Common concerns identified include, i) land use conflicts, ii) density and expansion concerns and iii) possible effects on critical habitat. These concerns will be dealt with on a case by case basis and reflected to the appropriate agency. Current environmental guidelines require a 50 meter treed buffer between existing approved cabin development areas and any forest operation.

5.1.7 TIMBER VALUES

Forests in District 21 provide many values to local residents. One of the most apparent values noted is the value of the forest for timber sources. The harvesting of timber for domestic and commercial purposes in District 21 has been ongoing for several years. Commercially the timber can provide employment to local residents and in many communities was the main revenue generator.

The ability for local residents to harvest timber for personal use (fuelwood and sawlogs) was also noted as an important value for stakeholders. Many families rely on these resources to provide building materials and for fuel to heat their homes, during harsh winter months.

Both commercial and domestic harvesting activities are expected to continue throughout the life of this five year plan and in subsequent plans. Specific areas have been identified for commercial and domestic harvesting as described further in this document.

5.1.8 TOURISM AND OUTFITTING

Outdoor recreational activities play a significant role in the lifestyle of most residents of the district. Such activities include hunting, fishing, kayaking, hiking and camping. Access to more remote areas is provided by snowmobile, boat, helicopter or float planes.

Eleven scheduled Atlantic Salmon Rivers, including their tributaries, are located within the management district. These and other rivers support a considerable tourist industry, primarily sport-fishing for salmon, brook trout, arctic char and northern pike. Also, local recreational and subsistence fishing is pursued by many residents of the district.

Although intensive fisheries management plans have yet to be initiated, the potential for increased activity exists on various non-scheduled water systems within the district. The quality of the inland sport-fishery in Labrador has a world-wide reputation, particularly for consistency, frequency and large fish size.

With the exception of hunting/fishing outfitting, little commercial tourism development, such as visitor lodges or wilderness touring has occurred in the district. However, considerable potential does exist for more formal and developed recreational facilities. This potential includes such projects as municipal and provincial parks and natural area reserves. Also, the extensive major river system in the district may provide additional opportunities for the development of canoe or kayak routes. These activities are strongly linked to maintaining a natural and aesthetically pleasing environment. A deep appreciation of the natural environment has always been an integral part of the character of Labrador residents. An accurate measure of this value cannot be expressed adequately, but it is recognized as a definite resource.

5.1.9 TRANSPORTATION

The transportation network in Forest Management District 21 was strongly influenced by the isolated nature of the Labrador coast. Intermittent air service is provided to most of the communities by gravel airstrips and a twin Otter service out of Goose Bay. Regular marine transportation is available at various developed harbors. Marine transportation to connect outport communities of Norman Bay, Williams Harbour and Battle Harbour are generally operational for six months (from mid-June through mid-December), while the marine service across the Labrador Straits is operational year round, depending upon ice conditions.

Currently, the Trans-Labrador Highway (TLH), which consists of an all-weather gravel road, connects communities from Cartwright south to Lanse au Clair and north to Happy Valley – Goose Bay. Proposed harvesting activities are not scheduled to occur within the right-of-way of the TLH. A minimum of 100 meter no cutting buffer will be implemented for all domestic and commercial harvesting along the TLH and its access roads. Additionally, approximately 50km of forest access road has been constructed or maintained under the direction of the Newfoundland Forest Service.

Forest industry development on the coast of Labrador has always been somewhat limited due, in part, to transportation problems. Operators have had to resort to barging their product to market and have had to keep large inventories of product for extended periods between shipping seasons. Additionally, access to sufficient timber, the basis for any industry expansion, has been limiting.

In addition to the TLH, snowmobile trails are commonly used for transportation during the winter months. However, this mode of transportation is not practical to support commercial movement of goods and services. Over all there are approximately 450 km's of groomed and occasionally groomed snowmobile trails in District 21. These trails connect numerous communities and provide access to domestic harvest blocks. The Government of Newfoundland and Labrador, through Labrador and Aboriginal Affairs Office continue to provide funding to support the Labrador Transportation Grooming Subsidy (LTGS). The purpose of the LTGS is to maintain snowmobile trails to remote Labrador Communities that do not have year-round transportation connections to service centers. The LTGS provides funding to maintain snowmobile trails to remote communities in District 21 including Norman Bay and Williams Harbor. Snowmobile trails are also used by adventure tourists. To protect the aesthetic value of the trails a minimum of 30 meter no cutting buffer will be implemented for all domestic and commercial harvesting along the trail systems. There are no commercial harvesting blocks scheduled for this planning period near any of the groomed trails.

5.1.10 VALUE ADDED PROCESSING

Although limited by its sporadic distribution across the District, there is an indication that there is an adequate supply to support management for commercial timber extraction. Furthermore, there are opportunities for advancement in the sawmilling and value added sectors of the forest industry. Opportunity exists for secondary processing in the District and Region, furthermore creating local employment. The Department along with other stakeholders is

working towards advancing the forest industry in the District and region to further create local employment opportunities.

5.1.11 WATER RESOURCES

Water resources within the district were identified as an important value to local stakeholders. As well as being a significant attribute of ecosystem health, aquatic habitat plays an integral role in the lives of local residents. Historically, water resources in the district have provided domestic food sources (fish & shell fish), supported various commercial fisheries (offshore & inland), and have provided tourism and recreational opportunities to local residents and to tourists. District 21 has several scheduled salmon rivers and many trout and char fishing waters which attract many tourists to the south coast of Labrador.

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

5.1.12 HABITAT PROTECTION

The protection and conservation of wildlife habitat has been identified by stakeholders as an important objective of timber harvesting. Any critical habitat that may be identified during pre-operational surveys will be forwarded and discussed with the Wildlife Division of the Department of Environment and Conservation.

6.0 MITIGATIONS

During the 2016 planning process, a number of mitigations were developed that are designed to protect other ecosystem values, which are specific to the responsibility of the Forest Service’s Branch. Table 6.1 outlines these issues and proposed mitigations.

Table 6.1 Issues and proposed mitigations raised during 2016 process.

STAKEHOLDER	ISSUES RAISED DURING PLANNING PROCESS	PROPOSED MITIGATIONS
Dept. of Environment & Climate Change - Wildlife	Forest management protection guidelines apply to all operating areas	Forest management protection guidelines will apply to all operating areas

<p>Business, Tourism, Culture and Rural Development - Tourism and Culture Branch</p>	<p>The plan references no dialogue with affected outfitters. Forest harvesting and new access could be detrimental to these businesses. It is recommended that consultations take place with outfitters on attached document and mitigation measures are put in place between Forestry officials and operators.</p>	<p>All known outfitters were invited to public consultation session held within the district on August 30th & 31st, 2016. No outfitters were present nor did the Forest Service receive any complaints, conflicts or suggestions otherwise.</p>
	<p>Mitigation measures should be put in place that preserves the visitor experience and views capes along highway routes, including highway and trail buffers as well as views cape management. It is recommended that forest harvesting along the touring corridor from L'Anse au Clair to Charlottetown not be visible. In areas along the TLH, it is recommended that landscape design techniques are utilized to design harvest blocks which minimizes the negative visual effects of clear cuts.</p>	<p>Where operationally feasible, the Forest Service will implement strategies to provide a balance between forest harvesting and the non-timber values identified by Tourism</p>
	<p>Forest harvesting within close proximity to major salmon rivers not degrade scenic settings being utilized by anglers and tourism stakeholders. Landscape design techniques are recommended to minimize and protect visual aesthetics. The management of forest harvesting and forestry road access will significantly impact the extent to which these resources are packaged to attract tourist.</p>	<p>Where operationally feasible, the Forest Service will implement strategies to provide a balance between forest harvesting and the non-timber values identified by Tourism</p>

	The plan references no impacts to Labrador Winter Trails Inc. In efforts to minimize conflict and implement appropriate buffers where needed.	Currently there are no commercial operating areas that identified on or near snowmobile trails groomed by the Labrador Winter Trails. To protect the aesthetic value of the trails a minimum of 30 meter no cutting buffer will be implemented for all domestic and commercial harvesting along the trail systems.
Labrador and Aboriginal Affairs Office	This plan requires consultation with the Innu Nation and NCC. Any concerns raised would have to be reflected in this plan.	All open house sessions were advertised through public notice. In addition, both groups were invited to participate in open house sessions in both districts and draft copies of the plans were provided with a 30 day review period.
Dept. Municipal Affairs - Land Management Division	Commercial and Domestic harvesting does not usually present an issue on Crown lands, however, it may raise concern when harvesting occurs on private land. Cutting of timber on private land can only occur with the permission of the land owner. Forestry Services Branch staff should contact the Regional Lands Office for up-to-date titles issued and their knowledge of private land claims prior to harvesting in designated areas during the five-year period.	Prior to the preparation of the annual work schedule the Regional Lands Office will be contacted for up to date titles and private land claims to ensure there are no conflicts.

	<p>During the life of this proposed five-year forest operating plan Crown lands applications will be accepted and processed in some of these forest operating areas. Each application is addressed on a case by case basis and referrals will be sent to Forestry Services Branch for comments. A decision on each application is made with respect to the referrals that are returned to the Crown Lands Administration Division. It should be noted that some applications are currently being reviewed and a decision to approve or refuse will be made once their review is complete.</p>	<p>Crown lands applications will be reviewed and commented on by the Forest Service in accordance to the plan which is in place at that time.</p>
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	<p>Licences to Occupy for remote cottages or trappers' cabins are scattered throughout most of the forestry operating areas and should have a minimum 20 metre buffer around the structure and greater than 20 metre as terrain warrants. This consideration should be a condition of the cutting permit. Issued Licences only provide an area for the footprint of the structure. Remote cottage owners are now permitted to apply to the Lands Branch for a Crown lands grant. If the application is approved, the cottage owner can acquire up to a maximum of 0.3 hectares of land through the Crown lands application process. Accessible cottages are different from remote cottages because the owners are issued a Crown lands grant that provides an area of approximately 0.4 hectares to place a structure, well and septic system if required. Forest operations are not permitted on private land without the permission of the land owner.</p>	<p>Apply environmental guidelines to all operations. A minimum of 20m treed buffer between existing approved licenses to occupy and any forest operation will apply. Buffer may be greater as conditions warrant or at the discretion of the District Manager.</p>
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	<p>Section 36 of the Lands Act refers to (“Squatters’ Rights”) which are areas that have had uninterrupted occupation by individuals and their predecessors for twenty continuous years or more immediately prior to January 1, 1977. These lands are usually unknown to the Lands Branch because there is no mandatory land registration in the Province. Forestry Services Branch staff should contact the Regional Lands Office for up-to-date titles issued and their knowledge of private land claims prior to harvesting in designated areas during the five-year period.</p>	<p>Prior to the preparation of the annual work schedule the Regional Lands Office will be contacted for up to date titles and private land claims to ensure there are no conflicts.</p>
	<p>ATV and Snowmobile Trails - where these occur the trails should be left undisturbed and undamaged. Consultation with the Newfoundland and Labrador Snowmobile Federation or applicable ATV trail licence holder is recommended.</p>	<p>Currently there are no commercial operating areas that are identified on or near snowmobile trails groomed by the Labrador Winter Trails. To protect the aesthetic value of the trails a minimum of 30 meter no cutting buffer will be implemented for all domestic and commercial harvesting along the trail systems.</p>

	<p>Cottage Development Areas are areas designated for cottage development within Cottage Planning Areas. These areas have been previously developed over the years and there have been an accumulation of titles issued for remote cottages (Licenses) or cottages that are accessible by an access road and have been issued a grant (freehold title). No harvesting is permitted in Cottage Development Areas without prior consultation with the Lands Branch. Most cottage development areas occur around waterbodies. The Lands Branch requests a 120 metre buffer around waterbodies where cottage developments exist. 120 metre includes the 15 metre shoreline reservation, a 90 metre granted lot (depth of lot) plus a 15 metre road right of way. Forestry Services should contact the Land Management Division of the Lands Branch for an up to date version of the Cottage Development Areas for use in annual plans. This should ensure that these areas remain undisturbed.</p>	<p>There will be no harvesting in any approved cottage development area.</p>
	<p>Forestry operations should not impede access to or with the rights of land users and land owners.</p>	<p>It is not anticipated that any forest operations will impede access of land owners</p>

	<p>Many of the municipalities within this zone have development and control regulations as well as municipal plans under the Urban and Rural Planning Act, 2000. Forestry related activities may or may not be permitted in some of the zones outlined in the municipal plans. Any zoning and/or zoning conflicts have been outlined in the attached Excel file in addition to GIS files that have already been emailed to Forestry Services planning staff illustrating areas where forestry activities are not permitted. This GIS file can be used for ongoing planning purposes and can be updated by the Lands Branch for new municipal plans or plan amendments. Forestry activity in any town that has development and control regulations under the Urban and Rural Planning Act, 2000 will require a permit from the respective town. Should the Forestry Services Branch feel that an area is critical to permit forestry related activities in an area where zoning does not permit those activities; the Forestry Services Branch should consult the applicable town to request that the town consider an amendment to their municipal plan.</p>	<p>In zones in which forestry is a permitted use Forestry Services will apply for a permit from the town to do so. All other areas where forestry is not permitted or discretionary use will be no cutting areas and identified on domestic maps.</p>
	<p>Any forestry activity within the building control lines of a protected road requires a permit from Service NL.</p>	<p>Once the plan is approved through the EA process, Forestry Services will apply for a permit from Service NL as required.</p>

Several other issues were identified during previous planning processes, but not discussed at this one. The Forest Service still considers these issues and their mitigations valid. Table 6.2 outlines the issues and proposed mitigation.

Table 6.2 Issues and proposed mitigations raised during previous planning processes that are still valid.

STAKEHOLDER	ISSUES RAISED DURING PLANNING PROCESS	PROPOSED MITIGATIONS
Dept. Environment & Conservation – water resources	All activities in PWS area require prior approval under the Water Resources Act	In an attempt to maintain water quality, there will be no domestic or commercial harvesting within protected water supply areas and buffers on forest activities will be applied as per the environmental protection guidelines.
	Recommend an environmental buffer of min. 15m along high water mark of all bodies of water showing on 1:50000 mapping	Minimum requirement for 30m forested buffer around all waterbodies identified on latest 1:50,000 topographic maps and on all waterbodies that are 1.0m in width or greater.
	Projects located on boundary of PWS areas must be reviewed ensure they are not within buffer zones and to ensure compliance with policy	The district has water supply areas, of which in an attempt to maintain water quality, there will be no domestic or commercial harvesting within them and PWS areas will be identified on domestic maps as no cutting.
Dept. Environment & Conservation – Environment Pesticide use	Must comply with Environmental Protection Act, Pesticides Control Regulations	Any proposed spray program planned for D21 will be registered as separate undertakings with the Environmental Assessment Division of the Department of Environment and Conservation for environmental assessment and further public review.
Dept. Environment & Conservation - Lands	Requesting a 120m buffer around waterbodies where cottage developments exist. Includes a 15m shoreline	Invited Crown Lands to participate in process, no response. Contacted regional lands office for locations of

STAKEHOLDER	ISSUES RAISED DURING PLANNING PROCESS	PROPOSED MITIGATIONS
	reservation, 90m cottage lot and a 15m road right of way.	cottage development areas. No response to date, however I don't foresee any conflict in applying such a buffer to these areas.
	Requesting individual remote cottages should have a minimum of 20m no-cut buffer around cottage.	Current environmental guidelines require a 50 meter treed buffer between existing approved cabin development areas and any forest operation. These guidelines are currently under review.
	no cutting on private land. Should contact the regional lands office for up-to-date titles issued and their knowledge of private land claims prior to harvesting.	Not anticipating any cutting on private land.
	ATV and snowmobile trails should be left undisturbed and an adequate buffer should be maintained. Recommend consultation with local ATV/Snowmobile clubs.	Currently there are no commercial operating areas that identified on or near snowmobile trails groomed by the Labrador Winter Trails. To protect the aesthetic value of the trails a minimum of 30 meter no cutting buffer will be implemented for all domestic and commercial harvesting along the trail systems.
Dept. Environment & Conservation - Wildlife	Rare plants occur in several domestic harvest blocks. Contact wildlife division to discuss mitigations.	Commercial areas are identified further in Annual Operating Plans. Any conflicts with rare plants can be buffered at that time. Domestic harvesting impact is very light especially during winter and will have little impact on rare plants in the district.
Dept. Tourism & Culture	Advise and consult with Tourism with regard to the initiation of the plan over the next four	The reason DNR prepares 5 year plans is to plan ahead. Agree with advising Tourism on an

STAKEHOLDER	ISSUES RAISED DURING PLANNING PROCESS	PROPOSED MITIGATIONS
	years.	annual basis of activities by copy of the annual operating plan; however do not see any benefit to opening the plan to consultation every year. All operations are outlined within 5 year plan and anything outside of this requires an amendment.

7.0 PUBLIC CONSULTATION PROCESS

7.1 Planning Objectives

Forest Resource managers in Canada are striving for a society that successfully integrates economic, environmental and social considerations into all resource-related decision making. Since the early 1990’s, there has been a country-wide shift from single resource management to a more comprehensive approach of forest ecosystem management. Sustainable Forest Management (SFM) must be balanced in light of social, economic, and environmental issues. In the context of SFM, this shift has resulted in a move from the traditional narrow focus of timber management, to incorporate non-timber values into the management planning framework. Another term that has become closely associated with SFM is “sustainable development” or in this case “sustainable forests”, which not only takes into account the social, cultural, economic, and environmental benefits of the present, but those of future generations as well. Involvement of Interested Stakeholders into the five-year planning process is recognized by the Forestry Services Branch as a key component to achieving sustainable development.

As a result of the 1995 Environmental Preview Report, the Forestry Services Branch adopted an adaptive management planning process, which has three objectives:

1. Establish a productive planning framework to include all stakeholders. An effective planning framework must have information and issues defined at the beginning of the process.
2. Learn more about forest ecosystems while they are being actively managed (i.e. adaptive management). Adaptive management incorporates strategies which help us learn about the forest ecosystem and to deal with uncertainties.
3. Establish an ecosystem approach to forest management which integrates the scientific knowledge of ecological relations and limits of growth with social values. This will help to attain the goal of sustaining natural ecosystem integrity and health over the long term.

Adaptive management makes decisions based on input from interested stakeholders and establishes a continuous learning program. The adaptive approach allows us to communicate,

share information and learn about forests being managed. This sharing of information, both old and new, then provides the flexibility necessary to adjust to changes and to set new goals. Such interaction is an absolute necessity for a subject as complex as an ecosystem.

7.2 Stakeholder Involvement

Since the mid 1990's, for each five-year plan, the Forestry Services Branch embarked upon a rigorous public consultation process involving a series of meetings spanning a number of months at an established venue, where interested stakeholders could discuss a range of forest management issues at an operational level.

With respect to the strategic level, in 2014, the Forestry Services Branch released a 10- year Provincial Sustainable Forest Management Strategy (PSFMS) Document (2014-2024), which emerged through wide consultation with citizens of the Province. The 2014-2024 PSFMS builds on the strengths of the previous strategy plans and uses a landscape-scale planning approach to implement the progressive and innovative ecological policies required for Sustainable Forest Management (SFM). The strategy builds on the strengths of the many modern and high-quality forest management programs that are currently being implemented in this province to ensure a vibrant and competitive forest industry.

Taking into account the many five-year plans successfully implemented within the province since the mid 1990's through public consultation processes and the recent PSFMS developed through public consultations, The Forestry Services Branch strives to improve its methods to garner advice from the public while also mitigating land-use conflicts. To this effect, as new five-year plans are being developed and implemented provincially, relevant issues raised from previous planning processes are considered the foundation the new plans.

In 2016, in addition to transferring issues/concerns/mitigations from previous planning processes, a revised approach of stakeholder involvement for the development of this plan was implemented. Known interested stakeholders from previous planning processes were engaged on a "one-on-one" basis to evaluate potential activity prior to the plan submission to the Environmental Assessment Process. The results of stakeholder involvement are identified in the Mitigations Table in Section 5.

8.0 MANAGEMENT GOALS, OBJECTIVES AND STRATEGIES

The Forest Service defines sustainable forest management as "the maintenance of the long-term health of forest ecosystems while providing ecological, economic and cultural opportunities for the benefit of present and future generations". Implicit in the definition of ecosystem management are the following four basic ideas:

- It deals with using concepts, principles, and relationships which are not fully understood to make decisions. Management must, therefore, be conservative and adaptive.
- It places emphasis on the long term processes (i.e. ecological rotation)
- It looks to manage the health and vigor of whole ecosystems
- It manages for a broad range of complex social and natural values (i.e. it is humanitarian)

Holling (1978) suggests that adaptive management assumes knowledge is provisional and focuses on management as a learning process or continuous experiment, incorporating the results of previous actions and allowing managers to remain flexible and to adapt to uncertainty. Thus adaptive management deals with what is not fully understood.

Much of the misunderstanding surrounding ecosystem management is the belief that short-term jobs, goods, services, and profits may have been provided at the possible expense of the long-term health of ecosystems. However, ecosystem management seeks to find a balance between short-term goals, while sustaining the functions and processes of the ecosystems (e.g. providing jobs and preserving the natural habitat of the indigenous wildlife species). Clearly, ecosystem management must be first concerned about the long-term viability of the ecosystems and, then, about management of the outputs that can be obtained from them. Without first providing for the long-term health of the ecosystem, how can economic development be sustained?

Society and its economy are linked directly to the ability to manage ecosystems effectively. During the past few years, the province has been facing a crisis due to the collapse of the fishery. Thus, Newfoundlanders and Labradorians are well aware of the consequences of being more concerned about maximizing short-term jobs and profits instead of looking first to properly manage ecosystems. The specter of a similar situation occurring in the terrestrial ecosystems haunts resource managers. However, this fear can serve as an impetus to assure that a parallel situation does not happen in the forest industry. Implementing ecosystem management will mean finding new ways and approaches of understanding and managing ecological principles. It is increasingly understood and accepted that society and its economy must change to align itself with the ecosystems in which people live and work, not the reverse.

The Forest Service has spent a great deal of time and energy establishing balances between short-term outputs (primarily jobs) and long-term maintenance of the forest ecosystem. While Forest Service staff recognizes the desperate need for meaningful employment in this province, they recognize the potential long-term damage that can occur to land-based ecosystems and the economy, if short-term goals supersede the forest ecosystem's ability to meet these needs. The task is daunting, reaching far beyond the allocation of a timber resource. This has required the development of partnerships with other resource managers, stakeholders, and the general public. The fundamental issues are establishing trust, building relationships and changing attitudes towards management at the ecosystem level.

8.1 Harvesting

The *Forestry Act, 1990*, has produced a philosophical and pragmatic shift in forestry thinking in Newfoundland and Labrador from an output-oriented management (i.e. timber management) to an ecosystem-based management approach. Ecosystem management is based on the concept of sustainable development, as described by Gro Harlem Brundtland in *Our Common Future* (1987). Section 2 of the *Forestry Act* describes sustained yield forest management as “a policy, method or plan of management to provide for an optimum continuous supply of timber in a manner consistent with other resource management objectives, sound environmental practices and the principle of sustainable development”. Further emphasis has been placed on this shift by the *Canada Forest Accord* and the 1992 National Forest Strategy, titled *Sustainable Forest: A Canadian Commitment*, of which the Government of Newfoundland and Labrador is a signatory. The goal of these two initiatives is “to maintain and enhance the long-term health of our forest ecosystems for the benefit of all living things, both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations”.

The Forest Service recognizes that single resource management is ineffective and too narrow in scope, to adequately address the requirement of managing forest ecosystems. Therefore, a new management strategy was adopted that focuses on ecological principles (i.e. adaptive ecosystem management or ecosystem management).

The management framework is the crucial element within the planning process. It integrates the past, present and future ecosystems into a meaningful context which reflects the aspirations and intentions of the stakeholders.

The model principles within the Terms of Reference reflect the philosophy of the management framework. The less than perfect understanding of all ecosystems places considerable emphasis on the precautionary requirement, an adaptive approach with the consensual agreement of all stakeholders.

The management framework is outlined by (a) providing a vision statement and guiding principles, (b) identifying key values and associated goals, (c) relating appropriate indicators and objectives, (d) developing an appropriate strategy, and (e) ensuring additional factors, concerns or issues are addressed specifically within the plan or its appendices. The management framework is part of a dynamic process, which stresses continuity over extended time frames.

Also accepted within this context are the following six principles, which are required to support this vision statement and serve as a foundation from which the sustainable forest management framework will be developed:

- Forest ecosystems are managed to maintain their ecological integrity, productive capacity, resiliency and biodiversity.

- Management practices are to respect all forest land use and forest values.
- Partnerships will be fostered to provide meaningful participation in sustainable forest management.
- Economic benefits from the forest resource will be maximized.
- Adaptive management principles are to be applied in the management of forest ecosystems.
- Conservation and compliance that ensures the protection of wildlife and forest ecosystems.

The forest ecosystem includes a multitude of living and non-living components that interact with each other and their environment. This dynamic process, having both spatial and temporal dimensions, is of immense intrinsic value. Its existence influences life on earth, hence values and goals presented can only reflect a small subset of the potential of the forest ecosystem to present or future generations.

Recognizing the magnitude of any attempt to identify or imagine a complete list of values, present and future, adopted from the *Provincial Sustainable Forest Management Strategy*, the following is a broad based list of **criteria** to be used as a measure of progression towards sustainable forest management within the forest ecosystems of the Province and District 21:

- Biodiversity of ecosystems
- Productivity and health of the ecosystems
- Soil, water, and physical environment conservation
- Forest ecosystem contribution to ecological cycles, both locally and globally
- Multiple benefits to society, both consumptive and non-consumptive
- Sustainable systems that endure through time

8.1.1 COMMERCIAL

Commercial operations will be confined to the 31 identified blocks in the plan. In general mechanical harvesters and conventional harvesting methods will be used in commercial areas. Selective operations will be done manually using chainsaw and will mainly operate during the winter months. It is anticipated that, with the exception of the selective-commercial snowmobile areaa, all commercial harvesting will be through the clearcut silvicultural system with the retention of non-merchantable and wildlife trees.

8.1.2 DOMESTIC

Domestic harvesting is expected to continue at current levels (~15,500 m³/year) consequently; approximately 77,500 m³ is estimated to be sufficient to meet district domestic requirements

for the next five years. The majority of domestic cutting will occur near communities in the district. Majority of the domestic wood harvested will be during winter months with snowmobile and chainsaw. This harvesting method will have little environmental effect and ground disturbance within the domestic areas.

8.1.3 HARDWOODS

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

8.2 Silviculture

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

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

8.2.1 FOREST RENEWAL

The silviculture program in District 21 will focus on monitoring and research. However, cutovers which do not regenerate as expected or burns may be identified for planting during the operating period. Further refinements to each project will be described in the Annual Work Schedules developed each year.

8.2.2 FOREST IMPROVEMENTS

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

8.3 Forest Access Roads

The construction of an effective road network is essential to ensure the success of commercial operations in the area. To ensure this success, approximately 14 kilometers in total of primary access road have been proposed for construction during this planning period. Based on current

costs this will require a funding commitment well in excess of one million dollars.

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

8.4 Forest Protection

8.4.1 INSECT AND DISEASE

Protection of the regions forests and related values continue to be a priority in Labrador. The hemlock looper insect control program has not been required since 2009 due to low insect numbers. No treatments are planned during this operating plan period due to expected low numbers. Monitoring for insects will continue with aerial and ground reconnaissance being conducted. The spruce budworm has caused defoliation in the Goose Bay area but there is no recent evidence of damage in this district.

8.4.2 FIRE

Resource protection, in particular fire suppression is necessary to protect Labrador's forest resource and is considered an essential operational activity. Even though large fires are uncommon in the recent past within District 21, forest fire occurrence is unpredictable. We must be prepared to respond quickly to reduce the loss of valuable commercial, recreational and non-commercial values on the landscape.

To determine initial attack strategies the FMD 21 has been loosely sub-divided into the following priority zones: 1) life, 2) property, 3) resources, 4) other. Routine fire patrols are to be performed regularly in District 21 by ground, fixed wing aircraft, water bomber and helicopter.

8.4.3 WIND THROW

Due to the old age class structure of the forests in District 21, areas of wind throw in the area is highly likely. Areas of wind throw have been observed on small scales throughout the District however with changing climate conditions with increased wind speeds and occurrences, wind

throw will be more prevalent in the District over the next five years. Identified commercial blocks have targeted some of the oldest stands first to try to salvage the wood before it can blow down. Should the District experience an excess of wind throw, additional measures will be considered. Existing measures for domestic permit holders include wind throw harvest outside of a domestic block with District Manager approval.

8.5 Information and Education

Efforts by District staff to educate and foster new ideas to the public and operators on ecosystem management initiatives will continue within the District. Continued interaction with the public and operators will likely result in the better understanding of key management decisions made by managers, and their relationships with the goals and objectives of forest management. During this planning period it is expected that District staff will continue to:

- Deliver presentations to school and youth groups on forest ecosystem management topics.
- Maintain contact and good working relationships with town councils, resource groups, development associations and other Government Departments.
- Conduct operator workshop on various management issues including utilization, ground disturbance and road construction on a regular basis.
- Continue to participate in National forestry and wildlife weeks.

9.0 PROPOSED ACTIVITIES

An overview of the proposed forest management activities scheduled for this five year period (2017-2021) is outlined in appended maps 3 & 4. Activities include: i) harvesting, ii) silviculture, iii) road construction.

The District 21 inventoried area is further refined into 4 planning areas. A total of 243,000 m³ solid is available for commercial and domestic harvest during the five years covered under this plan. Commercial operations will harvest approximately 180,500 m³, which is scheduled to be harvested from thirty-one commercial areas identified. Domestic allocations are expected continue at ~15,500 m³/year, for a five year harvest of 77,500 m³ total. The majority of the domestic harvesting will take place in designated domestic areas near communities.

Silviculture activities, namely planting, will be applied using a prescription approach during this planning period. Other activities will focus on monitoring and research with the intent of adapting an effective long term strategy for the District.

Considerable amounts of primary and secondary access road will be required to be constructed to access commercial timber resources outlined in this planning period. Road construction will occur in three of the four planning areas. Access roads will also support other activities such as

fire suppression, silviculture initiatives, and monitoring activities. Operational activities described in the following section should be considered within the context of the provincial sustainable forest management strategy.

9.1 Harvesting

Environmental Protection Guidelines were developed through the review of scientific literature, input from various Provincial and Federal Government departments and local stake holders (Appendix III). Any significant changes will be implemented immediately. All harvesting operations in the district will be subject to these guidelines along with the permit conditions and any requirements outlined in the five year operating plan or the strategy document.

9.1.1 COMMERCIAL

Table 9.1 Proposed commercial harvest activity 2017-2021.

Operating Area					Volume Proposed		
Number	Name	Tenure	Area (ha)	Number of Permits	Softwood		
					Core (net)	Const.	Sub-Total
CC-21-001	Charlottetown 1	Crown	142		9,972		9,972
CC-21-002	Charlottetown 2	Crown	50		5,112		5,112
CC-21-003	Charlottetown 3	Crown	211		15,017		15,017
CC-21-004	Charlottetown 4	Crown	214		19,314		19,314
CC-21-005	Charlottetown 5	Crown	76		3,900		3,900
CC-21-006	Charlottetown 6	Crown	130		9,222		9,222
CC-21-007	Charlottetown North 2	Crown	81		7,158		7,158
CC-21-008	A1 Alexis to Gilberts	Crown	130		7,052		7,052
CC-21-009	A2 Alexis to Gilberts	Crown	72		8,167		8,167
CC-21-010	A3 Alexis to Gilberts	Crown	219		27,785		27,785
CC-21-011	Alexis to Gilberts 1	Crown	283		20,224		20,224
CC-21-012	Alexis to Gilberts 2	Crown	106		9,432		9,432
CC-21-013	Alexis to Gilberts 3	Crown	122		12,276		12,276
CC-21-014	Alexis to Gilberts 4	Crown	117		11,312		11,312
CC-21-015	Alexis to Gilberts 5	Crown	161		18,611		18,611
CC-21-016	Noralls Pond 1	Crown	37		1,200		1,200
CC-21-017	Noralls Pond 2	Crown	65		7,044		7,044
CC-21-018	Noralls Pond 3	Crown	143		9,722		9,722
CC-21-019	Noralls Pond 4	Crown	92		8,145		8,145
CC-21-020	Noralls Pond 5	Crown	35		2,117		2,117
CC-21-021	3 Port Hope Simpson	Crown	93		6,887		6,887
CC-21-022	4 Port Hope Simpson	Crown	150		11,305		11,305

Operating Area					Volume Proposed		
Number	Name	Tenure	Area (ha)	Number of Permits	Softwood		
					Core (net)	Const.	Sub-Total
CC-21-023	5 Port Hope Simpson	Crown	55		5,262		5,262
CC-21-024	6 Port Hope Simpson	Crown	150		11,557		11,557
CC-21-025	7 Port Hope Simpson	Crown	67		6,462		6,462
CC-21-026	8 Port Hope Simpson	Crown	110		11,460		11,460
CC-21-027	9 Port Hope Simpson	Crown	101		9,356		9,356
CC-21-028	10 Port Hope Simpson	Crown	240		22,812		22,812
CC-21-029	11 Port Hope Simpson	Crown	62		6,233		6,233
CC-21-030	12 Port Hope Simpson	Crown	313		28,650		28,650
CC-21-031	1 Marys Harbour	Crown	69		6,094		6,094
Total			3,896		338,860		338,860

Commercial permits will be issued annually for the period of January 1 – December 31 upon approval from the District office. Currently there is additional AAC for allocation to new commercial permits or to increase allocations to existing permits.

Consideration will be given to existing commercial operators for increases in their allocations before any new permits are issued in the District. Increases in permit allocations will be subject to evaluation by the Forest Service and linked to local value-added processing capacity in the District.

All commercial operations will be scheduled to occur in the thirty-one operating blocks identified in this plan. Appended in the map booklet are the locations of these areas (Maps 5-35). Further refinements to the operating blocks to account for site specific features will be made in the annual work schedule prior to the beginning of each operating year. An additional net down of -20% has been applied to the anticipated volume from each operating block to account for stand level features that require protection.

A classification analysis of the inventoried area was completed to summarize the amount of area in each of the predominant strata for each of the planning areas (Appendix IV). These classifications were used during the identification of the commercial operating areas. Where ever possible, commercial operating areas were identified while trying to mimic the natural distribution of strata on the land base. This will ensure that all merchantable stands are harvested overtime and that not all the “good” wood will be harvested first, leaving the “bad” wood for future operations.

Majority of the commercial harvesting in the district will utilize mechanical equipment such as mechanical harvesters and forwarders. Harvesting of commercial timber on a small scale using manual cutters or some combination of both harvesting systems is expected. All commercial harvesting will be through the clear-cut silvicultural system, full tree harvesting will not be permitted.

Permits 385 m^3 will be considered small scale commercial operations. These operations generally use chainsaws and most likely operate during the winter months. Furthermore, they will generally harvest areas that do not have road access and areas that cannot be accessed by mechanical equipment.

9.1.2 DOMESTIC

The harvesting of fuelwood, sawlogs and building materials by residents for domestic use will continue under a domestic permit, primarily in the twelve areas identified in this plan. Domestic permit sales are expected to remain relatively stable over the five years of this plan. On average 650 domestic permits are issued each year in the District. These permits are available in person or by mail from any Forest Service office in the District. Domestic harvesters must wait until receiving their original domestic permit before harvesting activity can commence.

Domestic permits will be issued for the requested amount up to a maximum volume of 23 m^3 /permit for the period from January 1 to December 31 each year, unless otherwise stated. Analyses of domestic returns have indicated that on average each permit holder is harvesting 16 m^3 /year. The Forest Service will work over this planning period to gather more domestic harvesting data through mandatory regulatory returns, spot checks and random surveys. Each harvester is eligible to select a primary and secondary cutting area which will be shown on the permit. These areas are generally located close to the communities and are identified in the appended maps 36-55 and area sizes and volumes are depicted in Table 9.2. Permits, maps and conditions are required to be on person while harvesting and should be ready if checked by a Forestry Official. Domestic wood cutters will be encouraged to harvest insect killed wood.

Consensus was reached among local planning members that the following exceptions should apply to domestic harvesting in buffers:

1. Domestic harvesters should be allowed to harvest specialized boat timbers in any buffer.
2. Domestic harvesters should be able to cut dry wood or salvage blow-downs within the 100m buffer of the Trans-Labrador Highway.

These activities will require prior approval from District staff and occur within existing legislation. These activities will be closely monitored and subject to review on an annual basis. Modifications to these practices may be recommended as required.

Small volumes of wood are expected to be harvested outside of the identified domestic areas by cabin owners. Requests for domestic harvesting blocks outside the identified areas will require prior approval from District staff. Such operations will be monitored and will be subject to review on an annual basis. Modifications to this practice may be recommended and enforced as required.

Table 9.2 Proposed domestic harvest activity 2017-2021.

Operating Area				Estimated Number of Permits/year		Estimated Volume/year	
Number	Name	Tenure	Total Area (ha)	Commercial	Domestic	Soft wood	Hard wood
CC-21-501	Forteau	Crown	24,574	0	45	1,035	0
CC-21-502	Fox Pond	Crown	85,146	0	15	345	0
CC-21-503	Upper Pinware	Crown	110,113	0	15	345	0
CC-21-504	Lanse au Loup	Crown	31,268	0	45	1,035	0
CC-21-505	Pinware West	Crown	60,294	0	60	1,380	0
CC-21-506	Charlottetown 3	Crown	3,758	0	55	1,265	0
CC-21-507	Barge to Temple Bay	Crown	98,032	0	35	805	0
CC-21-508	Chateau Pond	Crown	49,069	0	10	230	0
CC-21-509	Alexis to Gilberts 2	Crown	9,681	0	25	575	0
CC-21-510	St. Lewis River 2	Crown	32,082	0	25	575	0
CC-21-511	St. Lewis River 1	Crown	49,277	0	70	1,610	0
CC-21-512	Marys Harbour 1	Crown	45,821	0	85	1,955	0
CC-21-513	Port Hope Simpson 2	Crown	14,785	0	5	115	0
CC-21-514	Port Hope Simpson 2	Crown	24,510	0	90	2,070	0
CC-21-515	Lodge Bay 1	Crown	22,101	0	25	575	0
CC-21-516	Charlottetown 5	Crown	10,215	0	10	230	0
CC-21-517	Pinware River Forest Access Rd	Crown	34,141	0	30	690	0
CC-21-518	Charlottetown 4	Crown	13,681	0	5	115	0
CC-21-519	Charlottetown 1	Crown	7,087	0	30	690	0
CC-21-520	Charlottetown 2	Crown	6,553	0	15	345	0
Total				0			0

9.2 Silviculture

Silviculture refers to the theory and practice of controlling the establishment, composition, growth and quality of forest stands to achieve the objectives of management (Smith, Larson, Kelty and Ashton, 1997). In the past, two of the most common techniques in District 21 are planting and pre-commercial thinning.

Historically, forest stands in District 21 have been subject to large scale disturbances including fire and harvesting. The occurrence of major fires in the district has had a strong influence on existing distribution of vegetation types including lichen woodlands and birch stands. Foster (1983) reported a strong correlation between fire distribution over the past 110 years and the location of lichen woodlands and birch stands.

Regeneration surveys completed in the district have indicated that the majority of the harvested areas adequately regenerate within a five year period and this can be easily seen on recent cutovers in the District. Although no regeneration surveys have been conducted in burn areas, observations have indicated that some of these areas have not been regenerating as fast. Many factors may have contributed to this slower regeneration time such as pre-disturbance site characteristics, seed sources, repetitive burns or fire temperatures. Harvested areas will be monitored and detailed regeneration surveys will be conducted in areas where regeneration appears to be inadequate three to five years after the disturbance.

The primary silviculture prescription for this planning period will be planting/gap planting and if required, site preparation to prepare the site for planting. Stands harvested in the past five years or those scheduled for harvest in this plan or burn areas not adequately regenerating will be treated as candidate areas for planting. Any stands harvested during this plan will be located within the proposed commercial blocks outlined in maps 5-35. Selection of the species to be planted will be highly dependent upon the pre-disturbance stand structure and will be dealt with on a site specific basis.

9.3 Forest Access

The system of resource access roads in the district is acceptable for the level of commercial forestry operations existing today, but for full harvest of the allocation to occur, additional road infrastructure is needed.

Road network construction is essential to the success of harvesting (domestic and commercial) operations, silviculture treatments and fire suppression in the district. In the past, all road construction in District 21 was constructed under the Provincial access road program, under the Department of Natural Resources. The anticipated forest access road network to access the commercial harvesting areas for this operating period is summarized in table 9.3 and appended in map 56. Based upon current construction costs, well in excess of one million dollars is required. Construction each year will depend on the amount of money available in the roads budget.

Table 9.3 Proposed Road construction for 2017-2021.

Operating Area		Construction/ Reconstruction	Length (km)	Water Crossings	
Name	Number			Culverts	Bridges
Charlottetown		New Construction	2.4	0	0
Discovery I		New Construction	2.5	0	0
Discovery II		New Construction	5.2	0	0
Port Hope Simpson		New Construction	3.9	0	0
Total		New Construction	14.0	0	0

Operational roads (secondary or spur) are not identified in this five year plan. However they will be necessary to ensure that timber scheduled for harvest is fully accessed. Operators will have to construct short spur roads to access all timber in each harvesting block. Royalty reductions, as per regulations, are offered as incentive for commercial operators to construct their own access. These roads are subject to established environmental standards and are subject to approval by District staff. Operator built roads will be identified during the preparation of the annual work schedules.

Due to the relative lack of existing forest access roads, decommissioning was not considered by the stakeholders during this planning period. A detailed review of the access roads program will be undertaken towards the end of the planning period to establish whether or not decommissioning will be required during the next planning horizon. Individual operators will be expected to rehabilitate extraction trails to a standard acceptable to district guidelines.

Road construction activity will be carried out as per Forest Service specifications and the Environmental Protection Guidelines, which are provided in appendix III. Under section 48 of the *Water Resources Act*, certificates of approval will be obtained from the Water Resources Management Division of the Department of Environment and Conservation for any culvert or bridge crossing. In addition, approval under section 5(1) of the *Navigable Waters Act (NWPA)* will also be obtained for any water crossing prior to the commencement of any work. An effort will be made to increase the number of bottomless culverts used on all fish bearing streams (1.0 m or greater).

The Forest Service will continue to work with the Department of Environment and Climate Change and the Department of Fisheries and Oceans to ensure unimpeded fish passage in all stream crossings involved in this and other operating plans.

9.4 Forest Protection

9.4.1 FIRE

The predominant disturbance in the Labrador Region has been the natural occurrence of forest fires; in particular some of the largest fires in the Region have been recorded in District 21. Although fire research is limited for the District, Foster (1983) estimated the fire cycle for the

southern coast of Labrador to be ~500 years. To ensure minimal losses an effective fire suppression program is necessary.

A fire suppression priority map (57) has been developed as a guide for fire suppression activities in the District. Although, natural cycles are preferred, suppression activities will occur in priority areas in order of human life, property, and resources. Forest fire suppression activities will occur within the strategies outlined in the PSFMP and in conjunction with regional fire management strategies.

Satellite offices in Port Hope Simpson and Labrador Straits have staff and equipment to provide initial suppression attacks when required. Two seasonal Conservation Officers (fire protection) are stationed in Port Hope Simpson from mid-May to September, complemented by three full-time Conservation Officers in Port Hope Simpson. The Port Hope Simpson office is manned from 1200 to 1900 hours daily. After regular hours, the district maintains a fire duty officer on stand-by to receive fire reports and dispatch staff and equipment. The Forest Management Centre located in North West River, assists in coordinating air support (tanker & helicopter) and can provide additional staff and equipment as required.

9.4.2 INSECT AND DISEASE

In addition to the environmental protection mechanisms outlined throughout other parts of this document (including the appended Environmental Protection Guidelines for Ecologically based Forest Resource Management) (Appendix IV), the forests of FMD 21 are also protected by province wide programs from insects and diseases. Since many forest pests are endemic, there is an increased risk of insect and disease outbreaks in over mature stands. The general strategy of harvesting the oldest stands first will not only potentially reduce the future risk of these outbreaks but also will reduce the future risk of fire by targeting the stratum that contains the most abundant dead and dying timber.

Insect and disease protection activities are coordinated on a Provincial basis from the Forest Protection Division in Corner Brook. During routine field work, District staff will focus on the forest condition in an effort to detect any significant insect or disease infestations as early as possible. All significant infestations will be reported to the provincial coordinator and appropriate action discussed with District and Regional staff.

Large scale infestations were not common on the south coast until 2006; consequently the application of spray programs occurred in 2008 & 2009 for hemlock looper. Since this time it appears that population levels of hemlock looper has decreased and it is unknown when population levels will rise again. Large scale spray programs using chemical or insect control agents may be required during this planning period. Any proposed spray program will be registered as separate undertakings with the Environmental Assessment Division of the Department of Environment and Conservation for environmental assessment and further public review.

9.4.3 WIND THROW

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

9.4.4 SURVEYS

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

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

Regeneration surveys will be conducted on areas that have been disturbed (harvesting or fire) to determine the quantity and quality of natural regeneration. Areas will normally be surveyed three to five years after the disturbance to allow sufficient time for seedling establishment. Surveys will be conducted as outlined in the Regenerations Assessment Procedures by the Newfoundland and Labrador Forest Service.

Problems with improper utilization will be addressed through regular monitoring and enforcement by District Conservation Officers. Formal surveys, defined by the Newfoundland Forest Service, will be carried out to obtain baseline data or to resolve disputes.

While these surveys are necessary to measure the immediate impact of activities on the ecosystem, mechanisms to monitor change over the long term are also necessary. An important component of this long term monitoring is the establishment and re-sampling of permanent sample plots and temporary sample plots in the District. In addition to obtaining growth and yield information, data pertaining to site, coarse woody debris and the presence of small mammals and song birds will be recorded and monitored over time.

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

9.5 Activities in Protected Public Water Supply Areas

There will be no commercial or domestic harvesting scheduled or permitted in either of the

protected water supply areas. Furthermore, these protected areas will be identified on domestic maps supplied to harvesters and enforced as no cutting areas.

9.6 Information and Education

Public awareness and education is a high priority for the Forest Service in District 21. Educating the public on best management practices is necessary and has proven beneficial. Staff will take part in several activities to ensure good communication and relations between the Forest Service and communities, such activities include visiting the local schools for presentations, career fairs, forestry and wildlife week and to judge science fairs. Some promotional materials will be distributed during special occasions. Throughout the life of this plan we hope to build on the success of these activities.

10.0 PLAN ADMINISTRATION

10.1 Monitoring

A monitoring committee, consisting of representatives from each stakeholder group, may be established to evaluate the results of the activities planned in this document. The Forest Services Branch will determine representation on this monitoring committee. The main focus of the committee will be to monitor activities and evaluate the overall progress towards the long-term goals outlined in this document and in the *Provincial Sustainable Forest Management Strategy 2014-2024* and make recommendations to the Forest Service where necessary. The Forest Service will prepare an annual work schedule for each operating year, which will be reviewed by the monitoring committee.

Adaptive management can be defined as a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Furthermore, research and monitoring are key components of this process. During the planning process several research and monitoring initiatives were identified by local stakeholders. Subject to operational funding, this plan will follow the various research and monitoring initiatives, which are described in further detail in the PSFMS.

Some of the broad scale research topics that will attempt to be targeted in this operating period are:

- Modification of harvest patterns
- Growth and yield data for strata
- Updated forest inventory and acquisition of new inventory areas
- Wind throw management regimes
- Visual assessment of forest harvesting (view sheds)
- Impacts of timber harvesting (ecological, social and economic)

Site specific information is also a key element in adaptive management. They provide benchmark data to base and evaluate forest management decisions. Numerous surveys are planned for this operating year, subject to funding and availability of staff, to provide this base line data.

10.1.1 OPERATIONAL

Both short and long term monitoring are integral to the adaptive management process. District staff will monitor harvesting operations to ensure compliance with terms set out under the Forestry Act and with guidelines set out under this Five Year Operating Plan. Long term monitoring will also continue on existing cutovers and silviculturally treated areas. Inspections will include documentation, reports, results and corrective actions if required.

10.1.2 PLANNING

10.2 Amendments

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

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

Changes that are not covered by the above must be submitted for Environmental Assessment (EA) in the form of an amendment to the five year operating plan. Once approved through EA the amendment still has to be approved by the Ecosystem Management Division of the Forest Service. Amendments requiring submission through EA will be reviewed by the planning team. Other amendments may also be reviewed by the monitoring committee if the District Manager deems that they represent a significant change to the plan.

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APPENDIX I - Legal Description - Forest Management District 21

Port Hope Simpson

All that piece or parcel of land situate and being in Eastern Labrador in the Electoral Districts of Cartwright – L'anse au Clair and Lake Melville abutted and bounded as follows:

At a point on the north shore of Hawke Bay, latitude $53^{\circ} 1' 20''$ longitude $55^{\circ} 53' 17''$, on the east coast of Labrador and sharing a common boundary with Management District 20;

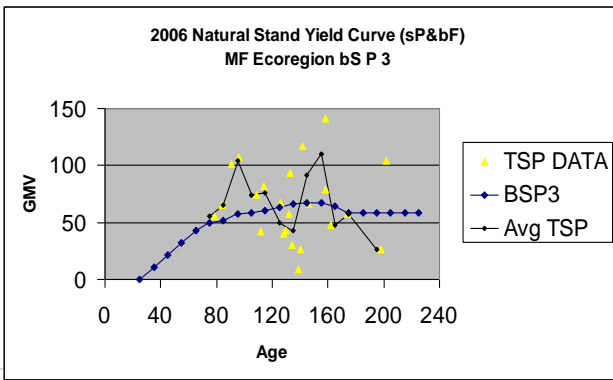
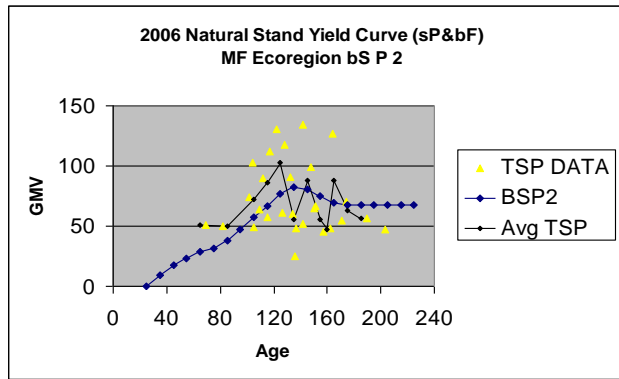
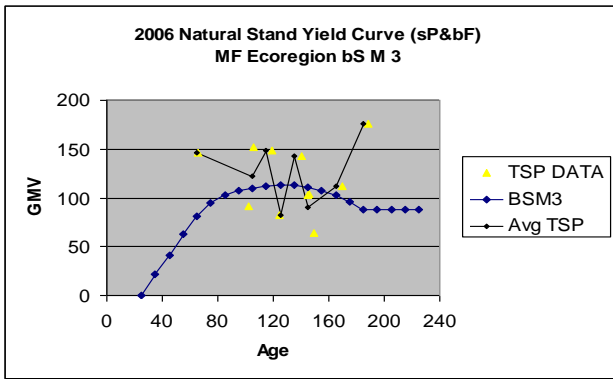
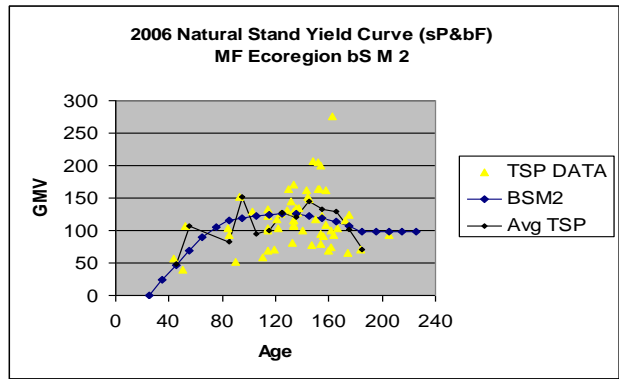
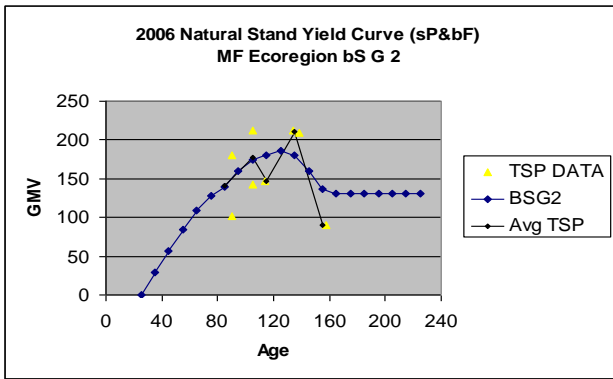
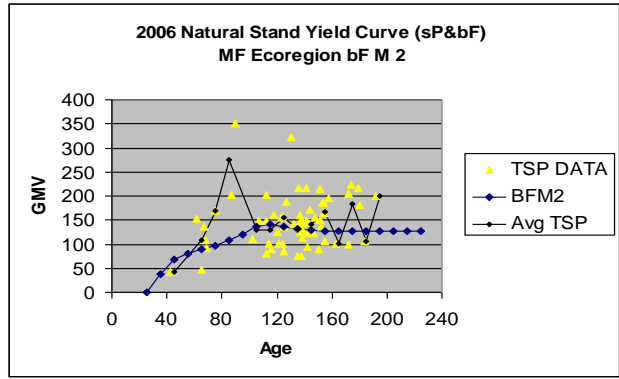
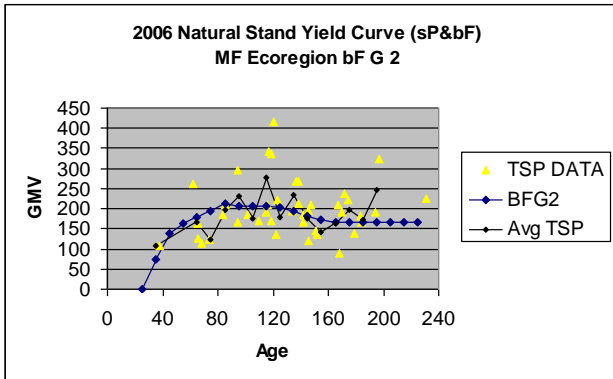
Then following the Management District 20 boundary in a generally westerly direction until it meets a point where Management District 20 boundary and Management District 19C boundary meet on the Paradise River;

Then following Management District 19C boundary south along Paradise River and south along St. Pauls River to where Management District 19C meets the Quebec – Newfoundland and Labrador border;

Then east and south along the Quebec – Newfoundland and Labrador boundary to where it meets the coast at the Strait of Belle Isle;

Then following the coast line in a northeast direction along the Strait of Belle Isle and north along the Labrador coast including all islands to the place of commencement at Hawke Bay.

APPENDIX II - District 21 Stand Yield Curves



APPENDIX III – 2013 Environmental Protection Guidelines



DEPARTMENT OF NATURAL RESOURCES

FORESTRY SERVICES BRANCH

2013 ENVIRONMENTAL PROTECTION GUIDELINES

FOR FORESTRY OPERATIONS IN NEWFOUNDLAND AND LABRADOR

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FORWORD

The 2013 Environmental Protection Guidelines for Forestry Operations in Newfoundland and Labrador is an updated version of the guidelines prepared in 1998 and has been developed through a consultative process with provincial Forest Managers and Planners, as well as other resource managers and stakeholders in the province. The Guidelines are intended to be stand level, on-the-ground guidelines to be used by Forest Managers and operators to ensure sustainable use of the forest resource without degrading the environment. More specifically, the Guidelines are designed to prevent and control degradation of soil, water, and vegetation and thus maintain healthy forest ecosystems.

The Guidelines set out sound and practical measures and are rooted in the best available scientific information. To ensure the incorporation of new research findings and technologies, the Guidelines will be reviewed periodically and adjusted to reflect any new ideas.

To facilitate use, the Guidelines are structured by forestry activity and include separate sections on harvesting, road construction, silviculture, forest protection, and operations within protected water supply areas. Each of these sections is sub-divided into a Planning section and a Conduct of Operations section and each list all the guidelines relevant to carrying out this activity.

These Guidelines will accompany Corner Brook Pulp and Paper's annual Certificate of Managed Land and will also be associated with the issuance of commercial cutting permits. Compliance with these guidelines will be monitored by Departmental staff.

These Environmental Protection Guidelines will complement the Newfoundland and Labrador Forest Service Planning Guidelines. Broader, landscape level issues will be addressed in the Department's new 20 Year Sustainable Forest Management Strategy. The recent revisions to the environmental protection guidelines, planning guidelines and provincial strategy will ensure that forestry activities in the province are carried out in an ecologically sound and sustainable manner.

The Department of Natural Resources (DNR) will continue to use science as a basis for refining and implementing sustainable forest policies and practices in the province. In particular, the development of these Environmental Protection Guidelines will continue to be an evolving process within which DNR will incorporate the best available information about forest ecosystems and sustainable forest management concepts in a timely fashion - through adaptive management and other innovative, scientific approaches.

1.0 HARVESTING GUIDELINES

1.1 Planning of Operations

1.1.1 Permits Required

1. When temporary water crossings are required to facilitate travel of harvesting equipment, the location and type of all water crossings must be submitted to the Department of Environment and Conservation (DEC). A permit is required from Water Resources Management Division of DEC, for any water identified on the latest 1:50,000 topographic maps. Appropriate protection (permit and Letter of Advice) 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 maps. The intent of these measures is to safeguard water quality and fish habitat.
2. All waste disposal sites require a valid permit under the *Environmental Protection Act*. Application for approval can be made by contacting the nearest Government Services Centre.
3. Timber harvesting is considered a development under the *Urban and Rural Planning Act* and, when this activity is proposed within a municipal planning area boundary or within 400 meters of a protected road, a development permit is required from Service NL, before any activity takes place.

1.1.2 Consultation Required

1. The Parks and Natural Areas Division (PNAD) of Department of Environment and Conservation will be consulted during the preparation of each District five-year operating plan. Where harvesting is proposed within one kilometer of an ecological reserve, wilderness reserve, provincial park or proposed reserve, PNAD will be expected to identify/discuss any concerns during the planning consultation process. Also, access roads will not be located within 500 m of the boundary of an ecological reserve, wilderness reserve, provincial park or proposed reserve, without first consulting PNAD.
2. The Sustainable Development & Strategic Science (SDSS) of Department of Environment and Conservation will be consulted on timber harvesting within woodland caribou habitat during the preparation of each District five-year operating plan
3. Rare and/or listed flora will be protected through mitigative measures, in consultation with the Wildlife Division (WD) of Department of Environment and Conservation.
4. Where specific forest cover is a requirement for the management of moose or other wildlife species, such areas will be identified by the Wildlife Division.
5. The impacts of forest operations on Newfoundland marten (hereafter referred to as marten) have been an ongoing issue. Until provincial guidelines are developed for marten habitat,

forestry activities within known marten recovery areas will require consultation with the Wildlife Division, during the preparation of five-year operating plans.

6. During the preparation of five-year operating plans, areas identified as “Sensitive Wildlife Areas” require consultation with the Wildlife Division.

7. The Historic Resources Division will be contacted during the preparation of the five-year operating plans to determine the location of historic resources and appropriate mitigation measures.

1.1.3 Planning

Planning forest operations for both Industry and Crown may include, but is not limited to:

- (i) boundaries of protected public water supplies (if applicable)
- (ii) existing and proposed access roads
- (iii) general location of extraction trails and landing locations
- (iv) areas sensitive to erosion
- (v) buffer zones around water bodies
- (vi) location of approved stream crossings
- (vii) location of fuel storage
- (viii) sensitive wildlife areas as shown in the five-year operating plan.
- (ix) sensitive fish habitat (e.g., salmonid spawning and rearing areas) identified in consultation with DFO.

1.1.4 Nutrient Poor Sites

If deemed necessary to harvest nutrient poor sites (e.g., those typed as Poor or Scrub on the Provincial Forest Inventory forest type maps), all efforts will be made to ensure such sites are regenerated in a timely manner.

1.2 Conduct of Operations

1.2.1 Minimizing Erosion and Disturbance

1. When extraction trails and winter roads are to be constructed, soil disturbance and impacts on water bodies are to be minimized. The operator will use culverts and/or temporary bridges, depending on site conditions, in order to minimize erosion and sedimentation, avoid restricting stream-flow, and 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 an extraction trail is in use. The trail is to be left in an environmentally acceptable condition thereafter. All temporary crossings are to be removed at the end of the operating season. As well, when an extraction trail is located on steep ground and is no longer in use, cut-off ditches and push-lanes must be created. The frequency of these is to be determined by the District Manager.

2. No more than 6 % of the forested floor within the harvested land base of an operating area can be disturbed by equipment (i.e., mineral soil exposure). In situations where specific operating areas require more than 6 % disturbance to capture available timber, the operator is required to obtain approval and then rehabilitate (i.e., leave the area in a condition suitable for successful forest regeneration and growth) the area to reduce the total net disturbance to the 6 % maximum. Disturbance is defined as per the Ground Disturbance Survey Guidelines developed by the NL Forest Service.
3. Heavy equipment and machinery are not permitted in any waterbody, on a wetland or a bog (unless frozen) without a permit from Water Resources Management Division the Department of Environment and Conservation and without contacting the DFO Area Habitat Biologist.
4. In areas prone to erosion and silting:
 - (i) use high floatation tires or similar devices which reduce ground pressure
 - (ii) conduct winter logging (i.e., harvest during winter) , or
 - (iii) place slash on extraction trails if conventional equipment is operating in an area.
5. Any forestry operation that directly or indirectly results in sediment entering a waterbody must be dealt with immediately by notifying DFO's Area Habitat Biologist and /or the District Manager within 24 hours.
6. Woody material of any kind (trees, slash, sawdust, slabs, etc.) is not permitted to enter a waterbody. Depositing woody material on ice within the high water floodplain of any waterbody is also prohibited.
7. To minimize potential for erosion and sedimentation, temporary waterbody crossings shall:
 - (i) have stable approaches
 - (ii) be at right angles, wherever possible, 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 wherever possible
8. Extraction trails and landings shall not be established within 20 metres of a waterbody.

1.2.2 Archaeological Find

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 Provincial Archaeology Office (709-729-2462). The Provincial Archaeology Office will respond immediately

and will have assessment requirements and/or mitigation measures in place within seven days as agreed to by the Provincial Archaeology Office and the operator. Forestry activity can then continue.

1.2.3 Timing of Operations

1. Harvesting is not permitted within woodland caribou calving and post-calving areas from May 15 - July 31. Calving areas will be identified by WD during the 5 year planning process.
2. Harvest scheduling may be modified during the migration of wildlife (e.g., caribou, waterfowl) and during temporary wildlife concentrations. Areas of concern and mitigation measures will be identify as part of the 5 year planning process.

1.2.4 Leaving Buffers and Wildlife Trees

1. A 20-metre, no harvesting activity buffer zone shall be established around all water bodies that are identified on the latest 1:50,000 topographic maps and along streams 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 for the protection of aquatic habitat. Every reasonable effort will be made to identify intermittent streams and they will be subject to this buffer requirement.

The District Manager must adjust the specified buffer requirements in the following circumstances:

- (i) the no harvesting activity buffer can exceed the 20 meters for sensitive fish habitat (e.g., salmonid spawning habitat).
- (ii) a 50-metre, no harvesting activity 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.
- (iii) no forestry activity is to occur within 800 metres of an active bald eagle nest or osprey nest during the nesting season (March 15 to July 31) and 200 metres during the remainder of the year. For other raptor species, like hawks, falcons, and owls) no forestry activity is to occur within 160 metres of a known nest at any time of the year. The location of any raptor nest site must be reported to the Wildlife Division.
- (iv) all hardwoods within 30 metres of an active beaver lodge are to be left standing.
- (v) a minimum 50-metre, no-cut, buffer will be maintained from the high water mark in Sensitive Wildlife Areas for waterfowl including breeding, moulting and staging areas. These sites will be identified by the Canadian Wildlife Service (CWS) and/or the Wildlife Division.

2. A minimum average of 10 snags (i.e., standing dead trees) or other suitable living trees per hectare shall be left individually or as small clumps on sites identified as habitat for wildlife (i.e., nesting and perching sites for birds, den sites for particular wildlife species, etc..). Preference

should be given to the largest trees (i.e., standing dead trees or live hardwoods). Research has shown that larger diameter snags are more valuable (last longer and contribute more to the biomass pool) than smaller diameter snags. Consequently, the trees retained should be ones which are from the dominant or co-dominate portion of the stand and be left in a fairly evenly distributed manner.

1.2.5 Petroleum Products

1. In the event of a spill and/or leak of petroleum products, the owner and/or the operator must make every effort to first, contain, and second, clean up the spill. Spills in excess of 70 liters, and all leaks must be reported by calling the following spill report line:

**Environmental Emergencies Spill Report Line
Canadian Coast Guard
1-(709) 772 – 2083 collect or 1-(800) 563-9089**

In this province, spills and leaks must be remediated in accordance with the *Guidance Document for the Management of Impacted Sites* prepared by Pollution Prevention Division of DEC. (see Appendix I)

2. No heavy equipment or machinery is to be refueled, serviced, or washed within 30 metres of a waterbody. Gasoline or lubricant depots must be placed at least 100 metres from the nearest waterbody. All fuel-storage tanks (including GEEP tanks) must be registered with Service NL and installed in accordance with the *Storage and Handling of Gasoline and Associated Products Regulations, 2003* as amended, under the *Environmental Protection Act*.

3. Used oil storage, handling and disposal is to comply with the *Used Oil Control Regulations, NLR, 82/02* under the *Environmental Protection Act*

4. 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 an 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. Construction and installation standards are clearly listed in section 27 of the *Storage and Handling of Gasoline and Associated Products Regulations, 2003* as amended, under the *Environmental Protection Act*.

5. Contaminated soil or snow must be disposed of at an approved treatment facility.

1.2.6 Clean Up of Site

Waste material is to be disposed of at an approved waste disposal site with the prior permission of the owner/operator. Prior to disposal it must be contained in a manner not to

attract wildlife. All equipment and waste materials are to be removed from the operating area when operations are completed.

2.0 FOREST ACCESS ROADS GUIDELINES

2.1 Planning of Roads

2.1.1 Permits Required

1. Any alteration within 15 metres of a natural waterbody (i.e. any water identified on the latest 1:50,000 topographic map) or development within a protected public water supply area, will require prior approval by the Water Resources Management Division of the DEC. (For alteration of a waterbody, a permit is required under Section 48 of the *Water Resources Act*, SNL 2002 cW-4.01. For any development in a protected public water supply area a permit is required under Section 39(6) of the *Water Resources Act*, SNL 2002 cW-4.01.) Alteration of a waterbody may include culvert installations, stream crossings (temporary or permanent), outfalls, infilling; or bridge, dam, and wharf construction. A Letter of Advice is also required from DFO for any alterations. Appropriate protection (permit and Letter of Advice) is still required for streams greater than 1.0 m in width not found on the 1:50,000 topographic map.
2. In addition to approvals from Water Resources Management Division and DFO, approvals are also required for culverts, bridges and abutments on navigable waters (any waterbody capable of being navigated by floating vessels of any description for the purpose of transportation, commerce or recreation. This includes both inland and coastal waters) from Transport Canada.
3. Resource road construction or any forestry activity is considered a development under the *Urban and Rural Planning Act*. Where this activity occurs within a planning area boundary or within 400 metres of a protected road, a development permit is required from Service NL before any activity takes place.

2.1.2 Areas to Avoid

Forest access roads, borrow pits, and quarries shall, wherever possible:

- (i) deltas, floodplains or fluvial wetlands
- (ii) terrain with high potential for erosion
- (iii) known sensitive wildlife areas such as:
 - caribou areas (calving, post calving, migrations routes, rutting areas, and winter areas)
 - waterfowl areas (nesting and staging areas)
 - raptor nest sites
 - species at risk habitat, rare flora or fauna habitat, and other unique habitats as determined by qualified authorities
- (iv) known sensitive fish habitat areas such as spawning and rearing grounds
- (v) historically significant areas such as archaeological sites

- (vi) existing reserves such as parks (municipal, provincial, national), wilderness areas, ecological reserves and wildlife reserves
- (vii) riparian buffer areas

2.1.3 Waterbody Crossings

Waterbody crossings shall:

- (i) have stable approaches
- (ii) be at right angles, wherever possible, 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 wherever possible

2.1.4 Burrow Pits and Quarries

With respect to borrow pits and quarries, the operator shall wherever possible, avoid:

- (i) minimize the number of new borrow areas opened for construction and/or maintenance
- (ii) use existing borrow pits whenever practical
- (iii) be in possession of a valid quarry permit from the Mineral Lands Division, DNR, for borrow pits outside resources roads right of way, prior to aggregate extraction activities as per the *Quarry Materials Act*.
- (iv) not locate borrow pits and quarries in sensitive areas as identified by planning processes

2.1.5 Wildlife Values

1. Wherever possible, forest access roads shall not obstruct wildlife movement. The following guidelines should be followed:

- (i) roads should be of low profile (less than 1 m above the surrounding terrain)
- (ii) slash and other debris shall be removed or buried
- (iii) the slope of ditches and road banks shall be minimized

2. Where road construction is to occur around identified waterfowl breeding, moulting and staging areas, mitigating measures will be identified during the 5 year planning process.

2.1.6 Road Access

1. Areas proposed for harvest using winter roads shall not be harvested without an approved reforestation plan.

2. A regeneration survey is required for all forest areas that will be affected by access due to road decommissioning and/or bridge/stream crossing removals. Prior to decommissioning, an approved (i.e. by Silviculture and Research Section of the Forest ecosystem Management

Division) reforestation plan is required for all areas that fail to meet the provincial silviculture stocking standards.

2.1.7 Decommissioning Roads

On a site specific basis, roads may be decommissioned. Levels of decommissioning include:

- (i) barring access
- (ii) removal of watercourse crossing(s)
- (iii) restoration of roadway including planting of trees.

Decommissioning is as decided through the planning team process or, under compelling circumstances, as decided by DNR (e.g., emergency closures).

2.2 Construction and Decommissioning of Roads

2.2.1 Road Construction

1. There shall be no bulldozing or burying of merchantable timber or poor utilization of merchantable softwoods and hardwoods during cutting of road right-of-ways. All merchantable timber shall be utilized and processed.
2. Where brush mat or corduroy is required, sub-merchantable or non-merchantable stems should be used first. In the event that these are not present or sufficient, permission must be obtained from a DNR official prior to merchantable stems being utilized. Stems are to be placed in a “butt to top” alternating fashion for the entire length of the area to be brush matted.
3. All manufacturers’ instructions for the proper installation of geotextiles or geogrids must be adhered to.
4. Earth shall be excavated as required to complete earth cuts, ditching, sub-excavation and shall include hauling, handling and disposal as directed. Only with the approval of the Engineer or Inspector may excavation occur outside the limits of the roadway for the purpose of obtaining suitable and/or sufficient material to complete embankments. All holes/pits are to be rehabilitated.
5. Fill materials for road building must not be obtained from any waterbody, from within the floodplain of any waterbody, or within the 30m no-grub zone.

2.2.2 Pits and Quarry Activity

1. 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 DNR official prior to construction where such conditions exist.

2. Overburden or grubbed material pushed off any gravel pit site must be retained in a manner that allows it to be pushed back into the pit after construction and spread in a neat and tidy fashion.
3. Existing pits are to be used, where possible, to minimize the opening of new pits.
4. Borrow pits are to be located at least 50 metres from the nearest waterbody.

2.2.3 Working near Waterbodies and In-stream Work

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 erosion potential. Gravel for these sections of road, including the bridge approach embankments, must be trucked.
2. Manual clearing at waterbody crossing sites should be used to remove or control vegetation.
3. Trees are to be felled away from all waterbodies. Slash and debris should be piled above the high water mark so that it cannot enter waterbodies during periods of peak flow.
4. Right-of-way widths at waterbody crossings should be kept to a minimum, preferably to the width of the driving surface plus water control features.
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 (an area where active erosion is likely). The placement of large riprap, armour stone or slope stabilization material is recommended in such areas.
6. Take-off ditching should be used on both sides of the road or in conjunction with culverts to divert the ditch flow off into the woods or stable vegetation areas before reaching the waterbody. The ditch itself shall not lead directly into the waterbody.
7. Grades in excess of 10% shall have culverts with baffle/ditch blocks on one end and cut-off ditches every 150 meters along the road. A baffle/ditch block can be constructed from gabion baskets, wooden structures, rock walls, or other approved materials. Unless otherwise specified, the height of the baffle shall be a minimum of one-half the diameter of the culvert requiring the baffle.
8. When working near waterbodies, road building operations causing erosion or siltation are to be suspended during periods of intense rainfall or when soils are saturated.

9. Any forestry operation that directly or indirectly results in sediment and/or turbid water entering a waterbody must be dealt with immediately. See Guideline 1.2.2.5 for further information.
10. Fording of equipment for stream crossing installation is to be kept to a minimum. Equipment activity in water crossing areas is to be kept to a minimum. All work is to be carried out from dry stable areas. Permission for exceptions must be obtained from DFO.
11. Heavy equipment and machinery are not permitted in any waterbody, on a wetland or a bog (unless frozen) without a permit from the DEC and without contacting the DFO Area Habitat Biologist.
12. Exposed mineral soil shall be stabilized during bridge construction and culvert installation.
13. All in-stream work is to be done in the dry and shall consider provision of fish passage.
14. Cofferdams are to be used to separate work areas from the stream when installing bridges or similar structures requiring abutments, or footings.
15. Water pumped from work areas and cofferdams is to be directed into a settling pond or stable vegetation areas.
16. Not more than one-third of the stream width is to be blocked at any one time.
17. The stream banks are to be rehabilitated upon completion and removal of a cofferdam.
18. All culvert bottoms in fish-bearing streams; are to be placed below the natural streambed level according to the following criteria: for culverts less than 750mm outside diameter, one-third the diameter of the pipe should be below the streambed; for culverts greater than 750mm outside diameter, a minimum of 300mm below the streambed. The only exception to this would be when bedrock is encountered where it is impossible to embed the culvert and when approval is obtained in advance.
19. In fish-bearing streams;
 - (i) culverts having a diameter equal to or exceeding 2000mm should be countersunk a minimum of 15% of the diameter below the streambed elevation,
 - (ii) a minimum water depth of 200mm should be provided throughout the culvert length. To maintain this water depth at low flow periods an entrance/downstream pool should be constructed,
 - (iii) downstream outlet pools are of particular importance for long culverts or culverts to be installed on steep slopes.

20. In-stream work should be scheduled to avoid potential adverse impacts on spawning activities, egg incubation, spawning habitat and fish migration in consultation with the DFO Area Habitat Biologist.

2.2.4 Archaeological Find

When an archaeological site or artifact is found, the condition in Guideline 1.2.3 will apply.

2.2.5 Petroleum Products

In the event of a spill and/or leak of petroleum products, see Guideline 1.2.6.1 for further details.

Guidelines 1.2.6.2 to 1.2.6.5 relating to petroleum products also apply in road construction and decommissioning operations.

2.2.6 Winter Roads

As with all season roads, soil disturbance and impacts on waterbodies are to be minimized with winter roads. Culverts or temporary bridges are to be used. Erosion control measures are to be maintained while the winter road is in use and, thereafter, left in an environmentally acceptable condition. All temporary crossings are to be removed at the end of the operating season and an inspection done by a DNR official, engineer or other qualified person to ensure any remediation that may be required is applied.

2.2.7 Decommissioning Roads

1. When roads are decommissioned or barred by gating or ditching or placement of obstacles, appropriate signage warning of any hazardous condition shall be placed in open view.
2. When decommissioning is through removal of watercourse crossings, areas adjacent to former culverts or bridge locations shall be stabilized to reduce potential for erosion. Appropriate signage shall also be placed.
3. When decommissioning roads by replacing soil, overburden and other natural obstacles on former roadway (so as to deny vehicular access and to enable planting in order to restore productive forest on the site), standard precautions such as silt fencing shall be used to prevent entry of silt in waterways.
4. Decommissioning shall not normally be undertaken until all necessary reforestation activities beyond the decommissioning point have taken place.

3.0 SILVICULTURAL GUIDELINES

3.1 Planning of Silviculture

3.1.1 Permits Required

Silviculture is considered a development under the *Urban and Rural Planning Act*. Where this activity occurs within a planning area boundary or within 400 metres of a protected road, a development permit is required before any activity takes place.

3.2 Conduct of Silviculture Operations

3.2.1 Preventing Erosion

To prevent erosion on sites proposed for row scarification, every effort should be made to follow the contours where slopes exceed 15%. If in such instances scarification has to occur parallel to the slope, the scarified trenches are to be intermittent (i.e., for every 20 m of trench, an un-scarified section 2 m in length should be left).

3.2.2 Protection of Waterbodies

1. Heavy equipment and machinery are not permitted in any waterbody, on a wetland or a bog (unless frozen) without a permit from the DEC and without contacting the DFO Area Habitat Biologist.
2. Any forestry operation that directly or indirectly results in sediment and/or turbid water entering a waterbody must be dealt with immediately. See Guideline 1.2.2.5 for further information.
3. Trees thinned during pre-commercial thinning, diameter limit thinning, commercial thinning or any other silvicultural treatment shall not be felled into waterbodies.

3.2.3 Placement of Windrows

Where slash is piled into windrows, windrows should be located where slash cannot be washed into streams at peak flooding conditions.

3.2.4 Trees Left for Wildlife and Other Values

1. There is to be no cutting of white pine.
2. Hardwood species, such as birch, are to be left when encountered in a stand scheduled for thinning where these do not compete with the conifer crop trees. Portions of thinning areas which are pure hardwood may be left unthinned when encountered. In mixed regeneration, various hardwood or softwood species may be favoured in future stand development in accordance with management objectives stated in the approved operating plan for the area.

3.2.5 Timing of Silviculture

Where possible, silviculture operations are to be reduced/avoided in areas identified by Wildlife Division during the periods of birth and/or hatching.

3.2.6 Archaeological Find

When an archaeological site or artifact is found, the condition in Guideline 1.2.3 will apply.

3.2.7 Fuels and Petroleum Products

1. In the event of a spill and/or leak of petroleum products, see Guideline 1.2.6.1 for further details.
2. Guidelines 1.2.6.2 to 1.2.6.5 relating to petroleum products also apply in silviculture operations.

3.2.8 Scarification Method

Where mechanical site preparation is required, methods selected shall be best suited for preparing the area for planting and for minimizing ground disturbance.

3.2.9 Choice of Species to Plant

In most planting situations, use of native species is preferred; however, judicious planting of non-invasive exotic tree species (such as those species which have been established in the province for decades, or other species which may come under review) may be planted in certain situations.

4.0 FOREST PROTECTION GUIDELINES

4.1 Planning for the Application of Pesticides (Insecticides and Herbicides)

4.1.1 Regulation of Pesticides

The use of pesticides is regulated by Health Canada and provincially by the DEC. The federal *Pest Control Products Act* states which products are registered for use in Canada. Hence, any products used must be contained in this list; and the provincial [*Environmental Protection Act*](#), [*Pesticide Control Regulations*](#) state that you must obtain a license to purchase, sell or handle Commercial or Restricted class pesticides in NL.

4.1.2 Licenses Required

1. To apply pesticides (e.g., insecticides) in the province, two licenses are required from Pollution Control Division, DEC. The first is a Pesticides Operators License which is issued for a specific program and valid for five years. To obtain this the applicant must submit project details including a map of the area to be treated, product to be used, and time of the year to be used. Following the completion of the project, a report must be submitted to DEC. The second license required is a Pesticide Applicators License. To obtain this license, the applicator must complete an exam. Only people in possession of this license may use the pesticide. It is valid for a period of five years.

2. To apply herbicides, the same conditions apply as above. An Operators License must be obtained for the project and is valid for five years. In addition, each member of the crew involved with application of the herbicide must complete an exam and obtain a Pesticide Applicators License.

3. A third program which requires an Operators License and a Pesticide Applicators License is the tree nursery program which may use pesticides to grow seedlings. Again the same conditions apply.

4.2 Conduct of Operations

4.2.1 Pesticides Use

Only bio-degradable pesticides will only be used and then only as part of an integrated pest management strategy.

5.0 GUIDELINES FOR FORESTRY OPERATIONS WITHIN PROTECTED PUBLIC WATER SUPPLY AREAS

The primary function of a Protected Public 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. By definition, a Protected Public Water Supply Area means the area of land and water designated as a Protected Public Water Supply Area, for a municipal authority operating a waterworks or using or intending to use a water sources, under Section 39 of the *Water Resources Act*. Any other activity within a Protected Public Water Supply Area 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 and Labrador, forestry operations are permitted in most Protected Public Water Supply Area on a limited and controlled basis provided the proposed operations have no, or minimal, water quality impairment potential. More specifically, commercial forest harvesting of any more than 10% of the total land area of the Protected Public Water Supply

Area, or 10% of the total merchantable timber, whichever is less, in any 12 month permit will not be permitted.

The following permits and approvals are required prior to the beginning of any forestry operations (whether commercial or domestic operations and including road construction, silviculture activities, and harvesting) within a Protected Public Water Supply Area:

- (i) Approval of the Five-year operating plan by the Environmental Assessment Division of DEC,
- (ii) Issuance of a permit under section 39(6) of the *Water Resources Act* which will include consultation with the community involved. Applications for development inside Protected Public Water Supply Area can be obtained from the Water Resources Management Division website (see Appendix I for link).

5.1 Conduct of Operations

The permits issued to contract harvesters should include the conditions indicated on the section 39 permit. In addition to environmental guidelines specified in sections above, the following will apply in Protected Public Water Supply Areas;

5.1.1 Map of the Operating Area

The Forest Service or appropriate Company official will provide the operator with a map indicating the harvesting area and the location of no-cut treed buffer zones, and will ensure that the operator is familiar with the boundaries and conditions of the approved detailed plan of operations.

5.1.2 Prevention of Erosion

In areas sensitive to erosion, depending on the nature and location of the proposed forestry operation, the Water Resources Management Division may not permit the activity to take place. However, where permitted the following mitigating measures should be put in place:

1. In sensitive areas prone to erosion, equipment used must have high flotation tires (e.g., tires generally greater than 85 cm wide) and/or be equipped with TerraTracks, bogie axles or similar devices. Alternatively, the operator is to use cable logging, or harvesting must be rescheduled for the winter when the ground is frozen.
2. Areas which have high potential for erosion and are greater than 30% slope should not be harvested. In such areas where forest cover may have been disturbed by blow down or fire, treatments including salvage (using cable logging, high flotation tires or other approved methods) and site restoration techniques may be considered as part of the detailed plan.

3. Wherever possible, extraction trails should run along contours and avoid wetlands.
4. Use of landings will be minimized. Any approved landing area shall be less than 0.25 ha and located at least 150 metres from PPWSA intake ponds.

5.1.3 Buffer Zones

No ground disturbance riparian buffer zone requirements in Protected Public Water Supply Areas are as follows:

Water Body	Width of Buffer Zone
Intake Pond or Lake or Reservoir	A minimum 150m
River intake (for a distance of 1000m upstream and 100m downstream)	A minimum 150m
Main river channel	A minimum of 75m
Major tributaries, lakes or ponds	A minimum of 50m
Other water bodies	A minimum of 30m

Any deviations will require approval from Water Resources Management Division.

5.1.4 Petroleum Products

Fuel storage and the operation of fuel storage equipment are regulated by the *Storage and Handling of Gasoline and Associated Products Regulations, 2003* as amended and the *Heating Oil Storage Tank System Regulations, 2003* as amended.

In addition to the above regulatory requirements and Sections 1.2.6.1 to 1.2.6.5 the following are to be adhered to;

- (i) If fuel must be stored in the PPWSA, it must be in the least sensitive area and be approved by Water Resources Management Division.
- (ii) Refueling must not take place within 150 metres of an intake pond.
- (iii) All tanks must be located at a minimum distance of 500 metres from any major waterbody.
- (iv) A fuel or oil spill clean-up kit must be kept on site 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, a container such as an empty drum for recovering the fuel or oil, and a containment boom.

5.1.5 Structures Prohibited in Water Supply Areas

1. Dormitory camps, garages or any other structures are prohibited within a Protected Public Water Supply Area.

2. The establishment of new sawmills is not permitted in Protected Public Water Supply Areas.

5.1.6 Reporting Water Quality Problems

Any water quality impairment problem should be reported immediately to the Water Resources Management Division.

APPENDIX I: RELEVANT LINKS

Applications:

Development Applications in Protected Public Water Supply Areas

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

Impacted Sites:

http://www.env.gov.nl.ca/env/env_protection/ics/guidancedocv.1.01external.pdf

Federal Legislation Links:

Canada Fisheries Act

<http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html>

Canada Navigable Waters Protection Act

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

Canada Species at Risk Act

http://www.sararegistry.gc.ca/approach/act/default_e.cfm#1

Provincial Legislation Links:

Newfoundland and Labrador Endangered Species Act

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

Newfoundland and Labrador Environmental Protection Act

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

Newfoundland and Labrador Forestry Act

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

Newfoundland and Labrador Historical Resources Act

http://www.assembly.nl.ca/legislation/sr/tableregulations/tableofregulations_h04.htm

Newfoundland and Labrador Quarry Material Act

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

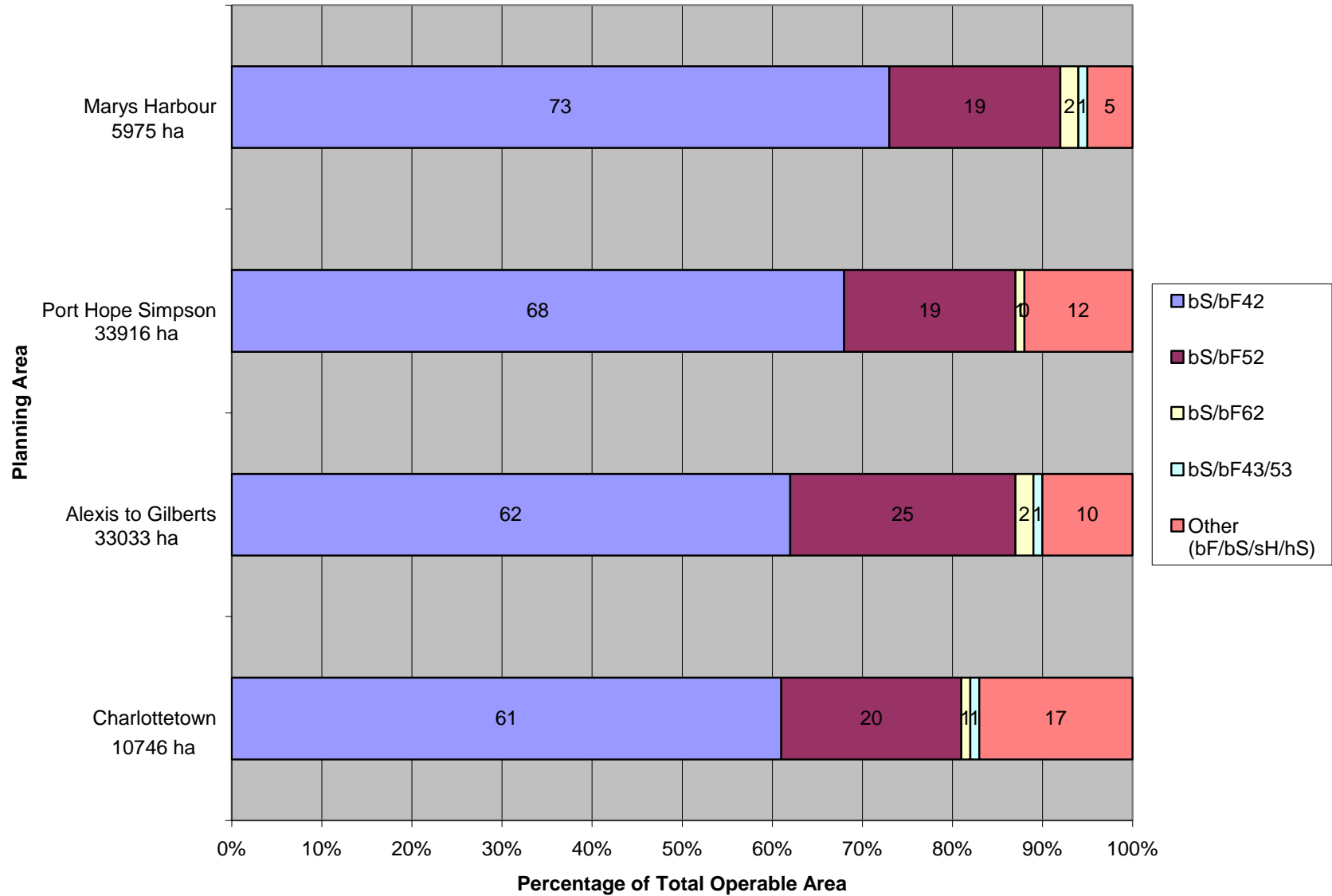
Newfoundland and Labrador Urban and Rural Planning Act

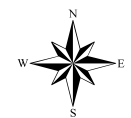
<http://assembly.nl.ca/Legislation/sr/statutes/u08.htm>

Newfoundland and Labrador Wildlife Act

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

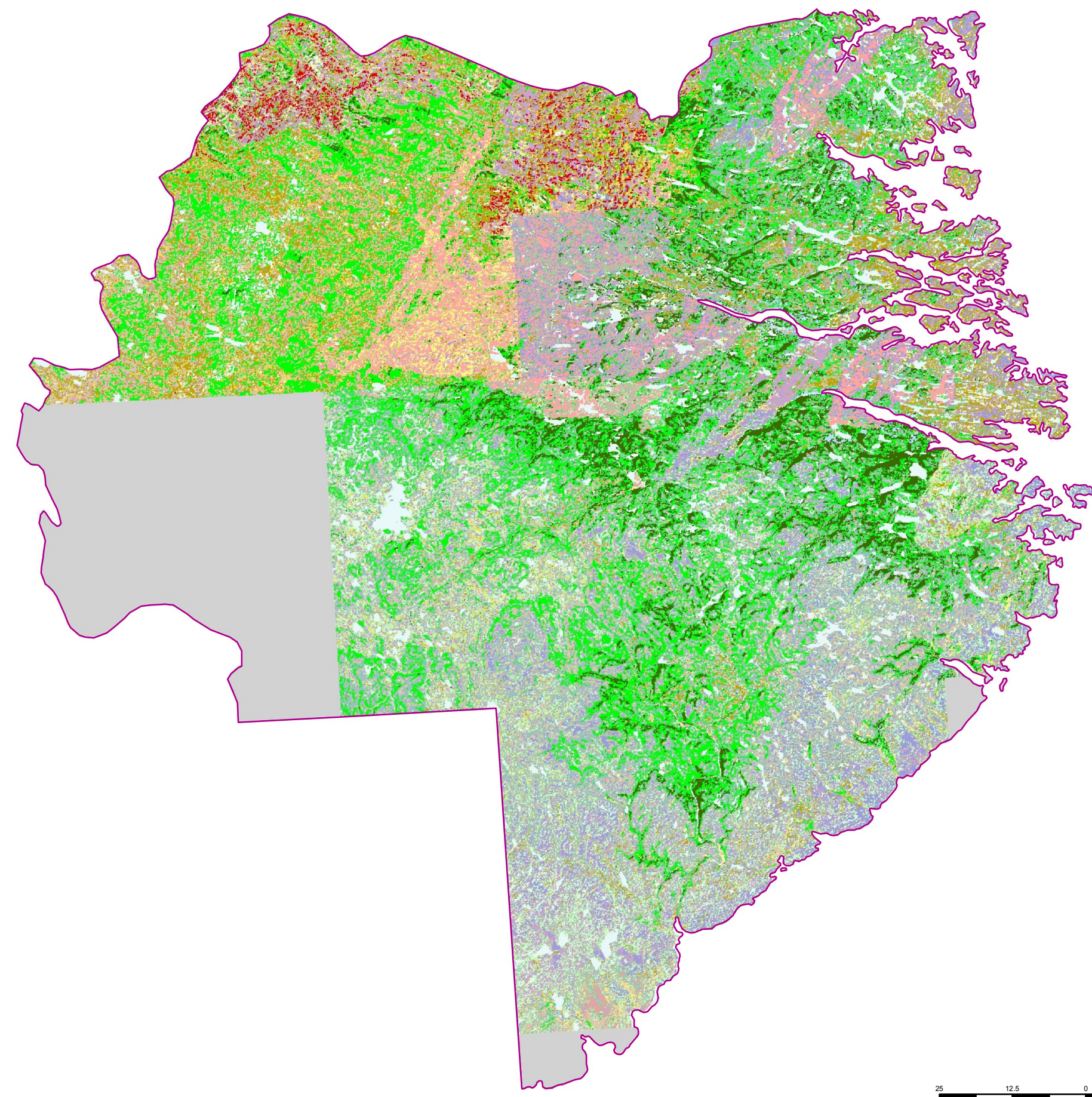
APPENDIX IV - Summary of Dominant Strata on the Landbase.





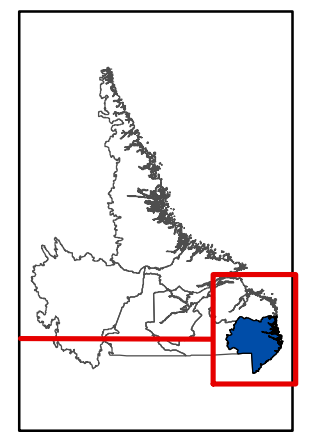
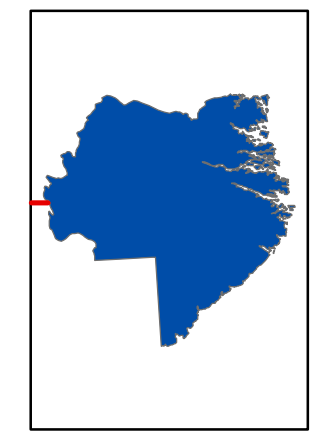
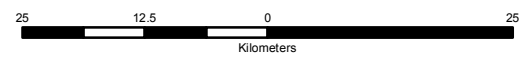
Map 1
Five Year Operating Plan: 2017-2021
Drieman Vegetation Classification

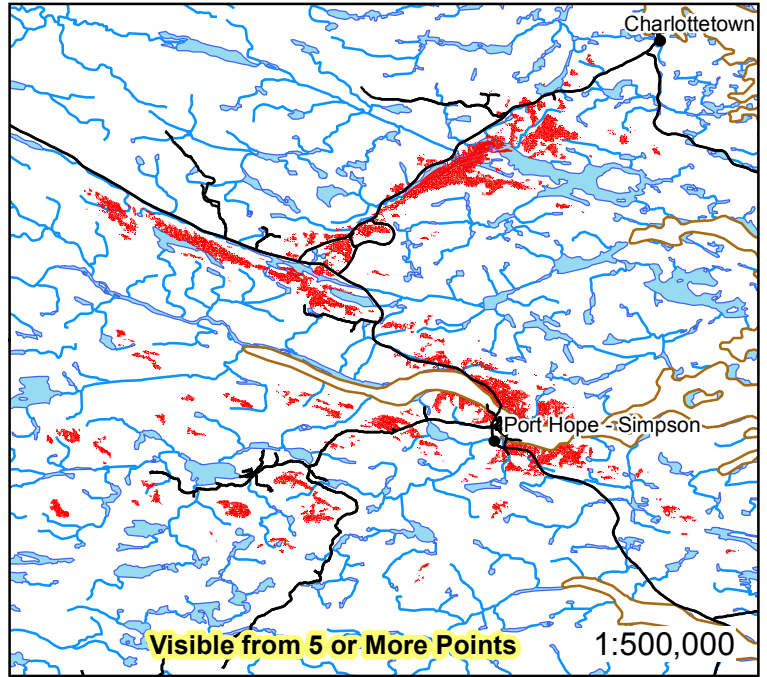
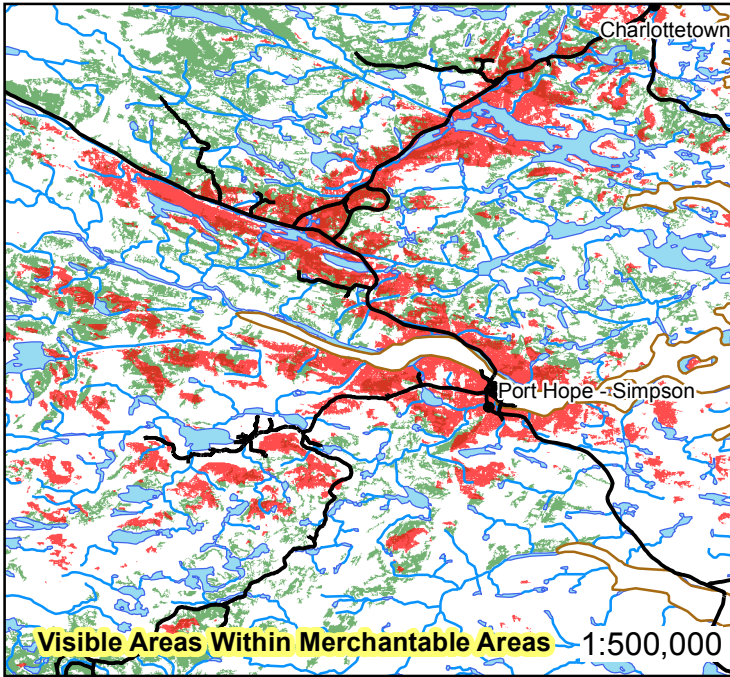
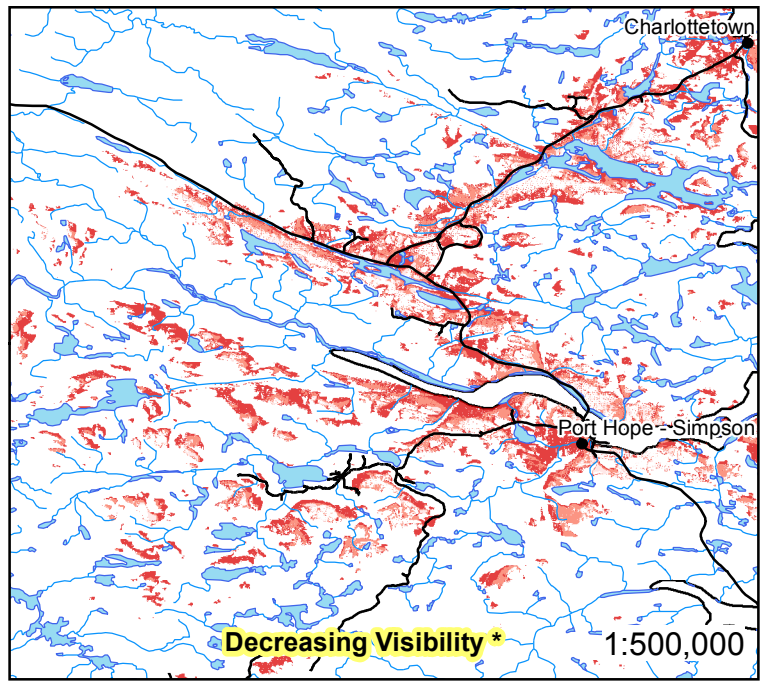
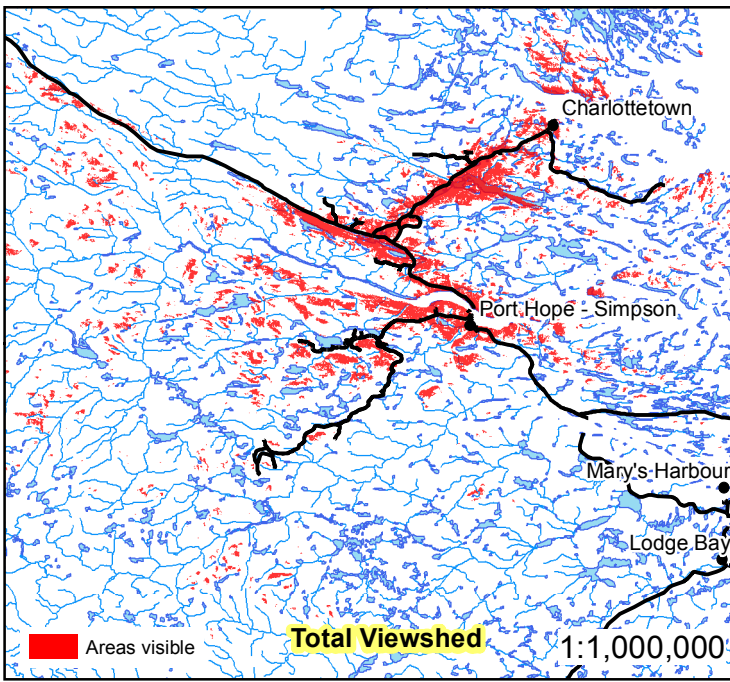
Planning Zone: Labrador
FMD: 21



LEGEND

- District Boundary
- Unclassified
- Heavily Stocked Spruce/Fir Commercial Forest
- Moderately Stocked Spruce/Fir Commercial Forest
- SCS with Sphagnum/Feathermoss
- SCS with Lichen mosses
- Immature Spruce/Fir
- Spruce /Fir Regeneration
- Mixedwood Mature
- Hardwood Mature
- Hardwood Successional
- Hardwood Scrub
- Lichen/Soil Barren
- Rock Barren
- Lichen/Recent Burn
- Recent Burn
- Lichen Scrub/Open Bog
- Open Bog
- String Bog
- Tree Bog
- Wet Sites
- Cleared Land
- Sand
- Waterbodies
- Waterbodies
- Cloud



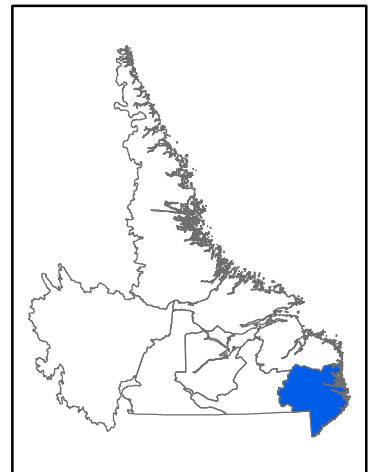


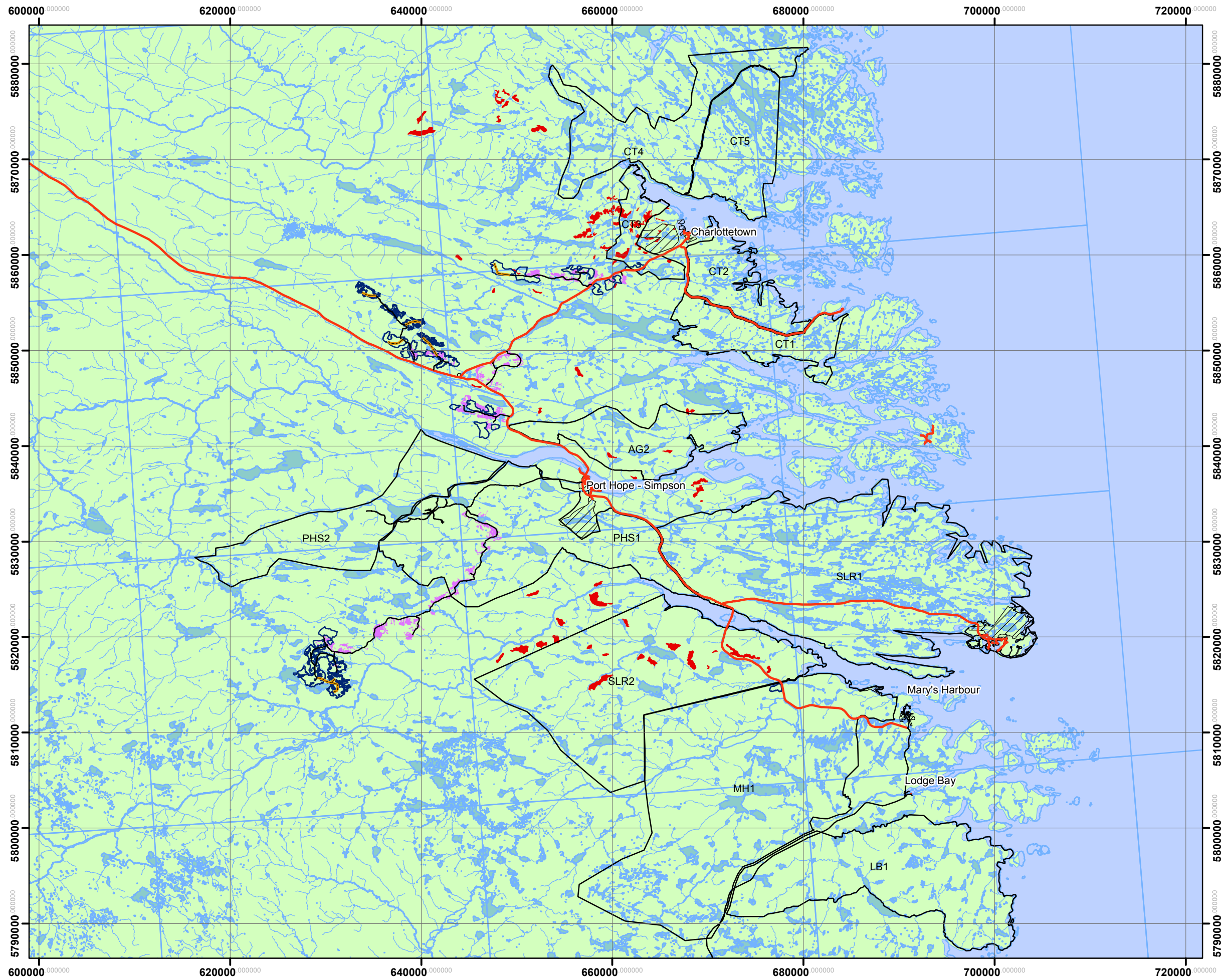
* Decreasing Visibility - The lightest areas are visible from 5 or more points viewpoints along the highway. The darkest areas are only visible from 1 viewpoint along the highway.



Map 2
Five Year Operating Plan: 2017-2021
Trans-Labrador Highway
Viewshed Analysis

Planning Zone: Labrador
FMD: 21



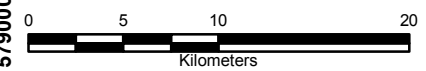
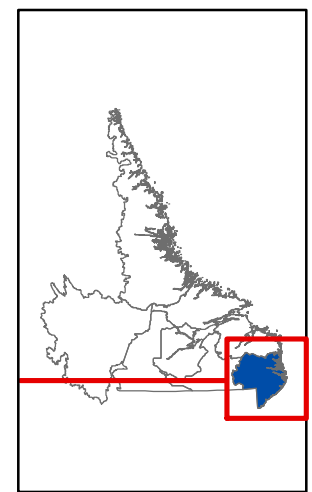
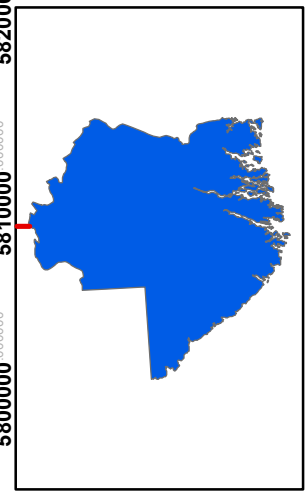


Map 3
Five Year Operating Plan: 2017-2021
Overview of Proposed Commercial Activities
North

Planning Zone: Labrador
 FMD: 21

Basemap Features

- Proposed Roads
- Access Roads
- Provincial Roads
- No Cutting
- Proposed Domestic Harvest Blocks
- Proposed Commercial Harvest Blocks
- Cutovers
- Insect Damage
- Brooks & Streams
- Lakes & Ponds

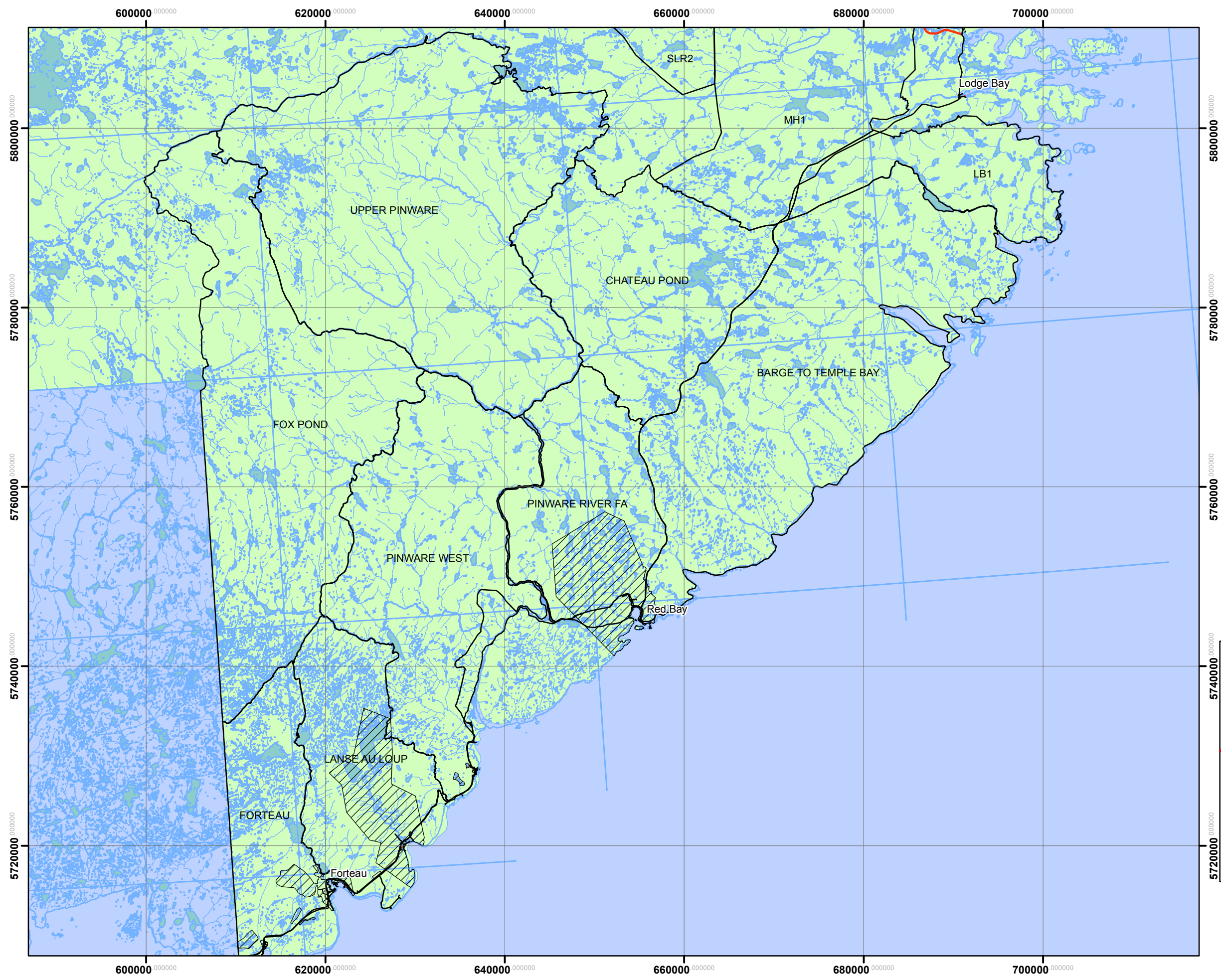
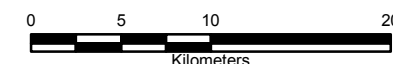
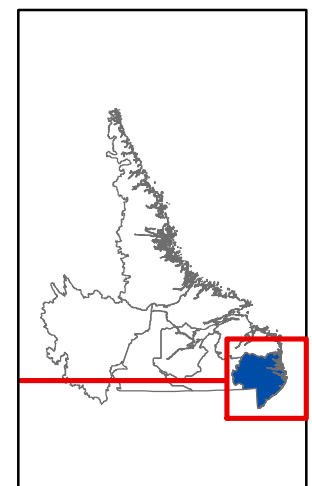
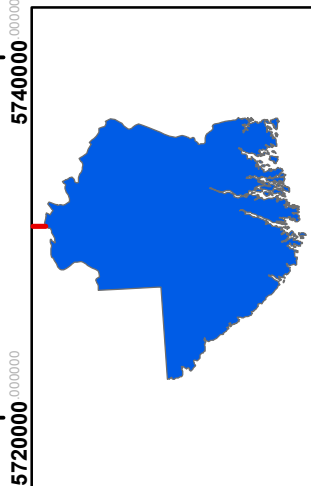


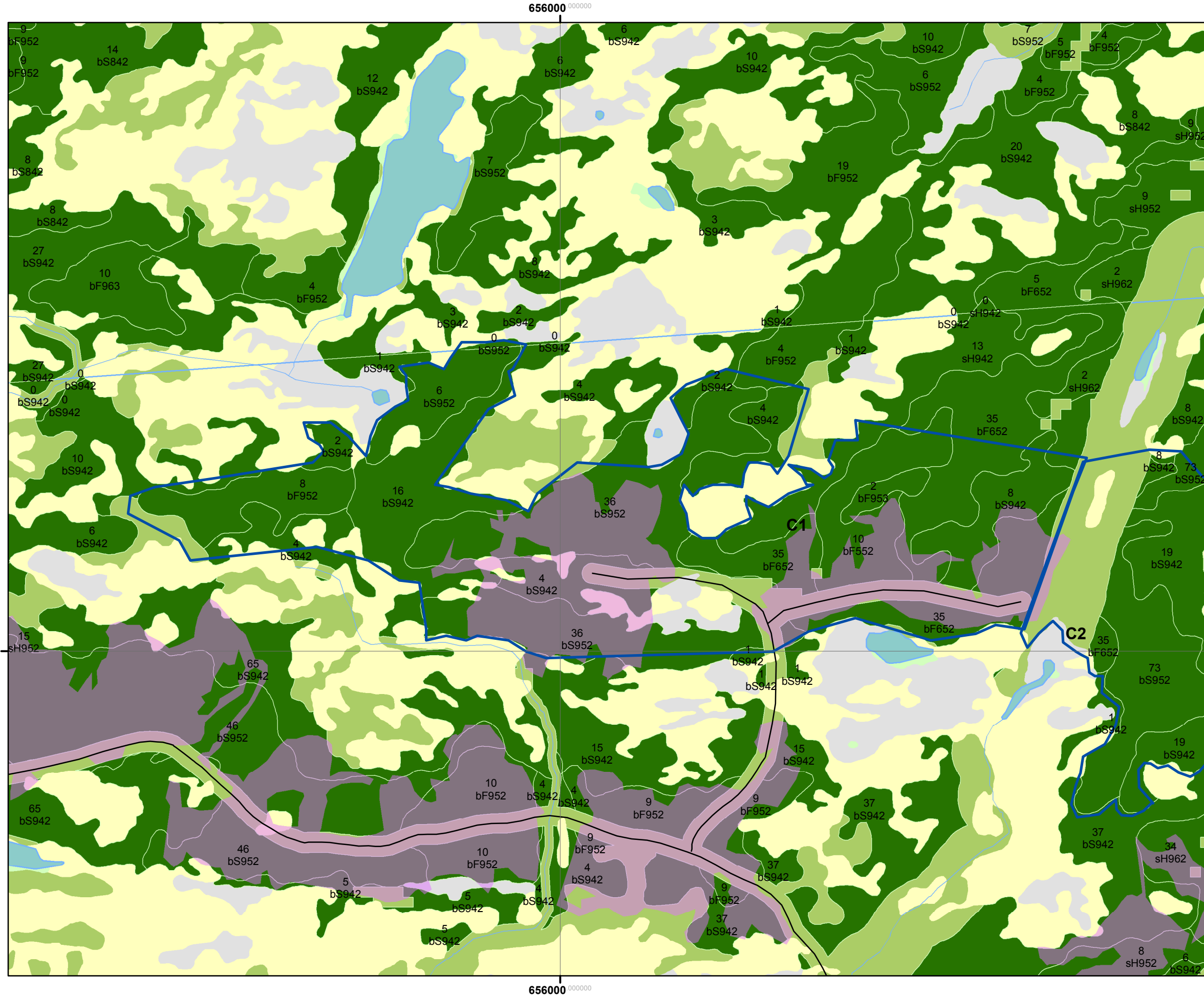
Map 4 Five Year Operating Plan: 2017-2021 Overview of Proposed Activities South

Planning Zone: Labrador
FMD: 21

Basemap Features

-  Access Roads
-  Provincial Roads
-  Brooks & Streams
-  Proposed Roads
-  Proposed Domestic Harvest Areas
-  No Cutting
-  Cutovers
-  Insect Damage
-  Lakes & Ponds





Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21001
Operating Area Name: C1

For block information and statistics
refer to Cover Page

Plan Features

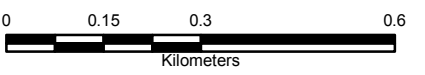
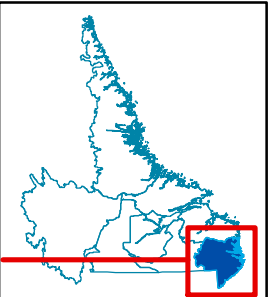
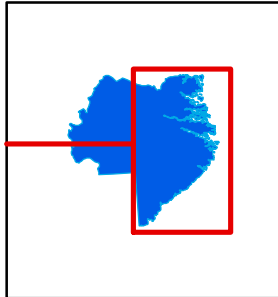
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting







Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21002
Operating Area Name: C2

For block information and statistics
refer to Cover Page



Plan Features

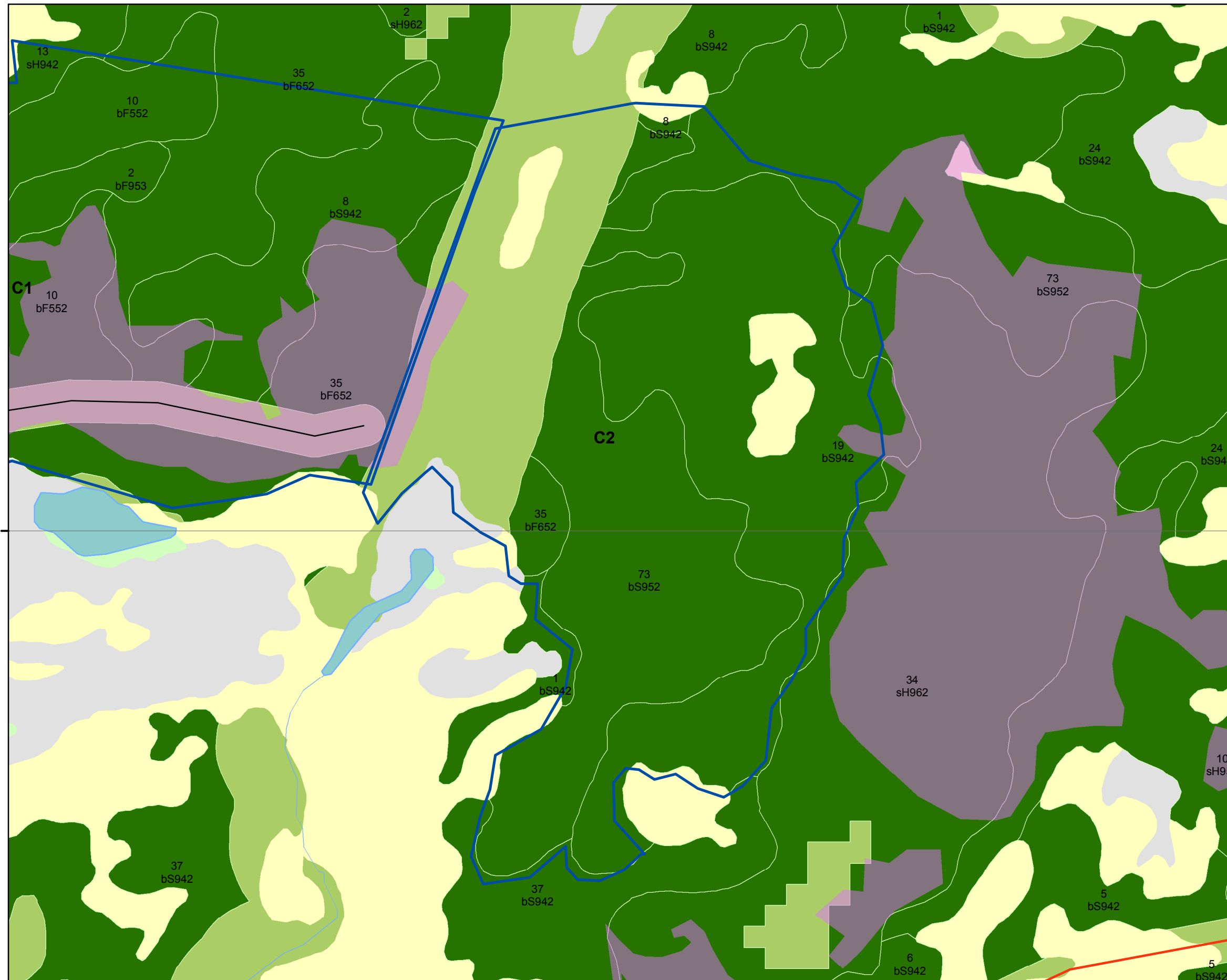
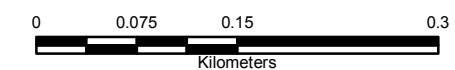
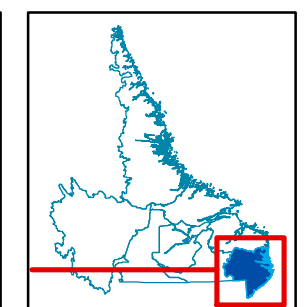
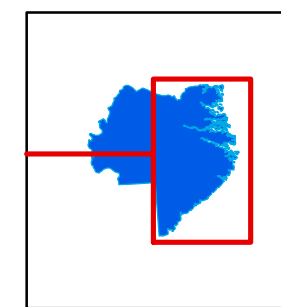
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

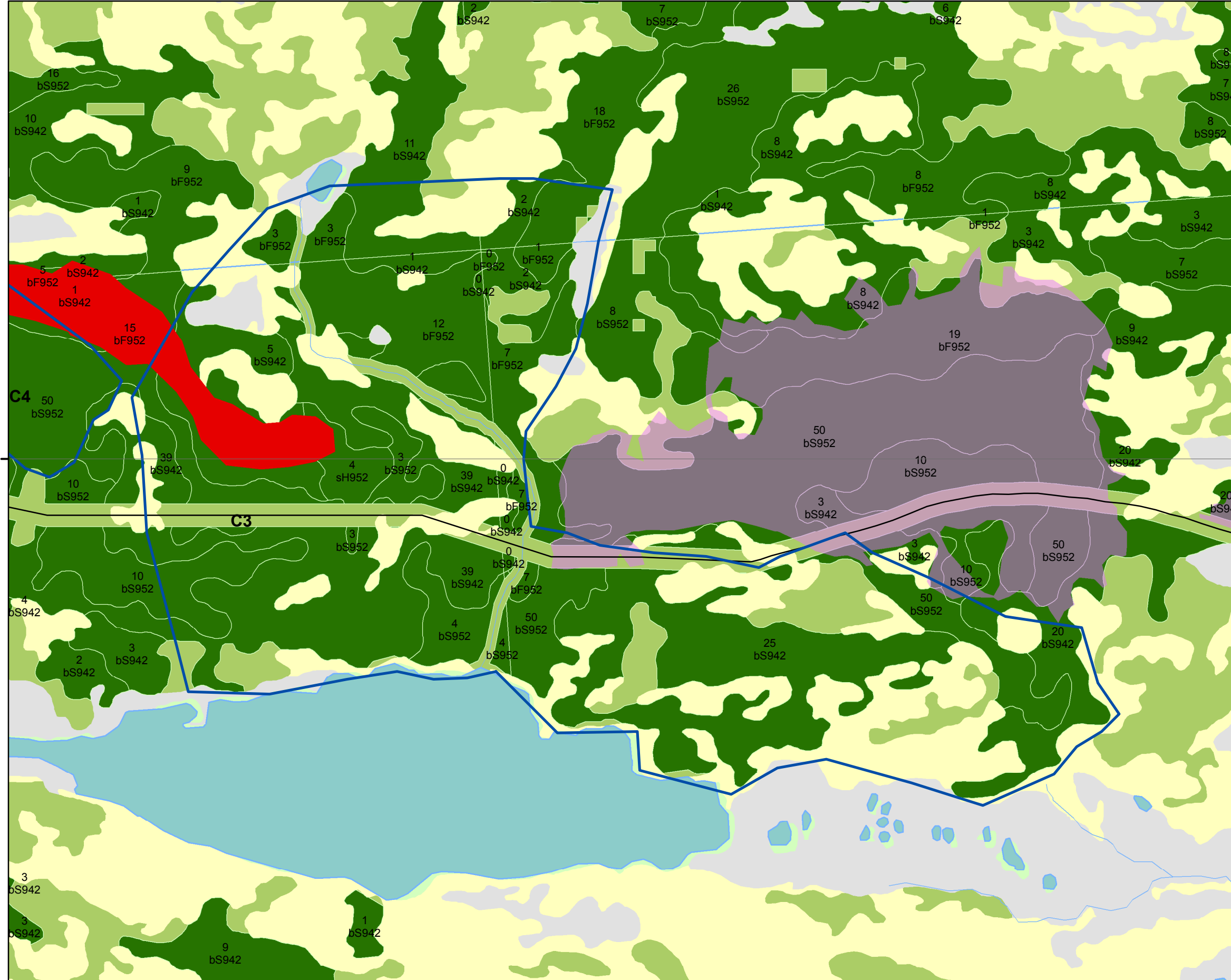


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21003
Operating Area Name: C3

For block information and statistics
refer to Cover Page





Plan Features

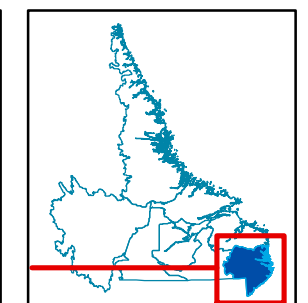
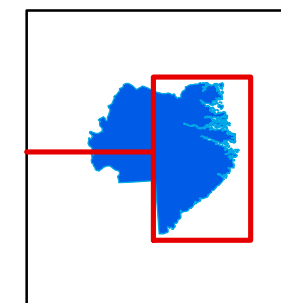
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

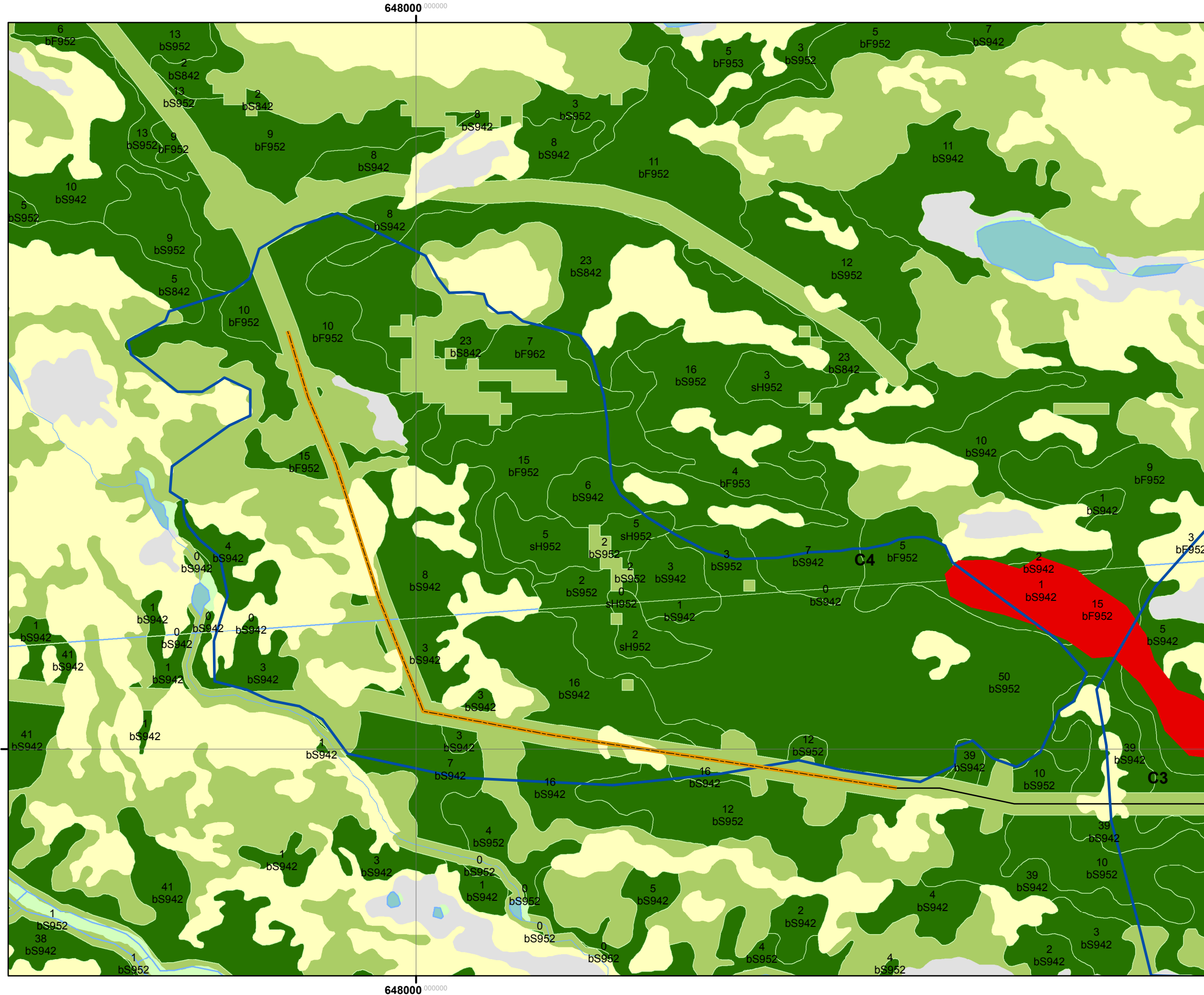
Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting





Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21004
Operating Area Name: C4

For block information and statistics
refer to Cover Page

Plan Features

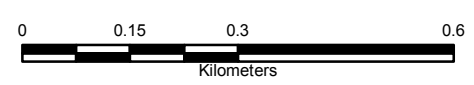
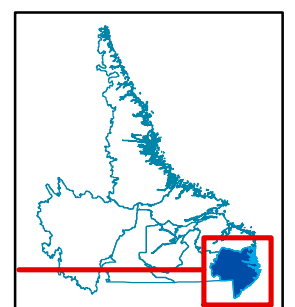
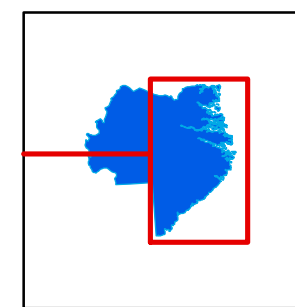
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting



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Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21005
Operating Area Name: C5

For block information and statistics
refer to Cover Page



Plan Features

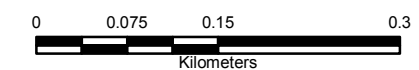
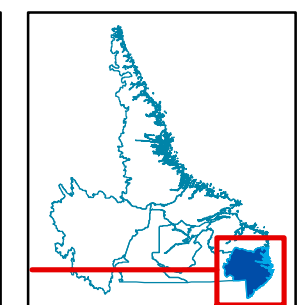
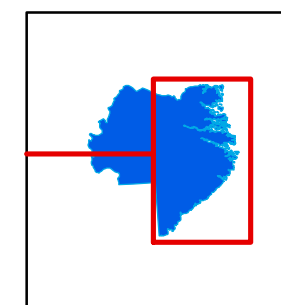
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

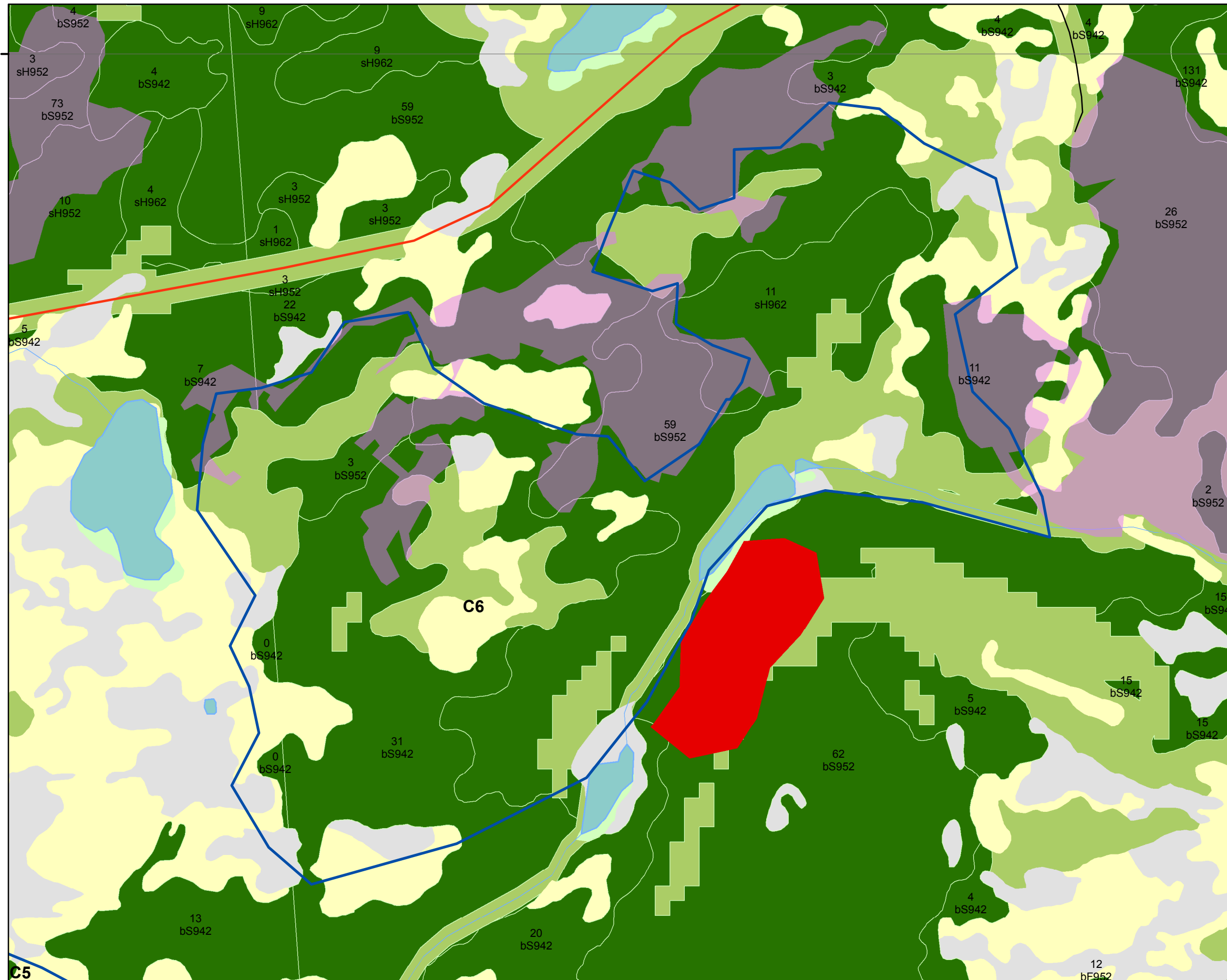


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21006
Operating Area Name: C6

For block information and statistics
refer to Cover Page





Plan Features

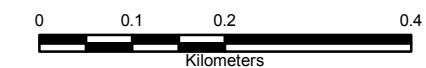
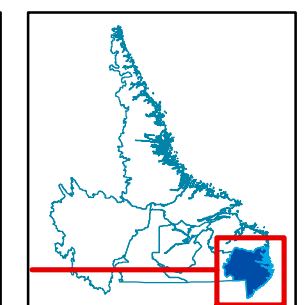
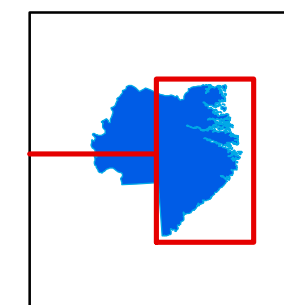
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21007
Operating Area Name: CN2

For block information and statistics
refer to Cover Page



Plan Features

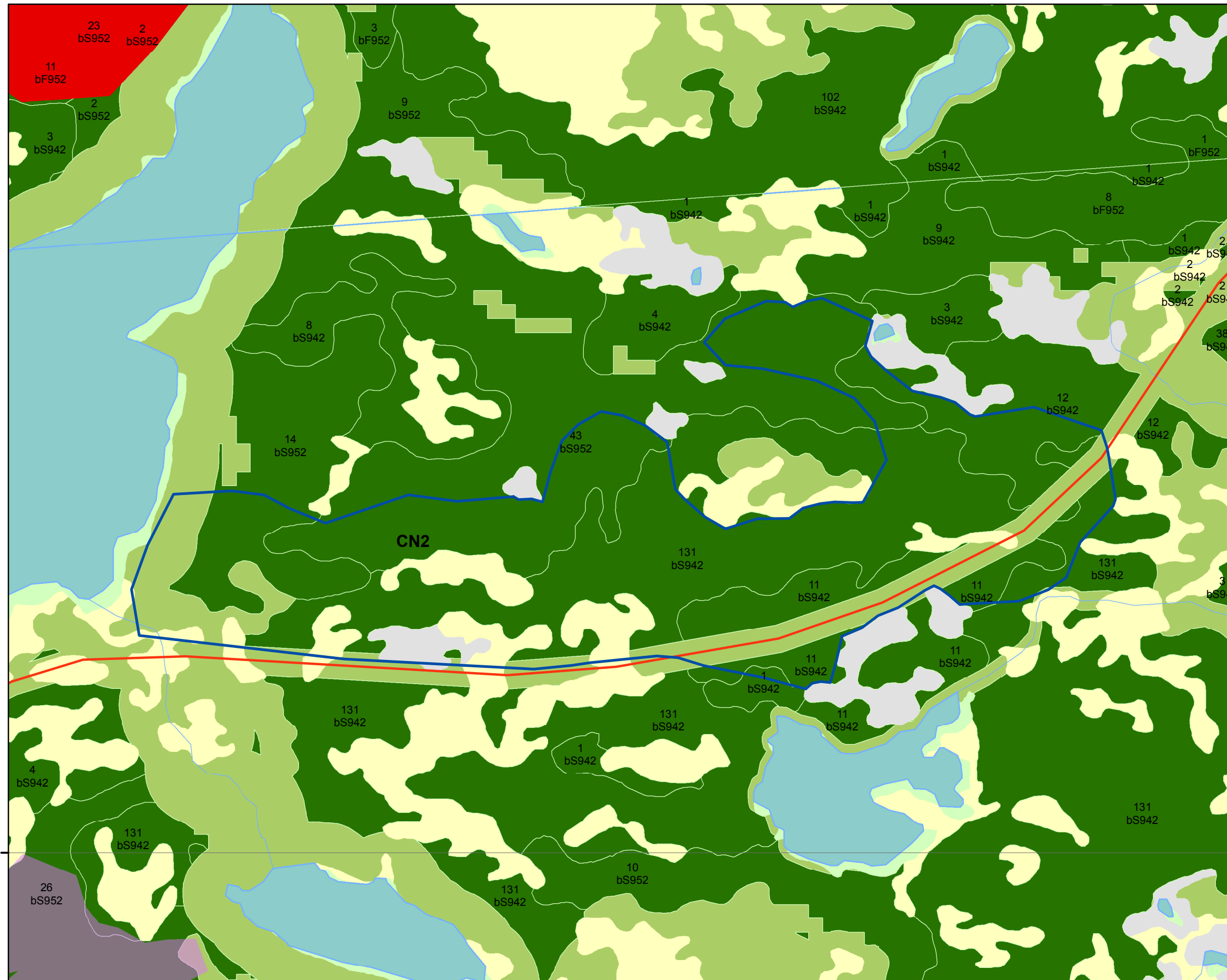
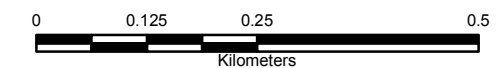
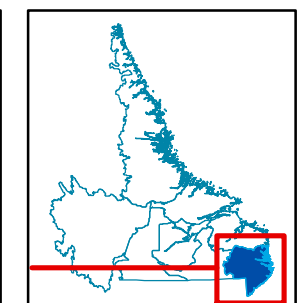
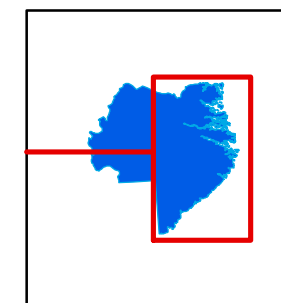
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

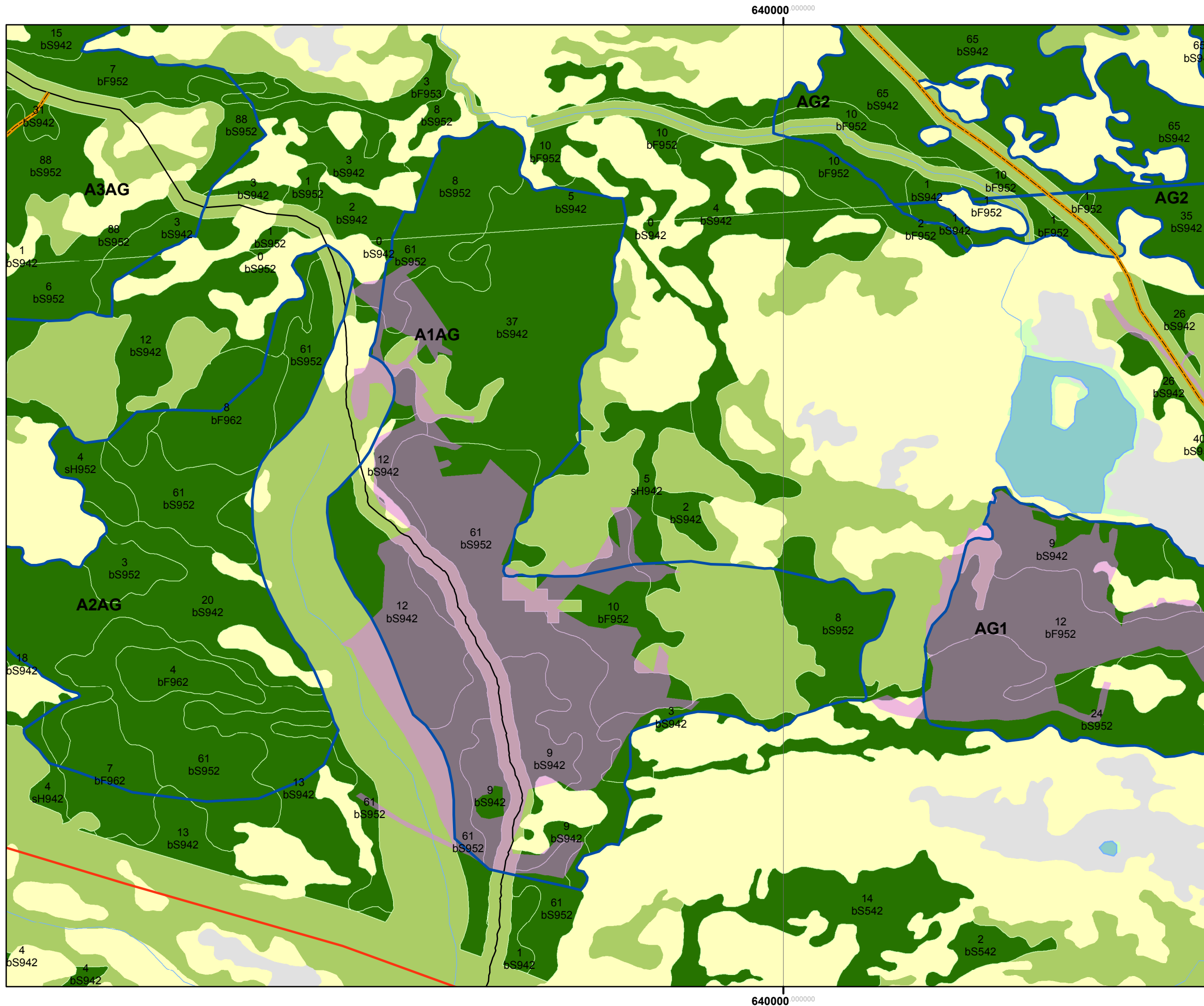
-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting



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**Five Year Operating Plan: 2017-2021
Commercial Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21008
Operating Area Name: A1AG

For block information and statistics
refer to Cover Page

Plan Features

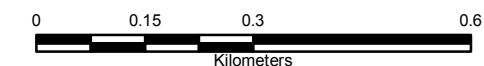
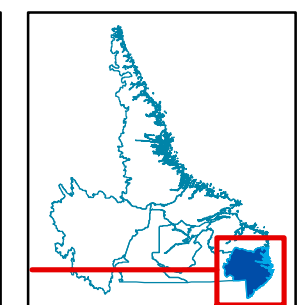
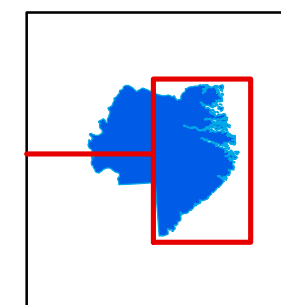
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting

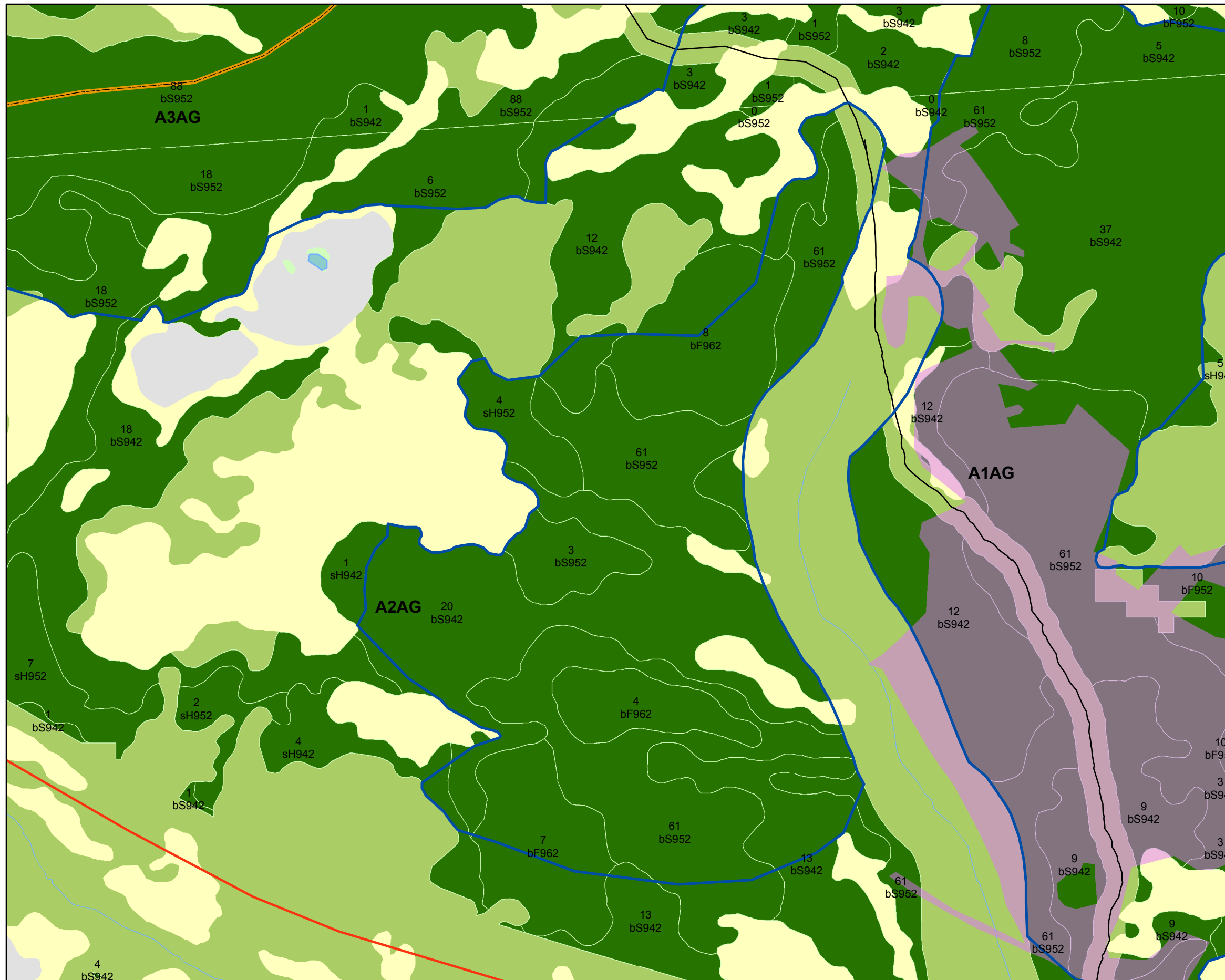


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21009
Operating Area Name: A2AG

For block information and statistics
refer to Cover Page





Plan Features

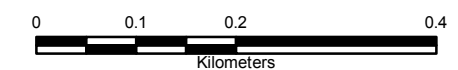
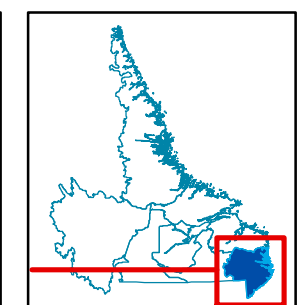
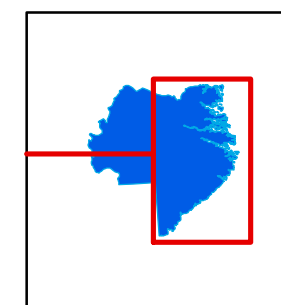
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21010
Operating Area Name: A3AG

For block information and statistics
refer to Cover Page



Plan Features

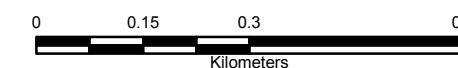
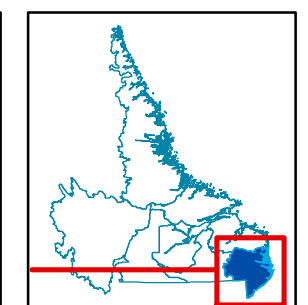
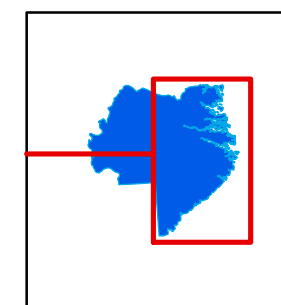
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting






Newfoundland Labrador





Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21011
Operating Area Name: AG1

For block information and statistics
refer to Cover Page



Plan Features

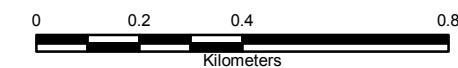
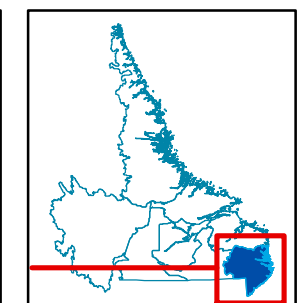
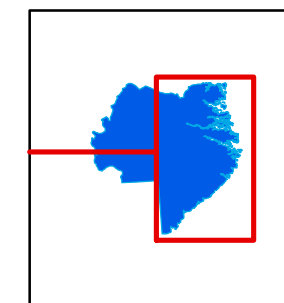
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

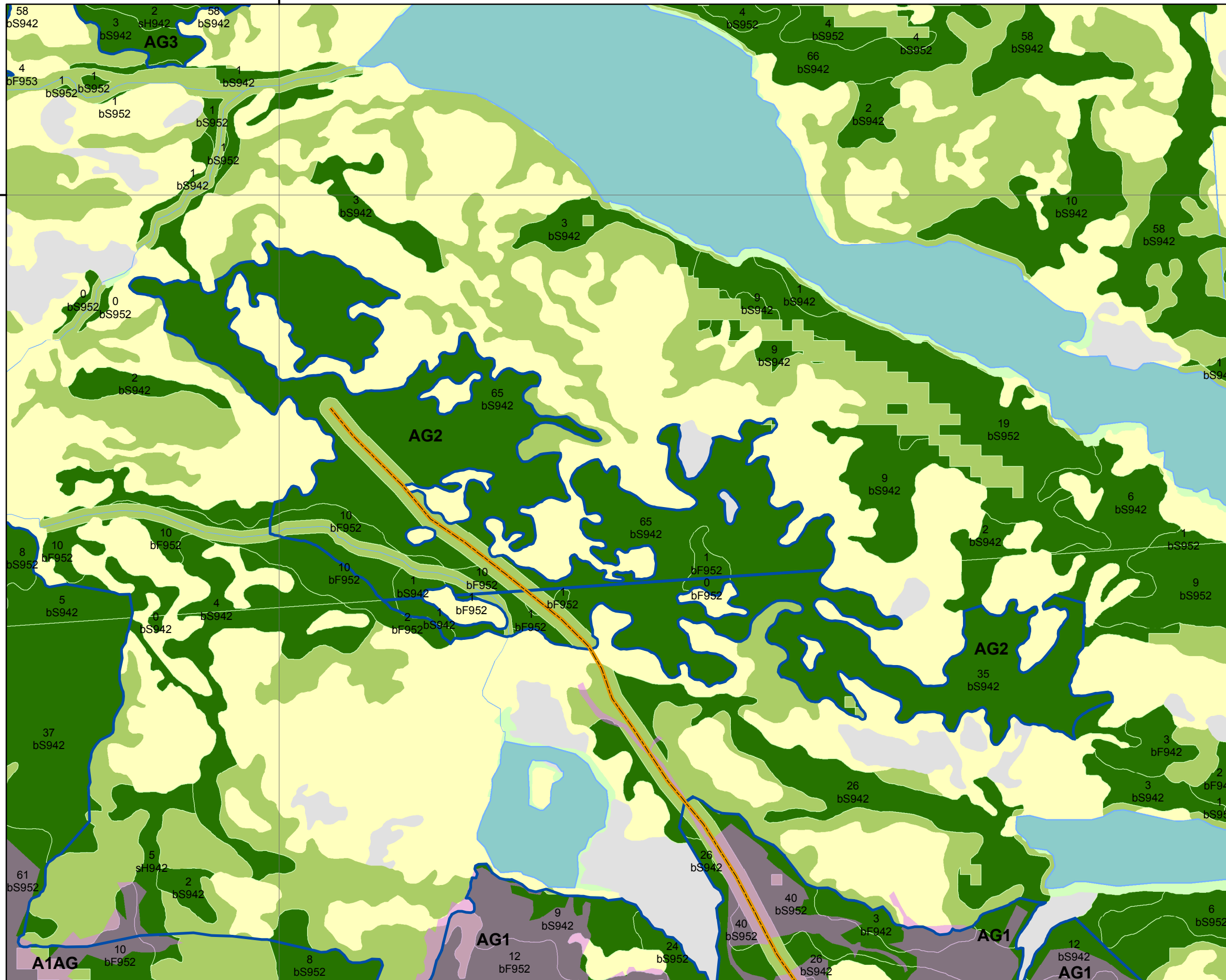


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**Five Year Operating Plan: 2017-2021
Commercial Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC20012
Operating Area Name: AG2

For block information and statistics
refer to Cover Page

Plan Features

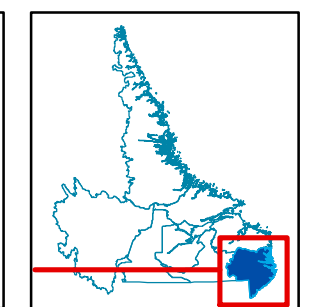
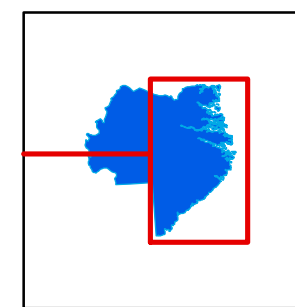
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

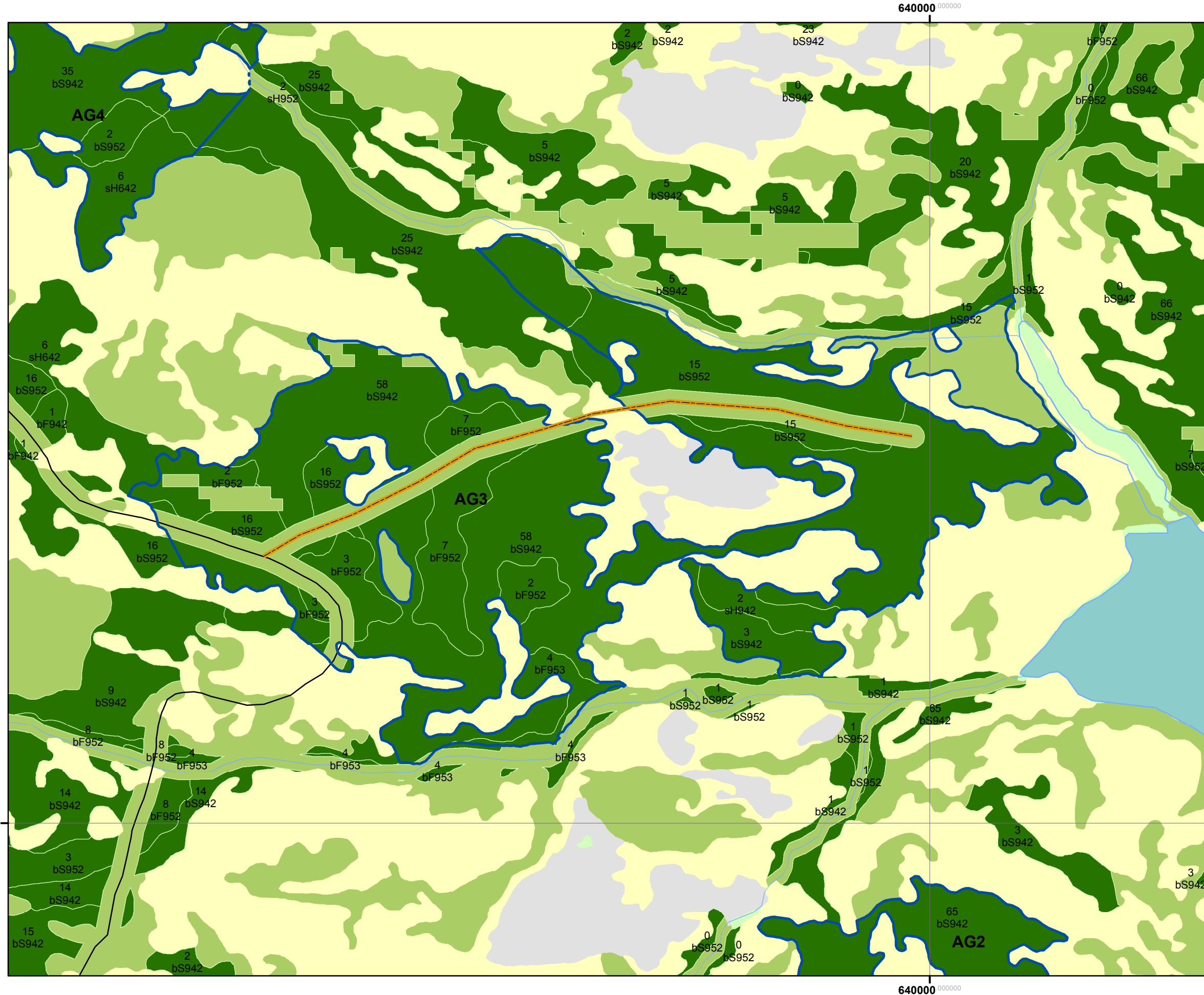
Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting





Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21013
Operating Area Name: AG3

For block information and statistics
refer to Cover Page

Plan Features

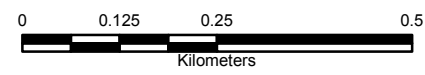
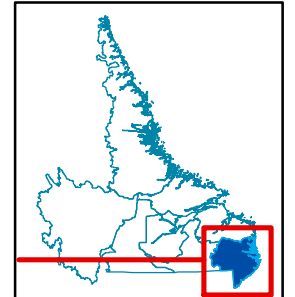
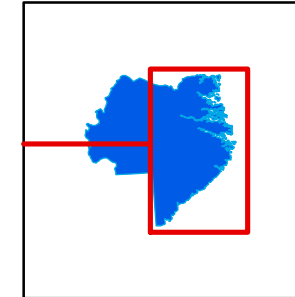
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting



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Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21014
Operating Area Name: AG4

For block information and statistics
refer to Cover Page





Plan Features

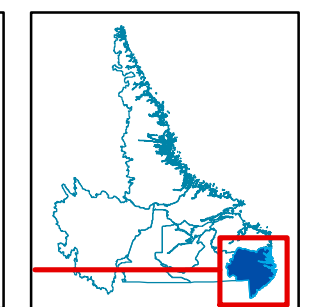
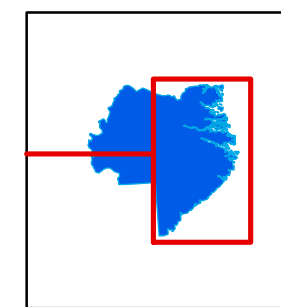
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21015
Operating Area Name: AG5

For block information and statistics
refer to Cover Page



Plan Features

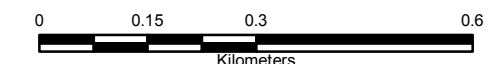
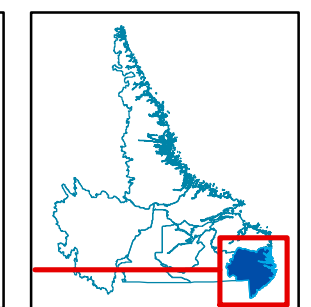
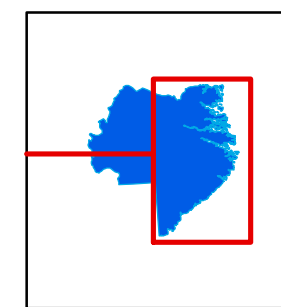
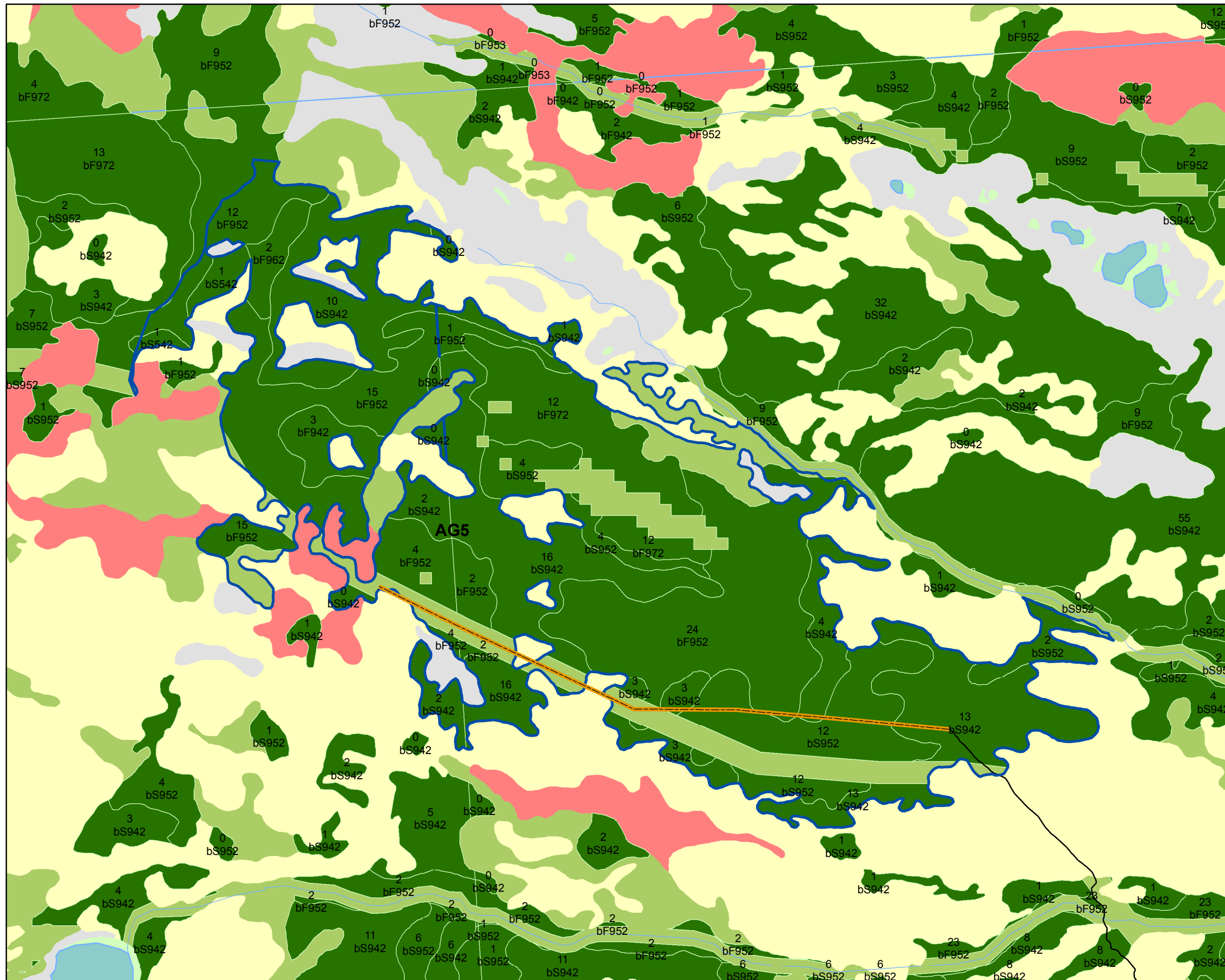
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

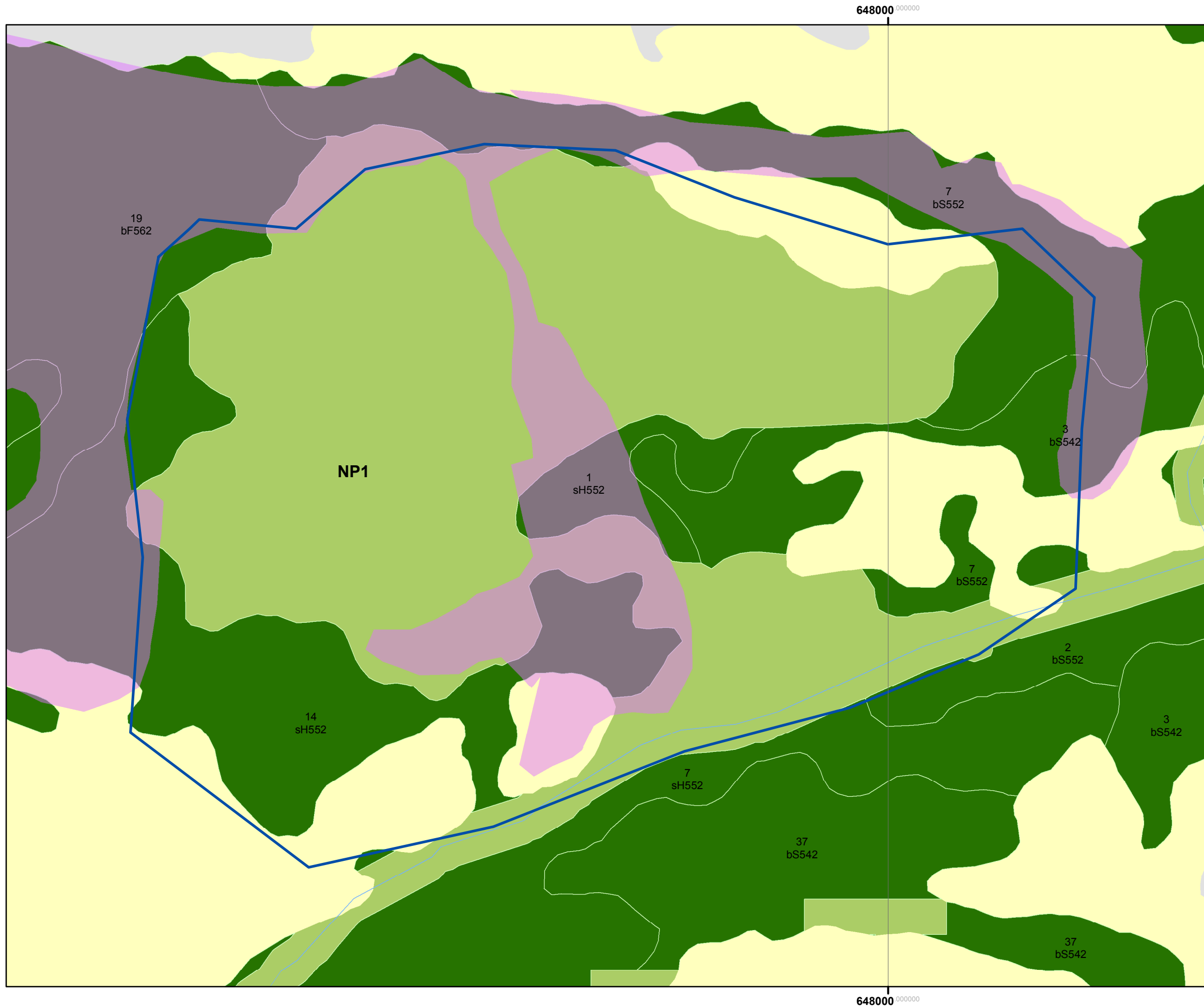
Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting





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**Five Year Operating Plan: 2017-2021
Commercial Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21016
Operating Area Name: NP1

For block information and statistics
refer to Cover Page

Plan Features

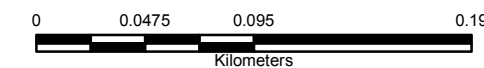
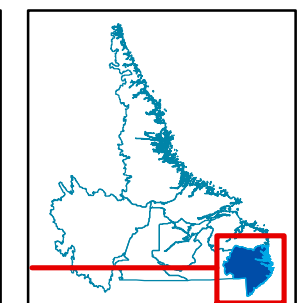
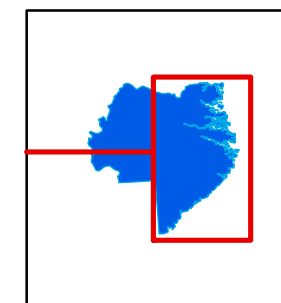
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

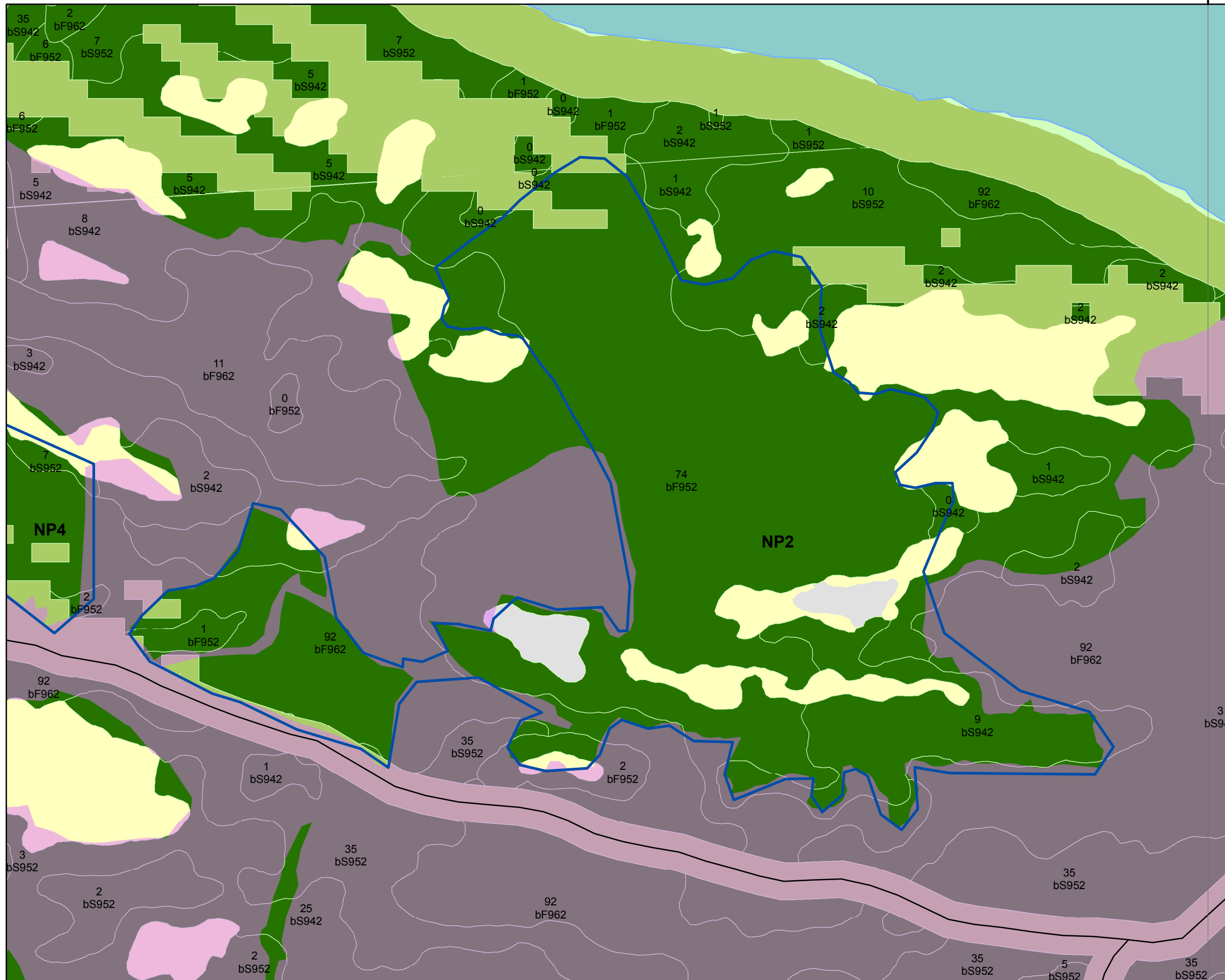
Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting





**Five Year Operating Plan: 2017-2021
Commercial Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21017
Operating Area Name: NP2

For block information and statistics
refer to Cover Page

Plan Features

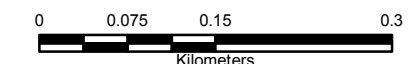
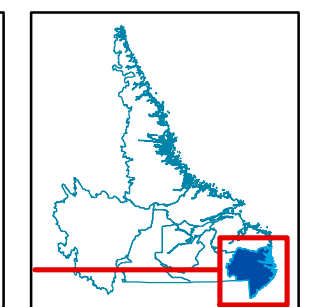
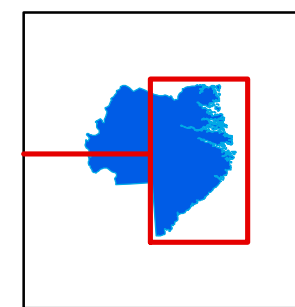
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting

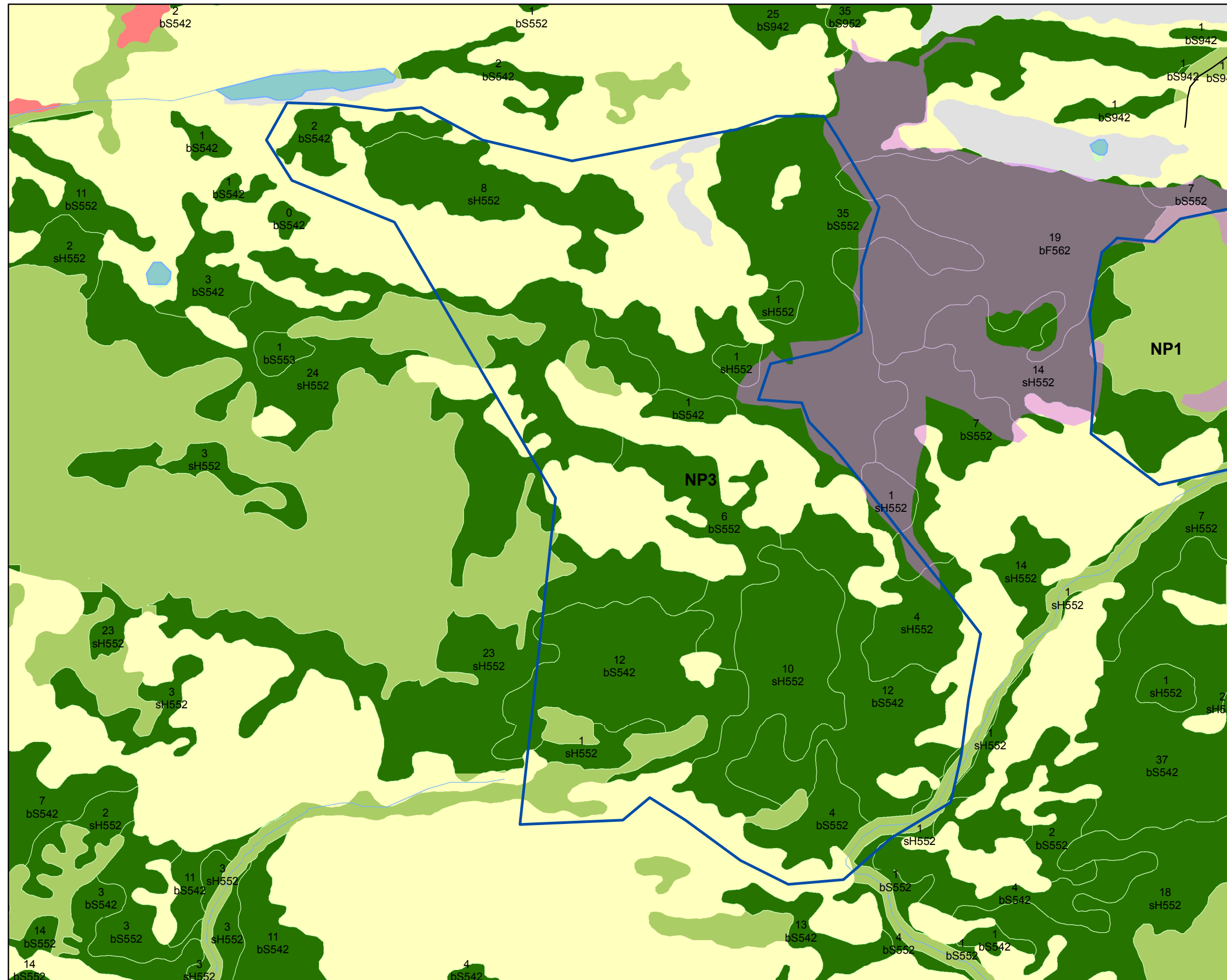


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21018
Operating Area Name: NP3

For block information and statistics
refer to Cover Page





Plan Features

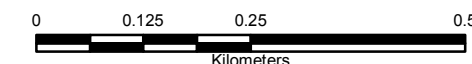
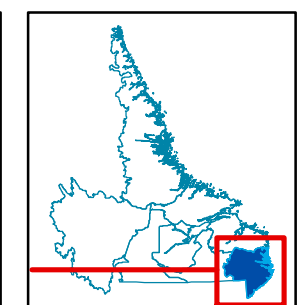
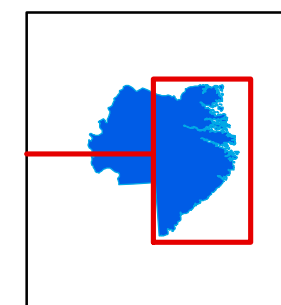
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

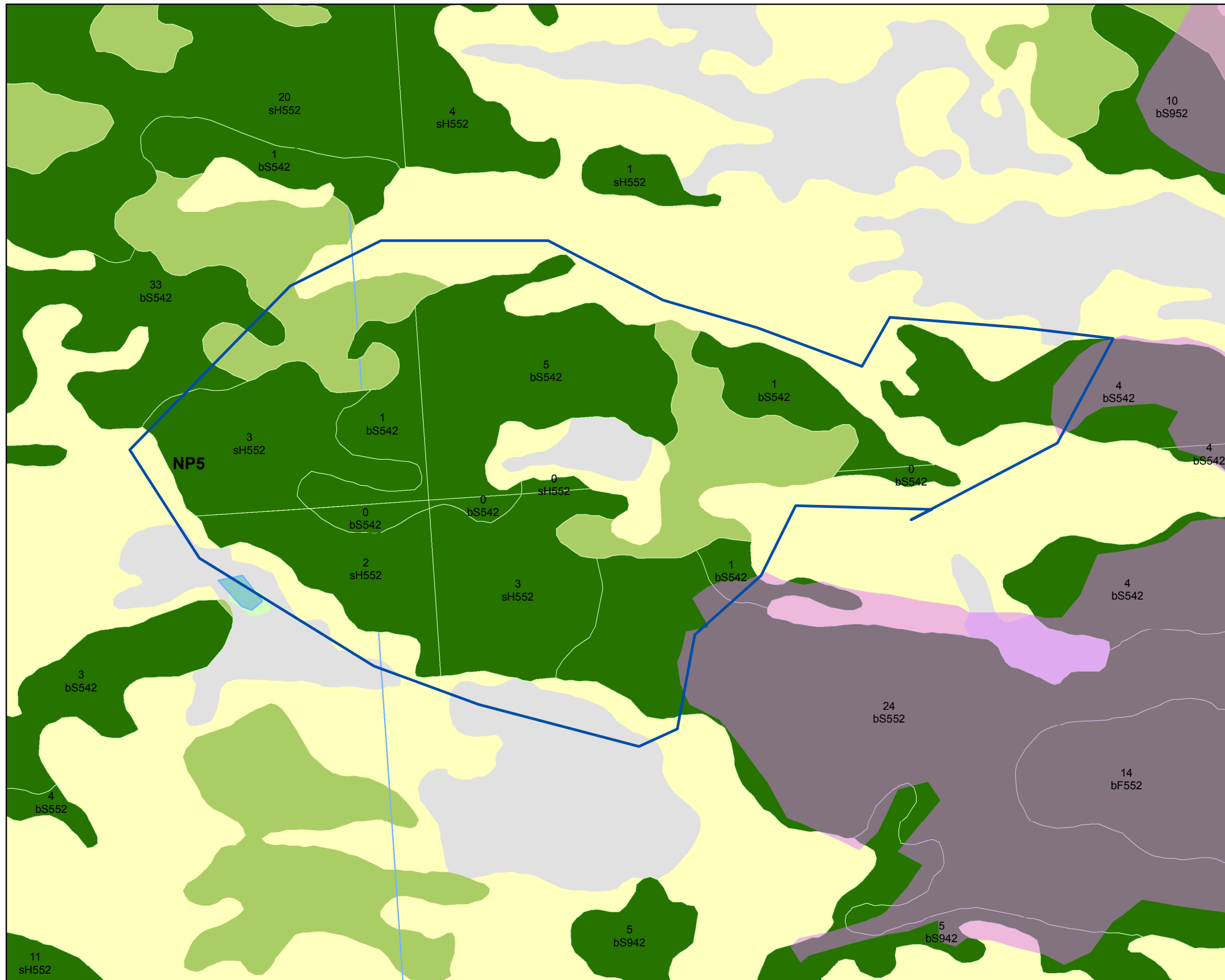


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21020
Operating Area Name: NP5

For block information and statistics
refer to Cover Page





Plan Features

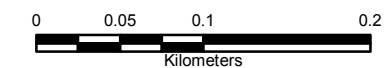
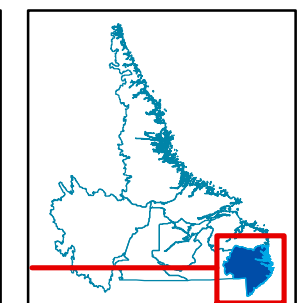
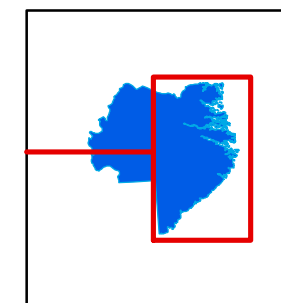
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

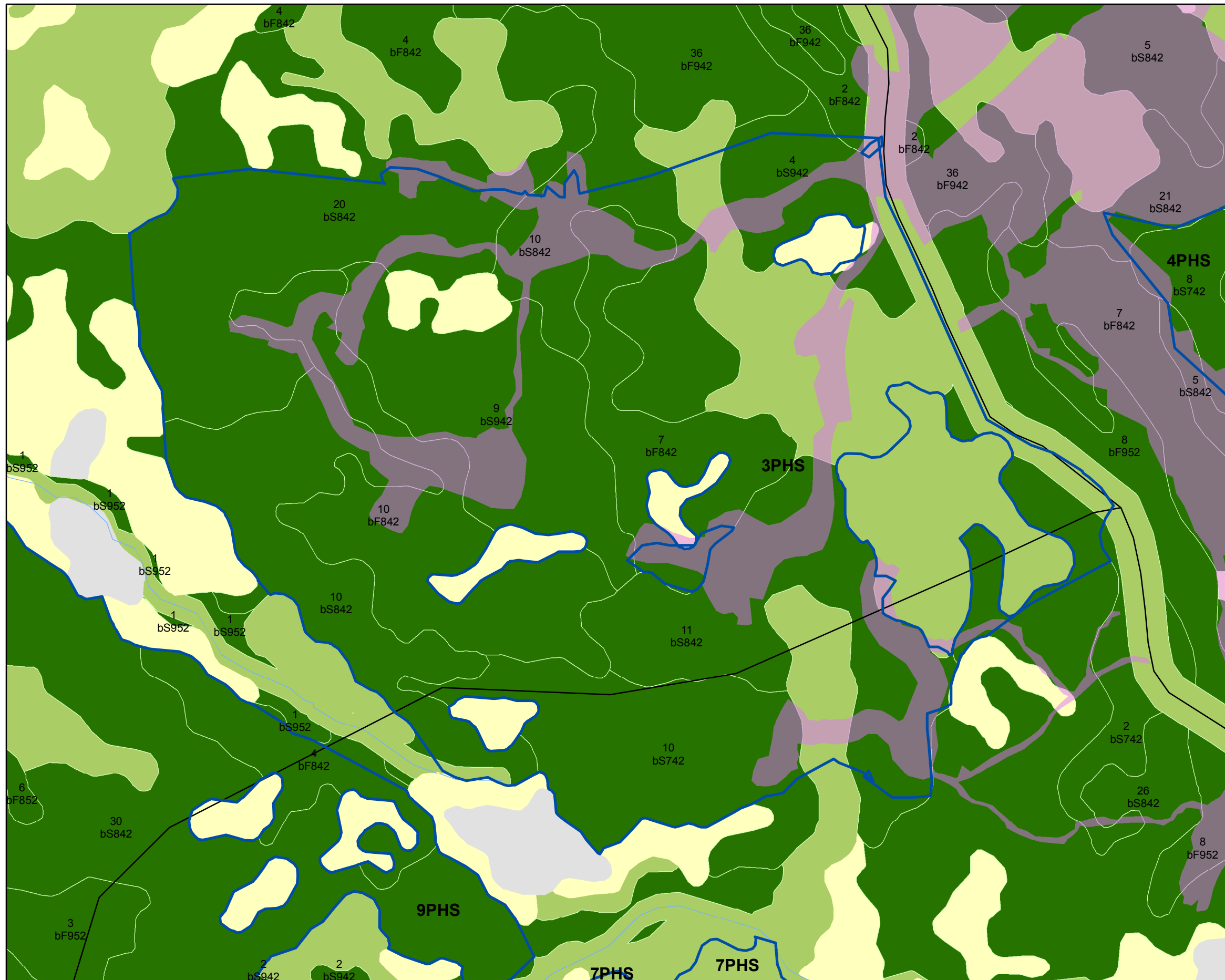


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21021
Operating Area Name: 3PHS

For block information and statistics
refer to Cover Page





Plan Features

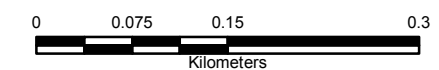
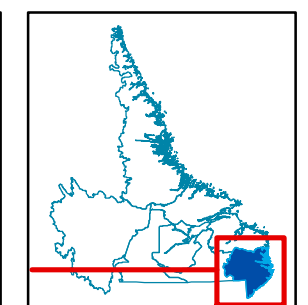
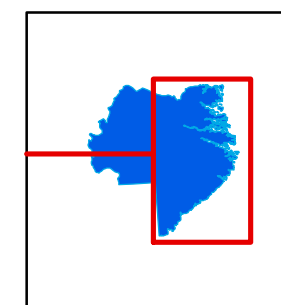
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21022
Operating Area Name: 4PHS

For block information and statistics
refer to Cover Page



Plan Features

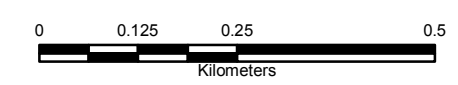
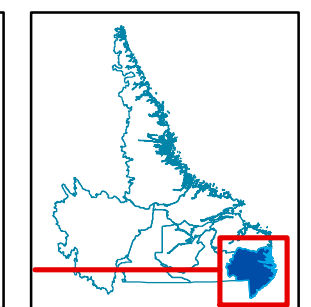
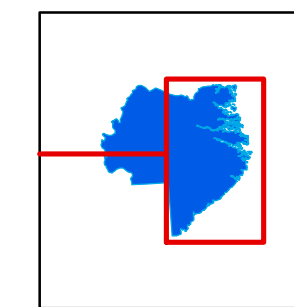
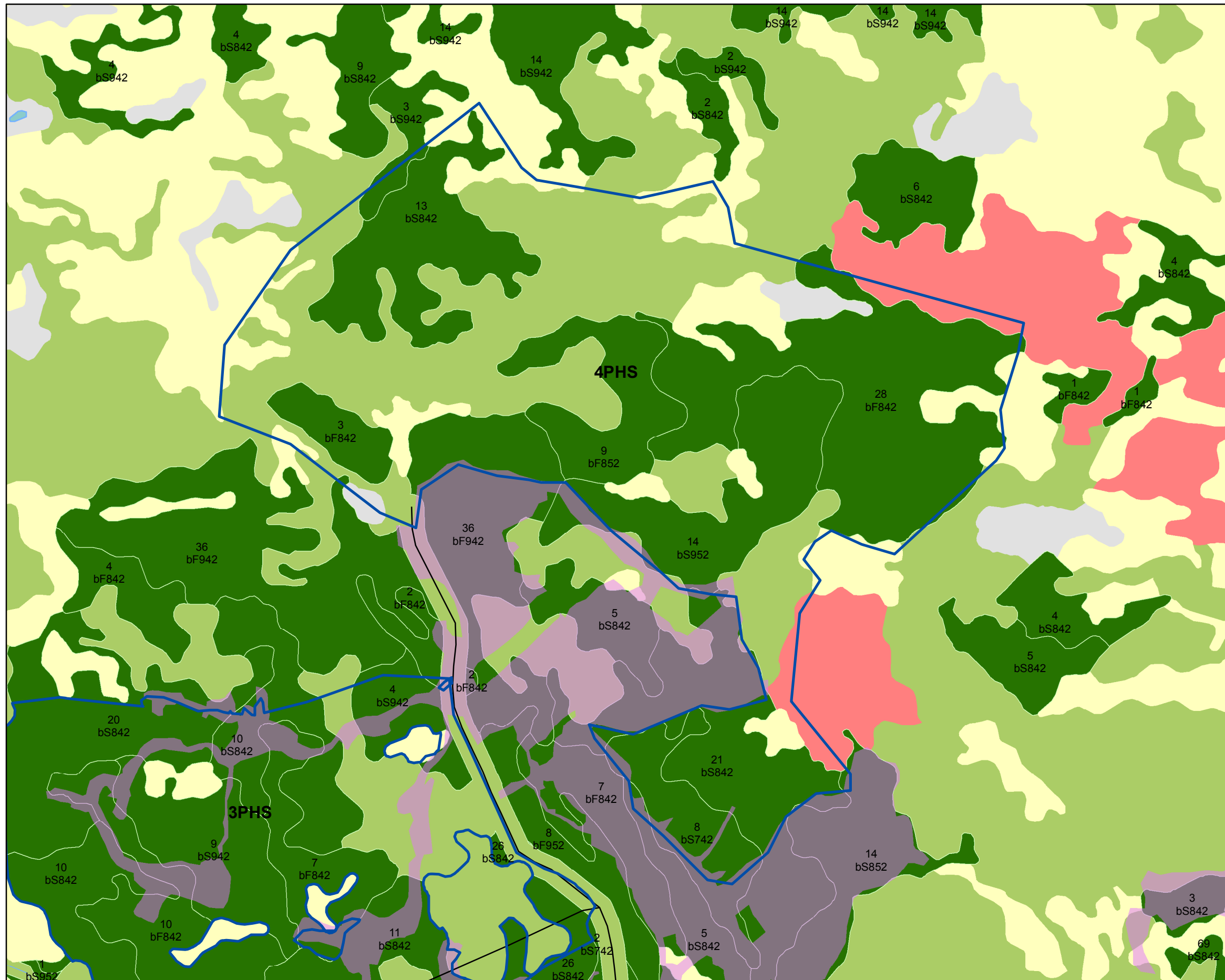
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

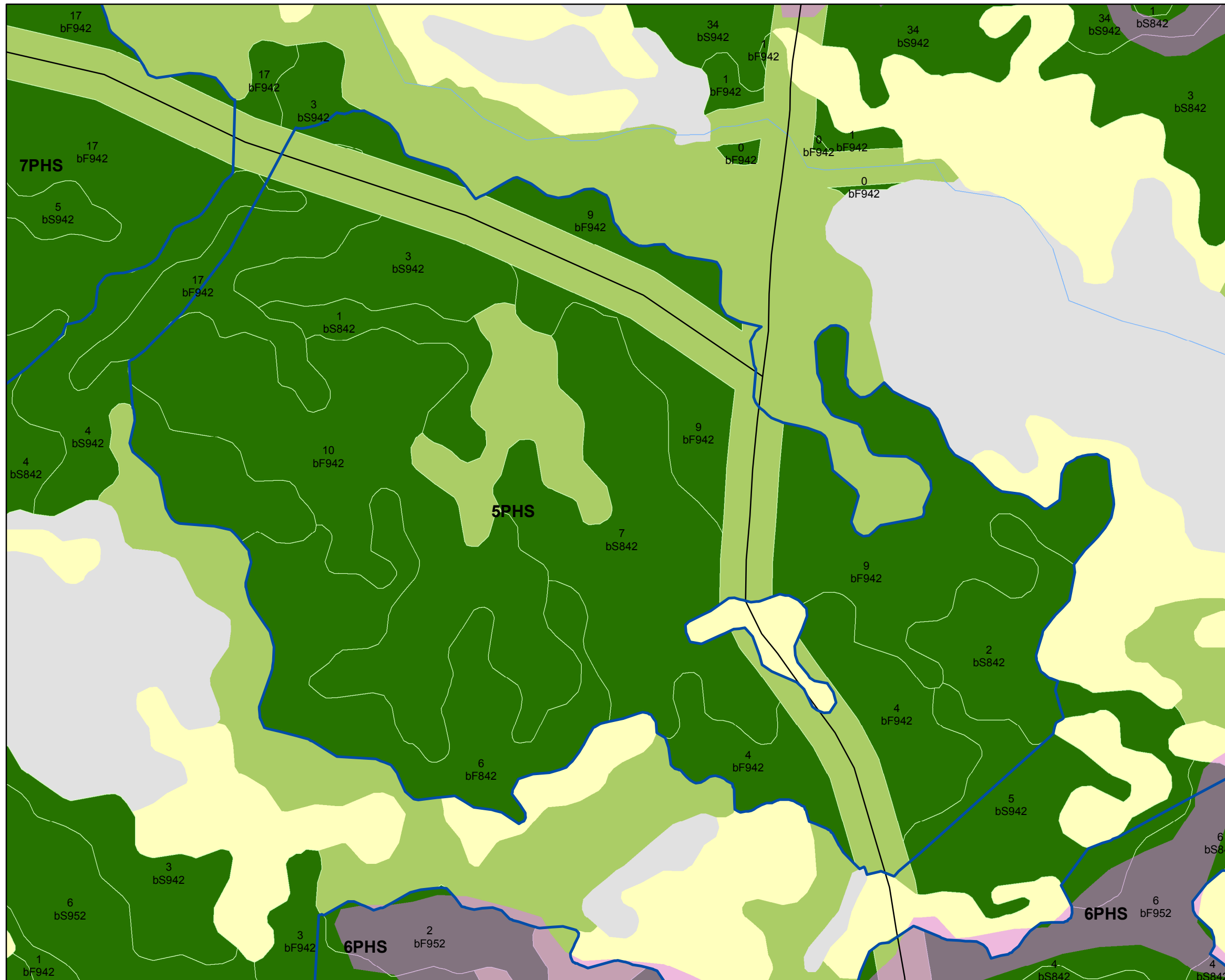


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21023
Operating Area Name: 5PHS

For block information and statistics
refer to Cover Page





Plan Features

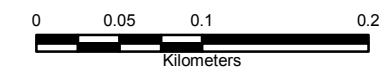
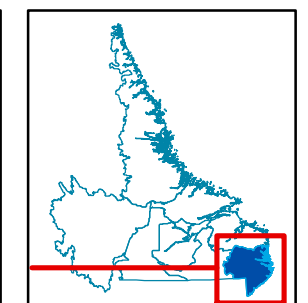
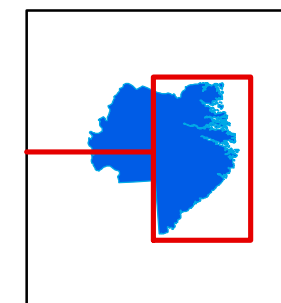
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

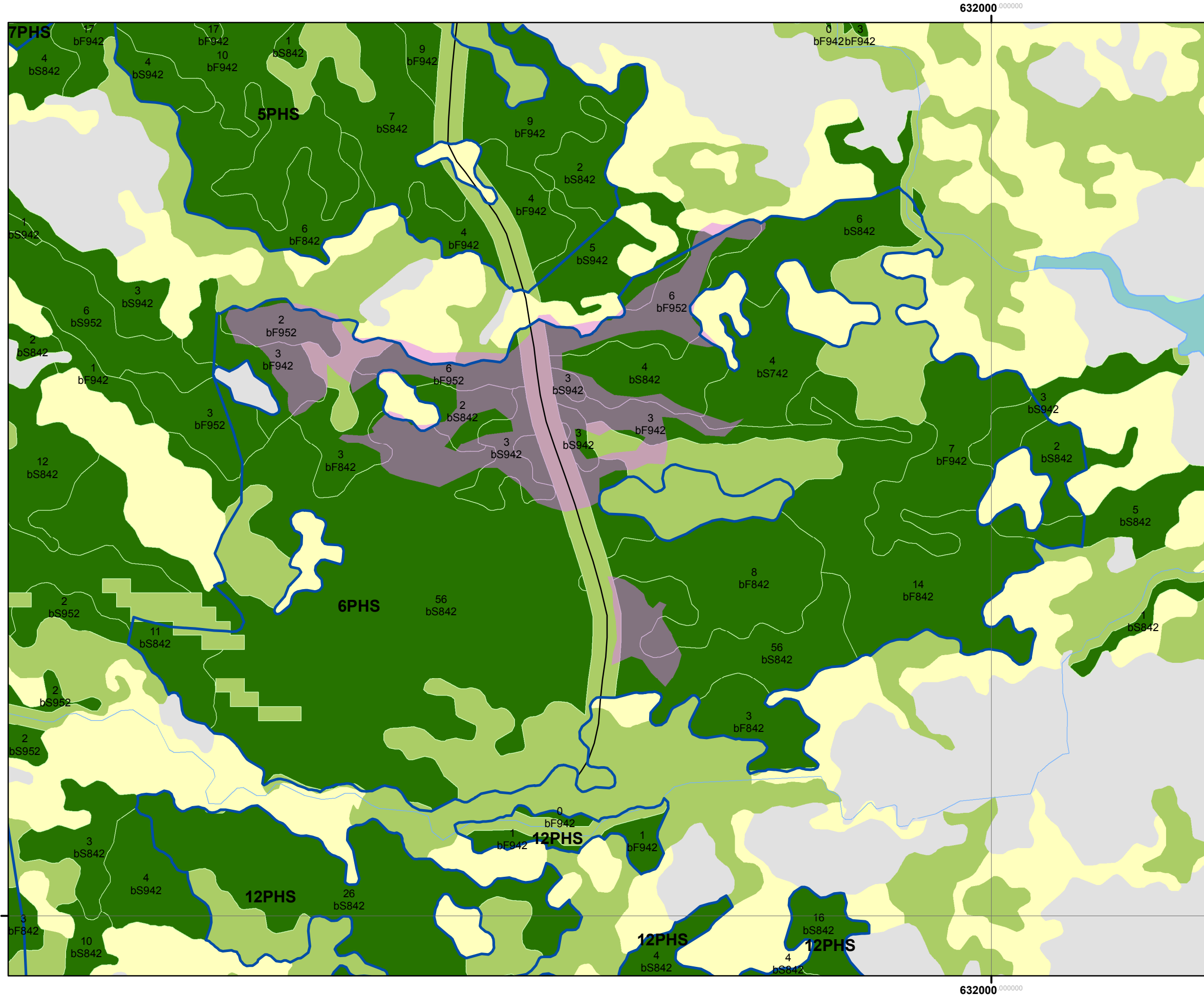
Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting





**Five Year Operating Plan: 2017-2021
Commercial Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21024
Operating Area Name: 6PHS

For block information and statistics
refer to Cover Page

Plan Features

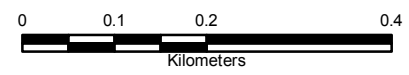
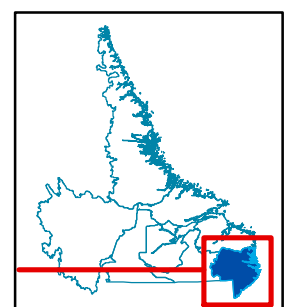
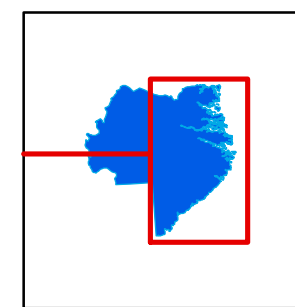
- Snowmobile Trails
- Proposed Roads
- Proposed Commercial Harvest Areas
- Harvestable

Basemap Features

- Brooks & Streams
- Snowmobile Trails
- Access Roads
- Provincial Roads
- Insect Damage
- Productive
- Cutovers
- Disturbances
- Scrub
- Non-Forested

Restrictions

- Snowmobile Trails
- No Cutting



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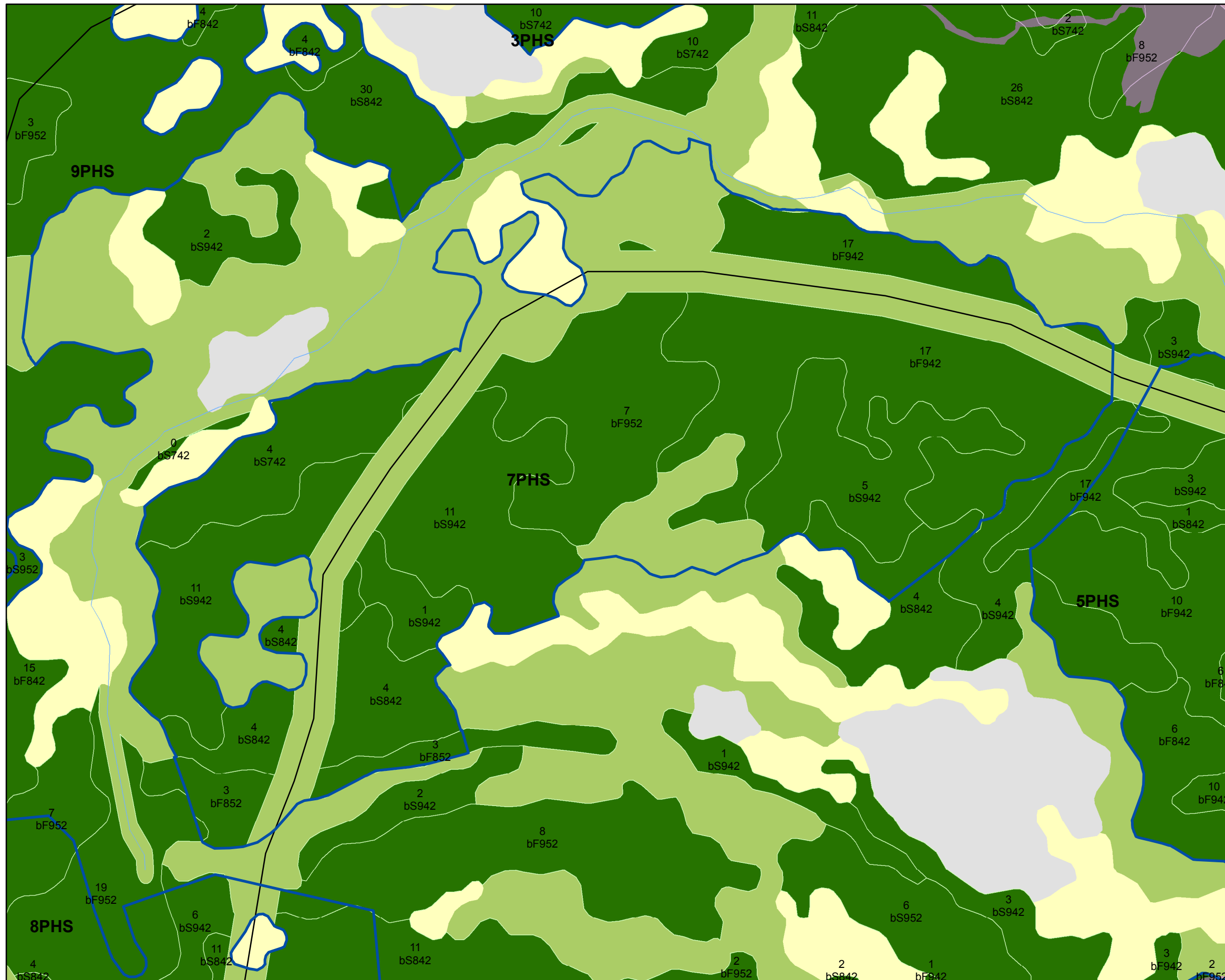
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Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21025
Operating Area Name: 7PHS

For block information and statistics
refer to Cover Page





Plan Features

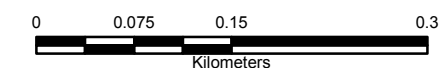
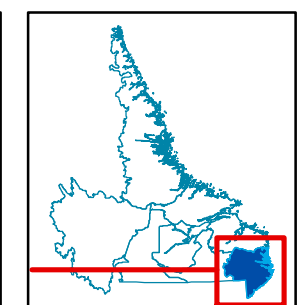
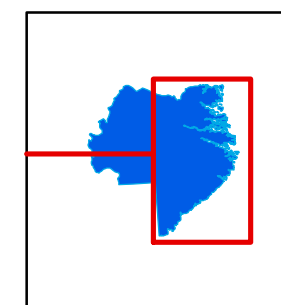
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21026
Operating Area Name: 8PHS

For block information and statistics
refer to Cover Page



Plan Features

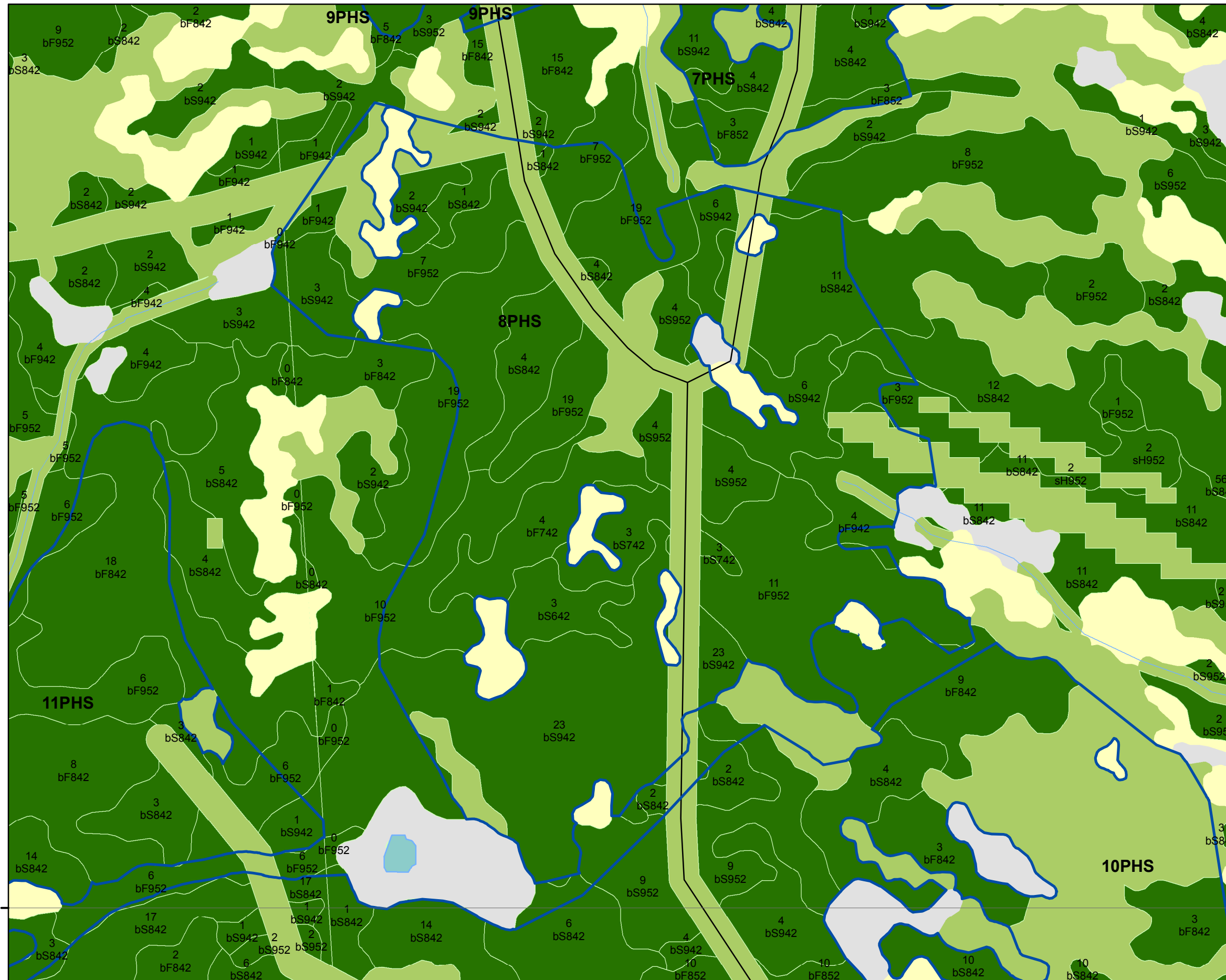
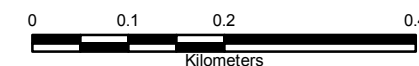
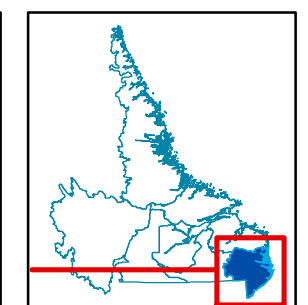
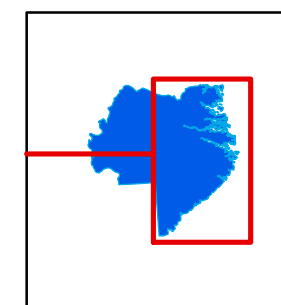
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting



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Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21028
Operating Area Name: 10PHS

For block information and statistics
refer to Cover Page



Plan Features

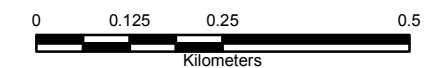
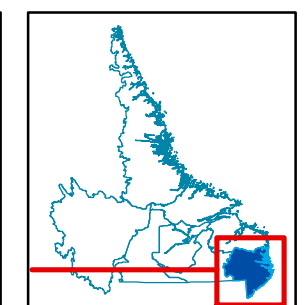
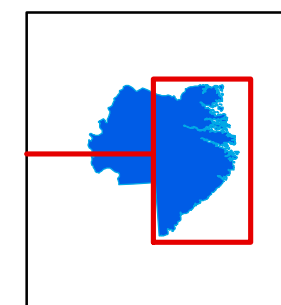
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

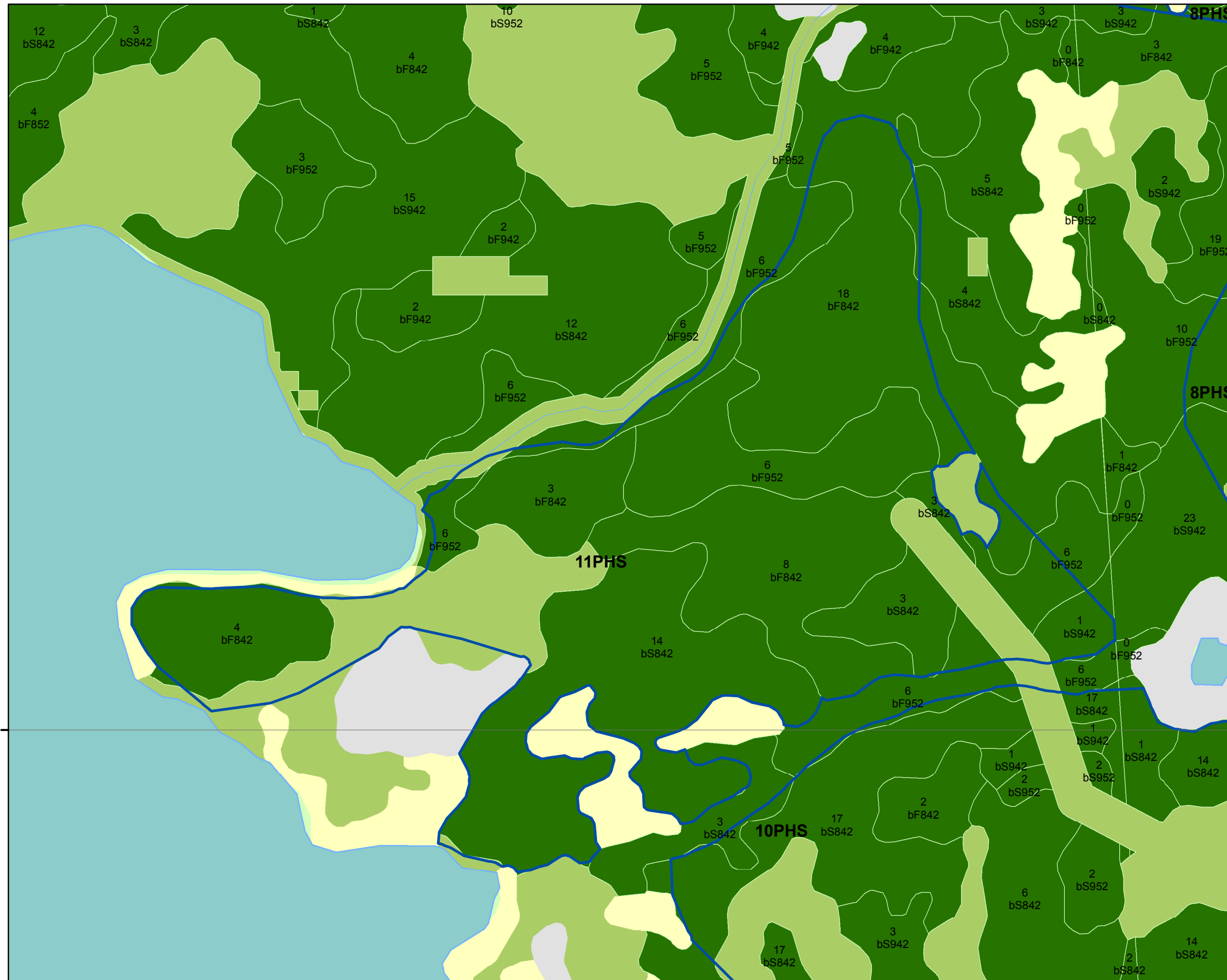


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21029
Operating Area Name: 11PHS

For block information and statistics
refer to Cover Page





Plan Features

-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

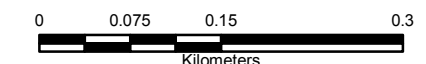
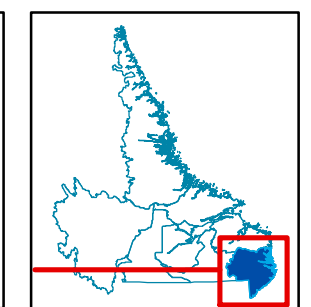
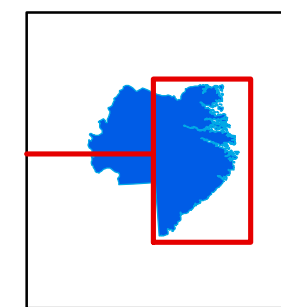
-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

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Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21030
Operating Area Name: 12PHS

For block information and statistics
refer to Cover Page



Plan Features

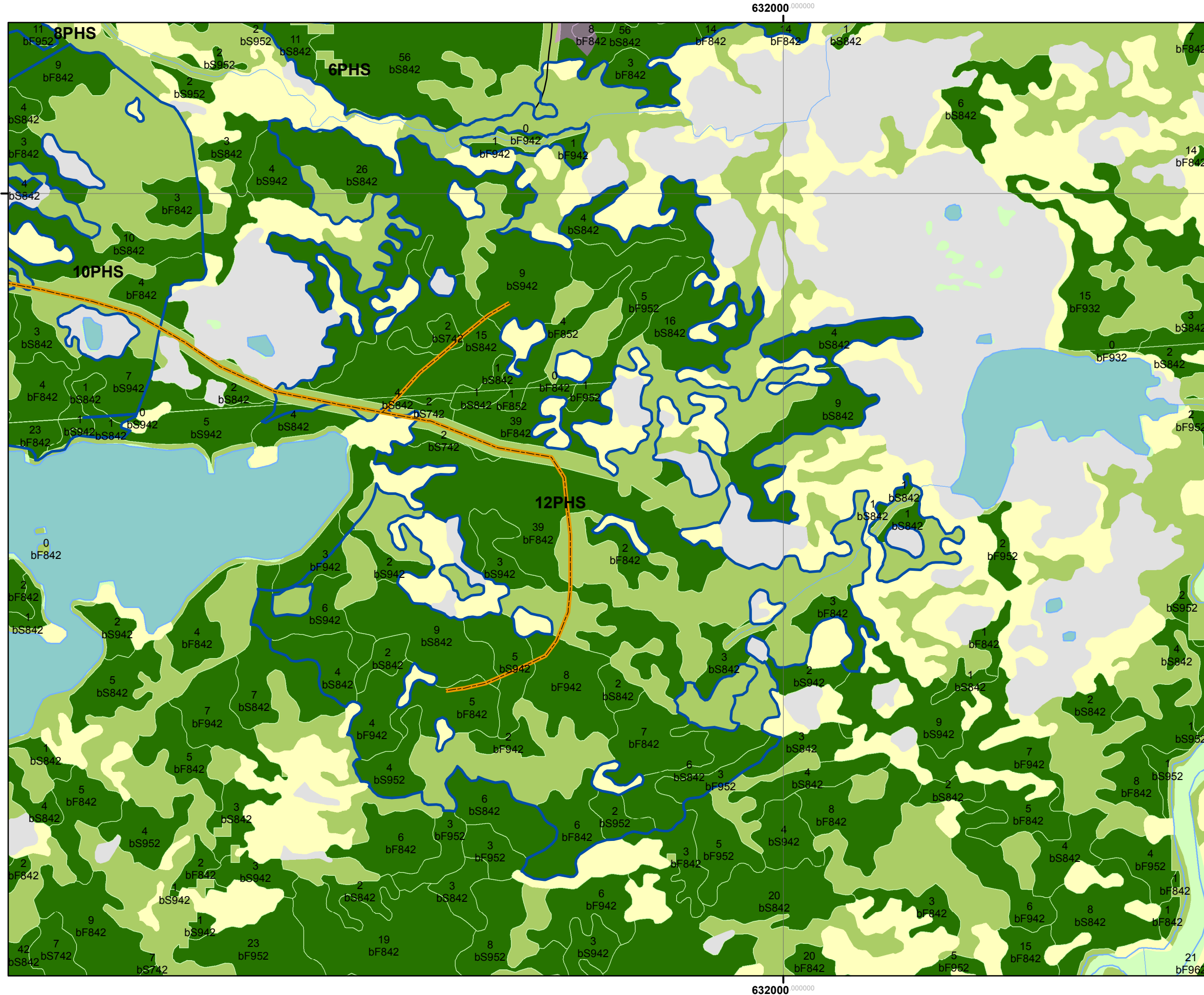
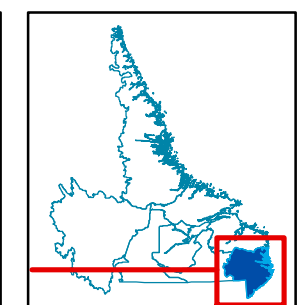
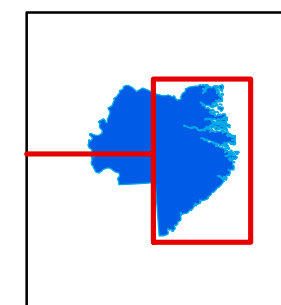
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting

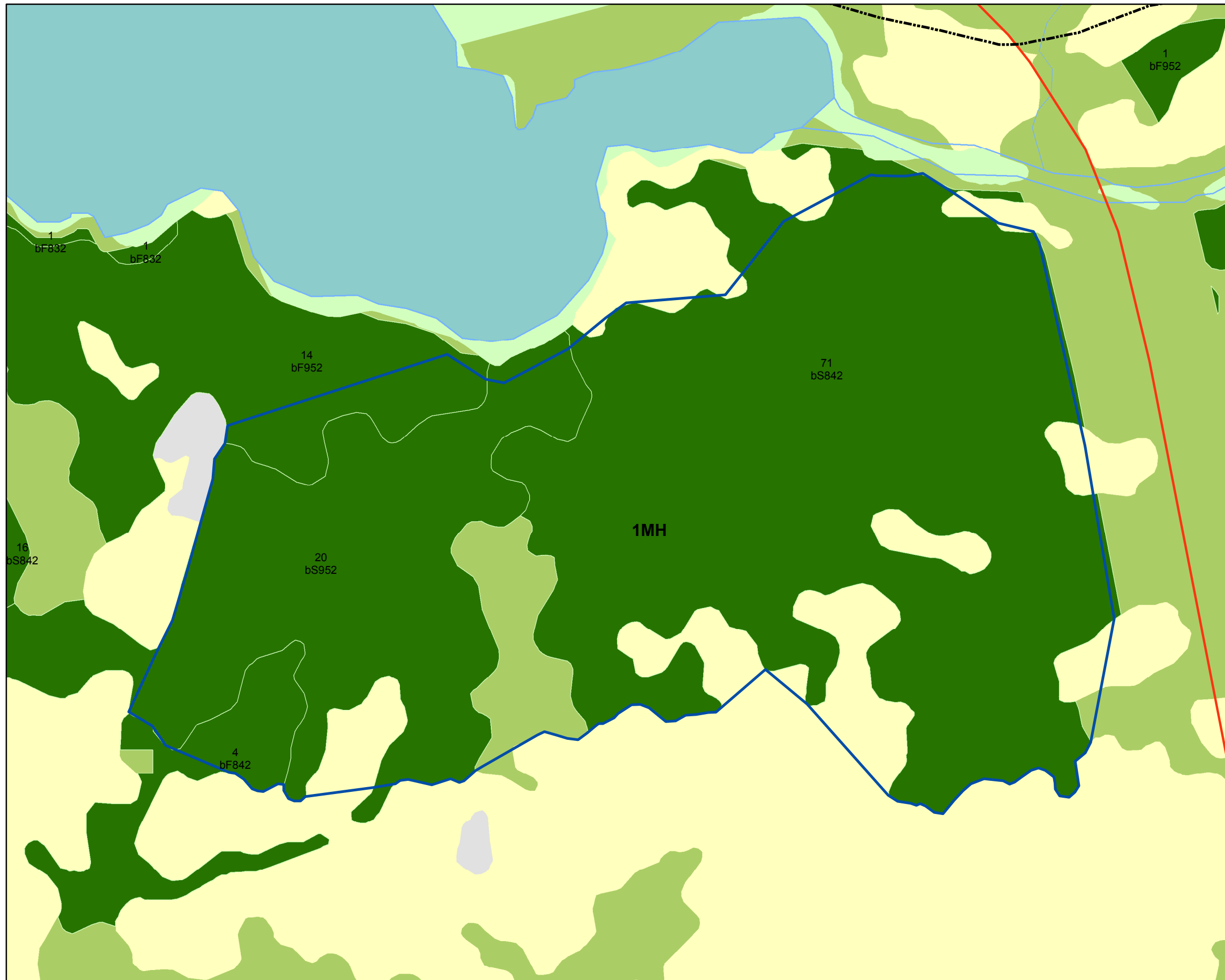


Five Year Operating Plan: 2017-2021 Commercial Harvest Plan Map





Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21031
Operating Area Name: 1MH

For block information and statistics
refer to Cover Page





Plan Features

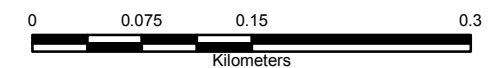
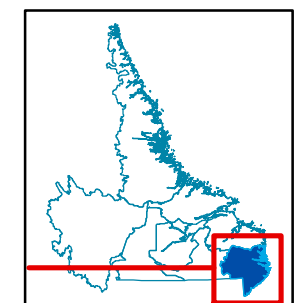
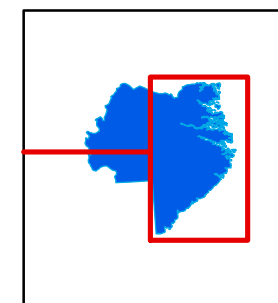
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Commercial Harvest Areas
-  Harvestable

Basemap Features

-  Brooks & Streams
-  Snowmobile Trails
-  Access Roads
-  Provincial Roads
-  Insect Damage
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21501
Operating Area Name: FORTEAU

For block information and statistics
refer to Cover Page



Plan Features

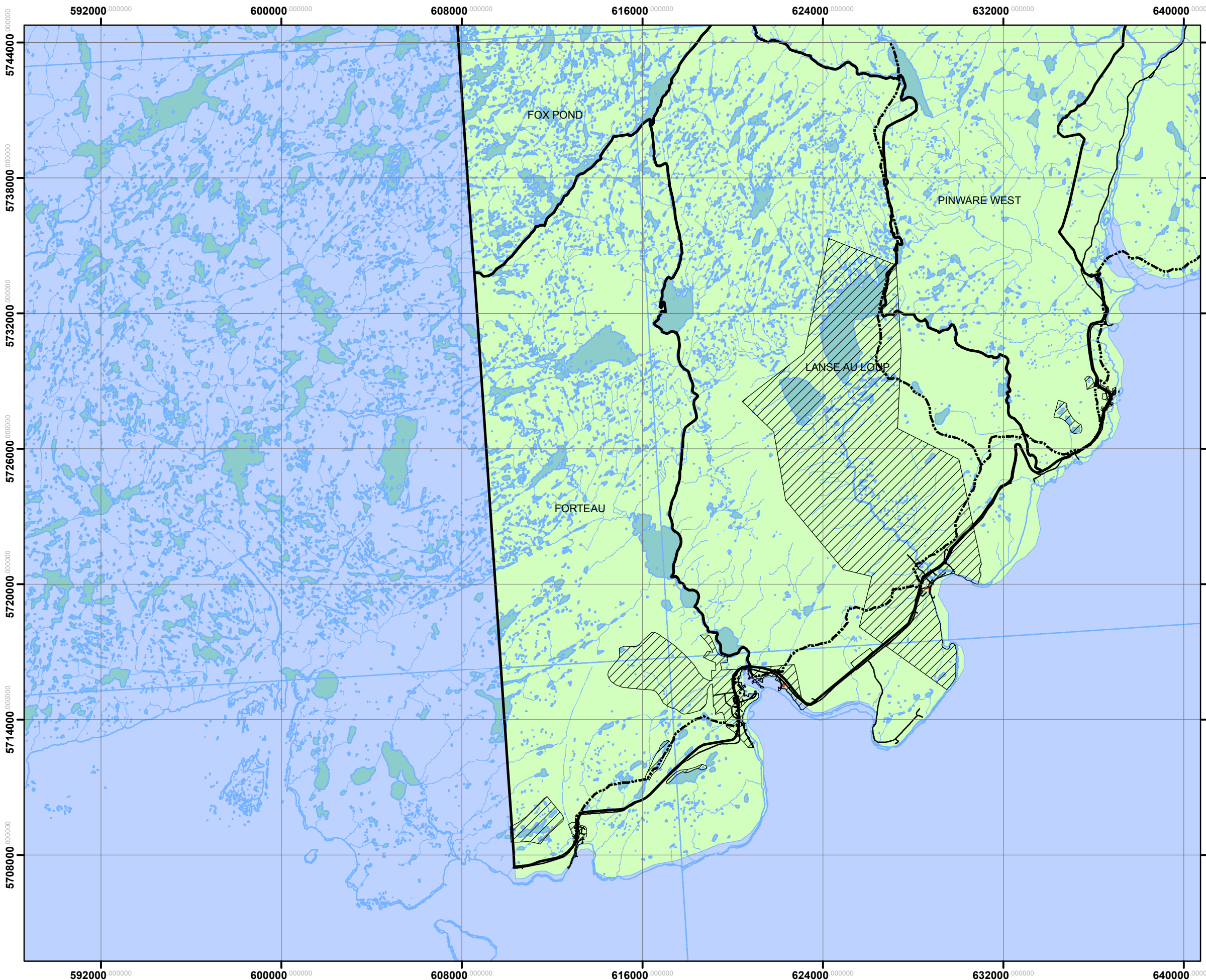
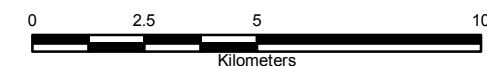
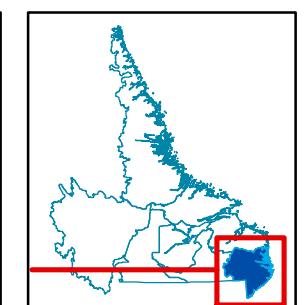
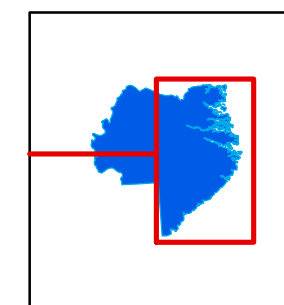
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

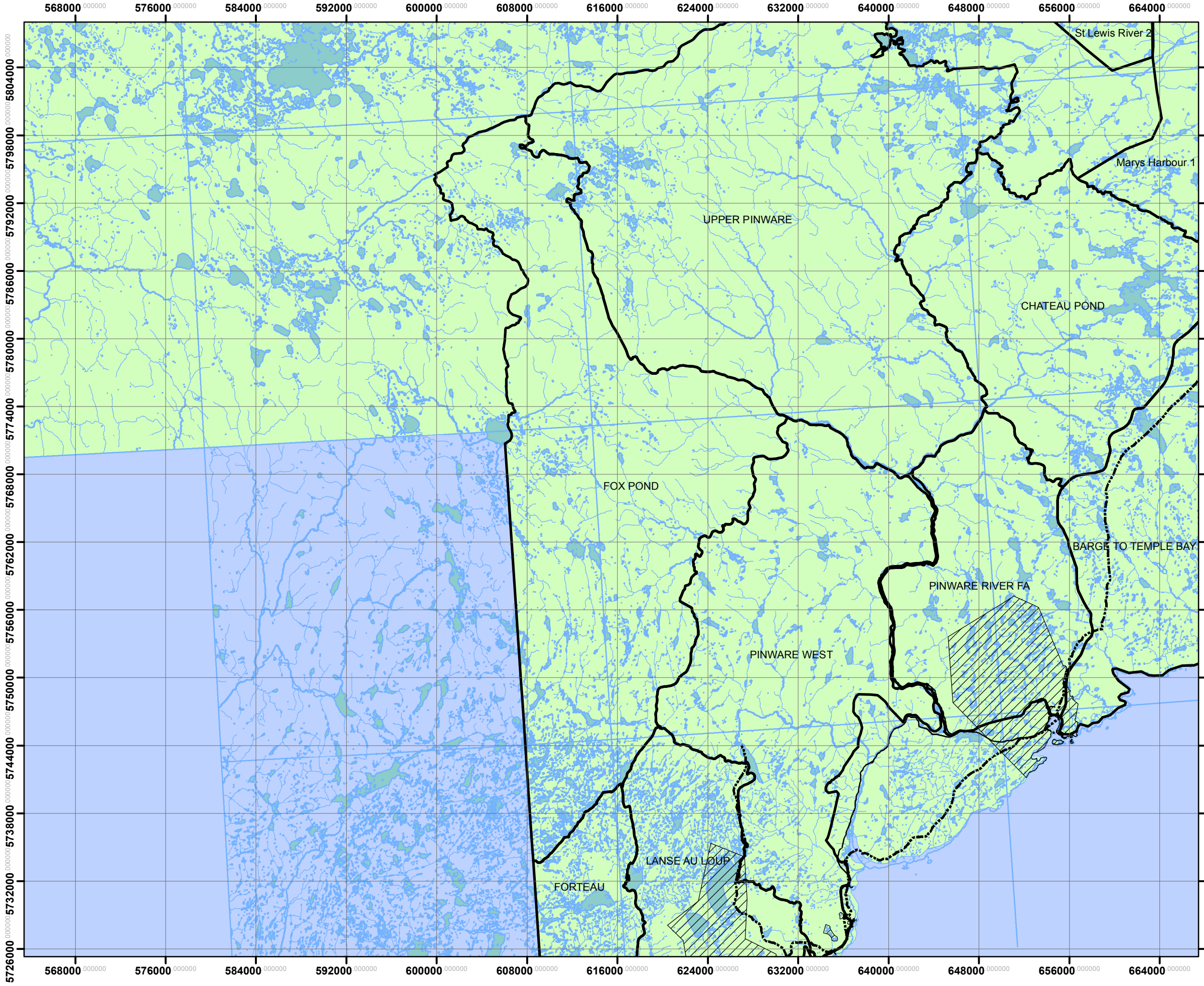
Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting





**Five Year Operating Plan: 2017-2021
Domestic Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21502
Operating Area Name: FOX POND

For block information and statistics
refer to Cover Page

Plan Features

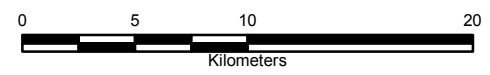
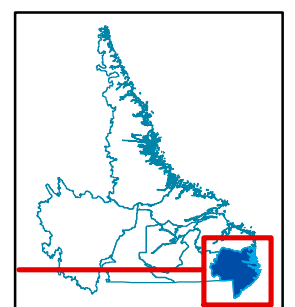
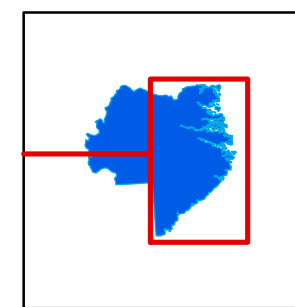
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21503
Operating Area Name: UPPER PINWARE

For block information and statistics
refer to Cover Page



Plan Features

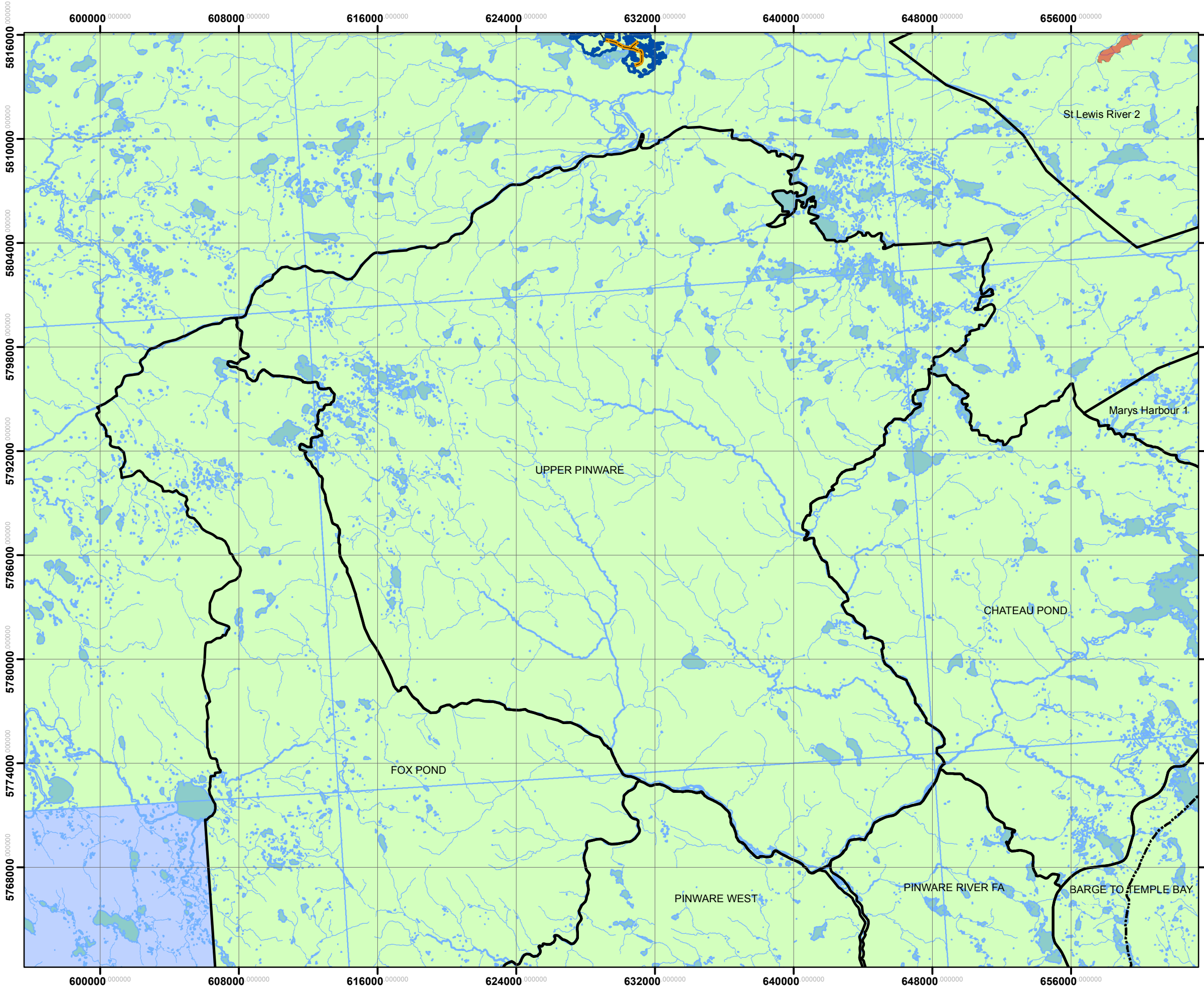
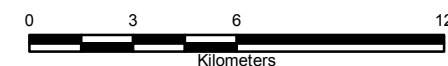
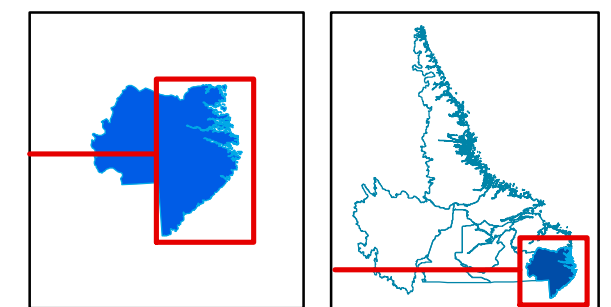
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

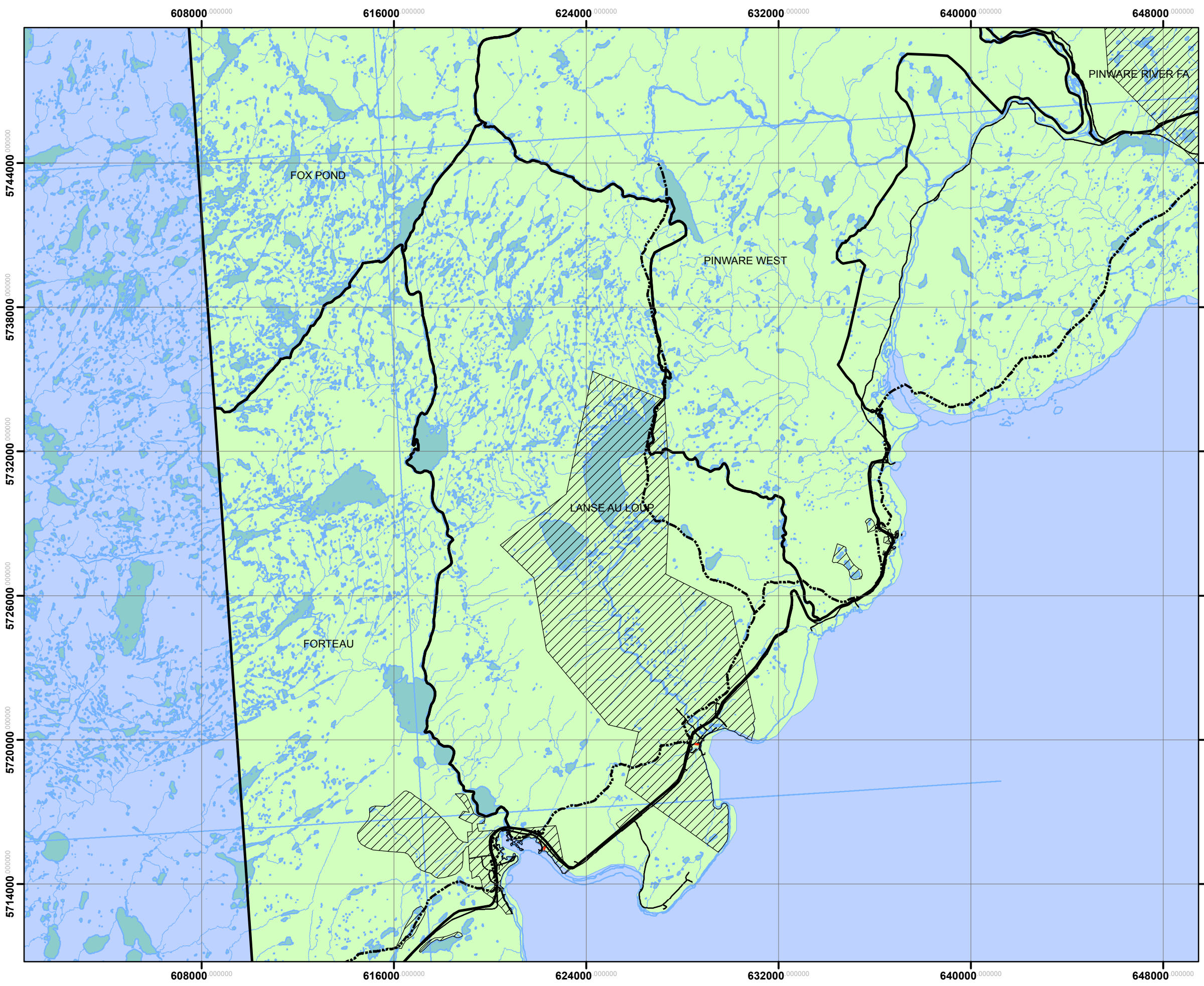
Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting





**Five Year Operating Plan: 2017-2021
Domestic Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21504
Operating Area Name: LANSE AU LOUP

For block information and statistics
refer to Cover Page

Plan Features

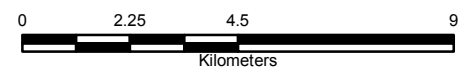
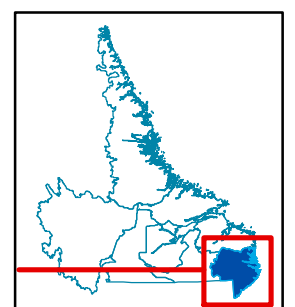
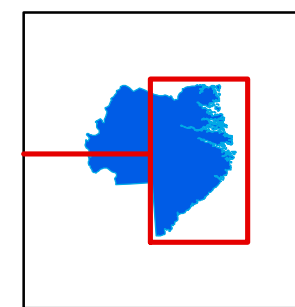
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

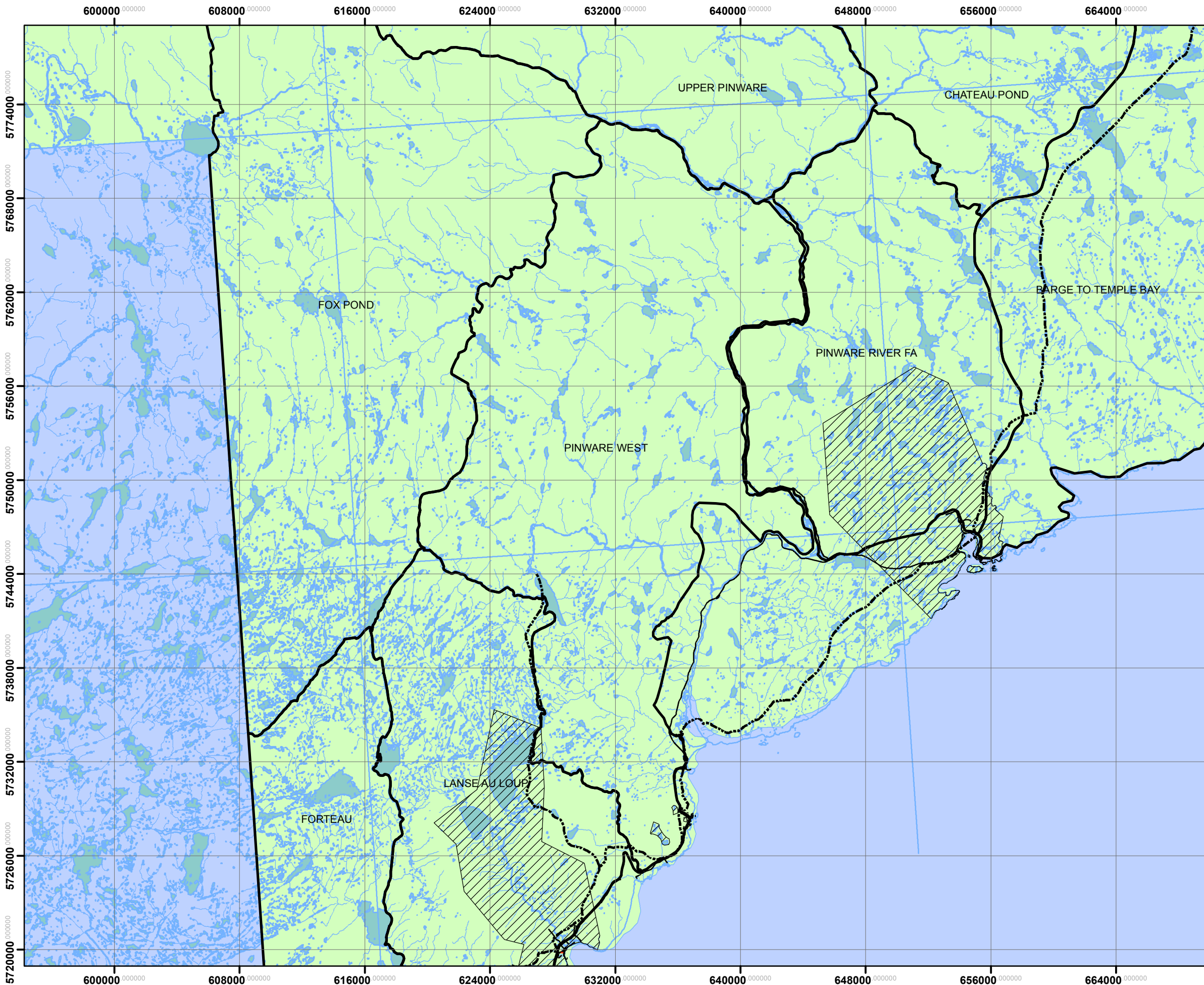
Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting





**Five Year Operating Plan: 2017-2021
Domestic Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21505
Operating Area Name: PINWARE WEST

For block information and statistics
refer to Cover Page

Plan Features

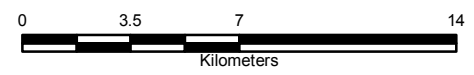
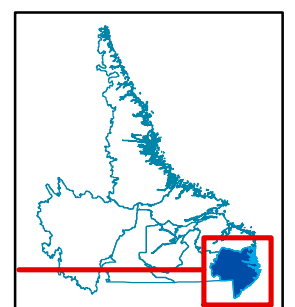
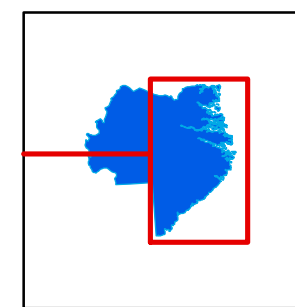
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21506
Operating Area Name: Charlottetown 3

For block information and statistics
refer to Cover Page



Plan Features

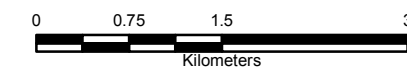
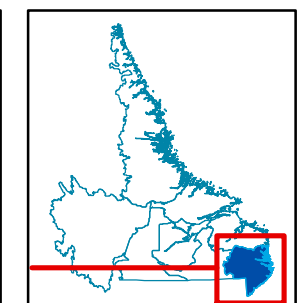
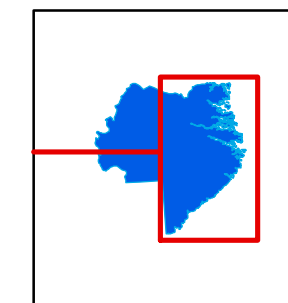
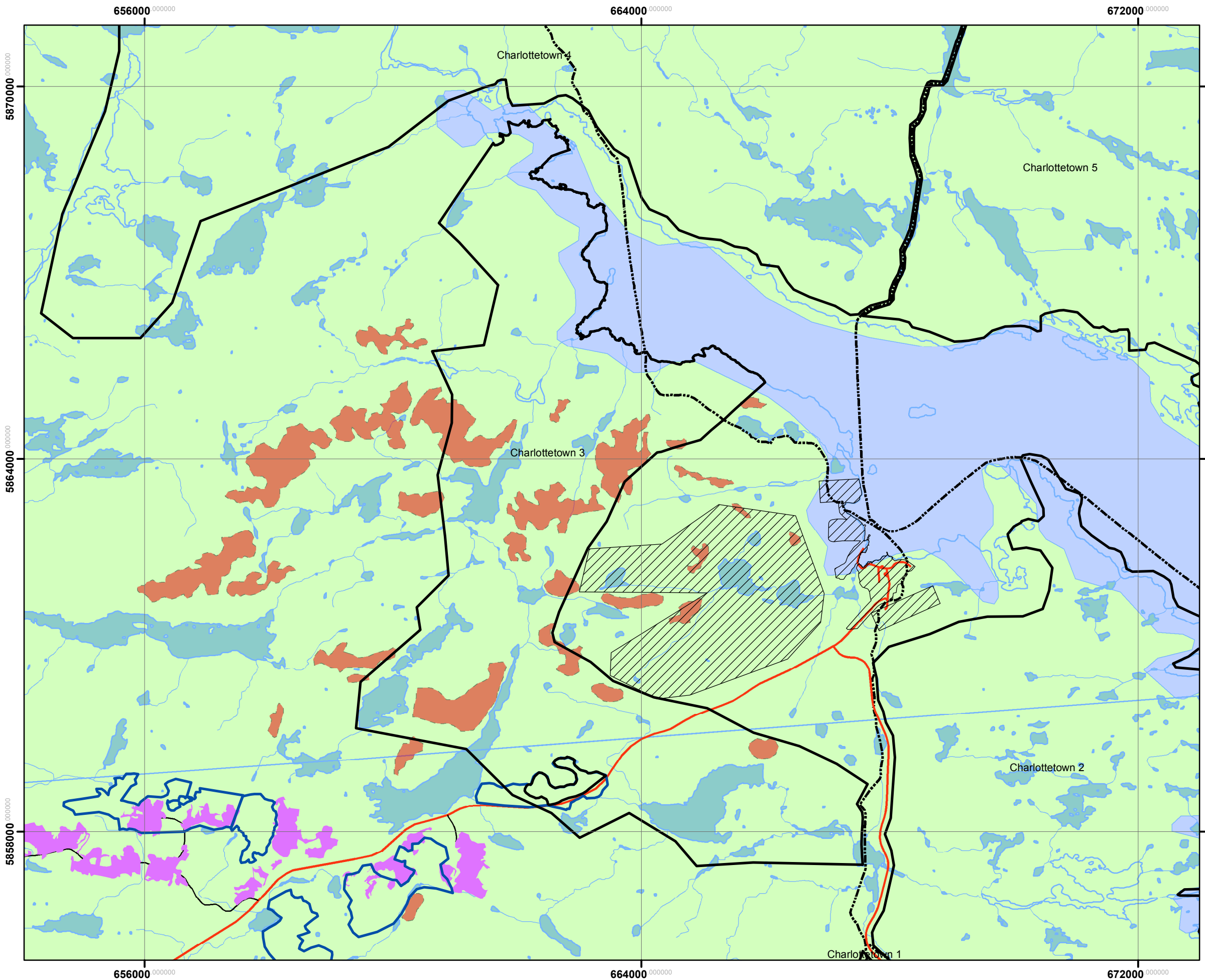
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

Basemap Features

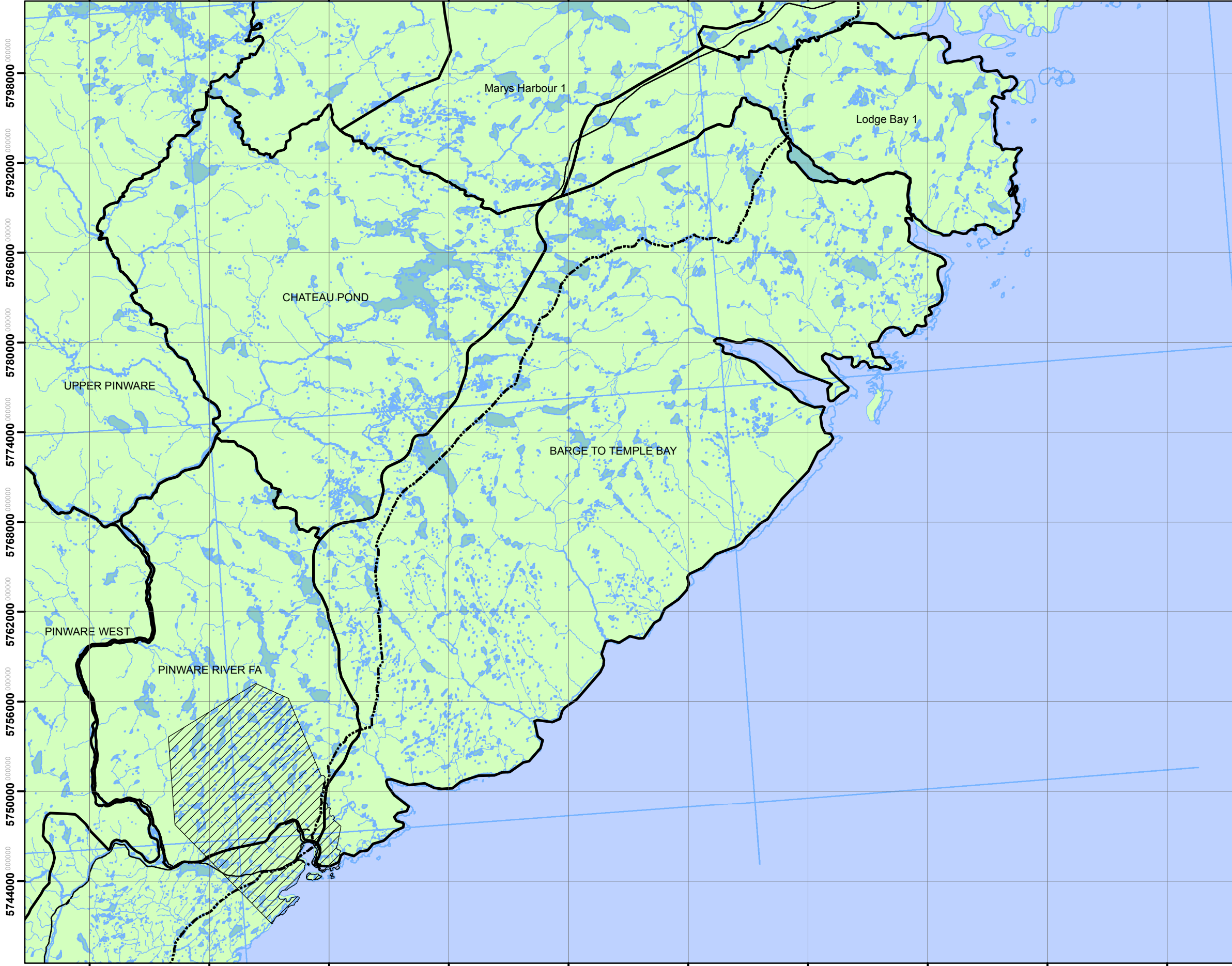
-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting



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640000 648000 656000 664000 672000 680000 688000 696000 704000 712000



Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

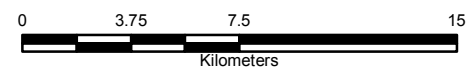
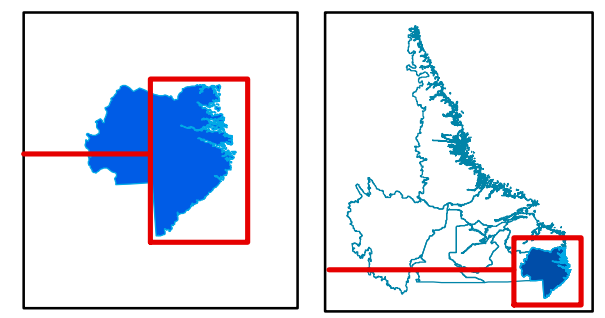
Planning Zone: Labrador
FMD: 21

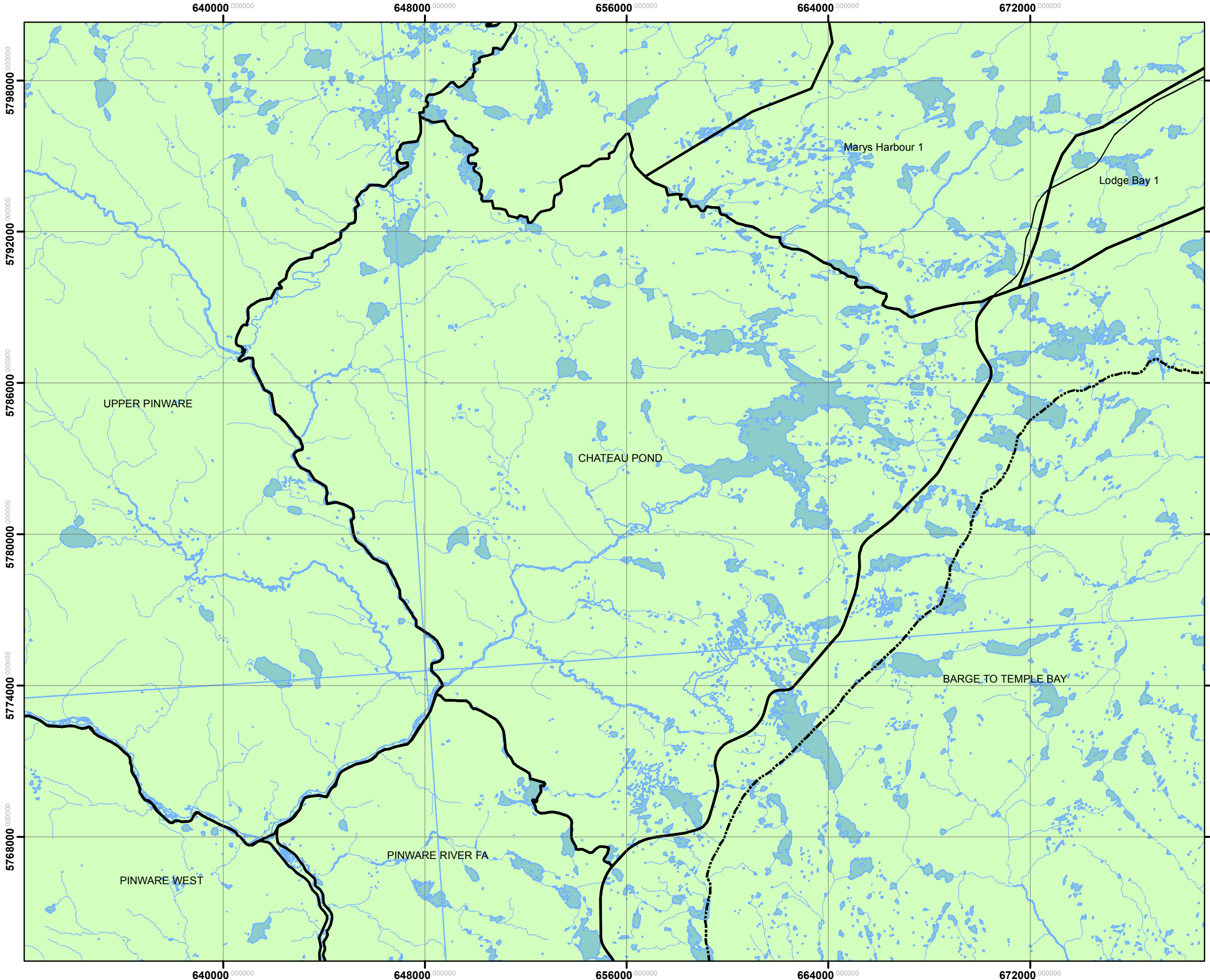
Operating Area Number: CC21507
Operating Area Name: BARGE TO TEMPLE BAY

For block information and statistics
refer to Cover Page

- Plan Features**
- Snowmobile Trails
 - Proposed Roads
 - Proposed Domestic Operating Area
 - Proposed Commercial Harvest Areas

- | | |
|-------------------------|---------------------|
| Basemap Features | Restrictions |
| Access Roads | Snowmobile Trails |
| Provincial Roads | No Cutting |
| Snowmobile Trails | |
| Brooks & Streams | |
| Insect Damage | |



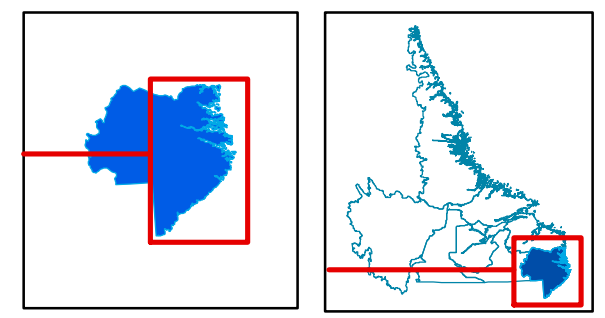


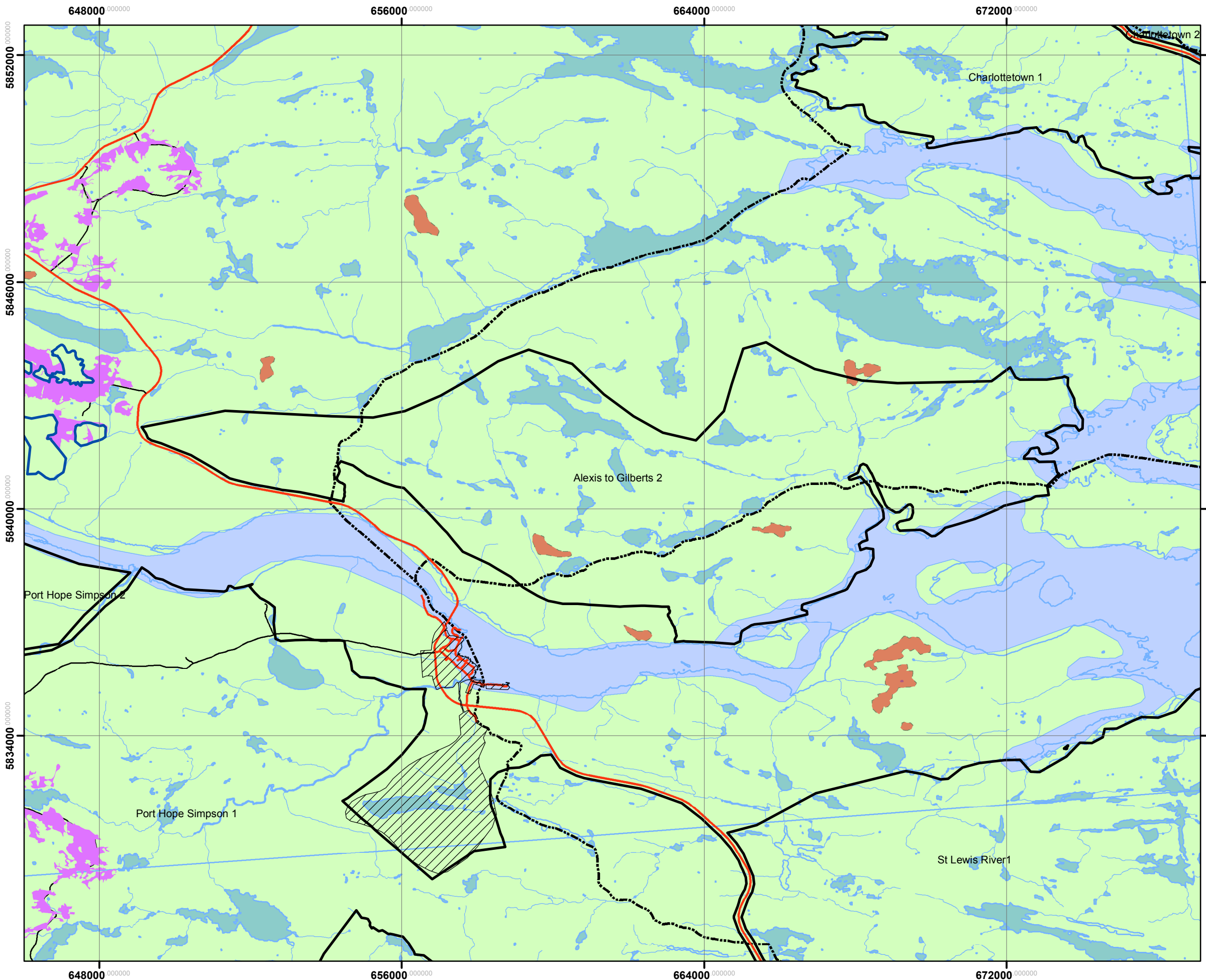
**Five Year Operating Plan: 2017-2021
Domestic Harvest Plan Map**

Planning Zone: Labrador
FMD: 21
Operating Area Number: CC21508
Operating Area Name: CHATEAU POND

For block information and statistics refer to Cover Page

- Plan Features**
- Snowmobile Trails
 - Proposed Roads
 - Proposed Domestic Operating Area
 - Proposed Commercial Harvest Areas
- | | |
|-------------------------|---------------------|
| Basemap Features | Restrictions |
| Access Roads | Snowmobile Trails |
| Provincial Roads | No Cutting |
| Snowmobile Trails | |
| Brooks & Streams | |
| Insect Damage | |





**Five Year Operating Plan: 2017-2021
Domestic Harvest Plan Map**

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21509
Operating Area Name: Alexis to Gilberts 2

For block information and statistics
refer to Cover Page

Plan Features

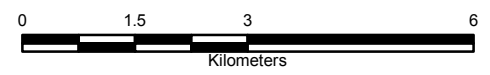
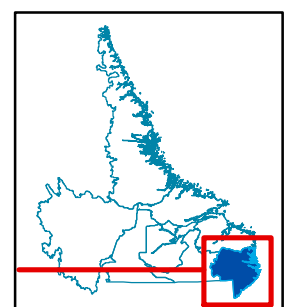
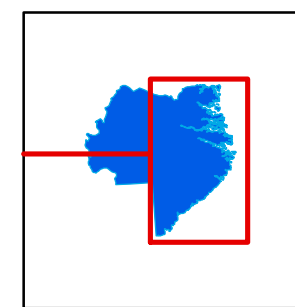
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting



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5852000 000000
5846000 000000
5840000 000000
5834000 000000





Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21510
Operating Area Name: St Lewis River 2

For block information and statistics
refer to Cover Page



Plan Features

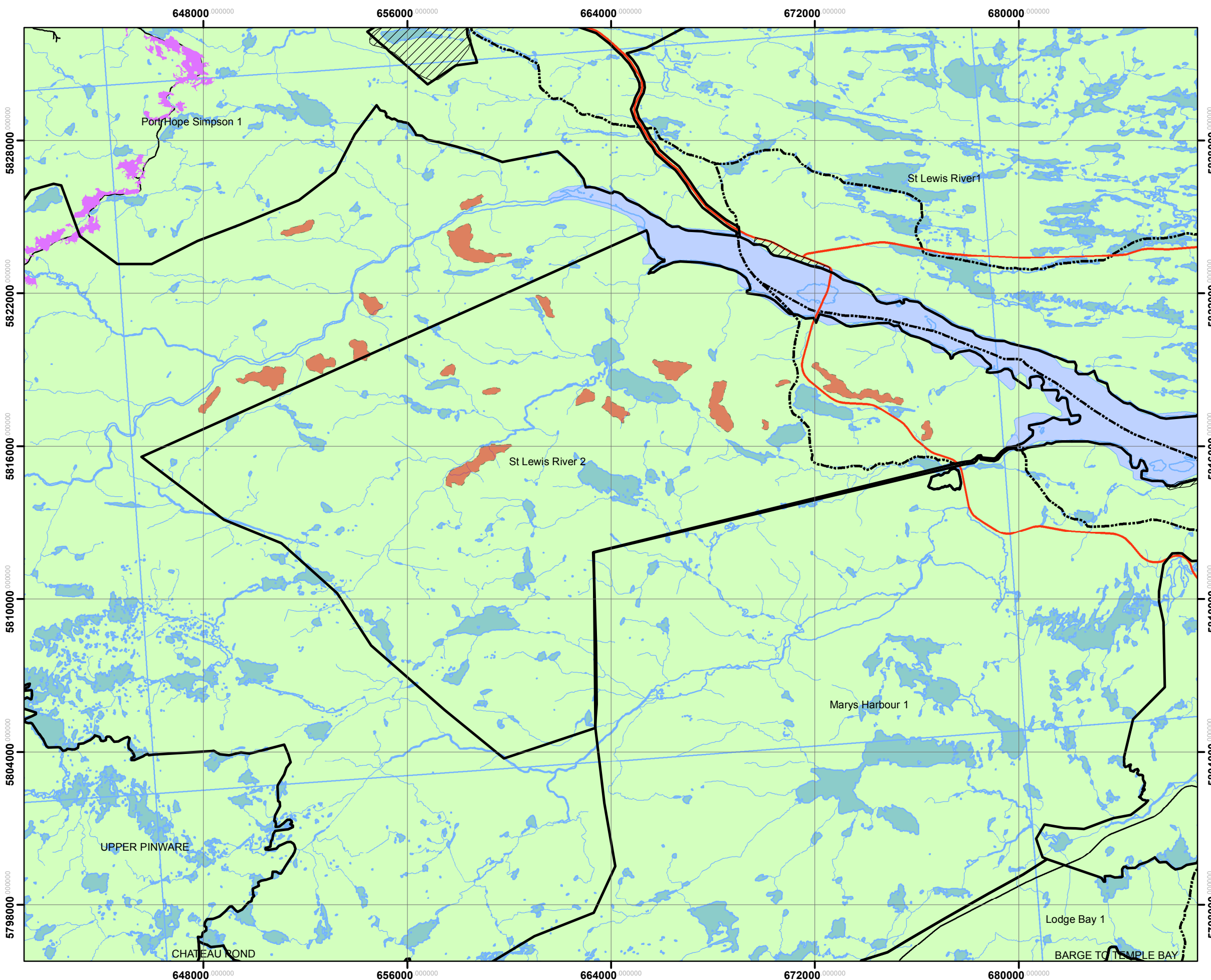
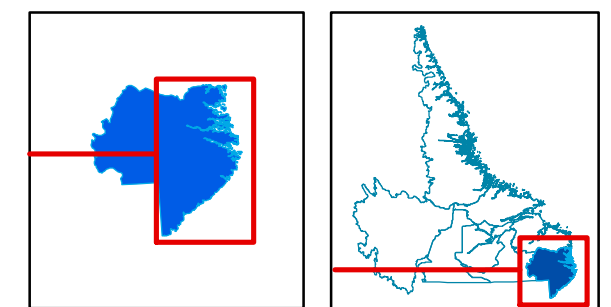
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21511
Operating Area Name: St Lewis River1

For block information and statistics
refer to Cover Page



Plan Features

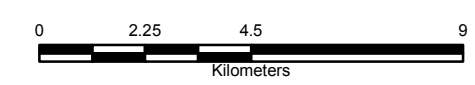
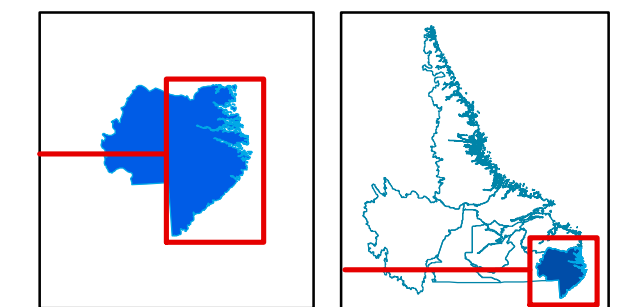
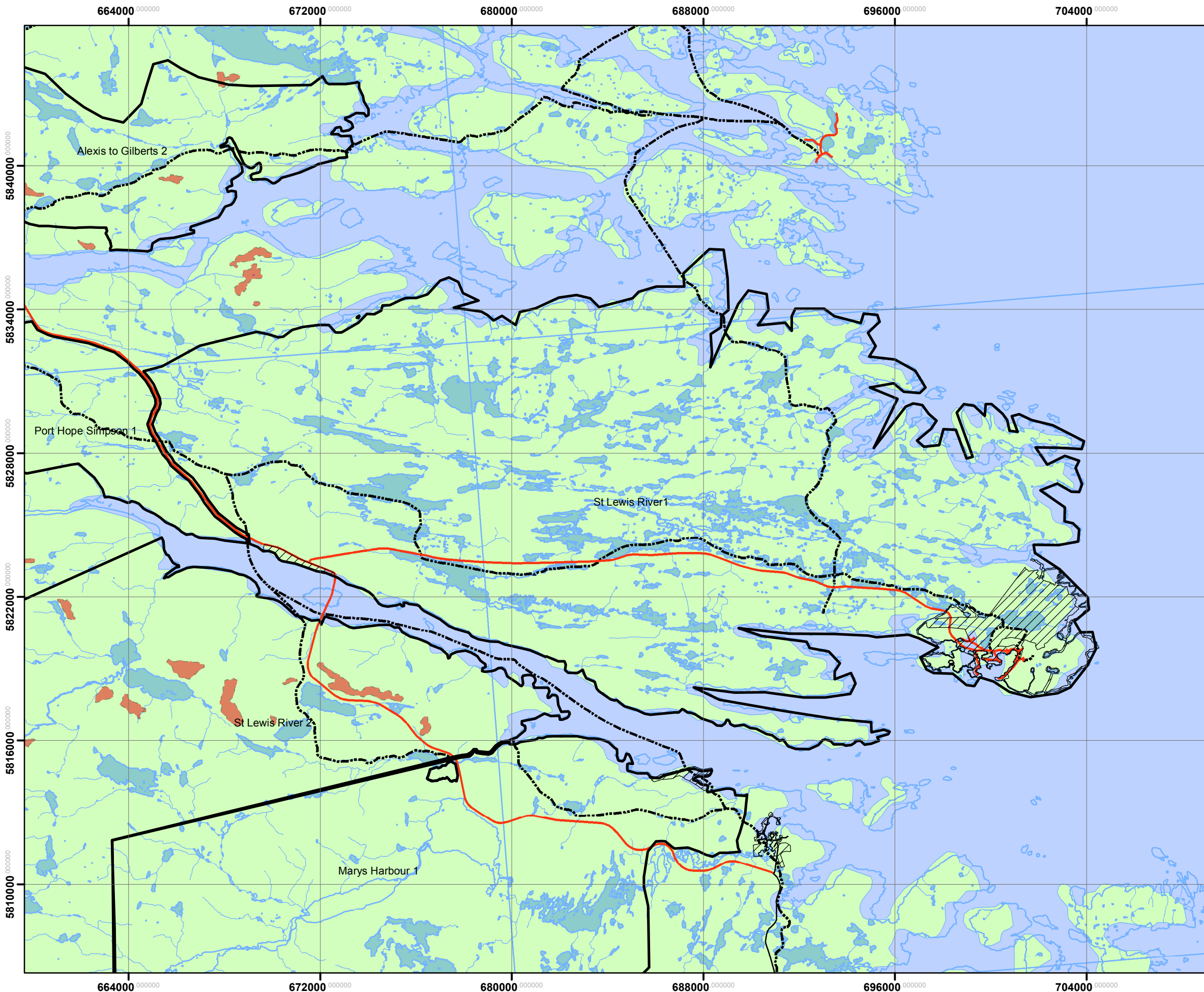
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21512
Operating Area Name: Marys Harbour 1

For block information and statistics
refer to Cover Page



Plan Features

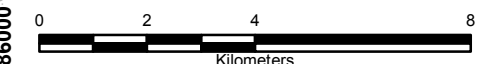
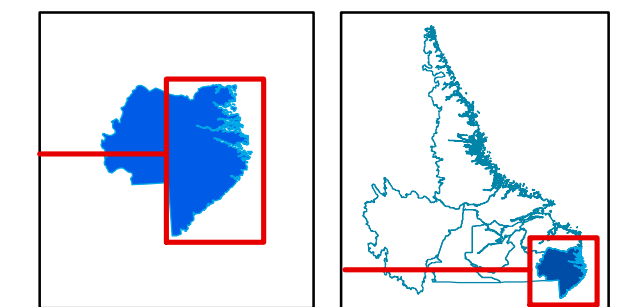
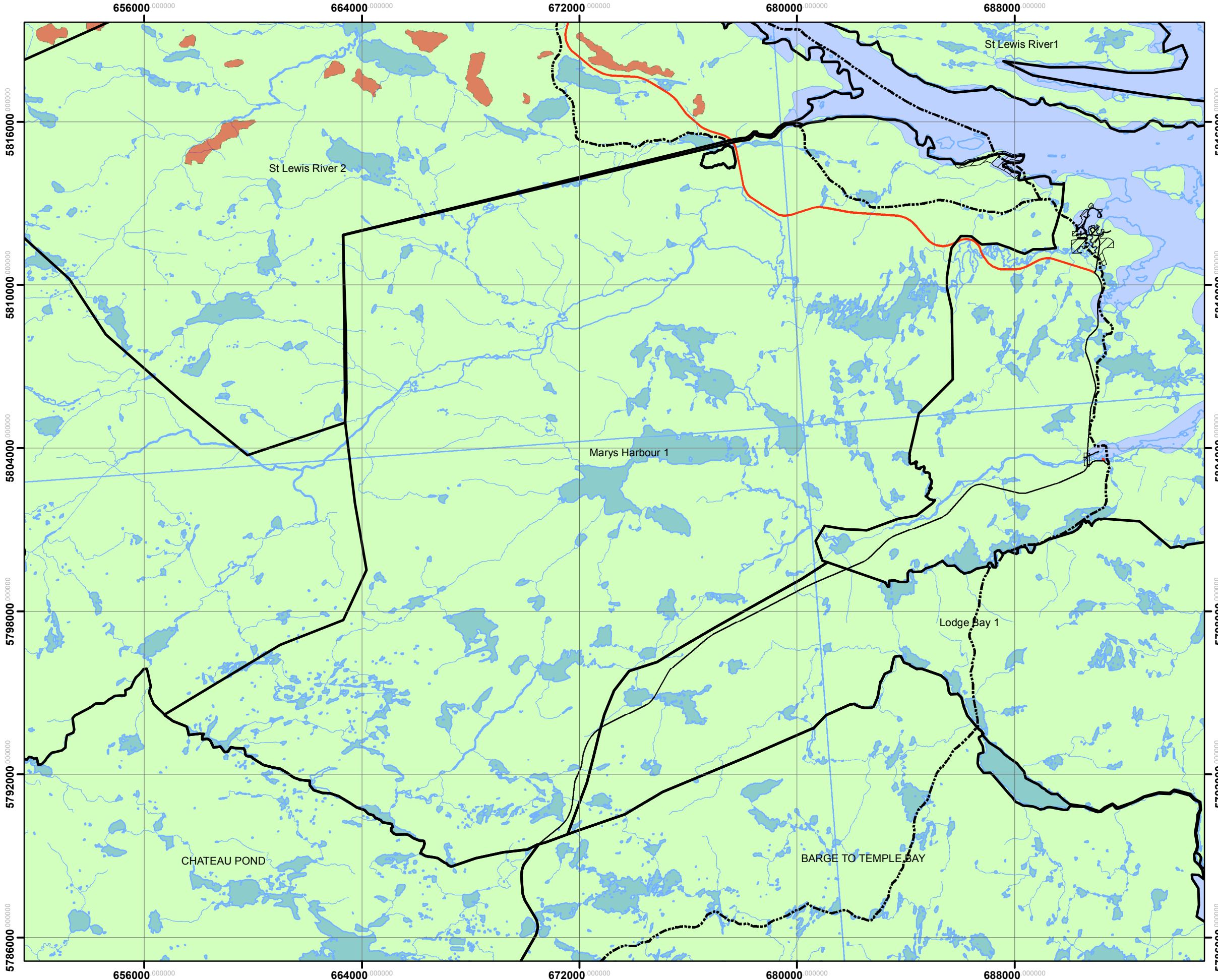
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21513
Operating Area Name: Port Hope Simpson 2

For block information and statistics
refer to Cover Page



Plan Features

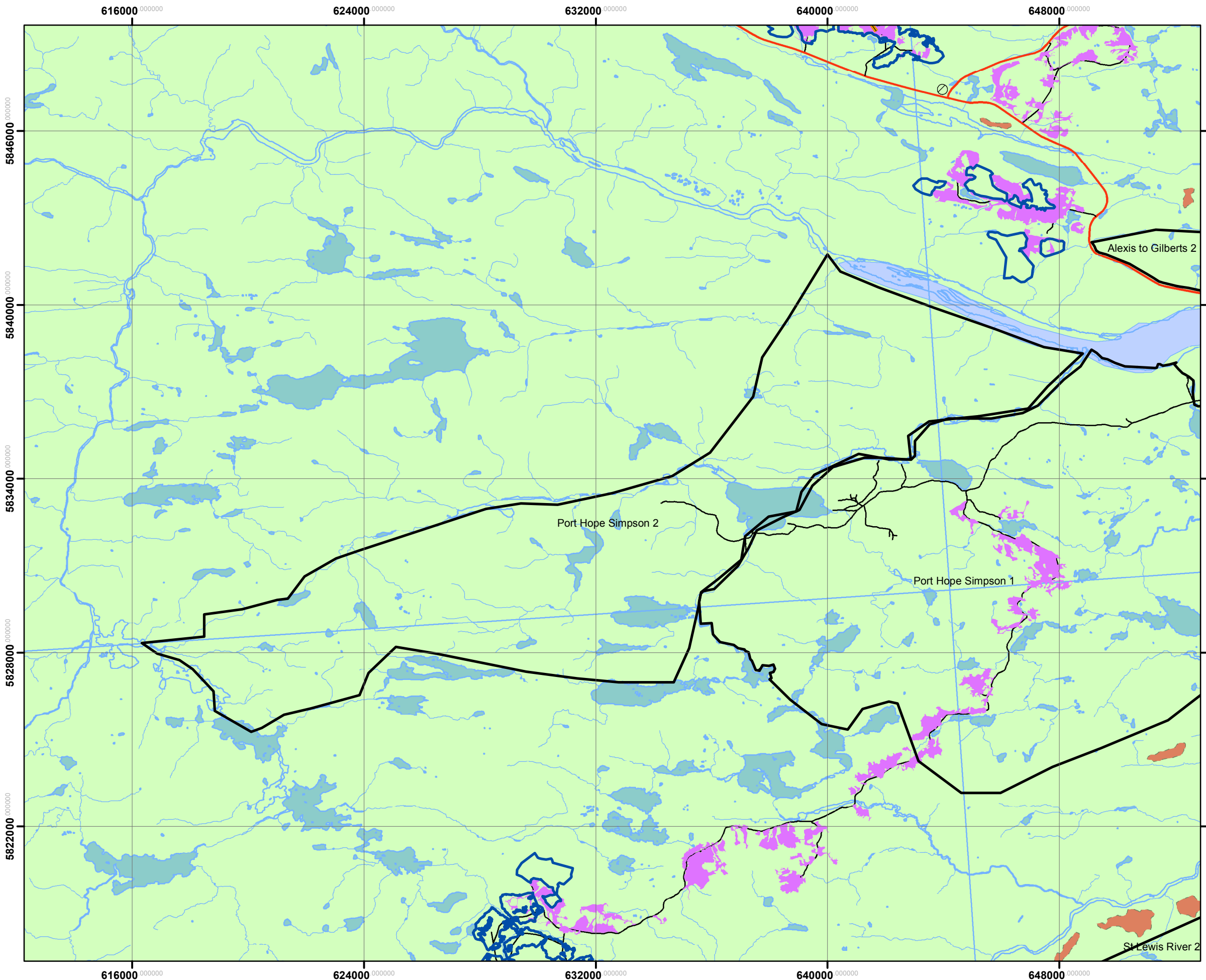
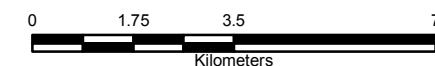
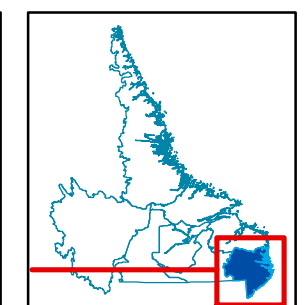
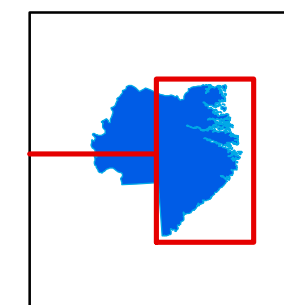
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

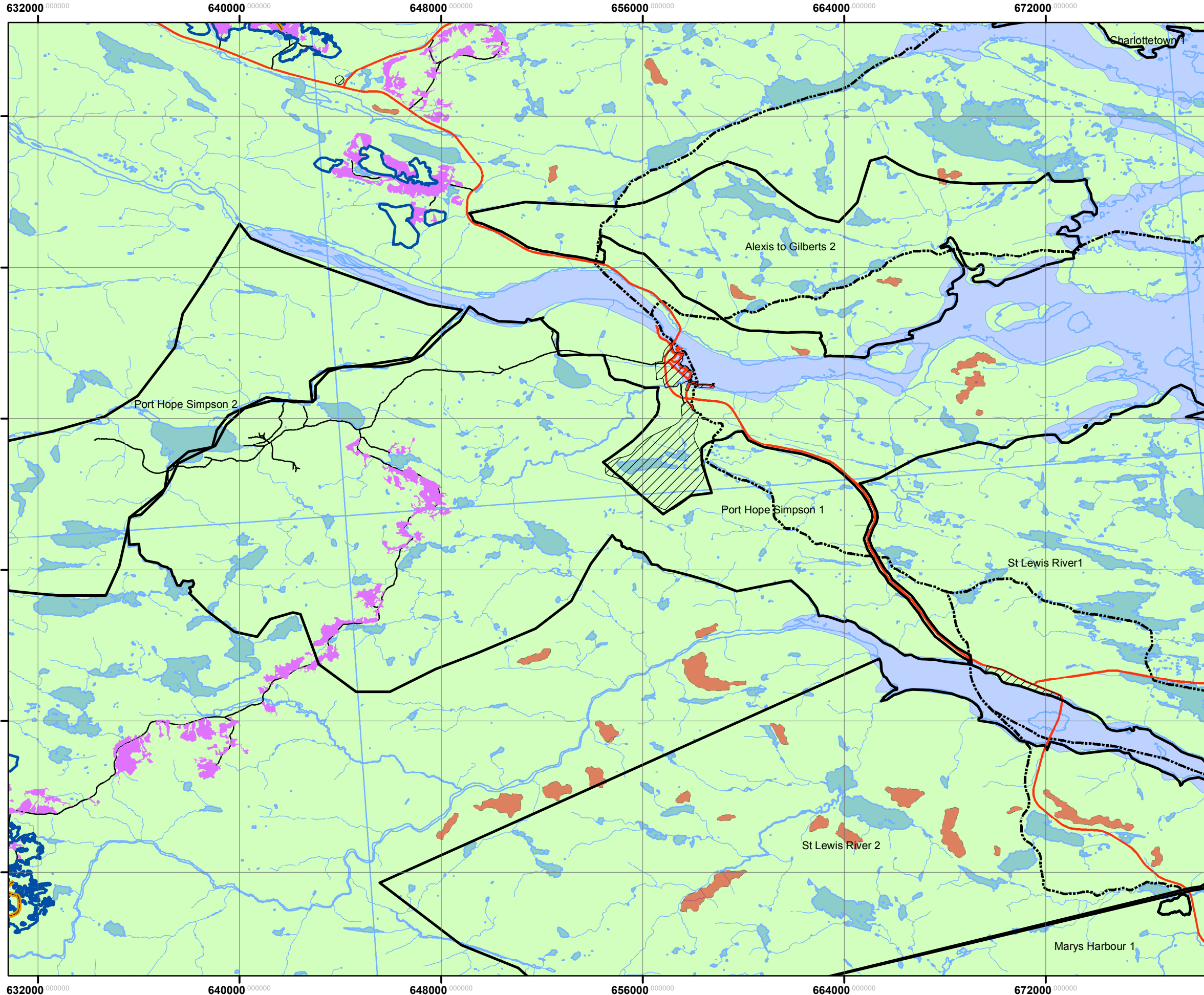
Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting





Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21514
Operating Area Name: Port Hope Simpson 1

For block information and statistics
refer to Cover Page

Plan Features

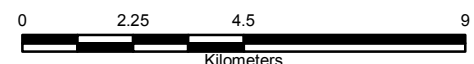
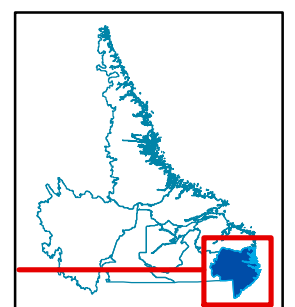
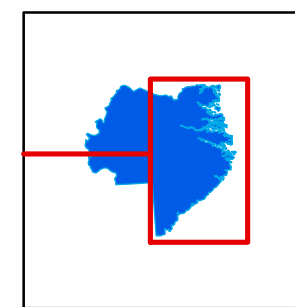
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting





Newfoundland Labrador

Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21515
Operating Area Name: Lodge Bay 1

For block information and statistics
refer to Cover Page

Plan Features

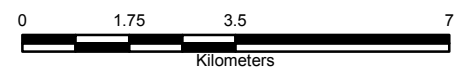
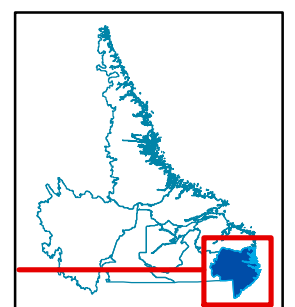
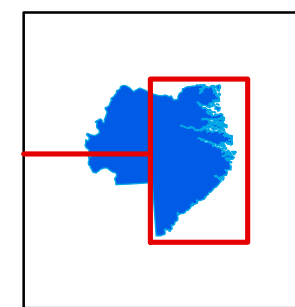
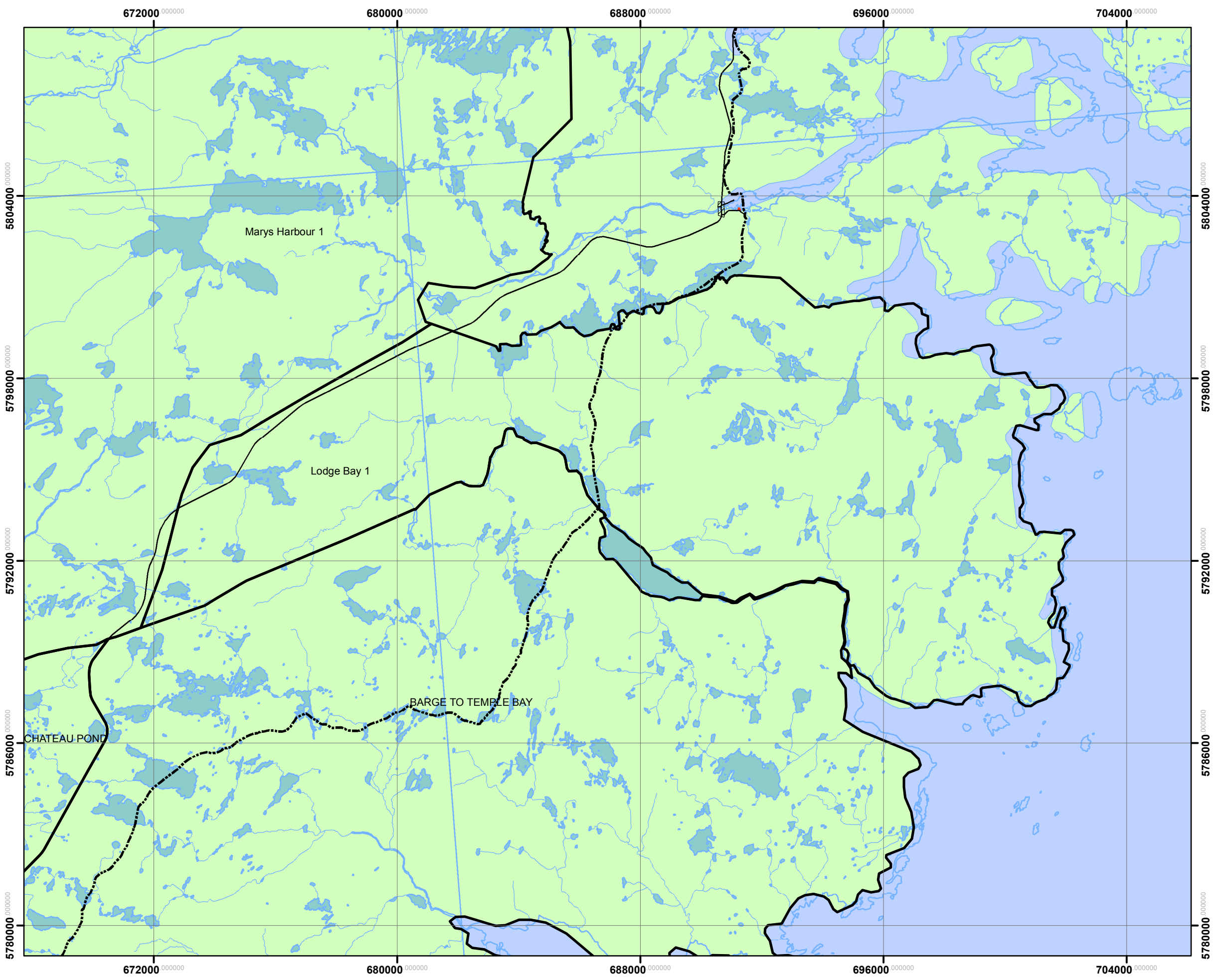
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21516
Operating Area Name: Charlottetown 5

For block information and statistics
refer to Cover Page



Plan Features

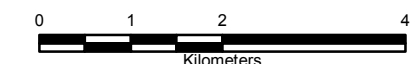
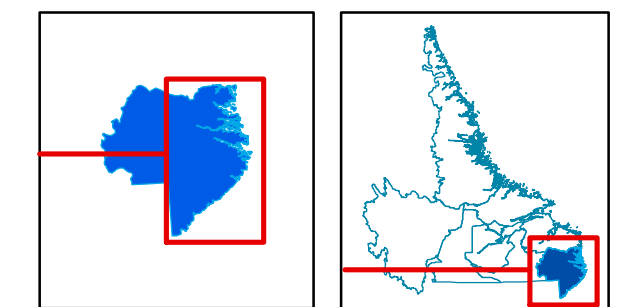
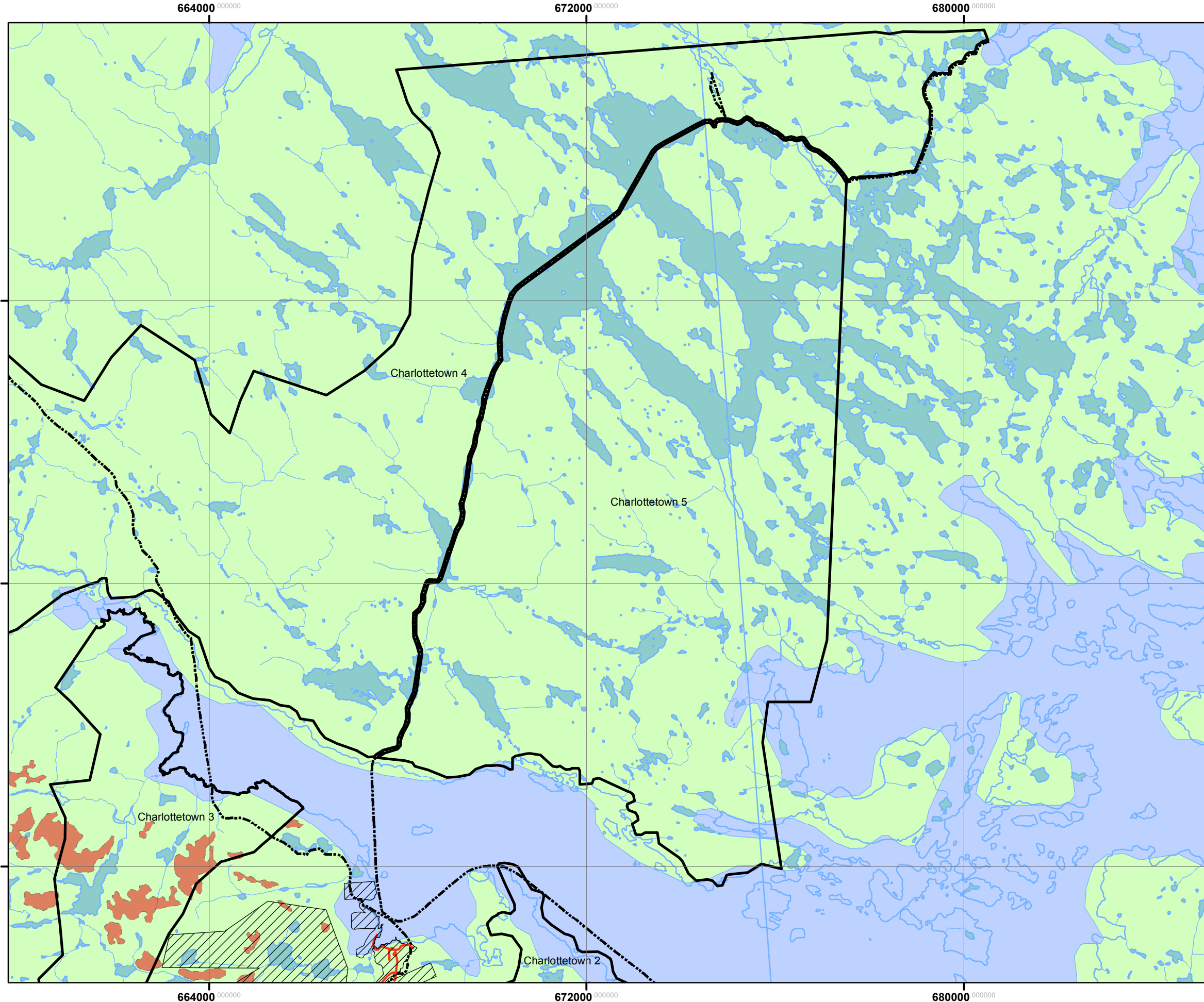
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21517
Operating Area Name: PINWARE RIVER FA

For block information and statistics
refer to Cover Page



Plan Features

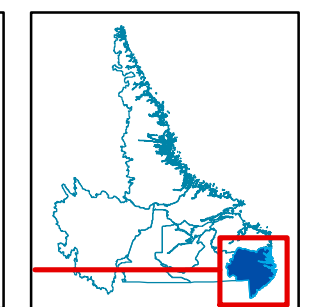
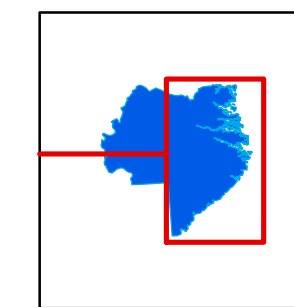
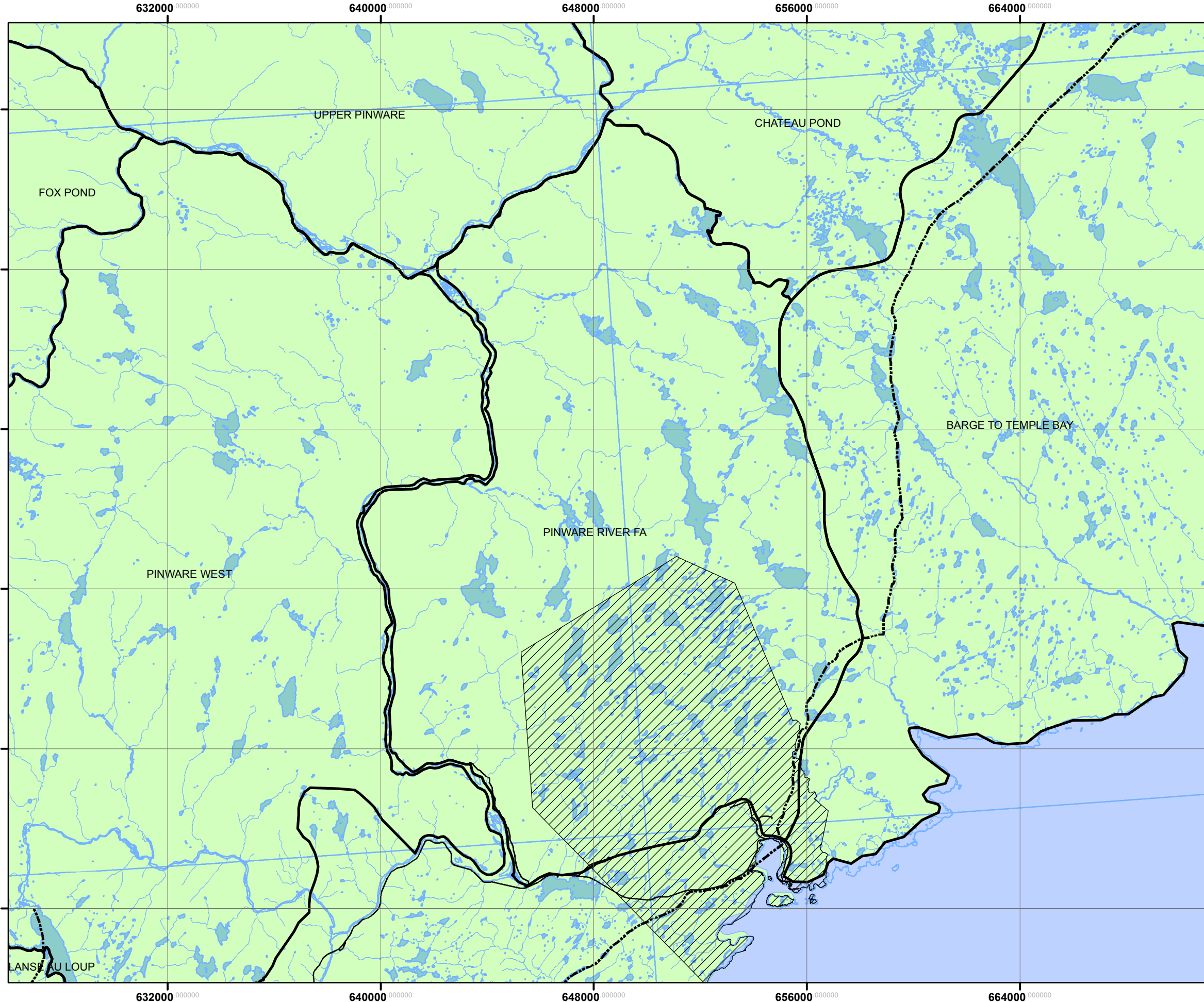
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting







Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21518
Operating Area Name: Charlottetown 4

For block information and statistics
refer to Cover Page



Plan Features

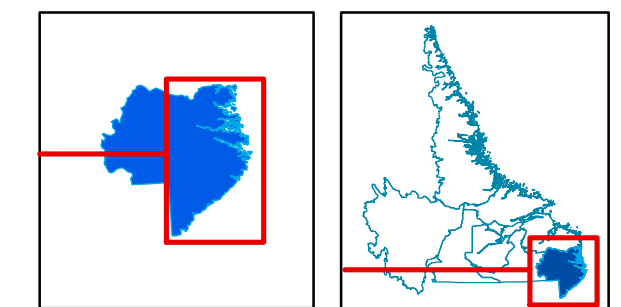
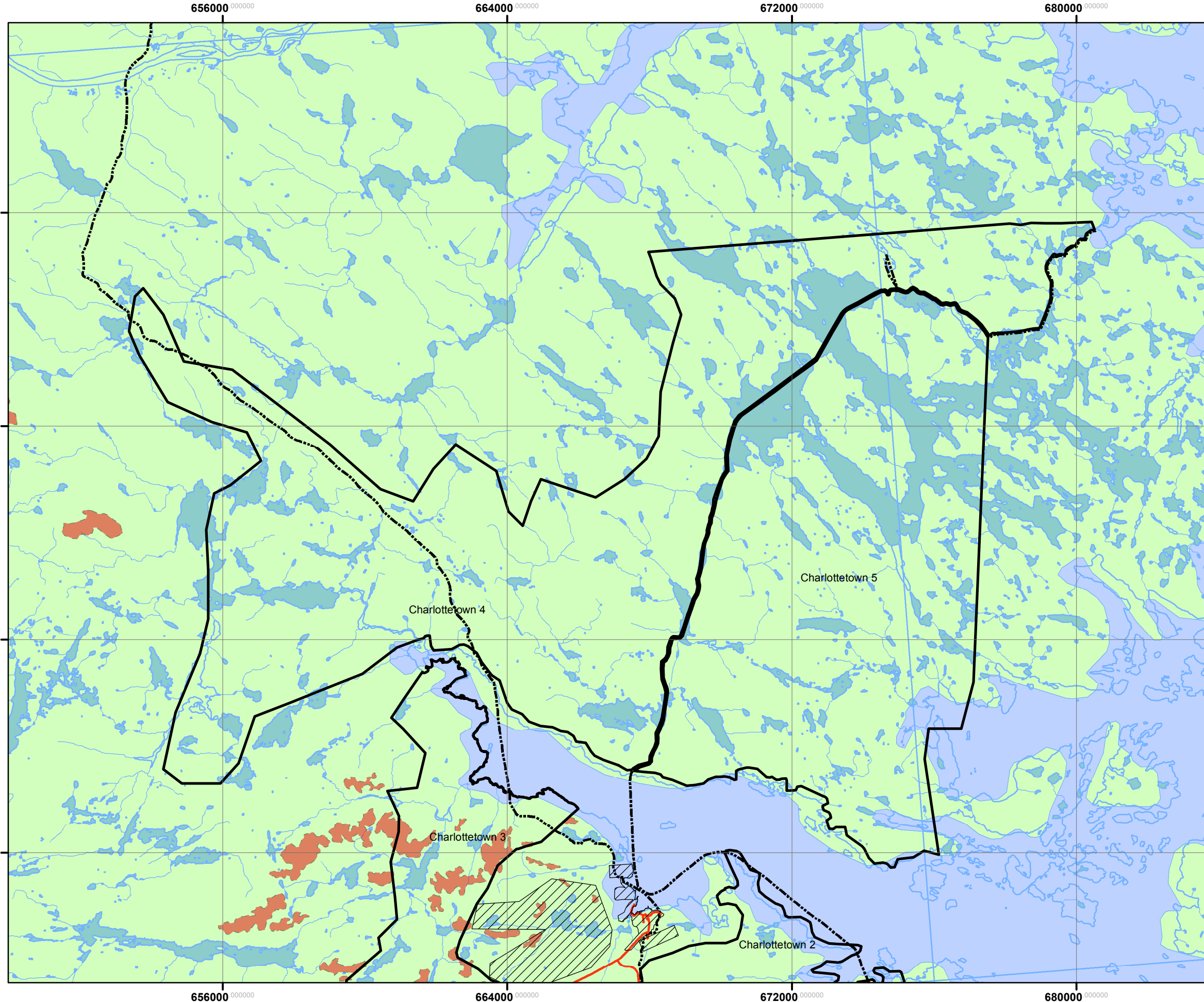
-  Snowmobile Trails
-  Proposed Roads
-  Proposed Domestic Operating Area
-  Proposed Commercial Harvest Areas

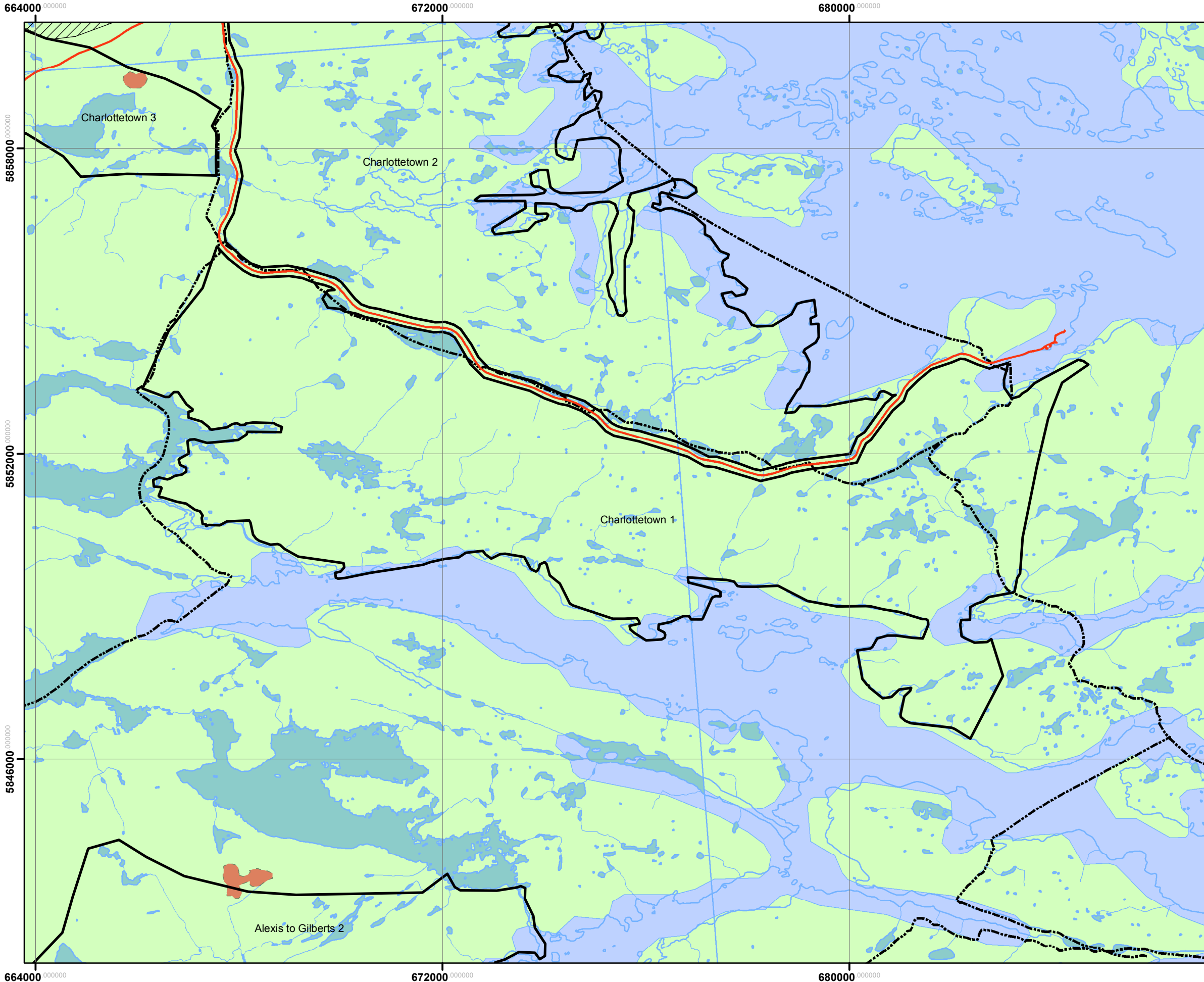
Basemap Features

-  Access Roads
-  Provincial Roads
-  Snowmobile Trails
-  Brooks & Streams
-  Insect Damage

Restrictions

-  Snowmobile Trails
-  No Cutting





Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21519
Operating Area Name: Charlotte Town 1

For block information and statistics
refer to Cover Page

Plan Features

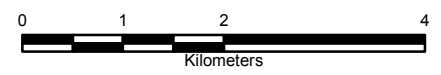
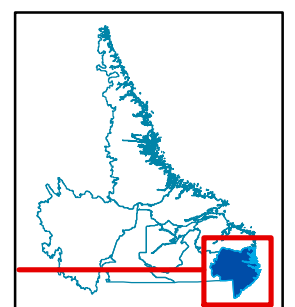
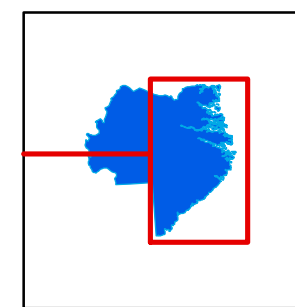
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

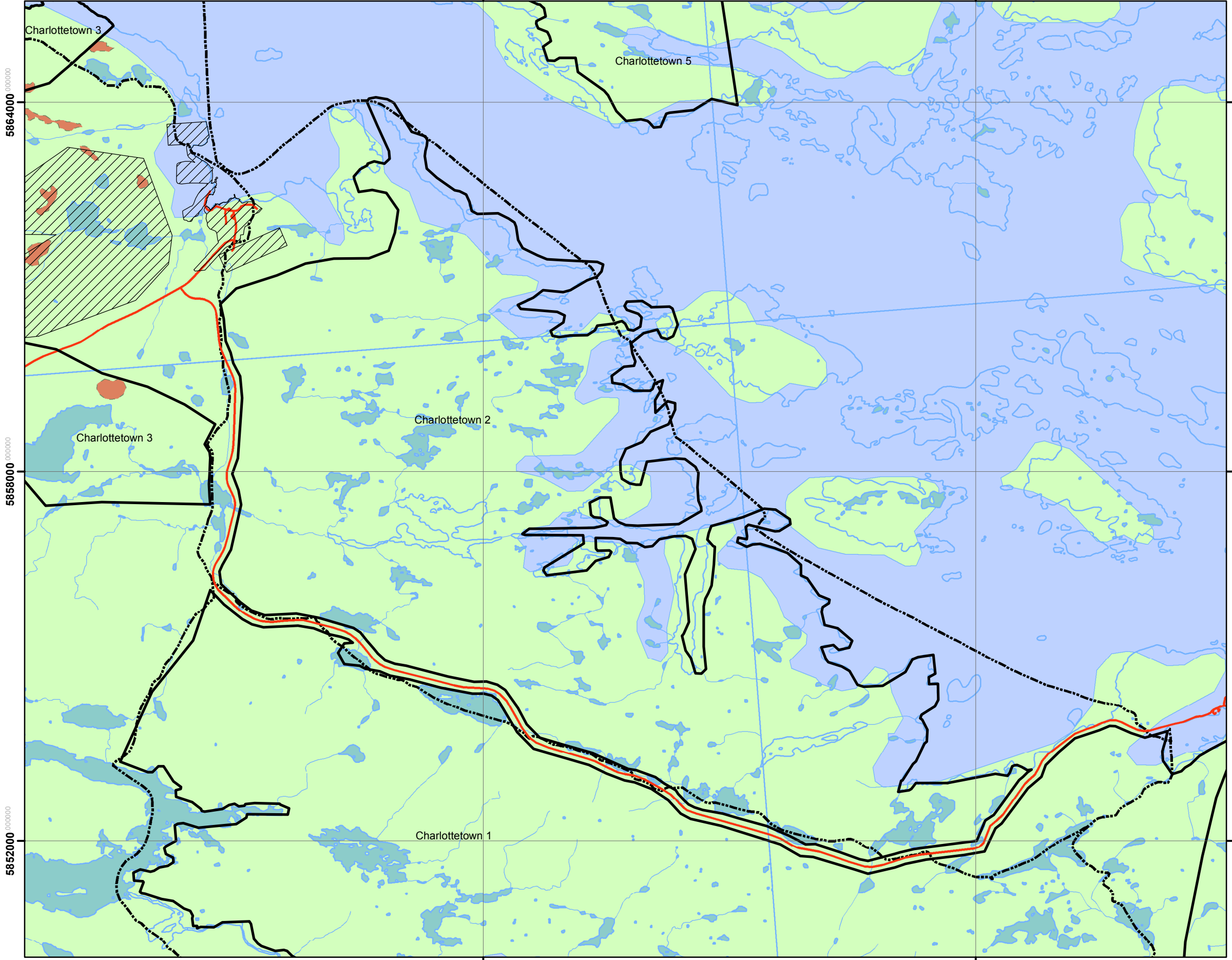
Restrictions

- Snowmobile Trails
- No Cutting



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Newfoundland Labrador

Five Year Operating Plan: 2017-2021 Domestic Harvest Plan Map

Planning Zone: Labrador
FMD: 21

Operating Area Number: CC21520
Operating Area Name: Charlottetown 2

For block information and statistics
refer to Cover Page

Plan Features

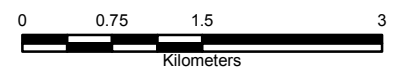
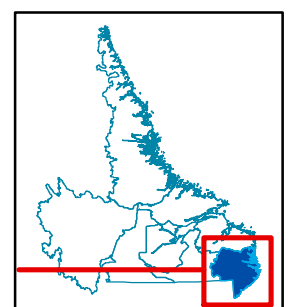
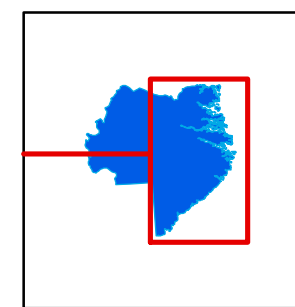
- Snowmobile Trails
- Proposed Roads
- Proposed Domestic Operating Area
- Proposed Commercial Harvest Areas

Basemap Features

- Access Roads
- Provincial Roads
- Snowmobile Trails
- Brooks & Streams
- Insect Damage

Restrictions

- Snowmobile Trails
- No Cutting



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Charlottetown 3

Charlottetown 5



Charlottetown 2

Charlottetown 3










Charlottetown 1

Map 56
Five Year Operating Plan: 2017-2021
Proposed Roads
 Planning Zone: Labrador
 FMD: 21


Plan Features

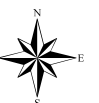
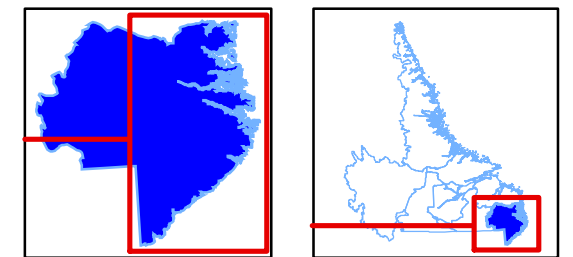
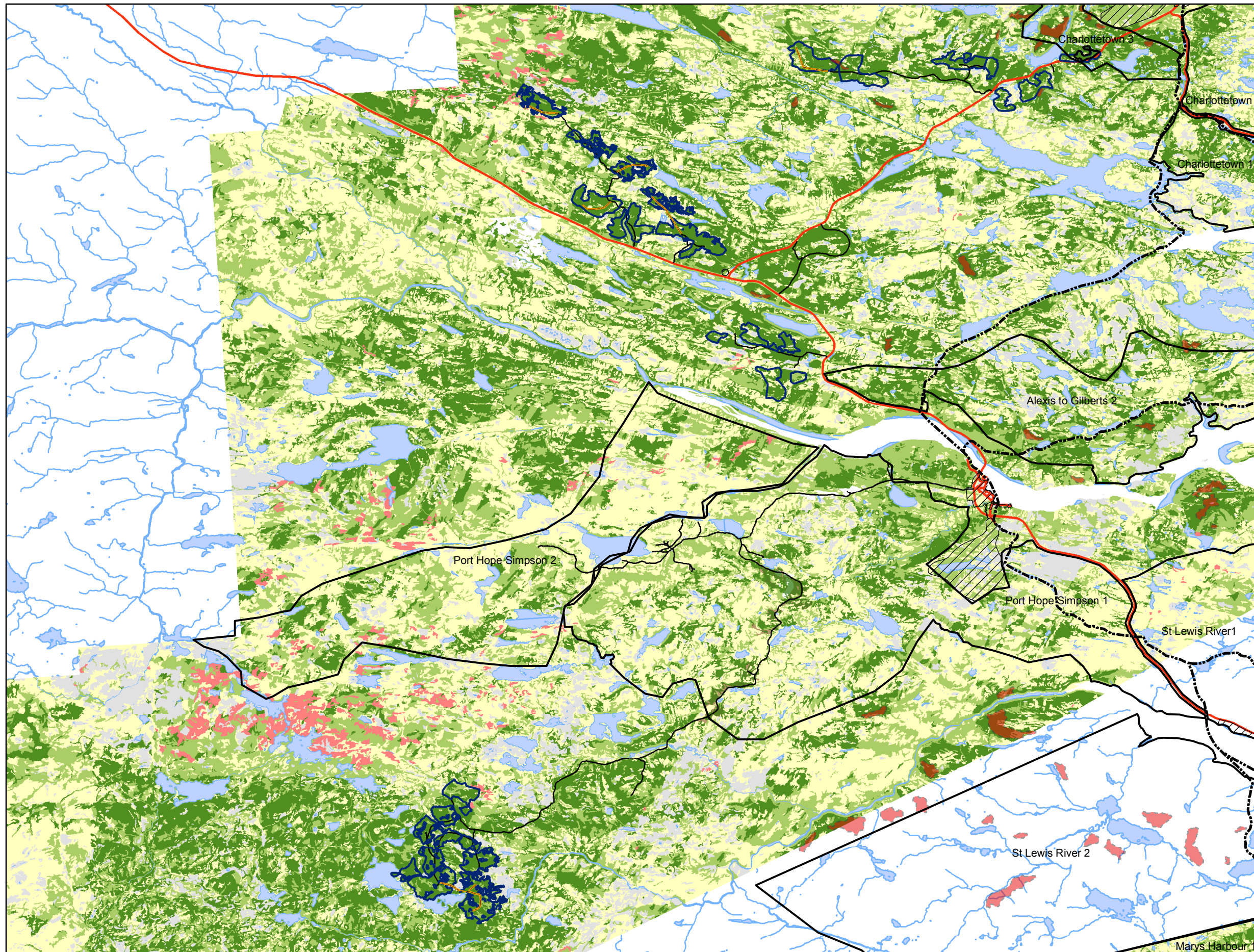
-  Proposed Roads
-  Commercial Harvest Blocks
-  Proposed Domestic Operating Area
-  Harvestable

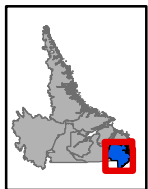
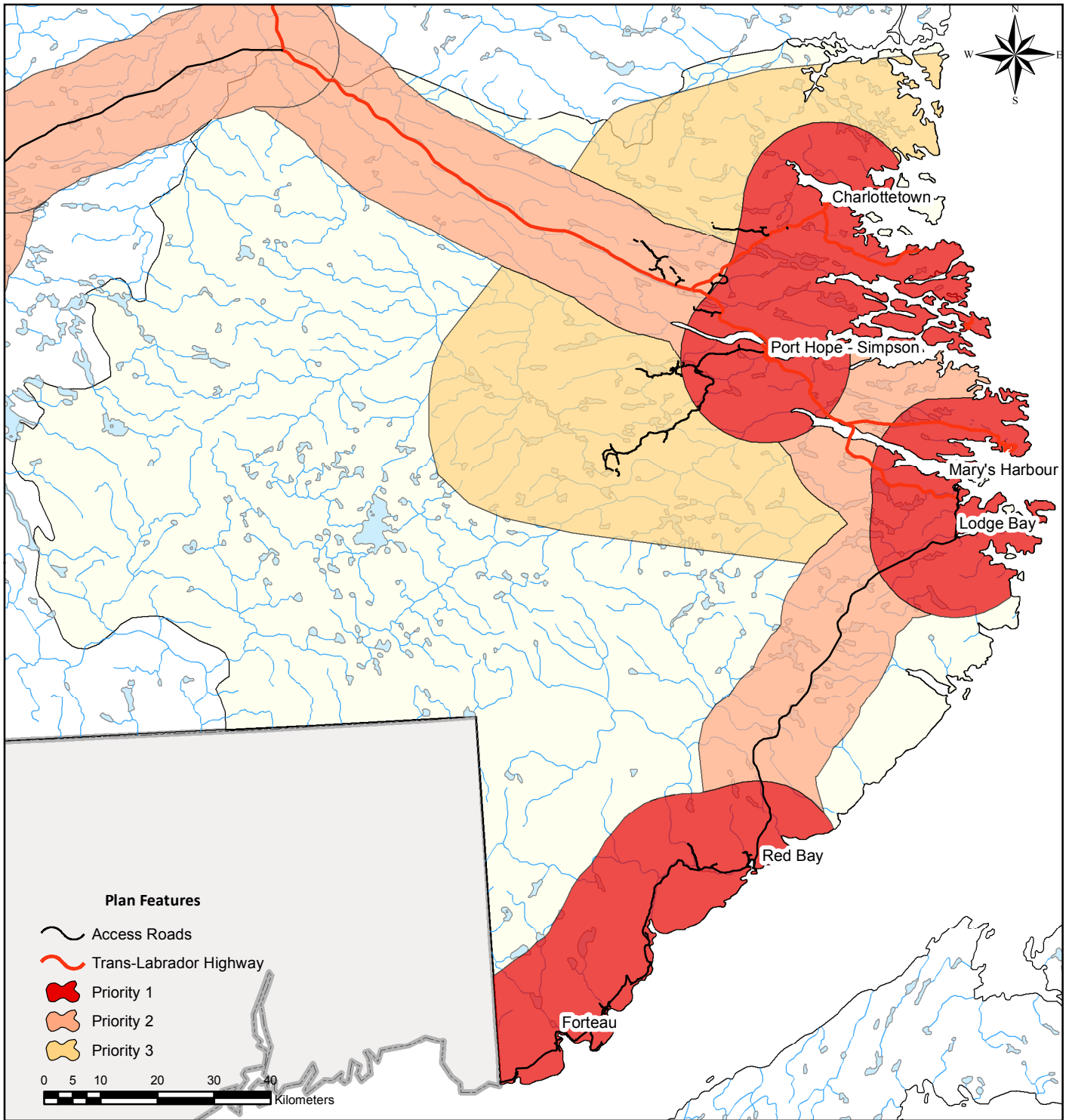
Basemap Features

-  Snowmobile Trails
-  Insect Damage
-  Access Roads
-  Trans Labrador Highway
-  Productive
-  Cutovers
-  Disturbances
-  Scrub
-  Non-Forested

Restrictions

-  No Cutting





Map 57
 Five Year Operating Plan: 2017-2021
 Fire Priority Areas
 Planning Zone: Labrador
 FMD: 21

