



SUSTAINABLE FOREST MANAGEMENT PLAN

Corner Brook Pulp and
Paper
Woodlands

2023
Version 13

Cover photo taken by District Planner Michael McCarthy

This Sustainable Forest Management (SFM) Plan is one of a number of documents required for sustainable management of the Defined Forest Area (timber limits) of Corner Brook Pulp and Paper Limited. Separate but associated documents on the Woodlands computer network, the Environmental Management System Manuals, serve as references for the implementation and maintenance of the environmental standards to which Corner Brook Pulp and Paper Ltd. is certified: the ISO 14001 Environmental Management System Standard, and the SFI 2022 Forest Management and Fibre Sourcing Standards.

TABLE OF CONTENTS

TABLE OF CONTENTS.....	iii
LIST OF TABLES.....	v
INTRODUCTION.....	1
DESCRIPTION OF THE DEFINED FOREST AREA (DFA).....	2
BIOPHYSICAL.....	3
Geography and Terrain.....	3
Geology and Soils.....	3
Ecosystems.....	3
Forest Types.....	6
Wildlife and Fish.....	7
SOCIO-ECONOMIC.....	9
Tenure (Ownership and Management Responsibilities).....	9
Communities within the DFA.....	12
Economic Impact.....	12
Forest Uses.....	13
FOREST MANAGEMENT PLANNING FRAMEWORK.....	16
Public Participation in Planning Processes.....	16
Five-Year Operating Plan.....	17
Annual Operating Plan.....	17
Sustainable Forest Management Plan.....	17
Adaptive Forest Management.....	18
INDICATOR PROFILES.....	19
Indicator 1.1.2 AAC Harvested.....	22
Indicator 1.2.1 Working Groups.....	27
Indicator 2.1.1 Sufficiently Stocked.....	36
Indicator 2.1.3 Non-native Tree Species.....	40
Indicator 2.3.3 Downed Woody Material.....	43
Indicator 2.3.5 Soil Disturbance.....	47
Indicator 3.1.1 Buffers and No Grub Zones.....	53
Indicator 3.2.1 Preharvest Planning.....	58
Indicator 3.2.2 Stand Replacing Disturbance.....	61
Indicator 4.1.1 Ecosystem Area by Type.....	67
Indicator 4.1.2 Within-Stand Structural Retention.....	71
Indicator 4.1.4 Caribou Habitat.....	75
Indicator 4.1.5 Pine Marten Habitat.....	80
Indicator 4.2.3 Age Classes.....	85
Indicator 5.2.1 Average Clearcut Size.....	90
Indicator 5.4.1 Forest Stakeholders.....	93

Indicator 6.1.2 Special Places..... 97
Indicator 7.1.1 Wood Utilization..... 102
Indicator 8.3.1 Engagement of Aboriginal People 105
Indicator 9.2.1 Women’s Employment Plan 108
Indicator 11.2.1 Investment in Training and Skills Development 110
REFERENCES113

LIST OF TABLES

Table 1. Native and introduced mammals on CBPPL’s Defined Forest Area ¹	8
Table 2. Location (FMD) and type of agreements involving CBPPL and the provincial government (Crown).....	10
Table 3. Timber rights relinquished by CBPPL.....	12
Table 4. Communities that benefit from CBPPL's DFA	12
Table 5. Softwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 5, 6, 9, & 16 for 2017-2021.....	23
Table 6. Softwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 14 & 15 for 2019-2023.....	24
Table 7. Softwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 10 for 2021-2025.....	24
Table 8. Hardwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 5, 6, 9, & 16 for 2017-2021.....	24
Table 9. Hardwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 14 & 15 for 2019-2023.....	25
Table 10. Hardwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 10 for 2021-2025.....	25
Table 7. Working Group Definitions	28
Table 8. Area of productive forest present on the DFA, 2022.....	30
Table 9. Non-productive Forest Area Summary, 2022.....	30
Table 10. Comparison of Productive Forest on the DFA by Working Group	32
Table 11. Comparison of Non-productive Forest and Non-forest Area on the DFA by Stand ID	33
Table 12. Percent of areas on the DFA that are sufficiently stocked.....	38
Table 13. Portion of non-native species planted as a percentage of the total productive	41
Table 14. The amount of residual structure retained in harvest operations as a percent of the Annual Operating Plan area, by District.	44
Table 15. Average Width (m) of Roads Built on CBPPL Limits from 2011 to 2022	51
Table 17. Percent of Land Area in Watersheds on CBPPL Limits with a Stand-replacing Disturbance	64
Table 18. Percent of the DFA harvested in poor black spruce forest and scrub types in Forest Management Districts 5, 6, 9, & 16.	69
Table 20. Poor Black Spruce Forest Type (PBSFT) Harvested in Caribou Secondary Core Areas	77
Table 21. Age Class of the Forest on the DFA from last Wood Supply Modeling 2020-2025....	87
Table 22. Percent of Each Age Class of the Total Productive Forest on the DFA*.....	87
Table 23. Average Cutblock Size on DFA by Year.....	91
Table 24. Stakeholder confirmation of CBPPL’s compliance with Agreements/Memorandums of Understanding (MOU)	94
Table 25. Total merchantable fibre (year-end weighted average) left on CBPPL cutovers.	103
Table 26. Employment Targets by Occupational Group	109

LIST OF FIGURES

Figure 1. CBPPL Defined Forest Area (DFA).....	2
Figure 2. Ecoregions of Newfoundland	4
Figure 3. Land classes present on the DFA (2017).....	7
Figure 4. General land and water classes on the DFA as of December 31 2020.....	31
Figure 5. Percent cutover disturbance 2011.....	50
Figure 6. Watersheds for the province of Newfoundland as defined by Forestry Services Branch	63
Figure 7. Pine Marten Core and Harvest Deferred areas in FMD's 14 and 15.....	83



Forest and Environmental Policy and SFI Principles

This Forest and Environmental Policy applies to the scope of the environmental management system for the Woodlands Division and the principals of the SFI Forest Management and Fibre Sourcing Standards.

We commit:

To conduct activities in a manner that protects the **health and safety** of our employees and the public.

To practice **sustainable forestry** to meet the needs of the present while promoting the ability of future generations to meet their own needs by practicing a land stewardship ethic that integrates reforestation and the managing, growing, nurturing and harvesting of trees for useful products, and for the provision of ecosystem services such as the conservation of soil, air and water quality and quantity, climate change adaptation and mitigation, biological diversity, wildlife and aquatic habitats, recreation and aesthetics.

To provide for regeneration after harvest, maintain the health and productive capacity of the forestland base, and to protect and maintain long-term soil health and productivity. In addition, to protect forests from economically, environmentally and socially undesirable impacts of wildfire, pests, diseases, invasive species, and other damaging agents and thus maintain and improve long-term **forest health and productivity**.

To protect and maintain the water quality and quantity of water bodies and riparian areas, and to conform with forestry best management practices to **protect water** quality, to meet the needs of both human communities and ecological systems.

To manage forests in ways that **protect and promote biological diversity**, including animal and plant species, wildlife habitats, ecologically and culturally important species, threatened and endangered species and native forest cover types at multiple scales.

To **prevent pollution** and protect key forest resources.

To manage the **visual impacts** of forest operations, and to provide **recreational opportunities** for the public.

To manage lands and **special sites** that are geologically or culturally important in a manner that takes into account their unique qualities.

To meet or exceed applicable federal, provincial and local forestry and related environmental **laws, statutes and regulations**.

To support advances in sustainable forest management through **research**, science and technology.

To improve the practice of sustainable forestry through **training and education** programs.

To set appropriate environmental **objectives and targets**, develop action plans to meet them, monitor progress and regularly review and update them.

To broaden the practice of sustainable forestry on all lands through **community involvement**, socially responsible practices, and through recognition and respect of **Indigenous Peoples' rights** and traditional forest-related knowledge.

To broaden the understanding of forest certification to the Forest Management and Fibre Sourcing Standards by documenting certification audits and making the findings **publicly available**.

To **continually improve** the practice of forest management, and our environmental management system regularly. And to monitor, measure and report performance in achieving the commitment to sustainable forestry.

To use and promote sustainable forestry across a diversity of ownership and management types that is both scientifically credible and socially, environmentally, and economically responsible to **avoid sourcing from controversial sources** both domestically and internationally.

John MacLellan
Woodlands Manager

Michel Girard
Vice President & General Manager

CBPPL Woodlands fully endorses the Kruger Inc. Corporate Environmental and Fibre Procurement Policies.

Jan 2023

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.

Corner Brook Pulp and Paper Limited (CBPPL) is committed to sustainable forest management by incorporating social, environmental, and economic values in the sustainable development of Newfoundland's forests. While a primary objective of our forest management plan is to provide a sustainable supply of high-quality raw material to the mill at a competitive cost, Corner Brook Pulp and Paper Woodlands recognizes that forests offer a multitude of economic, environmental, and social values and benefits. The Company is committed to managing the forests under its stewardship in a sustainable manner, to ensure that a full range of forest values and benefits are respected. Regulatory agencies 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.

This document is 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 follows the principles of sustainable forest management. CBPPL's first SFM Plan was developed over 16 months and released in July 2004. CBPPL wishes to illustrate to the public (the landowners) and to its customers that the DFA is being managed on a sustainable basis.

CBPPL Woodlands' Environmental Management System (EMS) is the vehicle that ensures fulfillment of the SFM. CBPPL's EMS is a registrant (2001) 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 2022 Forest Management and Fibre Sourcing Standards. Rigorous and regular independent third-party audits are involved in certification to these standards.

Throughout the text of this plan, references are made to Indicator Profiles (e.g. Indicator Profile 1.1.2). The Indicator Profiles, located in the final section of this Plan, contain the background information, management strategy, and implementation details for each of the indicators of sustainable forest management.

DESCRIPTION OF THE DEFINED FOREST AREA (DFA)

The Defined Forest Area (DFA) for this SFM Plan includes all forested land on insular Newfoundland for which Corner Brook Pulp and Paper Limited (CBPPL) has management responsibility. This does not include transmission lines that cross CBPPL limits. These timber limits span from the Codroy Valley on the southwest corner of the island, to Cat Arm on the Northern Peninsula, and east to Gander in central Newfoundland (Figure 1), and are contained within provincial forest management district's 5, 6, 9, 10, 14, 15, and 16.

CBPPL manages approximately 1.4 million hectares of Crown land on the Island of Newfoundland. The provincial government has responsibility to supervise, control, and direct various activities relating to forest resources on Crown lands (see page 9), and on their limits CBPPL is responsible for: preparing timber management plans for areas of productive forest; constructing and maintaining forest access roads; harvesting timber; and carrying out programs of reforestation and silviculture.

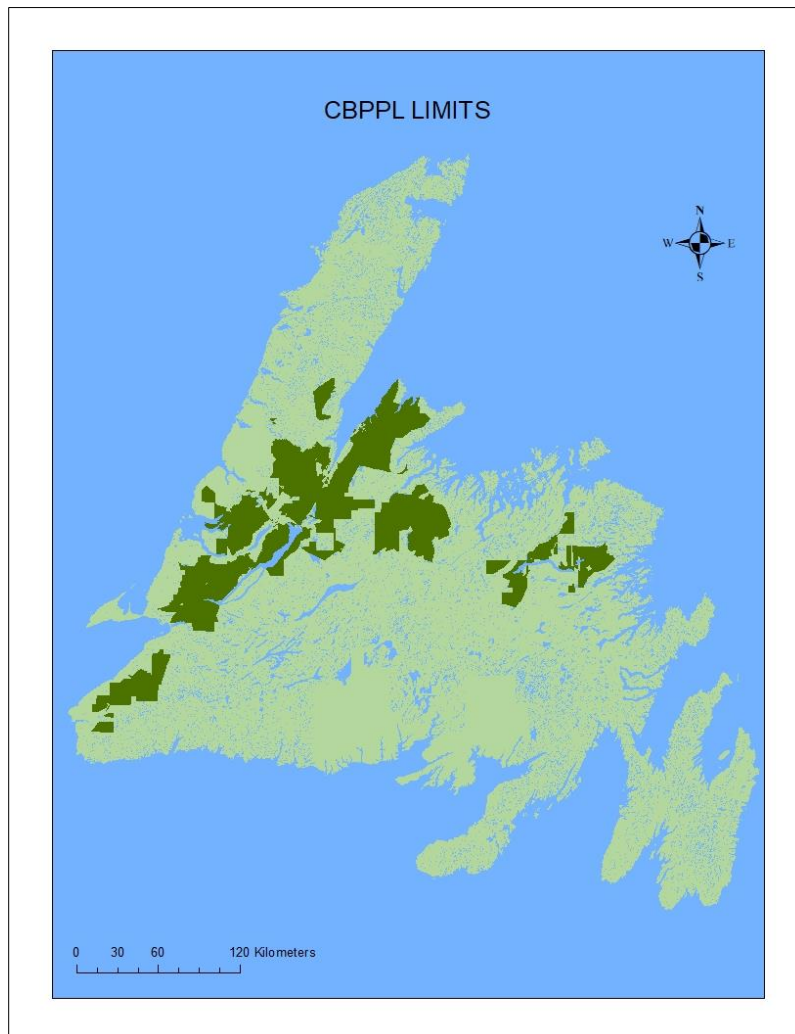


Figure 1. CBPPL Defined Forest Area (DFA)

The DFA is the portion of CBPPL's total timber license that the company currently manages. Some areas of the total timber license are temporarily transferred or exchanged to Crown (see page 10) so cannot be included in the DFA.

BIOPHYSICAL

Geography and Terrain

The Island of Newfoundland forms the northern extremity of the Appalachian geological province of Eastern North America. The island has been shaped by glaciation and is rugged as a result. The DFA includes parts of the island that have been scraped bare, and many valleys and low-lying areas with thick mantles of rocky glacial deposits. The DFA – like the island – is also characterized by rolling hills, mountainous areas, upland plateaus, and numerous bogs, barrens and ponds. There are abundant fresh water sources in the forms of large rivers, lakes and streams. Elevation on the island peaks at 814 metres above sea level in the Lewis Hills and can average 600-800 metres above sea level on other plateaus (GNL 2003).

Geology and Soils

The geology of the DFA is typical of the island. The surface geology is characterized by large areas of coarse-textured material (glacial till deposits), washed sediments, peat deposits, and rock outcrops. Rock types tend to be predominantly limestone, predominantly sandstone, conglomerate and shale, or predominantly volcanic rock. Under well-drained conditions, the most common form of mineral soil in the province is podzols. These soils typically have an organic layer (duff) over a distinctive red or reddish-brown layer rich in iron. Most of these soils tend to be coarse textured and very acidic (DFRA 2003b).

Ecosystems

Damman (1983) divided the Island of Newfoundland into nine ecoregion classifications (Figure 2). Ecoregions are defined as areas where comparable vegetation and soil can be found on the same parent material provided that these sites have experienced a similar history of disturbance. A significant portion of CBPPL's DFA (~81%) lies within two of these ecoregions, the Central Newfoundland Forest and the Western Newfoundland Forest. Approximately 8% falls in the Long Range Barrens, over 6% in the Maritime Barrens, and almost 5% in the Northern Peninsula Forest. The North Shore Forest comprises less than 0.2% of the DFA. Following are the key characteristics of each ecoregion (DFRA 2003).

- Western Newfoundland Forest
 - A. Serpentine Range Subregion
 - B. Corner Brook Subregion
 - C. Port au Port Subregion
 - D. St. George's Bay Subregion
 - E. Codroy Subregion
 - F. Bay d'Espoir Subregion
- Strait of Belle Isle Barrens
- Central Newfoundland Forest
 - A. Northcentral Subregion
 - B. Beothuk Subregion
 - C. Portage Pond Subregion
 - D. Twillick Steady Subregion
- North Shore Forest
- Northern Peninsula Forest
 - A. Coastal Plain Subregion
 - B. Beaver Brook Limestone Subregion
 - C. Northern Coastal Subregion
 - D. Eastern Long Range Subregion
- Avalon Forest
- Maritime Barrens
 - A. Northeastern Barrens Subregion
 - B. Southeastern Barrens Subregion
 - C. South Coast Barrens Subregion
 - D. Central Barrens Subregion
- Eastern Hyper - Oceanic Barrens
- Long Range Barrens
 - A. Southern Long Range Subregion
 - B. Buchans Plateau-Topsails Subregion
 - C. Northern Long Range Subregion



Figure 2. Ecoregions of Newfoundland

Northern Peninsula Forest

This ecoregion differs from most other forested parts of the island by a short growing season of 110-150 days, compared to 145-170 days for other areas. Precipitation is lower than in other regions, however, due to low summer temperatures and a shorter vegetation season, soil moisture supply is adequate. Limestone underlies most of the region, with acidic rocks more common on the eastern side of the peninsula.

Balsam fir is the dominant forest cover except at high elevations (300-400m) on the eastern side of the peninsula, where black spruce appears to be a natural component of the stands. There is very little fire history in this ecoregion. Approximately 100 species of plants are excluded from this ecoregion presumably because of the difference of climate (Damman 1965, 1976, and 1983).

Approximately 5% of the DFA is found in the Northern Peninsula Forest, in the Eastern Long Range subregion.

Western Newfoundland Forest

This ecoregion is characterized by a humid climate with a relatively longer frost-free period. It contains some of the most favourable sites for forest growth, although there is considerable variation due to altitude and proximity to the coast.

The absence of prolonged dry periods and presence of herbaceous growth appear to have excluded fires from all but the most coarse-textured soils. Consequently, balsam fir rather than black spruce is the dominant forest cover. White birch and yellow birch are common in protected valleys below 200m elevations, and red maple is more common and robust in this ecoregion than any other on the Island of Newfoundland.

The Western Newfoundland Ecoregion is subdivided into five sub-regions. The DFA's productive forest area overlaps with four: Corner Brook, St. George's Bay, Serpentine Range, and Codroy. The Corner Brook sub-region is hilly to undulating and supports some of the most productive forest stands of the island. The St. George's Bay sub-region differs in its soil types and consequently, serious growth and regeneration problems may be encountered. The Codroy sub-region has some of the most favourable conditions for growth in Newfoundland, and a large portion of the area has been cleared for agriculture. The forested landscape is dominated by steep slopes. The Serpentine Range sub-region is mountainous with low, sparse vegetation dominated by rock barrens. The serpentine and ultra-basic rock types support numerous rare plant species. Almost 30% of the DFA lies in the Western Newfoundland Forest.

Central Newfoundland Forest

This ecoregion comprises the largest portion of the DFA at over 50%. Central Newfoundland has the highest summer temperatures and lowest winter temperatures on the island. Due to the warm summers and high evapotranspiration losses, soils in the northern part of this ecoregion display soil moisture deficiency.

Forest fires have played a more important role in the natural history of this region relative to other ecoregions. Much of the balsam fir-feathermoss forest types have been converted by fire to black spruce, and some of the richer site types to hardwood forests dominated by white birch and aspen. Although aspen occurs in other regions, it is most abundant and vigorous in Central Newfoundland. Yellow birch is absent from this region primarily because of the short frost-free period. Red pine, designated as rare in Newfoundland, is most common in the Central Newfoundland Forest in small patches.

Most of the DFA in this ecoregion falls within the North-central sub-region. Pure black spruce forests and aspen stands dominate this area because of the prevalence of fire in the natural history of the sub-region. A much smaller portion of the DFA in the west lies in the Portage Pond sub-region, which is comprised of balsam fir on upland sites and some very productive black spruce stands of fire origin.

Long Range Barrens

Approximately 8% of the DFA is located in the Long Range Barrens ecoregion, and most of that is in the Northern Peninsula. This ecoregion includes the mountainous areas above treeline. Trees only occur as krummholz (stunted trees of poor form shaped by wind, salt or ice, and therefore non-productive) usually dominated by black spruce, balsam fir and eastern larch. Small patches of forest may occur in sheltered valleys. The vegetation is dominated by arctic-alpine plants clearly indicating that these barrens, unlike the Maritime Barrens, were never forested.

North Shore Forest

This ecoregion has the warmest summers of any coastal region, with a frost-free season several weeks longer than in central Newfoundland. This is the driest part of the island, and summer temperatures can cause soil moisture deficiencies. There are no sub-regions within this ecoregion, and less than 0.2% of the DFA falls into this area.

The vegetation in this ecoregion is similar to that of the Central Newfoundland Ecoregion, except that white spruce is more abundant in the forests.

Maritime Barrens

The Maritime Barrens ecoregion has the coldest summers with frequent fog and strong winds. The landscape pattern consists of usually stunted, almost pure stands of balsam fir, broken by extensive open heathland. Good forest growth is localized on long slopes of a few protected valleys. Approximately 6% of the DFA falls in the Maritime Barrens, all of it within the Central Barrens sub-region. Residual forests that have not been destroyed by fire have moderate capabilities here.

Forest Types

Of the almost 1.4 million hectares of total land area on the DFA, only 715,535 hectares are productive forest. The remainder of the land is bog, barren, water, and scrub land.

The forests of the DFA form the most eastern part of the Boreal Forest Region of North America. The forests are relatively small, primarily coniferous trees intermixed with hardwoods. The variety of species is quite limited. Repeated fires have established black spruce as a characteristic species across much of Central Newfoundland. Elsewhere, the forests are dominated by the presence of balsam fir.

The forests of the west coast are predominately balsam fir (with minor components of white spruce and white birch) which prefer moist, well-drained soils and can attain heights of 10-14 meters at 70-100 years on the best sites. Black spruce has a very high tolerance for unfavourable conditions, and is thus common on very wet and dry sites. Black spruce grows well on fertile sites, but is a poor competitor among faster growing hardwoods. Black spruce is found primarily in the central plateau of Newfoundland where forest fires are common. White spruce may be

found on more favourable sites.

Hardwoods have not formed a major component of forest cover types in this Province. However, white birch and trembling aspen are significant components of mixed-wood and hardwood stands on better forest sites throughout the island, especially the deep river valleys of the Western Long Range Mountains, and the Humber River and Beothuk Lake watersheds. Hardwoods may reach heights of 22 meters at 80 years on moist, fertile sites. The land classes present on the DFA are delineated in Figure 3.

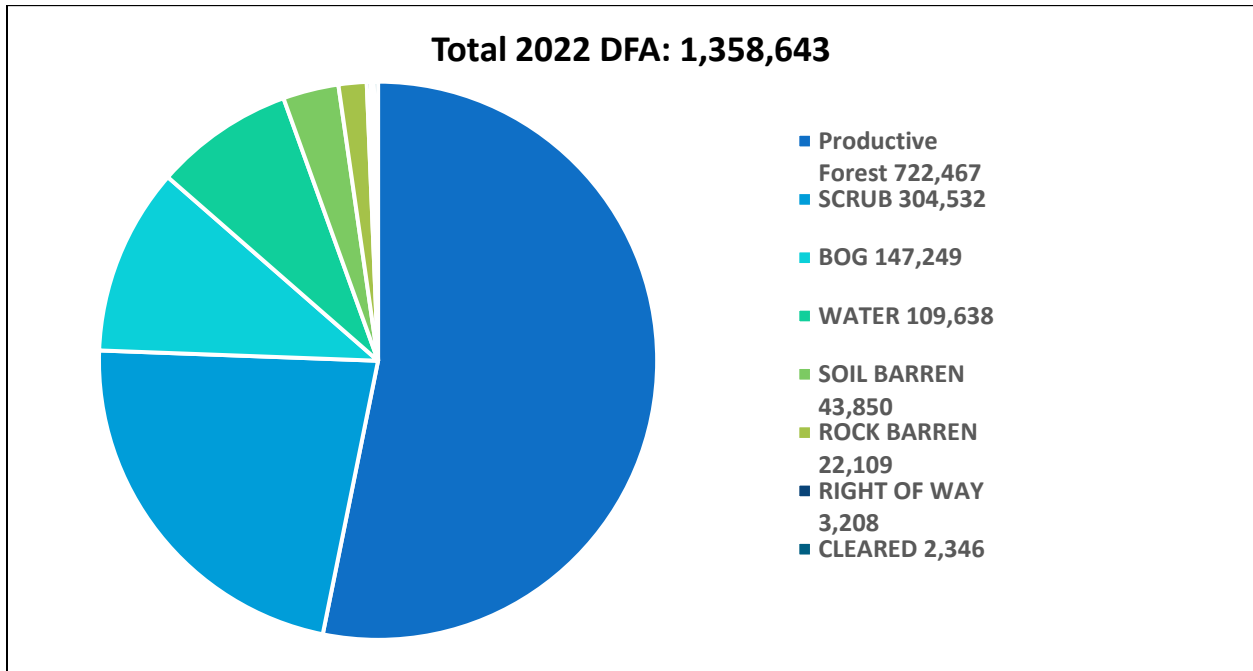


Figure 3. Land classes present on the DFA (2022)

Wildlife and Fish

There are currently 28 species of mammals that make the DFA their home (FLR, 2018); 14 are native to the island and 13 have been introduced (Table 1). Of the 368 bird species that have been identified on the Island of Newfoundland (NHSNL 2003), approximately 70 are common forest-dwelling species. There are also 20 species of inland fish on the DFA, from the familiar trout, salmon and smelt to the lesser-known mummichog and windowpane (Scott and Crossman, 1964).

The provincial government is responsible for managing and conserving wildlife in Newfoundland and Labrador, while the federal government has a mandate to protect and conserve fish habitat for coastal and inland fisheries resources.

Table 1. Native and introduced mammals on CBPPL’s Defined Forest Area¹

Family	Species/subspecies	Origin
Shrews	Masked (Common) Shrew (<i>Sorex cinereus</i>)	Introduced
Bats	Little Brown Bat (<i>Myotis lucifugus</i>)	Native
	Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Native
	Hoary Bat (<i>Lasiurus cinereus</i>)	Native
Hares	Arctic Hare (<i>Lepus arcticus/bangsii</i>)	Native
	Snowshoe Hare (<i>Lepus americanus</i>)	Introduced
Squirrels	Chipmunk (<i>Tamias striatus</i>)	Introduced
	Red Squirrel (<i>Tamiasciurus hudsonicus</i>)	Introduced
Beavers	American Beaver (<i>Castor canadensis/caecator</i>)	Native
Rats and Mice	Deer Mouse (<i>Peromyscus maniculatus</i>)	Introduced
	House Mouse (<i>Mus musculus</i>)	Introduced
	Meadow Vole (<i>Microtus pennsylvanicus/terraenovae</i>)	Native
	Bank Vole	Introduced
	Red-backed vole (<i>Clethrionomys gapperi</i>)	Introduced
	Muskrat (<i>Ondrata zibethicus/obscurus</i>)	Native
	Norway Rat (<i>Rattus norvegicus</i>)	Introduced
Insectivore	Masked Shrew	Introduced
Canids	Newfoundland Wolf (<i>Canis lupus/beothucus</i>)	Native
	Red Fox (<i>Vulpes vulpes/deletrix</i>)	Native
	Coyote (<i>Canis latrans</i>)	Introduced ²
Bears	Black Bear (<i>Ursus americanus/ hamiltoni</i>)	Native
Weasels	Ermine (<i>Mustela erminea</i>)	Native
	Mink (<i>Mustela vison</i>)	Introduced
	Newfoundland Marten (<i>Martes americana/atrata</i>)	Native ³
	Otter (<i>Lutra Canadensis/degener</i>)	Native
Cats	Lynx (<i>Lynx Canadensis/subsolanus</i>)	Native
Deer	Caribou (<i>Rangifer tarandus/caribou</i>)	Native ⁴
	Moose (<i>Alces alces</i>)	Introduced

¹ Reference: FLR 2018 (Fisheries and Land Resources)

² New arrival, first sighting 1986

³ Threatened: Species at Risk Act and Endangered Species Act.

⁴ Assessed Special Concern by COSEWIC in 2015

These wildlife species are an integral part of the Newfoundland environment. Species such as moose, snowshoe hare and grouse depend on early-successional stages of the forest. Over-mature forests are required by boreal owls for example, while many species use a mixture of forest types (CBPPL 2001). CBPPL funds research to study the effects of harvesting operations on some species inhabiting the DFA (see Indicator Profile 4.1.5).

Of the many mammals, bird, and fish species on the DFA, three mammal, 10 birds, and two fish species have been designated Species at Risk by the Committee on the Status of Endangered

Wildlife in Canada (COSEWIC) and by the Newfoundland Species Status Advisory Committee (SSAC). Others, such as the Song Sparrow, Winter Wren, and numerous plant species, are considered endangered or threatened but have not been legally designated national or provincially. All of these species at risk, designated or not, are considered in the Certificate of Managed Land, CBPPL's permit to operate, granted by the provincial government. See the section on forest management planning for more information.

Forest Disturbances

On portions of the DFA in central Newfoundland, fire is the most common natural disturbance. Those portions of the DFA on the western side of the island, however, experience disturbance by insects. There are five main insects with a significant impact on the DFA's forests: hemlock looper, balsam fir sawfly, spruce budworm, balsam woolly adelgid, and birch casebearer.

SOCIO-ECONOMIC

Tenure (Ownership and Management Responsibilities)

The provincial government is responsible for the planning, development and use of the forest resources of the province. The provincial government supervises, controls, and directs all matters relating to:

- constructing and maintaining forest access roads;
- protecting the forests of the province from fire, insect, and disease;
- carrying out programs of afforestation, reforestation, forest improvement, and tree improvement;
- cutting, classifying, measuring, manufacturing, marking, and inspection of trees and timber;
- preparing timber management plans for areas of productive forest land; and
- developing and maintaining an up-to-date inventory of the timber resources of the province.

CBPPL has exclusive ownership of the timber resource on the DFA. This right originates from several sources: a series of agreements, purchases, deeds, grants, and licenses dating from 1922 to 1994. The Bowater's Newfoundland Act of 1938 amended the term and conditions of all timber licenses currently held and subsequently acquired by CBPPL. By this Act, the term of all licenses held by CBPPL at that time and any future licenses subsequently acquired by the Company was extended to 99 years, commencing on the 29th day of November 1938. The Act states that during the term of the license "... *every such license shall operate to vest in the licensee during the continuance of such license the right to take and keep exclusive possession of the land therein described ... and shall vest in the holder thereof all right of property whatsoever in all trees and timber cut within the limit of the license...*".

The Bowater's Newfoundland Act also requires that "*The Company will at all times carry out its cutting operations in Newfoundland in accordance with good logging practice in such a manner as will best conserve the Company's forest areas so as to ensure both the permanent supply of timber for its mills and extensions aforesaid and the export of timber as herein provided.*" CBPPL's commitment to "*good logging practices*" is further defined in its Forest and

Environmental Policy (page vi). Implementation of this commitment is demonstrated in the Indicator Profiles, which are the foundation of CBPPL’s SFM Plan. CBPPL is subject to the provisions of the Forestry Act 1990 and subsequent amendments, and as a condition of the Certificate of Managed Land issued to the Company annually under this Act, must operate in accordance with the Province’s *Environmental Protection Guidelines for Ecologically Based Forest Resource Management*.

In order to facilitate economic development based on the hardwood timber resources in Forest Management Districts (FMD) 9, and 14, CBPPL transferred the management rights to this hardwood timber to the provincial government.

CBPPL has also entered into several other agreements with the provincial government concerning the transfer or exchange of cutting rights (Table 2). These agreements are made at the request of the provincial government, to obtain the right to fibre in various areas. Some areas are specifically for Crown (commercial) operators (e.g., White’s River, Cormack), some for local sawmills (e.g., Weir’s Pond, Chouse Brook, Clam Pond), some for domestic cutters (e.g., Westport, Chouse Brook, Howley and McIvers), and some for a combination of the three (Baie Verte). Transfer agreements allow the harvest of a specified annual allowable cut (AAC) of operable softwood stands (i.e. >60 years in Core or Operational), and any hardwood trees encountered during the harvest of operable softwood. Exchange agreements allow the harvest of all operable timber, both hardwood and softwood, on the exchange areas, tracked against the applicable AAC figures. There is no intent to balance the volume of the harvest from area to area.

Table 2. Location (FMD) and type of agreements involving CBPPL and the provincial government (Crown)

Name	Location	Type of Agreement	Date of Expiry
Southwest Gander	FMD 6	Transfer to Crown	Dec. 31, 2037
Gander River Protected Area	FMD 5	Transfer to Crown	Dec. 31, 2037
Turner’s Ridge	FMD 16	Transfer to Crown	Dec. 31, 2037
Faulkner’s Pond Extension	FMD 16	Transfer to Crown	Dec. 31, 2037
White’s River	FMD 16	Transfer to Crown	Dec. 31, 2037
Adies Lake	FMD 16	Transfer to Crown	Dec. 31, 2037
Governer’s Pond	FMD 15	Transfer to Crown	Dec. 31, 2037
McIvers & Cox’s Cove	FMD 15	Transfer to Crown	Dec. 31, 2037
Reidville, Junction Brook, Crooked Feeder, Goose Steady’s & Howley	FMD 16	Transfer to Crown	Dec. 31, 2037
Hampden	FMD 9 & 16	Transfer to Crown	Dec. 31, 2037
Twin Lakes	FMD 10	Exchange from Crown	Dec. 31, 2037
North Brook & Robinson’s Pond	FMD 15	Exchange from Crown	Dec. 31, 2037

In 2010, CBPPL sold some of its timber limits to the Crown; some to be used as protected areas, others as sources of fibre for Crown operators, sawmills, the pellet plant, and domestic cutters. These areas can be sorted into three groups.

One group consists of areas where harvesting has been restricted. Rodney Pond Reserve (District 6) and Little Grand Lake Provisional Ecological Reserve (Districts 14 & 15) are two examples where CBPPL had already agreed to no harvesting whatsoever. However, these areas could not legally become ecological reserves while CBPPL held timber rights, even if no harvesting occurred. Two other areas in District 15 & 16 will become primarily viewshed corridors. A designated portion of the Humber Valley, from near the mouth of the Humber to the tip of Deer Lake, will be set aside for aesthetic purposes, and for agricultural development (a section on the north shore of Deer Lake). A corridor from Cormack to Gros Morne, along highway 430 and Bonne Bay Road, will also be designated a viewshed. Finally in this group, the Main River Management Area (watershed surrounding the Waterway Park), previously restricted to a partial harvest to conserve old-growth forest, has been handed over to the provincial government to be developed at its discretion.

A second group of areas that were previously CBPPL limits and have been sold to the Crown will be used to supply fibre to Crown operators, sawmills, the pellet plant, and domestic cutters. A large block of forest south and southwest of Gander Lake and another block around Notre Dame Junction (both in District 6) will be set aside for Crown operators and sawmills. All of CBPPL limits in District 17 have been sold to Crown to be used for Crown operators and domestic cutters. CBPPL has also relinquished “absolute right of refusal” on any Crown wood in District 17 and “first right of refusal” on any Crown wood in District 18 to allow wood to go to the pellet plant in Roddickton.

A third group of areas has also been included in this 2010 agreement – blocks of CBPPL limits where Crown currently had control. The Rodney Pond Exchange and Dead Wolf block in District 6 will be used for Crown operators, and all CBPPL limits in District 8 will be used for Crown operators and sawmills in central and eastern Newfoundland.

In 2017 another transfer of CBPPL limits occurred involving Agriculture Areas of Interest (AOI). In order to aid the Government initiative to promote agriculture development in the province, CBPPL entered into an agreement to relinquish approximately 10,000 ha of its timber license area. The areas consist of 17 blocks spread across 5 forest Management Districts, primarily on the west coast of the island.

Through the transfers, exchanges, and sale of land, CBPPL has and continues to share its timber limits with other forest users of the forest for consumptive and non-consumptive purposes. The total timber rights relinquished in the sale transactions is outlined in Table 3.

Table 3. Timber rights relinquished by CBPPL

Block Description	District	Land Base (less Water)		
		Productive (ha)	Non-Productive (ha)	Total (ha)
Rodney Pond NASP Area	6	5,125	5,156	10,281
Little Grand Lake Reserve	14/15	24,939	16,031	40,970
Humber Valley Viewshed	15	17,165	3,811	20,976
Gros Morne Corridor Viewshed	15/16	4,030	1,906	5,936
Main River Watershed	16	26,477	27,418	53,895
District 6, East of SW Gander (excluding Rodney Pond)	6	41,942	38,534	80,476
District 6, Notre Dame Junction	6	15,860	10,376	26,236
District 17, All Holdings	17	74,907	96,302	171,209
District 8, All Holdings	8	23,956	13,492	37,448
Agricultural Areas of Interest	5,9,14,15,16	9,045	1,107	10,152
Sub-Total		243,446	214,133	457,579

Communities within the DFA

Many communities in provincial economic zones within and proximity to the DFA benefit from the forest resource (Table 4).

Table 4. Communities that benefit from CBPPL's DFA

Provincial Economic Zone	Economic Zone Title	Area
2	Hyron Regional EDC	Lab City to Churchill Falls
3	Central Labrador EDB Inc	Happy Valley Goose Bay and South
6	Nordic EDC	St Anthony to Roddickton
7	Red Ochre Regional Board	Rocky Harbour to Plum Point (Eastern Coast)
8	Humber EDB Inc	Corner Brook, DL, Hampden to Harbour Deep
9	Long Range Regional EDB	Stephenville and Port au Port, Burgeo
11	Emerald Zone Corp	Baie Verte, Springdale
12	Exploits Valley EDC	Grand Falls and Western part of Central
14	Kittiwake EDC	Gander, Lewisporte, Terra Nova
15	Discovery Regional DB	Clarenville, Bonavista
18	Avalon Gateway RED Inc	Placentia, St Bride's, Branch
19	Capital Coast Development Alliance	St John's, Mt Pearl, CBS
20	Irish Loop REDB	Ferryland, Trepassey

Economic Impact

CBPPL Woodlands employs some 175 employees in their harvest operations from almost 50 Newfoundland communities. This total includes approximately 20 seasonal forestry workers,

who carry out silviculture operations in the summer and fall. The Company employs another 340 people at the Mill in Corner Brook and in the Deer Lake Power Company.

In addition to this direct employment, the operation of the mill also has indirect and induced impacts. Indirect impacts are realized by employees working for firms supplying CBPPL with goods and services. Induced impacts are generated by the direct and indirect income earners spending their earnings in the economy. Labour income impacts (direct, indirect and induced) of CBPPL operations totals \$123.96 million (CBPPL, 2015).

Forest Uses

CBPPL shares forest resources with the residents of the province. There are many forest uses in the DFA. Consumptive values include timber products, hunting, trapping, fishing, and edible plant foraging such as berry picking. Non-consumptive values take in skiing, hiking, snowmobiling and bird watching. The range of values present on the DFA is described below.

Timber

The primary use of the forests of the DFA is to supply fibre to CBPPL's newsprint mill in Corner Brook. Besides newsprint production, the forest resources of the DFA also supply the needs of local sawmills, and the newsprint mill receives chips in return. In 2015, two local sawmills employed roughly 120 people and produced approximately 22.6 million board feet of lumber from the sawlogs provided by CBPPL. Production fluctuates with lumber prices. Domestic wood cutting is a very common activity across the DFA and permits are issued to the public to harvest hardwoods off company limits.

Tourism and Recreation

Many recreational opportunities exist throughout the DFA, which offers outstanding scenery and interesting topography, and provides opportunities for berry picking and viewing wildlife and flora. Hiking, skiing, and snowmobiling are just a few of the activities carried out on the DFA, and all are marketed as Adventure Tourism. This non-consumptive, recreation-based sector of the province's tourism industry is rapidly growing. Many of these activities are enhanced by or are dependent on forest resources. CBPPL has developed a "Special Places" program in its SFM Plan, which identifies and promotes areas on the DFA with distinctive natural characteristics (Indicator Profile 6.1.2). In 2010, CBPPL signed an agreement with the International Appalachian Trail Newfoundland and Labrador, providing protection for five areas on the DFA in western Newfoundland where the trail network plans to expand.

Mining

Mineral rights on the DFA are owned and administered by the provincial government, with the exception of one mining grant owned by CBPPL. This grant is approximately 83 square kilometres in area and is located on the north side of the Humber River near Hughes Brook. Mineral exploration permits issued by the province are referred to CBPPL in order to identify

any conflicts. Mines currently exist on the DFA in Glenwood and on the Baie Verte peninsula, and active quarries are common.

Agriculture

Some areas of the DFA are suitable for agriculture. CBPPL recognizes this potential and will continue to work with the provincial government and individual proponents of potential agricultural developments. Through the five-year forest management planning process, CBPPL will consider the potential agricultural development on the DFA. Examples are the timber rights relinquished on the north shore of Deer Lake (see page 12), which were in negotiation for some time, and the 2017 Agriculture Areas of Interest.

Outfitting

Numerous outfitters operate within the boundaries of the DFA, most of them catering to the big game hunter or angler. Some outfitters have diversified into non-consumptive areas of the tourism industry such as snowmobiling, dog sledding, kayaking, canoeing, nature viewing, hiking, and wildlife photography. These businesses depend on the forest for their livelihood. CBPPL and the Newfoundland and Labrador Outfitters Association have a Memorandum of Understanding in which both parties agree to seek reasonable and mutually acceptable measures to reduce conflicts. In Indicator Profile 5.4.1 CBPPL aims for the satisfaction of 100% of stakeholders inside CBPPL's 5-year operating plan for each Forest Management District, with whom CBPPL has an agreement.

Cabin Development

The construction of small cottages or cabins on public lands as a base for outdoor recreational activities such as hunting, fishing, or snowmobiling is a long-held tradition in Newfoundland and Labrador. The Provincial Government issues Licenses to Occupy (LTO) Crown land to individuals for recreational cottage development on public lands throughout the province, including the DFA. A License to Occupy does not grant, convey, or transfer any exclusive right, title or interest in, or to, a defined cottage lot or land area. It merely gives the licensee permission to occupy Crown Land and construct a cabin. All applications for LTOs on the DFA are referred to CBPPL for review and comment. CBPPL works with Crown Lands staff to accommodate these cottages on the DFA in areas where there is no conflict with the Company's operations or forest management activities. The province occasionally designates areas for permanent cottage development. In these areas, lands are alienated from the Company timber limits and either leased or sold to individuals. These areas are few and are subject to review under the Province's Environmental Assessment process before they are designated.

There are many personal cabins located on the DFA, both in cabin development areas and remotely. Cabin owners are generally appreciative of the forested land adjacent to and around their properties and the logging road access forestry operations provide.

Hunting, Fishing, Trapping and Snaring

Hunting, fishing, trapping, and snaring are all activities commonly practiced by residents on the DFA. These activities are regulated by the provincial government.

Protected Areas

CBPPL has cooperated in the designation of protected areas on its timber limits in various locations. Little Grand Lake Provisional Ecological Reserve was established on the DFA in 2002, to protect the Newfoundland pine marten (endangered at that time) in the area. Main River, also part of CBPPL's DFA, was designated as Newfoundland and Labrador's first Canadian Heritage River in 2001 and established as a provincial park (Main River Waterway Provincial Park) in 2009. CBPPL relinquished all timber rights in these two areas to the provincial government and agreed to carry out only selective harvesting in the 49 km² Special Management Area adjacent to Waterway Park. In 2013, CBPPL relinquished timber rights in the Main River Special Management Area (see page 12).

In December of 2016, CBPPL developed a Voluntary Protected Areas Agreement with Canadian Parks and Wilderness Society (CPAWS) as part of the Canadian Boreal Forest Agreement (CBFA). This agreement establishes 16 voluntary protected areas within the forest tenure area, supports the Large Intact Landscape deferral for the Island of Newfoundland (Cat Arm, Hampden Downs, and the southwestern portion of District 6), and supports the Natural Areas System plan for the Island of Newfoundland.

FOREST MANAGEMENT PLANNING FRAMEWORK

In the early 1900s, Newfoundland's Forest Industry began with the establishment of timber cutting rights and the development of the newsprint industry. Forest stewardship evolved from simple protection of the resource to sustained yield management. In 1973, a Provincial Forestry Task Force spearheaded the implementation of a structured management regime (DFRA 2003c). Forest management districts were designated under the new regime, each requiring a forest management plan containing:

1. A Forest Management Plan Report, one per district, outlining how the district will be strategically managed.
2. Five-Year Operating Plans, prepared by each timber cutting right holder, outlining where timber harvesting, silviculture and road construction will take place.
3. Annual Operating Plans, prepared by each timber cutting right holder, providing additional detail to the Five-Year Operating Plan.

By the 1980s, plans that had previously been prepared by forest managers alone, were being developed in consultation with other resource managers and the public. At the same time, new provincial environmental assessment legislation required five-year operating plans to be registered for review.

The 1990 Forestry Act outlined its approach as providing a "*continuous supply of timber in a manner that is consistent with other resource management objectives, sound environmental practices, and the principle of sustainable development.*" The Act also ensured the participation of the public by requiring the Minister to consult with the public in the development of Five-Year Operating Plans.

In 1995, a new "Proposed Adaptive Management Process" was implemented with three objectives:

1. To establish a proactive planning framework to include all stakeholders.
2. To learn more about forest systems while they are being actively managed (Adaptive)
3. To assume an ecosystem approach to forest management in order to sustain natural system integrity and health over the long term.

This process provided the foundation for the establishment of planning teams for each management district.

Public Participation in Planning Processes

There are opportunities for the public to contribute to sustainable forest management of the DFA. In the Five-Year Operating Plan, the provincial government is required by legislation to include public participation in the development of operating plans for each management district. CBPPL invites input from all stakeholders in the development of a plan for the entire DFA. Public inquiries and input can also be submitted through the website at any time:
www.CBPPLWoodlands.com

Five-Year Operating Plan

The provincial government produces a Sustainable Forest Management Strategy that outlines sustainable and adaptive ecosystem management strategies for the whole province. The provincial government released a 10- year Provincial Sustainable Forest Management Strategy (PSFMS) Document (2014-2024), which emerged through wide consultation with citizens of the province. The 2014-2024 PSFMS builds on the strengths of the previous strategy plans and uses a landscape-scale planning approach to implement the progressive and innovative ecological policies required for Sustainable Forest Management (SFM). The strategy also builds on the strengths of the many modern and high-quality forest management programs that are currently being implemented in this province to ensure a vibrant and competitive forest industry. This strategy is implemented through the Five-Year Operating Plan, a planning document required by the Forestry Act and submitted to the provincial government for each Forest Management District. The Five-Year Operating Plan has a detailed format that identifies where, when and how forest management activities will occur within a particular District.

Five-Year Operating Plans are prepared by each licensee in each Forest Management District and are developed following a public consultation process that invites input from stakeholders. As new five-year plans are being developed and implemented provincially, relevant issues raised from previous planning processes are considered to form the foundation of the new plans. In 2016, in addition to transferring issues/concerns/mitigations from previous planning processes, a revised approach of stakeholder involvement for the development of this plan was implemented. Known interested stakeholders from previous planning processes were engaged on a “one-on-one” basis to evaluate potential activity.

Once the Five-Year Operating Plan is completed, it must be registered with the provincial government to undergo an environmental assessment. During this process, interested government departments and the public are consulted and submissions are reviewed. A Plan released by the Minister of Environment is subject to any terms and conditions the Minister may set.

Annual Operating Plan

The 1990 Forestry Act also requires submission of Annual Operating Plans to the provincial government in advance of harvesting planned for the coming year. In addition to providing significant detail regarding wood supply, access road development, planned harvesting, environmental concerns and forest renewal activities, the Annual Operating Plan also addresses comments and recommendations generated during the development of the Five-Year Operating Plan. Following the approval of the Annual Operating Plan by these departments, a Certificate of Managed Land is issued to CBPPL, outlining the terms and conditions of the Plan’s approval.

Sustainable Forest Management Plan

CBPPL’s Sustainable Forest Management Plan complements the provincial government’s Sustainable Forest Management Strategy, described in the previous section. CBPPL’s plan sets

the strategic direction and broad goals and objectives for the Company's forest management activities, while providing information on planned forest development activities. This plan will be revised annually.

The Indicator Profiles associated with this plan can be found in the remainder of this document. These Indicator Profiles outline in detail the values, objectives, indicators and targets chosen specifically for CBPPL's DFA, explain the status of the indicator as of 2021, and include the management strategies necessary to achieve the targets.

Adaptive Forest Management

Management strategies for the indicators are currently being implemented, and their effectiveness is already being monitored. To follow the concept of adaptive forest management, monitoring must first determine if the management strategies are reflected in the operating practices (what we say is what we do), and then, if the management strategies are effective (targets are being met). Where desired outcomes are not met, management strategies can be changed to achieve targets, or more realistic targets can be set.

INDICATOR PROFILES

The next section contains a profile for each CBPPL indicator, based on the 13 Principles, 17 objectives, and 41 performance Measures. Objectives of the SFI 2022 Forest Management Standard, which are:

1. Forest Management Planning – To ensure forest management plans include *long-term* sustainable harvest levels and measures to avoid forest conversion or afforestation of ecologically important areas.
2. Forest Health and Productivity - To ensure *long-term* forest *productivity* and *conservation* of forest resources through prompt *reforestation*, *afforestation*, deploying *integrated pest management* strategies, *minimized* chemical use, *soil conservation*, and protecting forests from damaging agents.
3. Protection and Maintenance of Water Resources - To *protect* the water quality and quantity of rivers, streams, lakes, *wetlands*, and other water bodies.
4. Conservation of Biological Diversity – To maintain or advance the *conservation* of *biological diversity* at the *stand-* and *landscape-*level and across a diversity of forest and vegetation cover types and successional stages including the *conservation* of forest plants and animals including *aquatic species*, *threatened and endangered species*, *Forests with Exceptional Conservation Value*, *old-growth forests* and ecologically important sites.
5. Management of Visual Quality and Recreational Benefits - To manage the visual impact of forest operations and provide recreational opportunities for the public.
6. Protection of Special Sites - To manage lands that are geologically or *culturally important* in a manner that takes into account their unique qualities.
7. Efficient Use of Fiber Resources - To *minimize* waste and ensure the efficient use of fiber resources.
8. Recognize and Respect Indigenous Peoples' Rights - To recognize and respect *Indigenous Peoples'* rights and traditional knowledge.
9. Climate Smart Forestry – To ensure forest management activities address climate change adaptation and mitigation measures.
10. Fire Resilience and Awareness – To limit susceptibility of forests to undesirable impacts of wildfire and to raise community awareness of fire benefits, risks, and minimization measures.
11. Legal and Regulatory Compliances – To comply with all applicable laws and regulations including, international, federal, provincial, state, and *local*.
12. Forestry Research, Science and Technology - To invest in research, science, and technology, upon which sustainable forest management decisions are based.
13. Training and Education - To improve the implementation of *sustainable forestry* through appropriate training and education *programs*.

14. Community Involvement and Landowner Outreach - To broaden the practice of *sustainable forestry* through public outreach, education, and involvement, and to support the efforts of *SFI Implementation Committees*.
15. Public Land Management Responsibilities - To participate and implement sustainable forest management on *public lands*.
16. Communications and Public Reporting - To increase transparency and to annually report progress on conformance with the *SFI Forest Management Standard*.
17. Management Review and Continual Improvement – To promote continual improvement in the practice of *sustainable forestry* by conducting a management review and monitoring performance.

Each indicator profile begins by listing the SFI FM Objective, Performance Measure, Indicator, Target, and Acceptable Level of Variance, as well as the person responsible for that indicator. The profile then proceeds with detailed information as outlined in the topic headings below. Each indicator will be monitored through the Company’s Management Review process and reported upon annually in this plan.

Definitions – This section defines any terms or phrases necessary for full comprehension of an indicator by the public.

Detailed Description – This section describes the indicator in detail. This section may include background information, indicator rationale, and methodology used for indicator measurement.

Status in 2022– This section describes the status of the indicator based on the most current available data at the time of printing in 2023.

Acceptable Level of Variance – This section will provide details about the range of values for the indicator that is considered acceptable.

Management Strategy – This section provides a description of the chosen strategy, i.e. the elements of CBPPL’s management strategy that relate to the indicator, and links between this and other indicators.

Forecast, Predicted Results or Outcome – This section describes the long-term projection of future indicator levels. Some indicators will rely on complex computer models to satisfy the forecasting requirements, whereas others will rely on more simple methods. Forecasts will include, where appropriate, links to other indicators, and potential external factors that could affect indicator performance.

Implementation Schedule – This section outlines required actions for the successful tracking of each indicator. Where specific actions are required, this section identifies tasks, responsibilities and deadlines.

Monitoring / Reporting – This section outlines the frequency at which the indicator will be reported upon, as well as the frequency of monitoring/review. Sources of information necessary for reporting on the indicator are listed.

Links with Strategic and Operational Plans – This section identifies linkages between the indicator and the Newfoundland and Labrador Sustainable Forest Management Strategy, Five-Year Operating Plans, and Annual Operating Plans.

Indicator 1.1.2 AAC Harvested

Objective	1.0 Forest Management Planning
Performance Measure	1.1 Program Participants shall ensure that forest management plans include long-term harvest levels that are sustainable and consistent with appropriate growth-and-yield models.

Indicator:	1.1.2	Target	Acceptable Level
Proportion of the calculated long-term sustainable harvest level that is being harvested.		To harvest no more than 100% of the AAC over a 5- year period.	Not to exceed the AAC over a 5-year period
		Resource Person:	District Planner

Definitions

AAC – ANNUAL ALLOWABLE CUT – The volume of timber that can be harvested each year on a sustainable level, considering only the productive forest.

Detailed Description

This indicator seeks to measure the proportion of the Annual Allowable Cut harvested from CBPPL limits and a figure is provided annually for this indicator. It can be assumed that harvesting the entire AAC will provide the maximum possible amount of timber-related benefits; however, harvesting less than the AAC will add to the production capacity of the remaining forest.

During the 2001 Wood Supply Analysis, new Computer Models were used to derive the AAC numbers for Newfoundland. These models are known as Woodstock and Stanley. The new advantage of the Stanley Model is that it allows us to produce a spatial model of our forest and see on maps how and where the forest changes over time. With this new model our AAC was also broken down into three classes: Base AAC includes the timber stands we believe are readily accessible under normal operating conditions; Partition AAC is made up of small-scattered stands less than 50 hectares in size that cannot be blocked by Stanley using current spatial parameters; Class III AAC encompasses timber stands that are isolated and on steep slopes, making them very difficult and costly to harvest.

During the 2006-2010 Wood Supply Analysis productive forestland on the island was categorized as either Class I (available for harvest) or Class III (partially available for harvest). The calculated AAC accommodates constraints such as including an Operable Growing Stock Buffer, where in any harvest period no more than half of the accessible timber volume available may be harvested. Another constraint incorporated into the AAC calculation is the Old Forest Target, where 15% of the total productive forest within a Forest Management District must be older than 80 years. Along with these constraints, the AAC also takes into account areas that are protected due to the requirement to leave a buffer on water bodies, wildlife corridors and provincial and federal reserves.

During the 2011-2016 Wood Supply Analysis, productive forest on the island was categorized similar to the 2006-2010 analysis, i.e., as either Class I (available for harvest) or Class III (partially available for harvest). During the 2016-2020 Wood Supply Analysis, productive forest on the island was categorized as either Core (available for harvest) or Operational (partially available for harvest).

Actual volumes harvested in any one year are updated by Oct. 15 of the following year. If the actual harvest is greater than the AAC for one year, an adjustment will be made in the following year. AACs are calculated for a five-year period, with harvest figures being based on CBPPL’s Report of Past Annual (ROPA) for those years.

Status in 2022

To reduce the time-consuming procedure of doing a complete island wide wood supply every five years, it was decided by Gov. to adjust the wood supply time frame to coincide with the five-year plan zones (5YP). To accommodate this, the AAC tables had to be modified for each district. Zone 3 FMD 5 & 6 (2022-2026), Zone 5 FMD 10 (2021-2025), Zone 6 FMD 14 & 15 (2017-2023), and Zone 7 FMD 9 & 16 (2022-2026). The tables will be modified each year until all the five-year plan timelines are met. The government released the new AAC numbers to CBPPL April 1, 2022. No change to the softwood numbers and only a slight decrease to the hardwoods.

Table 5. Softwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 5, 6, 9, & 16 for 2017-2021.

Forest Mgmt. District	Total Available (Net) (M3/Yr.)	Harvested 2017	Harvested 2018	Harvested 2019	Harvested 2020	Harvested 2021	Harvested 2017 - 2021 (Ave./Yr.)	% of AAC Harvested 2017-2021*
5	53,326	18,496	24,791	34,483	36,694	42,329	31,359	58.8
6	69,342	0	0	0	0	0	0	0
9	169,248	131,102	209,990	68,814	156,077	177,921	148,781	87.9
16	139,400	128,220	121,768	119,905	79,006	94,706	108,721	77.9
Total	431,316	277,818	356,549	223,202	271,777	314,956	288,860	66.9

* In any one year the harvest may exceed the AAC, but the average for the 5 years cannot exceed the AAC available.

Table 6. Softwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 14 & 15 for 2019-2023.

Forest Mgmt. District	Total Available (Net) (M3/Yr.)	Harvested 2019	Harvested 2020	Harvested 2021	Harvested 2022	Harvested 2023	Harvested 2019 - 2023 (Ave./Yr.)	% of AAC Harvested 2019-2023*
14	122,262	811	26	15,565	0	0	5,467	2.6
15	283,431	213,600	189,791	196,432	0	0	199,941	42.3
Total	405,693	214,411	189,817	211,997	0	0	205,408	43.4

* In any one year the harvest may exceed the AAC, but the average for the 5 years cannot exceed the AAC available.

Table 7. Softwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 10 for 2021-2025.

Forest Mgmt. District	Total Available (Net) (M3/Yr.)	Harvested 2021	Harvested 2022	Harvested 2023	Harvested 2024	Harvested 2025	Harvested 2021 - 2025 (Ave./Yr.)	% of AAC Harvested 2021-2025*
10**	49,119	3,172	0	0	0	0	634	1.2
Total	49,119	3,172	0	0	0	0	634	1.2

* In any one year the harvest may exceed the AAC, but the average for the 5 years cannot exceed the AAC available

** No volumes to report in FMD-10 as the five year plan is for 2021-2025

Table 8. Hardwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 5, 6, 9, & 16 for 2017-2021.

Forest Mgmt. District	Total Available (Net) (M3/Yr.)	Harvested 2017	Harvested 2018	Harvested 2019	Harvested 2020	Harvested 2021	Harvested 2017 - 2021 (Ave./Yr.)	% of AAC Harvested 2017-2021*
5	3,750	800	4,101	603.50	70	18	1,118.5	29.8
6	2,730	0	0	0	0	0	0	0
9	5,050	612	0	54	1,189	5,162	1,403	27.7
16	1,300	0	0	655	0	721	275	21.1
Total	12,830	1,058	4,101	1,312.5	1,259	5,901	2,726	21.2

* In any one year the harvest may exceed the AAC, but the average for the 5 years cannot exceed the AAC available.

Table 9. Hardwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 14 & 15 for 2019-2023.

Forest Mgmt. District	Total Available (Net) (M3/Yr.)	Harvested 2019	Harvested 2020	Harvested 2021	Harvested 2022	Harvested 2023	Harvested 2021 - 2023 (Ave./Yr.)	% of AAC Harvested 2021-2023*
14	5,000	6,898	7,389	233	0	0	4,840	58
15	3,180	506	2,037	422	0	0	988	18.6
Total	8,180	7,404	9,426	655	0	0	5,828	42.7

* In any one year the harvest may exceed the AAC, but the average for the 5 years cannot exceed the AAC available.

Table 10. Hardwood Annual Allowable Cut (AAC) Available and AAC Harvested by Forest Management District 10 for 2021-2025.

Forest Mgmt. District	Total Available (Net) (M3/Yr.)	Harvested 2021	Harvested 2022	Harvested 2023	Harvested 2024	Harvested 2025	Harvested 2021 - 2025 (Ave./Yr.)	% of AAC Harvested 2021-2025*
10**	0	0	0	0	0	0	0	0
Total	160	0	0	0	0	0	0	0

* In any one year the harvest may exceed the AAC, but the average for the 5 years cannot exceed the AAC available.

** No volumes to report in FMD-10 as the five year plan is for 2021-2025

Management Strategy

It is our intention not to harvest 100% of the AAC available to CBPPL. The most recent Wood Supply analysis was conducted in 2022, resulting in an AAC for Corner Brook Pulp and Paper Limited reportable in 2021.

Since 2001 we have not harvested 100% of our available Base and Partition AAC; however, we have been able to harvest a portion of our Operational AAC.

Forecast, Predicted Results or Outcome

CBPPL will not harvest 100% of our AAC.

Implementation Schedule

Task	Details	Responsibility	Frequency
Update harvests.	Cutover Updates are used to verify what volumes were harvested from the DFA by operating area and Forest Management District.*	District Planner	Annually

* Procedure- The volumes harvested each year in each AAC class are determined by overlaying the updated cutover layer on an AAC Code layer developed by the provincial forestry department. This AAC layer shows what AAC

class each stand in the land base belongs to. The overlay is then used to determine the percentage of each AAC class harvested by area. The volume delivered (by Forest Management District) is proportionalized by the % area harvested in each AAC class. Therefore, if 60% of the harvested area in Forest Management District 15 was Base AAC, then 60% of the delivered volumes from that district would be Base AAC. This procedure is done as part of an annual AAC rationalization analysis.

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in the SFM Plan	Annually	Annual Updates

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
Establishing and maintaining long-term sustainable wood supply levels for each management district is a goal identified in this document.	This plan documents the five-year AAC figure and its distribution over the five-year period by district.	This plan documents the specific areas in each district in which the AAC will be harvested.

Indicator 1.2.1 Working Groups

Objective	1.0 Forest Management Planning
Performance Measure	1.1 Program Participants shall ensure that forest management plans include long-term harvest levels that are sustainable and consistent with appropriate growth-and-yield models

Indicator:	1.2.1	Target	Acceptable Level
Forest area by type or species composition		To maintain representation (by area) of current working groups close to current levels. Report on area of wetlands, and other non-forest ecosystem types.	To be within the set range for each of the working groups. (See Acceptable Level of Variance)
		Resource Person:	District Planner

Definitions

FOREST STAND – A group of reasonably homogeneous trees that can be differentiated from surrounding stands by its age, composition, structure, site quality, or geography.

WORKING GROUP – A code that represents the **predominant** tree species of a forest stand. In the forest inventory database all forest stands are categorized by working group, as well as other measured features (e.g. height, crown density, etc.). The working group code is determined based on plot data and photo interpretation. The working groups present in the CBPPL DFA are:

<u>Working Group</u>	<u>Code</u>	<u>Working Group</u>	<u>Code</u>
Balsam Fir	bF	Black Spruce	bS
Engelmann Spruce	eS	Hardwood Softwood	hS
Jack Pine	jP	Red Maple	rM
Red Pine	rP	Softwood Hardwood	sH
Trembling Aspen	tA	White Birch	wB
White Pine	wP		

SPECIES COMPOSITION – A code that represents the tree species that comprise a forest stand. These codes are made up of one, two or three species. One species (e.g. bF) indicates that 75-100% of the basal area in the stand is comprised of the identified species. Two species (e.g. bFwB) indicates that 50-75% of the basal area in the stand is comprised of the first identified species, while the remaining basal area is comprised of the second identified species. Three species (e.g. bFbSwB) indicates that 40% of the basal area in the stand is comprised of the first identified species, 30% is comprised of the second identified species, and 30% is comprised of the third identified species. The following is a list of species recognized in the inventory:

Species	Code	Species	Code
Balsam Fir	bF	Red Pine	rP
Black Spruce	bS	Scots Pine	sP
Balsam Poplar	bP	Sitka Spruce	sS
Engelmann Spruce	eS	Tamarack/Larch	tL
European Larch	eL	Trembling Aspen	tA
Jack Pine	jP	White Birch	wB
Japanese Birch	jB	White Pine	wP
Japanese Larch	jL	White Spruce	wS
Lodge pole Pine	lP	Yellow Birch	yB
Red Maple	rM		

Detailed Description

For this indicator, the area will be measured in hectares for each working group. (Species composition is too specific of a measure and results in excessive data, which in turn renders it difficult to set targets at this level.) Each set of species compositions has been “rolled up” to a working group using the provincial Forestry Services Branch Working Group Determination definitions (Table 7 below). Each area measurement for each working group will also be expressed as a percent.

Table 7. Working Group Definitions

Species Compositions in Each Working Group (bold)								
bF	bS	sH	sH cont'd.	hS	hS cont'd.	tA	eS	wB
bF	bFbStL	bFbSrM	bSwBwS	bFrMwB	wBtAbS	bP	rS	wB
bFbS	bFbSwP	bFbStA	bSwPwB	bFtAwB	wBtAtL	tAwB	sP	wBrM
bFbSwS	bFtLbS	bFbSwB	bSwStA	bFwBrM	wBtAsP	tA	sPjP	wBrMtA
bFtL	bS	bFrM	bSwSwB	bFwBtA	wBtAwS		sS	wBtA
bFwP	bSbF	bFtA	bSyB	bFwByB	wBtL	jP	sSbS	wByB
bFwPbS	bSbFrP	bFtAbS	tAbFbS	bFyBwB	wBsW	jP	sSsP	yB
bSbFwS	bSbFtL	bFtLwB	tAbSbF	bSrMtA	wBwStA	jPnS	jB	yBtA
wS	bSbFwP	bFwB	tAbStL	bStArM	wBwSyB			yBwB
wSbF	bSjB	bFwBbS	tAbSwS	bStAwB	wByBbF	rM		
wSbFbS	bSjP	bFwBtL	tAtLbS	bWwBrM	wByBwP	rMwB		
wSbS	bSIP	bFwBwP	tLbSwB	bSwBtA	wByBwS			
wSbSbF	bSrP	bFwBwS	tLrM	rMbS	wSwBrM			
wSjL	bSsP	bFwPwB	tLrA	rMtAbS	yBbF			
wSsP	bSsS	bFwStA	tLwB	rMwBbF	yBbFwB			
wStL	bStL	bFwSwB	tLwBbS	tAbF	yBbS			
	bStLbF	bFwSyB	wBbFbS	tAbFwB	yBwBbF			
	bStLwS	bFyB	wBbFtL	tAbS	yBwBbS			
	bSwP	bSbFrM	wBbFwP	tAbSwB	yBwBwP			
	bSwPbF	bSbFtA	wBbFwS	tAwBbF	yBwBwS			
	bSwS	bFbSwB	wBbSbF	tAwBwS	yBwS			

Species Compositions in Each Working Group (bold)								
bF	bS	sH	sH cont'd.	hS	hS cont'd.	tA	eS	wB
	bSwSbF	bSjPtA	wBbStL	tAwBbS				
	jL	bSrM	wBbSwS	tAwS				
	jLbS	bSrMtL	wBtLbS	sWbF				
	jLeLtL	bStA	wBwSbF	wBbFtA				
	rP	bStAbF	wBwSbS	wBbFyB				
	rPbS	bStAtL	wPwB	wBbS				
	sPrPjP	bStAwS	wSbSwB	wBbSrM				
	tL	bStLrM	wStA	wBbStA				
	tLbF	bStLtA	wSwB	wBbSyB				
	tLbFbS	bStLwB	wSwBbF	wBrMbS				
	tLbS	bSwB	wSwBbS	wBrMbF				
	tLbSbF	bSwBbF	wSwPwB	wBrMtL				
	tLbSwS	bSwBsS	wSyB	wBrMwS				
	tLwS	bSwBtL	yBbSbF	wBtAbF				
	wSbSjP							

This indicator can only be updated after calculation of the wood supply, which occurs every five years. This indicator was initiated in 2004, based on the 2001 wood supply, and reported only productive forest. The first update to report on productive forest, and non-productive forest and non-forest area was in 2010, and it reflected a significant land sale (>500,000ha) back to the Crown and changes in exchanges and transfers in Forest Management Districts (FMD) 6, 9, & 15. The resultant Defined Forest Area (DFA) was 1,493,403 ha. Since 2010 there has been numerous changes to our total DFA. The most recent being 2020 which included the reduction of FMD-06 by over half of CBPPL timber rights and the addition of half of FMD-10. Currently our DFA is 1,360,183 ha.

Status in 2022

The area of Corner Brook Pulp and Paper's timber limits (DFA) is represented in the following tables for 2022 as: working groups in productive forest; and non-productive forest, non-forested land, and water. The total area is 1,360,183 hectares (no change from 2021).

Tables 9 and 10 show that in 2022 all working groups have been maintained within the acceptable level of variance. There are nominal changes in the non-productive and non-forest areas as well. The new wood supply data for 2021-2025 has not been available for the last three years at the time this report was updated. The most current government updates were used to calculate the data.

Table 8. Area of productive forest present on the DFA, 2022.

Working Group	Total Area (ha)	Percent of Productive Forest Area on the DFA (693,045 ha)	Percent of Total Area on the DFA (1,360,183 ha)
bF	277,911	40.1	20.4
bS	183,934	26.5	13.5
DI¹	129,420	18.7	9.5
sH	69,944	10.1	5.1
hS	23,882	3.4	1.8
wB	7,208	1.0	0.5
tA	441	0.1	0.0
jP	397	0.1	0.0
eS	11	0.0	0.0
eL	3	0.0	0.0
rM	2	0.0	0.0
Total	693,153	100	50.9

¹ Disturbed by insects or fire

² Not sufficiently stocked

Table 9. Non-productive Forest Area Summary, 2022

Stand ID - Description	Total Area (ha)	Percent of Total Area on the DFA (1,360,183 ha)
Softwood Scrub	335,578	24.7
Bog	119,709	8.8
Water	109,548	8.1
Soil Barren	43,812	3.2
Wet Bog	23,145	1.7
Rock Barren	22,106	1.6
Treed Bog	4,327	0.3
ROW (Transmission)	1,775	0.1
Cleared Land	2,346	0.2
Residential Land	2,141	0.2
ROW (Road)	1,436	0.1
Agricultural Land	486	0.0
Sand	400	0.0
Small Island	221	0.0
Total Non-Productive Area (ha):	667,030	49.1

The information in the above tables has been grouped into major categories and is represented in Figure 4.

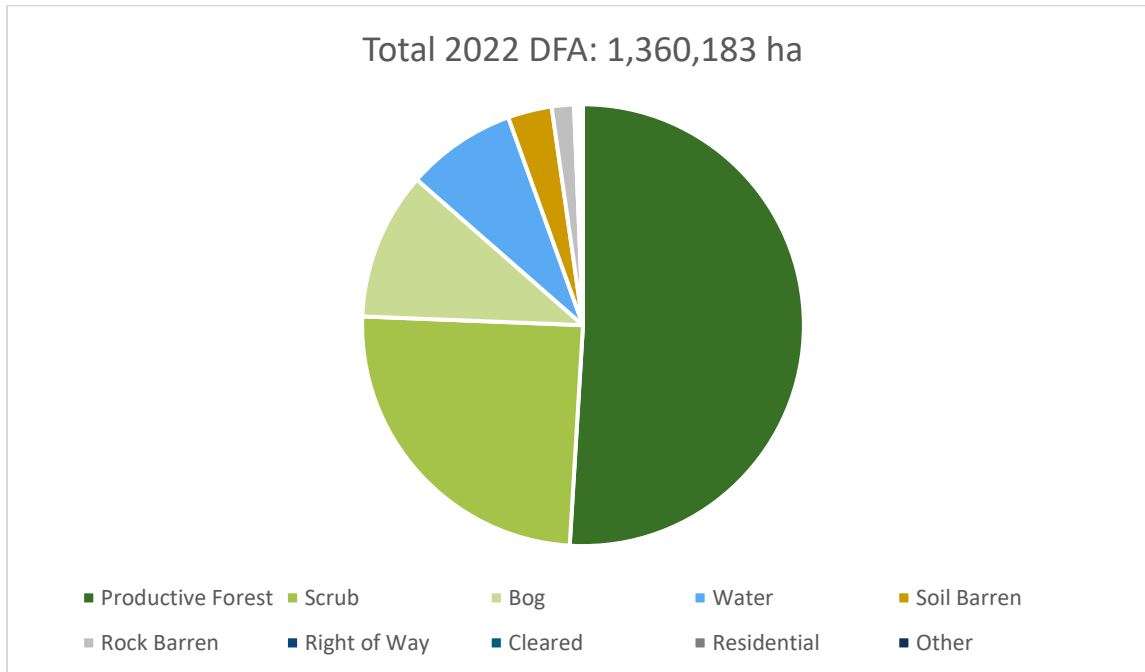


Figure 4. General land and water classes on the DFA as of December 31, 2022.

For comparison, the following tables represent working groups in productive forest and non-productive forest, non-forested land, and water for the base year of 2010, and for the years when the data was updated using the 2011 wood supply for 2012 and the government updates for 2020. For each working group and stand ID, a percentage of the DFA is indicated. The percent change from the base year (2010) to 2012 and 2022 is also indicated. The results indicate there was little change in all stand types.

Table 10. Comparison of Productive Forest on the DFA by Working Group

Working Group	2010	2012		2022	
	% of the DFA	% of the DFA	Change of % From Base Year	% of the DFA	Change of % From Base Year
Balsam Fir (bF)	23.6	22.9	- 0.7	20.4	- 3.2
Black Spruce (bS)	15.4	15.0	- 0.4	13.5	- 1.9
Disturbed by Insects (DI)	4.1	4.6	+ 0.5	9.5	+ 5.4
Softwood/Hardwood (sH)	3.6	3.8	+ 0.2	5.1	+ 1.5
Not Sufficiently Stocked (NS)	1.8	1.8	0.0	1.8	+0.2
Hardwood/Softwood (hS)	1.6	1.6	0.0	0.5	-0.3
White Birch (wB)	0.8	0.7	- 0.1	0.0	0.0
Trembling Aspen (tA)	0.0	0.0	0.0	0.0	0.0
Jack Pine (jP)	0.0	0.0	0.0	0.0	0.0
Engelmann Spruce (eS)	0.0	0.0	0.0	0.0	0.0
European Larch (eL)	0.0	0.0	0.0	0.0	0.0
Red Maple (rM)	0.0	0.0	0.0	0.0	0.0
Total Productive Area	50.9	50.5		50.8	

2010 data based on a DFA of 1,493,403 ha
 2012 data based on a DFA of 1,418,922 ha
 2019 data based on a DFA of 1,399,901 ha
 2020 data based on a DFA of 1,360,183 ha
 2021 data based on a DFA of 1,360,183 ha
 2022 data based on a DFA of 1,360,183 ha

Table 11. Comparison of Non-productive Forest and Non-forest Area on the DFA by Stand ID

Stand ID	2010	2012		2022	
	% of the DFA	% of the DFA	Change of % From Base Year	% of the DFA	Change of % From Base Year
Softwood Scrub	22.7	22.9	+ 0.2	22.1	-0.6
Bog	10.7	10.6	- 0.1	8.8	-1.9
Water	7.6	7.5	- 0.1	8.1	+ 0.5
Soil Barren	2.6	2.7	+ 0.1	3.2	+ 0.6
Wet Bog	1.2	1.3	+ 0.1	1.7	+ 0.5
Rock Barren	1.7	1.8	+ 0.1	1.6	-0.1
Treed Bog	0.7	0.7	0.0	0.3	- 0.4
ROW (Transmission)	0.1	0.1	0.0	0.1	0.0
Cleared Land	0.1	0.1	0.0	0.2	+0.1
Residential Land	0.1	0.1	0.0	0.2	+0.1
ROW (Road)	0.1	0.1	0.0	0.1	0.0
Agricultural Land	0.1	0.1	0.0	0.0	-0.1
Sand	0.0	0.0	0.0	0.0	0.0
Small Island	0.0	0.0	0.0	0.0	0.0
Hardwood Scrub	1.1	1.1	0.0	N/A	N/A
Not Interpreted	0.3	0.3	0.0	N/A	N/A
Total Non-productive/non-forest Area	49.1	49.5		50.2	

2010 data based on a DFA of 1,493,403 ha
 2012 data based on a DFA of 1,418,922 ha
 2019 data based on a DFA of 1,399,901 ha
 2020 data based on a DFA of 1,360,183 ha
 2021 data based on a DFA of 1,360,183 ha
 2022 data based on a DFA of 1,360,183 ha

Target

The target is to maintain representation of current working group classes close to current levels. Maintaining these levels would be based on factors that can be controlled by CBPPL. Natural phenomena such as insect infestation, blow-down, or forest fires would not fall under the category of factors that can be controlled. We will also report on the areas of wetlands and other non-forest ecosystems.

Acceptable Level of Variance

The terms major and secondary are used here to classify working groups with respect to the relative area they represent on the land base.

Major working groups:

- bF will be maintained at $\pm 10\%$ of current area.
- bS will be maintained at $\pm 10\%$ of current area.
- sH will be maintained at -10% to $+25\%$ of current area.
- Secondary working groups (all others) will be maintained within $\pm 25\%$ of the current area.

Management Strategy

To maintain representation of current working group classes close to current levels, CBPPL can only control in what working groups they harvest wood, and ensure that cutovers regenerate to the same working group. Factors out of the company's control include natural phenomenon as mentioned above, but also how stands are interpreted from one inventory to the next, and land base changes through exchanges and transfers.

Current areas of working groups will be based on the inventory available at the time (the government aims to inventory each Forest Management District on a 10-year cycle). The variance will be based on the wood supply model.

CBPPL Woodlands will continue to harvest AAC in the DFA within the levels set forth by government (Indicator 2.2.2). A 25-Year Spatial Plan is developed by CBPPL staff and submitted to the government for approval. This plan will ensure CBPPL stays within the assigned AAC levels. The government re-calculates the AAC every five years using the latest data possible to incorporate into the analysis. The government repeatedly monitors regeneration assumptions used in the model for required changes. This continual improvement in regeneration assumptions ensures that future projections of the areas of working groups are more reliable than in the previous model, thus providing a framework to manage this indicator more accurately with the development of each successive model.

Forecast, Predicted Results or Outcome

As is indicated in tables 9 and 10 above, the working groups bF, bS and sH will continue to maintain their current area plus or minus the acceptable level of variance. Future models will be developed to incorporate the secondary working groups as well, creating a better predictive tool to measure secondary working groups into the future, as is currently done with the bF, bS and sH working groups.

Implementation Schedule

Task	Details	Responsibility	Frequency
Update area of working groups and non-forest ecosystems	Re-assess area and percent of DFA in each working group and non-forest ecosystems	District Planner	Every five years after a new wood supply, or as the DFA footprint changes

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Every five years after a new wood supply	Every five years after a new wood supply	Provincial forest inventory
One interim review within 5-year period to determine trends, causes, explanations, and actions.	One interim review within 5-year period	Provincial forest inventory updated with recent disturbances (soft updates)

Links with Strategic and Operational Plans

20-year Strategy	5-Year Operating Plan	Annual Operating Plan
Regeneration assumptions are built into the wood supply calculation, which is used as a tool in developing this strategy. Sustaining the spruce component of regenerating forests in Newfoundland is a goal identified in this strategy.	Five-year plans are determined by the AAC. These AACs are determined by the working group composition and age class structure among other factors.	AOPs are determined by AACs, which in turn are determined by the working group composition, among other factors.

Indicator 2.1.1 Sufficiently Stocked

Objective	2.0 Forest Health and Productivity
Performance Measure	2.1 Program Participants shall promptly reforest after final harvest

Indicator:	2.1.1	Target	Acceptable Level
Proportion of areas sufficiently stocked after harvest.		To have a minimum of 97% of areas sufficiently stocked after harvest.	-3%
		Resource Person:	Silviculture and Scaling Supervisor

Definitions

STOCKING – refers to the degree or level to which disturbed forest sites are regenerated with seedlings, either by artificial means (planting or seeding) or through natural processes. *Sufficient* stocking is defined by the Province’s Minimum Stocking Standard, which states in part that the percent stocking of seedlings must be at least five percent more than stocking of merchantable trees in the pre-harvest stand, to a maximum of seventy percent stocked. Anything past the 70% stocking level would be in a “no-gain threshold”; in other words, the same volume could exist but would be spread out within a higher number of smaller diameter trees.

NATURAL REGENERATION – regeneration on disturbed forest sites occurring through natural processes. This can be in the form of “advanced regeneration” which becomes established on the forest floor or understory of a mature forest stand; or it can occur from seed dissemination *after* the disturbance has occurred.

BIOLOGICAL DIVERSITY – the variation of life forms within a given ecosystem.

GENETIC DIVERSITY - a level of biological diversity that refers to the total number of genetic characteristics in the genetic makeup of a species.

Detailed Description

Genetic diversity and biological diversity are dependent upon each other - diversity within a species is necessary to maintain diversity among species, and vice versa. Natural regeneration of harvested or disturbed areas ensures the maintenance of diversity that already exists in the ecosystem. Therefore, the *proportion of areas sufficiently stocked after harvest* can provide some measure of genetic diversity. For example, if we harvest a balsam fir stand and it regenerates naturally to balsam fir, then we can be relatively confident that the genetic diversity of this ecosystem is intact. If a fire in a balsam fir stand, results in the regeneration of white birch, genetic diversity is still present.

Regeneration surveys conducted on recent cutovers indicate the amount of regeneration present, and consequently if planting is required. Cutovers that require planting will also maintain their genetic diversity, as at least 100% of seedlings planted are produced from seed of local species.

The provincial tree nursery collects seed from enough different sources to ensure genetic diversity and does not practice genetic modification.

The genetic improvement of Newfoundland's planting stock has been researched for over 30 years. The early thrust was to identify the fastest growing, straightest, and healthiest individual trees in the wild and either collect seed or clone them by grafting branch tips. To date, over 850 of these individual trees representing 5 native species are planted in seed orchards. Currently the province is mating these superior trees with one another, trying to find the parent combinations that produce even faster growing trees. All white and black spruce seedlings grown for reforestation are "improved", that is, they come from seed produced in the province's seed orchards.

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 mixed wood 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 2005-2014 cutovers within the DFA indicates that 57% of harvested areas have adequate regeneration, i.e., stocking levels that meet the Minimum Stocking Standard, based on 42,403 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.

Status in 2022

Tree planting is undertaken in areas with insufficient stocking to ensure fully stocked stands. As of the end of 2022, 99.7% of all cutovers had been surveyed. The analysis of the 2005-2014 cutovers shows that 96.4% of the area surveyed was adequately stocked either by natural regeneration or by planting. The remaining 3.6% is regenerating, but not to fully stocked standards. Approximately 1% is scheduled for re-assessment to re-check stocking levels, and some areas are not able to be planted due to isolation or site conditions. CBPPL plants approximately 2.1 million seedlings per year.

Table 12. Percent of areas on the DFA that are sufficiently stocked.

Year	Areas Sufficiently Stocked
2008	97%
2009	94%
2010	94%
2011	95%
2012	95%
2013	96%
2014	98.7%
2015	96.1%
2016	95.1%
2017	95.6%
2018	95.6%
2019	95.7%
2020	96.1%
2021	96.1%
2022	96.4%

Acceptable Level of Variance

CBPPL will endeavour to ensure that 97% (-3%) of areas harvested are sufficiently stocked.

Management Strategy

Provincial guidelines stipulate that regeneration assessments should be made within 5 years of harvesting, and that areas not sufficiently stocked must be brought up to stocking standards. Depending on the nature of the area, these assessments are sometimes done 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 the provincial government.

By ensuring harvested areas are sufficiently stocked, either through natural regeneration or planting, CBPPL will ensure the maintenance of genetic diversity.

Forecast, Predicted Results or Outcome

Based on historic patterns, we would anticipate that natural regeneration will continue to be a dominant factor in overall softwood stocking levels. The extent to which natural regeneration coupled with tree planting will approach this level will be determined as we compile our regeneration status reports.

Implementation Schedule

Task	Details	Responsibility	Frequency
Prepare indicator report on stocking*	Indicator report should be prepared every year	Silviculture and Scaling Supervisor	Annually

* For procedures see *Regeneration Assessment Procedures for Newfoundland and Labrador* and *A Regeneration Stocking Standard for Newfoundland and Labrador*, both in the *Forest Regeneration Binder*.

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in Indicator Report	Annually (after completion of report).	Regeneration stocking surveys.

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
Assumptions relating to natural regeneration levels on various site types within the province are used in the calculation of the Annual Allowable Cut. Planting areas that do not regenerate naturally following disturbance is a goal identified in this Strategy.	5-Year tree-planting operating plans are in place based on historic natural regeneration levels by site type.	Annual tree-planting plans are developed based on regeneration survey results from the previous year. Annual planting activities are relatively predictable and in line with the 5-year plan and the 20-year Strategy outlooks.

Indicator 2.1.3 Non-native Tree Species

Objective	2.0 Forest Health and Productivity
Performance Measure	2.1 Program Participants shall promptly reforest after final harvest

Indicator:	2.1.3	Target	Acceptable Level
Proportion of regeneration comprised of native species;		On a five-year basis, to average no more than 0.1% annually, and 5% at any given time, of the productive forest land base of the DFA regenerated with non-native species.	0.03% annually
		Resource Person:	Silviculture and Scaling Supervisor

*A decrease in the area of the DFA could cause an increase in the percentage.

Definitions

INDIGENOUS TREE SPECIES – Tree species that are native to a specific geographic area. Such species are regenerated through either natural processes or artificial means including direct seeding, or through use of planting stock grown from local (native species) seed sources.

NON-NATIVE TREE SPECIES – Tree species that are not native to a specific geographic area.

Detailed Description

A cornerstone of biological diversity, conservation is the retention and maintenance of natural ecosystems. As indigenous tree species form a huge component of these natural (forest) ecosystems, it is important that these native species continue to predominate across the DFA. Indigenous species have evolved and adapted over time to the various site conditions, climatic factors and disturbances peculiar to our local area, and as such, have a considerable measure of resilience.

Approximately 65% of disturbed sites in the DFA regenerate naturally. This is particularly true for balsam fir forest types whose regeneration success rate averages 85%. While there is also a certain level of natural regeneration on black spruce sites (45%), these areas are more prone to insufficient stocking levels as black spruce is a fire-origin species, requiring forest fires to open their cones for natural regeneration. Generally, black spruce areas with insufficient regeneration are planted with black spruce seedlings grown from local seed.

Norway spruce have typically been planted on rich, balsam fir sites that have been infested with balsam wooly adelgid, which causes severe, long-term stunting of growth. The balsam fir adelgid

is itself a non-native insect and at present there is no recourse for treatment. The only option is stand replacement with an alternate species. In such cases, the spruces have been the species of choice, with Norway and White Spruce performing the best.

Status in 2022

In 2022, there was only native black spruce and white spruce seedlings planted on the DFA. Therefore, the annual target of no more than 0.1% non-native species was met. The total planting of non-native species to date is 1,668 ha. This translates to 0.241% of the productive forest portion of the DFA. This is well below the aim to not exceed 5% of productive forest land regenerated with non-native species at any given time. Table 13 shows the proportion of non-native species planted on the DFA in the past.

Table 13. Portion of non-native species planted as a percentage of the total productive forest on the DFA.

Year	Percent for Year	Percent Total
2009 ¹	0	0.119
2010 ²	0.028	0.184
2011	0.023	0.207
2012 ³	0	0.220
2013	0	0.220
2014 ⁴	0	0.220
2015	0	0.220
2016	0	0.220
2017 ⁵	0	0.226
2018	0	0.226
2019	0	0.226
2020 ⁶	0.013	0.241
2021	0	0.241
2022	0	0.241

¹ Productive forest up to 2009 was ~1,000,000ha. ⁴ Productive forest was ~715,535ha.

² Productive forest was ~760,000ha.

⁵ Productive forest was ~696,509ha.

³ Productive forest was ~716,000ha.

⁶ Productive forest was ~693,045ha

Management Strategy

Tree planting is a deliberate forest management activity, and it is fully within the control of CBPPL.

Forecast, Predicted Results or Outcome

As tree planting is entirely within our control, there is no reason why we cannot be within the defined target range.

Implementation Schedule

Task	Details	Responsibility	Frequency
Report on regeneration	Determine the proportion of non-native species on the DFA through regeneration reports	Silviculture and Scaling Supervisor	Annually
Survey existing Norway spruce planted areas	Determine if existing Norway Spruce on the DFA are self-regenerating	Silviculture and Scaling Supervisor	Every 5 years

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Report on number annually in Indicator Report	Annually	Tree planting records
Every 5 years	Every 5 years	Norway spruce monitoring records

Links with Strategic and Operational Plans

Provincial Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
This Strategy makes provision for the use of non-invasive, fast-growing, non-native species as a means to partially satisfy increased long-term fibre demands, and to offset the loss of productive forest land to non-industrial consumption.	N/A	Tree planting species is typically decided or planned on an annual basis.

Indicator 2.3.3 Downed Woody Material

Objective	2.0 Forest Health and Productivity
Performance Measure	2.3 Program participants shall implement forest management practices to protect and maintain forest and soil productivity

Indicator:	2.3.3	Target	Acceptable Level
Level of downed woody material		To leave a minimum of 10% of the Annual Operating Plan area, by district, in residual structure after harvesting activities.	N/A
		Resource Person:	District Planner

Definitions

ANNUAL OPERATING PLAN (AOP) – All operating areas planned for harvest across the DFA in one year.

RESIDUAL STRUCTURE¹: Elements such as living trees (individuals or patches), snags, cavity trees, downed woody material and plants that are left behind following a harvest operation to maintain the biological legacies of the stand.

SNAGS are dead or dying standing trees. They are utilized by a wide range of wildlife for nesting (primarily cavity nesters) and for foraging. Species include a wide variety of small mammals, different forest birds and owls, and a wide range of insects and fungi communities that function as the prey base for many other species. There are three aspects of snag management that need to be considered: quantity, quality and distribution.

WILDLIFE TREES: Trees with a minimum height of 2.0m and a minimum diameter at breast height of 10cm.

Detailed Description

Dead wood is an important component of a healthy forest ecosystem. Live trees can blow down and die, or trees can die standing (snags). These snags serve as important habitat for a wide range of decomposing organisms, as well as cavity-nesting species such as woodpeckers. Coarse woody material includes both downed woody material and standing trees that have been left to allow the woody material to decompose, both resulting in organic matter that eventually becomes part of the soil. Living trees may be left as well, with the intent that they will be dead or dying by the next rotation. Downed woody material can be managed by leaving both dead and live trees, downed decayed stems, as well as residual structure, during a harvesting operation.

¹ From Forest Stewardship Council Canada Working Group National Boreal Standard, Version August 6, 2004.

The amount of downed woody material left on site is, in part, a factor of the harvesting system used. CBPPL uses a shortwood harvesting system whereby all trees are felled, limbed, topped, and cut into 2.5 metre lengths in the woods. This means that only the merchantable wood is brought to roadside, and everything else is left on the cutover as downed woody material. Leaving snags and wildlife trees in harvested operating areas can also eventually contribute to downed woody material. A third way forest management planning can contribute to downed woody material is to plan for residual retention.

CBPPL manages “for the retention of stems or residual structure to be left after stand management activities in normal or salvage operations (following natural disturbances).” Maintaining residual structures in sufficient quantities and distribution will fulfill their ecological functions. One of these functions is to provide downed woody material.

Status in 2022

Downed woody material can be managed by residual structures during a harvesting operation. Cutover updates are required to report residual structure, and for any one year, cutover updates will be completed shortly after the harvest operation is finished. The following table reports on residual structure left on operating areas after harvest. CBPPL has left the minimum (and in most cases well above the minimum) of 10% of the operating area in residual structure after harvesting activities.

Table 14. The amount of residual structure retained in harvest operations as a percent of the Annual Operating Plan area, by District.

Year	Forest Management District						
	5	6	9	10	14	15	16
2014	19	42	24	N/A	N/A	33	*
2015	N/A	34	40	N/A	51	31	35
2016	N/A	35	33	N/A	16	19	*
2017	87	N/A	81	N/A	98	52	66
2018	97	N/A	86	N/A	99	90	94
2019	96	N/A	95	N/A	N/A	92	91
2020	95	N/A	94	94	N/A	93	92
2021	96	N/A	93	99	99	95	96
2022	99	N/A	95	95	98	98	94

N/A – No harvesting in that district in that year

* - Unavailable

Management Strategy

CBPP is committed to continuous environmental improvement of its woodlands operations. Through managing for within-stand structural retention, the company will be able to contribute to downed woody material and ultimately ecosystem diversity, a process that involves more than a supply of fibre for the mill.

The company’s management strategy for retaining residual structure is outlined in detail in Standard Operating Procedure PL-07. It involves four stages:

1. During the office preparation stage, Planners identify leave areas such as riparian and other required buffers, and harvest deferral areas.
2. On the ground, during their pre-harvest operational layout, Contractor Foremen identify leave areas such as insular and peninsular patches and small blocks of inaccessible timber.
3. During the actual harvesting, Harvester Operators leave areas around wet or soft sites, steep slopes, ledges or drop-offs, bird nests, and denning sites.
4. After harvest is complete the best available information will be used to create cutover updates, using sentinel which is satellite imagery. The cutover mapping stage will capture the remaining residual retention areas left for a variety of reasons.

An evaluation of the level of retention can be determined after the final stage, based on a sample of the harvested areas in each district where harvesting occurred.

Forecast, Predicted Results or Outcome

CBPPL conducts exercises to determine the amount of productive residual structure left on operating areas after harvest. Results show that in western Newfoundland, due to the topography, at least 10% of the operating area is already left in residual structure due to buffers, harvest deferral areas, steep slopes, ledges or drop-offs, and inaccessible timber. In some areas of central Newfoundland, however, efforts must be made to ensure the appropriate amount of residual structure remains after harvest. CBPPL is committed to reach the target set for residual structure. In addition, we expect to maintain the high level of downed woody material that currently exists in CBPPL cutovers after harvest solely as a result of the short-wood harvesting system used.

Implementation Schedule

Task	Details	Responsibility	Frequency
Retain residual structure on operating areas	Follow stages outlined in SOP PL-07 to retain at least 10% of the operating area in residual structure.	District Planner	Annually
Evaluate level of retention	After cutover photography is available by using the sentinel explorer program, then we determine the level of retention of residual structure.	District Planner	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in SFM Plan	Annually	Results of evaluation

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
The Strategy is largely grounded in the promotion of integrated forest management. This project is totally in line with these integrated forest management principles.	The 5-year operating plan identifies harvesting and silviculture treatment areas, and as such, would identify the stand types where operations will occur over the next 5 years.	The link to our annual operating plan is similar to the 5-year plan link, only on a more site-specific basis.

Indicator 2.3.5 Soil Disturbance

Objective	2.0 Forest Health and Productivity
Performance Measure	2.3 Program Participants shall implement forest management practices to protect and maintain forest and soil productivity

Indicator:	2.3.5	Target	Acceptable Level
Level of soil disturbance		1. Minimize soil disturbance on the harvested land base to less than 6% of the Annual Operating Plan (AOP) area 2. Ensure roads are built within CBPPL specifications	1. No greater than 6% of the Annual Operating Plan area 2. No more than 0.5m greater than the road specification
		Resource Person:	Roads Planning Technician

Definitions

ANNUAL OPERATING PLAN (AOP) – All operating areas planned for harvest across the DFA in one year.

COMPACTION – the increase in soil density resulting from repeated passes by heavy equipment.

OPERATING BLOCK – a specific operating area within the AOP, e.g., Dawes Pond.

RUTTING – occurs when the bearing capacity of the soil is exceeded by logging equipment. This is most common on wet sites. The wheels/tracks of the machine break through the surface of the soil making indentations commonly known as ruts.

SOIL DISPLACEMENT – The mechanical movement of soil from one area to another.

SOIL DISTURBANCE – The exposure of mineral and organic soils and the depositing of mineral or organic soils on top of undisturbed soil. On the DFA, this is due to construction of primary and secondary haul roads and the travel of tree harvesting, extraction, and site preparation equipment. Such equipment can compact, rut, gouge and scuff the forest floor resulting in immediate disturbance, or later disturbance through soil erosion.

SCARIFICATION – A method of site preparation for planting. Scarification is often used on cutovers not naturally regenerated, to remove heavy logging debris or deep organic soils, so that optimal planting sites are exposed.

Detailed Description

Ground disturbance refers to a change in the natural state of the soil caused by an artificially imposed force. Forest activities can lead to soil disturbances that include compaction, rutting, and soil displacement. In addition to the negative visual image associated with ground disturbance, other negative effects include reduced opportunities for regeneration, reduced site productivity, and the potential for surface soil movement by means of erosion.

Although an extraction trail may exhibit soil disturbance characteristics, depending on the type and amount of disturbance, it may be more of a benefit to seedling development than a hindrance. For example, areas where the organic layer has been removed, and the mineral soil exposed, is often quite comparable to scarification. Not all soil disturbances are negative resulting in area taken from production.

Sampling procedures adopted from the Forestry Services Branch provide a quantitative assessment for soil disturbance. Criteria for soil disturbance include compaction, soil displacement, and rutting.

In 2002 as part of CBPPL's EMS program, an assessment survey to measure soil disturbance on CBPPL's harvesting areas was commenced. Approximately 10 % of the 2002 cutovers were measured. Upon analyzing the data collected from the first year surveys, it was calculated that an average of 4.88% of the total operating area sustained soil disturbance on the cutover. As expected, summer harvest areas have significantly more soil disturbance than winter cutovers. The data also showed a correlation between each of harvest system type, soil type, and season (wetness of the ground) and the level of ground disturbance.

In 2004, the method to assess soil disturbance was revised to enable us to better determine the real negative impacts of soil disturbance. In August of 2004, the soil disturbance program was combined with the Fibre Recovery Program for the following reasons:

- Traditional procedures for assessing soil disturbance were very time consuming (involved a detailed measure of all soil disturbance in an operating area), and due to time limitations very few operating areas were assessed. Through combining utilization and soil disturbance surveys, all operating areas would be assessed.
- The results (i.e.: percent soil disturbance) did not provide an adequate measure of the true impacts of soil disturbance on our operations. For example, an area with 6% soil disturbance can in reality be worse than an area with 10% soil disturbance. The foremost concern involves how much area is removed from tree production.
- The new procedures do not involve calculating percent disturbance associated with roads. It has been found during past years' assessments that the percent disturbance associated with roads is directly affected by the area of productive forest within the operating area, and therefore does not present an adequate measure of soil disturbance – based on the use of best road construction methods. Therefore ensuring that roads are built within specifications is the best way to minimize the amount of disturbance associated with road construction. Measurements to the specifications take place during final inspection for payments to contractors. Width specifications for CBPPL roads are: Class I – 8.5m, Class II – 7.5m, Class III – 5.5m, Class IV – 5.0m (as per CBPPL's Forest Access Roads Classification Standards and Specifications/Road Construction Contracts).

Another way CBPPL currently minimizes ground disturbance due to road construction is by building winter roads. Winter roads are generally constructed for short service during freezing temperatures. They are built from a mixture of soil, snow, and ice, and therefore require less building material.

In 2015, the Government guidelines changed to require that no more than 6% of the total forest within an operating area can be disturbed due to forest operations, which includes roads and disturbance in the cutovers. Arbitrarily dividing the disturbance between the roads and cutovers, if disturbance on the cutover is greater than 3%, then the roads will have to be measured, berm to berm, to determine if the total disturbance on the Annual Operating Plan area is less than 6%. If total disturbance is greater than 6% of the Annual Operating Plan area, then rehabilitation measures must be taken to reduce the disturbed area on the cutover to an acceptable amount.

In 2017, CBPPL added a third target, “on identified sites with low soil strength, limit soil disturbance to 8% within the operating block”. This recognizes the likelihood of greater impacts in areas with low soil strength (soils highly prone to disturbance), while at the same time maintaining an acceptable level of soil disturbance no greater than 6% of the Annual Operating Plan area. Each year the Annual Operating Plan (AOP) undergoes a Planner’s Assessment of Areas, in which ground conditions are assessed and determined if they are suitable for spring operations. Areas with low soil strength will be identified using available government soils mapping combined with CBPPL professional knowledge and historic harvesting information. If a site is determined to have low soil strength, harvesting will not be scheduled in that area during the spring season, thus further helping to minimize soil disturbance impacts attributed to harvesting. To further minimize the potential for soil disturbance, particularly in the spring, sites with low soil strength will be noted under Special Considerations in the Operations Pre-Work Form. These practices began in 2017.

To monitor this target, surveys of areas that have identified low soil strength through the Planner’s Assessment of Areas will be reviewed for percent disturbance within the operating block and will be reported on in 2022.

Status in 2022

Target 1: Soil Disturbance

In past years, the Percent Cutover Disturbance table used results from operating areas that were cut in the previous year only. Areas that were cut late in the fall were not able to be assessed until the following summer once snow had melted. As these indicators are generally updated in the spring each year, the decision was made to include data from areas surveyed within the previous calendar year in each annual update instead of only using areas that were harvested within the previous year. The method of surveying has not changed but the timeline included will be different going ahead.

The table below shows the results of surveys conducted from 2011 to 2022. In 2022, 3 operating areas were assessed: 2 in summer areas, 1 in winter areas. The result of 1.38% cutover

disturbance for 2022 is an increase from the 0.76% observed in 2021. This value is significantly lower than the government target of 6%. The following table shows the results of surveys conducted from 2012 to 2022.

Figure 5. Percent cutover disturbance 2012-2022

Year	Ruts	Compaction	Soil Displacement	Cutover Disturbance
2012	0.04	0.32	0.30	0.66
2013	0.22	0.70	0.45	1.38
2014	0.07	0.09	0.58	0.74
2015	0.34	1.21	0.56	2.11
2016	0.07	0.20	0.20	0.46
2017	0.12	0.23	0.06	0.41
2018	0.21	0.32	0.33	0.87
2019	0.28	0.44	0.21	0.93
2020	0.39	1.93	0.49	2.81
2021	0.08	0.47	0.21	0.76
2022	1.09	0.09	0.20	1.38

Target 2: Road Disturbance

Although the area of ground disturbed by roads is not determined by the current assessment method, the area of productive land on the DFA that has been converted to roads has been calculated as 0.5%. This calculation is based on 2016 statistics from the Forestry and Wildlife Branch roads database. Ensuring roads are built within specifications is the best way to minimize the amount of disturbance associated with road construction. All new roads are measured as a part of a final inspection before payment is released to contractors.

Status in 2022

The table below indicates the surface widths of roads being built to CBPPL specifications. Results show that from 2012 to 2022, CBPPL has been within the identified variance (0.5m) of specifications for Class II, and IV roads.

Table 15. Average Width (m) of Roads Built on CBPPL Limits from 2011 to 2022

Year	Class II	Class IV	Variance Class IV
2011	5.50	**	**
2012	5.80	5.50	.50
2013	*	5.30	.30
2014	*	5.28	.28
2015	*	5.30	.30
2016	*	5.29	.29
2017	7.36	5.32	.32
2018	7.08	5.39	.39
2019	*	5.46	.46
2020	*	5.35	.35
2021	*	5.48	.48
2022	*	5.37	.37

* No Class II roads built
 ** No Class III roads built
 *** Data unavailable

Management Strategy

CBPPL will continue to monitor soil disturbance to determine the amount of ground disturbance on cutovers. Inspection results will allow us to guide our contractors to purchase the right equipment, plan our areas by season and type of existing equipment, and implement harvesting operation procedures that will minimize ground disturbance. Examples of these procedures could be guidelines for the percentage of a cutover on which machines can travel, or the standard width of operational roads.

CBPP is strongly committed to improving soil disturbance performance and has developed the following points of strategy to ensure effective remedial action:

- Conduct assessments that measure soil disturbance to enable effective management action.
- Identify specific problem areas of soil disturbance.
- Develop and implement an appropriate action plan.
- Develop a reporting system where results are communicated to the appropriate personnel to ensure necessary remedial action.
- Promote education and awareness amongst all employees.

CBPPL will continue to track adherence to roads specifications through periodic checks and measurements during final inspections. This will allow us to address any issues before they become problems, and therefore minimize the amount of soil disturbance associated with road building. When and where possible, we will also build winter roads to access wood harvested in the winter.

Forecast, Predicted Results or Outcome

CBPPL should be able to meet our target of no more than 0.5m greater than the road specification by adhering to best management practices for road construction.

Implementation Schedule

Task	Details	Responsibility	Frequency
Report on road widths vs. specifications.	Completed during road inspections	Roads Planning Technician	Annually
Conduct Planner's Assessment of Areas	Assess ground conditions of operating areas to determine if they are suitable for spring operations.	District Planner	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually	Every year (after completion of report) by EMS Review Committee	Soil disturbance surveys, assessment of areas.

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
The proportion of total productive forest area without measurable soil erosion and soil compaction due to forest operations has been identified as an indicator of this Strategy.	5-year operating plans will give guidance in planning for operations in areas with low soil strength from a soil disturbance viewpoint.	Soil disturbance surveys should use the AOP to plan for representative samples based on harvest system, season and soil types.

Indicator 3.1.1 Buffers and No Grub Zones

Objective	3.0 Protection and Maintenance of Water Resources
Performance Measure	3.1 Program Participants shall meet or exceed all applicable federal, provincial, state and local water quality laws, and meet or exceed BMPs developed under Canadian water quality programs

Indicator:	3.1.1	Target	Acceptable Level
Proportion of forest management activities, consistent with prescriptions to protect identified water features		To have zero nonconformances associated with watercourse buffers and 30m no grub zones	0
		Resource Person:	Environmental Management Representative

Definitions

WATERCOURSE BUFFER: A band of forest left relatively undisturbed so as to protect a water body from erosion.

NO GRUB ZONES: Areas extending on either side of a water crossing, adjacent to a road, where the removal of stumps or shrubs from the ground is prohibited.

Detailed Description

Fresh water is considered one of the most precious natural resources in the world today. A large percentage of Newfoundland's fresh water filters through the ecosystem before entering our rivers and lakes, and is found in wetlands such as swamps, marshes, and bogs. In Newfoundland almost 50% of the land base is made up of such areas. Forested watersheds provide a range of important services to residents including the provision of clean (potable) water and the support of healthy aquatic ecosystems.

There are many aspects of forest management activities including infrastructure construction (roads, bridges, landings, etc.) that may affect water quality and quantity and each of these activities may have immediate or long-term effects. Direct measurements of water quality and quantity are largely unfeasible across entire working forests. Established research on the effects of certain field practices on local water quality and flows have been used to establish regulations and guidelines to control field practices. These regulations and guidelines address such topics as fish habitat, stream crossings, and riparian areas. Forest planning and operational strategies may be guided by best management practices to minimize and mitigate impacts to water quality and quantity. Having detailed maps of surface water and wetland systems can help identify areas within a management area where certain planning, avoidance and mitigation strategies might be required.

Environmental Protection Guidelines for Forestry Operations in Newfoundland and Labrador (EPG) section 1.2.4, Leaving Buffers and wildlife Trees, states:

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 topographic system (NTS) maps. Streams greater than two meters 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 from 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 EPG also states that “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.” Thirty metre no-grub zones are marked on brooks on the latest 1:50,000 topographic maps and other brooks greater than or equal to 2m in width.

All required watercourse buffers are marked with pink flagging tape with the lettering “Lake and Watercourse Buffer Zone” prior to harvesting activities. Winter and spring operating areas are surveyed by Corner Brook Pulp and Paper Ltd. staff before snowfall, collecting the digital location of all waterbodies to be buffered, which are then displayed on the contractor’s operations map. This ensures that contractor foremen will be able to establish watercourse buffers on brooks which may be buried in snow and therefore indiscernible. For areas to be harvested during the summer period, waterbodies to be buffered are indicated on operational maps. Contractor foremen establish these watercourse buffers and all other permanent brooks not visible on inventory maps. When Corner Brook Pulp and Paper Ltd. staff mark the location of new access roads, or plan for the upgrade of old roads, the required no grub zones are identified at every water crossing with yellow flagging tape bearing the words “No Grub Zone”. In addition to the marking of watercourse buffers and no grub zones on the ground, these are also indicated on the operational maps found on the onboard computers in every harvesting, processing, forwarding, and excavating piece of equipment on Corner Brook Pulp and Paper Ltd.’s operations.

Status in 2022

There were zero nonconformances associated with buffers and no grub zones in 2022. Standard buffer sizes changed from 20 meters to 30 meters under the new 2021 EPG for *Forestry Operations in Newfoundland and Labrador*.

Cutting established watercourse buffers and disturbing the no grub zones are considered legal non-compliance by Corner Brook Pulp and Paper Ltd. Harvesting and road construction

contractors report any occurrences of these incidents to Corner Brook Pulp and Paper Ltd. who in turn report them to the Provincial Government.

The table below reports occurrences of these incidents for the past ten years.

Table 16. Occurrences of nonconformances associated with buffers and 30m no grub zones.

Year	# Buffers Cut	# No Grub Zones Disturbed	Total
2013	0	1	1
2014	1	0	1
2015	1	1	2
2016	1	3	4
2017	0	0	0
2018	0	1	1
2019	2	0	2
2020	1	0	1
2021	0	0	0
2022	0	0	0

Infractions associated with watercourse buffers and no grub zones have occurred in the past ten years, and with greater frequency in the 2015 and 2016. Many of these were due to operator inexperience or complacency and lack of proper supervision. Corrective measures were taken to mitigate the environmental implications, and to educate employees in environmental awareness and standard operating procedures.

In 2019 there were 2 buffer infractions that were reported. The first buffer cut occurred in District 15, North Brook summer operations. The equipment operator was following the buffer line around a small waterbody and noticed that he was getting too close, even though the ribbons were being followed. When he contacted the supervisor they discovered that the ribbons had been removed and re-placed to mark a trail to the pond. The second incident which also occurred in District 15, was determined to be a public firewood cutter harvesting birch in the buffer. This incident was reported to ensure that when government Conservation Officers are visiting our sites, they are aware that this illegal activity was reported, and can investigate if necessary.

In 2020 there was a buffer trespass incident in District 16 that violates the Company’s Restricted Area Compliance Policy. On night shift at 4am, the processor operator was traveling out of the cut block. When about 150 m from the road he turned to the right 90 degrees, travelled through the orange ribbons onto a scrub area. He then continued to travel along the scrub edge across an inventory brook continued on for 170m and stopped at the edge of another brook; then did he realize he was going the wrong direction to get to the road. He turned around and travelled out his track back to the cutover, he saw lights on the road and travelled to them. All the while he was in radio contact with the rest of the crew who was trying to help guide him. It was raining at the time making it difficult to navigate. The GPS was working. When the supervisor asked the operator what happen he said that he got mixed up and couldn’t find the road. After much follow

up and corrective actions, the incident was deemed to have occurred due to extenuating circumstances pertaining to operator competence. Restricted Areas Policy fine was waved but the #2 Environmental Compliance Inspection resulted in a failure due to the incident.

Management Strategy

Corner Brook Pulp and Paper Ltd.’s target is to have zero nonconformances associated with watercourse buffers and 30m no grub zones. In most of the infractions over the past ten years there was no issue with the marking of the buffers and no grub zones. In 2017, CBPPL revised employee orientation guidelines to include any employee that has worked offsite for more than three years as part of improved employee education.

Forecast, Predicted Results or Outcome

Corner Brook Pulp and Paper Ltd. has been working to reduce the number of watercourse buffer and no grub zone infractions through continually education with our Qualified Logging Professional (QLP) training program and by improvement of our Standard Operating Procedures (SOPs) when there are changes in governmental regulations and through continual communication, education, and monthly Environmental, Health, & Safety Meetings.

Implementation Schedule

Task	Details	Responsibility	Frequency
Discuss watercourse buffer and no grub zone infractions	Determine the cause of the infractions and develop corrective actions to prevent recurrence.	EMS Management Review Committee	As watercourse buffer and no grub zone infractions occur
Determine the number of watercourse buffer and no grub zone infractions each year	Review records of environmental incidents	Environmental Management Representative	Annually

Monitoring/Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in the Indicator Report	As watercourse buffer and no grub zone infractions occur	<ul style="list-style-type: none"> Incident Reports and Investigations

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
Evaluating the influence of forest management actions on water quality is a goal of this strategy	Environmental Assessment (a condition of the 5-Year Planning Process) addresses requirements for the protection of water quality	The Environmental Protection Guidelines for Forestry Operations in Newfoundland and Labrador (as per CBPPL’s Certificate of Managed Lands) addresses requirements for watercourse buffers and no grub zones

Indicator 3.2.1 Preharvest Planning

Objective	3.0 Protection and Maintenance of Water Resources
Performance Measure	3.2 Program participants shall implement water, wetland and riparian protection measures based on soil type, terrain, vegetation, ecological function, harvesting system, state BMPs, provincial guidelines and other applicable factors.

Indicator:	3.2.1	Target	Acceptable Level
Additions and deletions to the forest area.		To carry out pre-harvest planning on 100% of the annual operating area.	-20%
		Resource Person:	Sustainable Forest Management Forester

PRE-HARVEST PLANNING - On-the-ground field surveys of operating areas before and after road construction but before harvesting occurs, to verify forest inventory information.

RESOURCE ROADS – Include all unpaved roads constructed to access resources and developments (forest access roads).

Detailed Description

Resource roads are customarily permanent structures that provide a route by which transportation to and from the forest is possible. The primary function of these roads is the extraction of wood fibre, but various groups such as hikers, hunters, anglers, snowmobilers and berry pickers utilize these roads to access the forest for recreational activities.

Although resource roads are necessary, it is beneficial both financially and environmentally to build the minimum amount of road required. This can be accomplished through proper planning. The environmental benefits of minimizing the amount of roads include keeping the maximum amount of land in productive forest. Sustainability involves matching actual timber harvest to the long-term production capability of the forest. The long-term capability is only a theoretical calculation, so it is best to maximize the amount of land in productive forest to maximize production capability. Healthy, productive forests also help mitigate climate change by sequestering and storing carbon from the atmosphere.

Residual retention (preharvest) planning is another way to maintain productive forest ecosystems. CBPPL must develop a management strategy and operating procedures that:

- Generate clusters of small to medium size cutover areas scattered in the landscape (10-50% by area) that are in line with the results of the Pre Industrial Forest Condition (PIFC) analysis,
- Evaluate the degree to which harvest/silvicultural operations compare with best estimates on sizes and spatial patterns in the pre-industrial era (PIFC report) and sizes and patterns associated with ecological values,

- Specify objectives for the retention of stems or residual structure to be left after stand management activities in normal harvesting or salvage operations (following natural disturbances).

CBPPL Planners carry out on-the-ground field surveys of operating areas to verify forest inventory information before harvesting and road building occurs. Verifying forest inventory prior to building roads allows CBPPL Planners to locate roads in a more cost-effective manner, maximizing forwarder distance and eliminating any unnecessary road building. In the office, they also capture leave areas such as required buffers, permanent sample plot (PSP) buffers, harvest deferral areas, etc. Contractor foremen also capture leave areas on GPS units during their pre-harvest operational layout stage. Examples of leave areas identified in the field are insular patches, peninsular patches, and small blocks of inaccessible timber. The GPS data collected in this stage by the contractor foremen is exported from their GPS and sent weekly to CBPPL planners as a shapefile via email. Harvester operators also play a significant role in the creation of residual structure. In addition to instructions from the foremen, operators are constantly making decisions that result in leave patches. They often use their own judgment when working around wet or soft areas, on steep slopes, and ledges or drop-offs. Operators will also avoid bird nests and denning sites when encountered. Operator leave patches are communicated by contractor foremen to CBPPL planners.

Through the AWARE project partnership, the Harry's River Watershed was flown with LIDAR (Light Detection and Ranging) remote sensing. This data has been validated to be more accurate than on ground cruising and planners have used this data in their preplanning for this area as well.

Status in 2022

District Planners carry out on-the-ground field surveys of operating areas to verify forest inventory information before road building and harvesting occurs. Verifying forest inventory prior to building roads allows planners to locate roads in a more cost-effective manner, maximizing forwarding distance and eliminating any unnecessary road building. With the purchase of new software (Summit) planners can use GovNL stereo photography to view operating areas in 3D. Further delineation of productive stands and road placement is refined to optimize field work. A second station has been purchased for 2022.

From 2011, when this indicator profile was developed, until 2021, 100% of operating areas had forest inventory information verified before roads were built.

Management Strategy

CBPPL will endeavour to conduct preharvest planning on 100% of annual operating areas in a given year. When forest inventory information is verified, roads can be constructed in the best possible location to maximize forwarder haul distance and minimize the amount of productive land converted to road. Pre-harvest planning and operational layout will also identify leave areas of residual retention.

Forecast, Predicted Results or Outcome

Preharvest planning will result in a reduction in the amount of productive area lost due to permanent roads and landings on an operating area basis. Preharvest planning and operational layout will also contribute to maintaining productive forest ecosystems.

Implementation Schedule

Task	Details	Responsibility	Frequency
Carry out preharvest planning	CBPPL Planners will verify forest inventory information before roads are constructed and ensure forwarder distance is maximized.	District Planner	Annually
Carry out preharvest operational layout	Contractor Foremen will identify leave areas before harvesting is conducted.	District Planner	At each operating area

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in the Indicator Report	Annually (after completion of report).	Progress reports from District Planner

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
The proportion of forest land base occupied by permanent forest access roads is an indicator identified by the Newfoundland and Labrador Sustainable Forest Management Strategy	The preharvest planning work will be incorporated into the 5-Year Operating Plan.	The preharvest planning work will be incorporated into the Annual Operating Plan.

Indicator 3.2.2 Stand Replacing Disturbance

Objective	3.0 Protection and Maintenance of Water Resources
Performance Measure	3.2 Program Participants shall implement water, wetland and riparian protection measures based on soil type, terrain, vegetation, ecological function, harvesting system, state BMPs, provincial guidelines and other applicable factors

Indicator:	3.2.2	Target	Acceptable Level
Proportion of watershed or water management areas with recent stand-replacing disturbance		To limit the proportion of watershed with recent stand-replacing disturbance within the DFA to 25% or less.	+ 5%
		Resource Person:	District Planner

Definitions

STAND-REPLACING DISTURBANCES: Any disturbance to a forest ecosystem (human or natural-caused) that will result in the removal of the over story. For CBPPL this will include clear-cutting, selection cutting, forest fires and wind throw.

WATERSHED: The region draining into a river, river system or other body of water.

Detailed Description

Fresh water is considered one of the most precious natural resources in the world today. A large percentage of Newfoundland’s fresh water filters through the ecosystem before entering our rivers and lakes, and is found in wetlands such as swamps, marshes, and bogs. In Newfoundland almost 50% of the land base is made up of such areas. Forested watersheds provide a range of important services to residents including the provision of clean (potable) water and the support of healthy aquatic ecosystems.

Research has shown that the most significant impacts to forested watersheds following timber harvest are changes in water table levels and stream flow. It is likely that similar changes occur after fire. As a general rule, harvesting impacts on streamflow regimes are usually short-lived and less severe than those brought about by land-use changes, provided that forests soils are protected and vegetation recovery is rapid. In more well-watered areas, rapid revegetation often limits meaningful water yield increases to the first 3-5 years after treatment (Megahan & Hornbeck, 2000). Research by Natural Resources Canada provides a basis for the improvement of harvesting regulations by the provinces. This, coupled with the strict process management provided by forest certification, helps CBPPL evaluate and manage water quality and quantity on our land base.

A GIS analysis was undertaken in April 2011 to investigate the area in each watershed on CBPPL limits that had undergone a stand replacing disturbance in the past five years. Watershed boundaries used (Figure 6) were based on Forestry Services Branch defined watersheds for the

province of Newfoundland. This scale of watershed classification was the only one available at the time with a GIS layer, which was necessary for the analysis.

In 2017 an analysis of watershed size was carried out to determine if watershed data was available to help downsize the watersheds currently being used, yet still maintain a scale that could provide reliable results. Digital watershed data was used to build a hydrology component/layer to the conservation feature analysis to develop a series of watersheds that intersect our DFA. Although some smaller watersheds were found, there were a number that were much larger. Consequently, we will continue using the current data set, but will keep looking for new watershed data to satisfy this core indicator.

Status in 2022

To report on recent stand replacing disturbances within a watershed, we had to define “recent”. The research discussed in the previous section, indicates that “rapid revegetation often limits meaningful water yield increases to the first 3-5 years after treatment”. Based on this we defined recent as 5 years after harvesting, and provide an update every year. The results in the table below for two five-year periods show that CBPPL harvesting falls within the target of 25% or less disturbance in a watershed.

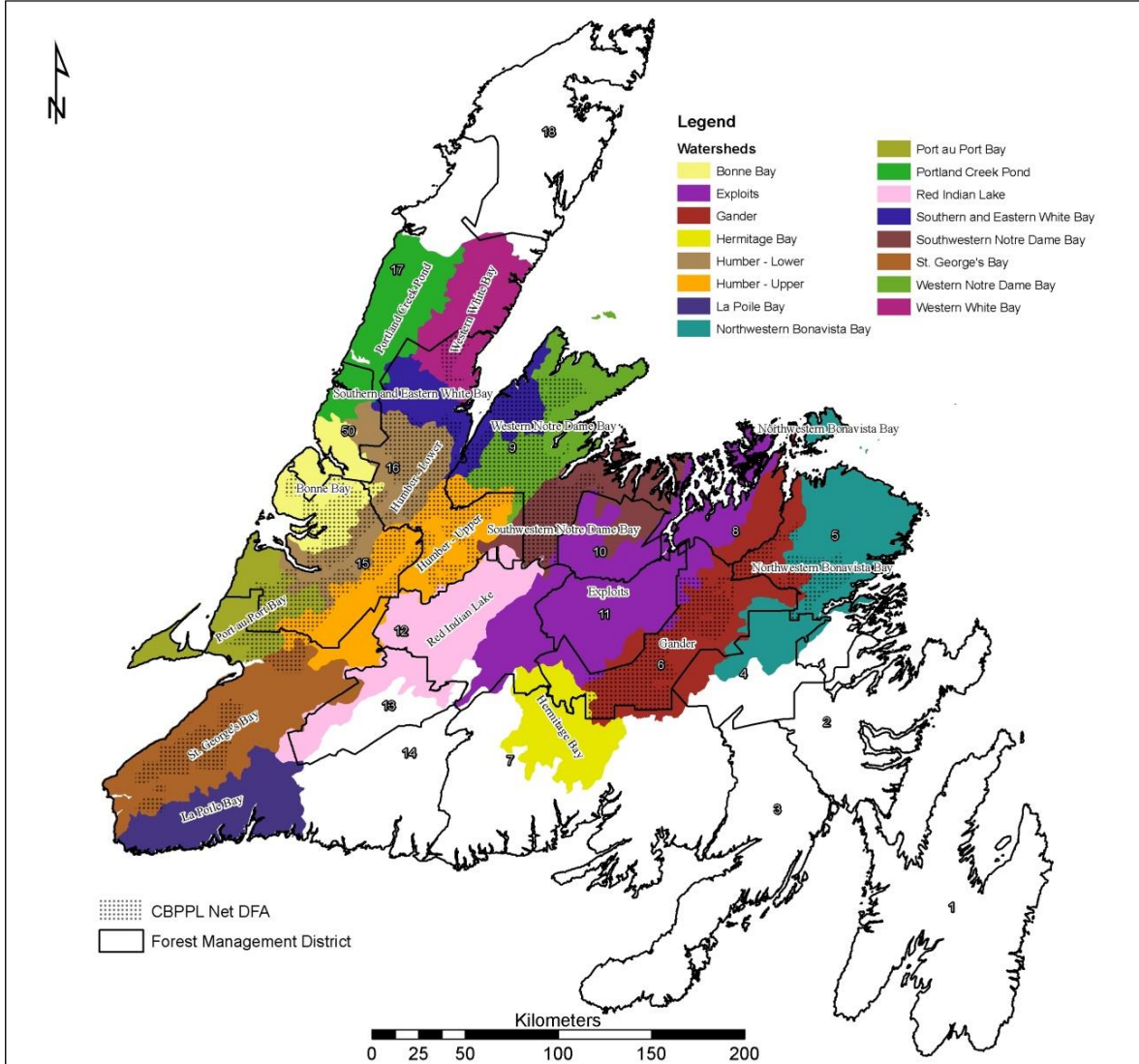


Figure 6. Watersheds for the province of Newfoundland as defined by Forestry Services Branch

**Table 17. Percent of Land Area in Watersheds on CBPPL Limits
with a Stand-replacing Disturbance**

Watershed	CBPPL Land Limits Within Watershed (2020)	2017-2021 Cuts Within Watershed		CBPPL Land Limits Within Watershed (2021)	2017-2021 Cuts Within Watershed	
	Area (ha)	Area (ha)	%		Area (ha)	%
Bonne Bay	79,106	644	.81	79,106	162	.2
Exploits	70,048	785	1.12	70,048	505	.72
Gander	82,794	1,044	1.26	82,794	1,067	1.3
Hermitage Bay	0.00	0.00	0.00	0.00	0	0
Humber—Lower	195,680	3,466	3.30	195,680	3,537	1.8
Humber—Upper	190,055	3,630	1.91	190,055	3,423	1.8
La Poile Bay	1,074	0.00	0.00	1,074	0	0
Northwestern Bonavista Bay	49,333	677	1.37	49,333	472	.95
Port au Port Bay	93,300	4,628	4.96	93,300	4,582	4.9
Portland Creek Pond	459	0.00	0.00	459	0	0
Red Indian Lake	2,031	0.00	0.00	2,031	0	0
Southern and Eastern White Bay	107,004	1,061	1	107,004	728	.68
Southwestern Notre Dame Bay	115,319	65	.05	115,319	166	.14
St. George’s Bay	135,593	400	.30	135,593	161	.12
Western Notre Dame Bay	111,950	1543	1.38	111,950	0	0
Western White Bay	21,111	0.00	0.00	21,111	2,133	10
Grand Total	1,254,857	17,878	1.42	1,254,857	16,936	1.34

*All area figures are of the watershed area within 2021 CBPPL DFA and not the total watershed area.

Management Strategy

Corner Brook Pulp and Paper's target is to have no more than 25% of a watershed within the DFA affected by some sort of recent stand-replacing disturbance, natural or human caused. Literature reviews indicate that effects of forest harvesting on water quality are negligible when disturbance levels are below 30% (Kotak et al, 2009), and minor effects on water yield (quantity) at harvesting levels of 30-40% of a watershed area (Rothwell, 1997). This level of disturbance is generally used as an upper limit for harvesting in watersheds in forest management plans. CBPPL has chosen as a management strategy to limit recent (within five years) disturbance levels, both human and natural caused, in each watershed to 30% or less. Harvesting disturbances will not exceed 25%.

This is the first step in our management approach to stabilize water quantity and will be reviewed and updated every two years through GIS analysis. To ensure recent harvesting disturbances do not exceed 25% of the watershed, another step is required.

Cutover updates are done annually by Corner Brook Pulp and Paper planners and submitted to Forestry Services Branch, which conducts a wood supply analysis every five years to calculate the Province's growing stock, which helps make adjustments to annual allowable cuts. This analysis also includes all recent cutover updates provided by CBPPL and any other major disturbances to the province's forest.

During the preparation of Annual Operating Plans (AOP) by CBPPL, planners will monitor the amount of area recently disturbed in any watershed. Not all watersheds will have operations annually so the system is always in a state of flux, with older disturbances re-vegetating and consequently, actively contributing to water retention.

There are many factors to be assessed before an area is submitted to provincial government in an AOP. In addition to Annual Allowable Cuts in a forest management district, the amount of area disturbed in a watershed will play a factor in the planning of the wood supply for CBPPL.

Coniferous forests have a greater influence on water yield than deciduous forests, and species conversions from softwood to hardwoods or grass will usually increase water yields (Megahan & Hornbeck, 2000). CBPPL has no stand conversion from softwood to hardwood occurring on our land base. Each stand replacing disturbance is quickly regenerated either naturally or through the help of planting coniferous tree species. Vegetation re-growth is usually very rapid with a complete coverage after one year. Since recent changes to the species mix required by the mill, all hardwood species are being left standing on cut blocks to help with water retention, wildlife habitat, biodiversity, and fuel wood.

Forecast, Predicted Results or Outcome

Initial analysis of the stand replacing disturbances created by Corner Brook Pulp and Paper Ltd. in each watershed over a five-year period was 1.34%, well within the acceptable level. More recent analyses show harvesting disturbances remain at a very low percentage of the watershed land base.

Corner Brook Pulp and Paper Ltd. does not forecast any drastic change to the percentage of area disturbed in the future.

Implementation Schedule

Task	Details	Responsibility	Frequency
Calculate the amount of stand replacing disturbance in each watershed	% of area disturbed	District Planner	Bi-annually
Review with District Planner	Create awareness and gather input	District Planner	Bi-annually

Monitoring/Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in the SFM Plan	Annually (after the completion of analysis)	<ul style="list-style-type: none"> • Cutover Updates • Gov't Watershed Layer

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
Evaluating the influence of forest management actions on water quantity is a goal of this strategy	Harvest areas are outlined and volume estimates calculated on a 5-year basis.	Harvest blocks are identified and net down volume calculations are completed annually.

Indicator 4.1.1 Ecosystem Area by Type

Objective	4.0 Conservation of Biological Diversity
Performance Measure	4.1 Program Participants shall conserve biological diversity

Indicator:	4.1.1	Target	Acceptable Level
Ecosystem area by type		To ensure that of the total area of CBPPL’s harvest averaged over the last 5 years in FMDs 5, 6, 9, 10, & 16, no more than 5% is within the poor black spruce forest type, and no more than 10% is within poor black spruce forest and scrub types.	$\pm 0.5\%$
		Resource Person:	District Planner

Definitions

BIODIVERSITY (BIOLOGICAL DIVERSITY) — “the variability among living organisms from all sources, including inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” [*Canadian Biodiversity Strategy*, 1995]

ECOSYSTEM — plants, animals and micro-organisms and their non-living environment, interacting as a functioning unit

Detailed Description

Ecosystem conservation represents a coarse-filter approach to biodiversity conservation. It assumes that by maintaining the structure and diversity of ecosystems, the habitat needs of various species will be provided. For many species, if the habitat is suitable, populations will be maintained. Two key characteristics of forest ecosystems are the community types, as driven largely by the species composition of the overstory, and community seral stages, as driven by succession and disturbance processes. These factors are strong predictors of the biotic communities that will inhabit both forest stands and the entire forest landscape.

Many foresters and forest ecologists prefer to understand forests as ecosystems, and not purely in silvicultural or timber-production terms. The CSA-SFM Standard defines an ecosystem in terms of a community of organisms interacting with the abiotic environment. Some ecosystem classifications favour characterizing ecosystems according to enduring features, such as soil type and parent material, topography, and surficial geology. Other ecosystem classifications favour characterizing ecosystems according to vegetation communities, including both understory vegetation and overstory trees.

Dr. A. W. H. Damman developed a forest site classification for Newfoundland while working with the Canadian Forest Service (CFS) from 1956-1967. His classification method combined

vegetation types with soil types to define forest types. He also predicted the successional relationships between forest types and their response to disturbance by fire and logging. With the exception of his research in central Newfoundland, much of Damman's work was unpublished, but Meades and Moores (1989) subsequently produced a field guide to the Damman forest types of Newfoundland.

To assist in developing an indicator of natural ecosystem diversity using Damman's forest types, CBPPL consulted with retired CFS Forest Ecologist Bruce Roberts. His interpretation of Damman's work is that it is very difficult to change the Damman forest types by harvesting. For example, planting white spruce and Norway spruce where balsam fir has been attacked by adelgid won't change the under-story, and eventually fir and birch will come back on these sites. The challenge, however, is greater where the sites are less productive and moisture becomes a limiting factor. Mr. Roberts suggested CBPPL concentrate on marginal forest sites supporting black spruce and kalmia (sheep laurel) in Central Newfoundland, and to strive to not fall below the productivity level in the current inventory. These sites do not regenerate naturally to black spruce after harvest, but to kalmia, leaving the site less productive. Ensuring these sites are sufficiently stocked (most likely by planting) would maintain their productivity level and maintain ecosystem diversity.

Performing site preparation and planting on the poor kalmia-black spruce forest type sites is often a challenge due to the very rough ground conditions and rocky/shallow soils. Because of this, site preparation and planting may not be physically possible on a portion of these areas.

Previous to 2010, the harvest of poor kalmia-black spruce forest types was not tracked separately but included in all cutover areas. CBPPL now tracks the harvest of these forest types separately through its annual cutover updates. However, the Damman site types are not mapped within our GIS system, so we use black spruce sites with a low volume (<70 m³/ha.) and a poor site type and scrub to represent marginal forest sites supporting black spruce and kalmia.

A GIS analysis of cutover records was conducted to calculate the amount of area cut within black spruce sites with a low volume (<70 m³/ha.) and a poor site type within FMDs 5, 6, 9, 10 and 16. The analysis is averaged over a five-year period, which means the target might be exceeded in one year, but over the five-year period, the target could still be met. The first analysis was conducted for the five years between 2007 and 2011, to determine the percent of the total harvest area that occurred in the "poor" black spruce forest type (see Table 5 below). Late in 2015 the target was expanded to restrict harvest in the scrub type as well: "and no more than 10% is within poor black spruce forest and scrub types". Reporting with scrub included began in the 2016 Sustainable Forest Management Plan Indicator Report.

Status in 2022

Through analysis of annual cutover updates, the total area harvested on the CBPPL DFA between 2018 and 2021 was 9,975.88 ha in FMDs 5, 6, 9, 10, & 16. The most recent analysis (2018-2021) reports the result for both parts of the target. The total area of harvested poor black spruce sites (volume less than 70m³/ha) from 2018 to 2022 was determined to be 528.26 ha, which is 5.2% of the total area harvested during that period. This is not below the 5% target. The total area of harvest that occurred in Scrub types from 2017 to 2021 was 454.42 ha, that is, 4.5%

of the total area harvested on the CBPPL DFA. Combined, the total area harvested in poor black spruce sites and scrub was 9.8%, which is below the specified target (10%). The results indicate that CBPPL has achieved the set target.

Table 18. Percent of the DFA harvested in poor black spruce forest and scrub types in Forest Management Districts 5, 6, 9, & 16.

Period	% Total Harvested Area in:	
	Poor Black Spruce	Poor Black Spruce and Scrub
2009-2013	1.2	N/A
2010-2014	1.0	N/A
2011-2015	1.6	5.7
2012-2016	4.2	7.2
2013-2017	4.8	9.1
2014-2018	5.8	11.0
2015-2019	5.5	10.5
2016-2020	6	11
2017-2021	3.6	6.8
2018-2022	5.2	9.8

Acceptable Level of Variance

CBPPL will endeavor to ensure that of the total area of CBPPL’s harvest averaged over the last 5 years in FMDs 5, 6, 9, 10 & 16, no more than 5% is within the poor black spruce forest type and no more than 10% is within poor black spruce forest and scrub types.

Management Strategy

CBPPL has several strategies to mitigate this issue. The first is a policy that began in the summer of 2010 to avoid scheduling poor black spruce forest sites for harvest due to regeneration risk and low harvester productivity. By avoiding harvesting these site types, CBPPL will lower the amount of area that is at risk of regeneration failure.

Second, where this site type is harvested, we make a special effort to ensure the sites are promptly regenerated (within reasonable operational constraints). Stocking survey records are maintained on all poor black spruce forest sites harvested within our regular regeneration assessment program.

By ensuring harvested areas on this site type are sufficiently stocked, either through natural or artificial regeneration, CBPPL will ensure the continuation of the black spruce component in this ecosystem type. This will maintain their productivity level and maintain ecosystem diversity.

Third, CBPPL will review the areas harvested in 2018 to determine why poor black spruce forest and scrub areas were cut more often than the target allows.

Forecast, Predicted Results or Outcome

By avoiding harvesting the poor black spruce site types, the percentage of area harvested will be lowered.

Implementation Schedule

Task	Details	Responsibility	Frequency
Determine the percentage of area cut in this site type.	Determine the percentage of area cut in this site type using the best available information, either cutover updates from photography or updated satellite imagery from Sentinel Explorer.	District Planner	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in SFM Report	Annually	CBPPL cutover records and government inventory.

Links with Strategic and Operational Plans

20-year Strategy	5-Year Operating Plan	Annual Operating Plan
Establishing and maintaining long term sustainable wood supply levels for each management district is a goal identified in this Strategy.	This plan documents the 5-year harvest plans figure and its distribution over the 5 year plan period.	Annual harvesting plan activities are developed in line with the 5-year plan and the 20-year Strategy plan.

Indicator 4.1.2 Within-Stand Structural Retention

Objective	4.0 Conservation of Biological Diversity
Performance Measure	4.1 Program Participants shall conserve biological diversity

Indicator:	4.1.2	Target	Acceptable Level
Degree of within-stand structural retention		To leave a minimum average of 10 wildlife trees or snags per hectare, individually, in clumps, or in patches.	100 wildlife trees or snags in clumps or patches per 10ha opening.
		Resource Person:	Sustainable Forest Management Forester

Definitions

WITHIN-STAND STRUCTURAL RETENTION refers to the retention of patches, clumps, or corridors of trees in the vicinity of a harvested area. Newly cut areas interspersed with patches, clumps, or corridors of trees help to maintain the natural diversity of forest types and age classes in an ecosystem.

SNAGS are dead or dying standing trees. They are utilized by a wide range of wildlife for nesting (primarily cavity nesters) and for foraging. Wildlife species that use snags include a wide variety of small mammals, different forest birds and owls, and a wide range of insects and fungi communities that function as the prey base for many other species. There are three aspects of snag management that need to be considered: quantity, quality and distribution. As part of the annual harvest that now occurs in stands that had been pre-commercially thinned (PCT), snags can also be created by removing the tops of merchantable trees in areas where naturally occurring snags are not present.

QUANTITY: From a quantitative perspective more research is needed. For now, the guide used is “Where safety is not an issue, a minimum average of 10 trees or snags per hectare (average on a cut block) or a clump of trees is to be left on all sites (harvesting and silviculture)” (*Environmental Protection Guidelines*).

QUALITY: The Department of Environment is currently looking at a qualitative way of assessing trees and snags for wildlife. Preliminary results of CBPPL’s Snag Management Program suggest that trees or snags with a minimum of 21cm diameter at breast height are preferred. The Environmental Protection Guidelines suggest that preference should be given to trees or snags with a diameter over 50 cm. A Masters student’s study of the availability and quality of snags for nesting habitat recommended managing for snags >30 cm dbh.

WILDLIFE TREES: Trees with a minimum height of 2.0 m and a minimum diameter at breast height of 10 cm.

DISTRIBUTION: From a distribution point of view, the Wildlife Division has indicated that it is beneficial to leave trees in clumps or patches rather than distributing individual stems evenly across the landscape. This promotes within-stand structure.

Detailed Description

At the stand level, the key to creating higher biodiversity involves the retention of key structural elements in the stand. One example is retaining snags (dead or dying trees) on a cutover during harvest. Leaving live trees, individually and in clumps, also adds structural elements to the cutover. Leaving a combination of snags and living trees on cutovers will provide biodiversity at the time of harvest and well into the future.

Snags provide essential habitat requirements for cavity-using birds and mammals. Snags are often utilized for safe nesting sites in the form of cavities and platforms, roosting and denning sites, hunting perches, display stations, and foraging sites. They also contain numerous insects for food. When a snag eventually tumbles it becomes downed woody debris that provides shelter and denning sites for mammals and birds, as well as providing a nutrient-rich base in which the next generation forest will take root.

In Newfoundland, snags are used by both primary and secondary cavity nesters. Primary cavity nesters such as woodpeckers (hairy, downy, three-toed and northern black-back) create and use cavities in snags while secondary cavity nesters such as chickadees, nuthatches and goldeneyes nest in cavities already formed. Raptors such as boreal owls and merlins use snags for hunting perches, and bats (little brown and eastern long-eared) utilize them for roosting. Downed woody debris is used by pine marten and small mammals such as voles, shrews and squirrels.

Live trees left on cutovers also provide habitat requirements for birds and animals, as nesting sites, hunting perches, and foraging sites. Clumps of live trees provide even more value to wildlife. As well, live trees retained in cutovers become snags in the next rotation.

CBPPL measures wildlife trees (snags and living trees) on cutovers in conjunction with fibre utilization surveys. Standard sampling procedures are utilized to provide a qualitative and quantitative assessment. Criteria for wildlife tree assessment is based on the number of wildlife trees in a sample plot, the percentage of trees over 30 cm dbh, an ocular assessment to determine if 10 wildlife trees/ha can be seen in the area around the plot, and an ocular assessment to determine if there is evidence of clumps of trees, buffers, or leave areas on the surrounding cutover.

Given the existing biodiversity native to Newfoundland, managing for snags and wildlife trees will be of great value to maintain ecosystem diversity. Even one standing snag per hectare can result in a considerable increase in biodiversity.

It is important to note that the *Environmental Protection Guidelines* set forth by the provincial government, state that a minimum average of 10 wildlife trees or snags per hectare must be retained on our harvest and silviculture blocks. This guideline consists of both living and non-living standing tree structures (wildlife trees). Snags refer to dead or dying trees.

Beginning in 2009, an ocular assessment was conducted of wildlife trees left over on the cutover, visible from the plot location during No. 3 Inspections.

Status in 2022

In 2022, ten #2 Inspections and 2 #3 Inspections were completed. There were no deficiencies recorded on the #2 inspections with respect to wildlife trees. On the #3 Inspections one of the areas did report a deficiency for wildlife trees. This area was released for inspection by the contractor for over a year before staff could get out to do the field visit. It is possible that some of the trees left could have blown down or were harvested by domestic cutters.

Management Strategy

CBPP is committed to continuous environmental improvement of its woodlands operations. Through managing for snags and wildlife trees, the company will be able to contribute to within-stand structural retention and ultimately ecosystem diversity, a process that involves more than a supply of fibre for the mill.

The following is an outline of the company's strategy to ensure within-stand structural retention:

- Conduct surveys that measure the number or quantity of wildlife trees and snags left after harvest, above and below 30cm diameter at breast height.
- Where possible, leave trees with a diameter greater than or equal to 30 cm at breast height.
- Promote education and awareness amongst all employees. A standard operating procedure (H-06 Leaving Wildlife Trees for Biological Diversity) has been developed to help operators and cutters understand the importance of leaving wildlife trees, and the characteristics of the best quality snags.
- Review and discuss results with contractors during monthly Safety and Environmental meetings and at Environmental Management System Meetings.

Forecast, Predicted Results or Outcome

Recommendations from the Wildlife Division indicate that standing living, and dead or dying trees are of equal value in terms of the maintenance of biodiversity. The snag management program will change its focus to include in the assessment not only snags, but also the number of standing living trees retained, to get a better representation of within-stand retention.

From our snag management program and other snag studies, it is apparent that both the physical appearance and dimensions of snags and their relative abundance is affected by forest stand and site type. Therefore, we can expect slight shifts in our snag retention patterns as determined by the specific stand types that we harvest on an annual basis. From the perspective of snag (habitat) value, we are expecting an increase in the retention level of higher value snags. This will be accomplished through a training and awareness program for our machine operators.

Implementation Schedule

Task	Details	Responsibility	Frequency
Report on results of inspections in Indicator Report	Report results	SFM Forester	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually	Annually	Results of surveys

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
The Strategy is largely grounded in the promotion of integrated forest management. This project is totally in line with these integrated forest management principles.	The 5-year operating plan identifies harvesting and silviculture treatment areas, and as such, would identify the stand types where operations will occur over the next 5 years. This would allow us to determine whether we might expect any significant shifts in snag retention pattern on a broader landscape level.	The link to our annual operating plan is similar to the 5-year plan link, only on a more site-specific basis.

Indicator 4.1.4 Caribou Habitat

Objective	4.0 Conservation of Biological Diversity
Performance Measure	4.1 Program Participants shall conserve biological diversity

Indicator:	4.1.4	Target	Acceptable Level
Degree of habitat protection for selected focal species, including species at risk		Where an Annual Operating Plan area overlaps with a caribou secondary core area (buffer), to harvest annually no more than 5% of the poor black spruce forest type, within the overlap area.	0
		Resource Person:	District Planner

Definitions

CARIBOU CORE AREAS – caribou calving/post calving areas and wintering grounds. A minimum of 30% of the 5-Year Plan harvestable forest in core areas and secondary core areas must remain uncut.

CARIBOU SECONDARY CORE AREAS - Buffers around all core areas drawn based on the avoidance distance caribou exhibit as a response to disturbance. A minimum of 30% of the 5-Year Plan harvestable forest in core areas and secondary core areas must remain uncut.

FOCAL SPECIES - species that warrant special conservation attention and are thus used to guide the management of ecosystems to conserve biodiversity.

POOR BLACK SPRUCE FOREST TYPE – in the Forest Resources Inventory, black spruce sites with a low volume (<70 m³/ha) and a poor site type.

RECRUITMENT – with respect to caribou populations, the number of young in the population.

SPECIES AT RISK – species defined as at risk by provincial and national legislation applicable to a given DFA.

Detailed Description

For most species, forest managers can manipulate habitats only, not species populations. Short-term needs, particularly for critical and core habitats, must be considered for species at risk.

Woodland caribou populations on insular Newfoundland have been in a state of decline since the mid-to late 1990s (DEC 2008). From an estimated peak of more than 90,000 caribou in 1996, populations declined to an estimate of 31,000 in 2015. This mirrors a previous decline in caribou

from a high of over 90,000 in 1890 to a low of ~10,000 in the early 1950s (DEC 2015). Although this pattern of rapid population increase followed by rapid decrease is a common pattern in wildlife populations, COSEWIC assessed Newfoundland Woodland Caribou as Special Concern in November 2014, due to the uncertainty of the future role of coyote.

In 2008, the provincial government dedicated \$15.3 million to a five-year scientific and management strategy of island woodland caribou populations (DEC 2008). The strategy built upon earlier efforts to better understand and mitigate the current decline in woodland caribou numbers and the role of predators in this decline. The caribou strategy focused on the continuation of the collection of necessary caribou data; initiation of a predator-caribou ecology study; implementation of an enhanced information and education program; cooperation with the Forestry Services Branch to improve wildlife management; increased emphasis on habitat assessment; and a province-wide regional assessment of black bear populations, one of the key predators of caribou calves.

Results of the strategy, reported in 2015, indicate that high densities of caribou put a strain on food availability (DEC 2015). This resulted in smaller animals and broad scale changes in habitat use as caribou began to forage in habitat they previously avoided (which included areas where they were more likely to encounter predators) in order to get adequate food. Predators, especially black bear and coyote, took advantage of small and highly vulnerable calves and calf survival dropped dramatically. In recent years, with the decrease in caribou density, the speed of population decline has slowed. As caribou numbers reduced, calves became larger. Observations of decreased predation and increased calf survival have been noted in recent years. Although the Newfoundland population is continuing to decline, some herds are showing stable or increasing numbers.

As a response to declining populations of island caribou, the Wildlife Division developed *Forest Management Guidelines for Woodland Caribou for the Island of Newfoundland* in 2007, to ensure adequate caribou habitat is available at all times. All available caribou location data was used to determine core areas made up of calving/post calving areas and wintering grounds. These core areas are redrawn at intervals based on the most recent location data. The guidelines allow harvesting of 25% of overmature forests (80+ years) within the core areas. Buffers around all core areas were drawn based on the avoidance distance caribou exhibit as a response to disturbance. These buffers are referred to as secondary core areas; a minimum of 30% of the mature forest in secondary core areas must remain uncut.

In addition to following the directives of the Wildlife Division, CBPPL was also involved in a national effort to develop and accelerate implementation of plans to protect woodland caribou, through the Canadian Boreal Forest Agreement. This Agreement was a collaboration between 19 forest industry companies and seven Canadian environmental non-government organizations. It directly applied to more than 73 million hectares of public forests licensed to these companies across Canada. One of the six goals of the Agreement was to fast-track plans to protect boreal forest species at risk, particularly woodland caribou. The forest companies committed to no forest harvesting or road building on 28.4 million hectares of boreal forest across Canada to allow for woodland caribou conservation planning. Working with local environmental non-

government organizations, CBPPL has deferred harvesting and road building on 151,957 ha of their timber limits.

Yet another avenue of caribou habitat protection has emerged in the 2014-2024 Provincial Sustainable Forest Management Strategy. The strategy has identified intact landscape forest management areas, whose primary objective is to protect ecological values with a minimum of human activity. Industrial forest harvesting is deferred for a ten-year period in these areas, which cover approximately 4 million hectare. These areas closely intersect with a large portion of the current caribou core areas and caribou secondary core areas.

Caribou habitat includes black spruce sites with a low volume (<70 m³/ha) and a poor site type (poor black spruce forest type). Outfitters requested we limit the amount of harvest of the poor black spruce forest type within areas designated as caribou secondary core areas (buffers) by the Wildlife Division.

Status in 2022

Each year, CBPPL operates under an approved Five-Year Operating Plan. The plan undergoes an Environmental Assessment, at which time any concerns are assessed and dealt with appropriately. During this process Provincial Wildlife Officials ensure the Operating Plans are in agreement with the 2007 *Forest Management Guidelines for Woodland Caribou for the Island of Newfoundland*, as well as the new core caribou areas identified by the 2011 caribou data. In the 5-Year Operating Plan, 75% of 2005 over-mature (80+ years) forest is maintained, and harvest rotations are extended to 120 years. By following their approved Five-Year Operating Plans, CBPPL automatically follows the caribou guidelines. In 2022 the provincial wildlife division introduced a new set of caribou primary and secondary cores for the island of NL.

To report on the status of this indicator each year, it is necessary to report the percent of area harvested within the secondary core area that is of the poor black spruce forest type. In 2022 CBPPL harvested poor black spruce forest type within the secondary core area. The analysis shows a decrease of 7.8 ha harvested from the previous year to a total of 4.5 ha for the year. This translates to 2.7 % of our total harvest below our target goal of 5% (see Table 20).

Table 20. Poor Black Spruce Forest Type (PBSFT) Harvested in Caribou Secondary Core Areas

Year	Harvest in Caribou Secondary Core Areas		
	PBSFT in Secondary Core (ha)	PBSFT Harvested	PBSFT as a percent of Total Harvest
		Ha	%
2015	107.1	4.4	4.1
2016	105.7	0.3	0.3
2017	407.4	14.5	3.6
2018	279.6	11.4	4.1
2019	166.5	10.6	6.4
2020	310.8	34.2	11.0

2021	268.8	12.3	4.6
2022	166.5	4.5	2.7

Management Strategy

Thirty-seven core areas have been identified for the Island of Newfoundland. A minimum area of over-mature forest (80+ years) has been calculated for each core; this amount should remain within that core at all times. During the annual operating planning process for each forest management district, planners will ensure the recommendations (targets) are followed with reference to the retention of over-mature forest as apply in core areas, buffers and migration corridors.

Forecast, Predicted Results or Outcome

Through pre-harvest planning, CBPPL schedules stands for harvest within an operating area. Where an operating area overlaps with a caribou secondary core area (buffer), pre-harvest planning will ensure that no more than 5% of the poor black spruce forest type is harvested annually within the overlap of a caribou secondary core area (buffer).

Implementation Schedule

Task	Details	Responsibility	Frequency
Where operating areas overlap with a caribou secondary core areas, ensure that no more than 5% of the poor black spruce forest type within the overlap area is planned for harvest.	Inside an operating area, calculate the amount of poor black spruce forest type within caribou secondary core areas. Schedule no more than 5% of this area for harvest.	District Planner	Annual Operating Plan for each FMD
After harvest, calculate the amount of poor black spruce forest type within caribou secondary core areas (buffer) that was harvested.	Inside an operating area, calculate the amount of poor black spruce forest type within caribou secondary core areas that was harvested.	District Planner	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in SFM Plan	Annually	Annual updates

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
---	-----------------------	-----------------------

<p>Intact Landscape Forest Management Areas identified in the Strategy closely intersect with a large portion of the current caribou core areas and caribou core buffer areas.</p>	<p>The 5-Year Operating Plan links operating areas to caribou core areas and secondary core areas (buffers).</p>	<p>The Annual Operating Plan will identify stands for harvesting.</p>
--	--	---

Indicator 4.1.5 Pine Marten Habitat

Objective	4.0 Conservation of Biological Diversity
Performance Measure	4.1 Program Participants shall conserve biological diversity

Indicator:	4.1.5	Target	Acceptable Level
Degree of suitable habitat in the long term for selected species, including species at risk.		To ensure no harvesting in pine marten deferred areas and corridors, and during denning period within core areas.	0
		Resource Person:	District Planner

Definitions

INDICATOR SPECIES: a species of plant or animal whose presence or absence indicates the general health of the community upon which the species is most dependent. Generally, providing for the needs of the indicator species will also meet the needs of most other organisms in the community.

Detailed Description

Pine marten habitat has a very diverse structure, which benefits small mammal species that are the prey base for marten, as well as predators of marten such as lynx, fox, and coyote. It also offers shelter for wintering moose and caribou and provides habitat for various bird species. Given the existing biodiversity native to Newfoundland, managing for pine marten habitat will be of great benefit to managing overall species diversity. For these reasons, pine marten has been chosen as an indicator of overall species diversity.

The pine marten is listed as a Threatened species on the Island of Newfoundland. Therefore, it is a priority to maintain its population at acceptable levels. It was listed as Endangered in 1994 due to the rate of decline in the estimated population since the last population estimate.

Approximately 300 animals were thought to be left in 1994, down from the between 630 to 875 animals estimated in the early 1980s.

Since 1997, improved modelling tools and ecological data for Newfoundland marten have become available to better manage for landscape-scale habitat availability. Temporally and spatially explicit models now allow both forest and wildlife managers to predict future forest landscapes and subsequently, assess the effects of forest harvesting on marten habitat.

In April 2007, the Canadian Forest Service, the Newfoundland Forest Service, and the Newfoundland and Labrador Wildlife Division, with assistance from Corner Brook Pulp and Paper, initiated a cooperative project to assess the impacts of the 25-year (2006 – 2031) forest harvest schedule for the island portion of the province. The intent was to maximize the extent to which productive forestland is managed sustainably for both marten and timber.

Forest Management District (FMD) 15 was identified as having the highest priority and initial focus of the project. A Marten Occupancy Model predicted the amount of suitable habitat and the number of potentially suitable home ranges for marten, first based on the 2005 forest inventory, and then based on CBPPL's 10-year harvesting plan. For a complete description of the project please see *Integrated Marten Habitat – Timber Harvesting Plan for Western Newfoundland, Project Report for Forest Management District 15* (Hearn et al, 2008).

The modeling results showed an increase in potential habitat in all forest management districts where CBPPL operates except one, where the amount of potential habitat would remain the same. Because the forest continues to age, even with harvesting, habitat will increase. The Marten Occupancy Model assessed the probability (0-100%) that an area can support an adult resident marten, based on the underlying and surrounding forest types.

In 2007, the status of pine marten was assessed again and it was downgraded to Threatened, due to possible stabilization in the previous 10 years. A variety of factors are attributed to the increase in population since 1994:

- effective regulations to reduce accidental catch by trappers;
- use of specific weight wire or cord for snaring hares which help release accidentally captured marten
- operative guidelines for forest harvesting in areas containing pine marten

In 2014, when five-year operating plans were developed in Forest Management Districts (FMD) 14 and 15, consultations with the provincial Wildlife Division resulted in a network of pine marten deferred areas and connecting corridors being established across both Districts (Figure 6). No harvesting is permitted within the areas set aside. At the time, in other Forest Management Districts, there was no harvesting in critical habitat, and no harvesting within core areas during the denning period.

Since the inception of restrictions with respect to pine marten areas, CBPPL has almost always been in compliance with the requirements. In 2017 a first infraction involving a pine marten leave area occurred. A forwarder trail was cut through a small peninsula delineated as a pine marten leave area, and in another section of the leave area less than 0.5 ha was harvested. As a result of this infraction, in addition to corrective actions, preventive measures have been established. The planning department in conjunction with the operation's superintendent regularly reviews the cutovers, updated using Sentinel 2 imagery. As well, during the preparation of subsequent 5-year plans, CBPPL's Planning Department will avoid the creation of fingers/narrow peninsulas when delineating leave areas, thereby enlarging Pine Marten leave areas.

Status in 2022

The target, to ensure no harvesting in pine marten deferred areas and corridors, and during denning period within core areas, excludes legal authorizations granted by the provincial government. In 2018 CBPPL received approval from the Wildlife Division to harvest during the pine marten denning period within a number of specified core areas, excluding critical habitat areas.

In the latest five-year operating plans for FMDs 5, 6, 9, & 16 (2017-2021), connecting corridors were established in all districts but FMD 5; no pine marten deferred areas were identified in any of the districts. In the latest five-year operating plans for FMDs 14 & 15 (2019-2023), there were no changes to the Pine Marten deferred areas, corridors, or core and critical areas. There were no infractions observed in 2022. Permission was granted from the Wildlife Division to harvest a small area of corridor in Logger School Road. This defined habitat was showing on a road area with a small sliver adjacent. Permission was granted to harvest.

Due to ongoing recovery efforts, martens have recaptured many parts of their historical range, notably the Baie Verte Peninsula, Stephenville area, and forested areas in southcentral Newfoundland. Recent data has the range moving into the Bay D'Espoir area and several sightings on the Avalon.

The population estimate, based on modeling completed in 2019, is approximately 2,500-2,800 animals. COSEWIC was therefore able to re-assess the species as Special Concern in 2022.

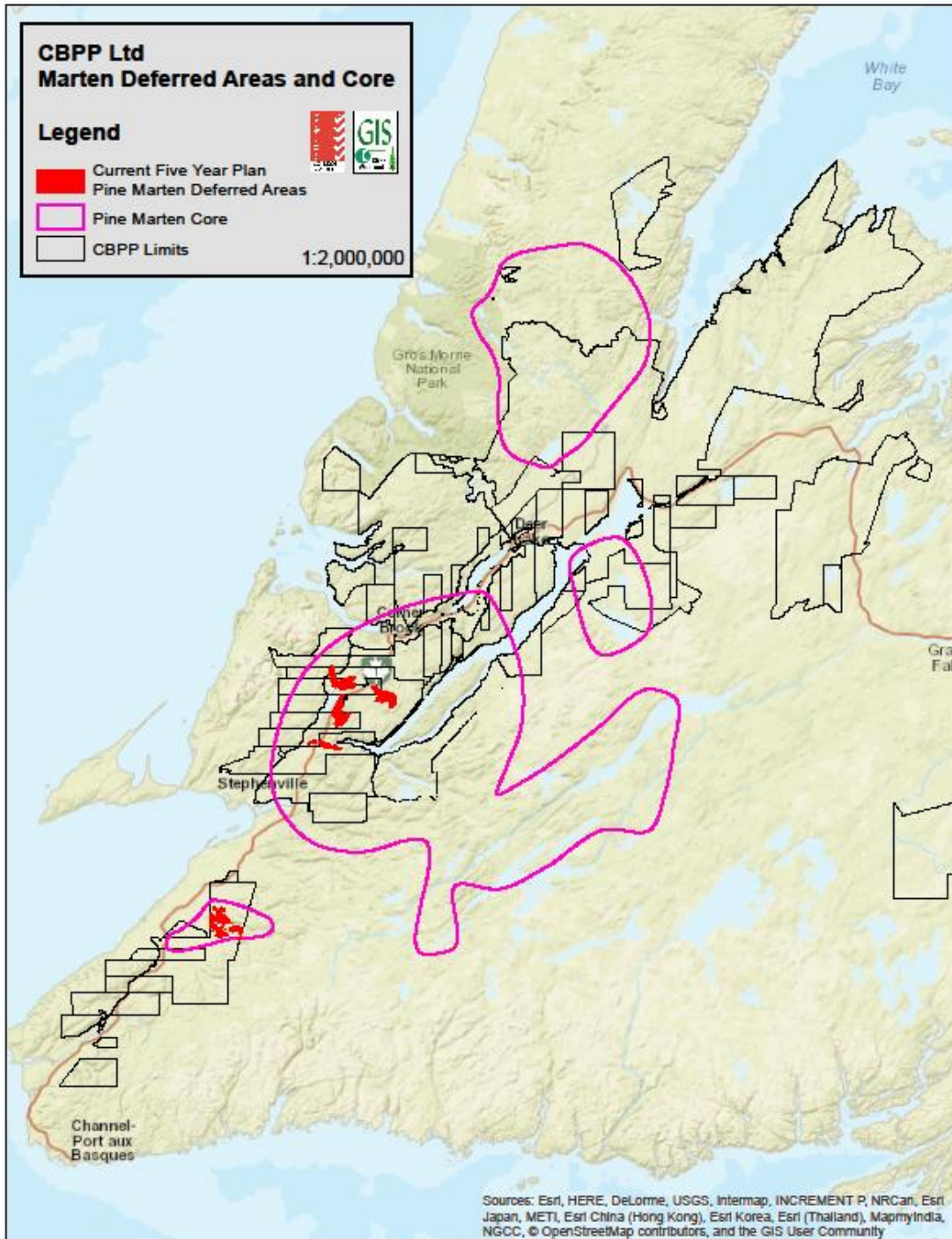


Figure 7. Pine Marten Core and Harvest Deferred areas in FMD's 14, 15, and 16.

Management Strategy

CBPPL will observe no harvesting in pine marten deferred areas and corridors, and during denning period within core areas, as requested by the provincial Forestry and Wildlife Branch. This will ensure sufficient suitable habitat for pine marten where they currently exist, and is conducive to the expansion of pine marten occupancy.

Forecast, Predicted Results or Outcome

CBPPL will continue to cooperate with the provincial Wildlife Division, to assist with the return of pine marten to their historic range.

Implementation Schedule

Task	Details	Responsibility	Frequency
Update indicator of marten habitat	Verify observance of no harvesting in pine marten deferred areas and corridors, and during denning period within core areas	District Planner	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in the SFM Plan	Annually	Cutover updates, harvesting and roads pre-work forms, updated operations map review
Annually after cutover updates	Annually	Sentinel 2 updates
Annually to Gov't	Quarterly EMS Meetings	Field staff

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
Maintaining and protecting terrestrial wildlife habitat is identified as a goal in this document.	Management requirements for pine marten with respect to forest harvesting are contained in the five-year operating plan.	The scale of change in an AOP is too small to have any impact on available Pine Marten habitat.

Indicator 4.2.3 Age Classes

Objective	4.0 Conservation of Biological Diversity
Performance Measure	4.2 Program Participants shall protect threatened and endangered species, Forests with Exceptional Conservation Values (FECV) and old-growth forests

Indicator:	4.2.3	Target	Acceptable Level
Forest area by serial stage or age class		To maintain representation by age class of the productive forest close to current levels.	± 10%
		Retain a minimum of 20 % of the productive forest on the DFA as old forest (81+ years old)	NA
		Resource Person:	District Planner

Definitions

FOREST STAND – A group of reasonably homogeneous trees that can be differentiated from surrounding stands by its age, composition, structure, site quality, or geography.

AGE CLASS – A general classification of age given to each stand in the forest inventory based on age data derived from plots and photo interpretation. The age classes are grouped into 20-year intervals, starting at 0 – 20 years (age class 1) and ending at 121+ years (age class 7). A separate age class (9) exists for stands of mixed ages.

Detailed Description

Measuring forest area by age class relies on some form of classification that takes into account the time since stand-replacing disturbance, as well as evolving forest structural development. Older age classes are often the most difficult to manage, primarily because they require so much time to develop. However, they are often host to unique communities that would not otherwise be present across the forest landscape. Older age classes at 20% of the Defined Forest Area (DFA) is recommended by some experts.

One measure of sustainability when harvesting is having a forest with an even age-class distribution. This allows for an equal amount of forest to be harvested each year over time. The premise is, by having an equal amount of forest at various stages or ages of development, and only harvesting at the mature and over-mature stages, we will always have younger forests developing into later stages, hence sustainability. Past management practices, repeated insect attacks, and forest fires have skewed the age class distribution of the forest in Newfoundland and Labrador, so that there is a disproportionate amount of forest in the youngest (0-20 years) and oldest (81-121+) age classes. This presents problems for forest managers because older timber needs to be harvested in a timely

manner, before being lost to fire, insect, disease, or blowdown. However, if harvested too quickly, the younger forest will not have time to grow to the late successional stages, and therefore will not reach their full productive capacity, or provide the specialized habitat of old forest required by some species. Thinning young stands can help move a proportion of the young age class into a structurally-harvestable stage, so the remainder of the young age class can grow to the mature and over-mature age classes.

It is the responsibility of the provincial government to set the Annual Allowable Cut. This is done by first removing from the equation forest required for other values – protected areas, buffers, habitat for species at risk, viewsheds, etc. Growth curves, anticipated losses to fire, insects and disease, and operational constraints (e.g. steep slopes) are then used to set the AAC. CBPPL must restrict their harvest to within the AAC allotted to them.

This indicator can be updated after the calculation of the wood supply, which occurs every five years. To show progression towards the target, it can be verified annually if the past year's harvest fell within the AAC levels set forth by the Forestry and Wildlife Branch. These AAC levels ensure sustainability by including the constraint of harvesting older stands (81yrs +) first, while ensuring a minimum of 15% of old growth forest is maintained. See Indicator 2.1.4 for the AAC harvested in past years.

CBPPL is in the initial stages of managing by range of natural variation. More research is required to determine the natural range of variation for forest types in CBPPL's DFA. As well, at this time, the Forestry and Wildlife Branch is not managing by range of natural variation, which complicates CBPPL's efforts. Considering all this, and the uncertainties of the effects of climate change on our abilities to manage by range of natural variation, CBPPL will continue for the time being to maintain current level age classes.

In 2012 the spatial database to determine the DFA footprint was updated to reflect changes in exchanges and transfers in Forest Management Districts (FMD) 6, 9, & 15, resulting in a new DFA area of 1,418,922ha. Changes in 2014 through exchanges and transfers in Forest Management Districts (FMD) 6, 9, & 15 and the Muskrat Falls transmission line ROW that intersected CBPPL limits resulted in a decrease of the DFA area to 1,417,831 Ha. Further changes in 2017 through exchanges and transfers, agricultures areas, and areas in FMD 10 has resulted in a further decrease of the DFA area to 1,399,901 ha. However, since the change from 2012 to 2017 is relatively small, we have chosen to continue using 2012 as the base year.

Status in 2020

As stated in the detailed description section of this indicator, calculations of the wood supply occurs every five years. Updates to this indicator will follow the same schedule as the wood supply projections. The new wood supply analysis is started and is expected to be released early 2021. As always we can review annually to show progression towards the target which is verified if the past year's harvest fell within the AAC levels set forth by the Forestry and Wildlife Branch. These AAC levels ensure sustainability by including

the constraint of harvesting older stands (81yrs +) first, while ensuring a minimum of 15% of old growth forest is maintained. See Indicator 1.1.2 for the AAC harvested in past years. Since conception of this indicator levels of old growth forest on our landbase has been maintained over 25% of the productive forest area. The majority of the company's harvest has taken place in managed stands of age class 3-4. Therefore the impact on age class 5 (81+) has been at a minimum. Last year from age class 5 and older we harvested 486 ha of land. This by percentage is only .2% of the total area for this age classes on productive forest land on the DFA. The change in percent resulting in a change of -.2.

In 2020 both the Age Class Table and Percent of Each Age Class table will be updated using the new DFA with hard updates once the new wood supply is complete. Changes based on cutovers can be reported each year and will be provided in the text as shown above.

Table 21. Age Class of the Forest on the DFA from last Wood Supply Modeling 2020-2025

Age Class	Total Area (Ha)
1 – (0 – 20)	76,010
2 – (21 – 40)	129,295
3 – (41 – 60)	101,928
4 – (61 – 80)	59,591
5 – (81+)	196,904
Total Productive Area	563,788

Table 22. Percent of Each Age Class of the Total Productive Forest on the DFA*.

Age Class of the Forest (Years)	2015	2020	
	Percent of Productive Forest on the DFA	Percent of Productive Forest on the DFA	Change in Percent
1 – (0 – 20)	35.3	13.5	-21.8
2 – (21 – 40)	19.5	22.9	+3.4
3 – (41 – 60)	10.7	18.1	+7.4
4 – (61 – 80)	8.6	10.6	+2
5 – (81+)	25.9	34.9	+9

*2015 based on 689,290 ha of productive forest

Target

The target is to maintain representation of current age classes close to current levels, and to retain a minimum of 20% of the productive forest on the DFA as old forest.

Maintenance would be based on factors that can be controlled by CBPPL. Natural phenomena such as insect infestation, blow-down, or forest fires would not fall under the category of factors that can be controlled.

Acceptable Level of Variance

The acceptable level of variance in the current age class structure is $\pm 10\%$. There is no acceptable level of variance for the retention of 20% of the productive forest on the DFA as old forest.

Management Strategy

CBPPL Woodlands will continue to harvest AAC in the DFA within the levels set forth by government (Indicator 1.1.2). Although AAC calculations are based on retaining a minimum of 15 % old forest, CBPPL will monitor the percentage of old forest and retain a level above 20%. Government re-calculates the AAC every five years using the latest data possible to incorporate into the analysis. The government repeatedly monitors regeneration assumptions used in the model for required changes. This continual improvement in regeneration assumptions ensures that future projections age classes are more reliable than in the previous model, thus providing a framework to manage this indicator more accurately with the development of each successive model. More reliable data will allow us to make better management decisions.

Forecast, Predicted Results or Outcome

CBPPL will continue with the management strategy to ensure the age class of the productive forest is maintained close to current levels, while working towards a more balanced age class.

Implementation Schedule

Task	Details	Responsibility	Frequency
Update current age class	Re-assess area and percent of DFA in each age class	District Planner	Starting in 2020 and every 5 years after, or as the DFA footprint changes significantly

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Every five years in Indicator Report	Every five years (after completion of report)	Provincial forest inventory

Links with Strategic and Operational Plans

20-year Strategy	5-Year Operating Plan	Annual Operating Plan
<p>Regeneration assumptions are built into the wood supply calculation, which is used as a tool in developing this strategy. Sustaining the spruce component of regenerating forests in Newfoundland is a goal identified in this strategy.</p>	<p>Five-year plans are determined by the AAC. These AAC's are determined by the working group composition and age class structure among other factors.</p>	<p>AOPs are determined by the AAC, which in turn is determined by the working group composition and age class structure among other factors.</p>

Indicator 5.2.1 Average Clearcut Size

Objective	5.0 Management of Visual Quality and Recreational Benefits
Performance Measure	5.2 Program Participants shall manage the size, shape and placement of clearcut harvests

Indicator:	5.2.1	Target	Acceptable Level
Average size of clear-cut harvest area does not exceed 50 hectares, except when necessary to meet regulatory requirements, achieve ecological objectives, or respond to forest health emergencies or other natural catastrophes.		Cut blocks not to exceed 50 hectare average. Block boundaries may include: adjacent stands, buffers, roads, waterbodies, or wetlands.	50 hectares/cut block +/- 5 hectares.
		Resource Person:	SFM Forester

Definitions

CLEARCUT - A silvicultural system in which the entire stand of trees is cleared from an area at one time. Clearcutting can be implemented in blocks, strips, or patches.

CLEARCUTTING METHOD – A method of regenerating an even-age forest stand by the cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class.

Detailed Description

The Provincial Sustainable Forest Management Strategy (2014-2024) describes commercial forestry on the island of Newfoundland as follows: “Commercial forestry has been concentrated in Central and Western Newfoundland Ecoregions and has focused on the harvest of the conifer species black spruce and balsam fir. From a forest management perspective, the most important differences between these ecoregions are the differences in the natural disturbance regimes. The Central Newfoundland Forest Ecoregion disturbance dynamics are driven primarily by fire, which tends to produce large-scale disturbances (up to tens of thousands of hectares). The Western Newfoundland Forest Ecoregion disturbance dynamics are driven primarily by insect outbreaks and wind events. Many of the forest management polices presented in this strategy are derived from our understanding of these ecoregion-specific dynamics.”

The forests on the island are part of the boreal forest, which is characterized as being disturbance driven resulting in the formation of relatively even aged stands. The clear-cut method 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. The clear-cut method is the only harvest system used by CBPPL at this time.

Previously data was collected from Harvester points from FP Data collectors which were then combined to create cutover polygons. In 2019 and going forward the cutover information will be taken from Sentinel 2 satellite imagery and cutovers are digitized in ArcGIS. This method of data collection allows the user to get accurate cutover shapes and remove buffers, fly-away points and roads that are not considered part of the cutover for this analysis.

For this indicator each cutover area is measured in hectares and then averaged over the total numbers of cutovers on the DFA for that particular year. Location information downloaded from FPDat systems in the harvesting, processing, and forwarding equipment is compiled and presented as cut polygons for each area. Cutover boundaries for this analysis include roads, waterbodies, adjacent stands, buffers, and wetlands.

Status in 2022

Clear-cut area data was extracted from the cutover geodatabase. Queries were set up in ArcGIS to display only 2022 data. The average cut-block size has shown a yearly decrease since 2018. This can be explained by the interpretation of the raw data. Using satellite imagery vs harvester points give a much more precise cutover polygon which does not need to be manipulated in any way to get the final cutover size. A total of 254 cutover blocks were used in the 2022 data collection. Of them only 9 were found to be over the 50ha average.

Table 23. Average Cutblock Size on DFA by Year

	2017	2018	2019	2020	2021	2022
Size (ha)	14.5	19.5	13.5	9.7	8.1	10.8

Management Strategy

Each year, the data set will be made available for the previous year’s cutovers. In 2019 and going forward the method at which the data is collected has changed and Sentinel 2 imagery will be used to create cutover polygons. Staff will continue to review the data as collected and monitor the trends in cutover size. If the averages continue to increase over time a strategy will need to be developed to plan cut block size in areas where the potential is high.

Implementation Schedule

Task	Details	Responsibility	Frequency
Report on results of GIS analysis in SFM Plan	Report results	SFM Forester	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually	Annually	GIS analysis of cutblocks

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
The Strategy is largely grounded in the natural disturbance regimes of the province. The clear-cut method most closely emulates these patterns and therefore is the most preferred method for harvest.	The 5-year operating plan identifies harvesting and silviculture treatment areas. The clear-cut method is the only harvest system used by CBPPL at this time.	The link to our annual operating plan is similar to the 5-year plan link, only on a more site-specific basis. The size, shape, arrangement and juxtaposition of clear-cut areas vary across the landscape depending on localized topography and terrain conditions.

Indicator 5.4.1 Forest Stakeholders

Objective	5.0 Management of Visual Quality and Recreational Benefits
Performance Measure	5.4 Program Participants shall support and promote recreational opportunities for the public

Indicator:	5.4.1	Target	Acceptable Level
Evidence of open and respectful communications with forest dependent businesses, forest users and local communities to integrate non-timber resources into forest management planning. When significant disagreement occurs, efforts towards conflict resolution are documented.		To aim for the satisfaction of 100% of stakeholders inside CBPPL’s 5-year operating plan for each Forest Management District, with whom CBPPL has an agreement.	-10%
		Resource Person:	Environmental Management Representative

Definitions

STAKEHOLDER - A person, group or organization that has interest or concern in an organization. Stakeholders can affect or be affected by the organization's actions, objectives and policies.

Detailed Description

There are many stakeholders on CBPPL limits, with interests in the social, cultural, ecological and economic benefits the forest can provide. Some draw their livelihood from the forest (outfitters and other tourism operators and commercial firewood operators), some use the forest for their recreational activities (e.g., snowmobiling, skiing, camping, fishing, hunting, hiking, boating) while others aim to ensure conserve, restore and manage forest habitat for wildlife and humans alike. Interactions between stakeholders and CBPPL occur on several levels, some with the Planning Department of CBPPL through details of an Agreement or Memorandum of Understanding, and others through requirements to environmental and forestry certifications.

CBPPL is committed to ensuring the interests of stakeholders are maintained on the DFA. This is demonstrated in the pro-active approach CBPPL takes when approaching stakeholders to discuss proposed forest management operations in the vicinity of their interests. This mainly occurs during the 5-year planning process. Cooperating with stakeholders on the DFA can help to ensure their interests are protected.

A target has been established to include all stakeholders inside CBPPL’s 5-year operating plan for each Forest Management District, with whom CBPPL has an agreement. This target will aim to meet with and satisfy the concerns of these stakeholders during the 5-

year planning process and during consultations concerning the environmental and forestry certifications.

Status in 2022

The most recent 5-Year Planning process was conducted in 2021 for Forest Management Districts 5,6 (Zone 3) and, 9 and 16 (Zone 7). These new plans will cover 2022-2026. During the development of 5-Year Plans, CBPPL seeks the input of all stakeholders located within or in proximity of the company’s timber license areas. This consultation approach can result in site specific mitigation measures, Memorandum of Understandings, harvest deferrals or continual communication regarding yearly activities. Agreed upon action items are warehoused in the Woodlands Department and reviewed during the preparation of Annual Harvest Plans to ensure compliance. From the 5YP’s for these zones a Stakeholder Engagement report, Tourism Stakeholder Consultation Plan and Viewscape Management Plans were developed and approved by Tourism, the Town of Baie Verte and Environmental Assessment Division. Annual consultations with stakeholders continue to occur with such groups as the Newfoundland and Labrador Snowmobile Federation, certain outfitters, and the Wildlife Division. The next 5YP process will take place in 2023 and will cover Districts 14 and 15 (Zone 6).

CBPPL has been tracking their compliance with Agreements struck with various stakeholders since 2014. The following table lists the stakeholder, what type of mutual arrangement exists between the two parties (agreement or memorandum of understanding), and if the stakeholder confirms that CBPPL has been compliant over the past year.

Table 24. Stakeholder confirmation of CBPPL’s compliance with Agreements/Memorandums of Understanding (MOU)

Stakeholder	Agreement or Memorandum of Understanding (MOU)	2018 Verification	2019 Verification	2020 Verification	2021 Verification	2022 Verification
Ducks Unlimited Canada – NL	Ducks Unlimited Cooks Marsh Agreement Data Use Agreement	13/03/2019	26/02/2020	01/03/21	03/01/2022	01/02/2023

Stakeholder	Agreement or Memorandum of Understanding (MOU)	2018 Verification	2019 Verification	2020 Verification	2021 Verification	2022 Verification
Freshwater-Alexander Bays Ecosystem Corporation (FABEC)	FABEC Memorandum of Understanding	07/03/2019	28/02/2020	26/02/21	1/02/2022	17/01/2023
NL Dept. of Fisheries and Land Resources	Hardwood Agreements- FMD's 9, 14	FMD 14: 12/03/2019 FMD 9: 09/04/2019	FMD 14: 04/02/2020 FMD 9: 30/04/2020	FMD 14: 25/02/2021 FMD 9 25/02/2021	05/05/2022	13/01/2023
Indian Bay Ecosystem Corporation (IBEC)	IBEC Memorandum of Understanding	08/03/2019	04/02/2020	25/02/2021	02/07/2022	11/01/2023
International Appalachian Trail NL (IATNL)	IATNL Memorandum of Understanding	17/03/2019	10/02/2020	08/03/2021	09/02/2022	20/01/2023
Nature Conservancy of Canada (NCC)	NCC Data Sharing Agreement	09/04/2019	24/02/2020 New Agreement signed April 9 2020	3/05/2021	Sent/022-05-05	01/02/2023
Newfoundland and Labrador Outfitters Association (NLOA)	NLOA Memorandum of Understanding	08/03/2019	17/02/2020	01/03/2021	04/02/2022	01/11/2023
Newfoundland and Labrador Snowmobile Federation	NLSF Memorandum of Understanding	07/03/2019	06/02/2020	01/03/2021	14/02/2022	01/11/2023
Airport Nordic Ski Club	Agreement	23/34/2019	21/02/2020	29/03/2021	Sent/resent 05/13/2022	20/01/2023
Camp 33 Trailer Park Inc.	Trailer Park Agreement	8/03/2019	14/02/2020	03/03/2021	Sent/resent 05/04/2022	17/01/2023
AWARE	N/A	12/03/2019	05/02/2020	25/02/2021	01/02/2022	Project has ended
Spruce Trails Snowshoeing Association	Spruce Trails Agreement		Agreement signed 27/01/2020	25/02/2021	16/02/2022	17/01/2023
Town of Baie Verte	Multipurpose Trail Agreement				First signed July, 19 2022	17/01/2023

Management Strategy

It is our intention to continue meeting with stakeholders as required in the agreements. As new Five-Year Plans are developed we will endeavor to involve all stakeholders with interests on our DFA and get them involved in the public consultation process to develop Five-Year Forest Management Plans. Through this process we should be able to reduce any future conflicts with our plans. Any conflicts that cannot be settled at the Five-Year Planning Team level will be dealt through the process agreed to in the Agreement/Memorandum of Understanding that Corner Brook Pulp and Paper Limited signed with the stakeholder.

Forecast, Predicted Results or Outcome:

Cooperation between CBPPL, and its stakeholders with agreements should result in the resolution of all outstanding issues.

Implementation Schedule

Task	Details	Responsibility	Frequency
Meet or consult with stakeholders as required.	Purpose of meeting/consultation will be to review current status of agreements/MOUs and any unresolved issues, or to discuss existing and potential high conservation values.	Environmental Management Representative	Annually

Monitoring / Reporting:

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in Indicator Report	Annually	Notes from meetings with stakeholders; correspondence with stakeholders

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
The Provincial Sustainable Forest Management Strategy identifies numerous goals and indicators to help maintain ecological, social, and nontimber economic values of the forest.	Stakeholders will be invited to participate in a renewed public planning team process, a goal of the Provincial Sustainable Forest Management Strategy.	Arrangements agreed to with stakeholders through Agreements and MOUs ² will be implemented in the AOP ³ as required.

² Agreement/Memorandum of Understanding

³Annual Operating Plan

Indicator 6.1.2 Special Places

Objective	6.0 Protection of Special Sites
Performance Measure	6.1 Program Participants shall keep a list of identified special sites and manage them in a manner appropriate for their unique features

Indicator:	6.1.2	Target	Acceptable Level
Protection of sites of special significance		To implement a “Special Places” program that will identify, describe, and promote a special sites on the DFA, and maintain them through management strategies specific to each site.	EMS committee review new special places put forward for consideration. Effort to maintain identified sites.
		Resource Person:	Environmental Management Representative

Definitions

SPECIAL PLACES / SPECIAL SITES – A project initiated from CBPPL Environmental Management System (EMS) review was the development of a “unique” areas program. There are plenty of special places on our limits - places people frequent to fish, camp or just spend time. The goal of CBPPL is to locate and describe these locations. They will be highlighted on our operating maps, and measures will be implemented to ensure the particular qualities that make the sites special places are considered when operating in or adjacent to these areas.

Detailed Description

CBPPL recognizes that our DFA provides more than just a supply of fibre for our mill. Other ecological, historical, cultural, and sacred values exist and should be carefully managed.

Through different partnerships, Woodlands staff as well as members of the public, have developed a list of Special Places. The Company intends to evaluate all listed sites so that CBPPL can make decisions on how to maintain the special qualities or characteristics of the sites.

Each designated Special Places is considered significant for one or more of the following reasons:

- areas containing rare plants
- wetland areas
- areas of particular value to animal species (bird, fish, invertebrate, mammal)
- interesting or unique geological features
- areas of sacred, cultural or historical significance

- areas containing high quality, representative or unusual forest types
- areas with aesthetic appeal
- areas of education and public outreach

The list was reviewed with the goal of ensuring that controls are in place to manage them, and preserve or maintain the attributes that make the areas special. Adding sites to this list in no way indicates that CBPPL will never operate there; it means these areas will be highlighted in our database so that appropriate management measures are taken to ensure contractors are fully aware of their existence and importance when operating near them.

These controls will include:

- identifying and evaluating suggested sites
- recording the location of each site
- entering the information into the Woodlands GIS database so it will appear when developing annual and five-year operating plans
- ensuring that before any operation commences, a Pre-Work Form will be completed and reviewed with the contractor. The Pre-Work Form will identify the significance of the special place and include any requirements for the contractor.

Our Special Places program was implemented in 2007 and launched via the CBPPL website. Three of the Special Places listed below (Little Grand Lake Provisional Ecological Reserve, Main River Waterway Provincial Park and Pasadena Ski and Nature Park) were at one time part of CBPPL's timber limits. These areas were sold back to the provincial government, the first two based on their value as protected areas and Pasadena Ski and Nature Park as part of a tourism initiated viewshed corridor from the mouth of the Humber River to the northeast tip of Deer Lake. T'Railway Provincial Park runs through CBPPL's timber limits in many areas and frequently influences CBPPL's management plans. CBPPL timber limits surround West Brook Ecological Reserve on three sides.

Several of the Special Places already have various forms of management strategies in place. Existing strategies developed by various agencies such as Ducks Unlimited, the provincial government, and the Corner Brook Stream Trail Association are incorporated into site-specific management strategies developed for the Special Places program.

Status in 2022

22 Special Places have been identified:

Healing Forest
Newfoundland & Labrador Snowmobile Federation Groomed Trails
Airport Nordic Ski Park
Birchy Basin (Upper Humber Wetlands Complex)
Blow-Me-Down Trails
Bottom Brook Arboretum
Chimney Cove
Cook's Marsh

Corner Brook Stream Trail
Crescent Pond Sitka Spruce Stand
Freshwater-Alexander Bays Watershed
Hampden Downs
Indian Bay Watershed
Inner Loon Pond Forest
International Appalachian Trail Newfoundland & Labrador
**Little Grand Lake Provisional Ecological Reserve*
Lomond Sink Hole
**Main River Waterway Provincial Park*
**Pasadena Ski and Nature Park*
Spruce Trails
Thomas Howe Demonstration Forest
**T'Railway Provincial Park*
**West Brook Ecological Reserve*

* Some of these Special Places were at one time part of CBPPL's timber limits, while others are on Crown land within or adjacent to CBPPL's timber limits. None of the sites indicated are maintained by CBPPL.

There were no new special places dedication for 2022. **Newfoundland & Labrador Snowmobile Federation (NLSF) Groomed Trail Network** continues to have additions onto the trail system that is entered into our Special Places data base. The NLSF is a group dedicated to providing strong leadership and support to safe, organized family oriented snowmobiling in the province of Newfoundland & Labrador through a network of well-marked and maintained groomed trails and to promote the province of Newfoundland and Labrador as Canada's snowmobiling destination. Their mandate is to ensure the interests of "all" members are put forward as a united voice with special emphasis on maintaining the freedom of "back country" snowmobiling which is currently available in all parts of the province. Much of the NLSF groomed trails are located on CBPPL logging roads and timber limits. CBPPL is committed to supporting local recreational activities, and have committed to allow the NLSF to groom the logging roads in the winter for recreation. As well we consult with the NLSF annually with their preparation for the upcoming snowmobile season and during preparation of Five Year Management Plans. It is our commitment to locals to allow recreation to continue on the trail system.

All of CBPPL's Special Places can be viewed at www.cbppplwoodlands.com on the "Special Places" page.

Management Strategy

Our intent is to have all of these sites fully evaluated so that CBPPL can make informed decisions on how to maintain the special attributes or qualities of the site, within the boundaries of a larger operating area. Information including photographs, why the site is special, vegetation surveys where applicable, and appropriate management recommendations will be gathered for these Special Places.

CBPPL also supports in principle the provincial government’s protected areas strategy, administered by the Natural Areas Program of the Department of Fisheries and Land Resources. Where these protected areas fall on CBPPL’s DFA, they will be incorporated into the special places program. An example is the West Brook Ecological Reserve. A complete list of protected areas can be found at:
<http://www.env.gov.nl.ca/env/parks/apa/index.html>.

Areas of sacred or archaeological significance on the DFA are identified and protected through an Environmental Assessment of the Five-Year Operating Plan. Submitted to the Department of Municipal Affairs and Environment, the Five-Year Operating Plan is sent to various government departments for comments. Areas of sacred or archaeological significance are identified by the Department of Tourism, Industry and Innovation, and requirements for protection of these areas are included in the Certificate of Managed Land, which is awarded annually by the Forestry Services Branch. However, CBPPL may not be able to add all of these areas to the Special Places program, as some archaeological/sacred sites might not be public knowledge.

Forecast, Predicted Results or Outcome

Corner Brook Pulp and Paper Limited believes it is in the best interest of the public and the Company to support a Special Places Program. By incorporating a Special Places Program into the current management strategy, CBPPL can decide how to maintain the special qualities or values of the sites, to the benefit of all, within the boundaries of our DFA.

The site locations will be marked on a Special Places Map. This information, available on the Company's website, will allow users of the DFA to enjoy sites identified as having special ecological, cultural or recreational significance.

Before any operation commences in or adjacent to these areas, a Pre-work Form will be completed and reviewed with the contractor to ensure that the special attributes of these sites are maintained for future generations.

Inviting interested persons, local recreational groups, and other special-interest groups to suggest additional Special Places will ensure the program continues in the future.

Implementation Schedule

Task	Details	Responsibility	Frequency
Describe the special sites	A description should be provided for special place’s sites as they are designated	Environmental Management Representative	Annually
Map the special sites	Each special site should be identified in the GIS database	District Planner	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in Indicator Report	Annually (after completion of report)	CBPPL staff and employees and the public

Links with Strategic and Operational Plans

20-year Strategy	5-Year Operating Plan	Annual Operating Plan
The designation of special places has been identified as a value in the Newfoundland and Labrador Sustainable Forest Management Strategy	As special sites are entered in the GIS database, they will be incorporated in the 5-year plan	Any special sites will be located on relevant operational maps to ensure that they are maintained on the DFA. Pre-work meetings with contractors before any operation commences in these areas will further ensure that their special significance is maintained for future generations.

Indicator 7.1.1 Wood Utilization

Criterion	7.0 Efficient Use of Fiber Resources
Element	7.1 Program Participants shall employ appropriate forest harvesting technology and in-woods manufacturing processes and practices to minimize waste and ensure efficient utilization of harvested trees

Indicator:	7.1.1	Target	Acceptable Level
Wood utilization		To average 2.5m ³ /ha of residual commercial volume on cutovers	+1m ³ /ha
		Responsible Person:	Operations Superintendent

Definitions

WOOD UTILIZATION – The proportion of wood fibre actually harvested and extracted from a given forest area, relative to the total merchantable wood fibre available. It is also referred to as *fibre recovery*.

Detailed Description

Fibre utilization is an important and integral part of forest management. It directly affects our fibre costs and AAC, and fibre recovery is an important element in the CBPPL Environmental Management System (EMS). By ensuring the maximum amount of merchantable fibre is taken off all areas harvested, it minimizes the number of hectares of forest harvested in any one year.

In 2000, the Forestry Services Branch determined that CBPPL was leaving 10.15m³/ha of merchantable fibre on cutovers, which is above the government standard of 6.0m³/ha set in 1996. In response, CBPPL initiated an aggressive action plan in 2001 to improve fibre recovery from its harvesting operations, including surveys to monitor the success of the fibre recovery program. As indicated in the table below, significant improvements have been made since then.

Since 2001, CBPPL has been conducting detailed assessment surveys on all of our cutovers using a methodology similar to that used by the Department of Natural Resources. Residual wood volumes are categorized by pieces, tops, brows, butt junks, down trees, standing trees and stumps. This breakdown is used to pinpoint specific problems and allows the Company to put remedial measures in place.

Status in 2021

Utilization survey results for 2021 is 1.56 m³/ha. The 2021 utilization result is slightly higher than the target. This is within an acceptable level. CBPPL continues to show good results in 2021 due to attention to detail by the contractor supervisors and high performance by the harvesting crews.

Table 25. Total merchantable fibre (year-end weighted average) left on CBPPL cutovers.

Year	Residual Merchantable Fibre* (m³/ha)
2009	2.19
2010	1.11
2011	1.52
2012	2.04
2013	2.15
2014	3.38
2015	1.88
2016	1.59
2017	1.21
2018	1.49
2019	2.44
2020	2.98
2021	1.56

* excluding non-recoverable tops

Management Strategy

Our management strategy will be a continuation of our current program, which involves the following:

- Measure the residual volumes on all our cutovers;
- Identify the sources or categories of fibre losses (e.g. stumps, tops, etc.), which will enable us to identify specific problems and take corrective actions.
- Implementation of an on-the ground education and awareness program for employees
- Frequent reporting on progress
- Constant communications with all employees
- Financial incentives for contractors to meet requirements

Forecast, Predicted Results or Outcome

The Fibre Recovery Program has produced favorable results. It is evident through the evaluation of past and present data that the program is an effective method of managing fibre loss. Each new operating season presents different challenges that must be effectively managed and addressed. For example, the largest contributing factor to the 2014 increase related to the high percentage of new operators we had working that year. While we are aware that from time to time we may have a bad year which adversely affects our overall results, we are still firmly convinced that we can achieve our stated target of 2.5 m³/ha. We are clearly trending in that direction, from 2015 on.

Implementation Schedule

Task	Details	Responsibility	Frequency
Prepare annual utilization report*	An annual utilization report shall be completed and the results shall be reported.	Operations Superintendent	Annually

* For procedure see Fibre *Utilization Control Program Procedures Manual*.

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in Indicator Report	Annually (after completion of report).	Utilization surveys

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
Improving harvesting utilization of individual trees and forest stands is identified as an action of the Newfoundland and Labrador Sustainable Forest Management Strategy. Maximizing fibre recovery from our forest operations is fundamental to this strategy.	The 5-year plan describes the stands and general area where we will be operating over a 5-year period. Furthermore, it provides specific wood volumes available in each operating area. These volumes, and hence the plan itself, are based on a calculated AAC and assume a certain fibre recovery level based on past experience. Improvements over our past experience may trigger an adjustment to our AAC and, by extension, future 5-year operating plans.	As with the 5-year Operating Plan.

Indicator 8.3.1 Engagement of Aboriginal People

Objective	8.0 Recognize and Respect Indigenous Peoples' Rights
Performance Measure	8.3 Program Participants are encouraged to communicate with and shall respond to local Indigenous Peoples with respect to sustainable forest management practices on their private lands

Indicator:	8.3.1	Target	Acceptable Level
Evidence of understanding and use of Aboriginal knowledge through the engagement of willing Aboriginal communities, using a process that identifies and manages culturally important resources and values.		1. Offer to meet with Miawpukek First Nation and Qalipu Mi'kmaq First Nation Band to understand their forest values, knowledge and uses, as they apply to the 5 year plan areas.	1. No variance
Level of management and/or protection of areas where culturally important practices and activities occur.		2. Discuss adaptive forest management strategies for the above values, knowledges and uses.	2. No variance
		3. Indicate in annual operating plan agreed-upon strategies.	3. No variance
		Resource Person:	Environmental Management Representative

Definitions

ABORIGINAL PEOPLE - In the Constitution Act, 1982, "Aboriginal peoples of Canada" includes the Indian, Inuit, and Metis peoples of Canada.

Detailed Description

Aboriginal people on the Island of Newfoundland are primarily Mi'kmaq, and have Aboriginal rights. There are two First Nation Bands on the island of Newfoundland that follow their traditional values on CBPPL limits: Miawpukek First Nation and Qalipu Mi'kmaq First Nation Band. Miawpukek First Nation has a reserve of 548 hectares in Baie D'Espoir (outside of CBPPL limits); Qalipu Mi'kmaq First Nation Band is a landless band.

First Nation's knowledge of sustainable forest management and their culturally important resources and values will be taken into account in the development of CBPPL's Sustainable Forest Management Plan and in operating plans.

Kruger Inc. has a *Policy to Promote Harmonious Relations with First Nations*, and Corner Brook Pulp and Paper Woodlands has drafted a *Vision for Harmonious Relations with First Nations* and *Memorandums of Understanding* between Corner Brook Pulp and Paper Ltd. and each of the two First Nation bands. Woodlands staff have met with both First Nation bands and presented this documentation for consideration. CBPPL would like to sign a *Memorandum of Understanding* with each First Nation band.

Both QFN and MFN were members of the Newfoundland Regional Working Group (NRWG) of the Canadian Boreal Forest Agreement (CBFA) and CBPPL engaged with Aboriginal partners through this process.

Representatives from Miawpukek First Nation, Qalipu First Nation, and Kruger Inc. are co-leads and partners on a number of committees which met in 2020 as part of the provincial government's "The Way Forward" process. These committees include Sustainable Forest Management, Research, Innovation and Diversification, Forest Business Development and Risk Management, Public Awareness and Human Resources, and Skills and Labour.

Status in 2022

In 2022 CBPPL staff continued to work with members of Qalipu First Nation during the public consultation process for the Five-Year Plan in District 6. From this process a Stakeholder Engagement Report was generated and approved by the Environment Assessment Division. Consultation continues in 2023 with respect to the Southwest Gander Operating area in the form of meetings with the concerned citizens to attempt to reach a consensus.

In 2022 the Annual Operating plan was sent to the Qalipu First Nation Office Natural Resources Director. No concerns were raised after this submission.

Five-Year Plan public consultations for District 14 and 15 are expected to take place in spring of 2023.

Management Strategy

CBPPL meets with forest stakeholders during the 5-Year Planning Process to discuss their values. CBPPL will now offer to meet with Miawpukek First Nation and Qalipu Mi'kmaq First Nation Band as well, to identify their values, which will then be integrated into the 5-Year Operating Plan and Annual Operating Plans. CBPPL will provide digital data from each Annual Operating Plan for the First Nation bands to review, to ensure that the commitments of the 5-Year Operating Plan are being followed.

Forecast, Predicted Results or Outcome

CBPPL will offer to meet with Miawpukek First Nation and Qalipu Mi'kmaq First Nation Band to discuss the incorporation of their values into the 5-Year Operating Plan. By providing the First Nation bands with digital data of the Annual Operating Plans, they can verify that their values are being respected and incorporated into the plans as agreed.

Implementation Schedule

Task	Details	Responsibility	Frequency
Meet with First Nation Bands	Offer to meet with Miawpukek First Nation and Qalipu Mi'kmaq First Nation Band to identify First Nation values.	SFM Forester	During 5-Year Planning Processes
Incorporate values	Once a management strategy has been agreed upon by CBPPL and First Nations, incorporate First Nation values into the 5-Year and annual operating plans when applicable.	SFM Forester	Annually
Provide Annual Operating Plan	Provide digital data from each annual operating plan to Miawpukek First Nation and Qalipu Mi'kmaq First Nation Band, to show integration of identified First Nation values.	SFM Forester	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in Indicator Report	Annually	Annual Operating Plans

Links with Strategic and Operational Plans

20-year Strategy	5-Year Operating Plan	Annual Operating Plan
Aboriginal perspectives and involvement have been identified as a value in the Newfoundland and Labrador Sustainable Forest Management Strategy	Participation in the public consultation process, to prepare 5-Year Forest Management Plans is open to all groups and individuals.	Aboriginal perspectives and involvement will be sought concerning annual operating plans affecting their traditional areas.

Indicator 9.2.1 Women’s Employment Plan

Objective	9.0 Legal and Regulatory Compliance
Performance Measure	9.2. Program Participants shall take appropriate steps to comply with all applicable social laws at the federal, provincial, and local levels in the country in which the Program Participant operates.

Indicator:	9.2.1	Target	Acceptable Level
Written policy demonstrating commitment to comply with social laws, such as those covering civil rights, equal employment opportunities, anti-discrimination and anti-harassment measures, workers compensation, Indigenous Peoples rights, workers’ and communities’ right to know, prevailing wages, workers’ right to organize, and occupational health and safety.		To report annually the statistics related to the Women’s Employment Plan, to the Minister responsible for Women and Gender Equality.	No variance
		Resource Person:	SFM Forester

Definitions

Detailed Description

The Women’s Employment Plan (WEP) was 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 has implemented by working collaboratively with our contractors and relevant community stakeholder organizations to help ensure a diverse and inclusive workforce during the various activities in our forest operations.

CBPPL is an equal opportunity employer in all sectors of its operation. The company encourages and supports the growth of women within the organization in many ways including identifying women for succession roles, and providing equal opportunity in all job competitions.

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 company will report yearly, through the SFM plan, to the Minister responsible for Women and Gender Equality. Employment targets, duration of work, and initiatives, will be represented in the status and tables below.

Status in 2022

In 2022 there were several new hires. Each posting includes appropriate language to encourage women to apply for all job opportunities. A gender equity and diversity statement are included in any such promotional material.

Table 26. Employment Targets by Occupational Group

Occupation	FT/PT/Seasonal	Direct (DH) Hire/Contractor (CH)	Estimated Time Frame	Total # of Employees	Target Female %	2020 % Female	2021 % Female	2022 % Female
Project Management/Administration	N/A							
Supervisors of Skilled Trades	FT	CH	Continuous	6	25%	0%	17%	0%
Professionals/Semi-professionals, Technicians	FT/PT	CH/DH	Continuous	14	25%	14%	20%	29%
Skilled Trades	Seasonal	CH	Continuous	98	25%	<1%	1.5%	3%
Manual Workers/Labourers	Seasonal	CH	Continuous	23 Planting	25%	6%	0%	13%
Apprentices	N/A							

Management Strategy

CBPPL will monitor the progress of the WEP and work closely with contractors to discuss opportunities to advance the plan.

Implementation Schedule

Task	Details	Responsibility	Frequency
Report progress	Report previous years efforts and statistics	SFM Forester	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually	Annually	Woodlands Operational Staff

Links with Strategic and Operational Plans

NL Sustainable Forest Management Strategy	5-Year Operating Plan	Annual Operating Plan
N/A	The WEP will be included in all 5 Year Plan going forward.	NA

Indicator 11.2.1 Investment in Training and Skills Development

Objective	11.0 Training and Education
Performance Measure	11.2 Program Participants shall work to foster improvement in the professionalism of wood producers

Indicator:	11.2.1	Target	Acceptable Level
Level of participation and support in training and skills development		Train 100% of the workforce to the requirements set out in the training matrix	-10%
		Resource Person:	Safety and Training Supervisor

Definitions

GENERAL SAFETY COMMITTEE - CBPPL holds bi-monthly General Safety Meetings. One purpose of the General Safety Committee is to review items from operations and jobsite meetings that could not be resolved. Woodlands management also meet weekly and issues that require immediate attention are dealt with at these meetings.

SKILLS DEVELOPMENT - A learned power of doing something competently: a developed aptitude or ability.

Detailed Description

Forests represent not only a return on investment for the organization but also a source of income and non-financial benefits for DFA-related workers, contractors, and others; stability and opportunities for communities; and revenue for local, provincial, and federal governments. Investment in the training and skills development of its workers and contractors serves to strengthen the organization and its viability, which in turn strengthens the viability of forest-based communities in its DFA.

One of the goals of CBPPL’s Forest and Environmental Policy is that the Company will “Promote environmental awareness among our employees and contractors and train employees in their specific environmental and forest management responsibilities.” This commitment to training and skills development is incorporated into the company’s Environmental Management System (EMS).

Training needs are identified by the General Safety Committee and form the basis for any training plans required. A Training Needs Matrix lists every possible job classification in CBPPL Woodlands and the training requirements for each. The training database, in Intalex, tracks the employees’ training and skills development, based on the requirements of the job classifications established in the Matrix.

When the EMS was implemented in 2000, job specific training needs were determined using a Training Skills Analysis and Record Form in which each employee’s training

records were reviewed to ensure they had the training required to manage Significant Environmental Aspects (SEA's) and emergency response. At the time, Superintendents and Contractors evaluated each employee and completed the form based on training received or assessed competency based on job experience.

This database, a computer software program, is maintained by the HR Department, and employee training records are entered as training is complete. The database is periodically checked against the Training Needs Matrix, thus ensuring employees have received competency training for their respective jobs.

The active employee list in the training database was reviewed against the Training Needs Matrix to determine the annual training program (table below). Because not all employees scheduled for training are able to attend, more than the minimum number required are notified.

Status in 2022

In 2022, the total number of employees trained in regulatory courses was acceptable but will require improvement in 2023. The target did not get met this year as per the requirements set out in the training matrix. Changes have been made in who administers the training program internally. It will now be a function of the HR Department. The current requirements of the training matrix is now being reviewed to ensure it reflects current legislation. The employee list is also being reviewed to ensure accuracy.

A focus with training is currently underway with shutdowns of operations one by one to complete required trainings.

Management Strategy

Skills development training will continue to be a very important component of CBPPL's Safety and Training Program and the Environmental Management System. The training database will be maintained by the HR Department. The active employee list in the database will be reviewed annually against the Training Needs Matrix to determine an annual training program. The HR Department will inform the Environmental Management Representative of employee training requirements with regard to Environmental Awareness, that is apart of the Qualified Logging Professional course, as new employees are hired.

Forecast, Predicted Results or Outcome

Investment in the training and skills development of its workers and contractors serves to strengthen the organization and its viability. Training outcomes will be improved for 2023.

Implementation Schedule

Task	Details	Responsibility	Frequency
Review training data base and training matrix	Determine annual training program for employees based on results of data base and matrix review.	Safety and Training Supervisor and Administrative Assistant	Annually
Arrange for required training	Organize course offerings for required training if economies of scale permit	Safety and Training Supervisor and Environmental Management Representative	Annually

Monitoring / Reporting

Frequency of Reporting	Frequency of Monitoring and Review	Sources of Information
Annually in Indicator Report	Annually	Training Needs Matrix Training database

Links with Strategic and Operational Plans

20-year Strategy	5-Year Operating Plan	Annual Operating Plan
Newfoundland and Labrador Sustainable Forest Management Strategy to continue to train department staff and district Planning Team members on factors pertaining to managing forests.	Training requirements for all personnel involved with developing and implementing 5 year operating plans	Training requirements for personnel involved in carrying out all aspects of the annual operating plans i.e. planning, layout and harvesting.

REFERENCES

CBPPL. 2001. Five Year Operating Plan (2002-2006) Forest Management District 16.

CBPPL. 2015. Social Economic Assessment Report.

CSA. 2008. Sustainable forest management. Canadian Standards Association. 81p.

Damman, A.W.H. 1983. An ecological subdivision of the island of Newfoundland. *Monographiae Biologicae* 48:163-206. Biogeography and Ecology of the Island of Newfoundland. Edited by G. R. South, Dr. W. Junk Publishers, The Hague.

DEC. 2008. Five-year caribou strategy seeks to address declining populations. <http://www.releases.gov.nl.ca/releases/2008/env/0207n06.htm>. Accessed on October 16, 2009.

DEC. 2010. Land Mammals of Newfoundland. Department of Environment and Conservation. http://www.env.gov.nl.ca/env/snp/programs/education/animal_facts/mammals/index.html . Accessed June 3, 2010

DEC. 2015. A report on the Newfoundland caribou. http://www.env.gov.nl.ca/env/caribou_complete.pdf. Accessed March 14, 2016

DFRA. 2003. Ecoregions of Newfoundland. Department of Forest Resources and Agrifoods. . Accessed on May 26, 2003.

DFRA. 2003b. Soil and Land Overview. Department of Forest Resources and Agrifoods. . Accessed on May 26, 2003.

DFRA. 2003c. Forest Management and Planning Alternatives. (unpublished).

DFRA. 1995. Proposed Adaptive Management Process.

FLR. 2018. Mammals Native to Newfoundland.

http://www.flr.gov.nl.ca/wildlife/snp/programs/education/animal_facts/mammals/index.html. Accessed April 12, 2018.

FSB. 2014. Provincial Sustainable Forest Management Strategy: Growing our Renewable and Sustainable Resource 2014-2024.

GNL. 2003. Newfoundland and Labrador: Discovering, Learning, Living. Government of Newfoundland and Labrador. Accessed on May 26, 2003.

Hearn, Brian J., John T. Neville, William J. Curran, and Dean P. Snow. 2006. First record of the Southern Red-Backed Vole, *Clethrionomys gapperi*, in Newfoundland: implications for the endangered Newfoundland Marten, *Martes americana atrata*. Canadian Field Naturalist 120(1): 50–56.

Hearn et al. 2008. Integrated Marten Habitat – Timber Harvesting Plan for Newfoundland. Project Report for Forest Management District 15. Draft. 32 pp.

Kotak, B.G., V.T. Keenan, J. Lidgett and S. Day. 2009. High Conservation Value Forest Assessment, Tembec Forest Management Licence (FML) 01. 216 pp.

Megahan, Walter F. and J. Hornbeck, 2000. Lessons Learned in Watershed Management: A Retrospective View. USDA Forest Service Proceedings RMRS-P-13. 2000.

NHSNL. 2003. Natural History Society of Newfoundland and Labrador. http://naturenl.ca/wp-content/uploads/2011/06/bird_checklist.pdf . Accessed on May 26, 2003.

NRC, 2009. Forest Carbon Accounting: The Operational-Scale Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3).

Rothwell, R.L. 1997. Saskfor MacMillan Limited Partnership Twenty-Year Forest Management Plan and Environmental Impact Statement for the Pasquia-Porcupine Forest Management Area: Forest Hydrology and Watershed Management. 70pp.

SARA. Species at Risk Public Registry.

<http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>. Accessed on June 3, 2016.

Scott, W.B. and E.J. Crossman. 1964. Fishes occurring in the freshwaters of insular Newfoundland. Dept. of Fisheries and Oceans.

Weirathmueller, F. 2018. NL Forest Industry Strategic Opportunities Analysis. F.W. Technologies.

