

Name of Undertaking: Forest Management District 5 and 6 (Zone 3)
Five year Operating Plan
2022 - 2026

Proponent: Corner Brook Pulp and Paper Limited
P.O. Box 2001
Corner Brook, NL.
A2H 6J4

Chief Executive Officer: Darren Pelley
Vice President and General Manager
709-637-3105

Contact Person: Kimberly Childs RPF BScF
Sustainable Forest Management Forester
709 637 3386 (office) 709-637-3469 (fax)
Email: kim.childs@kruger.com

Purpose: Carry out Forest Management activities as required.

Geographical Location: Forest Management Districts 5 and 6, within Planning Zone 3 extends from Seal Bay in the northwest, to the general area of the Bay D'Espoir Highway near Great Gull Lake

Operation: Timber harvesting, primary resource road construction, silviculture, and other forest management activities as required.

Occupations: Equipment Operators, Loggers, Mechanics, Technicians, Scalers, Supervisors, Foresters, Consultants and Managers

Documents: Zone 3 Five year Operating Plan 2022-2026

Approvals: Department of Fisheries Forestry and Agriculture
Department of Municipal Affairs and Environment
Department of Fisheries and Oceans (Federal)
Canadian Coast Guard

Schedule: January 1, 2022 - December 31, 2026

June 17, 2021
Date



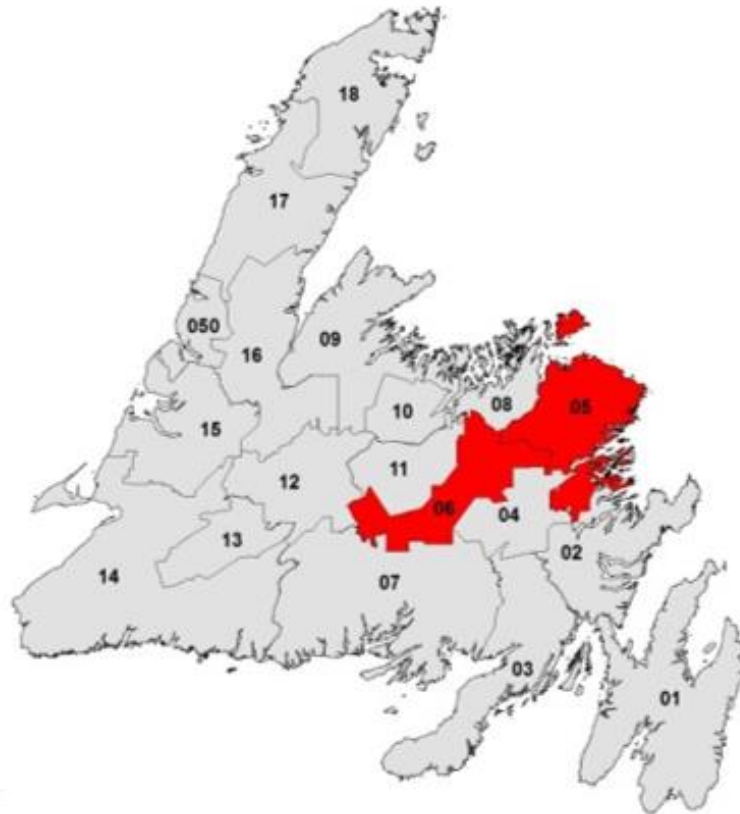
Kim Childs
Kimberly Childs RPF BScF

Corner Brook Pulp and Paper Limited

Five Year Operating Plan

Zone 3 Forest Management Districts 5 and 6

January 1st, 2022 –December 31st 2026



Corner Brook Mill

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1. Introduction

This new five year operating plan covers the period from January 1, 2022 to December 31, 2026 and represents proposed forestry activity upon Corner Brook Pulp and Paper Limited (CBPPL) timber lands within Forest Management Districts 5 and 6. The management of this land is consistent with strategies and philosophies implemented by CBPPL on all other CBPPL managed districts within the Province.

This five-year operating plan is compliant with established provincial planning requirements, Environmental Protection Guidelines, and standard operating procedures developed under a stringent Environmental Management System (EMS) which is registered under the ISO 14001 Standard and the Sustainable Forestry Initiative Forest Management Standard. Sections that are provincial in scope such as carbon, global warming are included in the provincial sustainable forest management strategy, while sections that are more descriptive or depict local conditions such as values, forest characterization and ecosystem description are included in the five year operating plan.

Forest Management Districts 04, 05, 06 and 08 are adjacent and share common ecoregion characteristics and collectively form Planning Zone Three. The requirement for submission to the Forestry Services Branch and for Environmental Assessment is one five year operating plan for each owner in each Zone. The requirement for submission to the Fisheries, Forestry and Agriculture Agency (FFA) and for environmental assessment is one five year operating plan for each owner in each zone. This zone is comprised of both crown land and private tenure, however; so there will be only one submission by the crown and one by Corner Brook Pulp and Paper. Throughout this five year plan, references will be made to Districts 04, 05, 06 and 08 individually but when combined they will collectively be referred to as Planning Zone Three or the Zone.

This document will attempt to fully integrate the presentation of information and discussions for CBPPL land in the zone. Discussion and information may be presented separately for each district where warranted based on unique and distinct differences in scope and content, with the main focus being on Districts 5 and 6. The more descriptive sections of this plan will be generic in nature and give information for the entire zone as well as some broad comparative statistics.

Finally, this document will build on previous documents. Information will be updated as required or new sections will be added if any new information is available. Sections from previous documents will be included if they are still relevant.

2. Landbase Description

2.1. General

Planning Zone 3 encompasses FMD's 4, 5, 6 and 8 (Map 1-1). It extends from Seal Bay in the northwest, easterly along the coast to New-Wes-Valley in the northeast, then southerly to Terra Nova National Park in the east and then west along the northern edge of the Bay Du' Nord Wilderness Area to the general area of the Bay D'Espoir Highway near Great Gull Lake.

2.1.1. Location

Forest Management District 4, known as the Terra Nova Management District, basically encompasses both the Terra Nova and Gambo River watersheds. Its boundaries follow tenure lines north of Mint Brook to the south shore of Gambo Pond, then extends south (including Terra Nova Lake) to the Bay Du Nord Wilderness Area, and continues as far west as Little Gander Pond. The western boundary generally follows a northeasterly direction passing just east of Dead Wolf Pond to a point near the headwaters of Mint Brook. The district also includes Kepenkeck Lake, Lake St. John and Deer Pond. FMD 4 has a total gross area of 297,147 hectares, and a total productive forest area of approximately 82,785 hectares.

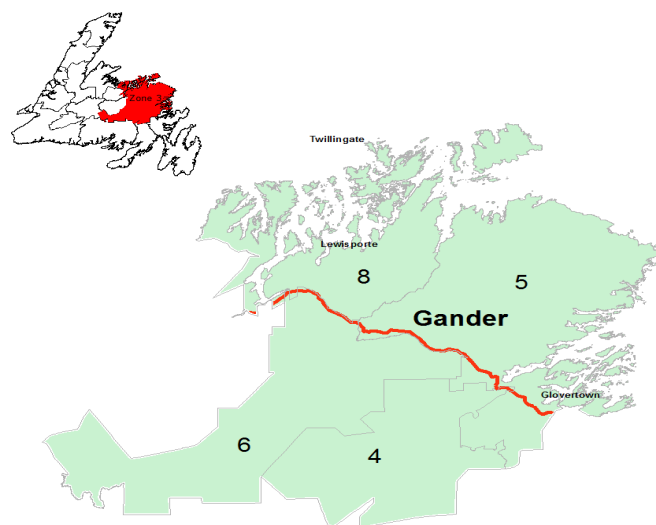
Forest Management District 5, known as the Bonavista North Management District, is located on the north side of Bonavista Bay. Its boundaries include the Gander River to the west and Gander Lake, Gambo Pond, and Terra Nova Lake to the south. To the east, the district is marked by Bonavista Bay and Terra Nova National Park. To the north, it ends to the Atlantic Ocean. The district also includes Fogo Island. FMD 5 has a total gross area of 581,040 hectares, and a total productive forest area of approximately 214,254 hectares.

Forest Management District 6, commonly referred to as the Glenwood Management District includes that parcel of land extending generally south and southwest of Gander Lake and the TCH to Great Gull Lake. The southern boundary extends from Great Gull Lake, west to Sitdown Pond and Great Burnt Lake. The western boundary extends through the headwaters of Great Rattling Brook northeast to the Bay D'Espoir Highway near Miguels Lake, and then continues on passing just south of Crowe Lake through to the TCH near Notre Dame Junction. FMD 6 has a

total gross area of 408,098 hectares, and a total productive forest area of approximately 152,818 hectares.

Forest Management District 8, also referred to as the Exploits Bay Management District, is located on the northeast coast, covering the geographical area, which can generally be defined as that located north of the former Canadian National Railway line (49th latitude) between the Gander River in the east and Seal Bay in the west. The northern boundary extends into Notre Dame Bay to include Twillingate, New World Island, Change Islands and Exploits Island, along with many other smaller islands. Major communities within the district are primarily located along the coast with population centers around Gander Bay, Twillingate - New World Island, Birchy Bay, Lewisporte, Norris Arm, Botwood and Point Leamington. FMD 8 has a total gross area of 283,000 hectares, and a total productive forest area of approximately 162,474 hectares.

The boundaries for these districts were originally proclaimed in Newfoundland Regulation 72/79 and filed on May 18, 1979 and revised under Consolidated Newfoundland Regulation 777/96. The FMD's 4 & 5 headquarters is located in the town of Gambo, while FMD's 6 & 8 fall under the jurisdiction of District Office in Lewisporte. There are also satellite field offices in Gander, Wings Point and Northern Arm. Administration of forest management activities in FMD 4 is shared between the Gambo and Clarenville district offices, while in FMD 6 they are shared between Gambo, Lewisporte and Bishop's Falls. This arrangement results from the existing road access points to FMD's 4 and 6 in relation to Forestry Services offices.



Map 1- 1 Planning Zone / District Map, Zone 3.

2.1.2. *History*

With the exception of Gander, the major communities within the planning zone area were built around the fishery, the railway and lumbering. Approximately 62,200 people live in this zone and most are located in communities of various sizes that follow the coastline. However; the largest single concentration is found inland at Gander, where the population is around 11,690.

The districts in this zone have a history that is both rich and varied. In FMD 5, Gander's existence stems from the need of a stopover point for transatlantic flights in the mid 1930's. Its development took on major importance during World War II because of the towns' strategic location, where, as many as 10,000 military personnel were stationed. Still, in spite of its contribution on the global and local scene, the Town of Gander was not established until 1951. This is a stark contrast to centers like Fogo Island, which began to settle around 1680 by French, Spanish, and Portuguese summer fishing stations.

The Wesleyville-Badgers Quay area is the birthplace of many great sealing captains. Greenspond, a small fishing community today, can trace its origins back to 1698. It was once a bustling community of 1,726 persons (1901) and was once known as the "Capital of the North"(Windsor, 1979). This community was very important to fishing industry by the late 1700's and by 1850 was heavily involved with the seal fishery. Gambo, whose heyday centered on the now defunct Newfoundland railway, is the birthplace of the last Father of Confederation, the late Premier Joseph R. Smallwood. Gambo was also the site of extensive lumbering activities in the 1800's. Another noteworthy railway and lumbering town in the region is Terra Nova. The Terra Nova River watershed, which essentially constitutes FMD 4, was extensively logged for pulpwood and lumber during the 1940's and 50's. Norwegian developers, who in 1920, started construction on a sulphite pulp mill at Glovertown, originally secured the timber limits associated with most of that district. Devaluation of the Norwegian Kroner disrupted the financing of the project and it was eventually abandoned (Munro, J.A., 1978). Subsequently, the Anglo-Newfoundland Development Company (the predecessor of Abitibi) obtained the rights to the Terra Nova limits in 1923 to support an expansion of the Grand Falls mill.

FMD 6 encompasses the watershed of both the Northwest and Southwest Gander Rivers and the area immediately adjacent to Glenwood, has a similar history. While the Corner Brook mill was still under construction, the Reid Newfoundland Company was also trying to promote a newsprint

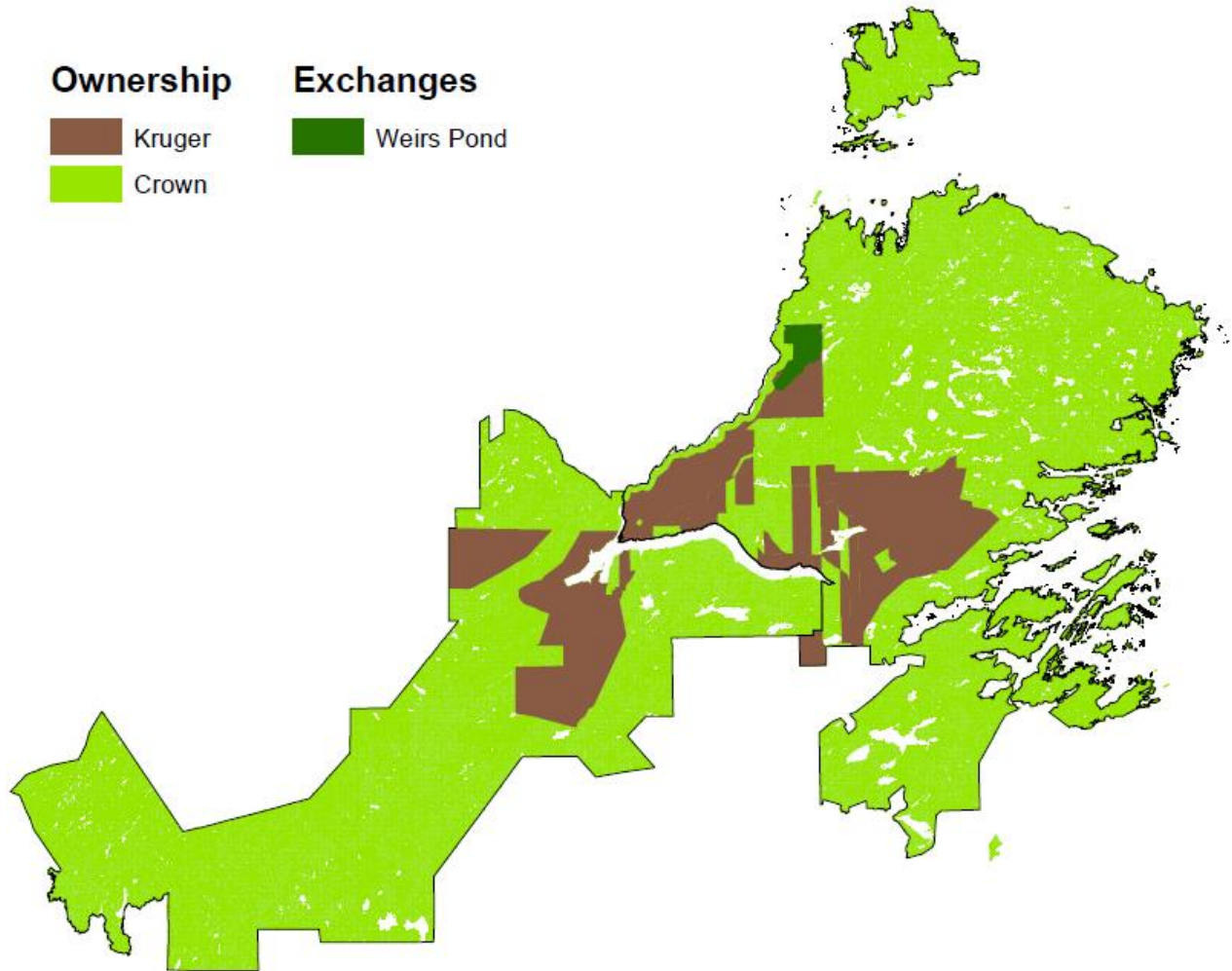
mill on the Gander River (Munro, J.A., 1978). The Gander Valley Power and Paper Company Limited was formed by the Reid's and the most of the area which constitutes FMD 6 was conferred along with water power rights by the government in 1924. The Hearst publishing organization in the United States was involved with the financing and had tentatively agreed to take the full output of the mill. This deal fell through and eventually the Reid's negotiated a deal which allowed the Bowater interests in England to acquire the Gander Valley and other properties for the Corner Brook mill in 1938, in what became known as the Gander Deal.

As with most areas of rural Newfoundland, historical settlement of communities in FMD 8 developed around the fishing and shipping industries. The community of Twillingate recorded settlers as early as 1700, making it one of the Provinces oldest seaports. During the early 1900's, Campbellton was an industrial town with a lumber mill, pulp mill and its own miniature railway. Over the past 30 years, commercial forestry activities have increased to the point where they now account for a significant portion of employment in the area. Small-scale farming is carried out in the Comfort Cove, Laurenceton and Northern Arm areas. Lewisporte; the largest community in the district is a service town with a large wholesale distribution center. It is also a main port for the coastal service to Labrador. These four districts have strong ties to the development of the forest industry in Newfoundland. In more recent years, the infrastructure, especially the network of forest access roads originally used to support the logging industry, is cited as an important component of other industry developments such as hunting and fishing.

2.1.2.1. Ownership

There are two major ownerships in the zone that comprise of Crown and Corner Brook Pulp and Paper Limited (CBPPL) (Figure 2). Crown land accounts for 88% of the timber ownership that comprise of all FMD 04 & 08, and portions within FMD's 05 & 06. Throughout the past number of years CBPPL has sold or exchanged some of its land base in FMD's 08 & 06 to Crown. As a result, within the whole zone CBPPL now only represents 11% ownership. These holdings are in the form of long term licenses that are not due to expire until 2037. Finally, miscellaneous timber holdings (e.g. private, DOT, parks, etc.) account for <1%.

When transfers and exchanges exist within the Zone, a detailed map accompanied with relevant information will be provided.



Map 1- 2 Timber ownership and active transfers and exchanges occurring throughout Zone 3.

2.1.3. *Physical Description*

The planning zone is a large area (approx 1.6 million ha) covering much of northeastern Newfoundland. Physical features vary a great deal over such a large landscape. The following descriptions apply generally to the districts in the planning area.

2.1.3.1. *Topography and Hydrology*

Planning Zone 3 contains a diversity of terrain types. The area has generally rolling topography dissected by several large valleys including: Southwest Gander River, Northwest Gander River and Gander River valleys. These rolling hills are commonly between 100 and 200 metres (asl) and rarely extending above 300 metres (asl). Hillsides drop steeply into the major valleys. Broad

lowland, below 100 m elevation, is found between the Exploits River and Botwood, and north of Norris Arm. The area has an extensive coastline dominated by bedrock with scattered pocket beaches. Another exception is the area west of New-Wes-Valley that is generally low relief lowland (less than 100 m asl) dominated by numerous lakes and wetland areas. The physiography is largely controlled by bedrock structure, shown by the numerous southwest northeast trending valleys, lakes and ridges. Hills are commonly orientated northeastward, reflecting bedrock lineation. The highest point in the management area is Mount Peyton (482 m asl) near Glenwood in FMD 6.

This region contains Gander Lake, which is one of the largest lakes in the province. The lake is 47 km long, an average of 2.0 km wide, has a surface area of 11,200 ha (EDM et. al., 1996), and a surface elevation of 25m asl. A bathymetry survey of the lake was completed in 1995 during the development of a watershed management plan for the Gander Lake Watershed Monitoring Committee (EDM et.al., 1996). Soundings in the Fifteen Mile Brook area recorded depths of 274 m (249 m below present sea level) and depths of 250 m off Little Harbour, decreasing to 60 m off Kings point and 27 m at the extreme eastern end of the lake. The field survey confirmed the maximum Lake depth at 290 metres.

In general, the drainage of the planning area is in a northerly direction and is characteristically poor with many large peat bogs throughout. The main rivers include: Gander, Gambo, Campbellton, and Terra Nova. Other rivers (Indian Bay, Dog Bay and Ragged Harbour), while smaller in size, drain large watersheds. In the past, many of these rivers were important transportation routes for water-driven saw logs and pulpwood. This is evident by the remnants of a number of large dams as well as the occasional man-made channel.

2.1.3.2. *Geology*

The area was completely glaciated during the last glacial period (Late Wisconsinan). Surficial geology mapping has been completed on parts of the area at scales of 1:50 000 (Batterson, 1991, 1999a,b; Mackenzie, 1993; Munro, M., 1993) and 1:250 000 (Liverman and Taylor, 1993, 1994a,b). Mapping of ice flow indicators identify three major flows. Early ice flow was eastward from a source in the Long Range Mountains, and subsequently by north to northeastward flowing ice from the main Newfoundland ice center.

This region shows abundant evidence of glacial activity, and is dominated by areas of bedrock and till. Bedrock that comprises much of the coastal area and the higher ground is smoothed,

commonly showing *roche moutonnée* forms. Drumlins are found at the head of Lewisporte Harbour, and crag-and-tail hills are found south of Loon Bay. Areas adjacent to the coast show large area of bedrock exposure, particularly west of New-Wes-Valley and north of Gander. Much of the area is covered by glacial till, commonly as a veneer (less than 1.5 m thick) or as a blanket (thicker than 1.5 m). Rogen moraines, oriented perpendicular to flow, are generally rare, although some are found in the Island Pond/Dans Pond area and near Sunday Pond and Frozen Ocean Lake. These were deposited by north to northeastward flowing ice, consistent with the regional ice flow direction.

The valleys of the lowlands were the main channels for melt waters created by retreating ice. In these valleys are found the glaciofluvial landforms of terraces, eskers, kames and valley trains. Gander Lake was likely a conduit for local ice flow. Ice contact gravel and eskers at the eastern end of the lake show that ice flowed through this area and into the sea at Freshwater Bay. Eskers are also found in the Caribou Lake area south of Gander Lake, the Mint Brook area near Gambo and the Terra Nova area. Areas of non-glacial sediment are generally confined to the valleys. The Great Rattling Brook, Southwest Gander River, Northwest Gander River and Gander River valleys all contain moderately to well sorted, stratified sand and gravel deposited in a glaciofluvial or fluvial environment. These systems were the routes of melt water during deglaciations. The Southwest and Northwest Gander River valleys are up to 6 km wide, with flat valley floors. They contain sand and gravel deposited by glaciofluvial outwash. The present channel into an alluvial plain up to 1 km wide has reworked some sediment. Melt water outflow from the Southwest Gander, Careless Brook valley and from the Northwest Gander River valley flowed northward through the outflow into the modern Gander River valley.

Evidence of higher water levels was found in the Gander Lake valley (Batterson and Vatcher, 1991). Beach sediments up to 39 m above Gander Lake have been identified. It is possible that higher water levels were the result of marine incursion. Raised marine features on the coast have not been examined in detail, but Munro and Catto (1993) reports Late Wisconsinan marine limits near Carmanville on the north coast at 43 m asl. Marine limit at the coast at the eastern end of the lake has been reported at about 30 m asl (Jenness, 1960; Grant, 1980). Undated marine shells have also been reported from the Gander River valley, north of Gander Lake. Higher water levels drained through the modern Gander River valley. During the Holocene, organic deposits developed in the poorer drained areas, and colluvial deposits formed at the base of the steeper

slopes. Both these processes continue today, although vegetated slopes have retarded the rate of colluviation.

FMD's 4, 5, 6 and 8 straddle three technostratigraphic zones of the Newfoundland Appalachians. These are, from east to west, the Avalon, Gander and Dunnage zones (Govt of NL, 1987). The Avalon Zone lies in FMD 5 east of a line drawn from Terra Nova Lake northward to the Dover area. This zone is characterized by thick successions of upper Precambrian volcanic, plutonic and sedimentary rocks that are overlain by fossiliferous mudstone, quartzite, limestone and shale of Cambrian age. These various rock types are well exposed in the areas around Bonavista Bay. Granitic and gabbroic rocks of late Precambrian age occur east of Traytown.

Granitic rocks of Devonian age occur in the Terra Nova Lake area. The Gander Zone lies in parts of all four districts. Its western boundary lies roughly along a line that extends from Great Gull Lake northeastward to the Ragged Harbour area. The western part of the Gander Zone consists of a thick sequence of quartz greywacke, quartzite, siltstone and shale. This grades eastward into metamorphic rocks consisting of schist, gneiss and migmatite. These rocks were intruded by massive and foliated biotite granites and by massive and foliated two-mica, garnet-bearing granites. The age of the sedimentary and metamorphic rocks is early Ordovician and older. The granitic rocks are as young as Devonian. The Dunnage Zone is situated in the western part of FMD 5 and covers most of FMD's 6 and 8. A thin sliver of Dunnage Zone rocks is located in FMD 4. Rocks within the Dunnage Zone are composed of Ordovician marine mafic volcanic, intrusive and sedimentary rocks that represent remnants of oceanic crust. These are overlain by oceanic basalts and subaerial felsic volcanic rocks. The volcanics are interlayered with and grade laterally into clastic sedimentary rocks. As is the case in the other zones, intrusive rocks of middle Paleozoic age intrude rocks of the Dunnage Zone and consist of granite, granodiorite, diorite and gabbro.

2.1.3.3. Soils

Portions of the districts have been surveyed with respect to soil profile but information is lacking in other areas, particularly near the coast. A soil survey was conducted in the Gander – Gambo area and the following information relates to that location. The remainder of the districts should not vary greatly with regard to these soil types due to similar parent materials mentioned above (Wells and Heringa, 1972). The survey concluded that the soils developed from glacial till. These include

mainly ground terrain deposits ranging from a few inches to over 20 feet thick and are composed largely of material derived from locally underlying rock. Podzolic soils are the main soils in the area with some orthic gleysols which are characterized by the lack of aeration and poor drainage.

There are some large areas of organic soils which may be broadly divided by the degree of decomposition and the vegetation apparent on the site. Sphagnum peat is the predominant type of organic deposit. Other types of organic soils found in the districts would be ericaceous peat and muck peat, both of which are less shallow in depth when compared to sphagnum peat. In relation to tree growth, the podzolic soils support the following species: black spruce – *Picea mariana* (Mill.) B.S.P.; balsam fir - *Abies balsamea* (L.) Mill.; white birch - *Betula papyrifera* (Marsh); and others of lesser importance than the three mentioned. The orthic gleysols support mostly black spruce, the growth of which is somewhat retarded due to the lack of available nutrients. Little, if any, tree growth is supported by the organic soils. The organic mucks support some vegetation depending on slope. Some shallow mucks occur on lower slopes under mixed forest and alder.

2.1.3.4. *Climate*

The climate of the four districts can be broken down into two main categories, in accordance with the two larger ecoregions of this area. The Central Newfoundland Ecoregion has the most continental climate on the island. As a result it has the warmest summers and the coldest winters. The mean daily temperatures for July and February are +15°C to +16°C and -4°C to -8°C, respectively. The precipitation ranges from 900 mm to 1300 mm annually with 3.0 m to 5.3 m of snowfall. This ecoregion also has the least wind and fog for the island. Due to the warm summers and the highest rates of evapo-transpiration, the soil moisture in this area is considered one of the driest on the island. A result of this is the high frequency of fire in this ecoregion due to its summer dryness. The North Shore Ecoregion has the warmest summers of all the coastal regions on the island, and the winters are cool. The mean July temperatures range from +15°C to +16°C, while the February mean temperatures range from -5°C to -7°C. The precipitation for this area is between 900 mm and 1200 mm with snowfall amounts ranging from 2.5 m to 3.5 m.

Due to its exposure, the high winds and high summer temperatures the high evapo-transpiration rates cause the soil in this ecoregion to be the driest for the island. The cold Labrador Current flowing from the north, especially with its pack ice in the spring, also influences this region. This

causes the growing season to be delayed when the ice is heavy. For additional information about the climate of the four districts refer to Meades and Moores, (1994).

2.1.4. *Ecological Characteristics*

2.1.4.1. *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 forests of Planning Zone 3, like all forests on the island, 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 phenomenon of periodic, catastrophic stand replacement natural disturbances such as fire and insect outbreaks which 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. All of these, with the exception of jack pine, commonly occur on the Island. However, by far the dominant species are black spruce and balsam fir; together they represent more than 90 percent of the growing stock on the island. Spruce is most abundant in north central Newfoundland where a climate characterized by relatively dry, hot summers has historically favored this fire-adapted species. In western Newfoundland the climate is somewhat moister and fires are far fewer in this region resulting in the ascendance of balsam fir, a species that is poorly adapted to fire. Like the rest of the Province, the forests of Planning Zone 3 (FMD's 4, 5, 6 and 8) are part of the larger boreal

forest ecosystem. The moraine areas, which are extensive in Zone 3 support, closed stands of conifers, largely black and white spruce *Picea mariana* (Mill.) B.S.P. and *Picea glauca* (Moench Voss), balsam fir *Abies balsamea* (L.) Mill. and tamarack *Larix laricina* (Du Roi) K. Koch. Broadleaf trees, such as white birch *Betula papyrifera* (Marsh.) occur in pure stands on richer soils, but it and trembling aspen *Populus tremuloides* (Michx.) are more prevalent in mixtures with the other conifers. Other needle-leaf trees, notably white pine *Pinus strobus* L. occur in spots scattered throughout the forest while Red pine *Pinus resinosa* (Alt.) is considered rare as it is only found in seven separate natural stands in FMD 5, concentrated in the Gambo-Glovertown area, two stands in FMD 4, two very small stands in FMD 8 and one stand in FMD 6. Soils of the boreal forests in FMD's 4, 5, 6 & 8 are predominantly classed as podzols although brunisols are also present. Throughout the contrasting areas of exposed bedrock, moraine deposits and low lying sphagnum bogs, this mosaic of soils and non-soils tends to be occupied by a range of plant communities dominated by lichens, shrubs and forbs. Climatic conditions of this region are heavily influenced by the proximity to cold Arctic air masses and the Labrador Current in the north and warm moist air and the Gulf Stream in the south. The interaction of these phenomena results in moderate annual precipitation, high evapotranspiration rates during warm summers and overall the most continental climate on the Island of Newfoundland; with the warmest summers, coldest winters and the least wind and fog.

The primary natural disturbance factors attributed to boreal forests are fire and insects. Forest fires were frequent and extensive in north-central Newfoundland and resulted in specific successional trends depending on site type. More often than not, the spruce component is increased following fire, whereas other disturbance types such as insects and cutting often results in an increase in the fir component. Repeated burning and cutting of dry, coarse-textured black spruce-feather moss site types can result in ericaceous species such as sheep laurel *Kalmia angustifolia* invading the site to produce heath-like conditions. Successional patterns on other forest cover types vary with site and type of disturbance. These are discussed in greater detail in subsequent sections of this report.

Forest development class, successional pattern and site type, influence the understory plant community throughout the district. The species composition and structure of these plants significantly impact on suitability of a site as wildlife habitat for various species. Some animals are very general in terms of habitat requirements and can occupy a wide range of site conditions, yet have specific seasonal requirements that can determine habitat quality. For example, the moose

requires wintering areas with suitable combinations of available cover and browse. It is widely accepted that a variety of forest age classes can provide increased habitat and sustainability for many wildlife species. On the other hand, some species require a specific age class or habitat condition to maintain healthy populations (e.g., Newfoundland marten (*Martes Americana atrata*)).

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. Streamside 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. Detritus in the form of needle and leaf litter, twigs and branches, forms the major energy base for consumer organisms. In highly shaded headwater streams, algae production is often low and yields only a small and seasonally variable contribution to the overall energy budget. As streams become larger further downstream, sufficient light penetrates the forest canopy, and consumer populations can take advantage of both particulate detritus and algae (Toews and Brownlee 1981). 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.

Major watersheds within the Zone include portions of the Gander River, Exploits River, Indian Arm Brook, Jumpers Brook, Ten Mile Lake, Big Lake, Campbellton River, Dog Bay River, Indian Bay River, Terra Nova River, Ragged Harbour River, Mint Brook and Traverse Brook. Many of these are associated with protected water supplies for communities within the districts. Small to medium sized lakes and ponds are common throughout the zone.

2.1.4.1.1. Ecoregions and Subregions

With the evolution of an ecosystem approach to forest resource management, it would be advantageous to have a standard framework to classify combinations like general climate and regional physiography, as well as the other components of an ecosystem, into distinguishable regions. Fortunately, such a framework exists, in a publication entitled *Ecoregions and Subregions of Insular Newfoundland* (after Damman, 1983).

Damman defined ecoregions as areas where a comparable vegetation and soil can be found on sites occupying similar topographic positions on the same parent material, provided that these sites have experienced a similar history of disturbance. Thus, an ecoregion cannot be defined in isolation from the physical landscape, but vegetation toposequence, vegetation structure; floristic composition and floristic distributions can provide the primary criteria (Damman, 1979). According to Damman, Newfoundland consists of nine ecoregions, which can be further divided into several sub regions. Labrador has ten ecoregions. Each of the Newfoundland and Labrador ecoregions and sub regions contain many of the same ecosystem variables. It is the dominance and variance of these variables (e.g., vegetation and climate) that determine their classification. FMD's 4, 5, 6 and 8 contain four of the ecoregions outlined by Damman (1983).

They are:

- II - Central Newfoundland Ecoregion (which contains IIA - the North central Sub region);
 - III – North Shore Ecoregion;
 - VII - Eastern Hyper-Oceanic Barrens Ecoregion and
 - VI - Maritime Barrens Ecoregion (which contains VID - the Central Barrens Subregion)
- (see Map 1-3).

Of these, IIA contains the largest portion in the district. The following descriptions are taken from *Forest Site Classification Manual - A Field Guide to the Damman Forest Site Types of Newfoundland* (Meades and Moores, 1994).

2.1.4.1.1.1. Central Newfoundland Ecoregion

The Central Newfoundland Ecoregion has the most continental climate in insular Newfoundland. It has the highest summer and lowest winter temperatures. Because of the warm summers and the high evapo-transpiration losses, soils in the northern section of this ecoregion have a soil moisture deficiency. The *Hylocomium*-Balsam fir forest type occupies the zonal soils of this area. These soils are generally lighter in color and have a lower organic matter content compared to other ecoregions.

Forest fires have had an important role in the natural history of this region. Many sites have been converted to black spruce, while white birch and trembling aspen occupy some of the richer sites.

The Central Newfoundland Ecoregion has four sub regions:

- IIA - North central Sub region;
- IIB - Red Indian Lake Sub region;
- IIC - Portage Pond Sub region;
- IID - Twillick Steady Sub region

Of these, only the North central Sub region is found in District 4, 5, 6 and 8 and contains, by far, the largest area of land relative to the other three ecoregions.

North central Sub region

This sub region has the highest maximum temperatures, lowest rainfall and highest forest fire frequency than anywhere else in Newfoundland. The sub region extends from Clarenville to Deer Lake with a mostly rolling topography of less than 200 meters (asl.). The history of fire is evident by the pure black spruce forest and trembling aspen stand that dominate the region.

2.1.4.1.1.2. North Shore Forest Ecoregion

The less prevalent North Shore Ecoregion is essentially a 20-25 km wide coastal zone that extends from Bonavista Bay to the Baie Verte Peninsula. Here, a continuous forest of black spruce and balsam fir dominates except on the coastal headlands where barrens prevail. White spruce is more common here than in central Newfoundland. The quality of growth diminishes as you approach the coastline. There are no sub regions in this ecoregion.

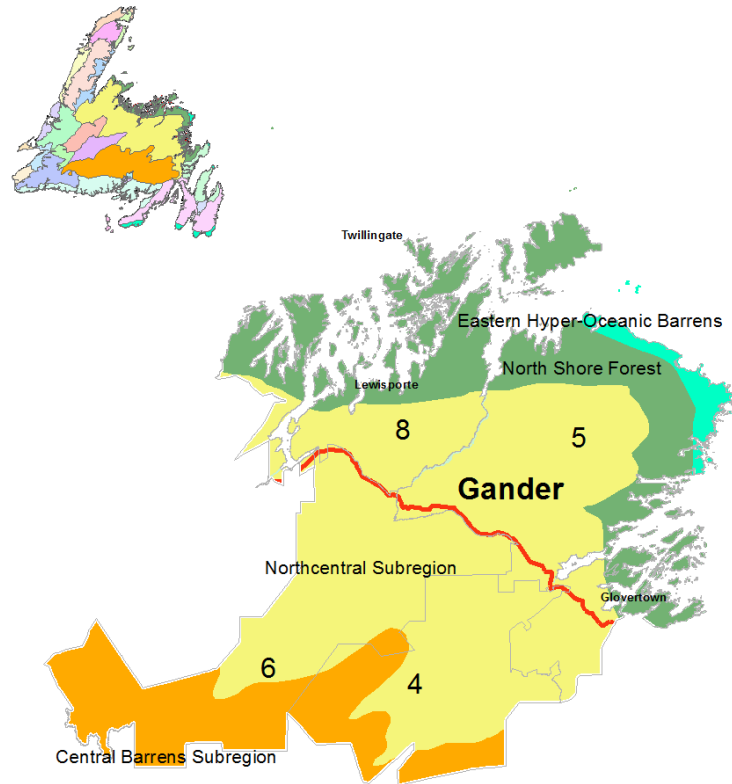
2.1.4.1.1.3. Eastern Hyper-Oceanic Barrens Forest Ecoregion

This ecoregion occurs on the extreme south coast of the Avalon and Burin peninsulas and on the northeast coast near Bay de Verde and Cape Freels. Here, the extreme oceanic climate limits the development of forest other than Balsam Fir krummholz. The heaths in this ecoregion are similar to oceanic parts of northern Scotland and southern Norway. This ecoregion constitutes very little of the land mass contained within the planning area being limited to the extreme northeastern coastline in FMD 5.

2.1.4.1.1.4. Maritime Barrens Forest Ecoregion

This ecoregion extends from the east coast of Newfoundland to the west coast through the south central portion of the island. Relatively mild winters with intermittent snow cover and the coldest summers with frequent fog and strong winds characterize it. The dominant landscape pattern

consists of usually stunted, almost pure stands of Balsam fir, broken by extensive open heath land. Good forest growth is localized on long slopes of a few protected valleys. The heaths are dominated by *Kalmia angustifolia* on protected slopes where snow accumulates and by cushions of *Empetrum nigrum*, or *Empetrum eamesii* on windswept ridges. The southern portions of FMD’s 4 and 6 extend into the northeastern extent of this ecoregion.



Map 1- 3 Ecoregions/Subregions occurring throughout Zone 3.

Table 1- 1 Ecoregions/ Subregions within Zone 3

Zone 3	Eco/ Subregion	District 4		District 5		District 6		District 8		Zone 3 (D4,5,6,8)	
		Total % Area Occupied in District	Relative % of Subregion in District	Total % Area Occupied in District	Relative % of Subregion in District	Total % Area Occupied in District	Relative % of Subregion in District	Total % Area Occupied in District	Relative % of Subregion in District		
	Area (ha) in Province									Relative % of Subregions in Zone	
North Shore Forest Ecoregion											
	North Shore Forest Subregion	550,662		34%	35%			54%	27%	61%	
	Section Sub-total	550,662									
Eastern Hyper-Oceanic Barrens											
	Eastern Hyper-Oceanic Barrens Subregion	160,335		5%	0.2					19%	
	Section Sub-total	160,335									
Maritime Barrens											
	Central Barrens Subregion	1,524,392	33%	7%			38%	11%		18%	
	Section Sub-total	1,524,392									
Central Newfoundland Forest											
	Northcentral Subregion	2,310,744	67%	9%	61%	15%	62%	12%	46%	5%	41%
	Section Sub-total	2,310,744									
	Grand Total	4,546,133									

2.1.4.2. *Ecosystem Condition and Productivity*

As with other parts of the Newfoundland's boreal forest, those of Planning Zone 3 have evolved in concert with a history of fire, insect attack and subsequent disease and wind throw. Human intervention in this forest has been extensive and widespread with a resultant significant impact on current landscape patterns. Landscape patterns determine the variety, integrity, and interconnectedness of habitats within a region. These landscape patterns are a direct result of the relationship between physical landforms and soils, disturbance history, and relationships among various species that makeup the ecosystem communities. These factors, while listed separately for clarity, are unavoidably interrelated. Landscape patterns play a pivotal role in determining the current conditions and health of forest ecosystems. These variables are evaluated in terms of productivity, stability and resilience.

Another important role determining the condition of a forest is change. Forests are an ever evolving entity, resisting stagnation, and constantly moving through their cycles of life, death, and renewal. The process of change over time is the essence of nature itself. It has been nature's underlying storyline since time began, and will continue to be until time ends. The main forces of change in our natural forest ecosystems are disturbance and succession. A definition of disturbance would indicate that it initiates a change in a community structure, which often ends up in the replacement of one set of species by another. However, replacement is not always the end result (e.g., a species like black spruce is aided in germination by disturbances like forest fire). Disturbances range from the fall of a single tree, to the destruction of thousands of hectares by forest fires. While disturbances may be very destructive, they can often rejuvenate ecosystems and diversify landscapes. Succession involves changes in both community composition and in the ecosystem structure and process. Succession is the orderly change whereby the dominant species is replaced by another species, then another etc. until a new dominant species establishes a relatively stable community.

The following sections will discuss each of these concepts in more detail as they relate to the ecosystems of Planning Zone 3. For the most part this section will be descriptive and explanatory in nature.

2.1.4.2.1. *Productivity*

Productivity is the accrual of matter and energy in biomass. In simple terms, primary productivity is the sum total of all biomass produced through photosynthesis. Secondary productivity occurs when this “primary” biomass is ingested and is added to that organism’s biomass. Since secondary productivity is directly dependent on primary productivity, it is this primary productivity component that drives the system. The level of primary production is dependent on the ability to produce biomass. This in turn is dependent on landscape features, soil, climate etc. In general terms, the more productive (ability to grow trees) a site is, the higher level of primary productivity. For example a forested stand would have a higher primary productivity than a bog or a good site would have a higher potential than a poor site. Overall, the landscape in Planning Zone 3 has approximately 43 percent productive forest. This distribution of productive sites across the landscape and range of productivity within these sites is largely dependent on landscape patterns, climate, and soils. The more productive areas of the zone occur in the lowlands of the river valleys. These areas have deeper soils and less exposed bedrock.

The landscape patterns are more consistent and the growing season is longer. In contrast, the northern parts of FMD’s 5 and 8 along the coast have soils are shallower with bedrock at or near the surface. The terrain in northern parts is much rougher and the growing season is shorter than in the valley lowlands (130 as opposed to 160 days). In practice, it is nearly impossible to measure the amount of biomass produced in an ecosystem, or the energy consumed in the process. However, in the Provincial Sustainable Forest Management Strategy, criteria and indicators to monitor productivity have been identified. One method outlined is tracking mean annual increment in m³/ha/yr of tree species by ecoregion. This can be readily measured over time and manipulated through silviculture treatments or affected by poor harvesting practices, which increase soil compaction. An example of secondary productivity is the number of moose per unit area. One must also recognize the forests inherent biological limits however, when attempting to measure or manipulate site productivity.

2.1.4.2.2. *Resilience*

Ecosystem resilience reflects the ability of the ecosystem to absorb change and disturbance while maintaining the same productive capacity and the same relationships among populations. Healthy forest ecosystems maintain their resilience and adapt to periodic disturbances. The renewal of boreal forest ecosystems often depends on these disturbances. Resilience is characterized by the forest’s ability to stabilize vital soil processes and maintain succession whereby the system is

returned to a community composition and the productivity level is consistent with the ecosystems physical constraints. To a large degree, a forest ecosystems' resilience is controlled by properties such as climate, parent soil, relief and flora. The potential for populations to recover from low levels following disturbance by having adequate regeneration capacity and a balanced distribution of forest types and age classes provides a reliable measure of resilience at the landscape level. Other measures include the percent and extent of area by forest type and age class and the percentage of disturbed areas that are successfully regenerated. Measuring and monitoring these parameters determine resilience. Forest activities must be carefully planned to not upset the natural balance and lower an ecosystem's resilience. An example is harvesting on the more fragile sites where steep slopes and shallow soil over bedrock increase the potential of site degradation beyond repair.

2.1.4.2.3. *Stability*

Nature is constantly changing and going through the unending processes of disturbance, growth, senescence, and decay. Therefore, stability of a forest ecosystem does not refer to one fixed position without variation. Ecosystem stability is more accurately defined as the maintenance of ecosystem changes within certain boundaries and the functional continuation of important potentials and processes such as energy capture. There are three levels of stability; species stability, structural stability, and process stability.

Species stability is the maintenance of viable populations or meta-populations of individual species. Structural stability is the stability of various aspects of ecosystem structure such as food web organization or species numbers. Process stability is the stability of processes such as primary productivity and nutrient cycling. To put stability in perspective, it must ensure that the system does not cross some threshold from which recovery to a former state is either impossible, (extinction) or occurs only after long time periods or with outside inputs (loss of topsoil) Some indicators of stability which can be monitored are: area of forest converted to non-forest use, area, percentage and representation of forest types in protected areas, percentage and extent of area by forest type and age class, and change and distribution and abundance of various fauna. These indicators can be measured and monitored to ensure stability is maintained and to evaluate the impact, if any, of forest activities on ecosystem stability.

2.1.4.2.4. *Disturbance Regimes and Successional Patterns*

There are four main driving forces that cause disturbance in the boreal forest. Harvesting accounts for the majority of disturbance in the zone and occurs on a regular and consistent basis. Fire and insect damage are the other two major disturbances and occur on a more irregular or cyclic basis. With the exception of a major atypical windstorm, wind throw usually occurs after some other agent like insects and/or disease weakens a stand. For this reason successional patterns after insect damage and wind throw will be discussed together. The following is a brief synopsis of the typical successional patterns that occur in the zone after each major disturbance type.

2.1.4.2.4.1. *Harvesting*

Regeneration patterns in the black spruce type after harvesting is generally back to the black spruce type with a minor component of balsam fir and some white birch on the better sites. There is a higher regeneration failure in this forest type with average not sufficiently restocked (NSR) rates at 25-30 percent across all ecoregion and site types. Another general trend is that the poorer the site quality the higher the NSR rate. These sites would be candidates for planting with black spruce or red and/or white pine. In some instances where balsam fir does regenerate on black spruce sites it becomes very chlorotic at a young age and is highly susceptible to attack from the balsam woolly adelgid. It therefore has not been considered as acceptable softwood regeneration species on these sites, and planting has become the norm.

In the balsam fir types, regeneration failure is much lower than the black spruce types averaging 15-20 percent across all ecoregion and site types. The majority of these sites will regenerate back to balsam fir after harvesting. There is also some regeneration of these sites to mixed balsam fir/black spruce and/or mixed softwood/ hardwood types. Regeneration pattern in the mixed wood types is generally back to mixed wood that is dominated by white birch and balsam fir with a minor spruce component. There is a higher component of white birch regeneration after harvesting in types that had a higher percentage of hardwood (hS) before harvest. Generally, the better the site class the more hardwood regeneration. Regeneration failure on the mixed wood types is highest in poor sites and lowest on the better sites averaging 10-15 percent.

There are two main white birch site types in the zone. The basic difference between them is terrain which impacts site quality. The G and H white birch sites are typically located on sloped

terrain resulting in continual ground water movement or seepage slopes. These sites are prone to revert to alder dominated NSR sites in the absence of very hot ground fire as the disturbance mechanism. Consequently the management prescription to ensure productivity on these valuable sites is to plant fast growing softwood species. The medium white birch sites are typically on more level terrain and will revert to white birch /balsam fir or white birch/black spruce after disturbance. Regeneration failure on these sites is low (10 percent). The management prescription to regenerate these site to white birch is to remove the overmature birch in a seed tree cut to provide a seed source for the next rotation of birch. Intermediate treatments of precommercial thinning to maximize saw log potential of these stands are recommended in future.

Harvesting of white birch in this zone has traditionally been for firewood purposes Recently, however, some of the harvest occurring has been directed to sawmilling with the development of a value added hardwood industry, which will place added pressure on the white birch resource in the zone. Evidence from domestic cutting in these types indicates that they will regenerate to mixed wood types dominated by balsam fir and white birch.

2.1.4.2.4.2. Fire

Since black spruce is a fire adapted species, it is not surprising that it is the most prolific regeneration species after fire across all forest types, site types and ecoregions within the zone. It regenerates as pure stands or in combination with white birch. Balsam fir is conspicuously absent after fire because most advanced regeneration in the under story is killed by the fire. Black spruce regeneration is somewhat correlated with the amount present in the pre fire stand. Generally, the higher the component of black spruce in the original stands, the higher the percentage of regeneration to black spruce. In mixed wood stands a higher component of white birch and sometimes trembling aspen is present after fire.

Regeneration after fire in white birch dominated stands is typically to white birch, but can also include a black spruce component. Regeneration failure after fire is on average 20-25 percent across all forest types, typically being higher as sites get poorer and ground fire temperatures decrease. Generally, the poorer site types will revert to Kalmia dominated NSR and require planting to ensure adequate regeneration. When ground fire temperatures are lower, less of the humus layer is removed and regeneration failure increases due to lack of adequate seedbed.

2.1.4.2.4.3. *Insect*

Balsam fir is highly susceptible to insect attack from the hemlock looper, balsam woolly adelgid, balsam fir sawfly, and spruce budworm, whereas black spruce is hardly impacted by these insects. For this reason, stands with a high component of balsam fir are more susceptible to insect attack and subsequently wind throw. Mature balsam fir types usually regenerate to balsam fir or to balsam fir hardwood mixtures.

In recent history, however, many insect killed fir stands have reverted to NSR due to the high browse rate on fir regeneration by moose in the zone. Disturbance by insect kill in young balsam fir stands can also cause succession to white spruce. Regeneration patterns in mixed wood types usually depend on the type of mixture. If black spruce is a component then it will persist and form part of the new stand. Otherwise balsam fir and balsam fir/hardwood mixtures regenerate after insect attack. Regeneration failure of fir sites after insect attack is low and only occurs approximately 15 percent of the time. Regeneration failure mostly occurs on sites where the immature balsam fir regeneration is killed by either insect attack as well, or over browsing by moose.

2.1.4.3. *Biodiversity*

Biodiversity is a term used to describe the variety of life on earth. A basic definition of biodiversity includes the variety of animals, plants and microorganisms that exist on our planet, the genetic variety within these species and the variety of ecosystems they inhabit.

Mishandling even small tracts of land could lead to extinction of several species, one of which may hold the key for the prevention or cure of some disease. While the boreal forest may not have the same extent of biodiversity that some of the equatorial regions possess, Canada does have many species of plants, animals, and microorganisms in its boreal and other forest regions.

Biodiversity provides such essential services as climate control, oxygen production, and purification of freshwater supplies, carbon dioxide removal from the atmosphere, soil generation, and nutrient cycling for humans. Without the species that provide these processes, humanity would be unable to survive.

The three components of biodiversity are species diversity, genetic diversity, and ecosystem diversity.

2.1.4.3.1. *Species Diversity*

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

2.1.4.3.2. *Genetic Diversity*

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

2.1.4.3.3. *Landscape Diversity*

Ecosystem diversity describes the range of natural systems found throughout a region, a country, a continent or the planet. Wetlands and grasslands are examples of ecosystems in Canada. A complex and intricate mix of plants, animals, microorganisms and the soil, water, and air they occupy create virtually limitless ecosystems around the world.

A forest interspersed with barrens, marshes, lakes and ponds provide for diversity across the landscape. Each ecoregion in the province should have representative areas protected, which displays the diversity where such exists. With this in mind, CBPPL supports the development of the Swan Island proposed ecological reserve in FMD 8 as a representative of the North Shore Forest Ecosystem, and the Gambo Pond proposed ecological reserve in FMD's 4 and 5 to represent the Central Newfoundland Forest Ecosystem. These areas can serve as a benchmark from which to measure and guide management decisions. These representative areas protect the

wilderness of the ecoregion and are vital for guiding management actions. As benchmark areas, they will illustrate the multi-species mosaic that planning actions must maintain. One unique aspect of landscape diversity in Planning Zone 3 is the high representation of native red pine stands relative to other planning zones on the island. Approximately one-half of the 22 + red pine stands native to insular Newfoundland are located in the planning zone.

Old growth forests are valued for their contributions to society in the sense of heritage, culture, aesthetics, and spirituality. Old-growth forests are best understood within the general context of forest disturbance. Disturbance is ubiquitous in forest ecosystems and may be defined as any relatively discrete event in time that disrupts ecosystems, community or population structure and changes resources, substrate availability, or the physical environment. Disturbances occur over a wide range of spatial and temporal scales and normally interact one with the other to produce the complexity of forest types found across our landscapes. Theoretically, boreal forests not disturbed by fire, insect or wind disturbance for long periods of time will revert to multi-cohort, self-perpetuating, gap-driven forests. When viewed from the perspective of forest-level disturbance, it may be stated that old-growth forests are common in areas not prone to recurrent or periodic stand replacing disturbance from fire, insects or wind. In situations where stand initiating events are rare, then old growth will tend to dominate. The disturbance forces, which would naturally recycle mature forests, are absent and therefore forests will tend to grow to the old-growth stage. Old-growth forests are thus composed entirely of trees, which have developed in the absence of stand replacing disturbance. Old-growth fir-spruce forests will self-perpetuate through small-scale gap dynamics in the absence of large-scale disturbance. Old-growth conditions in the Canadian boreal forest are rare or uncommon. This is understandable given the ubiquity of landscape-level fires and recurrent insect outbreaks.

As well, logging is becoming an increasingly significant disturbance factor in the boreal forests. Wildfire is paramount in controlling the dynamics of the drier, continental boreal forests of western Canada and Alaska. In Newfoundland, fire tends to be important in the forests of central region, characterized by its continental-like climate. The occurrence of old-growth forests on the Island of Newfoundland is unknown. Except for the old-growth research conducted in the upper Main River watershed, empirical definitions of old growth according to forest types and edaphic conditions are not available. Furthermore, the frequency of natural forest disturbances and their role in shaping landscape level forest composition and structure of the Island's forests are little understood. However, given our general knowledge of the historic occurrence of fire, insect and wind

disturbance in Newfoundland's forests, as well as recognition of a century of logging activity across the Island, it is reasonable to assume that primary old-growth forests on the Island are not common. DNR does acknowledge that the older cohorts in the age class structure of a district are important from many ecosystem perspectives. Accordingly, during the 2010 wood supply modeling, the maintenance of 15 % of the overmature cohort (i.e. 81+ years) on the landscape over the forecast horizon was a requirement on a district basis. This will be discussed further in other sections.

2.1.5. *Forest Characterization*

A forecast description of the future forest structure and composition anticipated from the implementation of the proposed forest activities under the plan. Refer to 1.7.2 for graphs.

2.1.5.1. *Land Classification*

There are six broad categories that currently represent how the land within a forest management district is classified 1) Regulatory alienations, 2) Non-harvestable inventory types, 3) Water features, 4) Operational alienations, 5) Non-Timber Values and 6) Productive forest. The sixth category represents the harvestable landbase and is further subdivided into Core, Operational and Domestic.

Regulatory alienations are areas which have a legal restriction which prevents harvesting. Non-harvestable inventory types are areas such as bog or scrub forest. Water features are simply bodies of water (lakes, ponds, rivers .etc) Operational alienations are areas which cannot be harvested due to a physical impediment (i.e extreme steep slopes). Non-Timber Values represent areas in which harvesting is not permitted due to a use other than harvesting such as agriculture or aesthetics. In this case productive forest is any forested area that is not restricted from harvest and is capable of producing at least 60 m³/ha of merchantable timber.

The total landbase for Zone 3 (Table 1-2, Map 1-3) is approximately 1.6 million hectares. Up until now the landbase descriptions, ecosystem description, discussion on biodiversity and general forest characterization have been at the Zone level. From this point forward information presented will specifically to CBPPLs tenure in FMDs 5 and 6.

Represented below and in Figure 1-1 is the CBPPL portion of Districts 5 and 6 broken down into the 6 categories.

1) Regulatory alienations	16,894 ha
2) Non-harvestable inventory types	44,744 ha
3) Water features	10,852 ha
4) Operational alienations	8,294 ha
5) Non-Timber Values	313 ha
6) Productive forest	
• Core	67,976 ha
• Operational	2,450 ha
• Domestic	4 ha

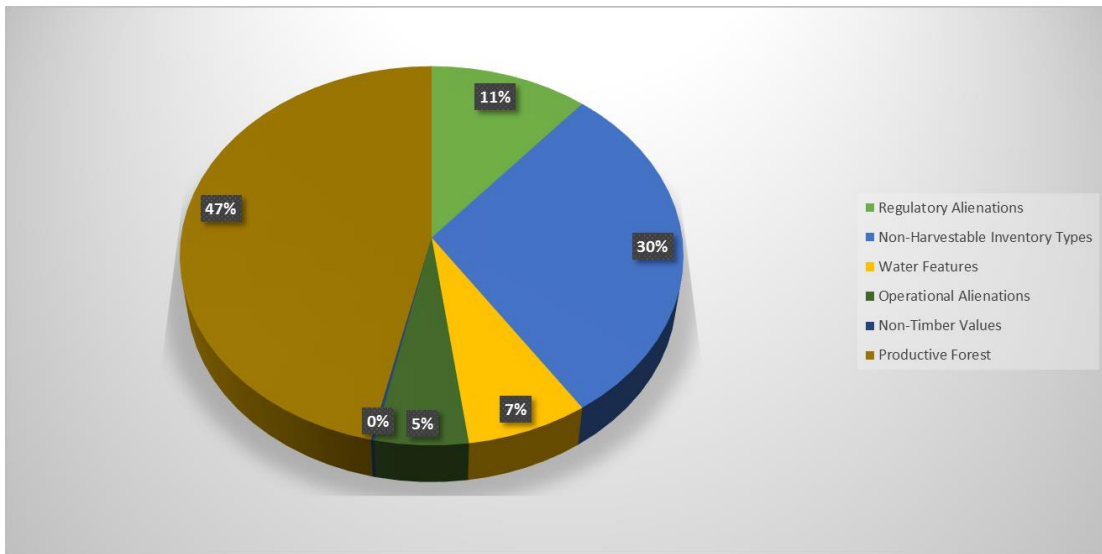
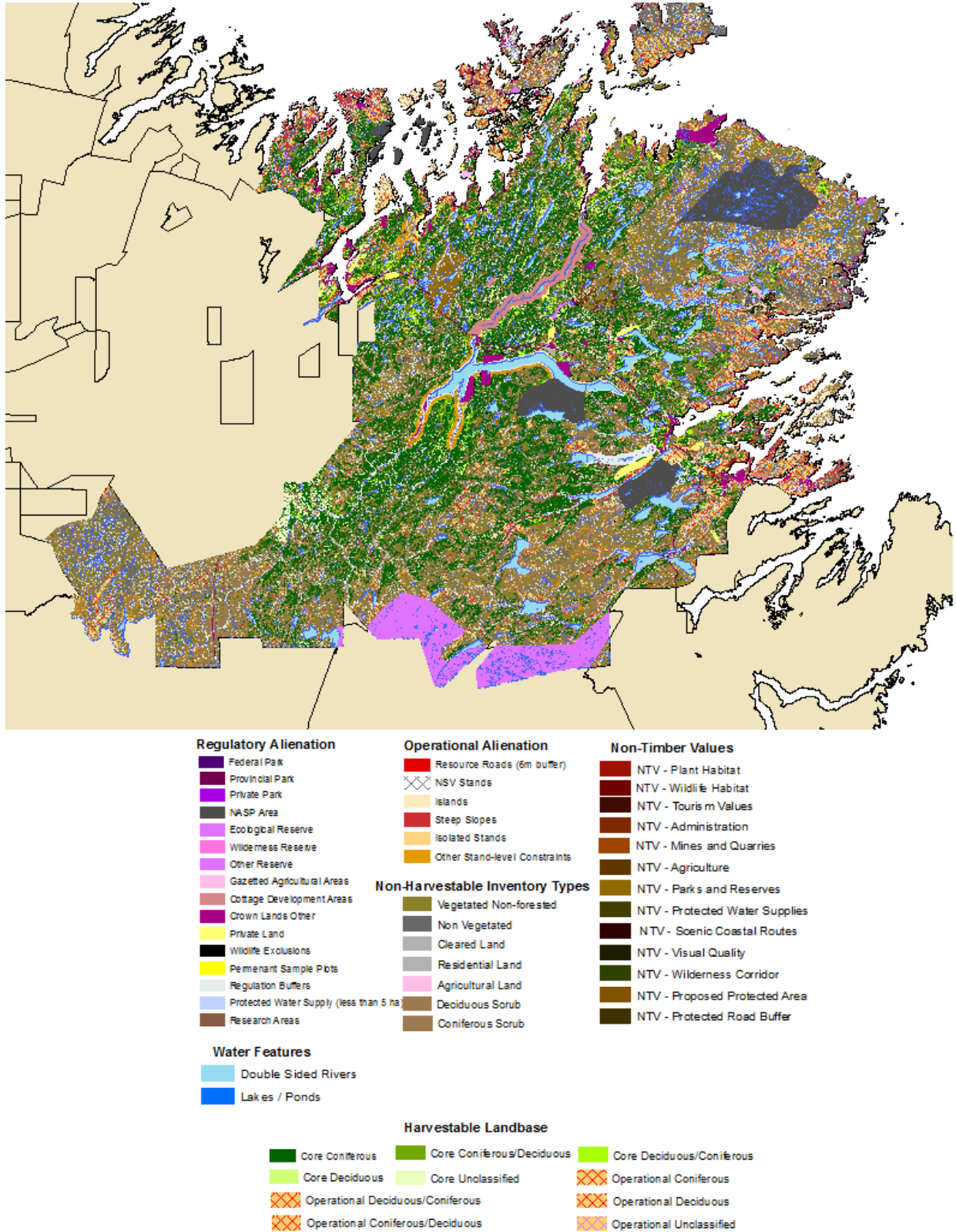


Figure 1- 1 Landbase Classification

Table 1- 2 Zone 3 CBPPL Limits Landbase Classification Table

Date: 17/08/2020		Zone 3					
Landbase Classification		Forested Area (ha)	Non Forested (ha)	Forested Area (ha)	Non Forested (ha)	Total Area (ha)	% Of Total
1	Regulatory Alienations	District 5		District 6			
1.a	Parks						
1.a.1	Federal	0.0	0.0	0.0	0.0	0.0	0.0%
1.a.2	Provincial	84.0	13.8	0.0	0.0	97.8	0.1%
1.a.3	Private	0.0	0.0	0.0	0.0	0.0	0.0%
1.a.4	Natural Areas System Plan	49.0	6.7	0.0	0.0	55.7	0.0%
1.b	Reserves						
1.b.1	Ecological	0.0	0.0	0.0	0.0	0.0	0.0%
1.b.2	Wilderness	0.0	0.0	0.0	0.0	0.0	0.0%
1.b.3	Others	0.0	0.0	0.0	0.0	0.0	0.0%
	Other						
1.c.1	Agricultural Areas	1,857.8	101.0	0.0	0.0	1,958.8	1.3%
1.d.1	Cottage Development Areas	500.1	86.8	1,156.9	59.3	1,803.1	1.2%
1.d.2	Crown Lands Other	653.6	289.3	453.9	27.3	1,424.1	0.9%
1.d.3	Private Land	1,019.0	91.3	42.4	2.3	1,155.0	0.8%
1.e.1	Wildlife Exclusions	0.0	0.0	0.0	0.0	0.0	0.0%
1.f.1	Permanent Sample Plots (PSP's)	49.7	5.3	45.2	1.3	101.5	0.1%
1.f.2	Regulation Buffers Water (30m)	4,456.1	1,083.8	3,330.0	1,382.6	10,252.5	6.8%
1.g.1	Protected Water Supply Areas	0.0	0.0	0.0	0.0	0.0	0.0%
1.h.1	Research Areas	44.8	1.7	0.0	0.0	46.5	0.0%
	Section Sub-total	8,714.1	1,679.7	5,028.4	1,472.8	16,895.0	11.2%
	Non-Harvestable						
2	Inventory Types						
2.a.1	Coniferous Scrub	16,630.4		7,113.5		23,743.9	15.7%
2.b.1	Deciduous Scrub	2,925.8		712.2		3,638.0	2.4%
2.c.1	Vegetated Non-forested		10,044.2		4,879.4	14,923.6	9.8%
2.d.1	Non Vegetated		1,683.6		489.7	2,173.3	1.4%
2.e.1	Cleared Land		155.7		30.0	185.7	0.1%
2.f.1	Residential Land		52.2		2.0	54.2	0.0%
2.g.1	Agricultural Land		8.0		9.0	17.0	0.0%
	Section Sub-total	19,556.2	11,943.7	7,825.7	5,410.1	44,735.7	29.5%
3	Water Features						
3.a	Water Bodies						
3.a.1	Lakes/Ponds		9,176.1		823.1	9,999.2	6.6%
3.a.2	Double Sided Rivers		145.8		707.6	853.4	0.6%
	Section Sub-total		9,321.9		1,530.7	10,852.6	7.2%
4	Operational Alienations						
4.a	Roads						
4.a.1	Right Of Way (Roads)		232.5		0.0	232.5	0.2%
4.a.2	Resource Roads (6m buffer)	338.1	8.5	175.2	10.0	531.8	0.4%
4.b	Stand Level						
4.b.1	NSV Stands	5,453.4		1,425.8		6,879.2	4.5%
4.b.2	Islands	0.0	0.0	0.0	0.0	0.0	0.0%
4.b.3	Steep Slopes	248.7	8.4	136.8	42.9	436.8	0.3%
4.b.4	Isolated Stands	0.0	0.0	0.0	0.0	0.0	0.0%
4.b.5	Other Stand-level Constraints	196.2	0.2	17.8	0.0	214.2	0.1%
4.b.6	Area Not Interpreted	0.0	0.0	0.0	0.0	0.0	0.0%
	Section Sub-total	6,236.4	249.6	1,755.6	52.9	8,294.5	5.5%
5	Non-Timber Values						
5.a.1	Plant Habitat	0.0	0.0	0.0	0.0	0.0	0.0%
5.b.1	Wildlife Habitat	27.0	39.3	0.0	0.0	66.3	0.0%
5.c.1	Tourism Values	76.4	0.0	0.0	0.0	76.4	0.1%
5.d.1	Administration	0.0	0.0	0.0	0.0	0.0	0.0%
5.e.1	Mines and Quarries	0.0	0.0	0.0	0.0	0.0	0.0%
5.f.1	Agriculture	0.0	0.0	0.0	0.0	0.0	0.0%
5.g.1	Parks and Reserves	0.0	0.0	0.0	0.0	0.0	0.0%
5.h.1	Protected Water Supplies	108.4	0.0	0.0	0.0	108.4	0.1%
5.i.1	Scenic Coastal Routes	0.0	0.0	0.0	0.0	0.0	0.0%
5.j.1	Visual Quality	61.9	0.0	0.0	0.0	61.9	0.0%
5.k.1	Wilderness Corridor	0.0	0.0	0.0	0.0	0.0	0.0%
5.l.1	Proposed Protected Area	0.0	0.0	0.0	0.0	0.0	0.0%
5.m.1	Protected Road Buffer	0.0	0.0	0.0	0.0	0.0	0.0%
	Section Sub-total	273.7	39.3	0.0	0.0	313.0	0.2%
6	Domestic Landbase						
6.a.1	Domestic Coniferous	2.2		0.0		2.2	0.0%
6.a.2	Domestic Coniferous/Deciduous	1.1		0.0		1.1	0.0%
6.a.3	Domestic Deciduous/Coniferous	0.4		0.0		0.4	0.0%
6.a.4	Domestic Deciduous	0.1		0.0		0.1	0.0%
6.a.5	Domestic Unclassified	0.0		0.0		0.0	0.0%
	Section Sub-total	3.8		0.0		3.8	0.0%
7	Harvestable Landbase						
7.a.1	Core Coniferous	33,762.3		22,995.0		56,757.3	37.5%
7.a.2	Core Coniferous/Deciduous	2,757.4		2,447.8		5,205.2	3.4%
7.a.3	Core Deciduous/Coniferous	2,321.3		1,089.8		3,411.1	2.3%
7.a.4	Core Deciduous	1,144.1		797.4		1,941.5	1.3%
7.a.5	Core Unclassified	526.2		125.9		652.1	0.4%
	Section Sub-total	40,511.3		27,455.9		67,967.2	44.9%
7.b.1	Operational Coniferous	1,581.9		523.0		2,104.9	1.4%
7.b.2	Operational Coniferous/Deciduous	170.3		91.2		261.5	0.2%
7.b.3	Operational Deciduous/Coniferous	59.7		1.8		61.5	0.0%
7.b.4	Operational Deciduous	17.3		0.0		17.3	0.0%
7.b.5	Operational Unclassified	5.1		0.0		5.1	0.0%
	Section Sub-total	1,834.3		616.0		2,450.3	1.6%
	Section Sub-total	42,349.4		28,071.9		70,421.3	46.5%
	Grand-total	77,129.8	23,234.2	42,681.6	8,466.5	151,512.1	100.0%



Map 1- 4 Landbase Classification Map – ZONE 3.

2.1.5.2. Forest Profile

2.1.5.2.1. Species Composition

Working group describes the dominant tree species present in a forest stand. This species may occupy 100 percent of crown closure of a stand or may be present in association with other species. The working group designation describes the stand in general terms based on the prevalent species whereby species composition describes specifically, the relative proportion of each individual tree species that make up a stand. For the purposes of timber supply there are five broad working groups within the Zone 3 CBPPL tenure. The softwood working groups dominate accounting for approximately 80 percent of the productive forest. The black spruce (bS) working group is by far the most prolific accounting for 63 percent of the working groups in FMD 5 and 74 percent in FMD 6 (Figure 1-2). Black spruce can occur as pure stands or in association with other species listed below. Balsam fir (bF) is the second most abundant on CBPPL tenure. Balsam fir can occur in pure stands or in association with one or more of black spruce, white spruce, white birch, trembling aspen, or larch in varying species compositions. Softwood/Hardwood and Hardwood/Softwood working groups occupy approximately 12 and 5 percent of the productive forest. These working groups occur as varying mixtures of fir, spruce, birch and aspen. The pure hardwood working group (white birch (wB), trembling aspen (tA)) occupies less than 1 percent of the productive forest on CBPPL tenure.

The following provides a more detailed outline for some of the larger groups, with additional descriptions of the selected accompanying forest types, as described by Meades and Moores, 1994.

A) Black Spruce - *Picea marina* (Mill.) B.S.P. Within this working group there are three main forest types that characteristically represent black spruce. These include: black spruce forest, black spruce fen, and *kalmia*-black spruce forest.

Black spruce forest includes a forest that has a thick humus layer with mainly black spruce as the dominant tree species. The sites within this forest type have a wide range of moisture from dry to wet and the fertility ranges from very poor to rich. Because there is such a wide range in both moisture and fertility, this forest type had to be broken down into six specific forest types. These include: *sphagnum*-black spruce, black spruce feathermoss/ bedrock, black spruce-feathermoss/very dry, black spruce feathermoss/ dry, black spruce-feathermoss/bog, and black

spruce-feathermoss/moist. This forest types produce merchantable timber. Most of these forest types are common throughout the four districts.

Black spruce-fen is characterized by an abundance of understory that is usually described as fertile but poorly drained. Due to this poor drainage the black spruce in this forest type are usually stunted. These forests are considered important wildlife and plant habitats because of the high fertility, and usually grow in open settings. As a result of the open grown, stunted trees, this forest type is not usually merchantable from a commercial harvesting perspective. This forest type is divided into two forest types: *carex*-black spruce and *osmunda* - black spruce, both of which are not common in the four districts.

Kalmia-black spruce represents a black spruce forest that is associated with bogs. The trees are open grown with black spruce as the dominant tree, which is usually stunted with abundant shrubs and mosses growing throughout its understory. These sites are normally infertile but range from dry to very moist. This forest type, because of small variations, can be broken down into four forest types: *nemopanthus-kalmia* black spruce, *sphagnum-kalmia*-black spruce, *kalmia*-black spruce, and *cladonia-kalmia*-black spruce.

These forest types are usually considered unmerchantable and are common throughout the districts. All three of these forest types are the result of regeneration on areas burned a number of times over the years. The natural succession following fire in Newfoundland's Boreal Forest is towards black spruce with limited amounts of certain pioneer species such as white birch and trembling aspen. Sites occupied by black spruce are usually away from river valleys and any flood plains in these valleys. Most black spruce occupy hillsides, ridges, and open barrens. Areas that are generally made up of rock outcrops contain black spruce as well.

B) Balsam Fir - *Abies balsamea* (L.) Mill. Another major forest type is the balsam fir forest. In some districts of the province this type is the dominant species, but in Zone 3 it is not. This species occupies sites that are usually fertile and moist but because these districts have a recurring history of fire, balsam fir cannot become established as they do not naturally occupy burned areas. Due to the complexities of the balsam fir forest type, it can be divided into several types. These are: *equisetum-rubus* balsam fir, *rubus*-balsam fir, *clintonia*-balsam fir, *taxus*-balsam fir, *dryopterishylocomium*- balsam fir, *dryopteris*-balsam fir, *dryopteris-rhytidadelphus* balsam fir, *dryopterislycopodium*- balsam fir, *hylocomium*-balsam fir, *gaultheria*-balsam fir, *pleurozium*-

balsam fir, *carex*-balsam fir, and *sphagnum*-balsam fir. They normally occupy river valleys and flood plains as pure stands or mixed with hardwoods, along with side slopes to these valleys. This working group is not as prevalent as spruce in the four districts with many of the thirteen forest types not present.

Some are found in limited locations throughout the four districts, which include: *rubus*-balsam fir, *dryopteris-lycopodium*-balsam fir, *hylocomium*-balsam fir, *pleurozium* - balsam fir, *carex*-balsam fir, and *sphagnum*-balsam fir. All balsam fir forest types have balsam fir as the main tree species, with white birch usually abundant throughout. The *rubus*-balsam fir forest type is found in low to mid-sloped areas that are moist. This forest type has an abundant herb layer but is limited to certain types which differentiate it from the *equisetum-rubus*-balsam fir forest type, which has a more diverse herb layer. The *dryopterislycopodium*- balsam fir forest type has narrow moisture regime from moist to somewhat moist that is nutrient rich. This forest type has ground cover that is dominated by ferns and certain moss types and plants that are specific to this type. The *hylocomium* balsam fir forest type is also moist to somewhat moist but is dominated by a layer of moss instead of the ferns. The *pleurozium*-balsam fir forest type has balsam fir and black spruce as the main tree species with few white birch. The moss layer is made up mainly of *pleurozium schreberi* and is found on dry to well drained areas such as dry ridges and outwash deposits. The *carex*-balsam fir forest type has willow found in it. The *sphagnum*-balsam fir is dominated by *sphagnum* moss on the forest floor and is poorly drained.

C) White Birch - *Betula papyifera* Marsh. This working group represents the major hardwood component for the forests of the province, and FMD's 4, 5, 6 and 8. White birch is normally found on the fertile sites along streams and rivers, as well as flood plains. It can also be found on fire origin locations as it is a pioneer species that seeds into an area once the forest cover is removed by fire. Pure white birch stands are not that common in the province, especially in the four districts. There are a number of white birch forest types, all depending upon the understory growth and the associated soil type.

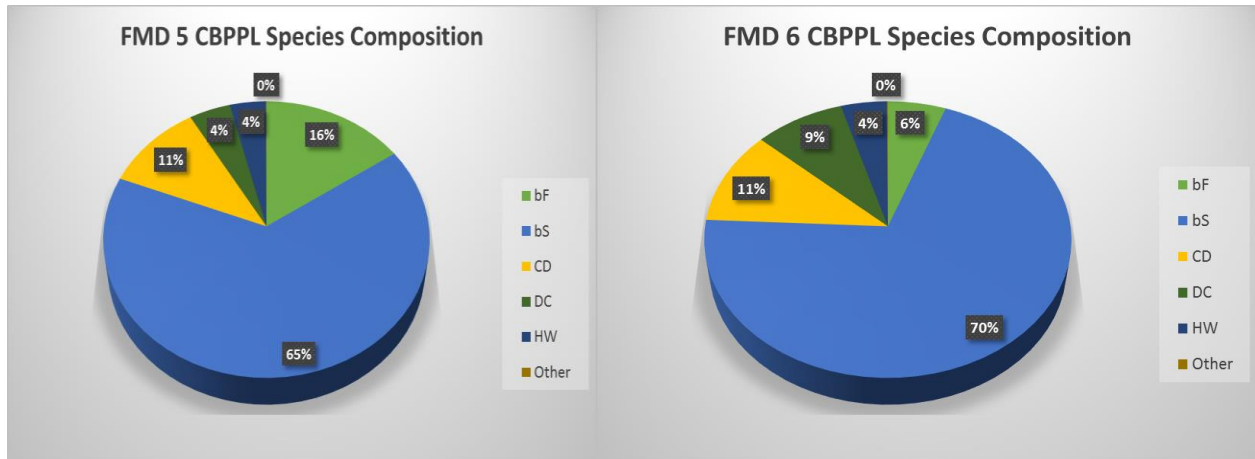


Figure 1- 2 Working group (species composition) by FMD

2.1.5.2.2. Age Class

Individual tree ages in a stand can all be the same after disturbance such as fire or harvesting; however in most cases the ages vary. Forest managers describe stand ages in terms of age classes which generally encompass 20 years. The age classes present in the zone are:

Age	Description	Age	Description
0-20	Regenerating	81-100	Over mature
21-40	Immature	101-120	Over mature
41-60	Semi-mature	121-140	Over mature
61-80	Mature	141-160	Over mature

161 + (actually represents uneven-aged stands)

The age class distribution for CBPPL tenure in Planning Zone 3, for the entire productive forest, is shown in Figure 1-3 for both FMDs 5 & 6. In general terms, the more balanced the age class distribution in a district, the higher the potential for an even flow sustained harvest of timber, because continuous timber supply is limited by the age class with the lowest frequency of occurrence. A balanced age distribution in the forest would also allow for the highest biodiversity by making habitat available at all stages of development, with the equivalent proportions of the forest to moving from one stage of development to the next over time. This would result in an ongoing renewal of habitat.

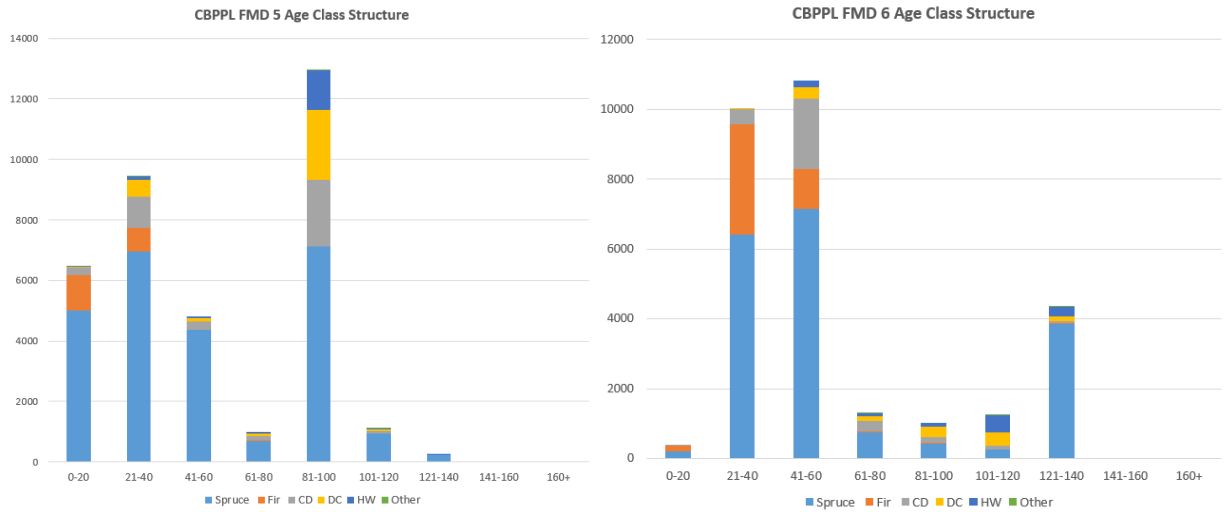


Figure 1- 3 Working group by Age Class by tenure. (Disturbed and scrub area removed)

It can be seen that both FMDs have an unbalanced age class structure with more productive forest falling in the younger age classes. This unbalanced age class structure limits the maximum sustainable harvest levels as the mature forest will have to be harvested before the immature stands can reach their peak yields. This is particularly evident in looking at the Core landbase which is the largest portion of the productive forest comprising the Zone 3 AAC for CBPPL (Figure 1-4).

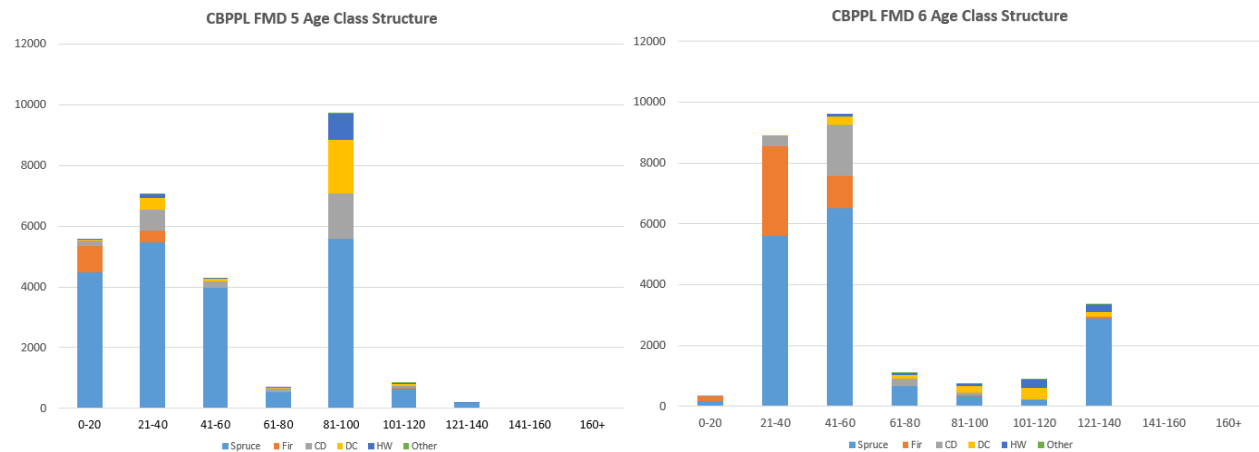


Figure 1- 4 Working group by Age Class by tenure for Core Landbase

2.1.5.2.3. Site Class

The Forest Services Branch has identified four site classes that refer to the potential of a given site to produce timber. These are high, good, medium and poor. The classes are based on a number of factors, some of which are soil type, moisture content, slope, and fertility. Site class is

determined through air photo interpretation supplemented with field checks. The classes indicate the volume of wood fiber that a site has the capability of producing under natural conditions by the time the trees reach their rotation age (which averages, generally, between 60 and 80 years depending on the species and the location). On average, good sites are capable of producing > 2.6 m³/ha/yr, medium sites 1.7 m³/ha/yr, and poor sites 0.8 m³/ha/yr. The following indicates the average potential in cubic meters per hectare for each site class at maturity (based on the provincial average).

Class m ³ /ha			
High = 200+	Good = 150	Medium = 120	Poor = 80

Since the occurrence of high site classes is so rare on the Island the Forest Service branch has combined the Good and High site types into the Good site type for the purpose of timber supply. The medium site class is by far the largest in the districts within CBPPL tenure in Planning Zone 3, holding approximately 70% of the total productive area found across FMDs 5 & 6. Figure 1-5 presents the site class information in graphic form to show the levels of site class in each district for CBPPL tenure.

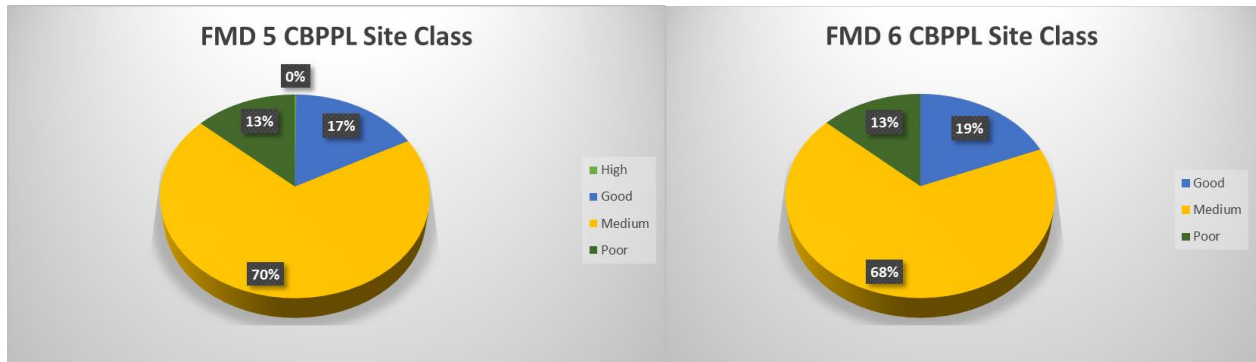


Figure 1- 5 Site class distribution by tenure and AAC class.

2.2. Past Planning Activities

2.2.1. Harvesting

2.2.1.1. Commercial Activity

Harvesting activities in this zone have been targeted towards satisfying the spruce requirement to the Pulp and Paper mill. The AAC in FMD 5 has been harvested to its full allocation due to its high spruce content and short haul distances from the operable stands to the main highway. The AAC

in FMD 6 hasn't been harvested to its full allocation due to the longer haul distances to the south of the district and the need for the fiber has been offset through the procurement of chips from Sexton lumber.

Table 1- 3 Commercial harvest summary table CBPPL FMD 6 (2017-2021)

FMD5			Core					Operational - Available				
Year			AAC	Harvested		Remaining		AAC	Harvested		Remaining	
				m3	%	m3	%		m3	%	m3	%
Softwood	1	2017	50,687	18,174	36%	32,513	64%	2,639	0	0%	2,639	100%
	2	2018	50,687	23,437	46%	27,250	54%	2,639	35	1%	2,604	99%
	3	2019	50,687	32,301	64%	18,386	36%	2,639	26	1%	2,613	99%
	4	2020	50,687	32,155	63%	18,532	37%	2,639	0	0%	2,639	100%
	5	2021	50,687	0	0%	50,687	100%	2,639	0	0%	2,639	100%
5 Year Sub-total			253,435	106,067	42%	147,368	58%	13,195	61	0%	13,134	100%
			Core					Operational - Available				
Year			AAC	Harvested		Remaining		AAC	Harvested		Remaining	
				m3	%	m3	%		m3	%	m3	%
Hardwood	1	2017	3,795	1,838	48%	1,957	52%	0	0	0%	0	100%
	2	2018	3,795	4,101	108%	-306	-8%	0	0	0%	0	100%
	3	2019	3,795	571	15%	3,224	85%	0	0	0%	0	100%
	4	2020	3,795	0	0%	3,795	100%	0	0	0%	0	100%
	5	2021	3,795	0	0%	3,795	100%	0	0	0%	0	100%
5 Year Sub-total			18,975.00	6,509.80	34%	12,465.20	66%	0	0	0%	0	100%

Table 1- 4 Commercial harvest summary table CBPPL FMD 5 (2017-2021)

FMD6			Core					Operational - Available				
Year			AAC	Harvested		Remaining		AAC	Harvested		Remaining	
				m3	%	m3	%		m3	%	m3	%
Softwood	1	2017	65,611	0	0%	65,611	100%	3,731	0	0%	3,731	100%
	2	2018	65,611	0	0%	65,611	100%	3,731	0	0%	3,731	100%
	3	2019	65,611	0	0%	65,611	100%	3,731	0	0%	3,731	100%
	4	2020	65,611	0	0%	65,611	100%	3,731	0	0%	3,731	100%
	5	2021	65,611	0	0%	65,611	100%	3,731	0	0%	3,731	100%
5 Year Sub-total			328,055	0	0%	328,055	100%	18,655	0	0%	18,655	100%
			Core					Operational - Available				
Year			AAC	Harvested		Remaining		AAC	Harvested		Remaining	
				m3	%	m3	%		m3	%	m3	%
Hardwood	1	2017	2,730	0	0%	2,730	100%	0	0	0%	0	100%
	2	2018	2,730	0	0%	2,730	100%	0	0	0%	0	100%
	3	2019	2,730	0	0%	2,730	100%	0	0	0%	0	100%
	4	2020	2,730	0	0%	2,730	100%	0	0	0%	0	100%
	5	2021	2,730	0	0%	2,730	100%	0	0	0%	0	100%
5 Year Sub-total			13,650.00	0	0%	13,650.00	100%	0	0	0%	0	100%

Note: 2021 Harvest data not included in table 1-3 or 1-4.

2.2.1.2. Domestic Activity

CBPPL doesn't manage its landbase for domestic harvesting with segregated blocks. Historically CBPPL issues 100 domestic permits, in each of its Zone 3 tenures, for the harvest of non-commercial species (hardwoods & larch).

2.2.2. *Silviculture*

The past levels of silviculture (2017-2021) in Zone 3 were less than anticipated. Since the AACs in Zone 3 have been undercut for the previous period the levels of silviculture are accordingly lower. 2021 data only included in the proposed section of the table below as the actual treated area was not available when this document was submitted.

Table 1- 5 Summary of completed silviculture activity (2017-2021)

Treatment Type	FMD 5		FMD 6	
	Area (ha)		Area (ha)	
	Proposed	Treated	Proposed	Treated
Pre Commercial Thinning	0.00	0.00	0.00	0.00
Planting	1258.00	919.08	200.00	193.22
Scarification	1460.00	893.98	225.00	184.78
Commercial Thinning	0.00	0.00	0.00	0.00
Cone Collection	0.00	0.00	0.00	0.00

2.2.3. *Forest Access*

The amount of road proposed was much greater in the past five years (2017-2021) than was actually constructed. The roads proposed were anticipation of either harvesting the full AAC or in anticipation of having to shift operations for unforeseen circumstances (operational flexibility). However the volume harvested in both districts could be mostly obtain through existing networks therefore reducing the amount of construction required. Only the proposed road data for 2021 is included in the table below, as the actual constructed was not available when this document was submitted.

Table 1- 6 Summary of forest access roads built 2017 to 2021.

Roads		
District	Proposed	Constructed
5	114.38	23.02
6	17.84	0.00
Total	132.22	23.02

2.2.4. *Natural Disturbances*

2.2.4.1. *Fire*

There were no significant fires during the last planning period. Historical data can be found on the gov.nl website.

2.2.4.2. *Insects*

There has been little insect activity in the Zone over the past decade. With the exception of the balsam wooly adelgid (aka aphid), no other insect infestations have been documented by the Forest Insect and Disease Branch of the Department of Natural Resources in Planning Zone 3. The majority of the remaining balsam fir stands in the zone are now infected with aphid. Wide scale treatment for eradication of this insect is yet to be developed. According, the only work carried out in the zone to deal with aphid has been the removal of balsam fir ingrowth through cutting in some plantations where the fir is competing with planted crop trees. It is hoped that this treatment will help reduce the spread of aphid.

3. Timber Supply Analysis

The current annual allowable cuts for each district are in effect from January 1, 2021 to December 31, 2025.

3.1. ***Methodology***

The province reviews its timber supply every five years in order to account for any changes in forest land base, growth rates, and management strategies. This schedule is consistent with the Forestry Act, 1990, which established management by forest management district and mandates that a wood supply analysis be completed every five years. The result of this analysis is a new set of annual allowable cuts (AAC's) for each forest management district. These AAC's are defined as the maximum annual rate at which timber can be harvested at a sustainable level indefinitely into the future (in reality, the AAC figures are applicable for a period of 160 years into the future and not infinity). Annual allowable cuts must be calculated on a district basis, however when "rolled up" provide us with the annual allowable harvest level for the island.

Forest Modeling:

- 160 year planning horizon
- harvest strategies (Even flow, Step up Harvest, non-declining)

Baseline Constraints:

- Even flow harvest level
- Silviculture treatment levels
- 2X Operable Growing Stock
- 15% age 81 + Old Growth Minimum

Table 1- 7 Provincial AAC classes

Timber Class	AAC	Description
AAC	Core	Unalienated Land - First priority in terms of timber harvesting landbase. Free to harvest
	Operationally Available	Unalienated Land - Secondary timber harvesting landbase. Free to harvest but operationally restricted (steep slopes, timing of harvest, etc)
Non-AAC	Regulatory	Alienated from harvest by regulations (parks, stream buffers, etc)
	Operationally Unavailable	Alienated from harvest by operational restrictions (steep slopes, isolate stands, etc)

3.1.1. *Guiding Principles and Policy Direction*

The key underlying principles that guide this analysis are:

- (i) the AAC must be sustainable;
- (ii) the level of uncertainty (risk) associated with the AAC must be minimized by using empirical information wherever possible;
- (iii) there must be conformity between information and assumptions used in the analysis and actions and decisions taken on the ground;
- (iv) the analysis must be consistent with other forest values and objectives; and
- (v) the timber supply calculation must consider economic factors, not solely the physical supply of timber.

In concert with the policy of establishing sustainable timber harvest levels, Government policy requires that harvesting not exceed the established AAC's. Likewise, Governments policy is to optimize forest industry opportunities from the sustainable fiber supply. Government also requires consultation be conducted during the timber analysis. The forest industry was consulted directly throughout the process.

3.1.2. *Factors Affecting Timber Supply*

The forests of insular Newfoundland are very variable in terms of age distribution.

Typically, there are significant amounts of mature/over-mature forest and regenerating forest, but limited intermediate age forests. This imbalance is not unusual in a boreal forest where cyclic catastrophic disturbances are common. Figure 4 illustrates this age class imbalance. The insufficient amount of intermediate age forest on the island is one of the most important factors

influencing AAC's, therefore it is the basis for many of our forest management strategies. Essentially; we are employing a matrix of measures designed to fill the gap in our age structure, which include: an aggressive forest protection program, harvesting programs that attempt to exclusively target the oldest stands first, and thinning the regenerating forest so that it becomes operable at an earlier age. Another important aspect of the Province's forest posing a challenge to forest managers is the natural fragmentation of the resource. The Province's landscape is characterized by many ponds, bogs, rivers, streams, and rock outcrops resulting in relatively small pockets of timber. This makes the determination of an economic timber supply very challenging given that each stand has unique economic characteristics. Arguable the most important factor affecting present and future AAC's is the available productive landbase. However, this productive landbase available for forest activity is constantly being evaluated by the demands/requirements of other stakeholder values. Therefore, it is important that we manage relationships with other users to minimize loss to the forest landbase, while taking into account these other values. As well, to mitigate losses to the productive landbase, we must continue to explore ways for growing more volume on the existing landbase.

In 2015, the Forest Service began another review of the provincial timber supply. Consistent with Department's vision, the analysis was structured to determine sustainable timber supplies while respecting a multitude of social, economic and environmental objectives. Timber supply, in this context, refers to the rate at which timber is made available for harvesting on a sustainable basis. The determination of supply (represented as AAC's) involved the use of computer models that forecast the sustainability of possible AAC levels. These models require three basic inputs. First, a description of the current state of the forest (forest characterization and availability), second, the growth rates associated with the current forest, and third, the management strategies applied to the forest. To arrive at these basic inputs require careful and detailed consideration of a broad range of both timber and non-timber values. More specifically, the following was considered in determining the sustainable timber supply.

3.1.2.1. Land Characterization

To get a current description of the forest resource (or stock), the Province has invested significant resources into creating and maintaining a Provincial Forest Inventory. Although the latest inventories used in the 2016 Wood Supply Analysis for this zone, the estimate of forest stock is kept current through an annual update program. This program accounts for all natural and man-made disturbances such as: fire, insects, harvesting, and any enhancement programs, including

tree planting and pre-commercial thinning. Also, each stand in the forest inventory is updated to reflect any yield changes that may have occurred since the previous inventory update.

3.1.2.2. *Land Availability*

The updated Forest Inventory was reviewed and classified at the stand level on the basis of the availability of each stand for harvest. The classification system consists of two broad classes being available for the AAC calculation;

- Core - available for harvest under normal conditions, and
- Operational - has restrictions for harvesting due to economic constraints.

The remaining productive forest has been removed for varying social/legislative reasons. The major removals are listed below:

3.1.2.2.1. *Non-Timber Related*

Consideration of non-timber values has a direct impact on Provincial AAC's. It is obvious that as the amount of productive forest land available for timber management drops, so too will the AAC. With the current restrictions, the AAC landbase (area where harvesting operations can occur) is only 18 % of the total productive forest land base. On average, in any one year, less than 1% of the productive forest land base is influenced by harvesting operations.

3.1.2.2.2. *No-Cut Buffer Zones*

The Province has guidelines that require all water bodies (visible on a 1:50,000 map sheet) be given a minimum 30 meter uncut buffer (from water's edge). In addition to these legislated water buffers, District Ecosystem Managers, in consultation with various stakeholders, have increased buffer zone widths beyond the 30 meter minimum to protect special values such as: salmon spawning areas, cottage development areas, aesthetic areas, wildlife habitat, outfitting camps, etc.

3.1.2.2.3. *Pine Marten and Caribou Habitat*

Habitat specialists are working in consultation with industry to study both species and ensure adequate habitat will be available for pine marten and caribou into the future. This work is examining the quantity and quality of habitat, as well as, the connectivity of habitat. With respect to Caribou, the Forest Services Branch, Corner Brook Pulp and Paper and the Wildlife Division are working together to develop an adaptive management strategy. This initiative started during

the development of Zone 5 planning process in 2011 and will be further explained in Section 4.2.1.1.2

3.1.2.2.4. Wildlife Corridors

As part of the evaluation process for harvesting plans, wildlife specialists sometimes recommend managed corridors to ensure various species of wildlife have sufficient cover to move around the landscape. These corridors are temporal in nature and generally have little impact on timber supply.

3.1.2.2.5. Protected Areas

All established and proposed protected areas are removed from the AAC calculations.

3.1.2.2.6. Watersheds

For each of the forest management districts in Planning Zone 3, all of the public protected water supply areas and some of the larger watersheds (eg Gander River and Terra Nova River) were digitized and captured within the forest inventory. These watersheds were added to the database in order to address any concerns about forest management within these watersheds and to permit the Forest Service to report on proposed activities within these watersheds over time.

3.1.2.2.7. Operational Constraints

Areas that are inaccessible (surrounded by bogs or hills), timber on steep slopes, and low volume stands are removed from the AAC calculation up front. Also, significant adjustments are applied to the Provincial Forest Inventory for stands deemed operable in the timber analysis but left unharvested within operating areas. The reasons for this are linked to the character of Newfoundland's forests; low volume, steep slopes, rough terrain, and excessively wet ground conditions etc. Again, all these timber and non-timber related issues are applied directly in the AAC calculation to ensure harvest levels do not exceed the sustainable level. With the introduction of new values and the broader application of current values, the pressure on future AAC's will continue to increase.

3.1.2.2.8. Growth Forecasting

A key requirement for forecasting future wood supply is an understanding of how forest stands grow and develop through time. That is, as a forest stand develops, how much merchantable (i.e.

harvestable) volume does it carry at any given point? These yield forecasts (referred to as yield curves) are required for each type of forest stand (called a stratum) comprising the forest under consideration. In Newfoundland, there are dozens of distinct forest strata for which separate yield curves are required. These are defined by the tree species in question (e.g., balsam fir, black spruce), the site quality (e.g., good, medium, poor), the geographic region (e.g., Central Newfoundland) and other factors likely to affect yield. Yield curves are a key element in a wood supply analysis. In fact, the validity, or “usefulness” of the wood supply analysis is determined by the truth or “correctness” of the yield forecasts. While there is no way of predicting with certainty how stands will actually grow in the future, care must be taken to ensure that the yield projections used are realistic and reasonable. Respecting the sensitivity and importance of these forecasts, the Forest Services Branch has directed a large portion of its resources and time into developing realistic yield curves. Two growth models were used, one for projecting stand development under natural conditions and the other for projecting growth under managed (i.e., silviculturally enhanced) conditions. Tree and stand development data generated from the Forest Service’s Forest Inventory Program were used to make stand growth predictions. These projections were then checked against empirical data from thousands of temporary plots established throughout the Island. If the projections varied from the real life evidence, the curves were adjusted to make them more accurate. In this analysis, yield curves were developed on an ecoregion basis to more accurately portray the varied stand growth within and among the districts.

3.1.2.2.9. Management Strategies

With the current state of the forest described and the yield forecasts developed, the next step was to design a management strategy for each sector of the forest. The key objective was to maximize long term AAC while at the same time taking into account other forest values. This involved developing strategies that minimized fiber losses and enhance forest sustainability.

3.1.2.2.10. Harvest Flow Constraints

An even-flow harvest constraint was used in the analysis to maximize the sustainable harvest level. This strategy produced the maximum even flow harvest but resulted in less than optimum economic use of the forest resource. If no even flow constraint is used and harvest levels are permitted to fluctuate in response to market value, the overall economic potential of the forest will increase. However, the lower economic potential is offset by stability in manufacturing plants and employment.

3.1.2.2.11. *Planning Horizons*

Given the Province’s commitment to long term sustainability of our forest resource, timber supplies were projected 160 years (equivalent to two forest rotations) into the future to ensure actions and strategies applied today will result in a sustainable forest in the future. Long term planning is fundamental in timber supply forecasting and ecosystem management as well.

3.1.2.2.12. *Operable Growing Stock Buffer*

The Province imposed an operable growing stock constraint in the analysis to ensure the sustainability of calculated timber supplies. The constraint imposes a condition that in any period there must be a minimum operable growing stock of two times the harvest level on the landscape. In other words, for every hectare that is harvested another harvestable hectare must exist on the landscape. The requirement for a growing stock buffer is based on a number of factors. First, several of our non-timber objectives are not explicitly accounted for in our planning process and therefore will require a growing stock buffer to achieve them. Second, we are unable to follow optimum harvest schedules explicitly due to operational restrictions on harvesting. Third, the Province is not willing to assume high risk with the sustainability of the timber supply. For these reasons a growing stock constraint of two times was used. This constraint was used in concert with harvest scheduling to help map out a reasonable harvest for the next 20 years.

3.1.2.2.13. *Old Forest Targets*

Consistent with our ecosystem policy, the province introduced into the analysis an old forest target that at least 15 percent of forests be older than 80 years. While this is a minimum target, actual results are usually higher. This initiative was designed to provide a coarse filter approach to maintaining representative forest structure. It ensures the presence of certain amounts of old forest across the landscape into the future. With advances in modeling, this target can now be tracked across a district rather than a single ownership. This has resulted in this strategy being less restrictive than the last analysis. As well, the site class distribution of the older forest reserve is being examined in an attempt to make it representative of each ecoregion and subregion.

3.1.2.2.14. *Operability Limits*

Operability limits are the time windows in which forest management actions such as harvesting can be undertaken within forest stands. Stand growth development as measured in stand

merchantable timber volume and individual piece size of trees determine a stand's readiness for harvest. In some young stands, one can have acceptable harvest volumes, but still have trees that are too small to harvest. In the wood supply analysis both stand volume and tree size were used to determine the earliest age when a stand could be initially harvested. In addition to determining the absolute earliest age a stand can be harvested, it was recognized that not all stands on the same site develop exactly the same at the same rate. The ending operability limits or the last age in which a stand can be harvested before it becomes too old to harvest is solely determined on a minimum stand volume of between 60 to 80 m³/ha, after which that stand does not have enough volume to make it economical to harvest. It should be noted that while the operability limits define the extreme end points of when stands can be harvested, very few stands are ever harvested at these extreme points. In order to meet other non-timber objectives and in order to maximize the total volume of wood harvested the model schedules stands to harvest somewhere inside the operability limit window.

3.1.2.2.15. Silviculture

Silviculture is one of the main forest management tools available to forest managers when they are analyzing the many different future forests that are generated using the wood supply modelling software. The silvicultural actions used in the 2020 analysis include; 1) precommercial thinning of balsam fir, black spruce, and softwood hardwood stands, and 2) full plant of any areas that do not regenerate naturally with either white spruce, black spruce, or Norway spruce. The planting levels for CBPPL tenure in districts 05 & 06, used in the analysis were 300 and 400 ha per year respectively with no precommercial thinning planned.

3.1.3. AAC Adjustments

3.1.3.1. GMV Volume Adjustments

Reductions are applied to the Net AAC, Gross Merchantable Volume (GMV) which account for net losses due to natural disturbances, operational factors or timber utilization.

3.1.3.1.1. Natural Disturbances

Projected future losses related to Fire, Insect and Disease are calculated by FEIS section and are based on historical five year running average.

3.1.3.1.2. Operational Losses (Predicted versus Actual Volumes)

Operational losses associated with stand level utilization and volume predictions are calculated based on data derived from commercial harvesting blocks (roughly 10% sample) occurring throughout the District over the previous five year period. Timber supply volume predictions are compared on a block by block basis against actual reported harvest volumes and a percentage difference, generally a reduction, is applied to the AAC to account for current and future operational losses. The Zone 3 operational loss is 9% for the 2022-2026 period.

3.1.3.2. Spatial Blocking Adjustments

Spatial blocking adjustments refer to the operational loss associated with the spatial scheduling. More specifically, the 20 year harvest schedule integration and the volume differences between the aspatial AAC and the spatially scheduled AAC. A major improvement that occurred in both the previous and the 2010 wood supply analysis is manual harvest scheduling. In 2001, the harvest scheduling was an automated process where the software picked the stands to be harvested over the 25 years based on user supplied criteria. The 2001 approach was an improvement over previously wood supply processes because there was no harvest scheduling completed. Basically, the software used cannot realistically know all the operational restrictions within a forest management district. By utilizing the spatial manual process, on the ground conditions that restrict harvesting are accounted for when a spatial harvest schedule is defined. The approach for 2016 was to use a 20 year harvest schedule using a 10 year harvest period. This was for two reasons; first, to reduce modelling complexity at the aspatial level and secondly, to align the amount of scheduled wood with the 2 times AAC allowed in a 5 year plan.

The proposed harvest schedule is then played back through the modeling software to evaluate its sustainability and determine if non-timber objectives are achieved. In most cases, the harvest scheduling exercise has to go through several iterations before an acceptable harvest schedule could be realized. The spatial arrangement of areas for timber harvesting is especially challenging in this province because of the natural fragmentation of our forests. This model provided forest planners with the ability to mimic realistic timber harvest schedules based on current practices and identify forest stands that are considered not as accessible for harvesting.

Manual harvest scheduling has several benefits. First, it fosters the long term sustainability of our AAC's by mimicking current harvest practices and accounting for actual on the ground conditions

which delay or restrict harvesting of stands. Secondly, the mapped 20 year harvest schedules build credibility into the forest management process. Every stand that will be harvested over the next 20 years must already be in the second (20-40 years old) or third (41-60) age class, can be easily identified and highlighted on the harvest schedule maps. Being able to see the wood that will be harvested in the future will help reassure people the resource is being used in a responsible manner. Next, harvest scheduling will help integrate the management of other forest resource values into timber management planning. All forest values can be typed directly to discreet forest areas, providing the link allowing the many different forest values to be managed simultaneously. The forested areas needed for each resource can be mapped and potential conflicts can be addressed.

Finally, the harvest schedule maps developed for the wood supply analysis can be a starting point for the 5 year management planning process, especially the first period. The harvest schedule maps, if done correctly, can help reduce the work of the 5 year planning process. One point to note is that harvest scheduling is completed only for the Core landbase. The Operational AAC, for the most part, is opportunistic at best and is harvested only if extra effort is applied. It is not scheduled because of the uncertainty of obtaining extra funding for access and harvesting.

3.2. AAC Results & Outputs

New AAC information for the 2021-2025 was not available at the time this document was produced. Allowable cut is expected to remain similar to the last AAC provided by Crown.

Table 1- 8 Annual Allowable Cut results 2011 through 2020.

				Provincial Annual Allowable Cut (AAC) 2011-2015										
Land Tenure	Zone	District #		Softwood Volume (m ³ /yr)					Hardwood Volume (m ³ /yr)					
				Core		Oper Constrained		Sub-total	Core		Oper Constrained		Sub-total	
Kruger	Island	3	5	46,600		4,700		51,300		2,000		100		2,100
			6	71,100		5,500		76,600		2,100		0		2,100
			Sub-total	117,700		10,200		127,900		4,100		100		4,200
				Provincial Annual Allowable Cut (AAC) 2016-2020										
Land Tenure	Zone	District #		Softwood Volume (m ³ /yr)					Hardwood Volume (m ³ /yr)					
				Core		Oper Constrained		Sub-total	Core		Oper Constrained		Sub-total	
Kruger	Island	3	5	50,600		2,600		53,200		3,700		0		3,700
			6	65,600		3,700		69,300		2,700		0		2,700
			Sub-total	116,200		6,300		122,500		6,400		0		6,400

4. Resource Values

4.1. Guiding Principles of Sustainability

There are five guiding principles of overall sustainability, which include; environmental, economic, political, social, and cultural sustainability. Environmental sustainability looks directly at ecosystem health, both now and in the future. Ecosystem health is determined by such factors as ecosystem integrity, biodiversity, productive capacity, and resiliency. The five year operating plan must ensure these factors are intact.

Economic sustainability demands that forest resources be managed and distributed efficiently and equitably among the stakeholders, within the capacity and limits of the forest ecosystem. Economic development has been given top priority by many of Newfoundland's people and their representative, the government. However, economic development should not proceed without the incorporation of the other factors into the decision making process.

Political sustainability refers to goals and management objectives being applicable, administrable, and practical. These goals and objectives must maintain these qualities well into the future with the aid of public input and support. Social sustainability means fairness and equity to all stakeholders. Cultural sustainability is attained by applying Newfoundland's culture to the planning process. A forest management strategy cannot be successful without allowances within the strategy for traditional access and use of the land. For generations, many of Newfoundland's public had free range in our pristine wilderness, a fact that cannot be ignored when planning for the zone. All are key interlocking components and each must be maintained if sustainable development is to be achieved. CBPPL is guided by the Sustainable Forest Management (SFM) Plan developed for their defined forest area.

4.1.1. *CBPPL Sustainable Forest Management (SFM) Plan Introduction*

The forest industry in Canada has evolved from the management of the timber resource to the management of the forest ecosystem. Previously, forest managers developed forest management plans in isolation, focusing on timber. But as the public began requesting the inclusion of other values, consultations with the public and other resource managers evolved simultaneously with the consideration of non-timber values. This has become a cornerstone of sustainable forest management.

CBPPL has joined in this shift to sustainable forest management by incorporating social, environmental and economic values in the sustainable development of Newfoundland's forests. Forestry Services and CBPPL have incorporated public consultations in the forest management planning process since the 1980s, developing a positive relationship among the government, CBPPL, and the community. Public involvement in the identification of values and the development of management plans benefits present as well as future generations.

The Sustainable Forest Management (SFM) Plan for the forested land on insular Newfoundland for which CBPPL has management responsibility, described as the Defined Forest Area (DFA). It was developed with the cooperation of the Public Advisory Committee (PAC), a group of dedicated individuals and organizations interested in sustainable development of the forests of the DFA. The planning process involves public consultation, and follows the principles of sustainable forest management.

CBPPL's first SFM Plan was developed over 16 months and released in July 2004. In late 2008, the Canadian Standard Association released a draft revised standard (CSA Z809-08), and the PAC began updating CBPPL's plan to conform to the new standard, incorporating lessons learned and continual improvement. In 2012, CBPPL was also certified to Forest Stewardship Council (FSC) Boreal Standard.

CBPPL wishes to illustrate to the public (the landowners) and to its customers that the DFA is being managed on a sustainable basis. To this end, CBPPL seeks to maintain certification to CAN/CSA-Z809, Canada's national sustainable forest management (SFM) Standard, and the FSC Boreal Standard. In 2018 and 2019 both of these standards (FSC and CSA respectively) were not maintained and instead replaced with CBPPL's newest forest management standards. In July of 2019 certification to two Sustainable Forestry Initiative Standards, Forest Management and Fibre Sourcing, was achieved. The PAC committee, although a requirement of the CSA standard only, was kept intact to continue to aid in public consultation for future planning inputs and to meet standard and government requirements.

CBPPL wishes to illustrate to the public (the landowners) and to its customers that the DFA is being managed on a sustainable basis. To this end, CBPPL seeks to maintain certification to SFI, and Canada's national sustainable forest management (SFM) Standard. Forest certification gives

organizations a system for continually improving their forest management performance and engaging interested parties in a focused participation process. Rigorous and regular independent third-party audits are involved in certification to both standards.

CBPPL Woodlands' Environmental Management System (EMS) is the vehicle that ensures fulfillment of the SFI Standards requirements. CBPPL's EMS is a registrant to the ISO 14001 Standard, a standard that incorporates environmental aspects and continual improvement into all forest operations. EMS applies to all Woodlands operations controlled by the company including management planning, road construction and maintenance, harvesting operations, transportation of fibre, silviculture and support services. The documented procedures of EMS will provide the system to satisfy all requirements of the ISO 14001 and SFI Forest Management and Fibre Sourcing Standards.

Throughout the SFM Plan, references are made to Indicator Profiles. The profiles, located in the final section of the plan (which can be found on CBPPL's website www.cbpppl.com), contain the background information, management strategy, and implementation details for each of the indicators of sustainable forest management as originally selected by the PAC and adapted to satisfy indicators for the SFI standards.

The auditing process, conducted by an independent third party, determines whether the requirements are implemented at the DFA level.

4.2. Values Structure

The forest ecosystems of the zone provide a wide range of values to different individuals and groups. These include consumptive values such as timber products, hunting, trapping, sport fishing, and berry picking, and non-consumptive values like skiing, snowmobiling, hiking, and bird watching. Also, there are intrinsic and intangible values such as a feeling of wilderness and peace which some people describe as spiritual. Although difficult to spatially describe or quantitatively measure, these spiritual values are considered to be a product or an accumulation of all values.

Other values such as water quality, parks and protected areas etc. provide for the protection of the forest ecosystems which can enhance the other values listed above. Many of the values in the zone were identified by this or previous or planning teams. Presentations of pertinent information on each value by knowledgeable individuals or groups provided stakeholders with relevant

information to make informed decisions. Other values, while not specifically outlined by the planning team, are also identified and discussed to provide a more complete description of the range of values found in the zone. The following represents a framework for characterizing values in a clear and consistent manner. This approach consists of three components:

(a) Characterization

- Description: Why the value is important, types of activities, intensity, spatial extent, employment, etc.
- Data in support: Statistical references.

(b) Critical Elements

- Forest Features: Elements at risk from harvesting or enhanced by harvesting (viewsapes, adjacency to water, mountains, habitat, wilderness ambiance, road access, etc.)

(c) Guiding Principles

A guiding principle is defined as "a fixed or predetermined policy or mode of action".

These ‘modes of action’ would be implemented in the five year plan in the form of:

1. Policies that should be in place to protect or enhance the resource value;
2. Methods for negotiation or inclusion of other stakeholders in resolving potential conflicts;
3. Special management provisions/strategies - such as buffer zone consideration, temporal operating periods, modified harvesting, or a best management policy; and/or
4. Models and/or forecasting strategies to determine economic contribution, biodiversity impact, or community sustainability

Individual values were discussed both at the strategic and operational level. Strategic level information (characterization, critical elements, and guiding principles) are the focus of discussion in this section. They provide a mechanism to resolve conflicts that might arise throughout or after the five year planning process. Where possible, the physical location of the value on the landscape (operational level) was also identified during the discussion of values (appendix 6). This helps facilitate the preparation of the five year operating plan by identifying potential areas of conflicting use early into the process. In many instances, the Environmental Protection Guidelines (EPG’s, Appendix 2) form the guiding principles for a value. Quite often the spatial extent or location of all values is not known (eg., raptor nests). Specific guidelines are still listed in order to provide a direction or course of action when and if these values are encountered.

4.2.1. *Biotic Values*

4.2.1.1. *Big Game*

4.2.1.1.1. *Moose*

Characterization:

Moose are not native to the island. Today, moose are distributed throughout the Island and the population is estimated to be about 125 - 140,000. Currently, moose are managed on an area/quota system in the province. The Island is divided into 50 management areas and license quotas are set annually for each area. Quotas are set based upon the management objective for each area (i.e., whether it is desired that the population increase, decrease or stabilize). Generally, if an area has too high of a moose population, managers will increase quotas to bring down the population in order to prevent damage to the habitat. However, if the habitat is in good condition, and the area could support more animals, future quotas may be increased. All or portions of 13 moose management areas 15, 16, 17, 20, 21, 22, 22a, 23, 24, 25, 27, 28 and 42 are located within the zone.

Critical Elements:

Harvesting is not expected to have a negative impact on moose populations in the zone because moose prefer the early serial stages of a forest and generally do well in areas after harvesting

4.2.1.1.2. *Caribou*

Characterization:

Caribou is the only native ungulate species on the island. Biologists estimate that prior to the railway being built in 1898 the population on the Island was approximately 100,000 animals but by 1930 the population had declined to about 10,000 animals. Between 1980 and 2000 the number of caribou has increased considerably on the Island with a population estimated at 90-100,000 animals. In the past few years however populations have declined significantly, with Planning Zone 3 being no exception. All or portions of 5 caribou management areas 63, 64, 67, 68, 72, are located in the zone.

Critical Elements:

It is unclear how forestry activities in the immediate vicinity of calving areas during the calving period may have an impact on caribou populations. Recent studies and anecdotal information has indicated that harvesting restriction zone around caribou calving zones may be significantly larger than first thought. It has also been shown that as roads are constructed and access is improved into remote areas, there is generally an increase in the number of animals which are killed due to road-kill and poaching.

CBBPL has worked with the Wildlife division to create connectivity corridors for this plan and will follow the EPGs with respect to caribou management.

4.2.1.1.3. *Black Bear*

Characterization:

The black bear is native to the Island and is found in forested areas. Currently, the number of black bears occurring on the Island is not known (due to difficulty in conducting a census) but is crudely estimated to about 6 - 10,000 animals. All or portions of black bear management areas 15, 21, 22, 23, 24, 25, 27, 28 and 42 are located within the zone.

Critical Elements:

- Den sites for winter hibernation;
- Forest cover

Guiding Principles:

Big Game Management Strategy (moose, caribou and black bear)

Management of big game species in the Province is accomplished by a planning process in which a Big Game Management Plan is prepared annually by the Wildlife Division of the Department of Tourism Culture and Recreation. This process takes into consideration information provided by the public and wildlife and forestry staff. Each year the Wildlife Division reviews all relevant data, such as recent census work, information provided on license returns, and jawbone or skull data and makes decisions on types and numbers of licenses of each species in each management area. Management of big game in the zone will continue to be addressed through this process.

Environmental Protection Guidelines

Moose

- Where mature stands of timber are required for moose shelter and yards, they will be identified in consultation with the Wildlife Division.

Caribou

- In areas where caribou utilize lichens, a minimum amount of lichen forest must be maintained for caribou. (This amount is to be determined through consultation with Wildlife Division);
- Harvesting and road construction will be minimized during the May 15 to July 30 calving period in operating areas adjacent to known calving areas;

- forest access roads, borrow pits and quarries shall avoid, where possible: known sensitive wildlife areas such as, calving grounds, post calving areas, caribou migration routes, caribou rutting areas and wintering areas.

Bear

A 50-metre, no-cut, treed buffer must be maintained around known bear den sites (winter) or those encountered during harvesting. Den sites must be reported to the Wildlife Division.

4.2.1.2. *Furbearers*

Characterization:

Ten species of furbearers occur in the zone; lynx, red fox, beaver, otter, muskrat, shorttailed weasel, red squirrel, mink, coyote, and pine marten (will be discussed in more detail in next section). Of these, red squirrel, mink and coyote are not native.

Critical Elements:

- Forest cover for protection;
- Water quality maintenance;
- Riparian buffer zones along aquatic areas;
- Snags and coarse woody debris (denning, nesting sites, etc.)

Guiding Principles:

Fur Bearer Management Strategy:

Recommendations concerning the management of furbearer species are developed annually by the Wildlife Division, upon consultation with provincial trappers, Newfoundland and Labrador Trappers Association, general public, and departmental staff. Like the small game management plan, the fur management plan, reviews the status of each fur bearer species annually and addresses the season dates and lengths, and if necessary closure of areas (or no open season). Management of all fur bearing species in the zone will continue to be managed through this process.

Environmental Protection Guidelines:

To protect beaver habitat, all hardwoods within 30 metres of a waterbody occupied by beaver will remain standing during harvesting operations.

4.2.1.3. *Salmonids*

Characterization:

The Atlantic salmon and the brook trout are native to the Island and are found in waterways surrounded by forested areas. There are 23 scheduled salmon rivers in Planning Zone 3 and

population counts are conducted on four major rivers including the Exploits, Campbellton, Gander, and Terra Nova as well as on the Middle Brook system. Currently, there are two areas in Planning Zone 3 where estimates of brook trout populations are recorded. These include Indian Bay system and the Rodney Pond system.

Critical Elements:

- Water quality maintenance;
- Riparian buffer zones along water systems

Guiding Principles:

Salmonid Management (Atlantic salmon and brook trout)

Management of Atlantic salmon and brook trout in the Province is delivered by the Federal Department of Fisheries and Oceans (DFO). DFO annually sets bag limits, season dates and river closure dates based on extreme water temperature. In the past, The Gander River system had additional local management provided by the Gander River Management Association (GRMA). Additionally some special brook trout waters (e.g. Indian Bay and Rodney Pond systems) are jointly managed by DFO, the Wildlife Division of the provincial Department of Tourism Culture and Recreation with input from the Indian Bay and Freshwater Alexander Bays Ecosystem Corporations (IBEC and FABEC). This process takes into consideration additional information provided by FABEC.

Protection

- DFO recommends that a 100 metre no-cut buffer zone be left in designated sensitive spawning areas.
- Under the Environmental Protection Guidelines designated protected public water supply areas (PPSWA's) also provide protection for these species through existing Environmental Protection Guidelines that apply to these areas (ie. increased buffers, usually 150 meters on intake ponds, 75 meters on main river stems, 50 meters on major tributaries and minimum 30 meter buffer regulated in the rest of the district). The scheduled rivers where increased buffers are currently in place within PPWSA's include Northwest and Southwest Gander Rivers, Campbellton River, Dog Bay Rivers, Peter's River, Charles Brook, Anchor Brook, Deadman's Bay Brook and Indian Bay Brook. Strict enforcement of these buffers will be continued during this planning period
- Minimum 30 metre no cut buffer on all water bodies in FMD 8
- Minimum 30 metre no cut buffer on all water bodies in FMD's 4, 5 and 6
- Minimum 30 metre no-grub zone on road approaches to brook and river crossings

Furthermore, protection for these species is strengthened locally through partnerships with community-based watershed management groups such as FABEC. A one kilometer wide management zone is currently regulated along the Gander River for protection of salmon habitat. During past plan development and transferring to this plan, negotiated increased buffers on waterways within the Indian Bay, Middle Brook, Terra Nova and Gander River Systems with organizations such as: IBEC, FABEC, and GRAMA are still considered applicable.

4.2.1.4. *Song Birds*

Characterization:

The distribution of songbird species in a forest ecosystem is widely considered to be a relative indicator of ecosystem health. Many songbird species are distinct to specific habitats (Whitaker et al., 1997) therefore; the presence, absence, or health of a specific songbird population can indicate the health of its corresponding habitat. Songbirds are also the natural predators of our native Lepidoptera pests (ie. looper and budworm) and help to control these populations. Consequently, their value cannot be underestimated.

Critical Elements:

- Forest cover for protection;
- Water quality maintenance;
- Riparian buffer zones along aquatic areas;
- Variety of forest seral stages and species (nesting sites, habitat, etc.)

Protection of songbird species will mainly involve protection of their habitat through the various methods discussed in earlier sections.

Environmental Protection Guidelines:

- (a) Knowledge of Legal Obligations – During planning, and immediately before implementation of operations, forest operators must familiarize themselves with the current legislation for the protection of migratory birds, their nests and eggs.
- (b) Risk Assessment and Planning – Determine the likelihood of the presence of migratory birds and their nests or eggs. Attempt to avoid engaging in potentially destructive or disruptive activities at key locations during key periods, such as breeding season.
- (c) Preventative and Mitigation Measures – In cases where forestry activities have to take place during the breeding season of migratory birds it is recommended that practices are conducted in a manner that:
 - a. Minimizes fragmentation and maintains interior forest habitat
 - b. Maintains forest structure in seral stages

- c. Use methods that promote natural regeneration
- d. Ensures not net loss of wetland function in forests
- e. Ensures that large snags are left in cut blocks
- f. Maintains hardwood stands within the cutblock
- g. Maintains contiguous areas of uncut forests as control areas and reserves.

4.2.1.5. *Other Avian Species*

Characterization:

Other valued avian species include ptarmigan, grouse, migratory birds and raptors. The former includes important game species, while the latter (ie. raptors) occupy higher trophic levels in the food chain. Higher level trophic feeders are considered important indicators of ecosystem health as they are sensitive to environmental stress. Population trends for these species as defined by the Wildlife Division and Canadian Wildlife Service (CWS) are available on a regional basis.

Critical Elements:

- Forest cover for protection;
- Water quality maintenance;
- Riparian buffer zones along aquatic areas;
- Snags and coarse woody debris (prey habitat)
- Buffer zones on nesting sites
- The locations of all known bald eagle and osprey nests will be identified on all cutting maps and harvesters will be informed of their locations by Forest Services Staff. Regular operator checks and routine patrols of domestic cutting areas by Forestry Staff will ensure compliance of these guidelines.
- On recommendation by the CWS, sensitive waterfowl habitat has been protected through increased buffers of 50 meters on certain ponds. As well, the establishment of municipal wetland conservation areas in the planning zone by Eastern Habitat Joint Venture through stewardship agreements with municipalities (eg. Whitmans Pond – Town of Gander).

4.2.1.6. *Rare and Endangered Species*

4.2.1.6.1. *Pine Marten*

Characterization:

Before 1900, marten ranged over most of the forested areas on the island. Unfortunately, due to a variety of reasons, the population levels dropped where this species was listed to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered. Habitat loss,

predation, disease and accidental trapping and snaring are thought to be primary reasons for marten population decline in Newfoundland. Marten still naturally occurs in three main areas on the island including: Main River watershed, Little Grand Lake and Red-Indian Lake areas. Additionally, marten also now exist at Terra Nova National Park (TNNP) and surrounding landscape. As well, in the Bay Du’Nord Wilderness Area around Lake St. John through a relocation effort by the Eastern Newfoundland Pine Marten Recovery Team. Representatives from TNNP, Forest Services Branch, Wildlife Division and CBPPL are represented as stakeholders of the recovery team. The purpose of this team is to set short-term and long-term population goals for the species in eastern Newfoundland and recommend ways which this may be accomplished. The Team has been established for some time now and has worked on the process of evaluating critical and recovery marten habitat and determining which forest activities can take place within these areas. Approximately, 16 marten have been relocated to these areas and the population estimate today is approximately 300. Once listed as Endangered, COSEWIC has now downgraded the marten listing to Threatened. It is important marten habitat is protected in this area and some remnant stands of old growth (80+) forests remain throughout the zone. To accomplish this, a landscape approach to habitat management was initiated by the Forest Service in 1999. This involved working with stakeholders to identify critical or potential marten habitat, locating possible corridors, and identifying areas which would not be cut in the near future. This initiative has been ongoing since that time.

Critical Elements:

- Sufficient habitat to support a viable population of marten;
- Areas of known marten populations remain closed to snaring and trapping

Guiding Principles:

The basic unit for evaluation will be home range size for male (30km²) and female (15km²). All forest types can be considered marten habitat if they meet the following requirements:

- Sufficient habitat to support a viable population of marten;
- 70% or greater of that unit must be suitable habitat; - 40% or greater of the unit should have trees greater than or equal to 9.6m in height;
- The remaining portion of the 70% (30% or less) should have trees between 6.6 and 9.5m;
- 50% of the unit should be contiguous; stands will have to be within 50 m of an adjacent habitat to be considered contiguous.
- A qualifying stand will have to be within 150 m of another stand or habitat patch to be considered as habitat.

- minimum patch size equals 20 ha;
- basal area requirement equals 40 m³/ha (~18 m²);
- hardwood stands (insect kill, wind throw) will be considered where crown closure is greater than or equal to 30%;
- Softwood scrub that meets the minimum requirements (6.5 m) will be considered habitat.

Where height is not known, softwood scrub within 50 m and adjacent to a qualifying stand is considered as habitat. As stated, critical and recovery pine marten habitat is being or has been identified. The development and evolution of the marten habitat suitability model in recent years has been a useful tool in identifying potential marten habitat and evaluating impacts of harvesting on this habitat and resultant changes to population levels. Continued development and refinement of this model will provide more a reliable means of evaluating impacts of harvesting on marten habitat in the future. There is also ongoing research into a variety of aspects of marten dynamics through the Model Forest, Canadian Forest Service, and University of Maine. Recommendations resulting from any of these ongoing initiatives will be incorporated into harvesting prescriptions as required.

4.2.1.6.2. *Banded Killifish*

Characterization:

The Newfoundland population of Banded Killifish was first listed as special concern in 1989 due to the limited area of occupancy, limitation on potential for range expansion, and potential threats from logging and other activities that could lead to habitat degradation (Chippett, 2003). In 2003 the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recommended the status of special concern should be maintained. Banded killifish populations in Newfoundland are distributed over a wide range, but local populations are restricted to very confined regions within their respective watersheds. Populations appear to be locally abundant in representative areas that were sampled (i.e. Indian Bay watershed, Loch Leven and Freshwater Pond). Although multiyear data is not available, population estimates from 1999 indicate that over 20,000 individuals exist in the Indian Bay watershed. Estimates are not available for other local populations (Chippett, 2003). Although no killifish have been officially reported in other areas of the planning zone, it is highly likely other areas may contain suitable habitat.

Critical Elements:

- Water quality maintenance;
- Riparian buffer zones

Guiding Principles:

- Guidelines for the protection of freshwater fish habitat are developed by DFO’s Habitat Management Branch
- Designated protected public water supply areas (PPSWA's) also provide protection. As well, applying existing Environmental Protection Guidelines to these areas (ie. Increased buffers, 150 meters on intake ponds, 75 meters on main river stems, 50 meters on major tributaries and minimum 30 meter buffer regulated in the rest of the district).
- Protection of this species is also strengthened through partnerships with the community based watershed management groups. In the past, industry has negotiated increased buffers on waterways throughout the Indian Bay watershed area with IBEC and Middle Brook watershed with FABEC.
- DFO has indicated the level of protection provided by the PPWSA buffers and the additional buffers negotiated between IBEC and industry, along with the implementation of forestry best management practices will be adequate habitat protection for this species.

4.2.1.6.3.

Red and White Pine

Characterization:

Provincially, the range of white pine is shrinking due to a variety of reasons including past harvesting practices and infection from blister rust. However, significant stands of white pine still exist in forest management districts of Planning Zone 3. Red pine is the rarest tree species in the province with a distribution of some 22+ small stands (<15,000 trees in total). Despite this, it is represented fairly well in this Planning Zone. For example, an approximate 400 ha mature stand exists at Grant’s Pit in FMD 5. With approximately 5,000 trees, this is the largest known to exist in the province (Roberts, 1985). There are native red pine stands in FMD’s 4 and 8 as well. Since both of these species occur in Planning Zone 3, local protection is required to maintain local and provincial biodiversity.

Critical Elements:

- Maintenance or enhancement of stands on the landbase
- Minimizing loss of trees/stands through public education
- Minimize losses to fire, insect and disease
- Enhancement of younger age classes through planting natural regeneration and pruning to ensure continuance of the species
- Maintenance of native genetic stock

Guiding Principles:

- Enforcement of forestry act, regulations, guidelines and policies
- Gene preservation gardens for these species and a clonal orchard for white pine have been developed by DNR at Wooddale Tree Nursery. At some point, the goal is to produce seed from these gardens/orchards to grow pine seedlings of native origin.
- Some native red pine stands are protected under reserve status.
- DNR has adopted a no cutting policy of pine by non-traditional users and a phase out of cutting by traditional commercial users. Currently, no commercial operators harvest pine in Zone 3.
- Protection of these species in planning zone is expected to be strengthened by public education and no-cut conditions on permits (both domestic and commercial).
- Implementation of silviculture treatments designed to merge pine back into the landscape.
- DNR is collecting seed from red pine stands of native origin and the collection of white pine scions for the clonal orchard at Wooddale - DNR also implements stand level silviculture prescriptions such as pruning of immature white pine to reduce the infection rate of blister rust and cone production enhancement on red pine to ensure an adequate supply of native red pine seed.

4.2.1.6.4. Red Crossbill

The red crossbill, is currently listed as endangered. The Newfoundland Forest Service currently has a representative on the recovery team for this species. Any recommendations on modified forestry activities, if any, will be developed with input from all members.

4.2.1.7. Water Resources

Characterization:

The protection of water resources has emerged as a major issue in recent years both nationally and provincially. Events such as the E.coli 0157 outbreak in Walkerton, Ontario, our own Trihalomethane (THM) controversy, and numerous incidents of giradiazis in community water supplies have heightened public awareness on water issues. While much of the current focus is directed toward drinking water, it is also recognized that an equal importance must be attached to waters which have other beneficial uses. Human impacts both locally and globally have the potential to impair water for future uses.

In Planning Zone 3, there are approximately 157,000 ha or 11 percent of the total area of lakes, ponds, rivers, brooks and streams. There are 77 communities within the zone which derive their

potable water from 58 Public Protected Water Supply Areas (PPWSA's). It is the responsibility of the Department of Environment to monitor water quality of these protected areas. Recreational waters within this zone are used for activities such as fishing, boating and as a water supply source for numerous cottage owners. Industrially, waters within the zone are primarily used for hydroelectric production on the Exploits River at Bishops Falls and Rattling Brook in Norris Arm. As well, water is used for irrigation of agricultural areas, primarily in the Wooddale area. Human activity has the potential to alter water quality and water quantity. Commercial forest harvesting activity results in construction of new and upgrading existing access roads. If not constructed properly, this activity has the potential to negatively impact water quality. Mining operations within the zone are limited to mostly small quarrying operations for gravels and dimension stone and are typically associated with road construction. Some exploration activity for base metals has occurred sporadically throughout the region. Hydroelectric development has resulted in one brook diversion.

Critical Elements:

Forest management activities such as road construction, maintenance, timber harvesting, and silviculture may potentially alter the quality of water draining from watersheds. As well as other defining characteristics such as stream hydrology, sediment loadings, stream characteristics, and aquatic discharges from municipalities. Careless storage and handling of fuels by industrial and recreational users, stream diversions and agricultural operations are other examples.

Guiding Principles:

There are numerous protective measures listed in the Environmental Protection Guidelines under the broad categories of road construction, stream crossings, road abandonment, fuel oil handling and storage, support services and structures, harvesting, silviculture, and protected water supply areas. The EPG's are listed in their entirety in Appendix 2 and specific guidelines under the above sections can be found there.

4.2.2. *Human Values*

4.2.2.1. *Timber Resource*

Characterization:

One of the resource values is harvesting of timber to provide forest products. Historically, timber has been harvested since the first inhabitants settled in the zone. Initial uses were mainly domestic in nature to supply timber to build houses, fishing sheds, heating and cooking. With the increase in population, more commercial uses have arisen for timber, which includes: lumber, pulp and paper products, and value added products. Domestic harvesting still provides fuelwood

to heat many homes and sawlog material for residential home construction. There are approximately 2000 permits issued on Crown land in FMD 5 and 3000 permits in FMD 8. As well, in the past, approximately 1500 domestic permits were issued annually on CBPPL tenure.

Commercial activities provide many jobs in harvesting, sawmilling, trucking, pulp and paper manufacturing and related spin off industries for local residents. Silviculture treatments are important to the forest resource because it ensures a vigorous and healthy forest is maintained. Forest renewal activities ensure productive landbase is maintained by planting areas that are not sufficiently restocked. Forest improvement activities help improve and enhance the growing stock which can reduce harvest cost, enhance forest product options and increase sustainable timber supply.

Protection of the forest from various disturbances is also a major characteristic of resource management. Because of the long fire history in the zone, protection through well maintained and/or upgraded initial attack equipment (i.e. water bombers, pumps, hose and trucks) and well trained fire management staff is required. A large fire today in the older softwood forest would be devastating to industry. While insect kill has not been a major disturbance in recent years, protection is still critical since there is a significant area of thinned balsam fir stands, which is paramount to future AAC's. Protection of other resource values through modification of activities and enforcement is also important.

4.2.2.1.1. Spruce and Fir

Black spruce, white spruce and balsam fir are the main sawlog and pulpwood species within the province. Within this planning zone, black spruce accounts for more than 90 % of the softwood harvest. Black spruce fiber is valued for its strength properties in lumber and pulp and paper products. Recently, Newfoundland black spruce received the highest strength rating in North America for use in the production of wooden I-beams. Additionally, spruce and fir-dominated stands comprise more than 84% of the available forested habitat in the zone. These species are managed for maximum sustainable harvest levels though the harvesting and silviculture strategies referred to later in section 6. Protection and long term sustainability of these species will be achieved through strict adherence to AAC's and refinements to future woodsupply analysis.

4.2.2.1.2. White Birch

Traditionally, white birch has been a valued species for domestic fuelwood. However; it is now emerging as an important value-added species within the sawmilling and value added manufacturing industries of the province. It also has recently been researched for its ability to produce sap and the subsequent global marketability of this product. Accordingly, three areas have been set aside for sap production research on Crown limits in the planning zone.

Additionally, white birch benefits the cycling of nutrients, the structure of forest soils, and can help in the reduction of insect infestations and in the decrease in spread rates of forest fires (Perry, 1994). White birch dominated stands comprise approximately 15% of the forested land base in the planning zone. With efforts to manage this species on a sustainable basis, in 2002 the first AAC's were developed for white birch and were refined in the 2005 woodsupply analysis. One of the criteria of species sustainability is its ability to regenerate. To aid in the sustainability of white birch, silvicultural prescriptions are being considered and designed to favor its regeneration. Implementation of this prescription would help facilitate a birch component on the landscape, increasing the diversity of both flora and fauna and maintaining natural processes within managed stands.

Critical Elements:

The overall objective is to ensure the AAC is maximized while taking into account other resource values and conducting environmentally sound operations. This is achieved by

- Maintenance or enhancement of productive landbase
- Planting of non-regenerating areas
- Maintenance of the white birch component
- Minimizing loss of landbase to other users
- Minimize losses to fire, insect and disease - timely access road construction
- Enhancement of younger age classes through thinning to correct age class imbalance
- Maintain both a sawlog, pulpwood and firewood industry
- Maintain support of local research into birch sap production

Guiding Principles:

- Enforcement of forestry act, regulations, guidelines and policies
- Maintenance of AAC's; adherence to harvest schedules
- Minimize loss of productive land base through spatial and temporal compromises and continuous dialogue with other resource users
- Maintenance of white birch sap production and harvesting activities occur at the landscape level without negative impacts to either activity
- Education (staff, public, operators)
- Aggressively conduct silviculture, access road, and protection activities
- implement best management practices.

The Environmental Protection Guidelines for Ecologically Based Forest Resource Management outline courses of action and mitigative measures for conducting forestry activities. The most recent version of the EPGs can be found on the GovNL website.

4.2.2.2. *Agriculture*

Characterization:

Soil surveys show 100,000 ha or 0.9% of the Island has mineral soils suitable for farming. There is a substantial agriculture industry in the zone, with considerable potential to expand and provide increased economic benefits. As well abundant organic soils available on peat lands create opportunities for cranberry and commercial sod production.

Commercial agriculture is concentrated in Campbellton, Comfort Cove, Gambo, Northern Arm and Pleasantview. Agricultural products produced represent a significant portion of the total agriculture industry in the province. There are approximately 80 commercial farms in Planning Zone 3 from the livestock sector (poultry, beef, hogs, sheep and fur) and the Crops Sector (vegetables, small fruit, forages, Christmas trees and greenhouses production). The Agrifoods Development Branch owns and operates the Provincial Seed Potato Farm near Glenwood. There is also a peat harvesting industry (HiPoint Peat) near Bishop's Falls.

There are several commercial blueberry farms in the zone comprising a significant portion of the provincial industry. Blueberries originating from managed areas have the potential to draw a higher market value than wild berries. In the past few years, over 40 hectares have been developed for intensive blueberry management. The newest agricultural sector developing in the zone is cranberries. Recently there has been established in the Grand Falls region, eleven new cranberry farms, along with already established operations in Terra Nova and an experimental site at Deadman's Bay, operated by the Agrifoods Development Branch.

Critical Elements:

Surveys indicate approximately five percent of soils in the province are suitable for agriculture. It is difficult to identify and plan all sites for potential future agriculture use and often this will result in conflicts with other land uses, particularly forestry because these sites are of high growing capability. Although a suitable landbase is the first critical element necessary for a successful agriculture operation, markets and the interest of individuals are also prime factors in the development and location of future farms. In the spirit of managing the ecosystem for multiple benefits, provisions will be available for the agriculture industry to expand.

Guiding Principles:

Lands designated for forest management can include areas with high potential for agriculture. Consequently; the Forest Services Branch will work with the Department of Agriculture to determine where potential opportunities exist for agriculture development areas.

4.2.2.3. *Mining*

Characterization:

Within Planning Zone 3, there is a diverse geological environment which hosts a wide variety of both metallic and industrial minerals including, but not restricted to; copper, nickel, lead, bitumen, granite, gneiss, marble, gold, asbestos, silver, iron, limestone molybdenum, uranium and thorium. There is also granite with dimension stone potential. Some of the geologic history of the zone features rock types and rock formations which indicate the processes and geologic ancestry of the parent material, from which some of the soils of the planning zone's ecoregions were derived. In this zone, there are 5600 mineral exploration claims staked and registered. The majority of claims have been staked for their precious (e.g. gold, silver) and base (e.g. zinc, copper) metal and dimension stone (e.g. granite, gabbro) potential. In addition, some claims have been staked for their industrial mineral (e.g. silica, mica, talc) potential. There are also in excess of 314 quarries in the zone. Expenditures for mining exploration in Planning Zone 3 are in excess of \$1 million annually for metallic and industrial mineral and dimension stone exploration, where activities have been concentrated in the Gander River Valley.

Exploration activities typically consist of prospecting, geological mapping, grid linecutting, geochemical surveys, ground and airborne geophysical surveys, mechanized trenching and diamond drilling. In addition, there are a large number of active quarries in the zone which generate significant royalties. These figures are included to illustrate the significant contribution that mining has to the local and provincial economy.

Critical Elements:

Location of deposits close to markets is vital in controlling aggregate costs which often increase dramatically with increased transportation distances.

Guiding Principles:

Harvesting timber for prospecting lines must meet the same rigor as commercial harvesting. The mining industry should enact best management practices to minimize negative impact on ecosystem values.

4.2.2.4. *Historic Resources*

Characterization:

The provincial archeology office (PAO) is the agency responsible for management and protection of archaeological sites and artifacts in Newfoundland and Labrador. This program is carried out under the Historic Resources Act, which ensures any development with potential to have adverse impacts on historic resources are investigated and monitored by a qualified archaeologist, through

an archaeological impact assessment. Archaeological sites are non-renewable resources and are considered a vital role in understanding our heritage. It is important to professionally record as much information as possible at an archaeological site to fully understand its history. To do this properly, the site must not be disturbed. Generally, archaeological sites are small, spatially bounded units. Therefore, protecting these resources usually do not have an adverse impact on forestry activities. Archaeological surveys have been carried out in several areas within the zone over the past 20 years. There are a number of known archaeological sites within Planning Zone 3 which are protected under the Historic Resources Act. Many areas still remain to be surveyed so there is potential for other historic resources to be discovered. Sites of archaeological significance, such as Boyd's Cove, Black Harbour, Wigwam Point, Gander River and the Bloody Bay Reach Archeological Sites (i.e. Burnside archeological tours of the Beaches and the Quarry) also hold the key to our understanding of past. While some of these sites have been developed (Boyd's Cove, the Beaches, the Quarry and Wigwam Point, others have not had archaeological work completed and their locations cannot be disclosed. These sites show evidence of Maritime Archaic Indian, Palaeoeskimo, recent Indian and European occupation. Archaeology is very important for our tourist industry. Archaeological excavations and interpretive sites draw thousands of visitors each year to this province. The preservation and interpretation of archaeological sites will continue to benefit the tourism industry in this province for years to come. Thousands of tourists from all over the world visit our archaeological sites each year and the numbers continue to increase (e.g. Boyd's Cove and Burnside typically see approximately 8,000 visitors per year combined). Each year archaeology projects provide many seasonal jobs. For example, Boyd's Cove and Burnside employ approximately 15 people each year. Many of these people are successful in obtaining employment in archaeology and conservation for longer periods of time. By calling for archaeological impact assessments on projects which have potential to negatively impact historic resources, the PAO is providing jobs for consulting archaeologists in the province. New businesses are created as a result of archaeological projects, which include: bed and breakfasts, boat tours, restaurants and gift shops.

Critical Elements:

Major threats to historic resources are projects involving activities which disturb soil layers and/or provide unintended public access to the archaeological resources. Forestry activities such as construction of access roads and bridges, harvesting and mechanical site preparation have the potential to negatively impact valuable historic resources. When impact assessments are carried out and new sites found, it adds to our understanding of Newfoundland and Labrador's heritage.

When archaeological sites are discovered through impact assessments, these resources are protected from damage or destruction.

Guiding Principles:

Any project involving land-use has the potential to adversely impact historic resources.

Therefore, it is important the Provincial Archaeology Office is involved at the planning stage to ensure mitigative measures that protect historic resources. Known archaeological sites and potential unknown sites are protected by utilizing no harvest buffer zones, whereas archaeological assessments may be required in other areas. Archeological buffers are typically required along rivers and ponds, as well as, along the coastline where there is a high potential for archaeological resources to be found. Occasionally there are accidental discoveries made of historic resources. In the event this does happen, activities should cease in this area and contact be made immediately with the Provincial Archaeologists.

4.2.2.5. The Greater Terra Nova Ecosystem

Characterization:

The primary role of Canada's national parks is maintenance of ecological integrity. Although enshrined in policy for many years, this role has recently been given prominence in legislation by the passing of the Canada National Parks Act in October 2000. The Report of the Panel on Ecological Integrity of Canada's National Parks (February 2000) noted that parks all across the country (including TNNP) are under threat from stresses both within and outside the national parks. Ninety percent of forested parks are under stress from external forestry activities. The primary challenge for national parks in maintaining their ecological integrity is that most parks are part of larger ecosystems and the area set aside for the parks is not large enough to protect the full integrity of that ecosystem. Large-scale changes on the landscape surrounding parks can isolate the park ecologically creating an "island". Parks Canada must work with adjacent land managers in striving to achieve its mandate.

Biodiversity goes beyond the range of wildlife and plant species to include the range of habitats and landscapes. Loss of special habitats such as old-growth forest and associated species may impair the ecological integrity of TNNP in ways that are not currently understood. In recent history, the endangered Newfoundland pine marten has been relocated to the park and in some of the adjacent forest area in FMD 4. Habitat connectivity with other core populations may be critical to long term survival of marten in TMNP. While ecological integrity has prominence regarding the management of national parks, legislation and policy dictate broader responsibilities for national

parks. These include providing opportunities for Canadians and others to have high-quality experiences in a natural setting.

Critical Elements:

- To maintain ecological integrity
- To maintain native biodiversity and natural processes.
- To maintain viable wildlife populations

Guiding Principles:

The long-term effect on the park's ecological integrity can rarely be isolated to one cause and is more often due to the effects of many activities. For that reason it would be important to assess the cumulative environmental effects of all activities as part of the forest management planning process.

- Maintain species composition as well as the age structure and ecological functions of the various forest-types across the landscape over the long term.
- Maintain proportion of interior forest (mature forest >250 m from an “edge”)
- Maintain landscape connections between the park and the surrounding landscape. This would require effective, permeable movement zones between populations and/or critical habitats.
- Manage and operate according to the precautionary principle, particularly as it relates to species at risk.
- Ensure landscape characteristics are maintained that allow marten to achieve their habitat requirements at the landscape scale. This could mean ensuring forest management practices allow for a continuous distribution of marten habitat and home ranges to the park boundary. A conservative approach that preserves future options should be adopted until the marten guidelines are fully developed.

4.2.2.6. Recreational Trails

Characterization:

Newfoundland T’Railway

A large section of the Newfoundland T’Railway Provincial Park lies within the zone and has an impact on forestry operations. The former CNR right-of-way, which is 25 feet each side of the center line, is the main route for the T’Railway, with some minor deviations. It provides for an all season, multi-use recreation corridor developed and managed with community partners to maximize adventure tourism and recreational opportunities. The T’Railway is protected for the present and future enjoyment of the public, as part of a system of provincially designated parks and natural areas. The Provincial Parks Act provides the legislative framework for the

administration and management of the T’Railway, which constitutes the Province’s contribution to the Trans Canada Trail System. It is the largest provincial park in the Province with the most users. It is used primarily for snowmobiling, skiing, hiking, walking and all-terrain vehicle usage. Other new or historical uses such as commercial and domestic harvesting access, quarry and mining access and cottage access are also permitted with a special permit.

4.2.2.6.1. Other Trails

There are at least another 45 + recreational trails that protect heritage and provide for expanded recreational opportunities within the planning zone. Among the more important historic trails are those of Eastport, Twillingate, New World, Cottle's and Fogo Islands. These trails are traditional walking links between the communities and now lead to vantage points to scenic ocean vistas, whale and iceberg watching. Today, they provide recreational opportunities for hiking, skiing, viewing of exceptional landscapes, and nature walks, as well as preserving our heritage of isolated fishing and logging communities.

Critical Elements:

- Protection of the historical landscape integrity of trail corridors
- Preservation of the scenic quality along trail corridors
- Control of land usage adjacent to trails

Guiding Principles

- Coordination of activities with various other agencies responsible for land management outside the T’Railway corridor to ensure that the integrity of the park is maintained
- Coordinate and build partnerships with other stakeholders and user groups such as communities, industry and recreational organizations for the long term maintenance and development of the trails
- In an attempt to preserve the natural value of the T’Railway, other land management agencies are requested to maintain a 100 m buffer and to consider viewsapes in their harvesting and development plans. Buffers of varying widths have also been applied to other trails in the planning zone.

4.2.2.7. Parks and Protected Areas

Characterization:

The mission statement of the natural areas program is to protect in an unimpaired condition, large wilderness examples of provincial ecoregions including their natural processes and features and rare natural phenomena, so as to preserve the diversity and distinctiveness of the Province’s ecologically sustainable future for the benefits of present and future generations. Natural areas are store houses of natural diversity that exists in a wild, pristine state. They serve as ecological

bench marks indicating the natural succession of forest ecosystems. They also preserve in perpetuity, provincially significant representative and special natural features and outstanding recreational environments.

There are many types of protected areas in the province. The Wilderness and Ecological Reserves Act enables the Province to establish the following; wilderness reserves (Component 1), ecological reserves (Component 2) and protected sites (Component 3). Component 1 reserves are defined using the critical habitat of high level, wide ranging species i.e. caribou. They generally cross ecoregion boundaries, protect complete systems and are large (> 1000 km²). Component 2 reserves protect representative samples of ecoregions (not included in Component 1 reserves) and are mid-sized (50-1000 km²). Component 3 reserves protect exceptional natural features, such as, rare species or areas of unusual biological richness and are generally small (< 50 km²). The benefits of protected areas are to preserve biodiversity, provide areas for scientific research, provide opportunities for environmental education and provide standards against which the effects of development can be measured. Protected areas in the zone include: the T’Railway, Terra Nova National Park, Bay Du’ Nord Wilderness Area, and Notre Dame Junction, Dildo Run and Jonathon’s Pond Provincial parks. As well, two candidate proposed ecological reserve areas, one for the Central Newfoundland Forest Ecoregion and one for the North Shore Forest Ecoregion currently have interim protection.

Critical Elements:

- Preservation of biodiversity
- Maintenance of protected area integrity
- Maintain natural processes and features

Guiding Principles:

- The Province of Newfoundland's Natural Areas Systems Plan recommends that a minimum of 12% of the province’s entire land base be protected.
- Only allow traditional (hiking, berry picking, hunting etc.) activities, educational activities and scientific research within protected areas provided the integrity of the reserve is not compromised
- Prohibit all forms of new development such as mining activity, hydroelectric projects, forestry activity, agriculture activity, roads and trails and cottages and new structures.
- Where forestry operations are within one kilometre of provisional and ecological reserves, wilderness reserves or provincial parks, modified operations may be necessary

4.2.2.8. *Outfitting*

Characterization:

An economic impact study conducted in 1995 by the Department of Industry, Trade and Technology suggests a big game license has a net economic impact of \$6864. By approximating this value at \$7000 for 2006, it is possible to estimate the economic contributions of this industry: approximately 300 licenses * \$7000 / license = \$2.1 million. An additional \$135,000 is estimated to be brought in from fishing. (Bear hunting has not been included in the above figures). Given that 85 percent of the hunting market comes from the United States of America, it follows that the above monetary figures are reflections of money entering the Province from elsewhere. It should be recognized that the outfitting industry provides this revenue to the Province each season and has the potential to do so indefinitely.

Over the past ten years, a significant number of traditional hunting and fishing businesses have diversified into non-consumptive aspects of the tourism industry. Such activities include, but are not limited to: snowmobiling, dog sledding, kayaking, canoeing, nature viewing, hiking, and wildlife photography. The ability to diversify has positively impacted the viability of outfitting operations and as such, increasing numbers of operators are considering these opportunities. Diversification can lengthen seasons of operation, increase and lengthen employment and reduce dependency on a single sector of the tourism industry. Pristine wilderness settings are necessary for many of these types of diversification.

Critical Elements:

Remote outfitting camps are dependent on their remoteness, where forest access roads potentially impact the ability of a camp to maintain its remote status. Increasing accessibility through establishment of access roads may lead to increased hunting and fishing pressures in a given area, which may lead to decreased success rates of tourists. Forest access roads may also lead to increased resource development, which has a potential negative an impact on both remoteness and game availability. Forest harvesting may also have the potential to impact negatively upon travel corridors, bear denning areas, and caribou feeding and calving areas.

While clients of big game and fishing outfitters are primarily interested in hunting or fishing experiences, they also show a great respect and admiration for pristine conditions and a healthy looking landscape. The landscape view experienced by clients plays a large role in leaving a lasting impression of the province. The view also has a direct impact on repeat client bookings and recommending the destination to others. Viewscapes become even more important once outfitters begin diversification into non-consumptive tourism activities. With these activities, there

is no trophy to bring home and that which is taken away is the experiences (i.e. sights, sounds, smells, etc.).

Guiding Principles:

It is necessary to ensure properly managed areas remain around outfitting camps, which have been determined by relevant parties. These types of Buffer zones can be difficult to negotiate due to varying ranges of activity from operator to operator. Some operators make use of areas that are 8 to 10 kilometers away from the main lodge.

- Consideration should be given to decommissioning roads and bridges (where possible) after forestry activity is completed. This will eliminate potential negative aspects to the hunting area by reducing the possibilities of increased hunting pressure. Access to hunters will be restricted or limited when roads are actively used for harvesting purposes.
- Cottage development is prohibited within established outfitting buffers.
- Where possible, harvest areas in the winter. Winter roads are less passable in summer and fall, which will facilitate reduced traffic.
- Where possible, construction of new forest access roads should occur away from existing outfitting camps. Harvesting should be restricted around hunting and fishing camps during their season of operation. At these times, harvesting should occur as far away as possible from outfitters.
- Forest operations will be undertaken in compliance with existing regulations
- Efforts will be made to ensure the integrity of viewsapes from outfitter cottages is maintained when conducting forest operations.
- Forest operations will be evaluated to ensure any garbage is removed.

4.2.2.9. Recreation

Characterization:

The Exploits and Bonavista Bay areas have outstanding scenery, interesting topography, and opportunities for viewing wildlife and flora in a natural setting. These elements represent a small list of reasons why the zone is used extensively for recreational purposes. Hunting, sport fishing, hiking, skiing, kayak/canoeing and ATV/snowmobiling are major recreational activities in the area. There are also a number of safe anchorages for boat touring in Exploits Bay. Non-timber recreational values are expected to play an increasing role in forest management practices.

Critical Elements:

Wilderness - Backcountry recreational activities are dependent on the existence of natural pristine wilderness areas. The temporary removal or alteration of this pristine wilderness through forest

harvesting practices may result in decreased recreational activities for a given period of time. An increase in forest access roads may increase accessibility to remote areas. In turn, this may increase the amount of traffic in an area (both vehicular and pedestrian) and decrease the value of the experience for many recreational activities. The majority of individuals involved in recreational activities are concerned about viewsapes. Many of the recreational activities occur because of particular viewsapes.

Guiding Principles:

To prevent negative ecological effects and provide positive experiences, access and levels of recreational activities can be monitored. Public surveys can be used to measure the experiences and the levels of recreation occurring in the zone. If possible, forest operations should avoid wilderness areas where high concentrations of recreational activities occur. Where operations are necessary, stakeholder meetings could prevent conflicts through temporal scheduling.

Decommissioning of forest access roads could be a possible option when forestry activities are completed. Where possible, harvesting should be conducted using winter forest access roads, which creates less traffic and better facilitates decommissioning. Where possible, the Land Branch of the Department of Environment and Conservation shall plan cottage development along newly developed forest access roads in conjunction with Forestry Services. This will allow for planned cottage development areas and potential Crown land reserves to help minimize potential land use conflicts. Aesthetic views using landscape design techniques will be utilized in areas where forest operations occur with high concentrations of recreational activities.

4.2.2.10. Tourism**Characterization:**

The tourism industry in Newfoundland and Labrador is based on natural and cultural resources, where protection is important for the industry to survive and grow. The tourism industry in Newfoundland and Labrador has experienced significant growth since 1997. Tourism Industry has been contributing between \$580 and \$700 million annually to the provincial economy. Government tax revenue from tourism in 1998 was estimated to be \$105 million. The worldwide growth of tourism at rate of 41 percent, the national growth of 25 percent and the provincially growth of 33 percent indicates tourism is Newfoundland and Labrador's best opportunity for economic diversification and growth.

There are many excellent tourist destinations in the zone. The Gander River (world class salmon river and protected area) and Terra Nova Rivers (candidate as a Canadian Heritage River), Terra Nova National Park, Bay Du' Nord Wilderness Area, the Beaches and Boyd's Cove archeological

sites, iceberg and whale tours of Twillingate, are examples of the more prominent tourist attractions.

Critical Elements:

- Viewscape
- Accessibility
- Wilderness ambiance
- Remoteness

Guiding Principles:

Work with TNNP, Tourism Division, local tourism operators and local town councils in the vicinity of TNNP to implement strategies that minimize visual impact of harvesting operations on the aesthetic values associated with viewscales. Also, in other important tourism areas including the Gander River, Indian Bay water system and the Freshwater Alexander Bays water systems, CBPPL will continue to work with local organizations such as FABEC & IBEC to examine the viewshed issues where applicable. Strategies can then be discussed, negotiated, and implemented to provide a balance between harvesting and the values associated with tourism.

6. Public Consultation

A component of forest-management planning in this province is public engagement. Since the 1990s forest management plans have been developed with advice from public planning teams. This process was designed to garner advice from the public and was intended to improve forest management practices at the local scale while also mitigating land-use conflicts. Because the forest management planning process is the only regular interface for public input, the planning teams have become a catch-all for many provincial resource management issues. In many cases, issues raised extend beyond the district or zonal boundaries, and may even be outside the scope of the planning team mandate. It is important to note, that the forest management planning and consultation process has had a measure of success. Diligent work by district managers and planners has led to the submission and implementation of many plans over the past several decades.

The stakeholder involvement process into the development of new five year operating plans in 2020 has changed from historical processes. Over the years Managers have seen a reduction in public participation in many zones. In anticipation of capturing an increased public awareness, in District Ecosystem Managers in conjunction with CBPPL have reached out to a number of known stakeholders in each district during spring 2021 as the plan was being developed. Due to public gathering constraints because of the Covid-19 pandemic the public consultation process was satisfied by other methods, given that general public meetings could not be held. A Draft version of all maps for Zone 3 was posted to the Corner Brook Pulp and Paper Website in June 2021. On the website interested persons are able to send in questions/comments to CBPPL Woodlands staff regarding the posted plans. Section 5 lists all mitigations from the online consultation. In addition a radio ad was aired for three weeks informing the public of the opportunity to view our plans on the website.

7. Management Goals, Objectives and Strategies

7.1. Harvesting

The forest in this zone is part of the boreal forest, which is characterized as being disturbance driven resulting in the formation of relatively even aged stands. The clear-cut silviculture system most closely emulates this natural disturbance pattern and therefore is the most preferred method employed for harvest. The size, shape, arrangement and juxtaposition of clear-cut areas vary

across the landscape depending on localized topography and terrain conditions. A modification of the clear-cut system takes place in domestic areas whereby the cuts are relatively small and disbursed resulting in the creation of a range of age and development classes. The clear-cut system is the only harvest system being considered in the zone at this time.

7.1.1. *Commercial*

Section 3 outlines in detail a general approach for the timber supply analysis and specific results and sensitivity analysis for the zone. The model used to calculate wood supply is a maximization model, outlining a specific course of action and timing of such actions to maximize timber production. The harvest schedule is an example, which indicates the specific forest strata to be harvested, and an indication on the timing of such harvest. The districts must follow this schedule as closely as possible in order for the AAC to remain valid. In general, the oldest timber considered in worst condition and losing volume fastest is targeted as first harvest priority. Younger stands that have been damaged by insects and disease may also receive high priority. Once managed stands are eligible for harvest, this priority may change in some cases to allow for a faster rotation on good sites that are silviculturally treated.

There is an insufficient supply of timber on Crown Land, particularly sawlogs, to supply the current sawmill industry. To help alleviate this problem the Crown has negotiated a series of transfers and exchanges with CBPPL in order to secure a stable supply of timber for these mills. With this arrangement, these sawmills utilize the sawlog material from these areas and sell the pulpwood and pulp chips (sawmills residue) to CBPPL. As well, these operators exchange pulpwood from their Crown cutting permits with CBPPL for sawlogs which also increases their supply.

Specific commercial strategy is as follows:

- Continue to encourage and promote growth in the sawmill industry through exchanges and transfers

7.1.2. *Domestic*

The harvest of domestic fuel wood from CBPPL limits in the Zone is confined to cutover cleanup and the harvesting of non-commercial species.

7.1.3. *Hardwoods*

The harvest of white birch occurs throughout the planning zone in close association with softwood harvest for saw logs, pulpwood and firewood. Hardwood utilization by CBPPL is limited to the issuance of several hundred domestic permits to allow residents of the zone to harvest non-commercial species for home heating use and 3-5 commercial firewood permits.

7.1.4. *Silviculture*

Section 2.1.3.2.4 describes regeneration patterns of major tree species by each disturbance type and generally by ecoregion. On average, there is 20 % natural regeneration failure rate (NSR) across all disturbance types. Generally, areas not regenerating naturally are renewed by some combination of site preparation and planting. Areas regenerated naturally are either left to develop naturally or may receive an intermediate stand density management treatment. In the case of balsam fir, which is a prolific regenerator and usually forms an overstocked stand, some form of thinning is usually applied to improve the growth and development characteristics of the regenerating stand. However; recently in FMD's 5 & 8, there is concern about the type (species) of regeneration because of increased presence of balsam woolly adelgid in the area. In these areas, regeneration to balsam fir may not necessarily be acceptable on certain site types. As well, on certain sites in FMD 8, particularly in the Seal Bay area, balsam fir has been regenerating on black spruce sites and often forms the majority of available stocking. This regeneration is "offsite" and often becomes chlorotic and stagnates at an early age. As a result of these concerns with balsam fir regeneration, planting levels tend to be much higher in this zone as compared to other areas in the province.

7.1.4.1. *Forest Renewal*

Forest renewal silviculture treatments are designed to ensure a new forest is established after disturbance by harvesting, insect, wind or fire. In most regions of the Province, prescriptions normally involve some form of treatment to prepare the site for accepting seedlings. Planting (either full or gap) is completed to ensure stocking of desired species is at acceptable levels. To ensure this, significant site preparation has been undertaken by the Crown within this zone.

Treatment of black spruce and balsam fir sites, which have been harvested normally, involves row scarification. This treatment of disc trenching the site one year prior to planting is required to produce an acceptable number of microsites, which created via row scarification are superior because they are a mixture of organic material and mineral soil.

Kalmia is an ericaceous species inhibiting growth of spruce seedlings through the production of chemicals considered toxic to spruce. As well, Kalmia restricts available nutrients on the site, causing not enough nutrients for spruce seedlings to grow properly. Where present, Disc trenching breaks up Kalmia root mats and allows the site to be better accessible and suitable for planting through the alignment of harvesting slash. The majority of the planting requirement in the zone is considered full planting of disturbed sites and without scarification, planted seedling success in Planning Zone 3 would be much lower than realized today. Depending on the site capability, the preferred planted seedling species is mainly with black or white spruce and to a lesser extent Norway spruce, larch (eastern and Japanese), red or white pine. This treatment is designed to regenerate disturbed sites to a stocking level that will produce equal or better harvest volumes than the original stand on similar tree numbers and shorter rotation lengths. Gap planting is completed with the same species as above, coupled with the natural regeneration already present on site results in a mixed softwood forest.

Where possible, seedlings are grown with seed from local seed sources. A seed orchard has been established at Wooddale Provincial Tree Nursery to produce seed from plus trees collected throughout the Planning Zone. Plus trees are normally selected because they have superior growth and physiological characteristics. First generation white spruce seed has already been produced at the nursery and some seedlings grown from this genetically superior source have already been planted in the zone. The ultimate goal is to establish plantations that have superior growth characteristics and thus increase yield and lower rotation lengths, while still maintaining genetic diversity.

Exotic species have been planted in operational trials at limited locations in the zone. These mainly include Japanese larch and Norway spruce because of their superior growth capabilities on particular sites. However, it is not anticipated this will form any substantive proportion of the provincial planting program.

Natural regeneration of softwood species throughout the zone typically relied on the excellent dispersal of balsam fir after clear cutting. However, as stated earlier balsam fir in this zone has become seriously infected with aphid. As a result, natural regeneration of balsam fir is seldom accepted. However, natural regeneration of white birch is becoming an issue in this planning zone. As noted in earlier sections white birch is an emerging commercial species. To ensure the

long-term viability of white birch supplies, regeneration methods will have to be implemented. Planting of white birch is not seen as a realistic option as the high populations of moose and rabbits in this zone would destroy seedlings as a browse source. It is recognized that replacement of white birch dominated stands after disturbance will require the establishment of a dense seedling cover. Over time the seedlings that are not browsed can be developed into valuable trees through other silvicultural techniques (e.g. thinning and pruning). Some white birch sites have been harvested in the planning zone utilizing seed tree harvesting. This technique involves leaving a specified number of white birch seed trees on applicable sites as seed sources for the next generation. Since white birch is a very prolific seed producer/ disperser, only limited seed trees are required (i.e. 2-10 per ha). The next phase of seed tree regeneration will involve a light broadcast scarification of harvested sites to produce as many microsites for white birch seedling establishment as possible.

7.1.4.2. *Forest Improvements*

Forest improvement prescriptions are designed to treat established forest stands in an attempt to enhance development. These treatments usually involve thinning overstocked balsam fir stands at either a young age 10 -15 years (precommercial thinning), or an intermediate age 25 - 35 years (commercial thinning) or cleaning/maintenance of young plantations 10-15 years of balsam fir in growth. Precommercial thinning and plantation cleaning reduce density levels in overstocked areas in order to maximize volume increment and operability (piece size) in the shortest period of time. Trees removed are not of merchantable size and are left behind to return the nutrients to the site. In the planning zone, balsam fir is usually thinned to favor any spruce that may be in the stand. In this way a mixed softwood stand is produced (depending on the original density of spruce) which is more diverse and less susceptible to insect infestation. As well, any hardwood species that are not in direct competition with spruce or fir are left to increase the biodiversity of the stand. Commercial thinning activity is undertaken on older balsam fir stands and is designed to capture mortality that would normally occur in the stand through self-thinning. The trees harvested are of commercial size and are extracted and utilized. The remaining trees are left to grow, free from competition and are harvested when mature. By salvaging this eminent mortality a higher yield can be obtained in these stands. As with precommercial thinning, spruce and hardwoods are left where possible to increase the stand diversity. This treatment has hardly been used in the zone. Both types of thinning and will produce large diameter stems in a shorter time period which should increase the percentage of merchantable volume in stands that is suitable for saw log material.

Specific silviculture strategies include:

- Ensure regeneration of areas disturbed by harvest, insect, wind and fire to prevent loss of and/or increase the future productive forestland base
- Use thinning/cleaning techniques in young stands to increase stand development, reduce rotation age, and improve stand quality through removal of aphid attacked balsam fir regeneration and increase the percentage of saw logs in stands
- Where possible, promote species mix, particularly with spruce and hardwoods to reduce susceptibility to insect attack and increase biological diversity
- Where possible, use seedlings grown from local seed sources to protect genetic diversity
- Ensure levels of planting and thinning used in the wood supply analysis are achieved
- Work towards pre harvest planning to identify areas with potential balsam woolly adelgid problems so that alternate silvicultural prescriptions can be promptly employed
- Continue development and implementation of silvicultural strategies designed to regenerate existing white birch dominated stands to white birch where applicable, as well as strategies designed to develop the white birch component of managed stands

7.1.5. *Forest Access Roads*

Timely access to harvesting areas is the key to successful implementation of harvest allocations. Roads also provide access for other recreational values such as hunting, fishing, skiing, berry picking and hiking. However, it is recognized roads can also have a negative impact both from an environmental perspective (loss of productive land base) and other value perspective (access near remote outfitting lodges).

As a general principle from both an environmental and cost perspective, the minimal amount of road required to effectively harvest available timber will be built. As well, roads are constructed to standards (e.g. width of right-of-way and driving surface etc.) that are the minimum required to access the timber in a safe and effective manner. Forwarding distances are maximized to the economic limit to minimize the amount of road constructed. These principles ensure the loss of productive land base and environmental disturbance are minimized. In sensitive and wet areas, winter harvesting and road construction are encouraged, to minimize environmental disturbance. In many instances, forest access roads “open up” new areas which are then subject to cabin development. Forest roads also provide access to remote areas where outfitting businesses operate. This generally leads to competition for hunting areas between local and “sport” hunters and may detract from the “remote” designation of the lodge. In such instances cabin development

should be controlled to limit local access. As well, road decommissioning may also be considered, depending on cost and mitigation of conflicting uses for a particular road.

The nature of the current wood supply, particularly FMD's 5 and 8, is that harvestable areas or stands are becoming smaller and more dispersed. Achievement of allocated harvest is contingent on accessing these areas and stands. Therefore, more road infrastructure is required to access this timber. Specific strategies include:

- Where possible, build winter roads to access sensitive and wet areas
- Minimize amount of road built by maximizing forwarding distances
- Use minimum road standard to safely and effectively match the logging chance
- Work with appropriate agencies (crown lands) to control cabin development
- Where possible, consider road decommissioning in areas of concern for other values (e.g. near remote outfitting lodges, PPWSA's)

7.1.6. *Forest Protection*

7.1.6.1. *Insect and Disease*

While having been a major natural disturbance factor within the zone, insects are now considered of lesser importance. Balsam fir is susceptible to most of the major insects and is in lower proportion throughout the zone than in the past. The budworm and looper damaged fir stands of the 1970's and 1980's that were salvage harvested have been replaced with planted less susceptible spruce species.

The major insect found throughout the zone today is the balsam woolly adelgid. It seems to be moving further inland, causing growth problems in young balsam fir stands. As outlined in the harvesting and timber supply analysis sections, wood supply forecast is based on following a rigid predetermined harvest schedule and minimizing inventory deductions (of which insect damage is a portion). In the event of a major insect infestation, salvage efforts may change harvest priorities, resulting in the optimal harvest schedule not being followed. If insect damaged stands cannot be harvested in a timely manner, an additional harvest in the form of unsalvaged mortality may occur resulting in inventory deductions that are higher than anticipated. In both circumstances, deviations from harvest schedules and inventory adjustment levels will be closely monitored to ensure that validity of AAC calculations are not compromised.

Specific strategies include:

- Use silvicultural techniques at the stand level to alter species mix and increase stand vigor; making stands less susceptible to insect attack (eg planting and cleaning).
- Where possible, use harvest-scheduling techniques to alter species mix across the landscape to avoid promotion for severe insect infestation
- Where possible, use species conversion techniques to convert adelgid susceptible balsam fir to other less susceptible species
- In conjunction with Provincial and Federal initiatives, use pertinent and approved biological and chemical insecticides such as BTK, Mimic, Neemix4.5 and NeabNPV (virus)
- In co-operation with Provincial insect and inventory divisions, monitor and measure adelgid infested stands to help refine yield curves to be used in the next timber supply analysis

7.1.6.2. *Fire*

Historically, fire has been a major natural disturbance factor within this zone, resulting from relatively low precipitation and high summer temperatures, combined with frequent lightning storms. A fire in an unusually dry year can have devastating effects on the forest and can exacerbate an already tight wood supply situation. The zone can minimize the risk of a serious fire by maintaining a highly trained, efficient and effective fire control program and by minimizing the risk in forest stands through maintenance of health and vigor.

Specific strategies include:

- Ensure harvest schedule is followed targeting oldest/worst condition (and high fire risk) stands
- Maintain fire control capabilities by both the Crown and Industry
- Where possible, promote species mixes (white birch) in stands to minimize risk

7.1.6.3. *Wind Throw*

Wind throw or blow down occurs in stands that are old and decrepit or in stands that have been predisposed by some other disturbance such as insects and disease. Blow down can also be increased in high-risk stands when unnatural edges are left on cutovers such as in the case buffers. To minimize the effects of blow down, stands will be managed to promote health and vigor mainly through silvicultural treatments and protection from insects.

Specific strategies include:

- Avoid thinning in areas with high wind damage potential (hilltops on high elevations etc.)
- Maintain forest in healthy vigorous condition through silvicultural treatments and protection from insects
- Design cut blocks to follow contours and natural boundaries to minimize risk of wind throw to residual forest
- investigate techniques to minimize the risk blow down in buffers (i.e. buffer management).

- Ensure harvest schedule is followed to target the oldest worst condition (and risk) timber first.
- Continue to sample overmature stands for signs of imminent breakup (e.g. wind throw and butt rot) and update harvest schedule on a 5 year basis accordingly to capture mortality

7.1.7. Information and Education

Information and education is important to providing for more active and effective participation in the forest management planning process. Through interaction with various user groups and the general public, we gain a better understanding of each other’s values and positions. Information about a stakeholder’s values and the location on the landscape provides a better ability to mitigate any potential negative impacts of harvesting activity on these values. For example, learning where a cabin is located can help planners when selecting areas for harvest and provide a contact to discuss impacts and mitigations. Public Planning team meetings provide a good exchange of information and ideas about a particular piece of land base. It is through such forums that information can be shared that provides a basis for more effective and informed participation. As a Forest Industry, other such vehicles for information and education, which will be actively pursued, include:

- Field trips (e.g. Crown and paper company woodlands tours, mill tours)
- School visits
- Open houses
- Commercial operator environmental training programs
- Information meetings
- Training courses
- Seminars
- General day-to-day contact

8. Proposed Activities

8.1.1. Harvesting

This section will outline all forest activities that will occur on CBPPL Limits in District 5 & 6 from 2022-2026. More specifically, all proposed harvesting, silviculture and access road construction activities as well as environmental protection measures, activities inside protected water supply areas, surveys, and information and education initiatives will be presented and discussed in detail. To present a more comprehensive overview of proposed activities on the entire district an overview map is presented in Appendix 3. Maps of individual operating areas and summary sheets are also presented in Appendix 3. The summary sheets give a brief description of each area, the type of activities that will occur and any issues raised and mitigative measures employed.

8.1.1.1. Commercial

The timber scheduled for harvest in the district is over mature with some small pockets of mature dispersed throughout. This proposed harvest follows the harvest schedule that was used to determine the AAC in Section 3. The proposed harvest blocks have more volume proposed than the AACs, however for operational flexibility Forest Services branch allows for 10 years harvest volume to be proposed with the stipulation that the 5 year AAC be adhered to.

Table 1- 9 Proposed commercial harvest activity FMD 5 2022-2026

FMD 5 Operating Area				Volume Harvested (m ³)		
				Softwood		
Number	Name	Tenure	Area (ha)	Core	Operationally Constrained	Sub-total
K-05-01	Soulis Pond	CBPPL	5,233	84,423	3,184	
K-05-02	Joe Batts	CBPPL	1,622	23,757	0	
K-05-06	Boot Pond	CBPPL	1,200	7,697	0	
K-05-07	Home Pond	CBPPL	8,301	94,157	0	
K-05-16	Jonathans Pond	CBPPL	4,418	92,474	991	
K-05-17	Butts Pond	CBPPL	5,509	115,571	680	
K-05-18	Little Harbour	CBPPL	1,139	16,730	82	
K-05-19	Whitman's Pond	CBPPL	126	2,812	0	
K-05-20	Weirs Pond	CBPPL	1,556	13,170	1,612	
K-05-21	Deadman's Pond	CBPPL	896	13,366	4,376	
Sub-Total			30,000	464,157	10,925	475,082

Table 1- 10 Proposed commercial harvest activity FMD 6 2022-2026

FMD 6 Operating Area				Volume Harvested (m ³)		
				Softwood		
Number	Name	Tenure	Area (ha)	Core	Operationally Constrained	Sub-total
K-06-03	Careless Cove	CBPPL	593	30636		
K-06-04	Dowd Pond	CBPPL	354	24308		
K-06-07	SouthWest Gander	CBPPL	3024	236035		
K-06-07	Dead Wolf South	CBPPL	589	58487		
K-06-18	Dead Wolf North	CBPPL	1340	100927		
K-06-23	Hussey Pond	CBPPL	0	0		
Sub-Total			5900	450393	0	450393

8.1.1.2. Domestic

There are no large scale domestic blocks on CBPPL tenure. Permits for non-commercial species can be obtained from CBPPL and have historically been approximately 100 per FMD. The Company policy as it relates to domestic and commercial cutting of hardwoods is that after pulpwood harvesting operations have been completed in an area, domestic and commercial cutting for fuel wood will be allowed on cutover areas to cut hardwoods left behind.

8.1.1.3. Silviculture

There are two silviculture prescriptions scheduled for the next five years; planting/gap planting including site preparation where required, and pre commercial thinning. Planting is designed to return a site to a minimum stocking level with the desired species, mainly spruce. There is full planting when there is complete natural regeneration failure and gap planting when a site has some desired regeneration but not enough to meet minimum stocking standards. Precommercial thinning is prescribed to reduce the density on overstocked regeneration so that growth can be concentrated on the remaining crop trees and thus reduce the time to harvest.

Areas that are scheduled for commercial harvest or have been recently harvested have been identified on the operating area maps and are candidates for planting or gap planting to black or white spruce. Site preparation using either mechanical means or prescribed burning will be employed on suitable sites that have impediments to planting. Approximate estimates for the next five years are as follows:

Table 1- 11 Proposed Silviculture Zone 3 2022-2026

Treatment	FMD	Area (ha)
Precommercial Thinning	5	0
	6	0
Sub-Total		0
Planting	5	2030
	6	500
Sub-Total		2530
Scarification	5	1830
	6	500
Sub-Total		2330
Other (Herbicide)	5	0
	6	0
Sub-Total		0
Grand-Total		4860

8.1.2. Forest Access Roads & Water

As timber closer to infrastructure has been harvested it is necessary to build roads to timber that has yet to be accessed. This remote timber has been incorporated into the timber supply analysis and must be accessed to ensure sustainability.

Table 1- 12 Proposed primary access road const. and water crossings FMD 5 2022-2026

Operating Area		Construction/ Reconstruction	Length (km)	Water Crossings	
Name	Number			Culvert	Bridge
Soulis Pond	K-05-01	Construction	3.5	0	1
Butts Pond	K-05-17	Construction	11.5	0	0
Sub-total			15	0	1

Table 1- 13 Proposed primary access road const. and water crossings FMD6 2022-2026

Operating Area		Construction/ Reconstruction	Length (km)	Water Crossings	
Name	Number			Culvert	Bridge
South West Gander	K-06-07	Construction	9	6	0
Sub-total			9	6	0

8.1.3. Forest Protection

Identify forest protection measures planned, as outlined below:

8.1.3.1. Fire

Wildfire has not been prevalent in the district in the past number of years and as a result there have been few timber losses. Despite this fact the district must remain vigilant in its fire suppression program to ensure any future losses are minimized. There are fire crews and equipment stationed at Lewisporte and Gambo District offices in the fire season whose direct responsibility is fire protection. In addition, support, equipment and manpower at both the regional level in Gander and provincial level in Corner Brook is available should the need arise. Gander houses the bank of provincial fire equipment and as well is the base for 2 air tankers and a helicopter with a crew of fire fighters for initial attack.

8.1.3.2. Insects and Disease

No forest mortality was documented by Forest Insect and Disease Surveys by the Forestry Services Branch in FMD's 4, 5, 6 and 8 during the last five year period. Monitoring and protection for insects and disease is done out of the forest protection division in Corner Brook.

8.1.3.3. Wind Throw

Wind throw is not a major concern on CBPPL limits for FMDs 5 and 6. Where wind throw may occur CBPPL will utilize the strategies outlined in section 7.1.6.3 of this plan.

8.1.3.4. Surveys

Utilization surveys will be conducted on all cutovers to insure loss of merchantable timber is minimized. CBPPL will work with the Industry Services Division in Corner Brook to implement a yield comparison study to compare the expected volume in an operating area to those actually attained. The results of this survey will help refine the inventory deduction described in Section 3.

As previously mentioned, reconnaissance and intensive regeneration surveys will be conducted on cutovers created during the next five years as well as those created in the past five years to determine the need for planting. As well, reconnaissance surveys will be done on regenerating stands to determine the suitability for precommercial thinning.

8.1.4. Activities in Protected Public Water Supply Areas

For harvesting operations inside PPWSA’s, wider buffers will be used and the pertinent EPG’s will be attached to any permits issued for these areas. There will be continuous monitoring inside these areas and buffers will be flagged to ensure compliance with the guidelines. In addition, a Certificate of Approval under Section 10 of the Environment Act must be obtained before any domestic harvesting commences inside the PPWSA.

Table 1- 14 Operating area overlap with PWSA

Operating Area	FMD	Area in PWSA	Operating Area	FMD	Area in PWSA
Soulis Pond	5	244	Careless Cove	6	7,748
Home Pond	5	6,540	Dowd Pond	6	1,690
Butts Pond	5	612	Southwest Gander	6	12,277
Little Harbour	5	663	Dead Wolf South	6	4,484
Deadmans Pond	5	896	Dead Wolf North	6	8,001
			Hussey Pond	6	7,520
	Sub-total	8,955		Sub-total	41,720

8.1.5. *Information and Education*

CBPPL in conjunction with Forestry Services will continue to attempt to educate the general public to ensure meaningful and effective consultation and input can be attained. This will be accomplished through fieldtrips and meetings, school presentations, open houses, meetings and National Forest Week activities.

8.2. **Plan Administration**

8.2.1. *Monitoring*

Monitoring of planned activities is critical to ensure objectives and operations are carried out in a manner consistent with various guidelines and provincial and federal legislation. Monitoring occurs at the operational level and the planning level.

8.2.1.1. *Operational Level*

Annually, Corner Brook Pulp and Paper Limited is issued a Certificate of Managed Land. Attached to this Certificate are schedules that set out the conditions that must be followed in order to maintain managed land status. Schedule five contains the Environmental Protection Guidelines (EPG). Industry planning and operations must comply with schedule five or the land can be declared unmanaged and fines levied. NFS staff will monitor for compliance with schedule five and recommend managed or unmanaged status.

All planned activities are monitored by the NFS to ensure all guidelines and regulations pertaining to environmental protection, harvesting, road construction, and silviculture are followed. Any infractions or deviations from the regulations or guidelines are dealt with as required under the Forestry Act.

In addition to the monthly Government monitoring for compliance Corner Brook Pulp and Paper Limited has put in place an Environmental Management System (EMS), which was registered to the internationally recognized environmental standards ISO 14001, CSA Z809, FSC Boreal Standard and SFI Forest Management and Fibre Sourcing Standards. For more information, see section 6 of the plan.

As part of this EMS, many monitoring activities take place throughout the year (checking for non-compliances) including:

- Field inspections (Number 1, 2 and 3) completed by contractors and Operations Superintendents,
- Yearly internal EMS audit,
- Yearly external EMS and field surveillance audits,
- External compliance audit every five (5) years,
- External communication from the public through our web site, cbppl.com.

All non-compliances are documented and reported to the EMS Management Review Committee. All non-compliances are reviewed by the EMS Committee, and corrective action is implemented where and when required.

8.2.1.2. *Planning Level*

The strategic planning section at forestry services monitors the implementation of this Five Year Operating Plan for this zone. This is a crucial role, as many implementation commitments are stated in the plan. The primary function of the planning section is to monitor plan implementation for consistency with commitments in the plan through approval of the Annual Operating Plans derived from this plan and review of the past annual reports associated with each year’s activities. The section will identify concerns with plan implementation provide recommendations for plan changes and establish protocol for concerns reported to them. Additional meetings between CBPPL, Strategic Planning and/or relevant stakeholders may be required to review amendments or provide recommendations should changes be required as a result of a catastrophic event such as fire which may precipitate changes to the plan.

8.2.2. *Amendments*

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

public review. Changes to this plan can be approved by the Forestry and Agrifoods Agency if they are:

- 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
- 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
- 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
- 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. Prior to approval through EA, the amendment has to be approved by the Ecosystem Management Division of the Forest Service.

Amendments will be reviewed by the monitoring committee if the District Manager deems that they represent a significant change to the plan.

8.3. Women's Employment Plan

The Women's Employment Plan (WEP) has been prepared as a conditional requirement by the Government of Newfoundland and Labrador. It describes the gender-equity goals and initiatives that Corner Brook Pulp and Paper plans to implement by working collaboratively with our contractors and relevant community stakeholder organizations to help ensure a diverse and inclusive workforce during the various phases of the proposed project.

We are an equal opportunity employer in all sectors of its operation. We encourage and support the growth of women within our organization in many ways including identifying women for succession roles, and providing equal opportunity in all job competitions. All roles that are posted

externally are advertised on our website, or indeed.ca. For specialty positions we often will post on websites associated with professional organizations such as CPA, as well as alumni groups within CNA and Memorial University.

Corner Brook Pulp and Paper is committed to establishing qualitative and quantitative goals for gender equity in order to improve employment outcomes for women in Newfoundland and Labrador. CBPPL has developed this Women’s Employment Plan (WEP) to establish a proactive approach toward a workplace environment with policies and practices that help ensure a work environment free from harassment and discrimination.

The complete WEP can be found in Appendix 2 of this plan.

8.4. Greenhouse Gas Management Plan

Corner Brook Pulp and Paper Limited (CBPPL) has employed various strategies to adapt to and mitigate climate change on the DFA. Throughout this document you will see various ways that the company is involved in partnerships with various groups, to stay abreast of possible change and to influence decision making with respect to climate change and impacts to forest operations. Though partnership with the Department of Fisheries, Forestry and Agriculture (FFA), CBPPL is involved in the process of wood supply modeling. Currently there has been no incorporation of the effects of climate change on the growth and yield into this model. CBPPL continues to partner with the FFA to work towards this goal.

8.4.1 Carbon Budget Model

In 2017, CBPPL entered into a research agreement to partner with the Canadian Forest Service (CFS) Integrated Assessment project for forest management in Newfoundland. CBPPL is the industrial partner in the carbon accounting group (with federal, provincial, and industrial partners). This project will develop a framework for Integrated Assessment of forest productivity in Newfoundland. Integrated Assessment will include considerations for biodiversity, regeneration, and carbon accounting, using the federally developed model carbon budget model, CBM-CFS3. Built on over a decade of research and development, the model was intended for application at the operational scale of forest management units. The model, which is now operational, enables us to measure the amount of carbon in our forests and predict how our management actions will affect carbon amounts. Pilot sites will be selected for the development and testing of the integrated assessment process in Newfoundland.

There will be two components of the research project that are of interest to CBPPL:

1. A baseline run of the carbon budget model for pilot sites in Newfoundland.
2. Refining and calibration of the carbon budget model for the province.

The CBM-CFS3 was designed to function in tandem with the province’s wood supply model, Woodstock. Data from Newfoundland will be provided to the CFS team by the provincial government for inclusion in the integrated assessment.

The CBM-CFS3 is an aspatial, stand- and landscape-level modeling framework to simulate the dynamics of all forest carbon stocks required under the Kyoto Protocol (aboveground biomass, belowground biomass, litter, dead wood and soil organic carbon).

The model uses much the same information that is required for forest management planning (e.g., forest inventory, tree species, growth and yield curves, natural and human-induced disturbance information, forest harvest schedule and land-use change information), supplemented with information from national ecological parameter databases. Users apply their own stand- or landscape-level forest management information to calculate carbon stocks and stock changes for the past (monitoring) or into the future (projection). Users can also create, simulate and compare various forest management scenarios in order to assess impacts on carbon (NRC, 2009).

The provincial government had planned to bring additional carbon stock information (carbon yield curves) from the carbon budget model into the Woodstock environment to perform carbon stock sensitivity analysis on management actions. However, the provincial government is still working towards carbon modelling and running the carbon budget model. The carbon budget model must be operated in tandem with the provincial wood supply model, Woodstock. The provincial government will be providing the provincial wood supply model to CFS for the purposes of this research.

A Carbon Budget Model Working Group comprised of staff from CBPPL, CFS, MUN, and the DFLR was created in 2018. This professional group worked to evaluate the current state of our provincial forests, quantify benefits associated with a variety of forest management strategies, related to Green House Gas emissions, climate change mitigations and carbon credit opportunities. The carbon pricing system was rolled out by the Provincial Government in 2018 with a Jan 1, 2019 commencement date. The regulatory approach taken by the province was a “hybrid” carbon pricing system. The first element was to place a carbon tax on all combusted fuels except where exemptions were provided. Those exemptions included: Home heating fuel, prescribed activities (e.g. agriculture, fishing, mining, forestry and silviculture), offshore and onshore petroleum and mineral exploration activities, electricity generation, aviation fuel and

municipalities. The second element was to establish a performance standard system for large industrial facilities.

Impacts to CBPPL as a whole are two tiered. Forest activities, minus trucking, are considered to be carbon neutral and therefore exempt from taxation at this point. Trucking will be impacted at the pump as diesel fuel carbon tax is 5.37cents/litre. The mill site however is covered under a performance based system, set to begin this year. Facility specific greenhouse gas targets include a 6% reduction target below baseline in 2019, rising by 2% per year, to 12% below baseline by 2022.

CBPPL has supported the Integrated Assessment research project, in the development of the carbon budget model. This research will help CBPPL to determine how the model could be used to predict the amount of carbon in the forest on the DFA and how harvesting and silviculture practices could affect carbon amounts. CBPPL could use model outcomes to set targets for impacts in the future. For example: “...must maintain X percentage of young age classes (0-20) on the DFA at all times.”

Because the carbon budget model cannot be used immediately for carbon accounting, CBPPL will use indicators from the Sustainable Forest Management Plan to contribute to carbon sequestration. Indicator 4.1.2, Degree of Within-Stand Structural Retention, contributes to carbon sequestration by leaving wildlife trees and snags in clumps, patches, and buffers. By minimizing the amount of roads and landings in a harvesting block (Indicator 2.1.1, Additions and Deletions to the Forest), the amount of forest land changed to non-forest that is incapable of sequestering carbon is lessened. And by restricting the proportion of a watershed areas with recent stand-replacing disturbance to 25% or less (Indicator 3.2.3), CBPPL is ensuring carbon sequestration in these areas.

Corner Brook Pulp and Paper Limited is committed to support the development of a baseline carbon budget, and the application and calibration of the carbon budget model. It will be an important decision-making tool to evaluate net carbon levels and to assess the impacts, if any, our forest management activities are having on ecosystem net carbon storage levels.

8.4.2 Reforestation Success

Forests help mitigate climate change by sequestering and storing carbon from the atmosphere. Therefore it is good for the global carbon cycle to maintain land in forest cover across its natural range.

Carbon accumulation in forests eventually reaches a saturation point, beyond which additional sequestration is no longer possible. This happens, for example, when trees reach maturity. An old

forest containing a large carbon stock shows a lower rate of carbon uptake than a vigorously growing young forest. Rapidly growing forests are the best at capturing and sequestering carbon. Sustainable management practices keep forests growing at a higher rate over a potentially longer period of time, thus providing additional net sequestration benefits over unmanaged forests. Since forests have a great potential to sequester and store carbon from the atmosphere, it is imperative to keep forest lands in vigorous tree growth at all times. This includes ensuring prompt tree regeneration following harvest.

CBPPL conducts regeneration surveys to assess harvested areas for sufficient stocking using the provincial government's *Regeneration Stocking Standard for Newfoundland and Labrador*, and *Regeneration Assessment Procedures for Newfoundland and Labrador*. The assessment procedures record the presence of acceptable softwood regeneration (black and white spruce and balsam fir), and other species on predetermined plots. CBPPL's Certificate of Managed Lands requires that the company provide results of the regeneration surveys to the provincial government. As of 2016, in harvested areas of previously mixedwood stands, regeneration surveys assess the presence of hardwood species as well as spruce and fir.

The analysis for this indicator is based on a ten year average, back dated to allow 5 years to conduct a regeneration survey plus 3 years to plan for and implement a planting program. An analysis of the 2001-2010 cutovers within the DFA indicates that 64% of harvested areas have adequate regeneration, i.e., stocking levels that meet the Minimum Stocking Standard, based on 61,640 ha of regeneration surveys. The (natural) regeneration success rate for the balsam fir working group is approximately 85%, and 45% for the black spruce working group. Tree planting is undertaken in areas with insufficient stocking to ensure fully stocked stands. CBPPL has been planting approximately 2.1 million seedlings per year and will endeavour to ensure that 97% of areas harvested are sufficiently stocked.

Provincial guidelines stipulate that regeneration assessments should be made within 5 years of harvesting. Depending on the nature of the area, these assessments are sometimes completed much earlier (e.g. 2 years), so that any required remedial treatments can begin sooner. Stocking survey records will be maintained on all harvested areas, and we will work towards being able to generate reports on a regular basis for harvested areas. Our regeneration survey record system is currently made available for periodic audit by provincial government.

8.4.3 GHG Reduction Programs

A Fuel consumption program was initiated across all aspects of our woodlands operations in 2009. Fuel consumption has very significant economic cost associated with our operation, as well

as the environmental cost. CBPPL evaluated fuel consumption to determine if it is a Significant Environmental Aspect of our operation and built programs to reduce it.

Some of the programs are highlighted in Table 1-15 below. As opportunity arises we will continually build on this program and make changes to the way we operate to decrease the amount of GHG that is emitted during forest operations, which include trucking wood to the mill.

Table 1-15 GHG Reduction Programs

Topic	Description
1 st offering of Smart Driver Program for the Trucking Fleet	A reduction of 300,000lts annually realized by our trucking fleet. At 350lts per tonne of CO2 we reduced our GHG emission by 847 tonnes of CO2 annually.
Educational Tools	Distributed Fuel Consumption Guide entitled “In Forestry Operations: Fuel Economy Counts” to Contractors
2 nd offering of Smart Driver Training	Training provided to Wood truck drivers provided by FP Innovations.
Backhauls	Backhaul routes were established to reduce the number of trips per unit volume of material. Less trips haul an equivalent amount of fiber, thus resulting in fuel savings. Example: Pulp wood delivered to CBPPL from central NL and logs returned to Sexton’s Lumber in eastern NL (80% backhaul – loaded 80% of the time).

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Appendix 1

Environmental Protection Guidelines

Appendix 2

Women's Employment Plan

Appendix 3

Operating Area Maps

Stakeholder	Contact	FMD	ISSUES / CONCERNS RAISED DURING 2022-2026 PLAN DEVELOPMENT on CBPPL Timber Limits (Government Depts. and on-on-one consultations with known stakeholders) Forest Management District 05 & 06	Mitigation
FABEC	John Baird		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Outfitters Association	Cory Foster		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
IBEC	Darren Sheppard		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Qalipu First Nations	Johnathan Strickland		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Newfoundland Hydro	Craig Parsons		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Nakiska on the River Gander River Outfitter	John Allan		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Bear Cliff Lodge Gander River Outfitter	Robert Coates		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Springdale Forest Resources	Dennis Young		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Springdale Forest Resources	Kevin Regular		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Meyers Minerals	Jamie Meyer		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Caribou Pond Outfitting Ltd.	Boyce Dove		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Newfoundland Wilderness Outfitters Inc - Northwest Gander River Outfitter	Tom Sargent		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Hinterland Outfitting Ltd. Southwest Gander River Outfitter	Craig Pomeroy		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Cottles Island Lumber	Rex Philpott		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Northwest Gander River Outfitter	Matt Wettlaufer		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Sexton Lumber	Kevin Sexton		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Sexton Lumber	Neil Greening		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
Newfoundland and Labrador Snowmobile Federation	Tony Sheppard		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	

Little Gull River Outfitter	Reg Robinson		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
Conne River Band - Miawpukek	Greg Jeddore		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
Canadian Wildlife Service	Joshua Mailhiot		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Concerned Citizen	Wilfred Bartlett		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Town of Gander	James Blackwood		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Concerned Citizen	Mike Brake		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Concerned Citizen	Overton Colbourne		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - MUN - Grenfell Campus	Stephen Decker		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Concerned Citizen	Sean Dolter		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Concerned Citizen	Basil English		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Burtons Cove Lumber	Terrance Fudge		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Town of Deer Lake	Carl Goudie		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - NRCAN	Darrell Harris		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Hearn Consulting	Debbie Hearn		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - IBEC	Carl Howell		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Ducks Unlimited Canada	Danica Jackson-Park		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - CONA	Glenn Knee		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Majors Logging	Dean Major		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - FLR	Wes Morgan		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - Concerned Citizen	Tim Moulton		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.
PAC - NLOA	Cyril Pelley		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.

PAC - Concerned Citizen	Tom Philpott		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
PAC - Concerned Citizen	Ralph Rice		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
PAC - Concerned Citizen	Sean St. George		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
PAC - Qulipu First Nation	Ian Sullivan		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
PAC - Concerned Citizen	George Van Dusen		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
PAC - Unifor Local 60N	Lindy Vincent		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
PAC - City of Corner Brook	Robert Wheeler		Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	
			Public Outreach complete. Mitigation table will be updated as correspondence with individuals or groups arises.	



Government of Newfoundland and Labrador
Department of Fisheries, Forestry and Agriculture

Environmental Protection Guidelines

for Forestry Operations in Newfoundland and Labrador

Date effective: January 01, 2021

Forestry and Wildlife Branch
Forest Ecosystem Management Division

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Copies of this publication may be obtained free of charge from:

Department of Fisheries Forestry and Agriculture
Forestry and Wildlife Branch
Forest Ecosystem Management Division
PO Box 2006
Corner Brook NL
A2H 6J8

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FORWARD

The 2021 Environmental Protection Guidelines for Forestry Operations in Newfoundland and Labrador is an updated version of original guidelines developed in 1998. It has been developed through a consultative process with Forest Managers, Planners, Industry and other stakeholders throughout the province. These guidelines are intended to be stand level, on-the-ground procedures 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 in an effort to maintain healthy forest ecosystems.

The guidelines set out sound and practical measures and based 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 new policies and procedures.

To facilitate use, the guidelines are structured by forestry activity and include sections on:

- harvesting;
- road construction;
- silviculture;
- forest protection;
- operations within protected water supply areas; and
- operations to reduce incidental take of migratory birds

Compliance with these guidelines will be monitored by Departmental staff.

The Environmental Protection Guidelines will complement the *Newfoundland and Labrador Forest Service Planning Guidelines*. Broader, landscape level issues are addressed in the Provincial Sustainable Forest Management Strategy.

The Department of Fisheries, Forestry and Agriculture (FFA) 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 the Environmental Protection Guidelines will continue to be an evolving process within which FFA 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 based approaches.

1. HARVESTING GUIDELINES

1.1. PLANNING 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, Climate Change and Municipalities (ECCM). A permit is required from Water Resources Management Division of ECCM, for any water identified on the latest 1:50,000 topographic maps. A Letter of Advice is required from DFO for any alterations. Appropriate protection (i.e. the permit and Letter of Advice) is still required for streams greater than 2.0 metre 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 planning area boundary or within 400 meters of a protected road, a development permit is required from Service NL.

1.1.2. CONSULTATION REQUIRED

1. The Natural Areas Program of the Department of Environment, Climate Change and Municipalities 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, Natural Areas will be expected to identify/discuss any concerns during the planning consultation process. New access roads will not be located within 500 metres of the boundary of an ecological reserve, wilderness reserve, provincial park or proposed reserve, without first consulting Natural Areas.
2. The Wildlife Division of FFA will be consulted on timber harvesting within woodland caribou habitat during the preparation of each District five-year operating plan.
3. Rare and listed flora will be protected through mitigation measures, in consultation with the Wildlife Division.
4. When 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, *Martes americana atrata* (marten) have been an ongoing issue. Proposed forestry activities within known marten recovery areas require consultation with the Wildlife Division.
6. During the preparation of five-year operating plans, areas identified as “Sensitive Wildlife Areas” require consultation with the Wildlife Division.
7. The Provincial Archaeology Office (PAO) of the Department of Tourism, Culture, Arts and Recreation 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:

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

1.1.4. NUTRIENT POOR SITES

If it is deemed necessary to harvest nutrient poor sites such as those typed as poor or scrub within the Provincial Forest Inventory, all effort will be made to ensure such sites are regenerated.

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, such as the 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.
2. No more than 6 per cent of the forested floor within the harvested land base of an operating area can be disturbed by equipment. In situations where specific operating areas require more than 6 per cent disturbance to capture available timber, the operator is required to obtain approval and then rehabilitate the area (i.e., leave the area in a condition suitable for successful forest regeneration and growth) to reduce the total net disturbance to the 6 per cent maximum. **Disturbance is defined as per the Ground Disturbance Survey Guidelines developed by the Forestry & Wildlife Branch.**
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 of the Department of Environment, Climate Change and Municipalities and without contacting the DFO Area Habitat Biologist.
4. In areas prone to erosion and silting:
 - I. conduct winter logging (i.e. harvest during winter), or
 - II. place slash on extraction trails if conventional equipment is operating in an area.
5. Any forestry operation that directly or indirectly results in chronic sedimentation under normal conditions entering a waterbody must be dealt with immediately by notifying either the DFO Area Habitat Biologist or the District Manager within 24 hours.
6. Woody material of any kind (i.e. 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; and
- V. allow room for direct gentle approaches wherever possible

8. Extraction trails and landings shall not be established within 30 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 at (709) 729-2462. The Provincial Archaeology Office will respond immediately and will have assessment requirements and 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 to July 31. Calving areas will be identified by the Wildlife Division and communicated to Forestry Branch during the five year plan development.
2. Harvest scheduling may be modified during the migration of wildlife (e.g., caribou, waterfowl, etc.) and during temporary wildlife concentrations. Areas of concern and mitigation measures will be identify as part of the five year planning process.

1.2.4. LEAVING BUFFERS AND WILDLIFE TREES

1. A 30 metre, no harvesting activity buffer zone shall be established around all water bodies that are identified on the latest 1:50,000 national topographic system (NTS) maps.

Streams greater than two metres in width that do not appear on the NTS maps require a 30 meter buffer and can be identified using the below criteria:

- The stream must have defined bottom;
 - banks that exceed 30 centimeters in depth;
 - meets or exceeds an average 2 meters in width measured at 40 meter intervals over a 200 meter distance along the stream.
2. Where the slope is greater than 30 per cent there shall be a no harvest buffer of 30 metres plus 1.5 times per cent 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 30 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 winter denning sites 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. Travel on established access roads outside a 200m of an active nest is a permitted activity, including forwarding of harvested timber, with the requirement that if roads/ trails are in use for two weeks or longer between March and July, the nest must be monitored and a summary of breeding success and travelling activities with appropriate mapping be emailed to WD at the end of trail usage or end of July, whatever comes first.
 - 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) or the Wildlife Division.
3. 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-dominant 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 or 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
(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 ECCM. (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 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 fuel storage tanks shall be registered with Service NL and have appropriate approvals for tank design. 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

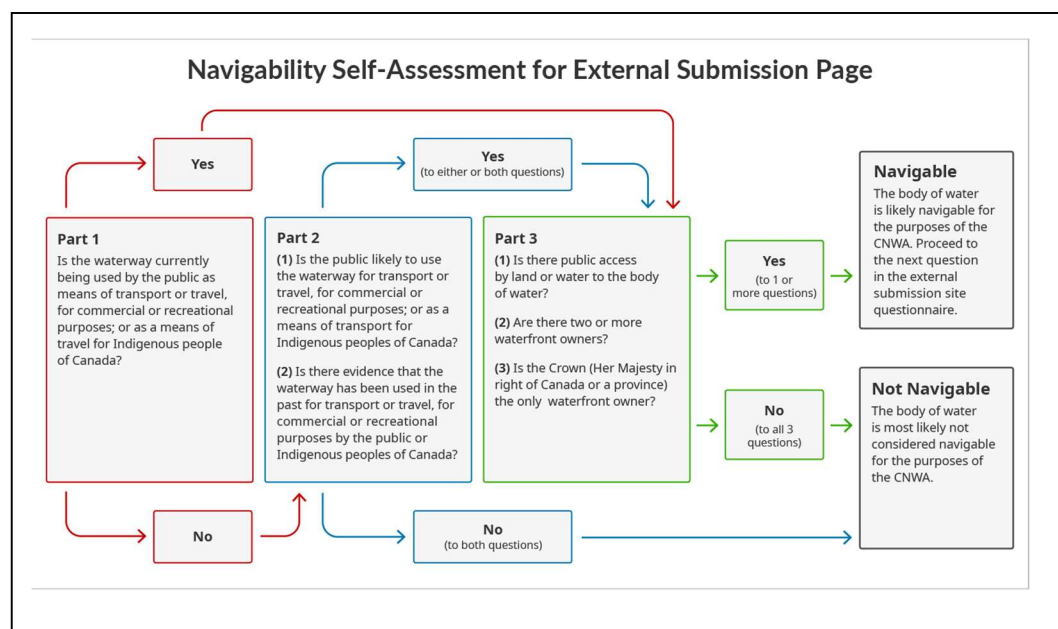
Waste material is to be disposed of at an approved waste disposal site with the prior permission of the owner or operator. Prior to disposal it must be contained in a manner not to attract wildlife. All equipment and waste materials are to be removed from the operating area when operations are completed.

2. FOREST ACCESS ROAD 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 NTS map) or development within a protected public water supply area, will require prior approval by the Water Resources Management Division of the ECCM. 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, temporary or permanent stream crossings, outfalls, infilling; and bridge, dam, and wharf construction. A Letter of Advice is also required from DFO for any alterations. Appropriate protection (i.e. the permit and Letter of Advice) is still required for streams greater than two metre in width not found on the 1:50,000 topographic map (using stream criteria as indicated in 1.2.4.1).
2. In addition to approvals from Water Resources Management Division and DFO, approvals from Transport Canada are required for culverts, bridges and abutments on navigable waters (i.e. 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). Transport Canada's Navigability Self-Assessment Tree must be utilized for each project to determine if a stream is Navigable or Not Navigable.



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, whenever possible shall avoid:

- I. deltas, floodplains or fluvial wetlands;
- II. terrain with high potential for erosion;
- III. known sensitive wildlife areas such as:
 - a. caribou areas (i.e. calving, post calving, migrations routes, rutting areas, and winter areas);
 - b. waterfowl areas (i.e. nesting and staging areas);
 - c. raptor nest sites; and
 - d. 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; and
- 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; and
- 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 of Department of Natural Resources and FFA, for borrow pits outside resources roads right of way, prior to aggregate extraction activities as per the *Quarry Materials Act*, and

- 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:
 - a. roads should be of low profile (i.e. less than one metre above the surrounding terrain);
 - b. slash and other debris shall be removed or buried; and
 - c. 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 a reforestation plan approved in the Certificate of Managed Lands.
2. A regeneration survey is required for all forest areas that will be affected by access due to road decommissioning and bridge or stream crossing removals. Prior to decommissioning, an approved reforestation plan by the Silviculture and Research Section of the Forest Ecosystem Management Division 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 crossings; and
- III. restoration of roadway including planting of trees.

Decommissioning is identified through the five year plan development or under compelling circumstances, as decided by FFA (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 the cutting of road right-of-way's. 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 these are not available or sufficient, permission must be obtained from a Forestry 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. Earth shall be excavated as required to complete earth cuts, ditching, and 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 or sufficient material to complete embankments. All holes and pits are to be rehabilitated.
4. Fill materials for road building must not be obtained from any waterbody, from within the floodplain of any waterbody, or within the 30 metres of a no-grub zone.

2.2.2. PITS AND QUARRY ACTIVITY

1. Where borrow pit or quarry activity is likely to cause sediment, laden runoff 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 a Forestry 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 INSTREAM 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.
2. 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.
3. 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.
4. 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.

5. 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.
6. Grades in excess of 10 per cent shall have culverts with baffle or ditch blocks on one end and cut-off ditches every 150 meters along the road. Baffle or 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.
7. 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.
8. Any forestry operation that directly or indirectly results in sediment or turbid water entering a waterbody must be dealt with immediately. (See Guideline 1.2.2.5 for further information.)
9. 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.
10. Heavy equipment and machinery is not permitted in any waterbody, on a wetland or a bog, unless it is frozen, without a permit from ECCM and without contacting the DFO Area Habitat Biologist.
11. Exposed mineral soil shall be stabilized during bridge construction and culvert installation.
12. All instream work is to be performed as per the DFO March 1998 "Guidelines for Protection of Freshwater Fish Habitat in NL." Marine Environment and Habitat Management Division Science Branch.
13. Cofferdams are to be used to separate work areas from the stream when installing bridges or similar structures requiring abutments, or footings.
14. Water pumped from work areas and cofferdams is to be directed into a settling pond or stable vegetation areas.

15. Not more than one third of the stream width is to be blocked at any one time.
16. The stream banks are to be rehabilitated upon completion and removal of a coffer dam.
17. All culverts, in fish bearing streams, are to be installed as per the DFO March 1998 "Guidelines for Protection of Freshwater Fish Habitat in NL." Marine Environment and Habitat Management Division Science Branch.
18. In fish bearing streams;
 - a. culverts having a diameter equal to or exceeding 2000 millimetres should be countersunk a minimum of 15 per cent of the diameter below the streambed elevation;
 - b. a minimum water depth of 200 millimetres should be provided throughout the culvert length. To maintain this water depth at low flow periods an entrance or downstream pool should be constructed; and
 - c. downstream outlet pools are of particular importance for long culverts or culverts to be installed on steep slopes.
19. Work to be completed in the stream bed, should be scheduled to avoid potential adverse impacts on spawning activities, egg incubation, spawning habitat and fish migration. It should also be done 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 1.2.2 will apply.

2.2.5. PETROLEUM PRODUCTS

In the event of a spill or leak of petroleum products, see Guideline 1.2.5.1 for further details. Guidelines 1.2.5.2 to 1.2.5.5 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. After use, it is to be left in an environmentally acceptable condition. All temporary crossings are to be removed at the end of the operating season and an inspection is to be conducted by a Forestry Official, engineer or other qualified person. This inspection is to ensure any required remediation has been completed.

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 be undertaken until all necessary reforestation activities beyond the decommissioning point has taken place.

3. SILVICULTURAL GUIDELINES

3.1. SILVICULTURE PLANNING

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 can occur.

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 per cent. If in such instances scarification has to occur parallel to the slope, the scarified trenches are to be intermittent (i.e. for every 20 metres of trench, an un-scarified section two metres m in length should be left).

3.2.2. PROTECTION OF WATERBODIES

1. Unless frozen, heavy equipment and machinery is not permitted in any waterbody, on wetland or a bog without a permit from ECCM 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 1.2.1.5 for further information.
3. Trees thinned during pre-commercial thinning, diameter limit thinning, commercial thinning or any other silviculture treatment shall not be felled into waterbodies.

3.2.3. PLACEMENT OF WINDROWS

When slash is piled into windrows, it should be located where the 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 Eastern White Pine, *Pinus strobus* or Red Pine *Pinus resinosa*.
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 or avoided in areas identified by the Wildlife Division during the periods of birth and 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 or leak of petroleum products, see Guideline 1.2.5.1 for further details.
2. Guidelines 1.2.5.2 to 1.2.5.5 relating to petroleum products also apply in silviculture operations.

3.2.8. SCARIFICATION METHOD

Where mechanical site preparation is required, the method 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 planting situations, the use of native species is preferred. However, in certain situations, use of non-invasive, exotic species, such as those which have been established in the province for decades, or those which may come under future review, may be planted.

4. 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 federally by Health Canada and provincially by MAE. The federal *Pest Control Products Act* states which products are registered for use in Canada, and the provincial *Environmental Protection Act, Pesticide Control Regulations* outlines licensing requirements and the conditions under which they can be purchased, sold or handed.

4.1.2. LICENCES REQUIRED

1. To apply pesticides in the province, two licences are required from the Pollution Prevention Division of ECCM. The first is a Pesticides Operators Licence which is issued for a specific program and valid for five years. To obtain this licence, 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 MAE. The second licence required is a Pesticide Applicators Licence. To obtain this licence, the applicator must complete an exam. Only people in possession of this licence may use the pesticide. It is valid for a period of five years.
2. To apply herbicides, the same conditions apply as above. An Operator's Licence 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 Licence.
3. A third program which requires an Operator's Licence and a Pesticide Applicators Licence 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. PESTICIDE USE

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

5. GUIDELINES FOR FORESTRY OPERATIONS WITHIN PROTECTED PUBLIC WATER SUPPLY AREAS

The primary function of a Protected Public Water Supply Area (PPWSA) is to provide the public with an adequate quantity of safe and good quality water on a permanent basis and to meet its present and future demands. By definition, a Protected Public Water Supply Area is 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 Areas on a limited and controlled basis provided the proposed operations have no or minimal, water quality impairment potential. More specifically, commercial forest harvesting of more than 10 per cent of the total land area of the Protected Public Water Supply Area, or 10 per cent of the total merchantable timber; whichever is less, in any 12 month period 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 includes 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 MAE,
- 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 (Appendix I).

5.1. CONDUCT OF OPERATIONS

All permits and contracts should include any conditions outlined under section 39(6) of the *Water Resources Act*. In addition to environmental guidelines specified in sections above, the following will apply in Protected Public Water Supply Areas.

5.1.1. MAP OF OPERATING AREA

The appropriate Forestry or Company official will provide the operator with a map indicating the harvesting area and the location of no-cut buffer zones, and will ensure 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 mitigation measures should be put in place:

1. Sensitive areas prone to erosion and areas which have high potential for erosion can be harvested if proper harvesting and site restoration techniques are a part of a detailed plan.
2. Wherever possible, extraction trails should run along contours and avoid wetlands.
3. Use of landings will be minimized. Any approved landing area shall be less than 0.25 ha and located at least 150 metres from Protected Public Water Supply 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
Intake Pond, Lake or Reservoir	Minimum 150 metres
River Intake (for a distance of 1000 metres upstream and 100 meters downstream)	Minimum 150 metres
Main River Channel	Minimum of 75 metres
Major Tributaries, Lakes or Ponds	Minimum of 50 metres
Other Waterbodies	Minimum of 30 metres

Any deviation 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 1.2.5.1 to 1.2.5.5 the following are to be adhered to;

- I. If fuel must be stored in the Public Protected Water Supply Area, it must be in the least sensitive area and be approved by the 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 AREA

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.

6. GUIDELINES FOR FORESTRY OPERATIONS TO REDUCE INCIDENTAL TAKE OF MIGRATORY BIRDS

In Canada migratory birds, nests and eggs are protected under the Migratory Bird Convention Act (MBCA). Currently, the inadvertent harming, killing, disturbance or destruction of migratory birds, nests, and eggs often referred to as “incidental take”, may be considered a violation under the MBCA and its regulations.

Bird nests occur in virtually every stand logged during the nesting season, which can run from mid-April through mid-August each year in Newfoundland and Labrador. This places forest operations in direct conflict with the MBCA during nesting season, with no opportunity to obtain a permit for authorization. Shutting down forest operations for this period would have huge economic and social implications.

Beneficial Management Practices (BMP) are designed to reduce risk of incidental take by making forest operators aware of their responsibility in the following areas:

- I. Knowledge of Legal Obligations
- II. Risk Assessment and Planning
- III. Preventative and Mitigation Measures

BMPs in this document apply to commercial forest operations during the migratory bird breeding season in Newfoundland and Labrador. Operations include the construction and maintenance of forest access roads, timber removal and transportation activities, silviculture related activities and forest harvesting.

6.1. KNOWLEDGE OF LEGAL OBLIGATIONS

During planning, and immediately before implementation of operations, forest operators must familiarize themselves with the current legislation for the protection of migratory birds, their nests and their eggs. Section 6 subject to subsection 5(9) of the *Migratory Bird Regulations* and Section 75 of the *Wild Life Regulations* outline the responsibilities of operators concerning this.

Forest operators are also responsible for the protection or avoidance of species listed under the *Species at Risk Act (SARA)* or the *Endangered Species Act (ESA)*.

6.2. RISK ASSESSMENT AND PLANNING

Planning ahead can help you comply with the law and minimize the risk of detrimental effects to migratory birds. Assessing the risks of effects is the first step for developing appropriate prevention and mitigation measures that help maintain sustainable populations of migratory birds.

In order to help ensure that you are complying with legal obligations, you should first determine the likelihood of the presence of migratory birds and their nests or eggs when planning activities to be carried out. It is recommend to use scientifically sound approach that considers the available bird habitats, the migratory bird species likely to be encountered in such habitats, and the time period of encounters. You should plan to avoid engaging in potentially destructive or disruptive activities at key locations or during key periods, such as the breeding season.

6.3. PREVENTATIVE AND MITIGATION MEASURES

Planning To prevent incidental take of migratory birds during forestry operations it is recommended to schedule activities to reduce disturbance during the migratory bird breeding season. The breeding season for most migratory birds within the province occurs between April 15th and August 15th, though some species do nest outside of this time period.

Shutting down logging operations for this period would have huge economic and social implications including:

- I. Mills may not be able to hold inventory for 4 months.
- II. Keeping the workforce in forestry.
- III. Cannot avoid planting or thinning during the nesting season as it is our legal obligation for reforestation.
- IV. Summertime harvest is sometimes recommended to maintain other values.
- V. Some areas can only be accessed and logged during the summer months.

In cases where forestry activities have to take place during the breeding season of migratory birds it is recommended that practices are conducted in a manner that:

- I. Minimizes fragmentation and maintains interior forest habitat.
- II. Maintains forest structure in seral stages including understory vegetation, standing residual materials, and downed coarse woody debris.

- III. Uses methods that promote natural regeneration in order to maintain forest structure, including understory vegetation.
- IV. Ensures no net loss of wetland function in forests.
- V. Ensures that large snags are left standing in cutblocks, as a source of nesting cavities.
- VI. Maintains hardwood stands within the cutblock.
- VII. Maintains contiguous areas of uncut forests as control areas and reserves.

APPENDIX I

RESOURCE MATERIAL

Development Applications in Protected Public Water Supply Areas

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

Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador

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

Guidance Document for the Management of Impacted Sites

[http://www.env.gov.nl.ca/env/env_protection/ics/Guidance Document For the Management of Impacted Sites V2.0 Feb 6 2014.pdf](http://www.env.gov.nl.ca/env/env_protection/ics/Guidance_Document_For_the_Management_of_Impacted_Sites_V2.0_Feb_6_2014.pdf)

FEDERAL LEGISLATION

Canada Fisheries Act

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

Canada Navigable Waters Protection Act

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

Canada Species at Risk Act

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

PROVINCIAL LEGISLATION

Newfoundland and Labrador Endangered Species Act

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

Newfoundland and Labrador Environmental Protection Act

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

Newfoundland and Labrador Forestry Act

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

Newfoundland and Labrador Historical Resources Act

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

Newfoundland and Labrador Quarry Material Act, 1998

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

Environmental Protection Guidelines 2021

Newfoundland and Labrador Urban and Rural Planning Act, 2000

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

Newfoundland and Labrador Wildlife Act

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

Kruger Inc. Corner Brook Pulp and Paper Ltd.

Women's Employment Plan

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1.0 Introduction

Corner Brook Pulp and Paper is a Kruger Company manufacturing newsprint for national and international markets. We manage approx. 1.4 million hectares of forest land which is used in the production process, mostly as pulpwood and saw logs.

This Women's Employment Plan (WEP) has been prepared as a conditional requirement by the Government of Newfoundland and Labrador. It describes the gender-equity goals and initiatives that Corner Brook Pulp and Paper plans to implement by working collaboratively with our contractors and relevant community stakeholder organizations to help ensure a diverse and inclusive workforce during the various phases of the proposed project.

Currently, active harvesting is an ongoing operation that maintains the Corner Brook Pulp Mill. Also included in this is tree planting, pre-commercial thinning and conventional cutting.

Describe the company's leadership and commitment to gender equality at the Executive level and lines of accountability? We are an equal opportunity employer in all sectors of its operation. We encourage and support the growth of women within our organization in many ways including identifying women for succession roles, and providing equal opportunity in all job competitions. All roles that are posted externally are advertised on our website, and on indeed.ca. For speciality positions we often will post on websites associated with professional organizations such as CPA, as well as alumni groups within CNA and Memorial University.

Corner Brook Pulp and Paper is committed to establishing qualitative and quantitative goals for gender equity in order to improve employment outcomes for women in Newfoundland and Labrador. CBPPL has developed this Women's Employment Plan (WEP) to establish a proactive approach toward a workplace environment with policies and practices that help ensure a work environment free from harassment and discrimination.

1.1 Project Timeframes and Workforce Estimates

The WEP was implemented January 1, 2019 and is considered an ongoing project for the life of the facility. Due to the nature of the project there is no construction phase required.

The workforce requirements and estimated number of workers required by NOC code for the Construction Phase are outlined in Table 1.

Occupation	NOC	Duration of Work	Number of Employees	CH/DE
Project Management				
Supervisors Skilled Trades	Not Applicable			
Professionals				
Semi-Professionals and Technicians				
Skilled Trades				
Manual Workers				

Table 1: Estimated Full-time Contractor-Hired (CH) or Direct Employee (DE) Hires, Construction Phase, by Occupation/NOC

Table 1A: Employment Targets by Occupational Group – Construction Phase

Occupation (NOC)	FT/PT/Seasonal	# of Employees	Target Female (%)	Direct Hire (DH) or Contractor (CT)	Estimated Timeframe
Project Management					
Administration					
Supervisors of Skilled Trades					
	Not Applicable				
Semi-Professionals, Technicians					
Skilled Trades					
Manual Workers/Labourers					
Apprentices					

Describe the scope of work in the Operations Phase:

Occupation	NOC	Duration of Work	Number of Employees	CH/DE
Project Management				
Supervisors Skilled Trades	8211 Supervisors, logging and forestry	10 months annually for	5	CH
Professionals	0811 Managers in natural resources production and fishing 2122 Forestry professionals	Full time	14	DE
Semi-Professionals and Technicians	2223 Forestry technologists and technicians	Full time		CH, DE
Skilled Trades	7521 8241	10 months annually for	133	CH
Manual Workers	8422 Silviculture and forestry workers	10 months annually for	21	CH

Table 2: Estimated Full-time (FT), Contractor-Hired (CH) or Direct Employee (DE) for the Operations Phase, Occupation//NOC

Table 2A: Employment Targets by Occupational Group – Operations Phase

Occupation (NOC)	FT/PT/Seasonal	# of Employees	Target Female (%)	Direct Hire (DH) or Contractor (CT)	Estimated Timeframe
Project Management			25%		
Administration			25%		
Supervisors of Skilled Trades					

Semi-Professionals, Technicians					
Skilled Trades	Seasonal		25%	CH	5 years
Manual Workers/Labourers	Seasonal		25%	CH	5 years
Apprentices	n/a				

1.2 Employment Diversity Commitments and Practices

Corner Brook Pulp and Paper has developed the following commitments to advance gender equity in employment and smooth the transition of women into leadership roles:

- Establish senior executive responsibilities for gender equality, develop capabilities and lines of accountability among senior management;
- Develop and communicate an executive-level vision statement to all staff and contractors, including commitments and goals;
- We conduct Respectful Workplace training on a three year refresher cycle to remind employees of the importance of diversity and inclusion in the workplace.

2.0 Recruitment and Employment

Corner Brook Pulp and Paper commits to the following measures to reduce the barriers to women’s participation and improve their employment on this project.

- Describe your pre-employment outreach to the Office to Advance Women Apprentices (OAWA) and Women in Resource Development Corporation (WRDC) to improve recruitment of women;
We have been in contact with the Office to Advance Women Apprentices, however, this project wouldn’t involve any apprentice roles.
- Describe internal employment equity processes including:
 - assigned lines of accountability for the Women’s Employment Plan;
 - delivery of mandatory Respectful Workplace training for all employees;
 - the review of HR policies and practices for gender bias;
 - workplace accommodation policies and practices, , exit interviews, climate surveys, etc. ;

- Union groups within our organization are inclusive in their practices, including creating gender neutral language in agreements, ensuring parental leave is included in wording to follow language in legislation
- All policies and programs outlined by CBPPL are required to be complied with by all contractors.
- Using the attached Table 3 (Appendix 1), identify targets that are above the National Occupational Classification Code employment figures for the following groups (for more information on NOC Codes for your project's labour force requirements, please go to <http://noc.esdc.gc.ca/English/noc/welcome.aspx?ver=16>):
 - Project Management
 - Administration
 - Supervisors of Skilled Trades
 - Semi-professionals, Technicians and Technologists
 - Skilled Trades
 - Manual Workers
 - Apprentices

3.0 Communication

To assist with maximizing opportunities for women, CBPPL is committed to outreach with a range of stakeholder organizations and institutions to improve opportunities for women through the following activities:

- We use appropriate language and imagery in all job advertisements and other communications to encourage women to apply for all job opportunities. A gender equity and diversity statement is included in any such promotional materials related to the development of this project and all opportunities with CBPPL.
- CBPPL has been in contact with organizations supporting women in science, trades and technical occupations such as the Office to Advance Women Apprentices (OAWA), and intends to expand this outreach in the coming years.
- We have participated in information sessions at the community level in collaboration with government and non-government stakeholders including the College of the North Atlantic to discuss opportunities for them to offer programs that align with the needs of industry.
- Conduct focus groups or other outreach sessions with stakeholders to better understand barriers to female employment with CBPPL.
- Develop and maintain a corporate culture and work environment within CBPPL that facilitates the achievement of the career goals of women and provides them with the training and support they need to assist them in meeting their goals and the goals of the company.
- The WEP is to be distributed with all capital works RFP.

4.0 Monitoring

CBPPL works closely with contractors on a daily basis, and will regularly discuss the progress of the Women's Employment Plan.

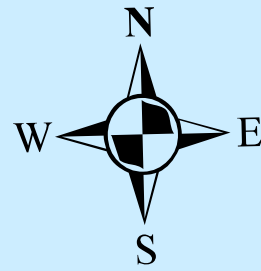
**Corner Brook Pulp and Paper Ltd.
Forest Management District 05
Five Year Plan (2022-2026)**



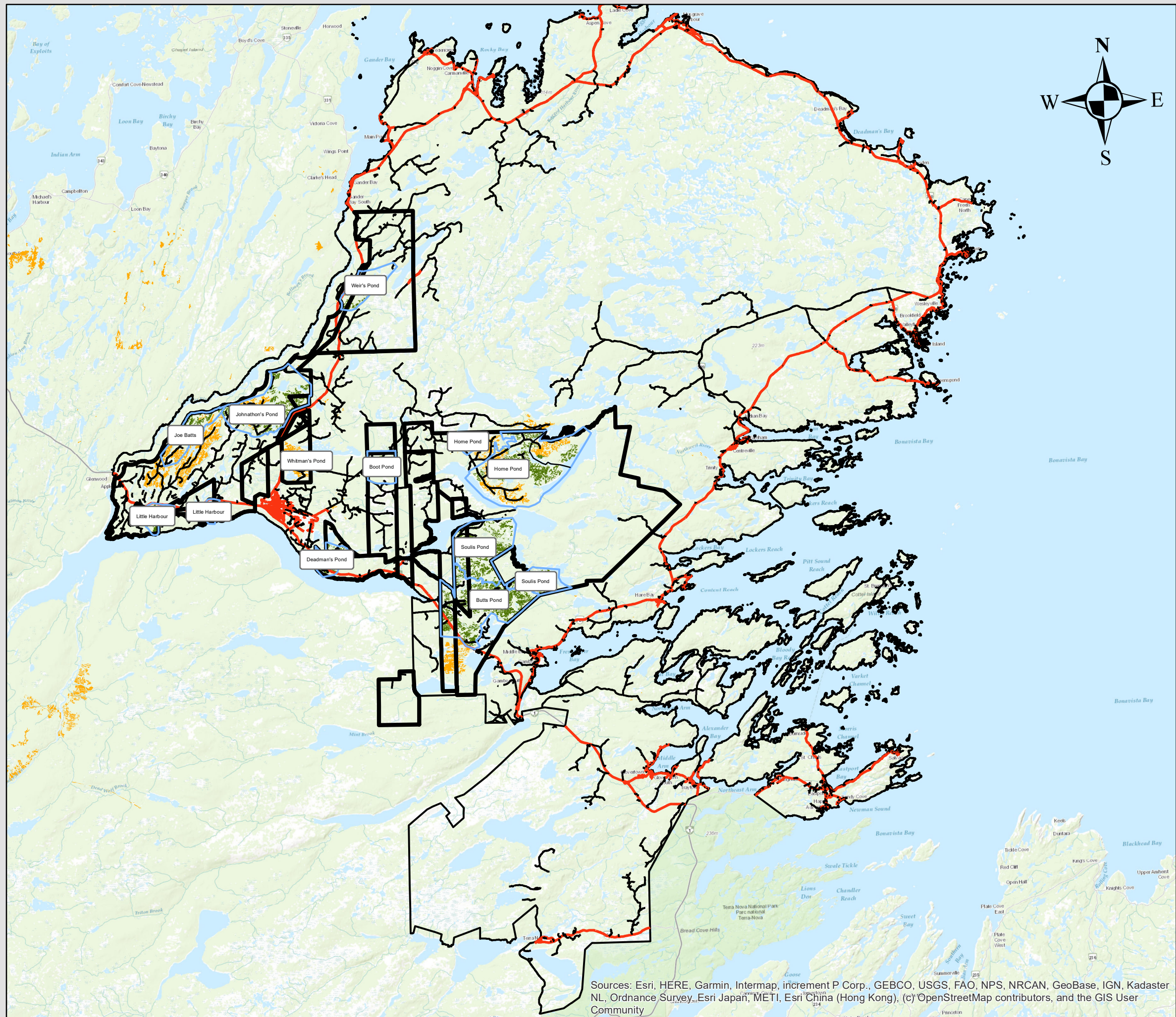
Legend

- Highways
- Resource Roads
- 5YP
- CBPPL Limits
- Cutover
- Proposed Harvestables

1:432,000



K_Num	Name
1	Soulis Pond
2	Joe Batts
3	Little Harbour
6	Boot Pond
7	Home Pond
16	Johnathon's Pond
17	Butts Pond
18	Little Harbour
19	Whitman's Pond
20	Weir's Pond
21	Deadman's Pond



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**


FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Soulis Pond</u>	Inventory Map #:	<u>078</u>
Harvest Area #:	<u>K-05-01</u>	NTS Map #:	<u>2E02-2D16</u>

Forest Inventory		
Gross	Net	Working Group
Volume: <u>84,423</u> m3	Volume: <u>76,825</u> m3	bF: <u>13</u> %
Area: <u>1,456</u> ha	Area: <u>1,325</u> ha	bS: <u>87</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:

- This operating area is contained inside a Protected Water Supply. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas.
- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.
- Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline.
- Primary road construction is planned in this operating area.
- This area falls within the municipal area for the town of Gander. CPPLL will consult with the town of Gander prior to any harvesting or road development and necessary permits will be obtained.



ISO 14001:2015
SFI 2015-2019

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Forest Management District 05 Five Year Plan (2022- 2026)

Soulis Pond (K-05-01) Scale:1:45,500

Forest Inventory Map 078 NTS Map 2E02-2D16

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

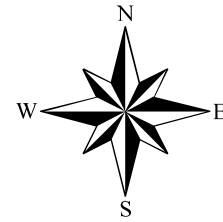
- Management Boundary
- Ownership Boundary

Land Features

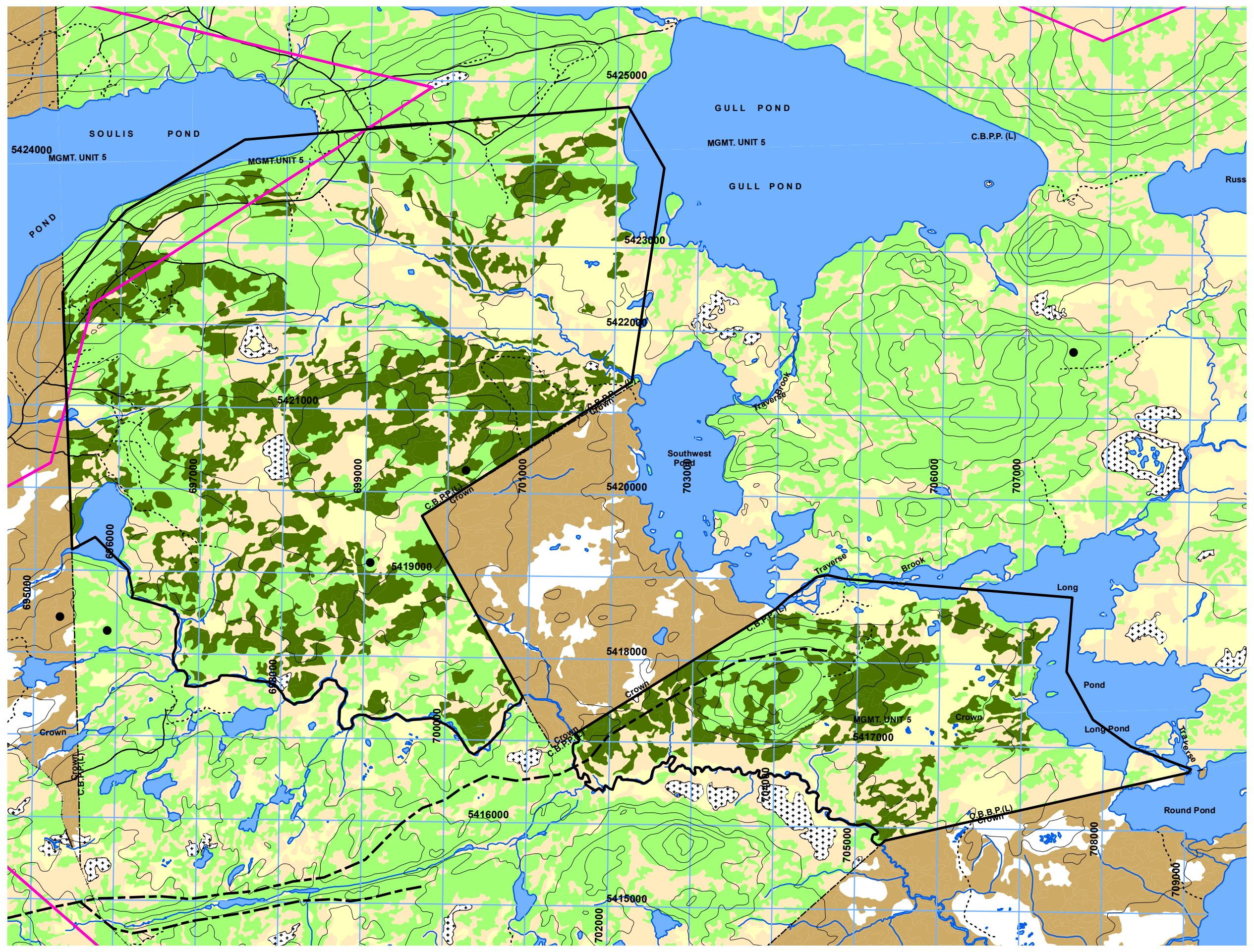
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05






**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Joe Batts</u>	Inventory Map #:	<u>065-077</u>
Harvest Area #:	<u>K-05-02</u>	NTS Map #:	<u>2E02-2D15</u>

Forest Inventory		Net	Working Group
Gross			
Volume: <u>23,757</u> m3		Volume: <u>21,619</u> m3	bF: <u>10</u> %
Area: <u>219</u> ha		Area: <u>199</u> ha	bS: <u>90</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline. - This area falls within the municipal area for the town of Gander. CPPLL will consult with the town of Gander prior to any harvesting or road development and necessary permits will be obtained. -Silviculture and Five-Year Plan boundary overlap. - Operating area is adjacent to the Gander River Management Area. 	
 <p>ISO 14001:2015 SFI 2015-2019</p>	<p>Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ http://www.cbtpl.com/.</p>



Forest Management District 05 Five Year Plan (2022- 2026)

Joe Batt's
(K-05-02)
Scale:1:45,000

Forest Inventory Map 065-077
NTS Map 2E02-2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

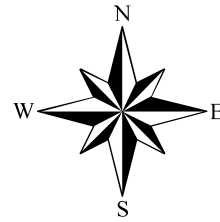
- Management Boundary
- Ownership Boundary

Land Features

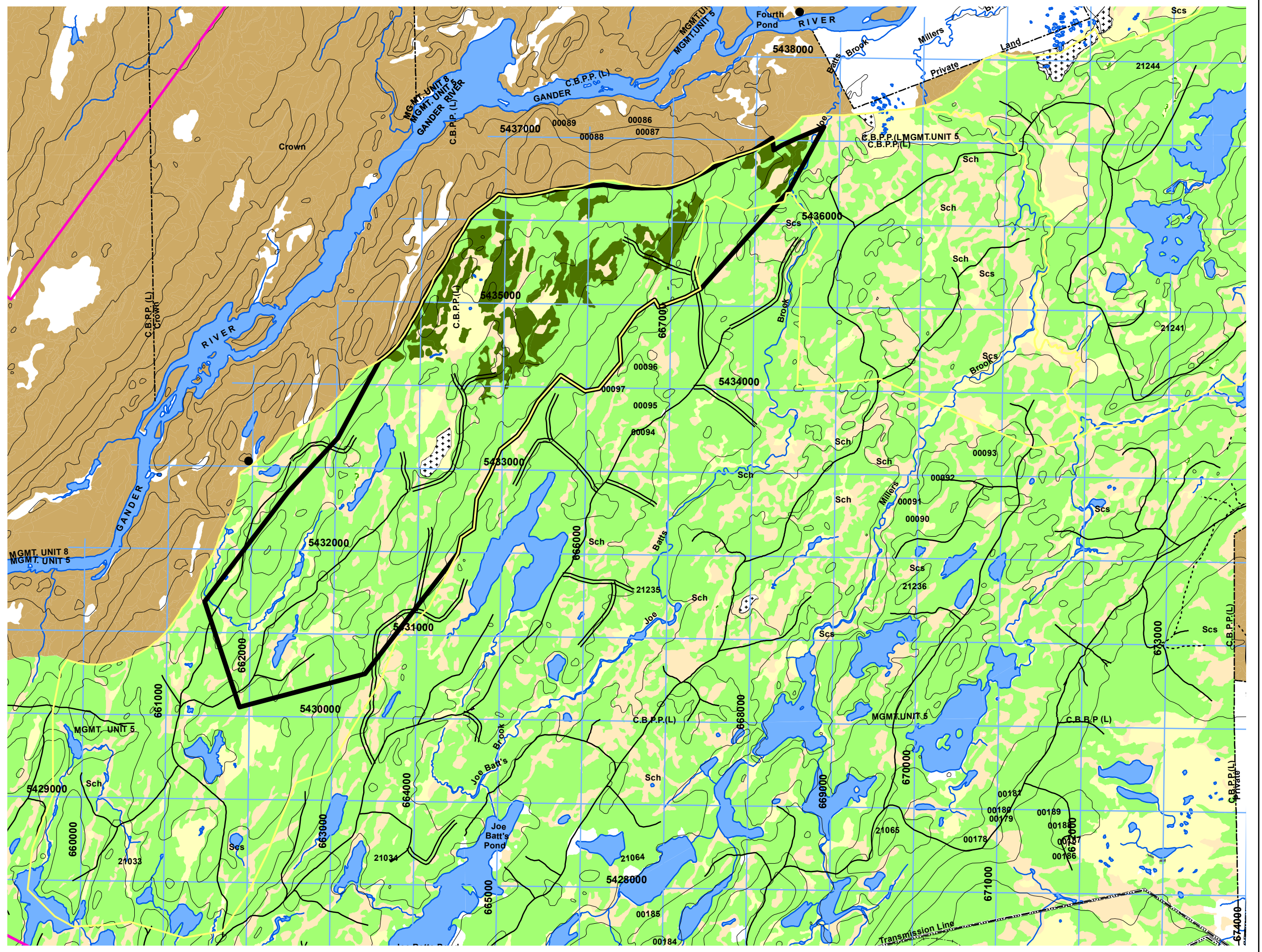
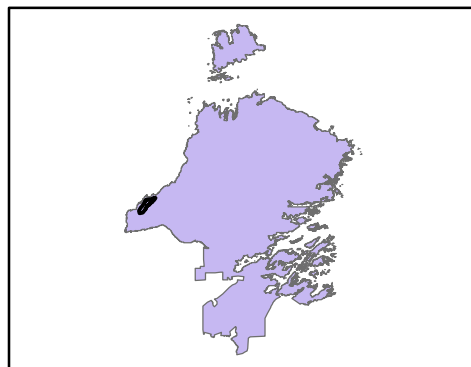
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**


FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Boot Pond</u>	Inventory Map #:	<u>066-078</u>
Harvest Area #:	<u>K-05-06</u>	NTS Map #:	<u>2E01-2D16</u>

Forest Inventory		
Gross	Net	Working Group
Volume: <u>7,697</u> m3	Volume: <u>7,004</u> m3	bF: <u>12</u> %
Area: <u>131</u> ha	Area: <u>119</u> ha	bS: <u>88</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:

- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.
- This area falls within a municipal planning area. CPPLL will consult with the town prior to any harvesting or road development and necessary permits will be obtained.
- This operating area has a shared forest access road and snowmobile trail system. Consultation with the NLSF takes place annually to discuss mitigations for the upcoming season.



ISO 14001:2015
SFI 2015-2019

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Forest Management District 05 Five Year Plan (2022- 2026)

**Boot Pond
(K-05-06)
Scale: 1:17,000**

**Forest Inventory Map 066-078
NTS Map 2E01-2D16**

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

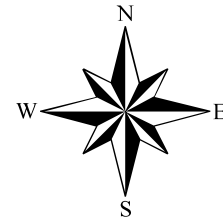
- Management Boundary
- Ownership Boundary

Land Features

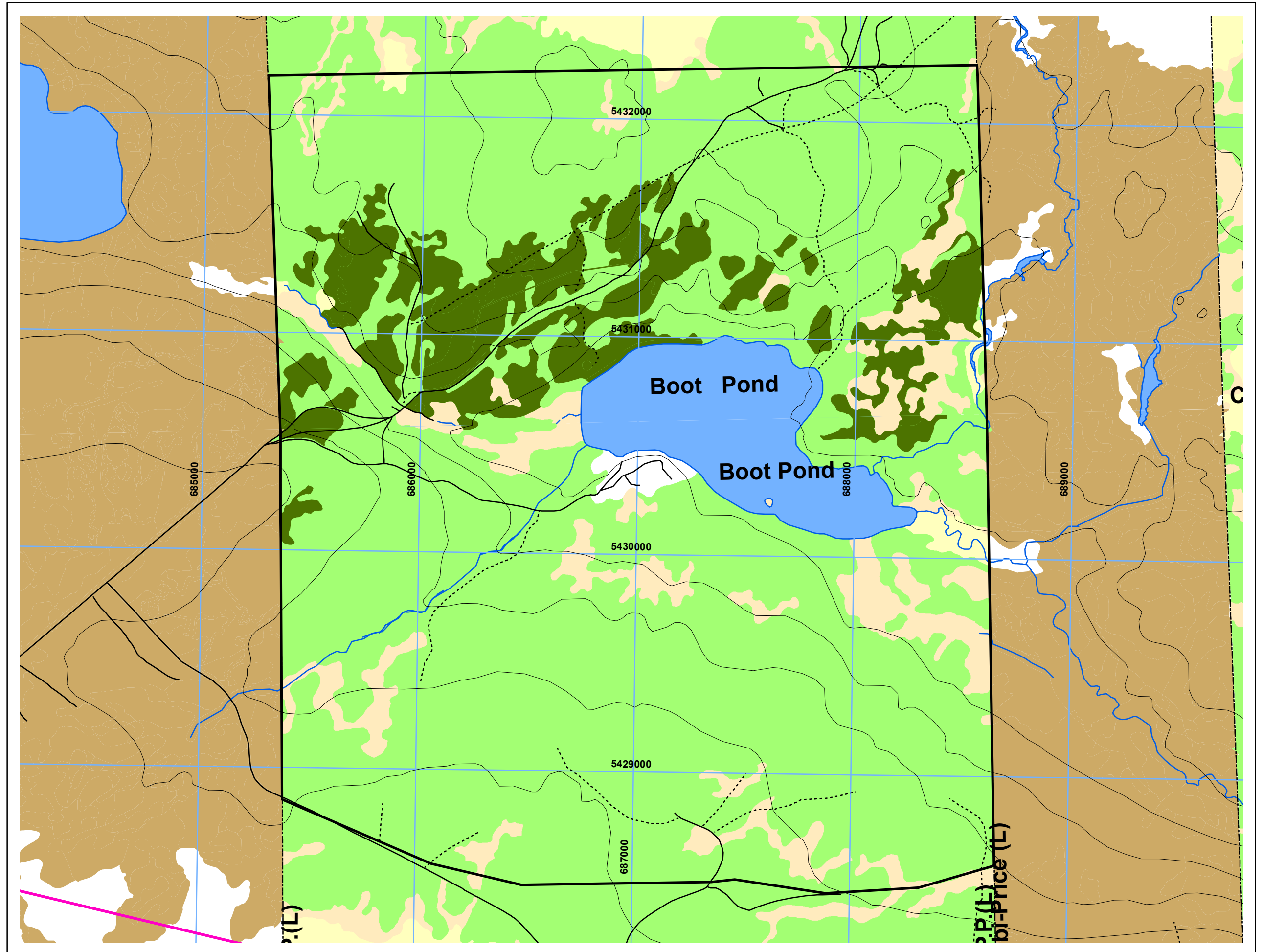
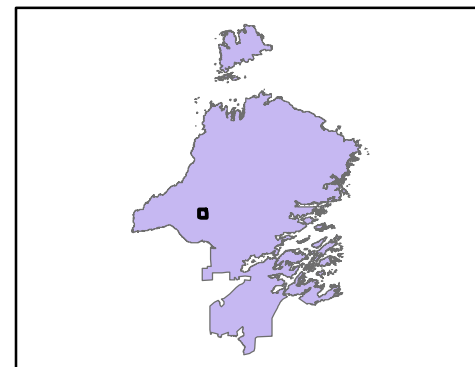
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05






**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Home Pond</u>	Inventory Map #:	<u>065</u>
Harvest Area #:	<u>K-05-07</u>	NTS Map #:	<u>2E02</u>

Forest Inventory		
Gross	Net	Working Group
Volume: <u>94,157</u> m3	Volume: <u>85,683</u> m3	bF: <u>12</u> %
Area: <u>1,144</u> ha	Area: <u>1,041</u> ha	bS: <u>88</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity. -Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline. - A portion of this operating area is within a PPWSA. A certificate of approval from the Water Resources Division will be obtained before any activity occurs. - Silviculture and Five-Year Plan boundary overlap. 	
 <p>ISO 14001:2015 SFI 2015-2019</p>	<p>Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ http://www.cbtpl.com/.</p>



Forest Management District 05 Five Year Plan (2022- 2026)

Home Pond
(K-05-07)
Scale: 1:50,000

Forest Inventory Map 066-078 NTS Map 2E01-2D16

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

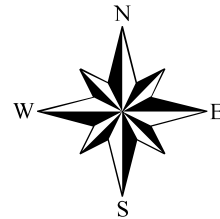
- Management Boundary
- Ownership Boundary

Land Features

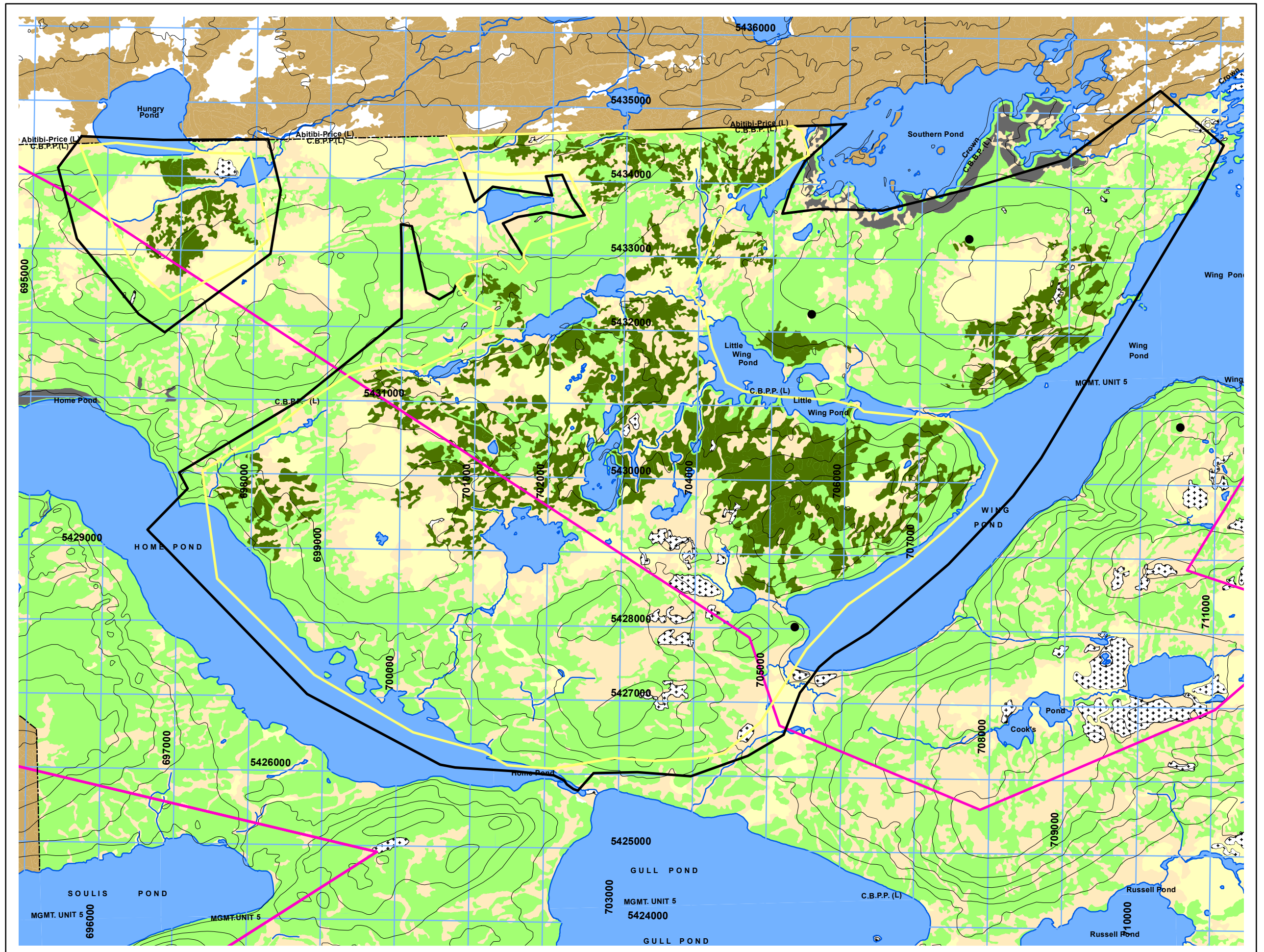
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





CORNER BROOK PULP & PAPER LIMITED FIVE YEAR OPERATING PLAN

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Jonathans Pond</u>	Inventory Map #:	<u>065</u>
Harvest Area #:	<u>K-05-16</u>	NTS Map #:	<u>2E02</u>

Forest Inventory

Gross

Volume: 92,474 m3
Area: 906 ha

Net

Volume: 84,151 m3
Area: 824 ha

Working Group

bF: 14 %
bS: 86 %

Operational Considerations:

Harvest System: Mechanical -SW3 - Shortwood - Harvester/forwarder
Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder

Terrain Conditions: Predominately gentle terrain in combination with rolling hill top
conditions, interspersed with rivers, ponds, streams and bogs.

Other Considerations and Mitigations:

- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline.
- Operating area is adjacent to Jonathans Pond Park. Boundaries will be clearly ribboned before operations begin.
- Operating area is adjacent to the Gander River Management Area.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.
- Silviculture and Five-Year Plan boundary overlap.



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Forest Management District 05 Five Year Plan (2022- 2026)

Jonathans Pond (K-05-16) Scale: 1:45,000

Forest Inventory Map 065 NTS Map 2E02

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

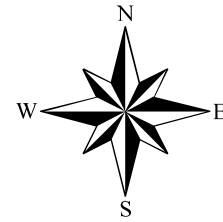
- Management Boundary
- Ownership Boundary

Land Features

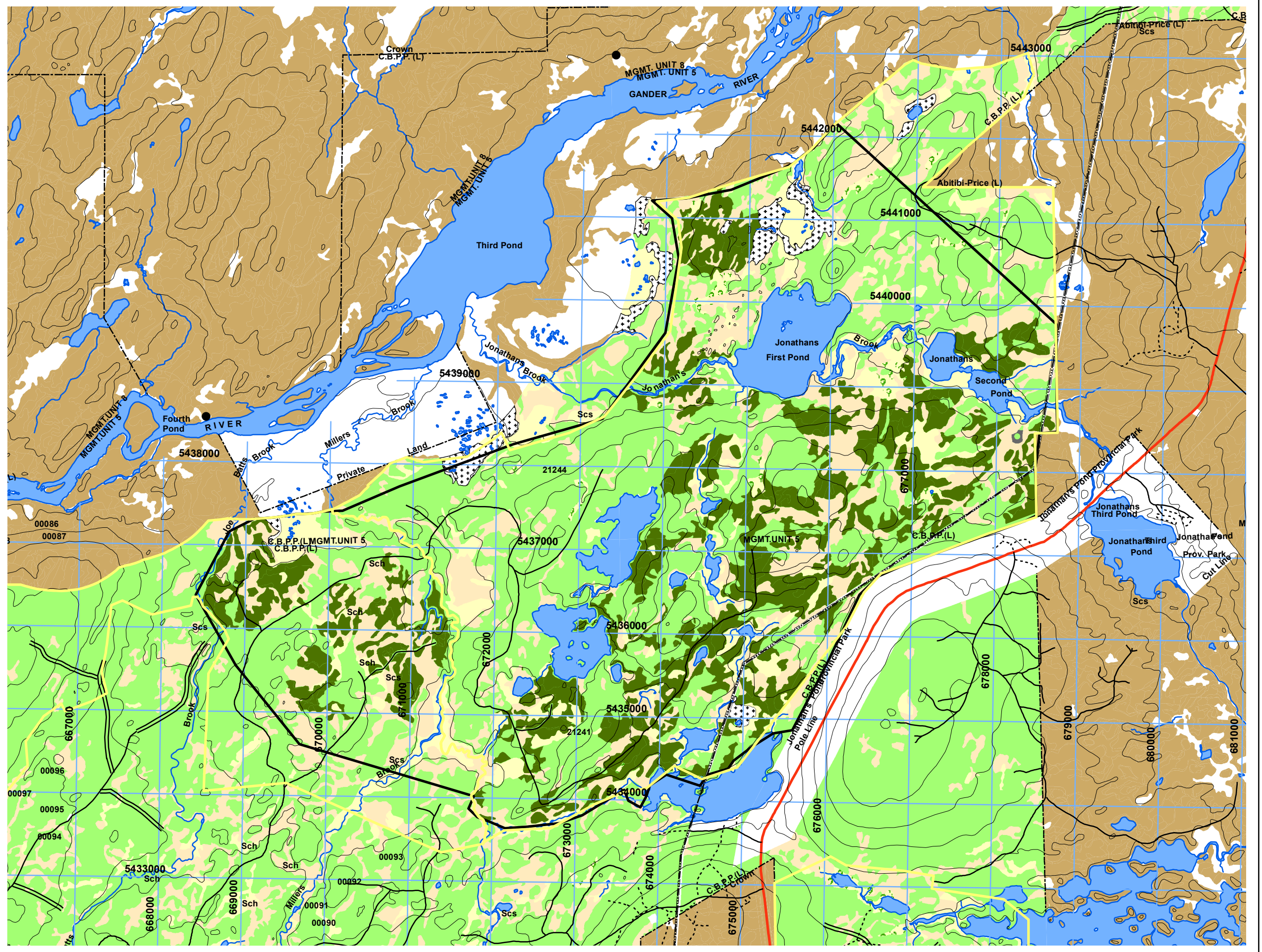
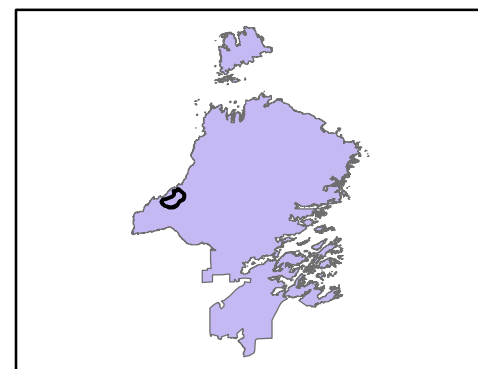
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05






**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Butts Pond</u>	Inventory Map #:	<u>078</u>
Harvest Area #:	<u>K-05-17</u>	NTS Map #:	<u>2D16</u>

Forest Inventory		Net	Working Group
Gross			
Volume: <u>115,571</u> m3		Volume: <u>105,170</u> m3	bF: <u>13</u> %
Area: <u>1,891</u> ha		Area: <u>1,721</u> ha	bS: <u>87</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity. - A portion of this operating area is within a PPWSA. A certificate of approval from the Water Resources Division will be obtained before any activity occurs. -This area falls within a municipal planning area. CPPLL will consult with the town prior to any harvesting or road development and necessary permits will be obtained. - Silviculture and Five-Year Plan boundary overlap. - Primary road construction is planned for this operating area. - This operating area has a shared forest access road and snowmobile trail system. Consultation with the NLSF takes place annually to discuss mitigations for the upcoming season. 	
 <p>ISO 14001:2015 SFI 2015-2019</p>	<p>Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ http://www.cbpl.com/.</p>



Forest Management District 05 Five Year Plan (2022- 2026)

Butts Pond Overview (K-05-17) Scale: 1:60,000

Forest Inventory Map 078 NTS Map 2D16

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

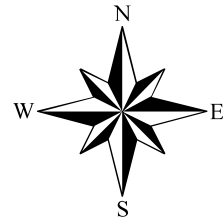
- Management Boundary
- Ownership Boundary

Land Features

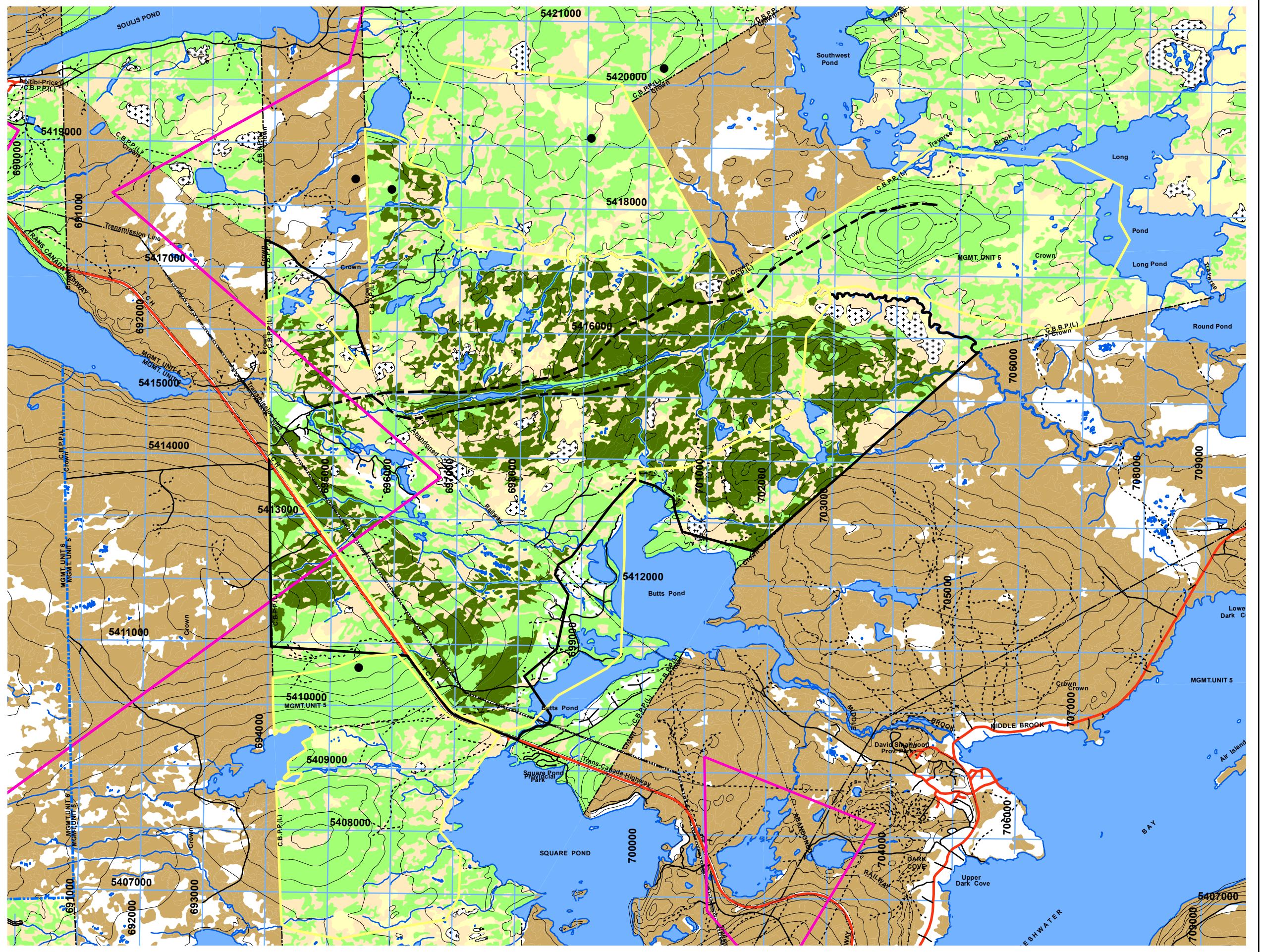
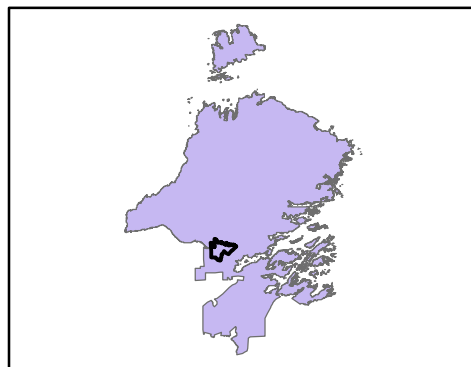
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





Forest Management District 05 Five Year Plan (2022- 2026)

Butts Pond Map 1 (K-05-17) Scale: 1:40,000

Forest Inventory Map 078 NTS Map 2D16

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

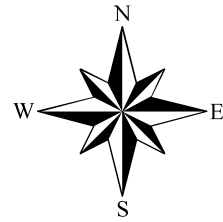
- Management Boundary
- Ownership Boundary

Land Features

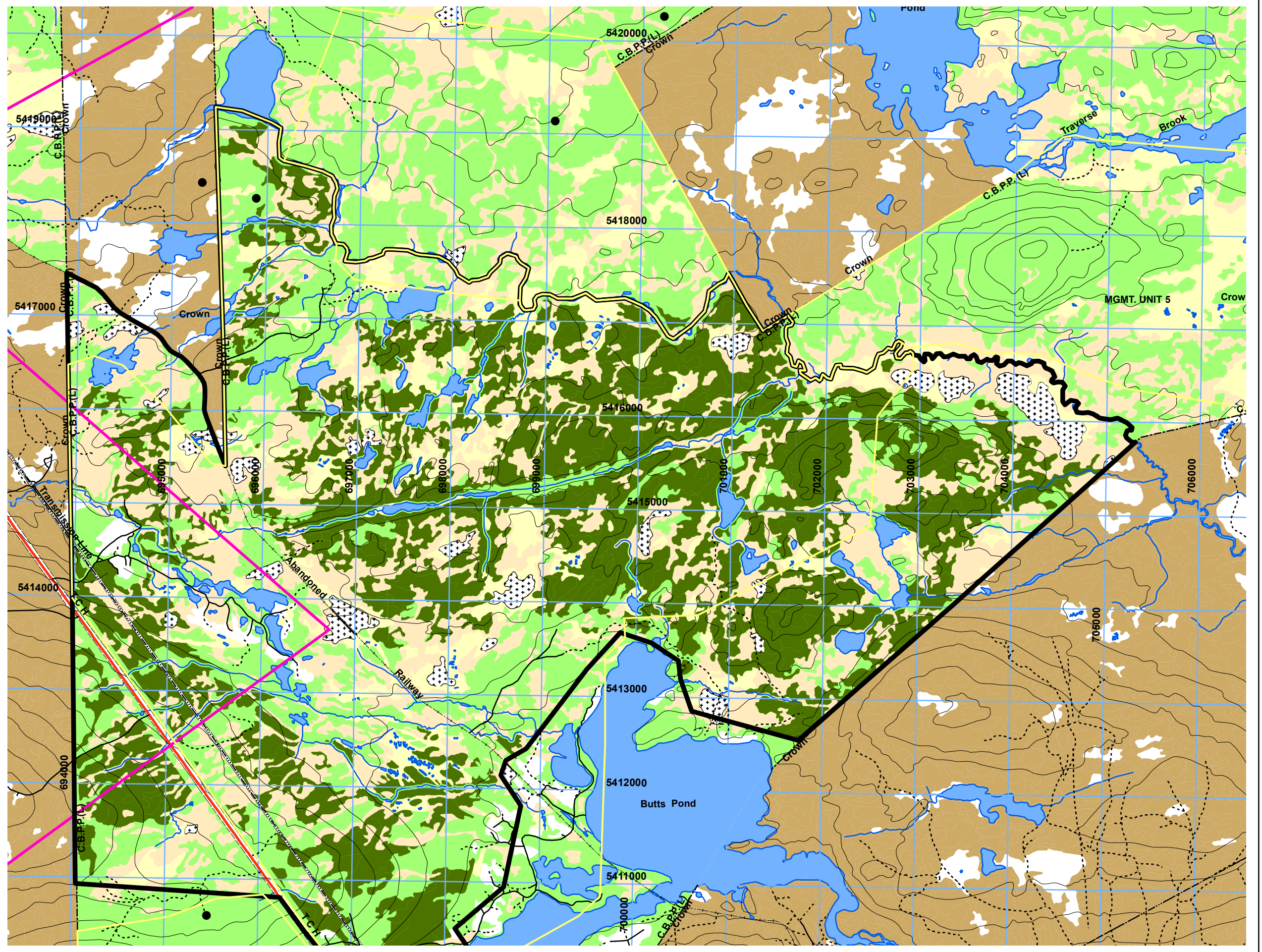
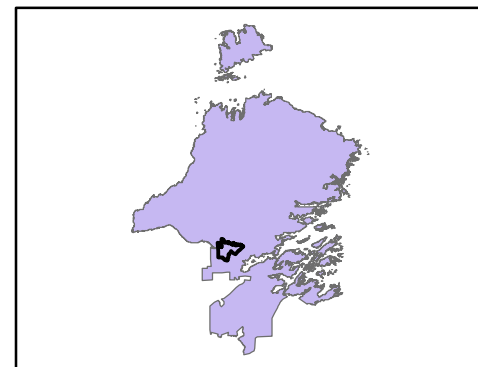
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





Forest Management District 05 Five Year Plan (2022- 2026)

Butts Pond Map 2 (K-05-17) Scale: 1:40,000

Forest Inventory Map 078 NTS Map 2D16

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

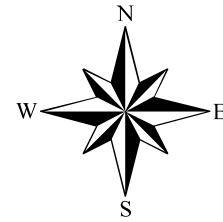
- Management Boundary
- Ownership Boundary

Land Features

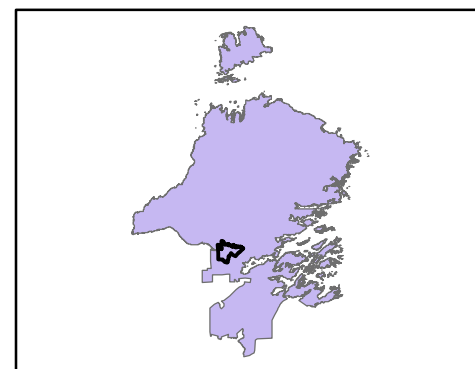
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





CORNER BROOK PULP & PAPER LIMITED FIVE YEAR OPERATING PLAN

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Little Harbour</u>	Inventory Map #:	<u>077</u>
Harvest Area #:	<u>K-05-18</u>	NTS Map #:	<u>2D15</u>

Forest Inventory

Gross

Volume: 16,730 m3
Area: 263 ha

Net

Volume: 15,224 m3
Area: 239 ha

Working Group

bF: 23 %
bS: 77 %

Operational Considerations:

Harvest System: Mechanical -SW3 - Shortwood - Harvester/forwarder
Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder

Terrain Conditions: Predominately gentle terrain in combination with rolling hill top
conditions, interspersed with rivers, ponds, streams and bogs.

Other Considerations and Mitigations:

- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.
- Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline.
- A portion of this operating area is within a PPWSA. A certificate of approval from the Water Resources Division will be obtained before any activity occurs.



Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ <http://www.cbpl.com/>.



Forest Management District 05 Five Year Plan (2022- 2026)

Little Harbour
(K-05-18)
Scale: 1:30,000

Forest Inventory Map 077 NTS Map 2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

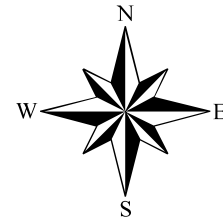
- Management Boundary
- Ownership Boundary

Land Features

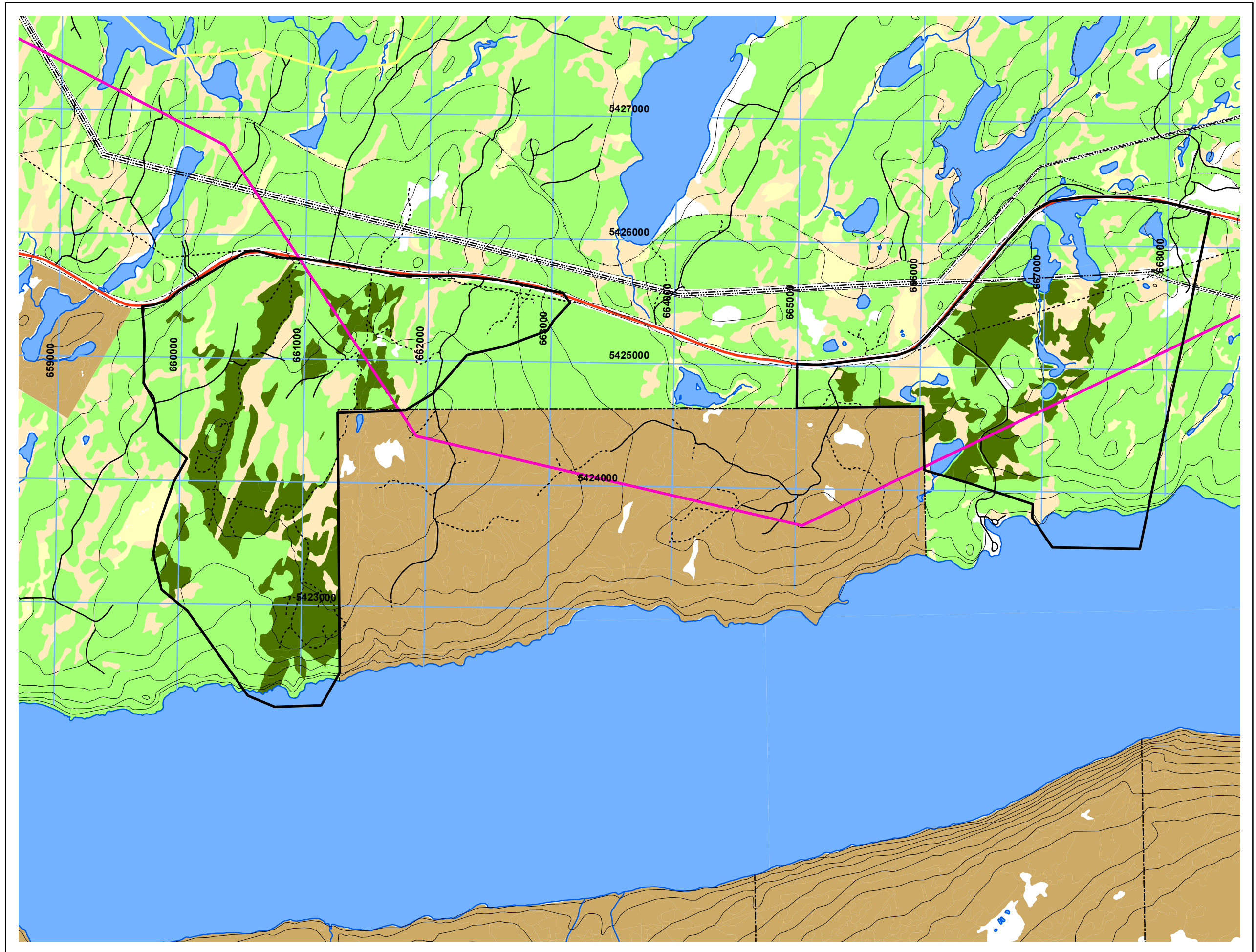
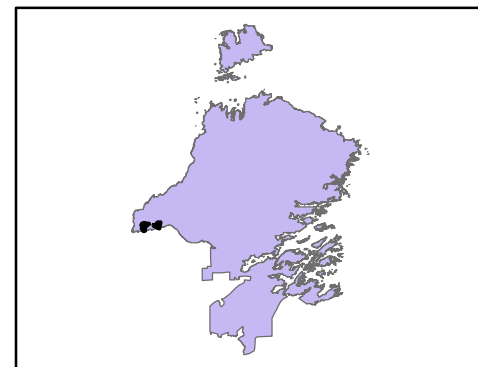
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





CORNER BROOK PULP & PAPER LIMITED FIVE YEAR OPERATING PLAN

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Whitman's Pond</u>	Inventory Map #:	<u>065</u>
Harvest Area #:	<u>K-05-19</u>	NTS Map #:	<u>2E02</u>

Forest Inventory

Gross

Volume: 2,812 m3
Area: 40 ha

Net

Volume: 2,559 m3
Area: 36 ha

Working Group

bF: 12 %
bS: 88 %

Operational Considerations:

Harvest System: Mechanical -SW3 - Shortwood - Harvester/forwarder
Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder

Terrain Conditions: Predominately gentle terrain in combination with rolling hill top
conditions, interspersed with rivers, ponds, streams and bogs.

Other Considerations and Mitigations:

- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.
- This area falls within a municipal planning area. CPPLL will consult with the town prior to any harvesting or road development and necessary permits will be obtained.
- Silviculture and Five-Year Plan boundary overlap.



Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ <http://www.cbppl.com/>.



Forest Management District 05 Five Year Plan (2022- 2026)

Whitman's Pond (K-05-19) Scale: 1:20,000

Forest Inventory Map 065 NTS Map 2E02

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

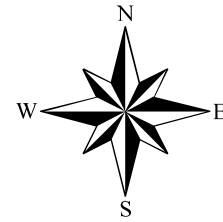
- Management Boundary
- Ownership Boundary

Land Features

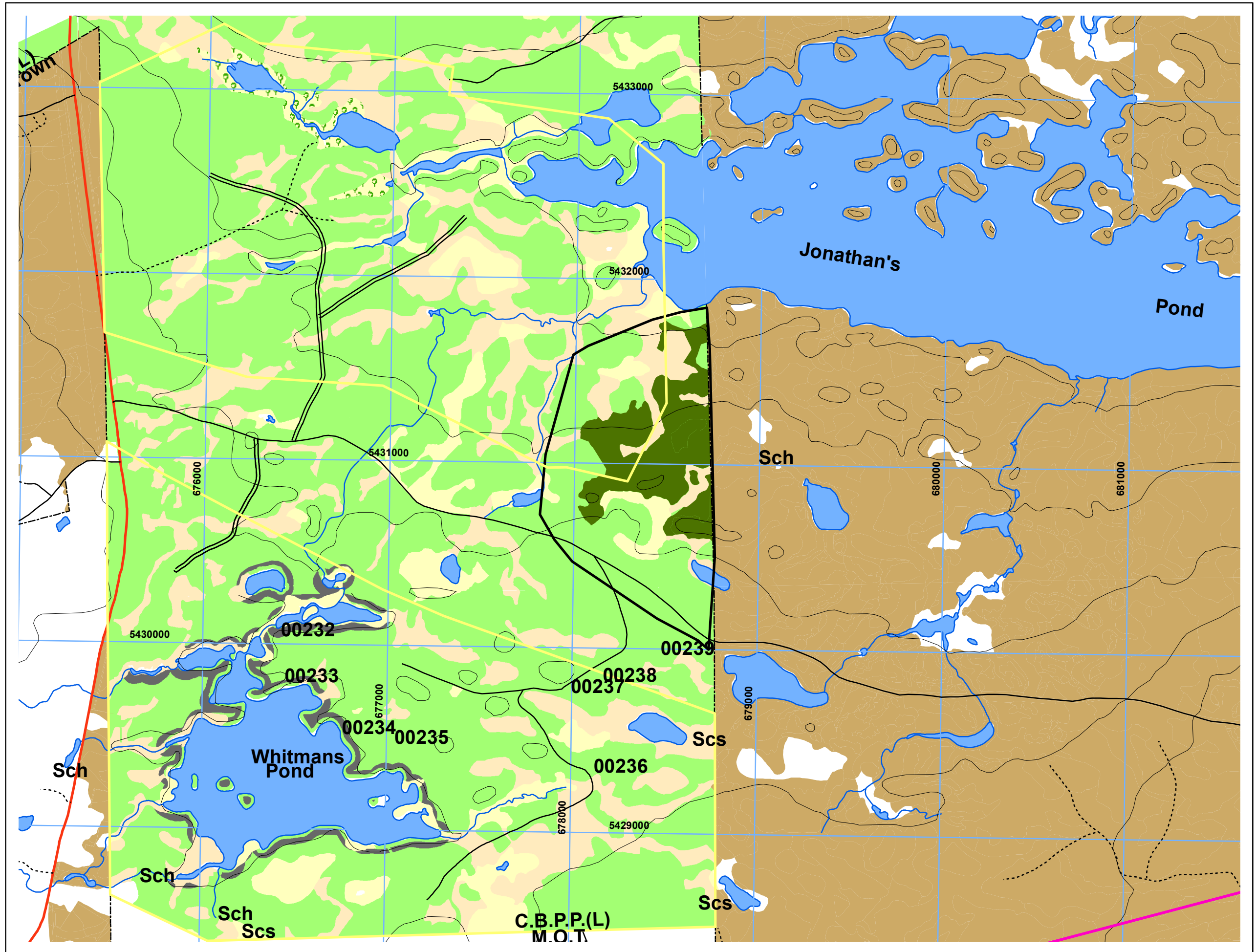
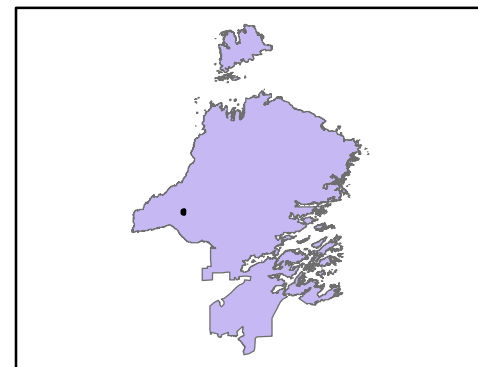
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





CORNER BROOK PULP & PAPER LIMITED FIVE YEAR OPERATING PLAN

FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Weirs Pond</u>	Inventory Map #:	<u>065</u>
Harvest Area #:	<u>K-05-20</u>	NTS Map #:	<u>2E07</u>

Forest Inventory

Gross

Volume: 13,170 m3
Area: 147 ha

Net

Volume: 11,985 m3
Area: 134 ha

Working Group

bF: 9 %
bS: 91 %

Operational Considerations:

Harvest System: Mechanical -SW3 - Shortwood - Harvester/forwarder
Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder

Terrain Conditions: Predominately gentle terrain in combination with rolling hill top
conditions, interspersed with rivers, ponds, streams and bogs.

Other Considerations and Mitigations:

- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline.
- Operating area is adjacent to the Gander River Management Area.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.



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Forest Management District 05 Five Year Plan (2022- 2026)

**Weirs Pond
(K-05-20)
Scale: 1:24,000**

**Forest Inventory Map 065
NTS Map 2E07**

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

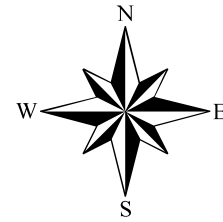
- Management Boundary
- Ownership Boundary

Land Features

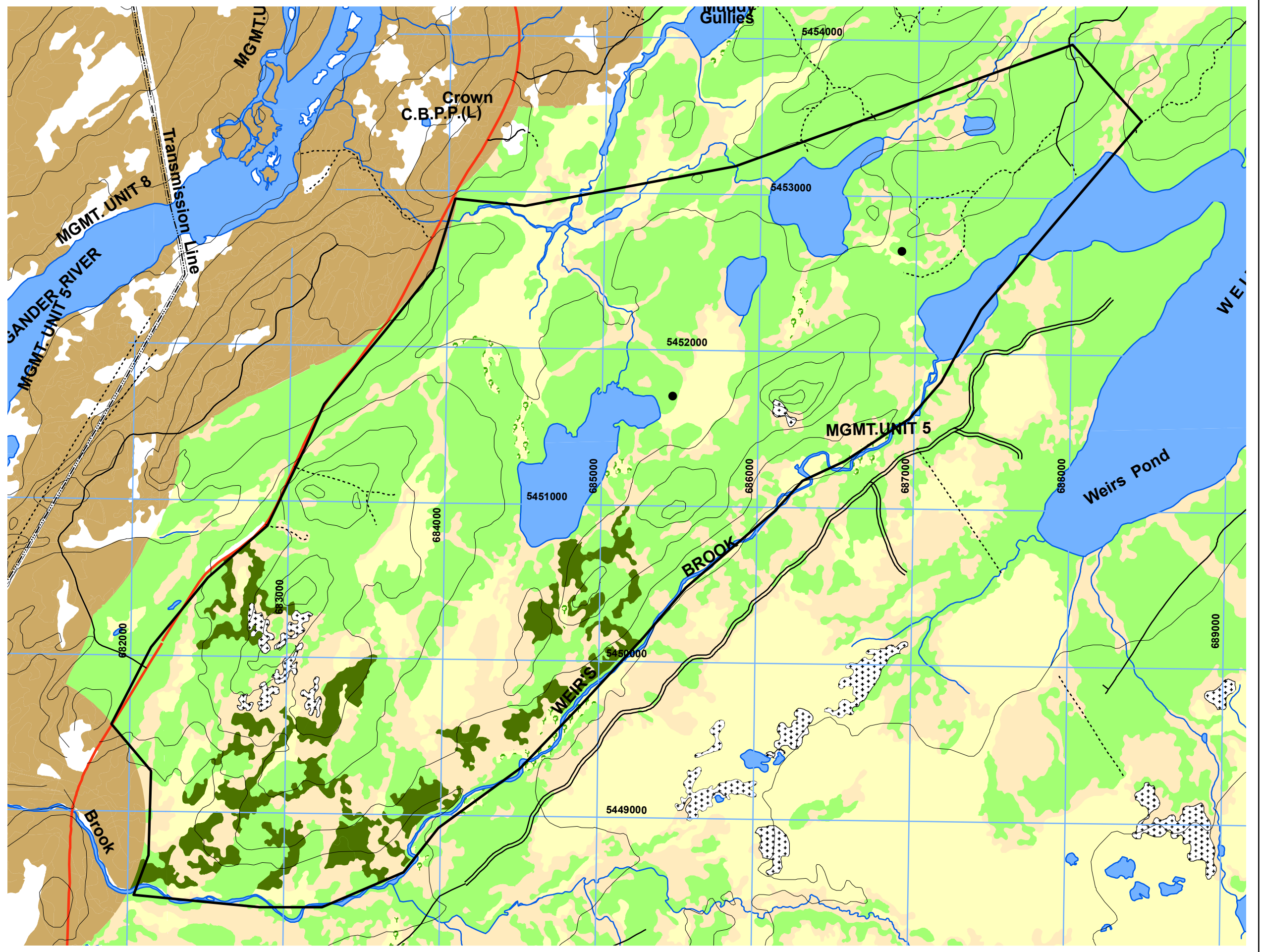
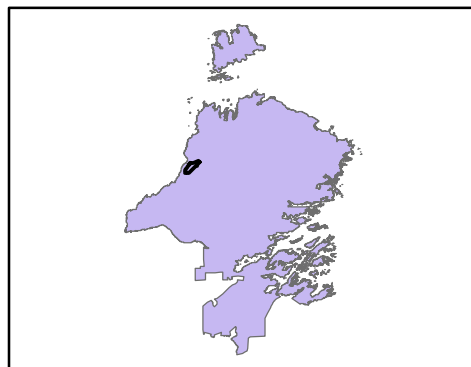
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 05





**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**


FMD:	<u>05</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Deadman's Pond</u>	Inventory Map #:	<u>078</u>
Harvest Area #:	<u>K-05-21</u>	NTS Map #:	<u>2016</u>

Forest Inventory		
Gross	Net	Working Group
Volume: <u>13,366</u> m3	Volume: <u>12,163</u> m3	bF: <u>10</u> %
Area: <u>276</u> ha	Area: <u>251</u> ha	bS: <u>90</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:

- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity.
- All of this operating area is within a PPWSA. A certificate of approval from the Water Resources Division will be obtained before any activity occurs.
- This area falls within the municipal area for the town of Gander. CPPLL will consult with the town of Gander prior to any harvesting or road development and necessary permits will be obtained.
- Transmission line passes through this operating area.

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ISO 14001:2015
SFI 2015-2019



**Forest Management District 05
Five Year Plan (2022- 2026)
Deadman's Pond
(K-05-21)
Scale: 1:17,500**

**Forest Inventory Map 078
NTS Map 2016**

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

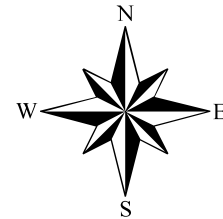
- Management Boundary
- Ownership Boundary

Land Features

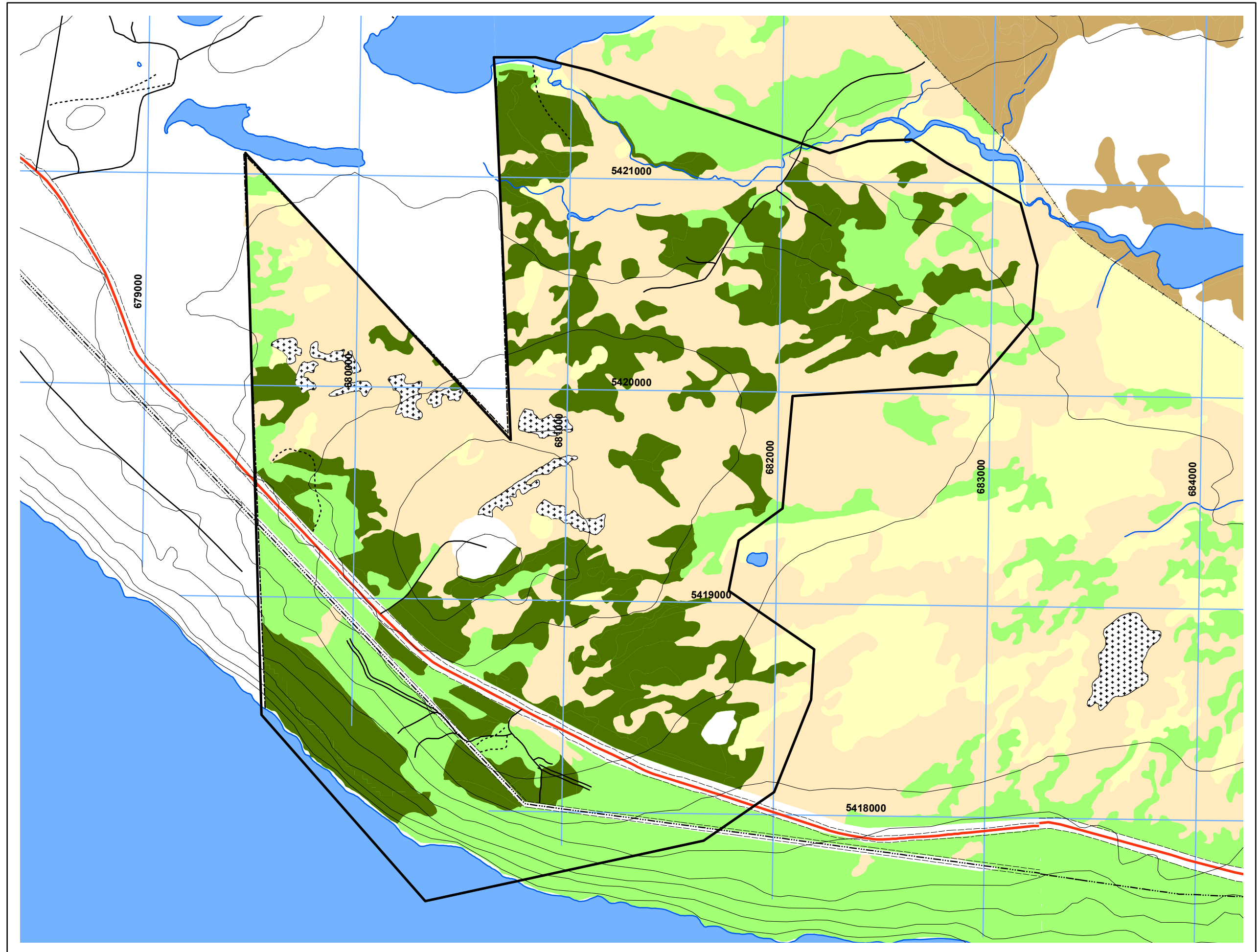
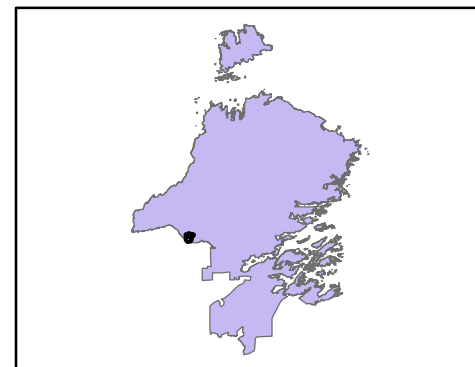
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks










Insert Map Showing
Five Year Plan Within District 05



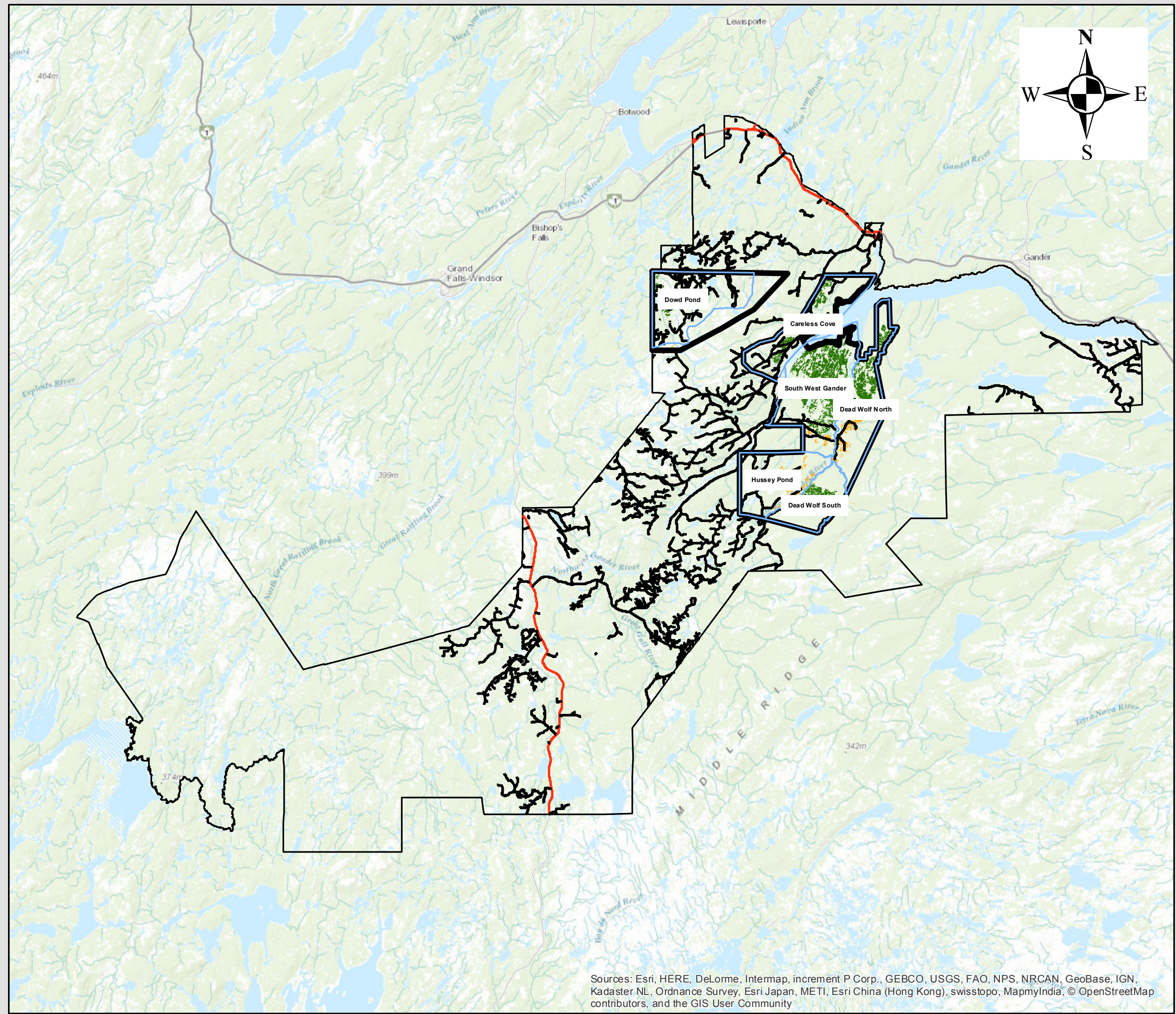
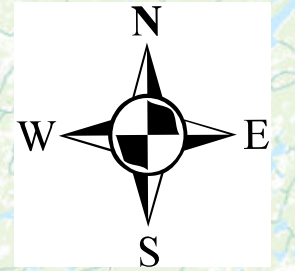
**Corner Brook Pulp and Paper Ltd.
Forest Management District 06
Five Year Plan (2022-2026)**

Legend

-  Highways
-  Resource Roads
-  5YP
-  CBPPL Limits
-  Ponds
-  Cutovers
-  Proposed Harvestables



1:500,000



K-Num	Name
K-06-03	Careless Cove
K-06-04	Dowd Pond
K-06-07	South West Gander
K-06-17	Dead Wolf South
K-06-18	Dead Wolf North
K-06-23	Hussey Pond

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community




**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>06</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Careless Cove</u>	Inventory Map #:	<u>076, 077</u>
Harvest Area #:	<u>K-06-03</u>	NTS Map #:	<u>2D14, 2D15</u>

Forest Inventory		Net	Working Group
Gross			
Volume:	<u>30,636</u> m3	Volume:	<u>27,879</u> m3
Area:	<u>593</u> ha	Area:	<u>540</u> ha
			bF: <u>35.5</u> %
			bS: <u>64.5</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - This operating area is contained inside the Protected Water Supply for the Town of Gander. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas. - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - Silviculture and Five-Year Plan boundary overlap. - This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity. - This operating area has a shared forest access road and snowmobile trail system. Consultation with the NLSF takes place annually to discuss mitigations for the upcoming season. - Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline. 	
 <p>ISO 14001:2015 SFI 2015-2019</p>	<p>Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ http://www.cbtpl.com/.</p>



Forest Management District 06 Five Year Plan (2022- 2026)

Careless Cove Overview (K-06-03) Scale: 1:70,000

Forest Inventory Map 076, 077 NTS Map 2D14, 2D15,

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

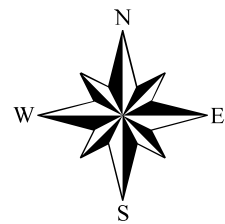
- Management Boundary
- Ownership Boundary

Land Features

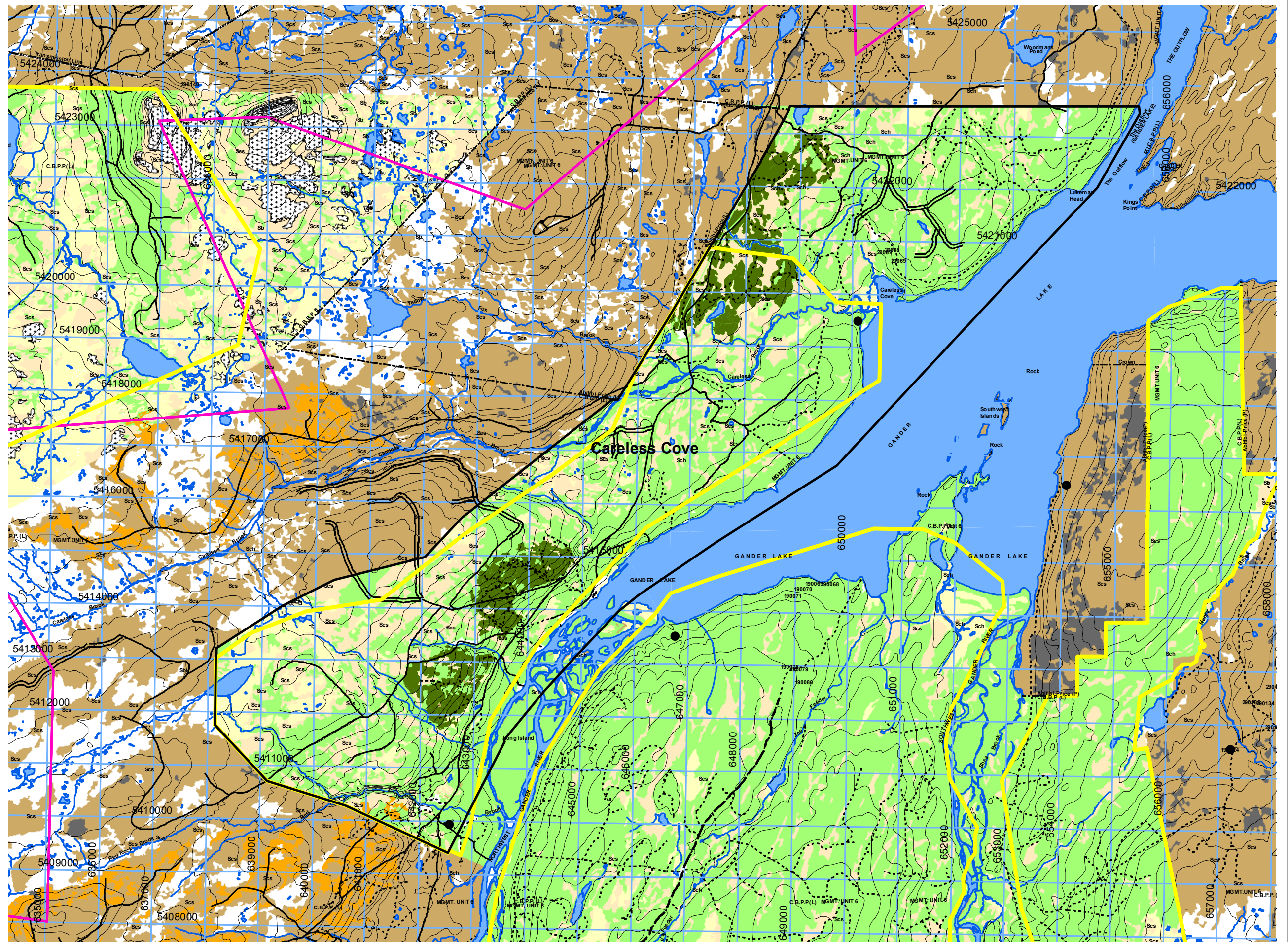
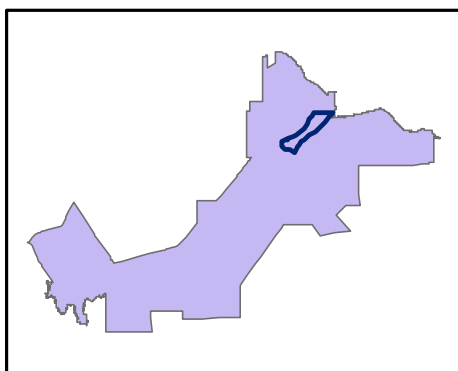
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





Forest Management District 06 Five Year Plan (2022- 2026)

Careless Cove Map 1 (K-06-03) Scale: 1:45,000

Forest Inventory Map 076, 077 NTS Map 2D14, 2D15,

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

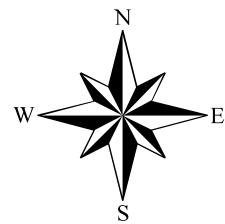
- Management Boundary
- Ownership Boundary

Land Features

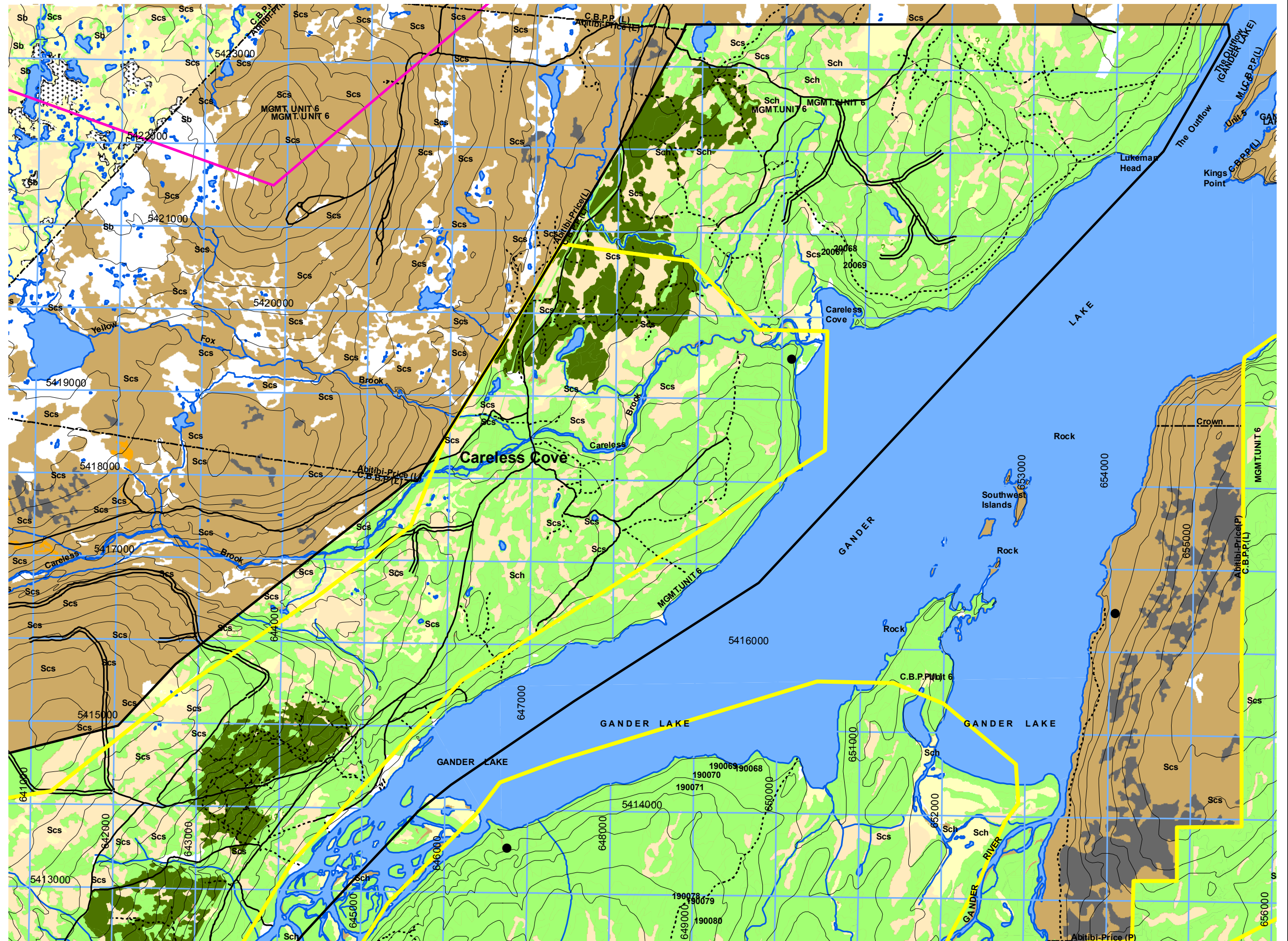
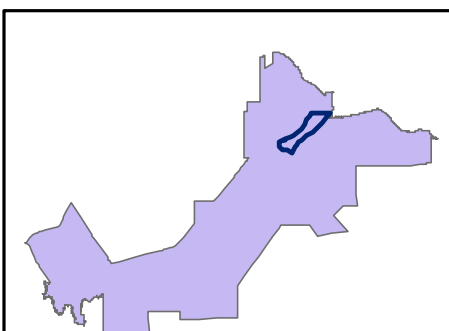
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





Forest Management District 06 Five Year Plan (2022- 2026)

Careless Cove Map 2 (K-06-03) Scale: 1:45,000

Forest Inventory Map 076, 077 NTS Map 2D14, 2D15,

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

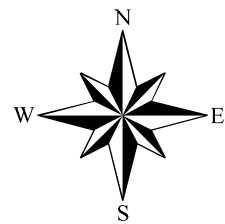
- Management Boundary
- Ownership Boundary

Land Features

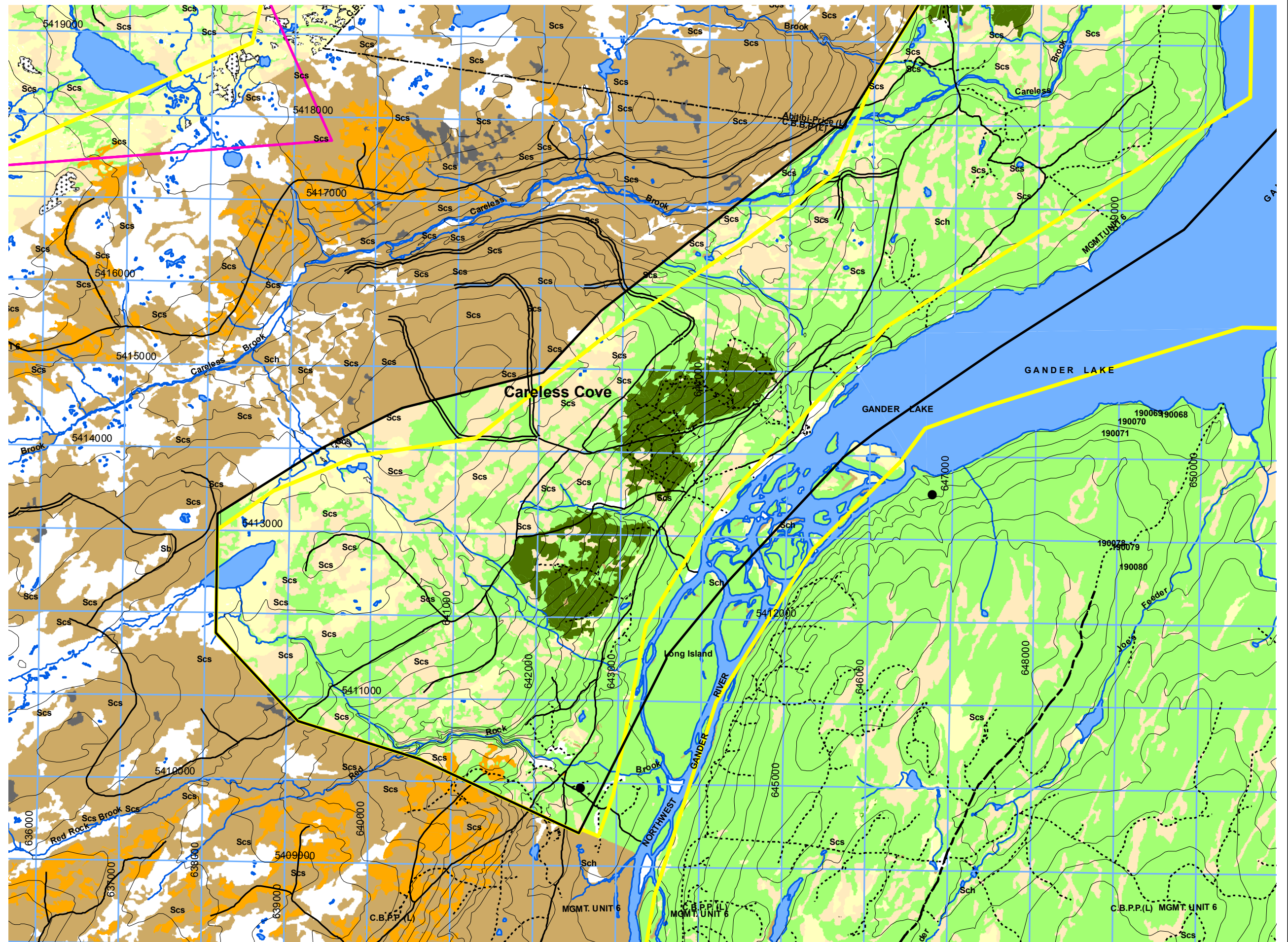
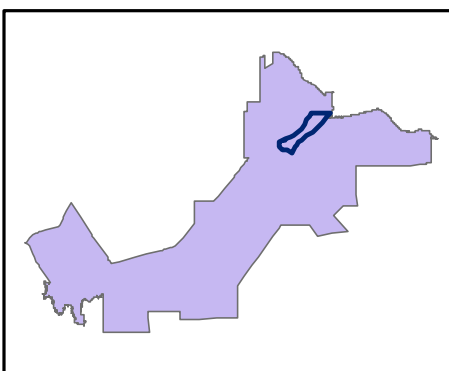
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**


FMD:	<u>06</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Dowd Pond</u>	Inventory Map #:	<u>076</u>
Harvest Area #:	<u>K-06-04</u>	NTS Map #:	<u>2D14</u>

Forest Inventory		Net	Working Group
Gross			
Volume:	<u>24,308</u> m3	Volume:	<u>22,120</u> m3
Area:	<u>354</u> ha	Area:	<u>322</u> ha
			bF: <u>46.4</u> %
			bS: <u>53.6</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:

- This operating area is contained inside the Protected Water Supply for the Town of Gander. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas.
- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- Silviculture and Five-Year Plan boundary overlap.
- This operating area has a shared forest access road and snowmobile trail system. Consultation with the NLSF takes place annually to discuss mitigations for the upcoming season.
- Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline.
- A portion of this operating area contains Caribou calving areas. The proposed harvest will follow the Forest Management Guidelines for Woodland Caribou. All conditions placed on this area by the Wildlife Division will be followed.



ISO 14001:2015
SFI 2015-2019

Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ <http://www.cbtpl.com/>.



Forest Management District 06 Five Year Plan (2022- 2026)

Dowd Pond (K-06-04) Scale: 1:45,000

Forest Inventory Map 076 NTS Map 2D14

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

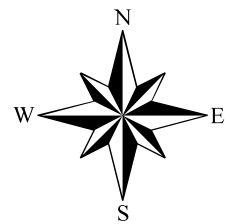
- Management Boundary
- Ownership Boundary

Land Features

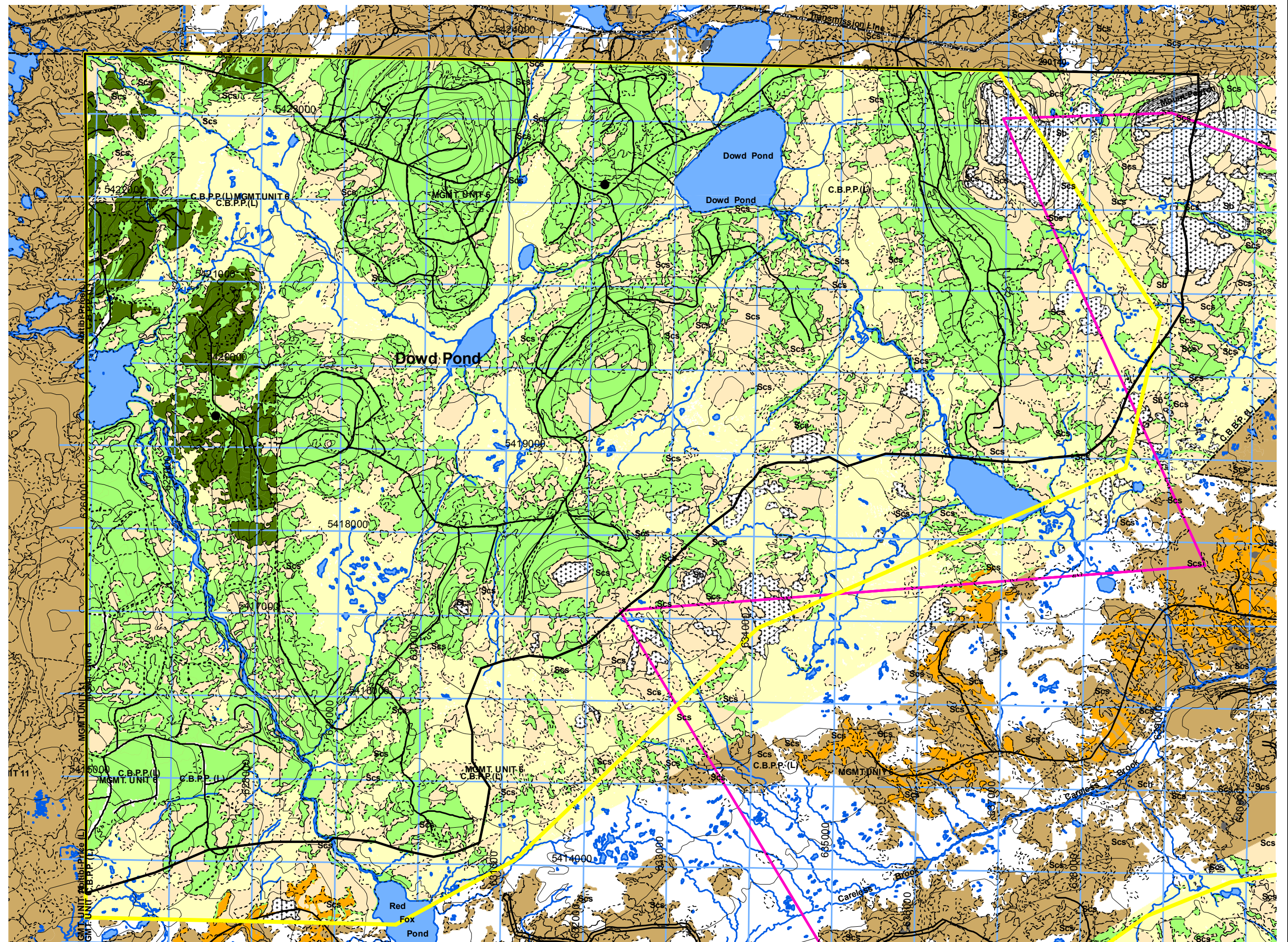
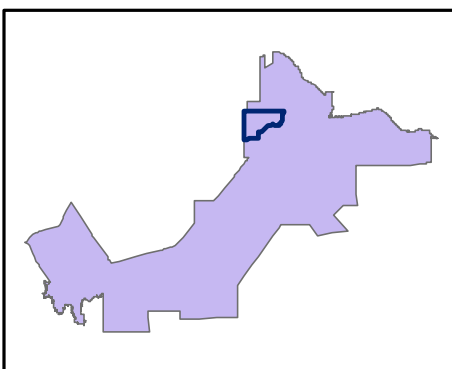
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06






**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>06</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>SouthWest Gander</u>	Inventory Map #:	<u>076, 077, 088, 089</u>
Harvest Area #:	<u>K-06-07</u>	NTS Map #:	<u>2D14, 2D15, 2D10,2D11</u>

Forest Inventory		Net		Working Group	
Gross					
Volume:	<u>236,035</u> m3	Volume:	<u>214,792</u> m3	bF:	<u>29.2</u> %
Area:	<u>3,024</u> ha	Area:	<u>2,752</u> ha	bS:	<u>70.8</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - This operating area is contained inside the Protected Water Supply for the Town of Gander. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas. - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - Silviculture and Five-Year Plan boundary overlap. - Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline. - Primary Road Construction is planned for this area. - This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity. 	
 <p>ISO 14001:2015 SFI 2015-2019</p>	<p>Corner Brook Pulp and Paper Woodlands is currently certified to an Environmental Management System standard and a Forest Management and Fibre Sourcing standard. For further information on the SFM plan visit our website @ http://www.cbpl.com/.</p>



Forest Management District 06 Five Year Plan (2022- 2026)

SouthWest Gander Overview (K-06-07) Scale: 1:80,992

Forest Inventory Map 076,077, 088, 089 NTS Map 2D10,2D11,2D14,2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

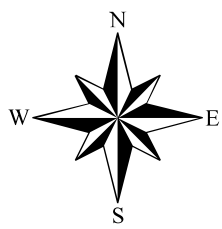
- Management Boundary
- Ownership Boundary

Land Features

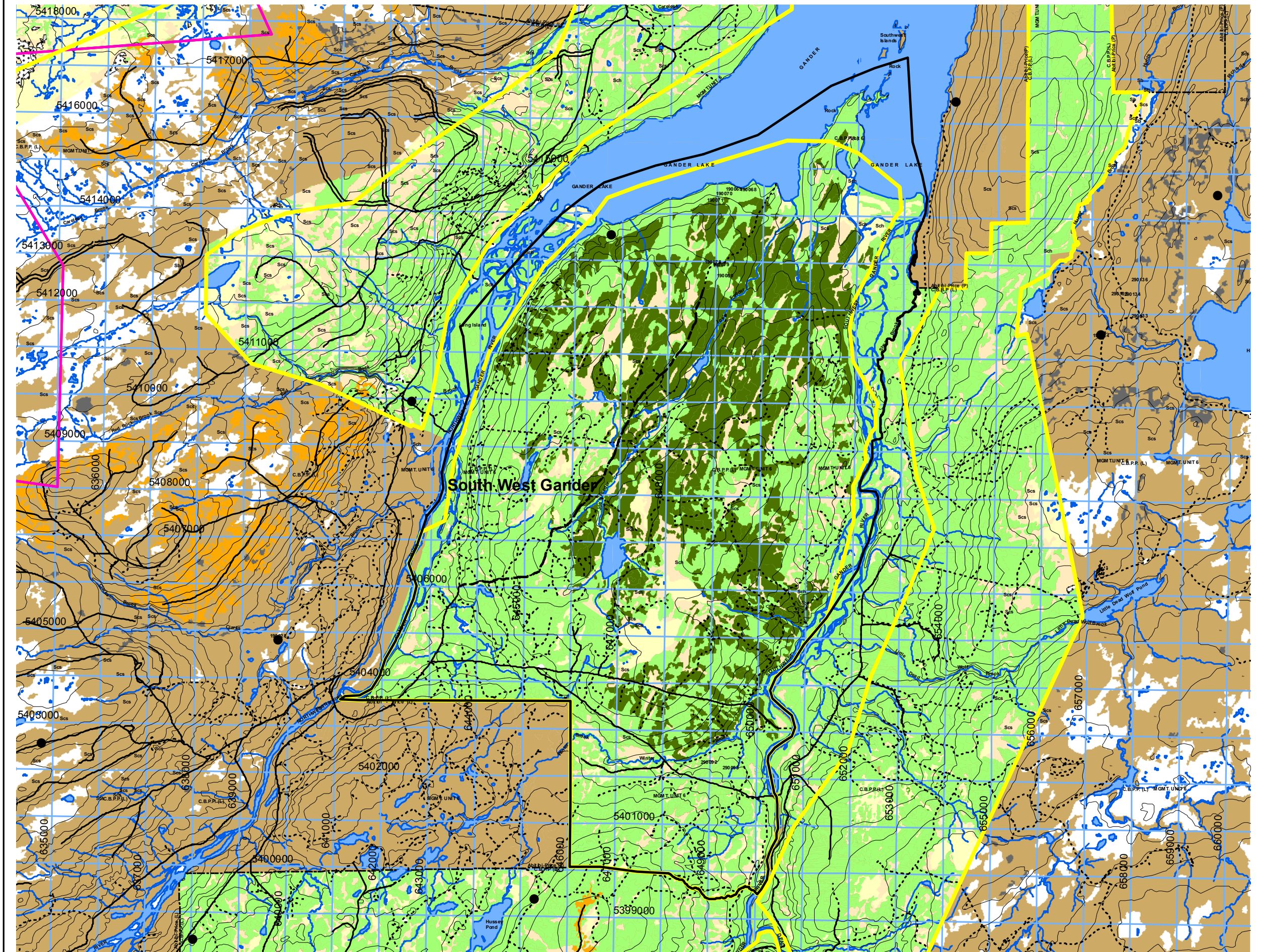
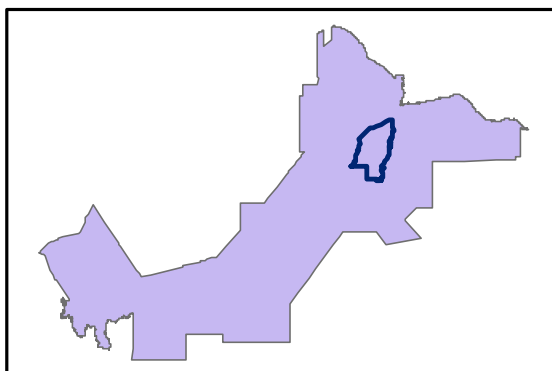
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





Forest Management District 06 Five Year Plan (2022- 2026)

SouthWest Gander Map 1 (K-06-07) Scale: 1:45,000

Forest Inventory Map 076,077, 088, 089 NTS Map 2D10,2D11,2D14,2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

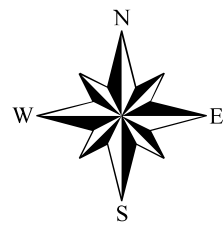
- Management Boundary
- Ownership Boundary

Land Features

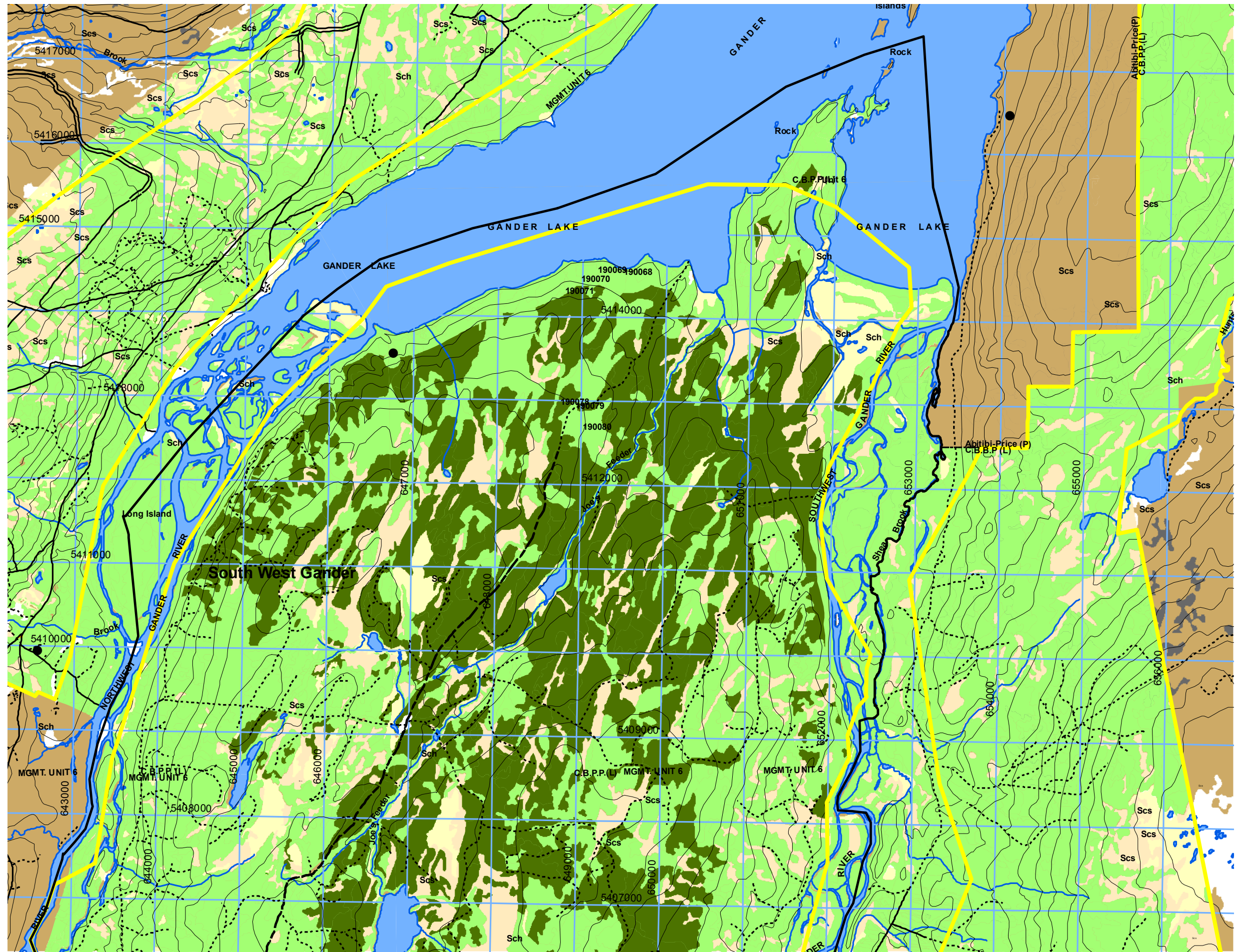
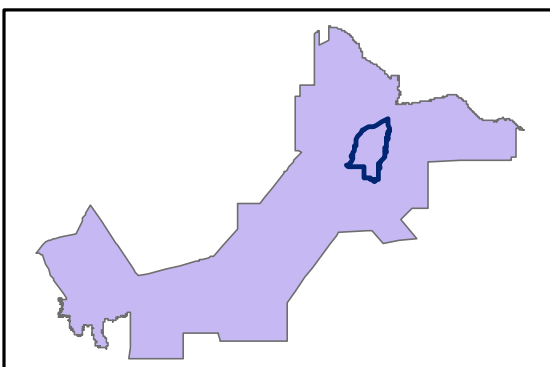
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





Forest Management District 06 Five Year Plan (2022- 2026)

SouthWest Gander Map 2 (K-06-07) Scale: 1:45,000

Forest Inventory Map 076,077, 088, 089 NTS Map 2D10,2D11,2D14,2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T/Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

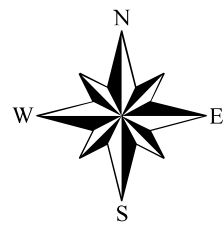
- Management Boundary
- Ownership Boundary

Land Features

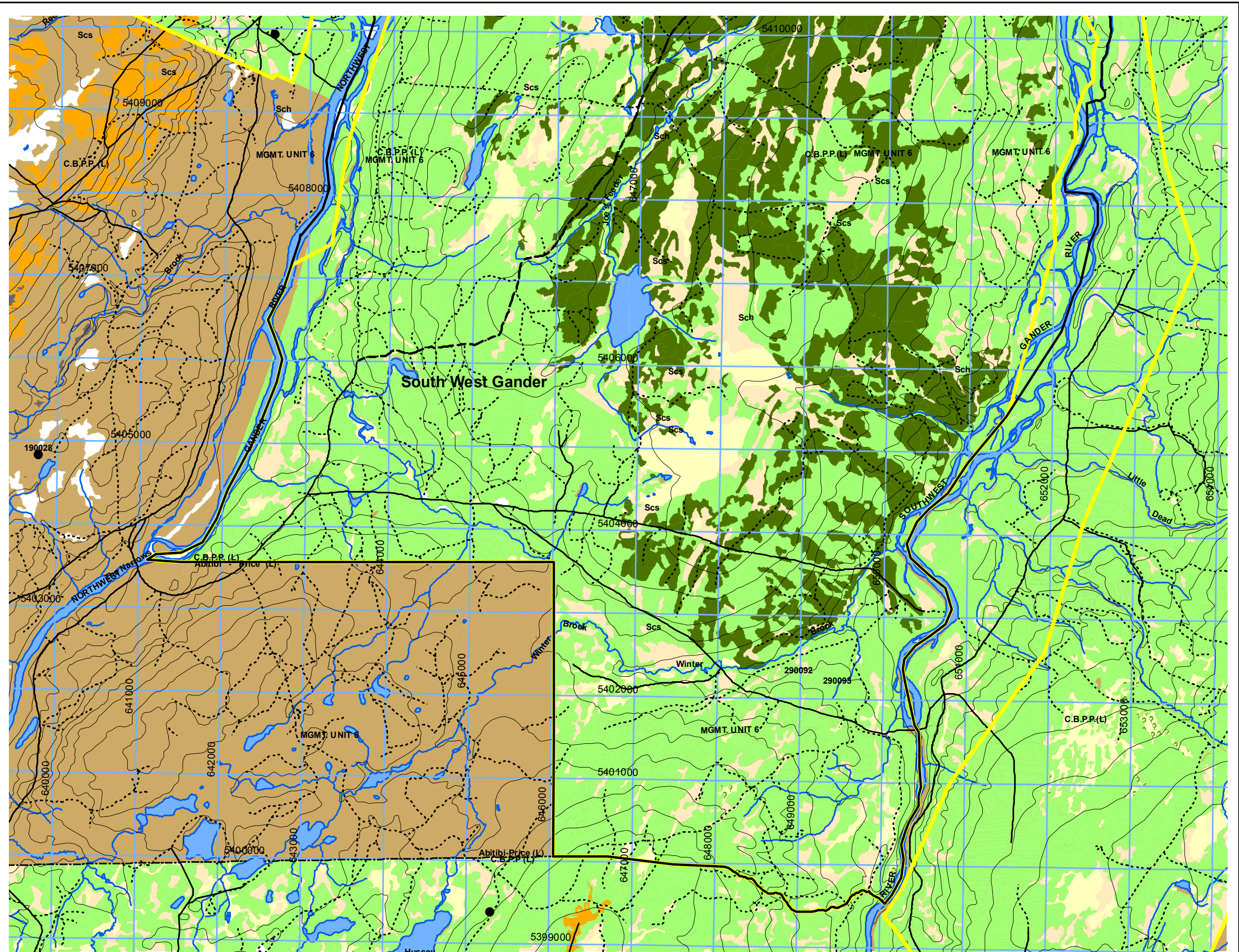
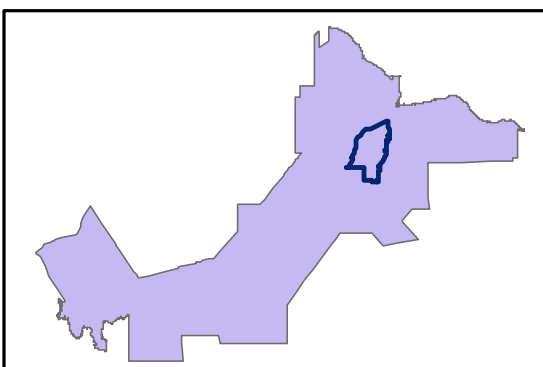
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





CORNER BROOK PULP & PAPER LIMITED FIVE YEAR OPERATING PLAN

FMD:	<u>06</u>	Plan Period:	<u>Jan 1, 2022 - Dec 31, 2026</u>
Operating Area:	<u>Dead Wolf South</u>	Inventory Map #:	<u>088, 089</u>
Harvest Area #:	<u>K-06-17</u>	NTS Map #:	<u>2D11, 2D10</u>

Forest Inventory

Gross

Volume: 58,487 m³
Area: 589 ha

Net

Volume: 53,223 m³
Area: 536 ha

Working Group

bF: 60.9 %
bS: 39.1 %

Operational Considerations:

Harvest System: Mechanical -SW3 - Shortwood - Harvester/forwarder
Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder

Terrain Conditions: Predominately gentle terrain in combination with rolling hill top
conditions, interspersed with rivers, ponds, streams and bogs.

Other Considerations and Mitigations:

- This operating area is contained inside the Protected Water Supply for the Town of Gander. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas.
- Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan.
- Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed.
- Silviculture and Five-Year Plan boundary overlap.
- Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline.
- Transmission Line passes through this Five-year plan area.



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Forest Management District 06 Five Year Plan (2022- 2026)

Dead Wolf South (K-06-17) Scale: 1:42,000

Forest Inventory Map 088, 089 NTS Map 2D10,2D11

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

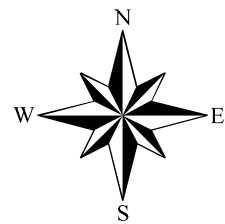
- Management Boundary
- Ownership Boundary

Land Features

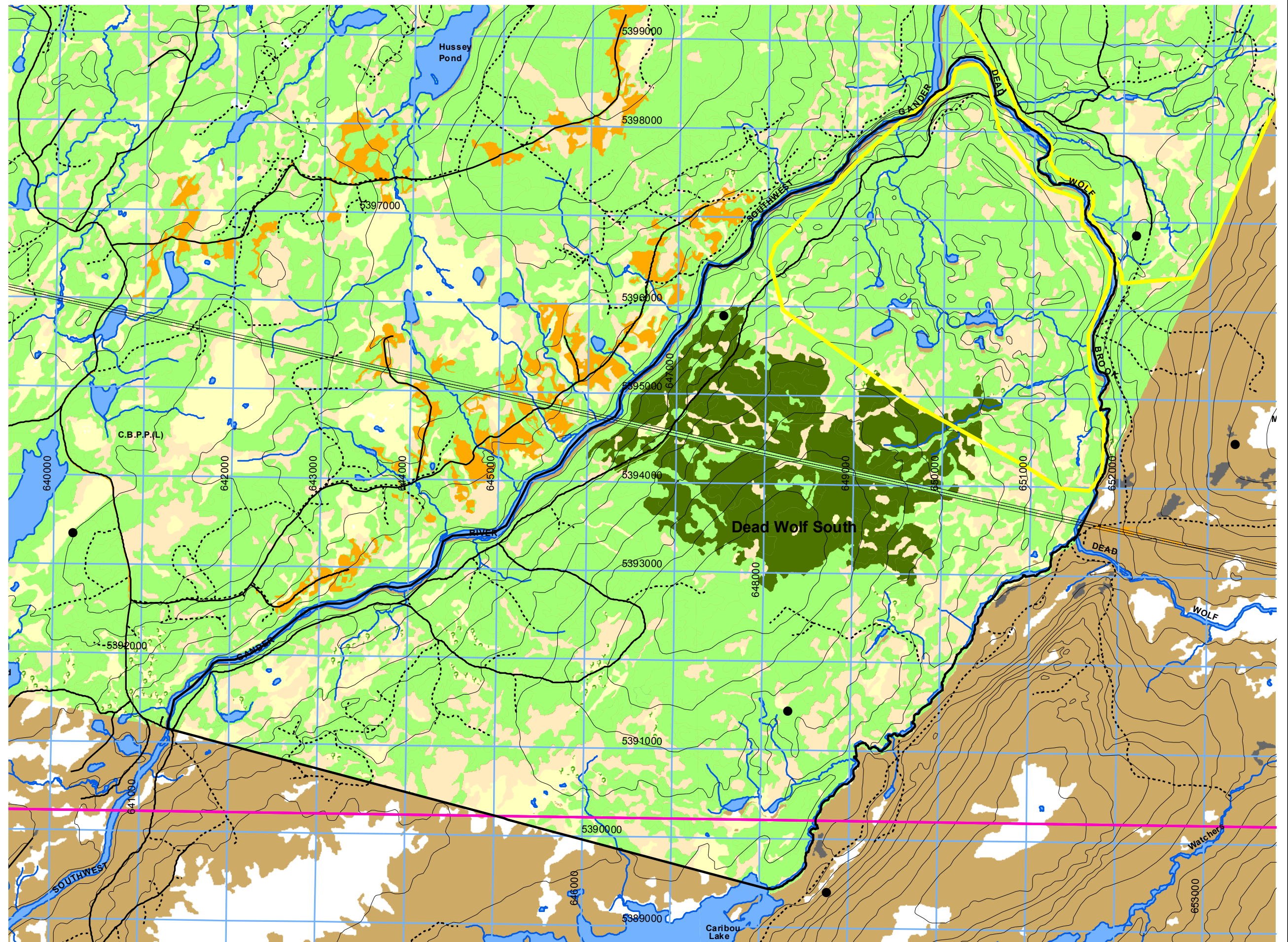
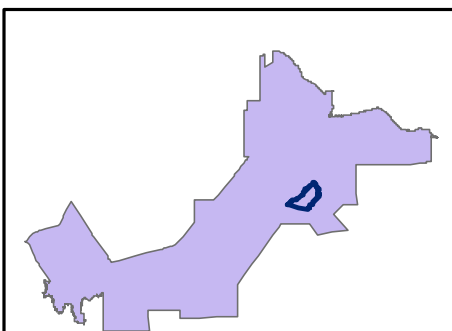
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06






**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>06</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Dead Wolf North</u>	Inventory Map #:	<u>077, 089</u>
Harvest Area #:	<u>K-06-18</u>	NTS Map #:	<u>2D15, 2D10</u>

Forest Inventory		Net	Working Group
Gross			
Volume:	<u>100,927</u> m3	Volume:	<u>91,844</u> m3
Area:	<u>1,340</u> ha	Area:	<u>1,219</u> ha
			bF: <u>24.2</u> %
			bS: <u>75.8</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - This operating area is contained inside the Protected Water Supply for the Town of Gander. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas. - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - Silviculture and Five-Year Plan boundary overlap. - Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline. - Transmission Line passes through this Five-year plan area. - This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity. 	
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Forest Management District 06 Five Year Plan (2022- 2026)

Dead Wolf North Overview (K-06-18) Scale: 1:115,000

Forest Inventory Map 077, 089 NTS Map 2D10,2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

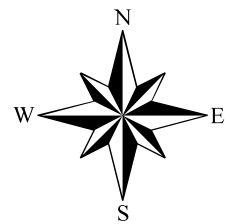
- Management Boundary
- Ownership Boundary

Land Features

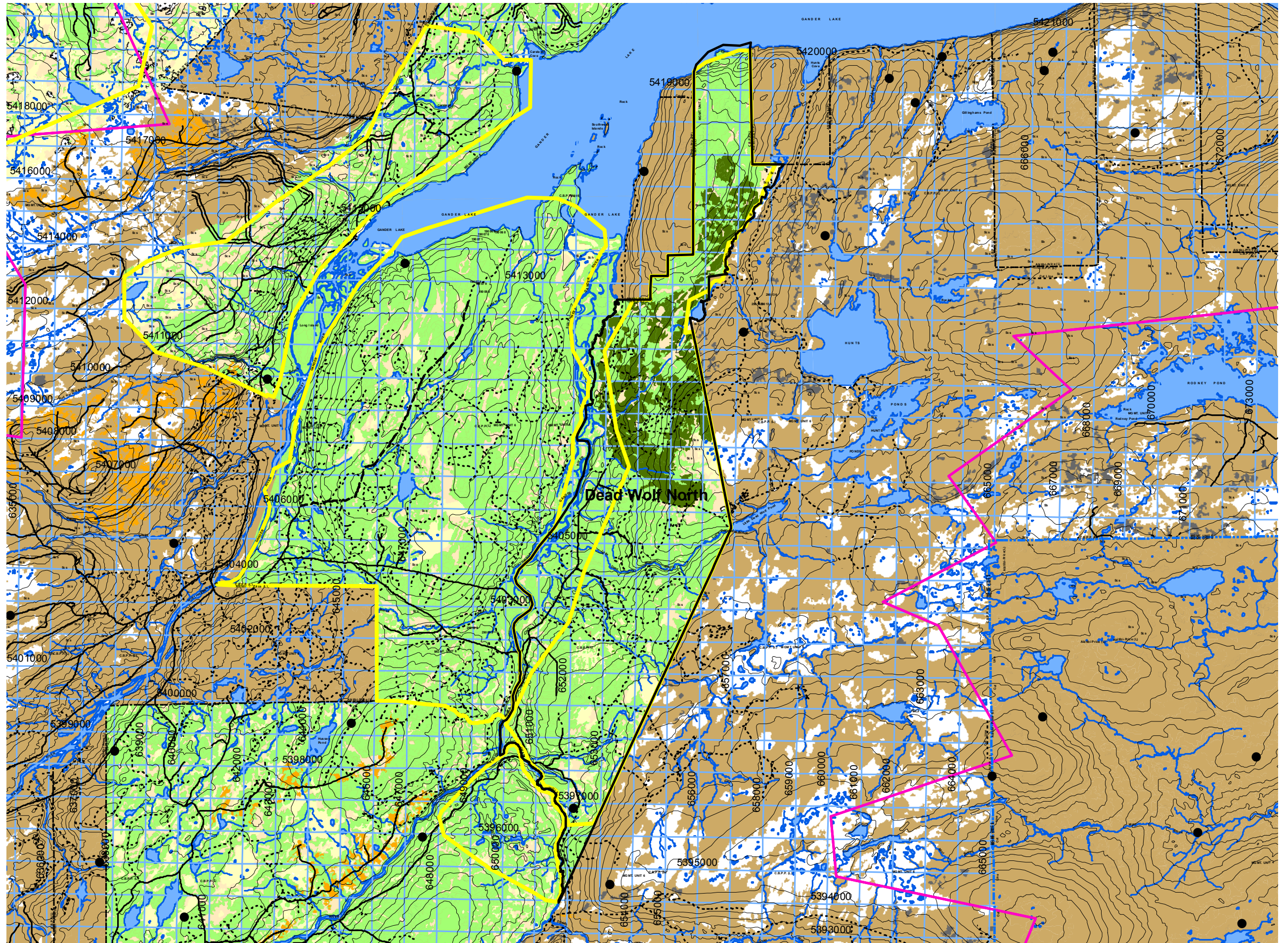
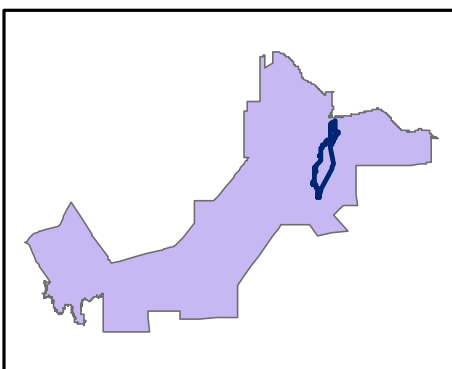
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





Forest Management District 06 Five Year Plan (2022- 2026)

Dead Wolf North Map 1 (K-06-18) Scale: 1:50,000

Forest Inventory Map 077, 089 NTS Map 2D10,2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

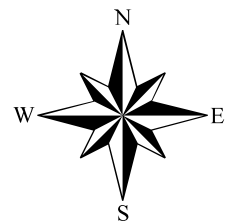
- Management Boundary
- Ownership Boundary

Land Features

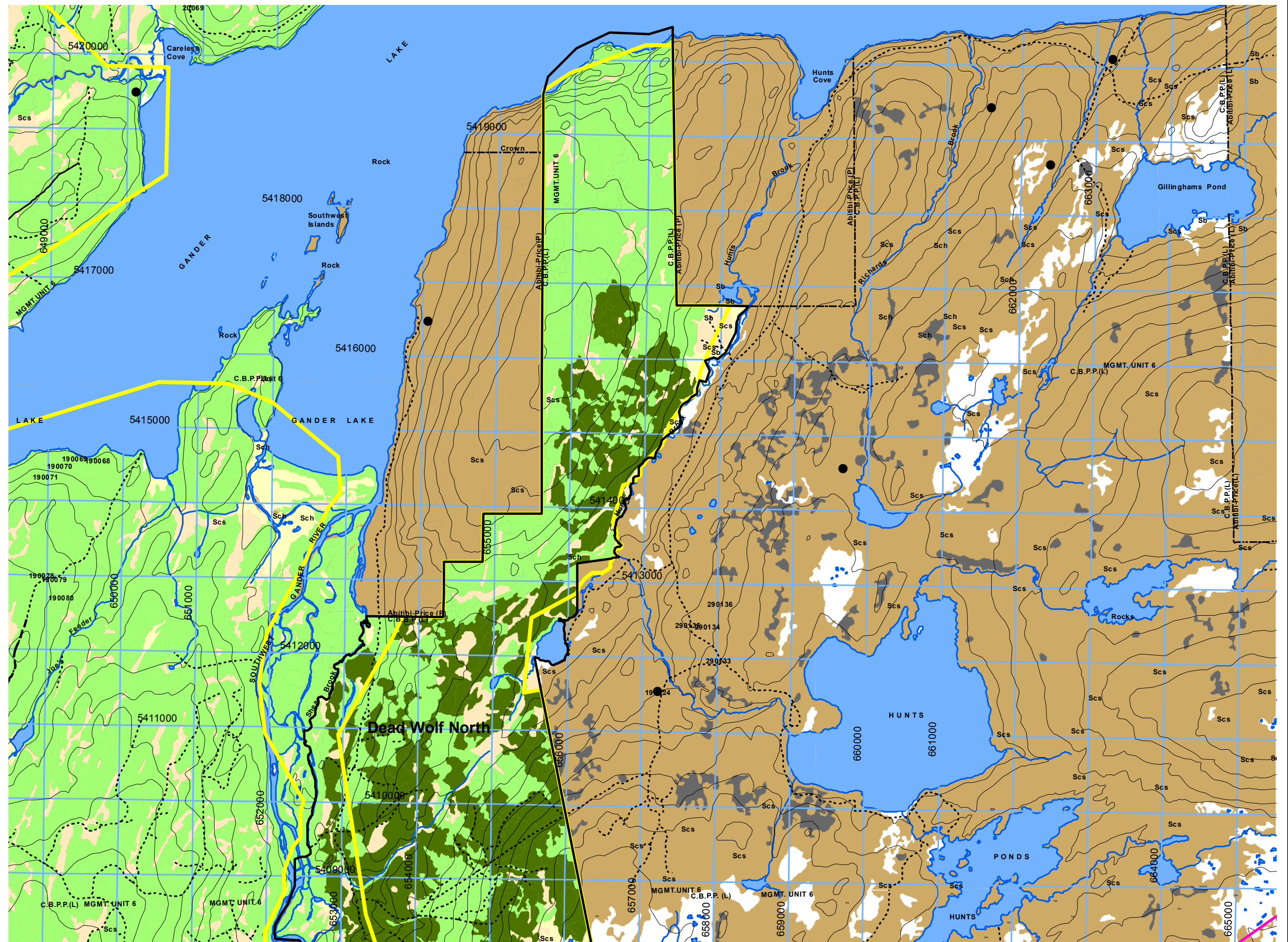
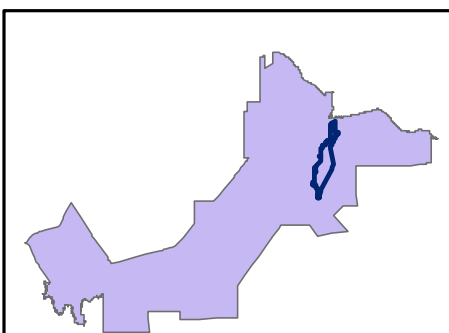
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06





Forest Management District 06 Five Year Plan (2022- 2026)

Dead Wolf North Map 2 (K-06-18) Scale: 1:58,000

Forest Inventory Map 077, 089 NTS Map 2D10,2D15

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

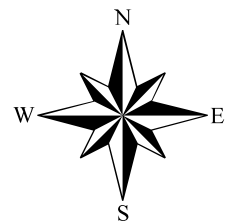
- Management Boundary
- Ownership Boundary

Land Features

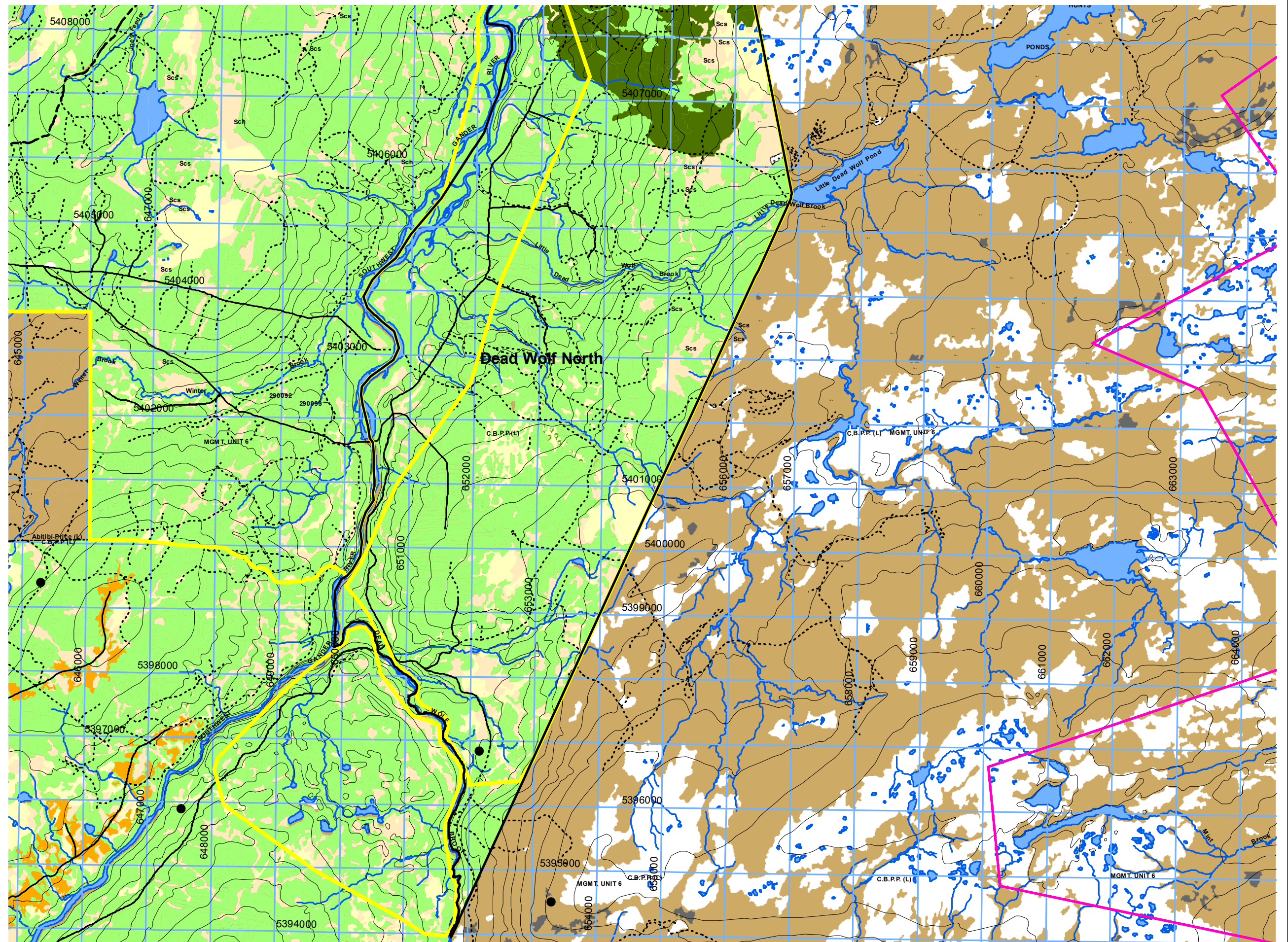
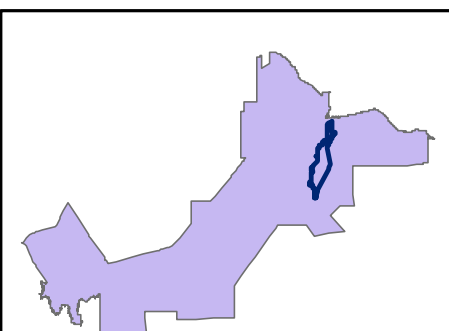
- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06






**CORNER BROOK PULP & PAPER LIMITED
FIVE YEAR OPERATING PLAN**

FMD:	<u>06</u>	Plan Period:	<u>Jan 1,2022 - Dec 31, 2026</u>
Operating Area:	<u>Hussey Pond</u>	Inventory Map #:	<u>088, 089</u>
Harvest Area #:	<u>K-06-23</u>	NTS Map #:	<u>2D11, 2D10</u>

Forest Inventory		
Gross	Net	Working Group
Volume: <u>0</u> m3	Volume: <u>0</u> m3	bF: <u>0</u> %
Area: <u>0</u> ha	Area: <u>0</u> ha	bS: <u>0</u> %

Operational Considerations:	
Harvest System:	<u>Mechanical -SW3 - Shortwood - Harvester/forwarder</u> <u>Mechanical -SW4 - Shortwood - Feller Buncher/Processor/Forwarder</u>
Terrain Conditions:	<u>Predominately gentle terrain in combination with rolling hill top conditions, interspersed with rivers, ponds, streams and bogs.</u>

Other Considerations and Mitigations:	
<ul style="list-style-type: none"> - This operating area is contained inside the Protected Water Supply for the Town of Gander. Forestry activities will conform with the Environmental Protection Guidelines related to operations within Protected Water Supply Areas. - Consultation with outfitters will be scheduled as feedback is received. Harvest and road plans will be presented to each outfitter for review. Responses from individual outfitter's will be dealt with and alterations (if required) may be made to the plan. - Reconnaissance surveys will be carried out on harvested areas. Silviculture prescriptions will be determined once assessments have been completed. - Permanent Sample Plots (PSP's) occur within this operating area and will have 100m no harvest buffer. PSPs will be mapped as part of pre-work packages provided to harvest contractors. Contractor supervisors are expected to identify plots in the field and buffer according to this guideline. - Transmission Line passes through this Five-year plan area. - This operating area contains some Private Land. CBPPL staff will consult the regional lands office for a list of up-to-date titles prior to commencing harvesting activity. 	
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Forest Management District 06 Five Year Plan (2022- 2026)

Hussey Pond (K-06-23) Scale: 1:40,000

Forest Inventory Map 088, 089 NTS Map 2D10,2D11

LEGEND

Five Year Plan Features

- Five Year Plan Boundary
- Proposed Silviculture Area
- Proposed Primary Road
- Proposed Harvest
- Permanent Sample Plots

Road Features

- TCH
- Paved Roads
- Resource Roads
- Winter Roads
- T'Railway Provincial Park
- Trails

Linear Features

- UTM Grid
- Contours
- Transmission Lines
- Protected Public Water Supply Area
- Wildlife Corridor

Administration Boundaries

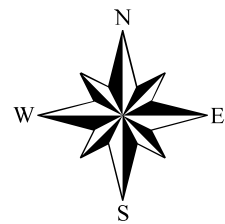
- Management Boundary
- Ownership Boundary

Land Features

- Forested Land
- Cutover
- Other disturbance
- Scrub

Water Features

- Waterbodies
- Brooks



Insert Map Showing
Five Year Plan Within District 06

