Sustainable Forest Management Plan












Tree Farm Licence 30

Canadian Forest Products Ltd.
Prince George Operations
&
BC Timber Sales
Prince George Business Area

June 16, 2006

CSA – SFM SUSTAINABLE FOREST MANAGEMENT PLAN

Canadian Forest Products Ltd.
Prince George Operations

&

BC Timber Sales
Prince George Business Area

TFL30 DFA

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

This Sustainable Forest Management Plan (SFM Plan) is the combined efforts of Canadian Forest Products Ltd. (Canfor) and BC Timber Sales (BCTS) to achieve Canadian Standards Association (CSA) certification to the CSA Z809-02 standard.

Canfor and BCTS support business practices that protect and enhance the environment for the use of current and future generations. They are committed to the goals of sustainable forest management and to a process that will continually improve their environmental performance. To achieve these objectives the signatories will:

- Develop and maintain a scientifically credible, structured, yet flexible framework for SFM at the management unit level that incorporates strategic level requirements.
- Manage all operations to comply with or exceed all legal requirements.
- Encourage local First Nations to become involved in the development of local SFM Plans, while respecting their rights and interests.
- Provide opportunities for communities, environmental groups and scientists to participate in planning and implementation in ways that reflect their interests and concerns efficiently in both time and cost and in ways that are effective for both stakeholders and resource managers.
- Identify, evaluate and control potential environmental risks and implement appropriate preventative measures.
- Communicate, inform, and promote awareness regarding environmental activities with employees, First Nations, and stakeholders.
- Develop and maintain a monitoring program accompanied by evaluation and reporting of findings and feedback into decision making that is designed to evaluate and report on the measures of sustainability of social, ecological, and economic values.
- Commit timely audits of environmental management systems and SFM parameters, and implement corrective measures as required.

The success of the TFL30 Sustainable Forest Management Plan is dependent upon the commitment of Canfor and BCTS to meet these objectives.

Canfor and BC Timber Sales wish to express its appreciation and gratitude to the individual members and community organizations that participated in the CSA – SFM Certification TFL 30 Public Advisory Group. Their active involvement and commitment throughout the entire CSA Certification process provided valuable input and insights into the development of the TFL 30 CSA Certification Values, Objectives, Indicators and Targets that are being used as the basis for developing the enclosed Sustainable Forest Management Plan.

In addition, Canfor and BC Timber Sales are very grateful to Roxanne Yanishewski for facilitating the Public Advisory Group process and to Forest Investment Account for providing funding for developing this SFM plan.

1.0 INTRODUCTION

As society has been increasingly affirming the wider set of values that forest ecosystems can provide, the forest industry has witnessed a distinct change in the philosophy of forest management. Though timber may still be the primary economic value from the forests, a wider range of economic, environmental and social values is being demanded. Forest management now involves the sustainable management of a much larger spectrum of values such that the benefits we enjoy from the forests today do not impact on the ability of subsequent generations to enjoy benefits from the forests in the future. The concept of "sustainable forest management", has gained acceptance at the international, national, and local levels. Furthermore, this concept has attracted the attention of buyers of forest products who are increasingly demanding that the products be derived from forests managed on a sustainable basis. As a result, forest certification has emerged as a dominant factor in the forest industry in order to provide assurances to buyers of wood products that the management of forests meets certain standards considered being critical for sustainable forest management.

Along with the move to Sustainable Forest Management, the principle of ecosystem management is gaining awareness. Ecosystem management is a process that integrates biological, social and economic factors into a comprehensive strategy aimed at protecting and enhancing sustainability, diversity and productivity of our natural resources As British Columbia forest companies have evolved and have become dependent on the global market place for the export of forest products, the issues of ecosystem management, sustainable forest management and forest certification have become paramount.

1.1 Historical Perspective of Canadian Forest Products

Having originated from a small forest products company on the banks of the Fraser River in New Westminster, B.C., Canfor has emerged as Canada's leading integrated forest products company. With the corporate office located in Vancouver, BC, Canfor directly employs 7,300 people as well as an additional 2,200 contractors.

In 1999, Canfor's acquisition of Northwood resulted in Canfor becoming Canada's largest producer of softwood lumber and Kraft market pulp. As a result of the Northwood purchase, Canfor acquired Northwood Pulp Mill, Prince George Sawmill, North Central Plywood, Rustad, Houston and Upper Fraser operations, the Kyahwood Forest Products Joint Venture and the J.D. Little Forest Centre. The purchase of Northwood was significant to the Sustainable Forest Management Plan as it also marked the acquisition of Tree Farm License 30 (TFL 30). With specific regard to TFL 30, the day-to-day management is administered from Prince George by Prince George woodlands operations. Tree Farm Licence 30 (TFL30) is the only area-based tenure managed by the Prince George operation and represents approximately 5 % of the annual wood volume currently managed from Prince George.

In 2004, Canfor acquired Slocan Forest Products, increasing the company's production to over 5 billion board feet per year.

Canfor continued to grow in 2006, by acquiring New South Companies inc., consisting of three sawmills, one remanufacturing facility and two lumber treatment plants in North and South Carolina. In addition in 2006, Canfor transferred its Englewood Logging operation, including Tree Farm Licence 37 to Western Forest Products and announced its intentions to create a Pulp Income Trust of its three Prince George pulp operations.

Being one of Canada's largest softwood lumber producers, Canfor heavily relies on export markets throughout North America and overseas to sell its lumber products. With the emerging trends of sustainable development and sustainable forest management, markets have also started demanding that forest companies be responsive to these emerging global trends. As a result, in July 1999 Canfor committed to achieving forest certification throughout all its forest operations as a means to demonstrate its commitment to sustainable forest management.

1.2 Canfor Corporate Policies and Objectives

As a result of the changing emphasis of forestry, Canfor has aligned its corporate mandate, policies and principles to be responsive to a shift in social priorities and values that reflect sustainable forest management and responsible forest stewardship.

1.2.1 Company Policies

In the past few years, Canfor has released a number of public statements that define the mission, vision, policies and guiding principles for the company. They include ***Canfor's Mission Statement***, ***Environment Policy*** and ***Forestry Principles***. As a result, Canfor is committed to the continual improvement in implementing the plan under the principles of adaptive management. These commitments are being used to guide the development of this Sustainable Forest Management Plan for TFL 30.

Canfor's Mission

We will be a highly successful competitor in the global forest products industry, managing with integrity the resources entrusted to our care.

We will be characterised by:

- Employing and developing highly motivated, empowered and committed people who enjoy their work.
- Consistently satisfying customer needs with quality products and services
- Enhancing the forest resource, ensuring responsible stewardship of the environment, and protecting human health and safety.
- Encouraging, recognising and rewarding excellence in all our endeavours, with an emphasis on innovation and results.
- Increasing value for shareholders.

We will be guided by the core values of integrity, trust, openness and respect for people.

Figure 1. Canfor's Mission Statement

Environment Policy

We are committed to responsible stewardship of the environment throughout our operations.

We will:

- Comply with or surpass legal requirements.
- Comply with other environmental requirements to which the company is committed.
- Set and review objectives and targets to prevent pollution and to continually improve our sustainable forest management and environmental performance.
- Provide opportunities for interested parties to have input to our sustainable forest management planning activities.
- Promote environmental awareness throughout our operations.
- Conduct regular audits of our forest and environmental management system.
- Communicate our sustainable forest management and environmental performance to our Board of Directors, shareholders, employees, customers and other interested parties.

February 2005

Figure 2. Canfor's Environmental Policy

CANFOR'S FORESTRY PRINCIPLES

Ecosystem Management
We will use the best available science to develop an understanding of ecological responses to natural and human-caused disturbances. We will incorporate this knowledge into higher level and operational plans by applying ecosystem management principles to achieve desired future forest conditions.

Scale
We will define objectives over a variety of time intervals (temporal scales), and at spatial scales of stand, landscape and forest.

Adaptive Management
We will use adaptive management to continually improve forest ecosystem management. This will require the development and implementation of collaborative research and monitoring programs.

Old Growth
We will include old growth and old growth attributes as part of our management strategies and philosophy in the forests where we operate.

Timber Resource
Canfor will ensure a continuous supply of affordable timber in order to carry out its business of harvesting, manufacturing and marketing forest products. Canfor will strive to maximize the net value of the fibre extracted for sustained economic benefits for employees, communities and shareholders.

Forest Land Base
We advocate the maintenance of the forest land base as an asset for the future.

Health and Safety
We will operate in a manner that protects human health and safety.

Aboriginal Peoples
We will pursue business partnerships and co-operative working arrangements with aboriginal people to provide mutual social, cultural and economic benefits and address mutual interests.

Communities
We will engage members of the public, communities and other stakeholders in the delivery of the Forestry Principles. The process will be open, transparent and accountable.

Accountability
We will be accountable to the public for managing the forest to achieve present and future values. We will use credible, internationally recognized, third party verification of our forestry operations as one way of demonstrating our performance.

Figure 3. Canfor's Forestry Principles

Through our commitment to SFM and Forestry Principles, we are also committed to respecting Aboriginal and treaty rights and to providing opportunities for interested Aboriginals Peoples to have input to our sustainable forest management planning activities.

1.2.2 Corporate Objectives

Canfor's objectives include:

- Canfor's management goals for TFL 30 reflect our strong commitment to our employees, shareholders, community, and the environment.
- We provide attractive investment returns to our shareholders. Our overall business strategy is to maximize profitability by reducing costs, improving efficiencies, developing new market opportunities, and merchandising products according to our customers' specific needs.
- We maintain a stable employment base and contribute to the development of our local communities.
- We protect existing forest values as we grow our future forests to sustain a maximum supply of quality timber to processing facilities in British Columbia.
- When developing longer-term management strategies and shorter-term operational plans, we balance economic, social and environmental objectives.
- We will ensure a continuous supply of affordable timber in order to carry out our business of harvesting, manufacturing and marketing forest products.
- We will strive to maximize the net value of the fibre extracted for sustained economic benefits for employees, communities and shareholders.
- We will seek and maintain certification under the International Organization for Standardization, Environmental Management System Standard (ISO 14001), and Canadian Standards Association Sustainable Forest Management System Standard (CAN/CSA-Z809-02).

1.3 BC Timber Sales, Prince George Business Area Corporate Policies and Objectives

BC Timber Sales is an independent organization within the B.C. Ministry of Forests and Range created to develop Crown timber for auction to establish market price and capture the value of the asset for the public. The vision of BC Timber Sales is to be "An effective timber marketer generating wealth through sustainable resource management".

BC Timber Sales has 12 Business Areas and an operational presence in 33 locations across BC. The organization currently manages 13 percent of the provincial annual cut, with its share increasing to approximately 20% in the 2006/07 fiscal year following the conclusion of the timber reallocation initiative. Included in the annual cut is an allocation for volume on TFL30 (21,312 cubic meters per year). This volume is administered through BC Timber Sales out of the Timber Sales Office located in Prince George.

BC Timber Sales is committed to certification of its operations. Recent efforts has resulted in certification of operations in both the Prince George and Kamloops business areas to the CAN CSA Z809-02 SFM standard.

For the Prince George Business area, BC Timber Sales has two SFM policies: i) an Environmental Policy and ii) a Sustainable Resource Management Policy. They are as follows:

Environmental Policy (August, 2005)

It is the policy of BC Timber Sales to:

- Comply with all relevant environmental legislation and regulations.
- Strive for excellence in forest management by continually improving the performance of resource management activities and practices.
- Maintain a framework that sets and reviews environmental objectives and targets and promotes the prevention of pollution associated with BC Timber Sales forestry activities.
- Monitor and evaluate key BC Timber Sales forestry operations.
- Communicate BC Timber Sales business activities and policies to all staff and make them available to the public.

BC Timber Sales is committed to managing and administering forest management activities on our operations through effective measures that ensure sustainable resource management.

Sustainable Resource Management Policy (October, 2005)

It is the policy of BC Timber Sales to:

- Conduct our forest management activities to comply with relevant legislation, regulations, policies and other requirements to which the organization subscribes;
- Develop and maintain a Sustainable Forest Management (SFM) system that is based on sound ecological, social, and economic values;
- Provide public participation opportunities to facilitate local input into forest management activities and plans.
- Provide the opportunity to First Nations to participate in the SFM process in a manner that respects their aboriginal and treaty rights;
- Maintain a framework that sets and reviews environmental and SFM objectives and targets, and promotes the prevention of pollution associated with our forest management activities;
- Monitor, evaluate, and implement appropriate changes to promote continual improvement of environmental and SFM practices;
- Seek to advance our knowledge of SFM science and technology and incorporate relevant measures into our overall planning process;
- Promote a work environment that protects the health and safety of staff, clients, and the public;
- Communicate and make readily available our Sustainable Resource Management Policy statements to staff, clients, First Nations, and the public

1.4 CSA – SFM Certification

In keeping aligned with its corporate policies and objectives, Canfor initiated the process toward obtaining forest certification for TFL30 under the Canadian Standards Association Sustainable Forest Management certification (CSA-Z809-96) in early 2000. In October 2005, Canfor started the process to move over to the updated Canadian Standards Association Sustainable Forest Management certification standard (CSA-Z809-02).

The Canadian Standards Association (CSA) is the official standards setting body for Canada. In 2002 they updated their Sustainable Forest Management standard based on a comprehensive set of internationally recognised sustainable forestry criteria. The CSA standard includes an environmental management system component consistent with the ISO 14001 standard and a performance component based on criteria and critical elements of sustainable forest management. It also includes public participation that involves a broad range of stakeholders with an interest in the forest area.

The following points capture the general steps involved in the CSA-SFM process.

- Values, Objectives, Indicators and Targets are identified through public process and provincial regulations.
- Future forecasts are done for indicators based on a few forest management scearios
- An SFM Plan is created for the Defined Forest Area
- Indicator performance is monitored over time, and
- Adjustments are made to ensure the objectives are met.

This certification includes both a process (systems) component and performance (on-the -ground) measures and this Sustainable Forest Management Plan is an integral component of the requirements for CSA-SFM certification of TFL 30. The process is based on the concept of continual improvement through and adaptive management process.

1.4.1 Public Participation

Public participation is one of the primary highlights of the CSA-SFM certification process. A main instrument for public participation is the formation of the Public Advisory Group (PAG). The PAG is fundamental with regards to providing input, evaluation and feedback into the various processes of SFM certification; from the selection of indicators in the initial stages through to the continual involvement in providing important evaluation and feedback as the process evolves.

1.5 Linkages to Environmental Management Systems registration (ISO 14001 EMS)

As Canfor and BC Timber Sales have obtained registration under the ISO 14001 environmental management system (EMS), there are many functional linkages with this CSA-SFM certification. The primary linkage between the ISO-EMS and CSA-SFM certification will be in the areas of tracking, monitoring and reporting of performance (i.e. measuring performance against the objectives derived from the CSA-SFM certification process).

More specifically, the indicators and management objectives derived from the CSA-SFM certification process will be included in the EMS Annual Environmental Programs. Subsequently, the management objectives and targets (where applicable) will be entered into the Canfor and BC Timber Sales' EMS incident tracking system. This database system automatically informs, people that they have been assigned tasks necessary to complete certain actions and will continually send reminders until the action is completed. The progress of meeting the management objectives and targets is reviewed monthly, and the entire EMS is subject to a third-party audit annually.

1.6 Overview of the SFM Plan

The primary purpose of this SFM Plan is to outline how Canfor and BC Timber Sales will manage Tree Farm Licence 30 for a sustainable flow of environmental, social and economic values to meet the needs of present and future generations. While this SFM Plan is a requirement for CSA-SFM certification, it also follows Canfor's objective of "enhancing the forest resource, ensuring responsible stewardship of the environment, and protecting human health and safety" (see Figure 1: "Canfor's Mission Statement"). In doing so, this SFM plan first provides a detailed description of the Defined Forest Area (DFA) of TFL30 that includes the geographical extent, a historical account of the TFL amalgamation, which resulted in TFL 30, and the land tenure arrangement. Also included is an overview of current forest management practices, current forest management planning, and enhanced forest management planning (which includes CSA-SFM certification).

The following section of the plan continues by outlining the local level indicators that have been selected to assess SFM using the CSA-SFM certification. A detailed description is provided for each indicator with respect to the management objective, what the indicator is meant to tell us, and how it relates to SFM (i.e. through the CSA-CCFM Criteria and Critical Elements). Furthermore, monitoring and reporting details are outlined for each indicator, which include the data requirements/considerations, the roles and responsibilities required at each stage of the indicator monitoring procedure, the implementation schedule, and targets that are related to the management objectives (if applicable).

The final section of this SFM plan outlines the formal process of adaptive management that will occur as part of the SFM of TFL 30. The development, forecasting and monitoring of SFM indicators is an integral component of the adaptive management process that provides a dynamic improvement framework for sustainable forest management.

1.7 Memorandum of Understanding

Canfor and BC Timber Sales have developed a Memorandum of Understanding (MOU), which outlines how they are going to work together in developing the Sustainable Forest Management Plan (SFMP) for TFL30. Participation in the development of the TFL30 SFM Plan requires Canfor and BC Timber Sales to work within a public process to jointly develop SFM indicators and targets. Canfor and BC Timber Sales will use the SFM indicators and targets to monitor progress, publicly report, and promote continuous improvement of the TFL30 SFM Plan as agreed to in the signed MOU.

As stated in the MOU, Canfor and BC Timber Sales agree to the following goals:

1. To jointly develop an SFM Plan covering the geographic area of TFL30 that meets the requirements of the CSA SFM standard (Z809-02).
2. To work together over the term of the plan to fulfill the TFL30 SFM Plan commitments including, data collection and monitoring, participating in public processes, producing public reports, and continuous improvement.

Canfor and BC Timber Sales have existing initiatives that will contribute to the overall SFM strategy. These include existing management systems such as ISO 14001 Environmental Management Systems, standard operating procedures, and internal policies. These will have to be re-examined to ensure they are compatible with the procedures outlined in this SFM Plan.

2.0 THE DEFINED FOREST AREA

2.1 Description of Tree Farm Licence 30

TFL 30 is located just northeast of Prince George in the Prince George Forest District (Figure 5). The TFL stretches from its western boundary near Summit Lake on Highway 97, eastward across the western foothills of the Rocky Mountains to slightly Northeast of Sinclair Mills. The total land base for TFL 30 is 182,298 hectares, with a productive forest land base of 159,385 hectares or about 87 % of the total area.

TFL 30 consists of Provincial Crown Land (Schedule B Lands) and lands owned by Canfor (Schedule A lands). Other ownership statuses also exist within the boundaries of TFL 30.

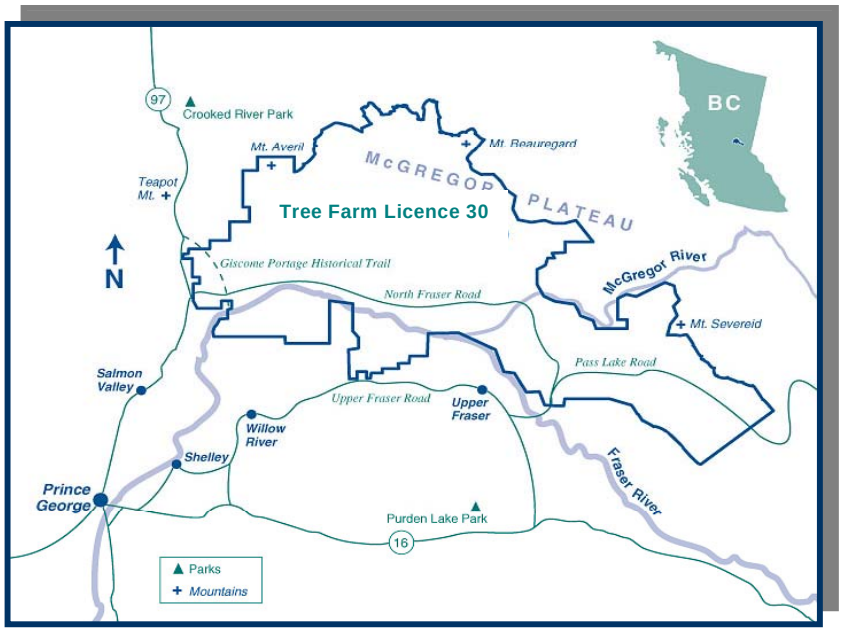


Figure 4. Location map for the Defined Forest Area (TFL 30)

Ownership Status	Area (ha)	Area (%)
Parks (Giscome trail)	93	0.05
Schedule A	410	0.23
Schedule B	181,366	99.48
Private Land (non-Canfor)	429	0.24
Total	182,298	100

The total landbase includes a very small portion of private land (429 ha) held by a number of private individuals. Since Canfor and BC Timber Sales do not have management responsibility on these 429ha of private land, they have been removed from the DFA. Therefore the size of the DFA is 181,869ha.

Forests in the area consist of spruce, balsam, Lodgepole pine, Douglas fir, cedar, hemlock and deciduous species.

2.2 Management Responsibility

It is recognized that Canfor and BC Timber Sales are not the only operator with management responsibility within the DFA. The British Columbia Ministry of Forests and Range (MoFR) has the overall authority for the approval of Canfor and BC Timber Sales' operational plans within the DFA, and to monitor Canfor and BC Timber Sales' compliance with the Forest and Range Practices Act of British Columbia. In addition, the MoFR is responsible for managing a number of campsites within the DFA. The Ministry of Environment (MoE) is responsible for developing and adhering to park management plans for those parks included within the DFA.

The MoFR, BC Timber Sales program (previously Small Business Forest Enterprise Program) carries out timber harvesting and forest renewal activities within the DFA, accounting for approximately 11% of the allowable annual cut or 21,312 m3 annually. BC Timber Sales' activities are required to be carried out in conformance with Canfor's forest Management Plan 9 (MP9) and the requirements contained in the SFM plan. Canfor has entered into an agreement regarding roles and responsibilities and data sharing. Significant variations from SFM plan objectives will be reported to the public and government through an annual report. BC Timber Sales staff are regular participants in the TFL30 Public Advisory Group and are aware of the objectives of the SFM plan.

2.3 History of the Defined Forest Area (TFL30)

Tree Farm Licence 30 is an amalgamation of five smaller TFL's that were originally granted in 1959 to the following companies: i) TFL 28: Shelley Development Ltd., ii) TFL 29: Eagle Lake Sawmills Ltd., iii) TFL 30: Sinclair Spruce Lumber Co. Ltd., iv) TFL 31: Upper Fraser Spruce Mills Ltd. and v) TFL 34: Church Sawmill Ltd.

Subsequent corporate acquisitions during the 1960's resulted in combining these TFL's into the present-day TFL 30. The chronology of events were:

- **1960:** Midway Terminals (later National Forest Products) purchased Sinclair Spruce Lumber Co. Ltd. and Upper Fraser Spruce Mills Ltd.
- **1961:** Noranda Mines Ltd. purchased Sinclair and Upper Fraser in addition to other National Forest Products' holdings in southern British Columbia and formed a new company called Northwood Mills Ltd.
- **1963:** Eagle Lake Sawmills Ltd. purchased Shelly Development Ltd.
- **1964:** Northwood Mills combined with Mead Corporation of Dayton Ohio to construct a new pulpmill at Prince George. The name of the new company was changed to Northwood Pulp Limited.
- **1964:** Northwood purchased Church Sawmills Ltd.
- **1966:** Northwood purchased Eagle Lake Sawmills Ltd.

The schedule by which the individual Tree Farm Licences were amalgamated into TFL 30 varied only slightly from the corporate acquisitions. In 1965 TFLs 30, 31 and 34 were consolidated, and in 1967 TFLs 28, 29, and 30 were further consolidated into the present-day TFL 30.

During 1998 Northwood Pulp and Timber Ltd. changed its name to Northwood Inc. During 1999, Canadian Forest Products Ltd. purchased Northwood Inc. There were no changes to the administrative boundaries of TFL 30 as a result of this acquisition.

In 1999, Canfor acquired all shares of Northwood which included Tree Farm licence 30.

2.4 Current and Projected Uses on TFL 30

TFL30 supports a wide variety of resource uses including fibre extraction, recreation, cultural/heritage, trapping and guide/outfitting.

2.4.1 Timber

The previous AAC from Management Plan 9 was approved at 330,000 m^3/yr, effective July 1, 2003. However, due to the mountain pine beetle impacts west of TFL30, Canfor has asked and has an approved reduction in the AAC on TFL30. The current AAC for TFL 30 is 201,312 m^3/yr, effective January 1, 2003. The Provincial Chief Forester will conduct a determination of a new AAC by December 30, 2008. The current AAC was apportioned accordingly:

- 180,000 m^3/yr (89%) Canfor, Schedule B Lands
- 21,312 m^3/yr (11%) BC Timber Sales program, Schedule B Lands

SFM indicator forecasting has indicated that the current harvest level 201,312 can be maintained for the short-term (5 years) and then stepping up to 330,000 m^3/year after 5 years. The long-range forecast predicts that the AAC will be enhanced to over 500,000 m^3/year within 70 years as future managed stands become fully available. The species profile from TFL 30 is dominantly a spruce/balsam mix with minor components of other coniferous species. To date, minor amounts of deciduous species have been utilized from TFL 30. Deciduous species are not managed as a crop tree species but will remain as optional utilization. The majority of the mature deciduous species are contained within high conservation value forests (large reserves) or retained as wildlife trees.

The primary timber demand is for coniferous sawlogs for use as dimension lumber, with residual grades utilized for Kraft pulp. A small percentage of logs meeting peeler/veneer standards are used for plywood.

2.4.2 Recreation / Tourism / Scenery

There is a wide range of recreational opportunities on TFL 30 including hunting, fishing, boating, caving, skiing, snowmobiling, and camping. Commercial tourism activities include five guide/outfitting tenures and boating/rafting on the McGregor and Fraser Rivers.

There are 5 Ministry of Forests and Range Campsites located within TFL 30, which include:

- Amanita Lake - 6 km on the Church FSR
- Averil Creek - 53 km on the North Fraser FSR
- Boundary Lake - 43 km on the North Fraser FSR
- Freya Lake - North of the North Fraser FSR
- Pass Lake - 36 km on the Pass Lake FSR

These sites provide two-wheel drive vehicle access and offer camping, boating, picnicking, hiking and fishing experiences.

Woodall and Bear Paw Ridges provide quality backcountry recreational experiences, which include hiking, skiing, snowshoeing, wildlife viewing and hunting. Management of this resource relies on the preservation of natural environments and exclusion of motorized access. To support this objective, large areas in the Woodall / Bear Paw Ridge areas have been designated as high conservation value forests. These include the Woodall recreation emphasis area and high value caribou habitat. Other large reserve areas across the TFL that will supply backcountry experiences are the McGregor River management area, the Horseshoe recreation emphasis area, and the Tri-Lakes Recreation emphasis area. The Woodall recreation emphasis area contains the Farm Trail, which provides hiking access to the sub-alpine and alpine ecosystems. A cabin exists on this trail and is located just outside the TFL boundary. Local recreation user groups maintain both the trail and cabin.

The majority of TFL 30 contains good quality road access, and as such provides ample opportunity for motorised recreational experiences such as day trips for hunting, fishing, snowmobiling, and skiing.

Several local recreation user groups have identified themselves as active users of TFL 30 and include, but are not limited to: UNBC Caving Club, Caledonia Ramblers Hiking Club, McGregor Wilderness Society, and Sons of Norway Ski Club.

To assist in maintaining quality recreational experiences, scenic areas have been designated across TFL 30. Scenic areas are established by the District Manager, Ministry of Forests and Range, and are based on a visual landscape inventory conducted by Canfor. Management objectives for block design and amount of allowable visual impact from harvesting are also established (Visual Quality Objectives) by the District Manager.

One provincial park exists within the TFL boundary: the Giscome Portage Trail. This trail is a designated heritage area and provides hiking and cultural experiences. The Park consists of a 200 metre wide strip of forests (100 metres either side of the trail) and bisects the westerly tip of the TFL.

Caving has been identified as a relatively new and growing recreation experience on TFL 30. The most prominent areas of karst formations / caving activity are the Woodall and Bear Paw Ridge areas. To date, several small cave locations have been identified within the TFL. The Fang Cave, which lies within Fang Provincial Park, on the Northeast corner of the TFL, is one of the largest known caves in Northern BC.

A recreation features inventory, visual landscape inventory, and recreation opportunities spectrum has been completed during the summer of 1999. These inventories document recreation values and are used in management plans to assist in setting management objectives.

As society's demands for out-door recreation experiences increase, the demand for visitor days, quality of experience, and variety of experiences is expected to increase as well. There are adequate facilities and range of experiences to support the current demand.

2.4.3 Wildlife and Biodiversity

TFL 30 contains a wide range of habitat types, from mountainous terrain to rolling plateau, to large winding rivers flanked by wetlands and kettle lakes. This diverse landscape supports a wide variety of flora and fauna and is inhabited by indigenous species representative of those found throughout north central BC. The Prince George Land and Resource Management Plan identifies martin, moose, grizzly bear and mountain caribou as key wildlife species for management on TFL 30. The District Manager has identified medium value caribou habitat as ungulate winter range, and has identified specialized harvest and road maintenance practices to protect caribou.

To conserve biodiversity and wildlife habitats, the following areas have been identified as large-scale reserves (no-harvests zones): McGregor River Management Zone, Horseshoe Recreation Emphasis Area, Tri Lakes Recreation Emphasis Area, Woodall Recreation Emphasis Area, Seebach River Management Area, and High Value Caribou Habitat Areas

2.4.4 Fisheries and Water

The watersheds within TFL 30 are tributary to the Fraser River and provide valuable habitat for migratory salmon as well as many other native fish species. The Seebach River Management Area is designated to protect salmon habitat.

Commercial or residential water infrastructures do not occur within TFL 30. There are no water licenses within the TFL. The demand for such infrastructures is unlikely in the short term.

2.4.5 Guide Outfitting and Trapping

There are eleven trapping licences and five guide / outfitter licences overlapping the boundaries of TFL 30 and covering 100% of the TFL area. The Ministry of Environment (MoE) administers both licences. As per an agreement with the MoE, the contact information for trapline licensees is maintained as confidential. As the entire TFL is currently occupied by trapping and guide licences, expansion of further tenures is unlikely.

2.4.6 Cultural, Heritage and First Nations

An important cultural feature on TFL30 is the Giscome Portage Historic Trail. To conserve the integrity of the heritage value associated with the trail, it is flanked by a 200-metre (100 metres either side) reserve area. The trail, including the reserve area was designated by the Prince George Land and Resource Management Plan as a protected area and has recently become a provincial park and is now administered by MoE.

Sustenance resources within TFL 30 have been utilized for centuries by the people of the Lheidli T'enneh First Nation, and as such historical / archaeological values exist and are scattered throughout the TFL. As per provincial policy, archaeological features and their locations are maintained in confidence. Predominant archaeological features located within TFL30 include culturally modified trees and cache pits.

Current uses of the TFL by the Lheidli T'enneh people include, but are not limited to, berry picking and medicinal herb gathering, fishing, hunting, and firewood gathering. Traditional and contemporary uses of the TFL landbase and its timber and non-timber resources will continue to be important aspects of the Lheidli T'enneh people and their culture. The Lheidli T'enneh have an unresolved land claim with the provincial government that extends over the entire TFL area, and beyond.

2.4.7 Minerals

The Prince George Land and Resource Management Plan indicates that the TFL has extensive potential for development of the mineral resource, but as of yet large-scale demand or mining operations do not exist.

2.4.8 Range

Range resource demand or tenures currently do not exist on TFL30. The development of the range resource appears unlikely in the foreseeable future.

2.4.9 Botanical Forest Products

To date, due to low potential, botanical forest products permits have not been issued within TFL 30

2.5 Overview of Current Forest Management Practices

2.5.1 Harvest Methods and Seasonal Distribution

Conventional ground-based harvesting utilizing crawler tractors and rubber-tired skidders are the prime logging methods in the Licence area. Cable harvesting is generally conducted on slopes exceeding 40 % and has accounted for approximately 10 % of the areas harvested over the past few years. Aerial logging has been conducted on a very small percentage of the area on TFL30.

During the course of Management Plan 9, harvest schedules will be developed to maximize the timber volume that will be harvested in the summer period. This is presently estimated to be 20 to 30 % of the annual volume.

2.5.2 Silviculture Systems

The majority of the area on TFL30 is harvested using the clear-cut with reserves silviculture system. Approximately 95 % of the area over the term of MP 8 has been harvested using clear-cut with reserves while 5 % of the area has been harvested using partial cutting systems. Partial cutting systems are utilized more often as a method of managing riparian management zones and ungulate winter range. As resource objectives become increasing complex, so will the design of silviculture systems. The total resource (20-Year) plan as an appendix to MP 8 provides a forecast of silviculture systems that are anticipated to occur.

2.5.3 Basic Silviculture

As per the terms of our Licence Agreement and the Forest & Range Practices Act, Canfor and BC Timber Sales are required to reforest and produce free growing stands on all areas harvested after 1987. Once free growing status is achieved the requirement for basic silviculture is complete. Generally, a reforested stand must have a sufficient number of trees and be free of potentially deleterious brush to be declared as "free growing".

A number of field practices are employed to achieve free growing stands. These practices include but are not limited to:

- Seed and Growing Seedlings: See section 2.6.4.
- Reforestation: To ensure a minimum regeneration delay and complete stocking, nearly all harvested sites are reforested using artificial regeneration techniques. Natural reforestation methods are used to augment planted stock in special cases where unique silviculture systems are employed. These are mostly restricted to higher elevation forests and ungulate winter range.
- Site Preparation: Mechanical site preparation and to a lesser extent broadcast burning and chemical site preparation are used as site preparation techniques for artificial regeneration. Raw planting without site preparation has also been applied to appropriate sites. Site preparation treatments are completed on all areas where deemed necessary to achieve acceptable stocking within specified time frames, as defined in the Site Plan for the area.
- Brushing and Weeding: Canfor and BC Timber Sales have completed a Pest Management Plan that details the types of treatments to be applied, including the use of chemicals, to control weeds. Canfor utilises the chemical herbicide glyphosate during brush and weed and site preparation programs. TFL30

is situated in a brush prone climate where vegetative competition, if uncontrolled, can have a severe impact on plantation survival and performance. In order to reduce dependency on herbicides, Canfor utilizes other measures such as, mechanical treatments, prompt reforestation, site preparation techniques, larger stock types, brush mats, and faster growing species. Experimental mulching and girdling projects have also been used.

- Silvicultural Surveys: Surveys are conducted on all sites to determine regeneration performance and assessment of Free Growing criteria. Surveys are also conducted as necessary to determine the level of brush competition prior to a brushing treatment.

2.5.4 Nurseries and Seed Orchards

Canfor requires an adequate supply of high quality seedlings of appropriate stock types for reforestation of denuded areas. To ensure this seedling supply, the company operates a nursery, the J. D. Little Forest Centre, and has seedlings grown under contract at other nurseries. The J. D. Little Forest Centre has an annual capacity of approximately eight million container seedlings.

Canfor, along with, Winton Global Ltd. and West Fraser Mills Ltd. comprise the members of the Vernon Seed Orchard Company (V.S.O.C.). The VSOC is involved in the tree breeding program and orchards are developed to realize the maximum genetic gain. The partnership in VSOC has allowed Canfor to access a secure seed supply. Currently Canfor is able to meet all spruce seed requirements for TFL30 from the seed orchard. Orchards are established that are anticipated to supply all Douglas fir and pine seed for TFL30 within seven years.

2.5.5 Enhanced Forestry Projects

Enhanced forestry projects are normally administered through Canfor's Forest Renewal BC (FRBC) and Forest Investment Account (FIA) Program. Backlog brushing treatments occurred during the years from 1995 to about 2000.

A site index adjustment project was completed on TFL30 and lead to better estimates of forest productivity in second growth stands. The better site values were used in the TFL30 MP9 timber supply analysis.

Converting non-commercial brush (NcBr) alder thickets to productive forest cover has been an established forest practice since 1979. Conversion is generally accomplished by mechanical or chemical site preparation or manual slashing followed by planting. During the term of MP 7 an average of 122 hectares were treated annually. The timber supply analysis for MP 8 assumed an average of 125 ha of conversion per year for 50 years for a total of 6250 ha. This practice is currently under review for its long-term timber benefits and economic and environmental costs.

2.6 Resource Inventories

The following inventories were conducted on TFL30 over the past several years and are used to support resource objectives in this plan. Forest Renewal BC funded all but the visual and recreation resource inventories. Further detail on all inventory and data layers is available in the TFL Management Plan No.9 Timber Supply Analysis Information Package.

1) Terrestrial Ecosystem Mapping (TEM): TEM was completed in the spring of 2000 for the entire TFL 30. The TEM is used for site index adjustments and habitat modelling, and is now with the Ministry of Environment, for final quality control and approval. (See Terrestrial Ecosystems Map in Appendix 1.)

2) Vegetation Resources Inventory (VRI): A VRI was completed in the spring of 2000 for the entire TFL. This inventory replaces the existing forest cover inventory, and was a commitment made by the licensee to resolve a volume overestimation problem in MP 8. The project involved a re-delineation of forest cover polygons (Phase I) and ground sampling to verify forest cover and structure (Phase II). These Phase II ground plots will serve as the foundation for a long-term growth and yield monitoring project.

3) Visual and Recreation Inventories: Three recreational inventories were completed in 1999: Recreation Features Inventory (RFI) Recreation Opportunities Spectrum (ROS) and Visual Landscape Inventory (VLI).

4) Site Index - Biogeoclimatic Ecosystem Classification Project (SIBEC): The SIBEC project was completed in the spring of 2000 and is used to provide a correlation between site index and biogeoclimatic ecosystem or TEM.

5) White Pine Weevil (*Pissodes Strobi*): In association with the SIBEC project, samples of weevil intensity in regenerating spruce stands were taken. This information is used to help define the area at risk from spruce terminal weevil attack and is also used to assess impacts to timber supply. The Growth and Yield Report (See Management Plan 9) identifies yield reductions attributable to white pine weevil.

6) Site Index Adjustment Project: The objective of this project was to develop reliable potential site index estimates in post-harvest regenerated stands for the major commercial tree species and ecosystems on TFL 30. The project was completed in three phases. Phase 1: Preliminary site index estimates were developed for spruce on TFL 30. Phase 2: Field random sampling on 61 plots was completed to estimate actual site index estimates for spruce in post-harvest regenerated stands. Phase 3: Final potential site index estimates were developed using statistical adjustments. A final report and map was created and distributed to the Ministry of Forests and Range in the spring of 2000.

7) Interior Watershed Assessment Procedure (IWAP): An IWAP and sediment source survey was completed for the entire TFL area in December of 1998. The IWAP is used to support watershed level management criteria. The sediment source survey and IWAP are also used to prioritize watershed rehabilitation projects.

8) Level D Terrain Mapping: Level D terrain mapping was completed in 1997 and classifies the entire TFL into polygons of stable, unstable and potentially unstable terrain. This coverage replaces the ESA soil coverage that was used for previous timber supply analysis and management plans.

2.7 Canfor's Forest Management Planning (MP9)

Management plans are a legal requirement for all Tree Farm Licences in British Columbia (i.e. TFL30 is the Defined Forest Area). The purpose of the management plan is to define objectives, goals and commitment and management strategies for a Tree Farm License over a five-year period. Furthermore, management plans, together with an associated timber supply analysis and 20 Year Plan are the primary sources of information by which the Provincial Chief Forester makes an independent determination of AAC for Tree Farm Licenses.

The current management plan for the DFA (MP9) will expire in July 2008. As part of Canfor's ongoing efforts to address high priority Mountain Pine Beetle attacked stands (which do not exist on the TFL in a significant way), Canfor has requested, and received approval from the Minister, in a letter (attached) dated March 16, 2006, that the AAC on the TFL be dropped from 330,000m^3 to 201,312 m^3 for the period January 1, 2003 to December 31, 2008. In additional Canfor has asked for an extension of MP9 until June 2013.

Other public plans include Canfor's and BC Timber Sales' Forest Stewardship Plans (FSP) and Pest Management Plans (PMP). The current FSP's provides the public and administering government agencies with results and/or strategies that will be used to address the resource objectives that have been set by government under Forest and Range Practices Act (FRPA). The PMP's provides the public and administering government agencies with information regarding concepts of integrated pest management pertaining to forest vegetation management including the spraying of chemicals to control completing vegetation. As part of the PMP, annually a "Notification of Intent to Treat" (NIT) is advertised (newspaper and letters) to allow for public comments.

In preparing the management plan for the DFA, Canfor has certain commitments and/or legal requirements to integrate the results from other planning process.

2.7.1 Higher Level Plans

Higher Level Plans (HLP) are established by statutory decision-makers and prevail over all other plans, including Management Plan 9. All relevant objectives and/or strategies from HLP's must be integrated into plans lower in hierarchy (including MP 9). Canfor and BC Timber Sales is committed to meeting or surpassing all legal requirements, including achieving the objectives of HLP's.

The only applicable HLP is the Objectives for Recreational Sites and Trails for five recreation sites within TFL30. The District Manager, Ministry of Forests and Range, established the HLP for these recreation sites on May 12th, 1997.

2.7.2 Prince George Land and Resource Management Plan

The Land and Resource Management Plan (LRMP) was approved by Cabinet on January 25, 1999 and provides strategic direction for planning and resource development within the Prince George Forest District. The LRMP provides specific resource management direction for individual Resource Management Zones (RMZ) and provides general resource management direction that is applicable to all RMZ's. TFL 30 contains two RMZ's: RMZ 31 which is the main body of the TFL and RMZ 32 which consists of a 200 m strip of forest flanking the Giscome Portage Trail. RMZ 32 is a protected area under the LRMP and is now designated as a provincial park. The LRMP process was a community-based effort for land-use planning, of which Canfor and BC Timber Sales (Small Business Forest Enterprise Program at the time) were participants. We are committed to the implementation of the objectives and strategies within the LRMP.

2.8 Forecasting and Scenario Analysis

The CSA SFM Standard requires explicit forecasts for all indicators. Forecasting indicators requires approaches suited to each indicator. These may include mathematical models, GIS models for quantitative indicators, or scenario-building techniques for qualitative indicators.

Some indicators were forecasted using a GIS modeling technique as follows: An SFM indicator-forecasting project covering the area of the plan was initiated in December 2005. The purpose of the project was to forecast the effects of chosen forest management scenarios on the long-term sustainability of the chosen indicators/measures based on the established targets and thresholds developed in the Public Advisory Group process. A digital dataset was developed that included various base forest inventory GIS data coverages, timber data GIS coverages, non-timber GIS coverages and licensees cutblocks and roads.

A base case was developed and modeled into the future for about 250 years and is the basis for comparing all other management scenarios. The base case used the best available knowledge about current forestry management practices and the growth of the forest. The beetle epidemic is modeled using the provincial-level projection of mountain pine beetle epidemic, current to April 2005. Several other scenarios were modeled and results presented to the Public Advisory Group. The scenario chosen for moving forward in this plan is the Scenario 1 – SFM Base Case. This scenario simulates using current management practices and full implementation of the non-spatial old growth targets. A summary report of outlining assumptions and results of the basecase and scenarios are included in the Appendices.

However many of the indicators in this SFM Plan were forecasted by the scenario-building technique, using a logical “what if” scenario analysis on how the ecological, environmental, and social values of SFM would be affected if the target for each indicator were not achieved.

Using the coarse woody debris indicator and target used in previous examples, a forecast using the "what if" scenario analysis could be as follows:

As this indicator currently has the target set at 100% consistency, one other scenario should be identified:

a) What if 50% of cutblocks were consistent with coarse woody debris requirements in operational plans?

If only 50% of cutblocks met coarse woody debris requirements in operational plans there could be several negative impacts to ecosystem health and diversity. Maintaining coarse woody debris is a legal requirement. If insufficient CWD is retained, soil nutrient and moisture retention levels may decrease. Dispersed CWD provides shelter to small animals, as well as young seedlings that require shade and snow retention for survival. CWD piles are valuable denning sites for small furbearers whose numbers may decrease in their absence. By enhancing plant and animal habitat, CWD contributes to the overall health and diversity of the forest ecosystem. Therefore, Canfor and BCTS are committed to meeting the target of 100% consistency with operational plan requirements for CWD.

This method is somewhat subjective in predicting the "what if" scenario, but it can highlight how important the individual indicator can be to overall SFM in a manner mathematical models cannot achieve.

Note, “what if” scenarios are strictly hypothetical scenarios used for contrasting the impacts of operational practices on environmental, social and economic indicators. Where those scenarios depict a practice that falls below the legal requirement, the legal requirement will prevail as a minimum. Any forest practice referred to in legislation has a legal requirement. Forest Stewardship Plans also constitute a legal requirement.

3.0 SFM INDICATORS AND MONITORING PLANS FOR THE DFA

The TFL 30 Public Advisory Group (PAG) identified 55 Indicators and Objectives to be used to report progress towards achieving the goals of Sustainable Forest Management (See Appendix 3, 4 and 5 for more details on Values, Goals, Indicators, Objectives, PAG members and PAG terms of reference).

Within this SFM Plan, the following definitions from the CSA Z809-02 apply:

- **Indicator** — a variable that measures or describes the state or condition of a value.
- **Objective** — a broad statement describing a desired future state or condition of a value.
- **Target** — a specific statement describing a desired future state or condition of an indicator. Targets should be clearly defined, time-limited, and quantified, if possible.
- **Value** — a DFA characteristic, component, or quality considered by an interested party to be important in relation to a CSA SFM element or other locally identified element.

This section summarizes the current status of the indicator and objective, the management practices being implemented or requiring to be implemented, and the responsibilities for monitoring the indicator to address the values and goals identified by the TFL 30 PAG.

Statement of Indicator	***Target and Variance***
A reiteration of the indicator as identified in the CSA matrix	Targets and allowable variance are identified. Variances are listed in the same units as targets.

This indicator addresses the following CSA – SFM parameters

CCFM Criterion: A reiteration of the indicator as identified in the CSA matrix ***CSA SFM Element:*** A reiteration of the indicator as identified in the CSA matrix ***Value:*** A reiteration of the indicator as identified in the CSA matrix ***Objective:*** A reiteration of the indicator as identified in the CSA matrix

Description of Indicator

It may be difficult to understand what an indicator is trying to measure from just the wording of the indicator. The information contained under this heading is meant to provide some clarity and a better description of what the indicator is measuring.

It is common to view sustainable forest management as the balance between ecological, economical and social values with respect to forest management. Continual local stakeholder involvement is critical to determine and maintain this balance and to define SFM on a local level. For the defined forest area, the public advisory group was very important in the process of establishing local level indicators for the application of SFM. In developing the indicators the public advisory group used the CSA-CCFM framework of criteria and critical elements to derive local level values and objectives for the defined forest area. From these values and objectives, local level indicators were developed and management objectives for these indicators were established. The information contained under this heading offers a brief synopsis of how this indicator relates to SFM and attempts to capture the logic in the selection of the indicator to represent the associated criterion (or criteria) and critical element(s). As it is often the case that one indicator will be associated with more than one criterion and/or critical element, those inter-linkages will be described in this section (where applicable).

Current Practices and Status of Indicator

The information provided under this heading summarizes current and best management practices required to meet the objectives or to quantify the current state of the indicators. This will often include cross-references to past Management Plans of TFL 30, obligations under the Forest Practices Code and Forest and Range Practices Act laws and regulations, or Canfor and BC Timber Sales' initiatives beyond regulated management practices (e.g., Environment Policy, Forestry Principles, and Environmental Management System (EMS) obligations).

Establishment of Targets and Future Practices
This section explains the method of determining and reasoning behind the established targets and variance levels. It often lists the method of data collection or the data source for measurement of the indicator.

Forecasting and Predicted Trends
CSA specifies that: "a) quantitative and long-term projections of expected future indicator levels have been prepared for each indicator; b) that the assumptions and analytic methods used in forecasting have been specified; and c) the public participation process was used to select the preferred forecast". Where possible and when they exist, this section provides a summary of the forecasting assumptions and analytical methods used to project a variety of possible future forest conditions that could result from present forest management activities.

To forecast future forest conditions and indicators we have relied on the processes and tools developed by the McGregor Model Forest Association. This process applies scenario planning and spatially explicit forecasts to demonstrate how a set of management criteria (scenarios) affects the evolution of future forests (See Appendix for results of the scenario planning project). Once forecasted, each scenario is then compared to expected outcomes and other scenarios, across a common set of performance indicators. The managing partners of TFL 30 (Ministry of Forests and Range; Ministry of Environment; Department of Fisheries and Oceans; and Canfor) were involved to help describe desired future forest conditions, develop indicators, and analyze the results. The scenario planning project (SPP) began in September of 1998 and was completed in July of 1999.

The results of the scenario planning was presented to the TFL 30 PAG for use in setting objective targets for achieving the goals of sustainable forest management. Canfor has also used the results of the scenario planning project, to select management options that can best achieve the array of timber and non-timber benefits (future forest condition) as described by higher-level plans, the Prince George LRMP, and the Biodiversity Guidebook. The primary result or product of the scenario planning project was a set of management options that is used as the initial "base case" scenario for timber supply forecasts for management plan 9.

Monitoring and Reporting Procedures
The information provided under this heading summarizes the sources of indicator monitoring information, tasks, responsibility and timelines to ensure that Canfor and BC Timber Sales meet the objectives. More specifically, the indicators and objectives derived from the CSA-SFM certification process will be included in the Canfor's and BC timber Sales' EMS Annual Environmental Programs. Subsequently, the management objectives and targets (where applicable) will be entered into the Canfor's and BC Timber Sales' EMS incident tracking system.

Responsibility and Continuous Improvement Opportunities
Analysis of data collected during the monitoring phase is important to relate indicator performance to the particular management strategy applied to achieve the target. Without this analysis, it is impossible to learn what changes are necessary to meet targets or how to implement them.

The analysis, evaluation and continuous improvement phase of SFM is one of the most difficult aspects of the process. The personnel responsible for data analyzing must be objective when determining if changes are required to either the indicators or the strategies use to achieve targets. Co-operation between the PAG, Canfor and BC Timber Sales is important for continuous improvement of sustainable forest management performance.

3.1 Old Forest

Statement of Indicator	***Target and Variance***
The amount of old forests by landscape unit/Natural Disturbance Type within the DFA.	Targets: as per Table 1 Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CSA Criterion:*** Conservation of Biological Diversity
CSA Critical Element: Ecosystem Diversity
Local Value: Well-balanced and functioning ecosystems.
Local Objective: Maintain Landscapes that support the natural diversity, variety and pattern of ecosystems.

2) ***CSA Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity
CSA Critical Element: Forest Ecosystem Resilience
Local Value: Resilient forest ecosystems.
Local Objective: Well-balanced ecosystems that support natural processes.

Description of indicator

Maintenance of old forest stands is crucial for forest management as it conserves landscape ecosystem biodiversity. As harvesting usually targets mature stands, forest management must consider how harvesting affects the distribution and percentage of older stands across the landscape. Forest stands exist under different soils, climatic, ecological and natural disturbance conditions. This indicator is designed to ensure the maintenance of old forest representation by biogeoclimatic variant within each landscape unit according to the age of old forest and the percentage of old forest retention by natural disturbance type (*Order Establishing Provincial Non-Spatial Old Growth Objectives*, June 30, 2004 *http://ilmbwww.gov.bc.ca/ilmb/lup/policies_guides/oldgrowth/index.html*). This is a “state of the forest” indicator and portrays the percentage of the landscape that is represented by the older (late) age classes i.e. mature and old forests.

Current Practices and Status of Indicator

Canfor and BC Timber Sales have been implementing the principles of landscape biodiversity at the Forest Development Plan level since 1999. These principles have included maintaining representative amounts of old forest across landscapes and ecosystems. Table 1 identifies the current status of old forest representation and targets associated with each landscape and ecosystem on TFL30.

In the majority of cases the current status of mature and old forests exceeds the minimum level requirements. In these areas, current and future practices will be to continue to harvest while monitoring the levels of old and mature forests to ensure the minimum target threshold limits are maintained. In some cases however, the amount of old forest is less than the target (or zero), while the amount of mature stage forest exceeds the target (e.g. Averil ESSFwk2). This is because there is currently very little or no forest in these ecosystems that is classified as having an age greater than 250 years old. Current and future practice in these cases will be to avoid harvesting old forest, continue cutting mature forest (where applicable), and to plan for recruitment of old forest as the mature forest ages. The time for recruitment to satisfy the minimum old requirement will be reflected by the "achieved by" column in Table 1. Exceptions to this may be made for forest health protection activities to deal with damaging agents (windthrow, beetle kill).

Establishment of Targets and Future Practices

Targets for old forest amounts were based on the biodiversity guidebook and the Provincial non-spatial old growth order. Forecasting of the old forest amount occurred in all scenario’s of the indicator forecasting project. Results of the indicator forecasting are shown in Table 2.

As forest harvesting continues, the expectation is that the amount of mature and old forest will be reduced to approximately the minimum thresholds; however, it will take an entire rotation to achieve these thresholds. The exception to this is that over the short and mid terms the amount of old forest (because of ageing) may increase before decreasing. This is especially true for the areas where old forest is necessary for recruitment.

Forecasting of this indicator will also occur during the timber supply analysis, which typically occurs at five-year intervals. At the annual meeting, results of further forecasting will be presented to the PAG as part of the annual report.

Table 1. Current State of Old Forest

Landscape Unit	NDT	BEC Subzones	Old Forest (years)	Current Status as of March 31, 2006	Target %	Achieved By
Averil	3	SBSwk1, mk1	Old > 140	24%	> 11%	Annually
	1	ICHvk2	Old > 250	13%	> 13%	Annually
	1	ESSFwk2	Old > 250	0%	> 19%	2026
Seebach	2	SBSvk	Old > 250	8%	> 9%	2011
	3	SBSwk1	Old > 140	47%	> 11%	Annually
	1	ICHvk2	Old > 250	13%	> 13%	Annually
	1	ESSFwk2, wc3	Old > 250	6%	> 19%	2031
Woodall	2	SBSvk	Old > 250	6%	> 9%	2011
	1	ICHvk2	Old > 250	7%	> 13%	2016
	1	ESSFwk2, wc3	Old > 250	2%	> 19%	2071

Table 2. **Forecasting Results of Old Forest**

Landscape Unit	NDT	BEC Subzones	Old Forest (years)	Target %	Forecasting Results Range over 250 years
Averil	3	SBSwk1, mk1	Old > 140	> 11%	24 to 11%
	1	ICHvk2	Old > 250	> 13%	13 to 16%
	1	ESSFwk2	Old > 250	> 19%	21 to 19%
Seebach	2	SBSvk	Old > 250	> 9%	9 to 15% in 140 yrs to 11% in 250 yrs
	3	SBSwk1	Old > 140	> 11%	47 to 11%
	1	ICHvk2	Old > 250	> 13%	13 to 15%
	1	ESSFwk2, wc3	Old > 250	> 19%	19 to 29%
Woodall	2	SBSvk	Old > 250	> 9%	9 to 12%
	1	ICHvk2	Old > 250	> 13%	13 to 26%
	1	ESSFwk2, wc3	Old > 250	> 19%	2% to 76% in 180 yrs to 62% in 250 yrs

Monitoring and Reporting Procedures

Forest cover information owned and maintained by Canfor will provide data on age class distribution within TFL30. The forest cover information is updated every 5 years in preparation for the timber supply analysis. Short term updates for reporting purposes, are completed by combining the forest cover base maps and Canfor's spatially linked forest information system (GENUS). Canfor also maintains Terrestrial Ecosystem Mapping (TEM), which is a detailed description of the ecology of TFL30 and is completed to the ecological association level. Canfor and BC Timber Sales will review the indicator to ensure the amount of old forest area is maintained as laid out in the Forest Stewardship Plan. A review of the indicator status will occur in conjunction with the timber supply analysis. Canfor and BC Timber Sales will also review plans on an annual basis to determine if targets for each NDT are achieved as planned and determine if a plan of action to correct any shortcomings and monitor threats by damaging agents is required.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales will look for opportunities for continual improvement and recruitment strategies for BEC units with targets cannot be met in the short term. Old forest losses due to the Mountain Pine Beetle epidemic are to be monitored and are expected to be minimal.

3.2 Interior Old Forest

Statement of Indicator	*Target and Variance*
The amount of old interior forest by NDU/merged BEC within the DFA.	Target: as per Table 3 Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CSA Criterion:*** Conservation of Biological Diversity
CSA Critical Element: Ecosystem Diversity
Value: Well balanced and functioning ecosystems.
Objective: Maintain landscapes that support the natural diversity, variety and pattern of ecosystems.

2) ***CSA Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity
CSA Critical Element: Forest Ecosystem Resilience
Value: Resilient Forest Ecosystems
Objective: Well-balanced ecosystems that support natural processes

Description of Indicator

Old interior forest conditions are achieved when the climatic and biotic impact of adjacent younger stands no longer influences environmental conditions. This indicator is important because many species are dependent upon old interior forest conditions for their habitat requirements. Historically, natural disturbance events such as fire, insects, and wind created diverse landscapes that provided sufficient reserves of mature timber to create ample interior old forest conditions. Sustainable forest management can contribute to creating these conditions by planning harvesting patterns that do not "fragment" the landscape into patch sizes insufficient in area to achieve these goals. By creating interior forest conditions, ecosystem diversity is maintained in the Defined Forest Area (DFA) as well as habitat for plant and animals species that depend on these ecosystems. Having a diverse representation of all ecosystem types enhances forest ecosystem resilience by providing habitat for species that contribute to the overall health and productivity of the forest

Current Practices and Status of Indicator

The Landscape Objective Working Group (LOWG), which has representation from MSRM, MOF and timber licensees, aided MSRM in the development of landscape biodiversity objectives for old interior forest conditions for the Prince George Forest Region, which included the TFL30 DFA. These objectives were established by MSRM in consultation with licensees, BCTS and the MoFR and utilize Natural Disturbance Unit (NDU) research conducted by DeLong (2002). Old interior forest retention objectives have been established for each NDU that occurs within the DFA. The NDU equates to the previous three Natural Disturbance Types. The baseline analysis for the establishment of landscape biodiversity objectives across the Prince George TSA used a buffered distance from existing openings and younger age classes to calculate the amount of old interior forest. . This Order does not apply to Tree Farm Licenses however TFL30 has adopted the targets as outlined in the Biodiversity Objectives (Table 3).

Table 3. Current Interior Old Forest Condition and Forecasting Results.

NDU / Merged Biogeoclimatic Unit	Target Total Old Forest Area (ha)	Target Old Interior %	Target Old Interior ha	Current Old Interior %	Current Old Interior ha	Old Interior in 50 Years %	Old Interior in 50 Years ha
A2 NDU_McGregor Plateau_ESSF	137	≥40%	≥55	190%	260	5%	7
A3 NDU_McGregor Plateau_SBSmk1	816	≥25%	≥204	282%	2,301	1%	12
A4 NDU_McGregor Plateau_SBSvk, wk1	13,397	≥10%	≥1,340	35%	4,635	4%	507
A14 NDU_Wet Mountain_ESSFwk2	3,907	≥40%	≥1,563	92%	3,612	77%	3,006
A15 NDU_Wet Mountain_ESSFwc3	2,479	≥40%	≥992	48%	1,192	83%	2,049
A16 NDU_Wet Mountain_SBSwk1	1,273	≥25%	≥318	139%	1,768	24%	310
A17 NDU_Wet Mountain_SBSvk	28,952	≥25%	≥7,238	66%	18,983	7%	2,025
A19 NDU_Wet Trench Mountain_ESSFwk2	935	≥40%	≥374	109%	1,019	105%	983
A20 NDU_Wet Trench Mountain_ESSFwc3	29	≥40%	≥11	105%	30	105%	30
A23 NDU_Wet Trench-Valley_SBSwk1	1	≥10%	≥0	0%	0	0%	0
A25 NDU_Wet Trench-Valley_SBSvk	10,342	≥25%	2,585	30%	3,117	5%	509

Establishment of Targets and Future Practices

Targets for this indicator were derived from the Order Establishing Landscape Biodiversity Objectives. It is important that old interior forest objectives be managed with a temporal perspective (i.e. achieving the objectives over time). These objectives were established by ILMB in consultation with licensees, BCTS and the MOF and utilize Natural Disturbance Unit (NDU) research conducted by DeLong (2002). Old interior forest retention objectives have been established for each NDU that occurs within the Prince George DFA. The baseline analysis for the establishment of landscape biodiversity objectives across the Prince George TSA used a buffered distance from existing openings and younger age classes to calculate the amount of old interior forest.

As stands age, Canfor and BC timber Sales will have to demonstrate how the dynamics of old interior forest will change and be managed. Canfor and BCTS planning foresters designing cut blocks into the future will be developing and refining short time span (likely 5-year) operational interior old forest forecasts and monitoring these on an ongoing basis so that new development allows interior old forest to meet the targets. A critical part of the strategy in the immediate future will be to minimize fragmentation of mid-aged (60-100 year old) forests, as these are the stands that will provide the old interior forest conditions in the future.

Forecasting and Predicted Trends

Due to the complexity of calculating interior old forest, forecasting results are only presented into the future for 50 years. The amount of interior old forest was not part of the modeling constraints applied during forecasting analysis and therefore the forecasts are simply reported out values. As a result, the future forecast condition shows that for a few of the NDU/merged BEC, there is a trend below the targets overtime, particularly in relation to non-ESSF merged BEC units. The final design of cut blocks and assuring amount of interior old forest is an operational planning exercise and not a modeling exercise.

Planning foresters designing cut blocks into the future will be developing and refining short time span (likely 5-year) operational forecasts and monitoring these on an ongoing basis so that interior old forest meets the targets. Additional forecasting of this indicator will occur during future indicator supply analyses, which are anticipated to be at five-year intervals.

Monitoring and Reporting Procedures

The Planning Forester will be responsible for monitoring the old interior forest retention levels and determining if the indicator objective is being met through these targets. This will include comparison to appropriate areas outside the TFL30 to better monitor trends and influences of forest interior conditions. At the annual meeting, results of further forecasting will be present to the PAG as part of the annual report.

As forest harvesting continues the expectation is that the availability of the forest interior condition will be reduced/or increased to approximately the minimum thresholds, as the case may be. It is expected to take up to several decades to achieve thresholds where the recruitment strategy is planned.

Responsibility and Continuous Improvement Opportunities

GIS specialists are responsible for maintaining updated forest cover information, Terrestrial Ecosystem Mapping (TEM) and Natural Disturbance Unit boundaries. The planning forester is responsible for monitoring the forest interior status and determining what action, if any is required to achieve the targets as determined.

3.3 Young Forest Patches

Statement of Indicator	*Target and Variance*
The young forest patch size distribution by NDU/merged BEC within the DFA.	Target: as per Table 3 Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element: Ecosystem Diversity
Value: Well balanced and functioning ecosystems.
Objective: Maintain landscapes that support the natural diversity, variety and pattern of ecosystems.

2) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity
CSA SFM Element: Forest Ecosystem Resilience
Value: Resilient forest ecosystems
Objective: Well-balanced ecosystems that support natural processes.

Description of Indicator

A patch is a forest unit with identifiable boundaries and vegetation different from its surroundings. Often patches are even aged forests established from natural disturbances such as fire, wind or pest outbreaks, or from harvesting. Patches may be created from a single disturbance event or through a combination of events such as a fire and subsequent salvage harvesting. The result of varying disturbance events over time is a landscape of forest stands and patches of different sizes composed of a variety of species, stocking levels and ages. Many natural disturbance events, such as wildfire have been reduced by forest management practices. In the absence of natural disturbance, timber harvesting is used as a disturbance mechanism and therefore influences the distribution and size of forest patches over much of the Defined Forest Area (DFA). Patch size distribution created by harvesting should emulate the patterns historically created by a natural disturbance regime, where patches varied in size and shape. Patch size categories used in Prince George Forest District include the following: <51 hectares, 51-100 hectares, 101-1000 hectares and > 1000 hectares.

The indicator addresses the pattern of young forest patches distributed across the landscape, where young forests are defined as stands 0 to 20 years of age. In order to remain within the natural range of variability of the landscape and move toward sustainable management of the forest resource, it is important to develop and maintain young patch size targets based on historical natural patterns. This indicator will monitor the consistency of harvesting patterns compared to the natural patterns of the landscape.

Current Practices and Status of Indicator

Canfor and BC Timber Sales have been implementing the principles of landscape biodiversity at the Forest Development Plan level since 1999. These principles have included providing for a natural patch size distribution across landscapes and ecosystems. Table 4 identifies the current status of patch size distribution and targets associated with each landscape and ecosystem on TFL 30. In most cases, due to past harvesting trends, the current status of the patch size category is not near the target required. As the forest grows older, and new harvesting is carried-out, the targets will be maintained or achieved; however, this process will take several decades (in some cases). Current and future practice will be to prescribe further harvesting that will accelerate the trend toward the desired target for each category. This can be achieved within the Forest Stewardship Plan by:

- Closely monitoring and addressing forest health problems before they create excessive patches (either alone or by linking existing cutblocks).
- Planning to connect medium and small patches to create larger patches where there is a surplus of smaller patches and deficit of larger patches.
- Protecting "leave strips" between patches for a minimum of 20 years where the targets for the category are close to the target.
- Reforesting insufficiently stocked areas as soon as possible, and where practical.

The patch size objective was met in 2005/06 as the targets that were to be achieved annually were accomplished.

Table 4. Current Young Patch Size Distribution and Forecasting Results.

Natural Disturbance Unit	Young Patch Size Class				Needed Future Young Patch Size Trending
	< 50 ha	50-100 ha	100-1000 ha	>1000 ha	
McGregor Plateau – Target %	10%	5%	45%	40%	
Current Young Patch Size Distribution %	3%	3%	3%	90%	Trend towards increasing < 50ha and 100-1000ha blocks
Year 50 – Young Patch Size Distribution %	19%	6%	17%	58%	
Wet Mountain – Target %	20%	10%	60%	10%	
Current Young Patch Size Distribution %	7%	7%	22%	64%	Trend towards increasing < 50ha and 100-1000ha blocks
Year 50 – Young Patch Size Distribution %	25%	11%	20%	45%	
Wet Trench – Target %	20%	10%	60%	10%	
Current Young Patch Size Distribution %	6%	4%	1%	89%	Trend towards increasing < 50ha, 50-100ha & 100-1000ha blocks
Year 50 – Young Patch Size Distribution %	13%	5%	10%	71%	

Establishment of Targets and Future Practices

Targets are derived directly from the Order Establishing Landscape Objectives for PG TSA (2004), and are based on the NDU research developed by Craig DeLong (2002). Specific factors will limit how effective Canfor and BC Timber Sales will be at trending toward patch size targets. These include historical harvesting patterns that have fragmented portions of the DFA and natural disturbance events such as wildfire and to a lesser degree the mountain pine beetle epidemic located in the south west corner of TFL30.

There are some measures that can be taken to achieve patch size distribution targets. Forest health will have to be closely monitored and addressed before they create excessive patches (either alone or by linking existing cutblocks). This will be particularly challenging in areas of high mountain pine beetle infestation. Harvesting should be planned to connect medium and small patches to create larger patches where there is a surplus of smaller patches and deficit of larger patches. The maintenance of "leave strips" between patches for a minimum of 20 years can be done where the targets for the category are within the desired range.

Forecasting and Predicted Trends

Due to the complexity of calculating young patch, forecasting results are only presented into the future for 50 years. The patch size categories were not part of the modeling constraints applied during forecasting analysis and therefore the forecasts are simply reported out patch size values. As a result, the future forecast condition shows that for a couple of the categories, there is a trend away from the targets overtime, particularly in relation to larger openings. The final design of patches is an operational planning exercise and not a modeling exercise.

Planning foresters designing patches into the future will be developing and refining short time span (likely 5-year) operational forecasts and monitoring these on an ongoing basis so that patches trend toward the targets. Additional forecasting of this indicator will occur during future indicator supply analyses, which are anticipated to be at five-year intervals.

Forecasting of this indicator will also occur during the timber supply analysis, which typically occurs at five-year intervals.

Monitoring and Reporting Procedures

The Planning Forester oversees the generation of accurate landscape unit planning maps. This will occur every 5 years in conjunction with the FSP review. Data will be available through the GENUS database and TEM systems.

Future forecasting of this indicator will occur during the timber supply analysis, which occurs in five-year intervals.

Responsibility and Continuous Improvement Opportunities

It will be the responsibility of the Planning Forester to monitor and report on the progress towards target achievement set for this indicator. Progress will be reported annually to the PAG for the operating year April 1 to March 31.

3.4 Wet Trench & Wet Mountain Young Patch Size Distribution

Indicator Statement	*Target and Variance*
Trend towards the percentage of area of patches in 101-500ha range within the Wet Trench and Wet Mountain of the young patch size distribution class 101-1000ha	Target: 70% Variance: ±10%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element: Ecosystem Diversity
Value: Well balanced and functioning ecosystems that support natural processes
Objective: Maintain landscapes that support the natural diversity, variety and pattern of ecosystems

2) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity
CSA SFM Element: Forest Ecosystem Resilience
Value: Resilient Forest Ecosystems
Objective: Well balanced ecosystems that support natural processes

Description of Indicator

As noted earlier, a patch is a forest unit with identifiable boundaries and vegetation different from its surroundings. Often patches are even aged forests established from natural disturbances such as fire, wind or pest outbreaks, or from clearcut harvesting. Patches may be created from a single disturbance event or through a combination of events such as a fire and subsequent salvage harvesting.

Patch size categories used in Prince George Forest District include the following: <51 hectares, 51-100 hectares, 101-1000 hectares and > 1000 hectares. However in the higher elevation areas (Wet Trench and Wet Mountain natural disturbance units) the range of 101- 1000 hectares was too large a range to actually account for the natural disturbance ecology. Therefore the range was sub divided into 101-500 hectares and 501-1000 hectares.

The result of varying disturbance events over time is a landscape of forest stands and patches of different sizes composed of a variety of species, stocking levels and ages. Many natural disturbance events, such as wildfire have been reduced by forest management practices. In the absence of natural disturbance, timber harvesting is used as a disturbance mechanism and therefore influences the distribution and size of forest patches over much of the Defined Forest Area (DFA). Patch size distribution created by harvesting should emulate the patterns historically created by a natural disturbance regime, where patches varied in size and shape.

The indicator addresses the pattern of young forest patches distributed within the Wet Trench and Wet Mountain NDU, where young forests are defined as stands 0 to 20 years of age. In order to remain within the natural range of variability of the landscape and move toward sustainable management of the forest resource, it is important to develop and maintain young patch size targets based on historical natural patterns. This indicator will monitor the consistency of harvesting patterns compared to the natural patterns of the landscape.

Current Practices and Status of Indicator

The Landscape Objective Working Group (LOWG) which has representation from the Ministry of Agriculture and Lands, the Ministry of Forests and Range (MoFR) and timber Licensees, developed landscape biodiversity objectives for patch size distribution for the Prince George Timber Supply Area (PGTSA). Although the TFL30 DFA is not accountable to the LOWG, Canfor and BC Timber Sales have chosen to adopt these objectives which utilize the research conducted by DeLong (2002). Young forest patch size distribution objectives have been established for each NDU that occurs within the DFA The NDU boundaries equate closely to the Natural Disturbance Types boundaries so the NDT names remain the same.

Current status is shown on the following table.

Table 5. Wet Mountain & Trench Current Young Patch Size Distribution and Forecasting Results.

Natural Disturbance Unit	Young Patch Size Class		
	Area in 100-1000 ha	Area & % in 100-500 ha	Area & % in 500-1000 ha
Wet Mountain – Target %		**70% ±10%**	
Current Young Patch Size Distribution	3912 ha	3001 ha 77 %	911 ha 23%
Year 50 – Young Patch Size Distribution	2143 ha	2143 ha 100%	0 ha 0%
Wet Trench – Target %		**70% ±10%**	
Current Young Patch Size Distribution	110 ha	110 100%	0 ha 0 %
Year 50 – Young Patch Size Distribution	828 ha	828 100 %	0 ha 0 %

Currently, within the 100-500 ha patch size class, the Wet Mountain NDU is within the target range and the Wet Trench NDU is above the target range. As new cut blocks are designed in the short term within the Wet Trench NDU, there will be efforts made to increase young patch area within the 500-1000 ha patch size category, so that the 100-500 ha young patch area falls within the target range.

Establishment of Targets and Future Practices

Targets come directly from a review of the natural disturbance dataset for the Prince George TSA based on the NDU research developed by Craig DeLong (2002). Specific factors will limit how effective Canfor and BC Timber Sales will be at trending toward patch size targets. These include historical harvesting patterns that have fragmented portions of the DFA and natural disturbance events such as wildfire, and insect and disease epidemics.

Forecasting and Predicted Trends

Due to the complexity of calculating young patch, forecasting results are only presented into the future for 50 years. The patch size categories were not part of the modeling constraints applied during forecasting analysis and therefore the forecasts are simply reported out patch size values. As a result, the future forecast condition shows that there is a trend outside the target range overtime, particularly in relation to decreasing larger openings. The final design of patches is an operational planning exercise and not a modeling exercise.

Planning foresters designing patches into the future will be developing and refining short time span (likely 5-year) operational forecasts and monitoring these on an ongoing basis so that patches trend toward the targets. Additional forecasting of this indicator will occur during future indicator supply analyses, which are anticipated to be at five-year intervals.

Forecasting of this indicator will also occur during the timber supply analysis, which typically occurs at five-year intervals.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will monitor Patch size targets based on natural disturbance units. Data sources used in the monitoring process include forest cover inventory, NDU maps, adjacent licensee planning and harvest history information and GENUS data. Forest cover inventory information with updates based on harvesting activities will be analyzed on an annual basis to ensure forest management is moving toward patch size targets within theses NDU. Canfor and BC Timber Sales will compare results with appropriate areas outside the TFL30 to monitor trends and influences.

Responsibility and Continuous Improvement Opportunities

It will be the responsibility of the Planning Forester to monitor and report on the progress towards target achievement set for this indicator. Progress will be reported annually to the PAG for the operating year April 1 to March 31.

3.5 Biodiversity reserves

Statement of Indicator	*Target and Variance*
The amount in hectares of landscape-level biodiversity reserves within the DFA.	Target: as per Table 6 Variance: 0%
Hectares of unauthorized forestry related harvesting or road construction within Protected Areas.	Target: 0 ha Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
   CSASFM Element: Ecosystem Diversity
   Value: Well balanced and functioning ecosystems.
   Objective: Maintain landscapes that support the natural diversity, variety and pattern of ecosystems.

2) ***CCFM Criterion:*** Conservation of Biological Diversity
   CSA SFM Element: Genetic Diversity
   Value: Genetic diversity.
   Objective: Maintain natural genetic diversity.

3) ***CCFM Criterion:*** Conservation of Biological Diversity
   CSA SFM Element : Protected Areas and Sites of Special Biological Significance
   Value: Sites of Special Biological Significance
   Objective: Sites of special biological significance are identified and appropriately managed.

4) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity.
   CSA SFM Element: Forest Ecosystem Productivity
   Value: Productive ecosystems.
   Objective: Maintain ecosystem conditions that are capable of supporting naturally occurring species.

Description of Indicator

Distributing biodiversity reserves, at a variety of scales (small and large), throughout the managed forest will provide for a mix of vegetation age, structure, and composition that will support a variety of species habitat requirements. There are two levels of Biodiversity Reserves: The **stand level**, which include mapped wildlife tree patches and riparian reserve areas, and at the **landscape level**, which includes provincial parks and all other large reserve areas that are removed from the timber harvesting land base. This indicator evaluates the amount of productive forest devoted to landscape level biodiversity reserves for each biogeoclimatic variant. The indicator is related to three SFM parameters and provides for ecosystem diversity, and genetic diversity and forest ecosystem productivity.

Landscape biodiversity reserves provide for ecosystem diversity by creating a variety of different forest types, ages, structures, and composition across a broad area. Maintaining landscape level reserves promotes the distribution of a variety of unmanaged biogeoclimatic variants across the planning area, and therefore ensures that a variety of forest stand types are maintained. This same variety will include a mix of species, and diversity within species that will promote genetic diversity. By providing for ecosystem and genetic diversity, forest ecosystem productivity is enhanced from a wide range of species and habitats all contributing to a well functioning and resilient system.

Tracking the amount of area harvested within Protected Areas will allow forest managers to determine if there are flaws in the planning and implementation of forestry activities.

Current Practices and Status of Indicator

The Provincial Government currently classifies landscape level retention through higher level and strategic planning initiatives. Some examples of this include Crown Land Plans and the Parks and the Protected Areas Strategy. Canfor through its Management Plan can also recommend large scale biodiversity reserves.

A target of zero hectares of unauthorized forestry related harvesting or road construction within Protected Areas has been established, as there should be no tolerance for errors of this nature. Using GIS and spatial databases, site plans are planned and reviewed to ensure forestry activities are not planned within Protected Areas. EMS checklists and active supervision of road construction and harvesting are currently used to ensure Site Plans are implemented correctly in the field.

No harvesting has occurred during April 1, 2005 to March 31, 2006 in protected areas within the DFA.

Establishment of Targets and Future Practices

Landscape level baseline targets for each of the variants were established from a review of the current status of parks/ protected, wildlife/habitat reserves from the Crown Land Plan, and other large-scale reserves from the Timber Supply Review process. Neither Canfor nor BC Timber Sales established these reserve areas, but has participated in the process of their allocation, mainly through the participation in various land-use planning processes which were co-ordinated and led by the Provincial Government over the past number of years. Canfor and BC Timber Sales will continue to work with the various Government Agencies responsible for land-use planning and advocated for the continued protection of landscape-level reserves consistent with the baseline targets.

Canfor and BC Timber Sales have established a target of zero tolerance for trespasses within Protected Areas. Ensuring unauthorized forestry related harvesting within protected areas does not occur preserves the values that society places on them.

Table 6. Current Status of Biodiversity Reserves.

Biodiversity Reserve Type	Current Status (Ha)* As of March 31, 2006	Target (Ha)*	Area of unauthorized harvest (ha)	Achieved by
Giscome Portage Trail	93	93	0 ha	Annually
Horseshoe Recreation Area	649	649	0 ha	Annually
High Value Caribou Habitat	8,313	8,313	0 ha	Annually
McGregor River Management Zone	3,182	3,182	0 ha	Annually
Seebach Riparian Management Zone	1,196	1,196	0 ha	Annually
Tri Lakes Recreation Area	675	675	0 ha	Annually
Woodall Recreation Area	1,734	1,734	0 ha	Annually
Total	**15,842 ha**	**15,842 ha**	**0 ha**	

*All areas refer to the productive forested portion of the TFL

Forecasting and Predicted Trends

Canfor and BC Timber Sales will continue to maintain the small and large-scale biodiversity reserves within the DFA. Over the long-term, it is anticipated that there will be a continual increase of areas set aside for biodiversity reserves as greater knowledge is accumulated regarding the ecological requirements to conserve ecosystem biodiversity. Canfor and BC Timber Sales recognize that large scale biodiversity reserves, may be dynamic and will be are assessed and taken into account during the timber supply analysis estimated to be every 5 years.

It is predicted that Canfor and BC Timber Sales will have zero hectares of their forestry operations within Protected Areas. Canfor and BC Timber Sales have established a target of zero tolerance for trespasses within Protected Areas and at this time that target is expected to be met. This indicator is not easy to quantifiably forecast, however, it is important to identify what the accepted targets mean to Sustainable Forest Management. To forecast this indicator, a “what if scenario” analysis can be used to help identify the importance of the stated target to overall SFM within the DFA. The current target is set at 0 ha of unauthorized forestry related harvesting or road construction within Protected Areas. The following “what if scenario” is used in this analysis:

a) What if only 50% (7,921 ha) of the landscape reserve area was established?
b) What if a target of $\leq$10ha of unauthorized forestry related activities was established?

If only 50% (7,921 ha) of the landscape reserve area was established within the DFA, this would have several negative impacts to ecosystem health and diversity. If insufficient landscape reserves are retained, natural ecosystem functioning levels may decrease. Dispersed landscape level reserves provides habitat to animals and maintain natural genetic diversity.

10 ha or less would represent a very small area to be harvested or disturbed by road construction within a Protected Area. However, ecologically it could be quite serious. The area disturbed could be an extremely rare plant community or important habitat for a Species at Risk. Unauthorized road construction could create access to previously inaccessible sites creating opportunity for poaching, all terrain vehicle use, and other human activities.

Ensuring that landscape reserves are present on the landscape and that the target of 0 ha of unauthorized forestry related harvesting within Protected Areas is met will protect their ecological function and preserve the values that society places on them.

Monitoring and Reporting Procedures

Landscape level biodiversity reserves are calculated areas of total productive forest area within the Defined Forest Area (DFA). Canfor and BC Timber Sales will continue to work with Government Agencies to promote the designation of landscape level reserves. Canfor and BC Timber Sales will also maintain and update spatial data of all landscape-level reserves consistent with land-use and boundary designations from Provincial Agencies. Where significant changes to the designation of reserve areas or inventories have occurred, an automated GIS query is run to assess performance relative to the stated target. Performance relative to the stated target will be assessed and reported in the annual SFM Plan report for the operating year April 1st to March 31st.

The Planning Forester is responsible to monitor updates on Protected Areas through higher-level plans and government Orders. Canfor and BC Timber Sales will ensure the location of Protected Areas is updated on an annual basis.

Responsibility and Continuous Improvement Opportunities

The Canfor and BCTS Planning Forester are responsible for working with the Government Agencies' land-use planning processes. Opportunities for developing new landscape level reserves should be made in consideration of other objectives (protected species, old growth protection) and the current mountain pine bark beetle infestation. If unauthorized harvesting or road construction within Protected Areas the Ministry of Forests and Range, the Ministry of Environment, and the Ministry of Agriculture and Lands will be notified. Improvements in Site Plan development and implementation, either by training, increased supervision or other methods can be adopted if required

3.6 Stand Level Retention

Indicator Statement	*Target and Variance*
The average percentage of stand level retention in harvested areas within the DFA	Target: >7% annually (> 3.5% by cut block) Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element: Ecosystem Diversity
Value: Well balanced and functioning ecosystems
Objective: Maintain landscapes that support the natural diversity, variety and pattern of ecosystems.

2) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element: Genetic Diversity
Value: Genetic Diversity
Objective: Maintain natural genetic diversity.

Description of Indicator

As noted in the previous section, biodiversity reserves can occur at the stand level. Stand level retention consists primarily of wildlife tree patches (WTPs) and riparian management areas. WTPs are forested patches of timber within or immediately adjacent to a harvested cut block, while riparian management areas are associated with water features. Stand retention provides a source of habitat for wildlife, sustains local genetic diversity, and/or protects important landscape or habitat features, such as mineral licks and raptor nesting sites. Maintenance of habitat through stand retention contributes to conservation of ecosystem diversity by conserving a variety of seral stages, structure and unique features at the stand level.

Current Practices and Status of Indicator

Canfor and BC Timber Sales manage stand level retention within TFL30 for each cut block. Retention level in each block is documented in the associated Site Plan and recorded in the database systems and reported out in RESULTS on an annual basis.

From April 1, 2005 to March 31, 2006, only one block was logged greater than 15ha in size and the level of stand level retention was 17.2%.

Establishment of Targets and Future Practices

The targets of 3.5% and 7.0 % are derived from the Forest Planning and Practices Regulation, Section 66: Wildlife Tree Retention. These targets were established by the Provincial Government to ensure an adequate amount of original stand structure is maintained in and/or around a cut block as a result of landscape planning. This is a change from forest planning that was previously assessed at a stand level. It is anticipated that the larger the cut block design, the more retention will be associated with the block. Salvage blocks may have reduced retention in relation to their size compared to non-salvage blocks due to diminished quality of stand level retention features. In all cases, the minimum retention requirements will be maintained.

Forecasting and Predicted Trends

Stand level retention is not easy to quantifiably forecast. However, forecasting of this indicator can be completed with the use of a “what if scenario” to help assess anticipated future trends for stand level retention. This could include two potential scenarios:

a) What if there was no stand level retention prescribed in managed stands?
b) What if three times the stand level retention was prescribed in managed stands?

The ecological benefit from stand level retention is assumed to increase with the number of retention areas present in managed stands. Benefits increase up to a saturation point where overall value then begins to level off. At this point in time it is not possible to identify this saturation point as each stand has different ecological attributes. If no stand level retention was prescribed, it is expected that biodiversity values would diminish. Wildlife productivity may decline, ecosystem and genetic diversity would decrease and natural patterns across the landscape would not be represented. Conversely, if three times the stand level retention was prescribed in

managed stands one could anticipate economic values from the timber resource would not be fully achieved. Silviculture activities such as reforestation could potentially become less efficient and more costly due to smaller harvesting units. Higher levels of retention would also increase fragmentation of the landscape, making patch size distribution objectives more difficult to achieve.

The comparison of the above scenarios implies that a balance of values can be achieved through an identified level of stand retention that lies somewhere in between the two situations. Although this level has not yet been identified through past experience or through scientific findings, Canfor and BC Timber Sales is committed to achieving the indicator target and will strive to continually improve practices, as new information becomes available. Within the TFL30 DFA, future trends suggest that stand level retention will remain constant.

Monitoring and Reporting Procedures

Information for stand level retention is to be found in Site Plans and Canfor's and BC Timber Sales' information tracking systems such as GENUS. Stand level retention will be measured within TFL30 by cut block. Each block must contain at least 3.5% retention and there is no maximum value for retention areas. All cut blocks harvested and completed between April 1 and March 31 of each year must have an average of 7.0% retention of the total area of the cut blocks.

Annually, stand retention data will be updated as future blocks are harvested, and then reviewed to ensure targets are being achieved. Results will be reported to the Public Advisory Group (PAG) as part of the SFMP annual report. Retention percentages are also reported to the Ministry of Forests and Range annually through RESULTS for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

The Planning Forester is responsible for monitoring and reporting stand level retention percentages. In the event the stand retention levels in planned blocks is less than the target retention %, Canfor and BC Timber Sales will have to demonstrate this will not result in non-conformance to target or redesign the proposed blocks to meet targets.

A potential opportunity for continual improvement would rely on developing strategies to assess the effectiveness associated with wildlife and biodiversity objectives through stand level retention. This would allow for evaluation and future adjustments of the targets to sustain biodiversity values within harvested stands. Canfor and BC Timber Sales will encourage research to evaluate the success of previous stand level retention in order to improve future WTP design.

3.7 Coarse Woody Debris

Indicator Statement	*Target and Variance*
The percentage of site plans that have Course Woody Debris (CWD) retention within the natural range appropriate for the site.	Target: 100% Variance: 0%
Percentage of cut blocks consistent with CWD requirements in operational plans.	Target: 100% Variance: 0%

These indicators address the following CSA-SFM parameters:

1) ***CCFM Criterion :*** Conservation of Biological Diversity
CSA SFM Element : Ecosystem Diversity
Value : Well balanced and functioning ecosystems.
Objective: Maintain landscapes that support the natural diversity, variety and pattern of ecosystems.

Description of Indicators

Coarse woody debris (CWD) is defined as material greater than 10 cm in diameter, in all stages of decay and consists of above-ground logs, exposed roots and large fallen branches (B.C. Ministry of Forests, 2000). CWD is a vital component of a healthy functioning forest ecosystem in that it provides habitat for plants and animals. It is also an important source for soil nutrients and aids in soil moisture retention. Targets for CWD requirements are identified in the site plan for a specific cutblock.

Despite the fact that there is often an economic incentive to minimize debris that is left behind on site-specific CWD retention levels will be targeted in all areas to be harvested. Removal of logging debris can be detrimental if the habitat needs of organisms are compromised. Thus, retention levels have to balance economic and ecological factors. The CWD levels that exist within WTPs and riparian retention areas, unsalvaged burns, or unsalvaged mountain pine beetle sites within the DFA will also serve to compliment CWD levels retained within harvested blocks. These indicators ensure that CWD retention requirements are part of the planning process and those requirements are achieved in cut blocks.

Current Practices and Status of Indicator

The current performance standard for harvested blocks is defined in the provincial wide CWD strategy “A Short-term Strategy for Coarse Woody Debris Management in British Columbia’s Forests”(BC MOF, 2000). This strategy's objectives include maintaining small, dispersed CWD piles where appropriate to provide denning habitat for furbearers such as pine martens. Other objectives include providing a range of decay and diameter class CWD, and providing both coniferous and deciduous CWD. Standing dead trees can be utilized or stubbed trees can create both CWD and wildlife habitat. The composition and disbursement of CWD and wildlife trees can be managed to reduce impacts from danger trees, wildfire and forest pests or forest disease hazards. Current levels of CWD in the DFA are expected to exceed the stated target for this indicator.

As of March 31, 2006, there is no established natural range for CWD in ecosystems on TFL30, therefore the target will be assumed to be the default amount noted in the Forest Planning and Practices Regulation, which is 4 pieces/ha of a certain size. It is also recognized by Canfor and BC Timber Sales that 4 pieces/ha is an unrealistic small amount and not likely sufficient for biodiversity. Nonetheless, this will occur until a natural range of CWD can be established. Work is currently underway to gather information for establishing a natural range of CWD in ecosystems that cover TFL30. This includes a literature review by June 2006, analyzing current data on CWD in natural forests by September 2006 and gathering new CWD data within natural stands December 2007, and developing a monitoring strategy for collecting data in managed stands by June 2007.

From April 1, 2005 to March 31, 2006, one block was logged greater than 15ha in size and this block did not specify CWD targets within the natural range.

Establishment of Targets and Future Practices

The target of 100% consistency with CWD requirements in operational plans and on the ground reflects the importance that Canfor and BC Timber Sales place on these indicators. Canfor and BC Timber Sales will continue to implement pre-work checklists, interim inspections, and final reviews to ensure targets have been met.

Over the next two years, Canfor and BCTS will work with the other licensees in the PGTSA to sample a range of ecosystems to gather information to benchmark the natural range of CWD and develop an integrated, cost-efficient strategy for CWD monitoring in managed stands.

Forecasting and Predicted Trends

The target of 100% consistency with site plans is expected. The exact level of success is difficult to forecast, as it is dependent on unpredictable factors such as human error. However, it is important to identify what the accepted targets mean to sustainable forest management. Coarse woody debris levels can influence ecosystem diversity values of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for a measure such as this. As this measure currently has the target set at 100% consistency, one other scenario should be identified:

a) What if 50% of cutblocks were consistent with coarse woody debris requirements in operational plans?

If only 50% of cutblocks met coarse woody debris requirements in site plans there could be several negative impacts to ecosystem health and diversity. If insufficient CWD is retained, soil nutrient and moisture retention levels may decrease. Dispersed CWD provides shelter to small animals, as well as young seedlings that require shade and snow retention for survival. CWD piles are valuable denning sites for small furbearers whose numbers may decrease in their absence. By enhancing plant and animal habitat, CWD contributes to the overall health and diversity of the forest ecosystem. Therefore, Canfor and BCTS is committed to meeting the target of 100% consistency with operational plan requirements for CWD and ensuring these requirements are achieved in the cut blocks.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will conduct pre-work meetings prior to the start of projects, monitoring inspections as the work is progressing and final inspections once the work is complete to ensure the commitments specified in the Site Plan are met. These initial, interim and final checks are part of Canfor's and BC Timber Sales's Environment Management System (EMS). If a non-conformance with the Site Plan occurs in the field, this information will be recorded on an activity inspection form and then entered into an incident tracking database or other similar system so that issues can be tracked and mitigated as required.

The percentage of forest operations consistent with CWD requirements will be reported in the annual SFM Plan report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for monitoring, tracking and reporting coarse woody debris levels in their cutblocks. There are many areas for continuous improvement opportunities to maximize the ecological value of leaving CWD without increasing harvesting costs and adhering to current utilization standards. Improvement opportunities will be site specific and may utilize one or more of the following principles:

- Maintain a wide range of diameter and decay classes.
- CWD accumulations at roadside or landings should be minimized to the extent practical. Dispersing small CWD pile throughout blocks may be more beneficial to creating small mammal habitat.
- Retaining standing live/ dead trees and/or stubs on cutblocks can provide important sources of CWD recruitment
- Larger pieces of CWD are more valuable than smaller pieces.
- Retention of a variety of species is preferred.
- The ecological benefits of CWD within riparian areas can be particularly important.
- The retention of CWD should be harmonized with other silvicultural objectives.

As localized research provides data on the natural range of variability of CWD, targets may be updated to better reflect ecological units (NDU/BEC).

3.8 Caribou Habitat

Statement of Indicator	***Target and Variance***
The amount in hectares of Caribou Ungulate Winter Range Habitat within TFL30.	Target: ≥7171 ha high value habitat ≥ 5459 ha corridor habitat Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element : Species Diversity
Value : Sustained populations of flora and fauna native to the DFA.
Objective: Maintain habitat to support flora and fauna native to the DFA.

2) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity.
CSA SFM Element : Forest Ecosystem Productivity
Value : Productive ecosystems.
Objective: Maintain ecosystem conditions that are capable of supporting naturally occurring species.

Description of Indicator

Mountain caribou populations are highly sensitive to disturbance and predation within their habitat. Caribou numbers have been in decline due to a variety of causes. Disturbance within critical habitat can put severe downward pressure on productivity of caribou populations by increasing predation. This is mainly a result of an increase in forage vegetation that has attracted deer and moose that in turn have attracted predators such as wolves. Increased road access into critical habitat has also resulted in increased hunting pressure and disturbance from motorized and non-motorized recreation. Furthermore, the caribou's low rate of reproduction results in the population's inability to cope with these pressures. Caribou corridors are designed and maintained to access various seasonal habitat requirements (i.e. wintering, rutting, calving habitat), while also reducing the predator advantage of limiting the species to a specific place at a particular point in time.

With respect to the conservation of biological diversity, sustainable forest management must consider the flora and fauna native to the DFA and the potential impacts it can have on sensitive species. Having viable Mountain Caribou populations will also maintain forest ecosystem productivity, as they are a long established species that utilize certain plant communities and are prey for carnivores. Maintaining critical ecosystems that are capable of supporting Mountain Caribou is therefore crucial in meeting the objectives of this indicator.

An "Ungulate Winter Range (UWR)" is defined as an area that contains habitat that is necessary to meet the winter habitat requirements of an ungulate species (Government of B.C., 2001). Mountain Caribou were one of the ungulate species considered in the creation of UWR.

Current Practices and Status of Indicator

The B.C. Conservation Data Centre has placed Mountain Caribou on the provincial red list. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) have listed caribou in the southern mountains of BC as threatened. All cutblocks in approved ungulate winter ranges will be consistent with the management guidelines in the approved Order for Ungulate Winter Range #U7-003. The order prescribes specific objectives to maintain Mountain Caribou winter range, to provide high suitability snow interception, cover, and foraging opportunities. Site plans prepared for these areas will reflect these objectives. More information on the order can be found at the Government of BC website http://www.env.gov.bc.ca/wld/uwr/ungulate_app.html. Caribou corridors are designed and maintained to access various seasonal habitat requirements (i.e. wintering, rutting, calving habitat), while also reducing the predator advantage of limiting the species to a specific place at a particular point in time. Maintaining identified travel corridors between the winter range habitat facilitates utilization of UWR.

Current status of the Caribou UWR within the DFA is shown in Table 7.

Table 7. Current Status of Caribou Habitat and Connectivity Corridors.

Caribou Management Areas	Current Status	Target	Allowable Variance	Achieved By
High Value Caribou Habitat	Current status is 100% reserved from harvest. 7171 ha	Reserve 100% of the high value Caribou habitat (7171ha) from harvesting.	None	Annually
Caribou Connectivity Corridors	There are 5459 ha with a total of 20 BEC/NDT combinations for tracking. On average across all units currently 76% of the forested area is mature.	Maintain 5459 ha functional* caribou connectivity corridors.	None	Annually

*functional is defined as at least 200m in width and 70% mature forest

Establishment of Targets and Future Practices

Due to the declining populations of Mountain Caribou in the DFA, Canfor and BC Timber Sales are committed to 100% of forest operations being consistent with approved Ungulate Winter Range Order #U7-003. Canfor and BC Timber Sales will continue to prepare and implement Site Plans consistent with the management objectives outlined in that Order. These objectives can be obtained in more detail from the above website. Canfor and BC Timber Sales are also committed to maintaining the designated travel corridors as outlined in Table 7.

Currently within the Prince George area there is a Caribou Recovery Implementation Group focused on developing a plan that had the best chance of leading to full recovery of mountain caribou within the Hart and Cariboo Mountains. Canfor and BC Timber Sales participate as a member on this group. A draft caribou recovery plan has been developed and sent to the provincial coordination body for review and socio-economic trade-offs analysis. Canfor and BC Timber Sales will monitor the process and provide regular update to the public advisory group.

Forecasting and Predicted Trends

All forest operations are expected to be consistent with Caribou Ungulate Winter Range requirements as identified in Site Plans. The exact level of consistency is difficult to forecast as conditions depend on variables such as site conditions and human error. However, it is important to identify what the accepted targets mean to SFM. Conservation of caribou winter range values will maintain species diversity within the DFA. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for the indicator. As the indicator currently has a target of 100%, One other scenario should be identified:

a) What if only 50 % consistency occurred between forest management operations and approved provincial Caribou Ungulate Winter Range requirements as identified in Site Plans?

Implementing only 50% of strategies to protect these values could lead to significant ecological, economic and social impacts. The precarious nature of Mountain Caribou populations means that failure to manage their winter range properly could decrease their numbers to unrecoverable levels. For example, harvesting and road construction performed in a manner inconsistent with the UWR orders could reduce forage opportunities that the caribou depend on for winter survival. Such activities would be inconsistent with the objective to maintain habitats that support flora and fauna native to the DFA. The decline of already low caribou populations would reduce forest productivity, as they are important consumers of arboreal and terrestrial lichens and a prey source for wolves, bears, and other carnivores.

The above "what if scenario" helps to identify some of the potential future impacts of not achieving the stated targets for this measure. Therefore, Canfor and BC Timber Sales will continue to ensure that 100% of all forest operations are consistent with caribou winter range requirements in operational plans. The indicator will remain at the target of 100% if all processes and protocols are followed.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will conduct pre-work meetings prior to the start of projects, monitoring inspections as the work is progressing and final inspections once the work is complete to ensure the commitments specified in the Site Plan are met. These initial, interim and final checks are part of Canfor's and BC Timber Sales’ Environment Management System (EMS). If a non-conformance with the Site Plan occurs in the field, this

information will be recorded on an activity inspection form and then entered into an incident tracking database so issues can be tracked and mitigated as required.

The percentage of forest operations consistent with caribou winter range management requirements will be reported in the annual SFM Plan report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Planners are responsible for being aware of the location of ungulate winter range as specified in Schedule A of the Order for Ungulate Winter Range # U7-003 and the management objectives outlined in that order. They are also responsible for being aware of corridor locations. Foresters responsible for preparing Site Plans must ensure the management activities prescribed in that document are consistent with the management objectives in the order. Harvesting supervisors are primarily responsible for ensuring Site Plan requirements are implemented in the field during harvesting operations. Silviculture foresters are also responsible for ensuring silviculture activities are consistent with ungulate winter range strategies. If problems in implementing the Site Plan objectives persist, corrective and preventative actions will be identified to improve consistency.

3.9 Species at Risk Notice / Orders & Habitat

Indicator Statement	*Target and Variance*
The percentage of forest operations consistent with approved provincial Species at Risk Notice/ Orders requirements as identified in operational plans	Target: 100% Variance:0%
The amount of Species at Risk (wildlife) habitat (ha) within TFL30	Target: TBD by June 2007 Variance: + 6 months

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element: Species Diversity
Value: Sustainable populations of flora and fauna native to the DFA
Objective: Maintain habitat to support flora and fauna native to the DFA

2) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity
CSA SFM Element: Forest Ecosystem Productivity
Value: Productive Ecosystems
Objective: Maintain ecosystem conditions that are capable of supporting naturally occurring species.

Description of Indicator

In the Defined Forest Area (DFA), mountain caribou (Rangifer tarandus), grizzly bear (Ursus arctos), fisher (Martes pennanti), and wolverine (Gulo gulo) are red- or blue- listed species that play a key role in the ecosystems and/or are of great socio-economic value.

The indicator is intended to monitor the compliance of forest operations to approved provincial Species at Risk Notice/ Orders requirements as identified in site plans. Being consistent with these requirements will ensure that the habitats that are required to support these Species at Risk will be maintained. Overall ecosystem productivity will be maintained by ensuring these species continue to play their roles in the healthy functioning of the DFA's forests.

Notices and Orders are legal entities created through Government Regulations. Currently, the DFA has no Species at Risk Notices and Orders.

Current Practices and Status of Indicator

Currently there are no Species at Risk Notices and Orders within the DFA. However it is important to ensure should the Species at Risk legislation apply to the DFA in the future Canfor and BC Timber Sales have strategies in place and will adhere to the requirements.

In an effort to develop management tools to predict and manage habitats of species at risk, Canfor over the last few years has created Species at Risk habitat maps over the DFA. This includes the following species: Caribou, Grizzly Bear, Fisher and Wolverine. Some of the predictive maps have been field-tested and results suggest that that it is possible to predict the winter distribution of fisher and wolverine using simple habitat criteria.

Over the next year meetings will occur with BCTS and the public advisory group to share the maps and to help identify critical habitat amounts for use in this indicator.

Establishment of Targets and Future Practices

The target of 100% of forest operations to be consistent with approved provincial Species at Risk Notice/ Orders requirements as identified in site plans was established in recognition of the high value that Canfor and BC Timber Sales place on Species at Risk management. Site Plans will continue to prescribe the most recent management techniques when Species at Risk are identified. Forestry operations will be supervised and reviewed should any SAR requirements in operational plans be required.

Species at Risk habitat maps along with other important social, economic and ecological information will be assembled to identify areas of exceptional conversation value on the DFA over the next year.

Forecasting and Predicted Trends

There are no known SAR habitat notices/orders identified within TFL30 hence 100% compliance is expected. However, Canfor has currently developed predictive SAR habitat maps and is currently field verifying them and it is likely in the near future that SAR habitat will be identified within the DFA. The long-term success of the species at risk objectives is difficult to predict, SAR may be identified by government within the DFA, weather events, climate and unique site characteristics will vary with time and space. However, it is important to identify what the accepted targets mean to SFM. Conservation of species at risk will maintain species diversity within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for the indicator. As the indicator currently has a target of 100%, one other scenario should be identified:

a) What if only 50 % of forest operations were consistent with approved provincial Species at Risk Notice/ Orders requirements or predictive habitat areas by Canfor as identified in site plans?

If only 50% of forest operations were consistent with the SAR Notice/Orders requirements or predictive habitat areas as identified in operational plans, there could be significant ecological, economic and social impacts. Species at Risk, by their very definition, are vulnerable to disturbance or destruction of even small degrees. Ecologically, the loss or decline of any species at risk would reduce species diversity in the DFA. It would also reduce forest productivity by failing to maintain ecosystem conditions that are capable of supporting naturally occurring species. As Notices/ Orders are contained in legislation, failure to be consistent with their requirements could result in monetary penalties and costly litigious proceedings. In addition to these ecological and economic impacts, societal values may be reduced if only 50% of forest operations were consistent with approved provincial Species at Risk Notice/ Orders requirements as identified in operational plans. These species hold intrinsic worth for many people and any activity that threatens their status will meet with disapproval.

The above "what if scenario" helps to identify some of the potential future impacts of not achieving the stated targets for this measure. Therefore, Canfor and BC Timber Sales will continue to ensure that 100% of all forest operations are consistent with approved provincial Species at Risk Notice/ Orders requirements in site plans.

Monitoring and Reporting Procedures

Final harvest inspections will continue to be performed where consistency with approved provincial Species at Risk Notice/ Orders requirements as identified in site plans will be confirmed. Areas of inconsistency will be noted during these inspections and will be entered into an incident tracking database. Annually, inconsistencies will be reported in the SFMP annual report for the operating year of April 1st to March 31st

Responsibility and Continuous Improvement Opportunities

Planners are responsible for being aware of Species at Risk, their habitat and plant communities at risk. Foresters responsible for preparing Site Plans must ensure the management activities prescribed in that document are consistent with approved provincial Species at Risk Notice/ Orders requirements. Harvesting supervisors are primarily responsible for ensuring site plan requirements are implemented in the field during harvesting operations. Silviculture foresters are also responsible for ensuring silviculture activities are consistent with management requirements. If problems in implementing the Site Plan objectives persist, corrective and preventative actions will be identified to improve consistency. Improvements in operational plan implementation will be adopted if required. Continual improvement will also involve increasing knowledge of the interactions between harvesting and Species at Risk.

3.10 Riparian Management Areas

Statement of Indicator	*Target and Variance*
Percentage of forest operations consistent with riparian reserve requirements as identified in Site Plans.	Target: 100% Variance:0%
Percentage of forest operations consistent with riparian management requirements as identified in Site Plans.	Target: 100% Variance:0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSA SFM Element*:* Species Diversity
Value: Sustained populations of flora and fauna native to the DFA.
Objective*:* Maintain habitat to support flora and fauna native to the DFA

2) ***CCFM Criterion****:* Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity.
CSA SFM Element: Forest Ecosystem Productivity
Value: Productive Ecosystems
Objective*:* Maintain ecosystem conditions that are capable of supporting naturally occurring species.

3) ***CCFM Criterion:*** Conservation of Soil and Water Resources.
CSA SFM Element: Water Quality and Quantity
Value: *Water* Conservation
Objective: Maintain water quality and water quantity in the Defined Forest Area

4) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value: Short and long term benefits
Objective: Maintain flow of non-timber benefits

Description of Indicator

Riparian areas are the zones adjacent to lakes, streams, and wetlands. They encompass the area covered by continuous high moisture content and the adjacent upland vegetation. In British Columbia legislation has identified Riparian Management Areas (RMAs) which consist of a Riparian Management Zone (RMZ) and, where required, a Riparian Reserve Zone (RRZ). The width of these zones is determined by attributes of streams, wetlands, lakes, and adjacent terrestrial ecosystems. The RRZ, if required, is immediately adjacent to the stream and is a no-harvest zone. RRZs are proposed and implemented in cutblocks and road construction areas, but they also continue in existence after harvest until a mature stand is re-established. This indicator will ensure that the RRZ that exists after harvesting activities is consistent with what was prescribed in the Site Plan or road construction design

Identifying and managing RRZs provides for the maintenance of species diversity by conserving riparian and aquatic environments, which are key for the survival of species (flora and fauna) dependent upon riparian conditions. In addition to providing critical habitat, RRZs function to conserve water quantity and quality features by reducing the risk induced by forest harvesting activities to waterbodies. By protecting species diversity and water quality, forest productivity is sustained, as both of these attributes are needed to maintain ecosystem conditions. Thus, the identification, assessment, and tracking of RRZ management is crucial to ensuring riparian areas and waterbodies are not unduly impacted.

Current Practices and Status of Indicator

Currently, riparian reserves are identified in the Site Plan for each cut block and through field assessment. A Site Plan is completed prior to harvesting for most areas within the DFA. They identify the type of riparian features present within or adjacent to a proposed harvest area, the size of the RMA (which includes the RRZ where applicable), and a prescription for specific activities within the RMZ to protect water quality and habitat values. EMS, pre-work forms are completed prior to harvesting to review all applicable RMA objectives, including RRZ locations. Canfor and BC Timber Sales also complete harvest inspections for all harvested areas to ensure riparian aspects contained in Site Plans are implemented in the field.

Currently 100% of Canfor and BCTS forest operations on the DFA are consistent with riparian reserve and riparian management requirements as identified in Site Plans.

Establishment of Targets and Future Practices

This indicator's target was developed through a review of past performance and legal requirements within the DFA. The target value of 100% has been established to ensure that all riparian management practices, specifically RRZ designation and management, continue to remain consistent with the Site Plan and other operational plans.

RRZs will continue to be documented at the Site Plan stage. All streams, wetlands, and lakes in or immediately adjacent to a planned harvest area will be classified in the field prior to the commencement of operations. Riparian Reserve Zones (RRZ) that meet or exceed the RRZ widths required by legislation will be located and clearly marked in the field. Site specific management practices will be included in Site Plans to maintain regulatory riparian reserve zones, and protect them from significant windthrow where needed.

Forecasting and Predicted Trends

Riparian management has historically been an important aspect of forest management within the DFA. Canfor has gained considerable experience in successfully identifying and protecting riparian features, and this success is predicted to continue. The exact level of consistency is not easy to quantifiably forecast over a defined time frame, as it is operational in nature. However, it is important to identify what the accepted targets mean to Sustainable Forest Management. To forecast this indicator, a "what if scenario" analysis can be used to help identify the importance of the stated target to overall SFM within the DFA. The following "what if scenario" consists of one scenario as the current target is set at 100%:

a) What if less than 100% of blocks with Riparian Reserve Zones were consistent with the RRZ requirements as identified in the Site Plans?

Ecological values such as water quantity and quality, and stand level retention could be compromised if less than 100% of blocks with Riparian Reserve Zones were consistent with Site Plans. RRZs are an important part of forest management because they can impact many other forest resource values. They can provide a water body buffer and conserve aquatic habitat conditions such as shade requirements and water temperature. Maintaining stream bank stability within the reserve also protects water quantity and quality. As RRZs can contain upland habitat they can also contribute to stand level retention and overall biodiversity. If less than 100% of RRZs were implemented across the DFA, large areas of riparian habitat could be damaged, water quantity and quality could possibly decrease and stand level retention could decrease. These impacts could influence other economic and social values in the DFA such as tourism and recreation, and potentially reduce quality of life values by decreasing water quality.

Monitoring and Reporting Procedures

Final harvest inspections will continue to be performed where the riparian management area (including riparian reserves) consistency with site plan strategies will be confirmed. Areas of inconsistency will be noted during these inspections and will be entered into an incident tracking database. Annually, inconsistencies will be reported in the SFM Plan annual report for the operating year.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for the implementation, monitoring, and tracking of their operational plans for their cutblocks in TFL30. Continual improvement will involve ongoing review of performance and the EMS will be adjusted where required as tied to pre-works, inspections, and training.

3.11 Personnel Trained to Identify Species at Risk & Sites of Biological Significance

Indicator Statement	*Target and Variance*
Percentage of appropriate personnel trained to identify Species at Risk and their habitat	Target: 100% Variance: 0%
Percentage of appropriate personnel trained to identify Sites of Biological Significance	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion :*** Conservation of Biological Diversity
   CSA SFM Element : Species Diversity
   Value: Sustainable populations of flora and fauna native to the DFA
   Objective: Maintain habitat to support flora and fauna

2) ***CCFM Criterion:*** Conservation of Biological Diversity
   CSA SFM Element: Protected Areas and Sites of Special Biological Significance
   Value: Appropriate Management to Conserve Identified Sites of Special Biological Significance
   Objective: Sites of special biological significance are identified and appropriately managed

Description of Indicator

For the purposes of this SFM Plan Species at Risk are currently derived from the following sources:

1) Endangered or Threatened Species: As identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Species at Risk Act.
2) Red Listed Animal Species, Forested Plant Communities and Plants: Defined as taxa being considered for or already designated as extirpated, endangered or threatened. Extirpated taxa no longer exist in the wild in British Columbia, but they do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed.
3) Blue listed Animal Species and Forested Plant Communities: Defined as taxa considered being of Special Concern in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive to human activities or natural events. Blue listed taxa are at a lower level of risk than red listed species.
4) Provincially Identified Wildlife: Refers to those Species at Risk and Regionally Important Wildlife that the Minister of Water, Land and Air Protection designates as requiring special management attention under the Forest and Range Practices Act.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): This committee is comprised of representatives from federal, provincial territorial and private agencies as well as independent experts in order to assign national status to species at risk in Canada.

Some Species at Risk in British Columbia are found in areas of forestry development. Sustainable forest management must consider their needs when preparing and implementing operational plans. Appropriate management of these species and their habitat is crucial in ensuring populations of flora and fauna are sustained in the DFA. In the DFA the application of landscape and stand level biodiversity management measures contribute to the maintenance of most biodiversity needs. These management approaches are "coarse filter"; i.e. they represent general measures to conserve a variety of wildlife species.

Sites of biological significance are sites that support red and blue listed plant communities and rare ecosystems. Sites of biological significance also include protected areas, which the Canadian Standards Association defines as "an area protected by legislation, regulation, or land-use policy to control the level of human occupancy or activities" (*Canadian Standards Association, 2002)*. Protected areas can include national, provincial parks, multiple use management areas, and wildlife reserves. Sites of biological significance include such features as bald eagle or osprey nest, mineral licks, and avalanche chutes. Identification of these sites by planning staff is essential to their protection through the development of management strategies.

Appropriate personnel include key Canfor staff and contractors and BC Timber Sales staff and contractors directly involved in operational forest management activities. By implementing this indicator, forest management should become more aware of these unique sites and dramatically reduce accidental damage to these valuable features. As training programs are completed, Canfor and BC Timber Sales will significantly increase the

number of key personnel able to improve the protection of sites of biological significance. The protection of all forest components is an integral aspect of Sustainable Forest Management, which recognizes the value of all organisms to the health of the forest ecosystem.

This measure ensures that designated Species at Risk and Sites of Biological Significance are properly managed by ensuring the appropriate staff is trained.

Current Practices and State of Indicator

Training to identify Species at Risk for appropriate staff has been completed with refresher training planned. Newly hired staff will have training needs evaluated and receive training as required. Training records will be reviewed annually to identify training needs and to ensure appropriate personnel are trained.

Currently 100% (Canfor) and 96% (BCTS) appropriate staff and contractors have been trained on Species at Risk and Sites of Biological Significance within the DFA. Any outstanding staff requiring training will be addressed in June 2006.

Establishment of Targets and Future Practices

The target of 100% of appropriate personnel to be trained to identify Species at Risk was established to reflect the importance Canfor and BC Timber Sales place on managing for Species at Risk. Canfor will expand the list of staff to be trained in species at risk to include harvesting supervisors in 2006.

Forecasting and Predicted Trends

It is difficult to predict the success of achieving the targets for training key personnel over a defined time period. The target of 100% of the appropriate personnel being trained to identify Species at Risk and their habitat and Sites of Biological Significance will be maintained. However, it is important to identify what the accepted targets mean to SFM. In order to forecast this measure, a "what if scenario" analysis can be used to help identify the importance of the stated target to overall SFM within the DFA. The following "what if scenario" consists of one scenario as the current target is set at 100%:

a) What if only 50% of key personnel were trained to identify Species at Risk or Site of Biological Significance?

If only half of the people directly involved in operational forest management activities are aware of Species at Risk then there is significant risk that these species or their habitat could inadvertently be disturbed. Many of these species are inconspicuous (particularly the plant species) and could be easily overlooked. Otherwise conscientious staff may plan road construction and harvesting that damage or destroys Species at Risk or Site of Biological Significance simply because they were unaware of them. By having 100% of key personnel trained to identify them the likelihood of inadvertent disturbance is dramatically reduced. Training will also ensure appropriate management strategies are implemented and ensure habitat is maintained to support flora and fauna in the DFA. The indicator percentage will be reported in the annual SFMP plan for the operating year.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will track training information through training records. Such records are currently maintained as part of EMS programs, and are updated as more staff completes the training program.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for identifying the key personnel that requires training. The training program should evolve over time as more information is gained about the Species at Risk and Sites of Biological Significance in the DFA. This information may come from formal research, or may arise from anecdotal sources that may increase once more informed personnel are in the field.

3.12 Species at Risk & Sites of Biological Significance Management Strategies

Statement of Indicator	*Target and Variance*
Percentage of forest operations consistent with Species at Risk management strategies applicable to TFL30	Target: 100%, annually Variance: 0%.
Percentage of forest operations consistent with Site of Biological Significance management strategies applicable to TFL30	Target: 100%, annually Variance: 0%.

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion :*** Conservation of Biological Diversity
   CSA SFM Element : Species Diversity
   Value: Sustained populations of flora and fauna native to the DFA
   Objective: Maintain habitat to support flora and fauna native to the DFA

2) ***CCFM Criterion:*** Conservation of Biological Diversity
   CSA SFM Element: Protected Areas and Sites of Special Biological Significance
   Value: Appropriate Management to Conserve Identified Sites of Special Biological Significance
   Objective: Sites of special biological significance are identified and appropriately managed

Description of Indicator

As mentioned previously Species at Risk are currently derived from the following sources:

1) Endangered or Threatened Species,
2) Red Listed Animal Species, Forested Plant Communities and Plants,
3) Blue listed Animal Species and Forested Plant Communities, and
4) Provincially Identified Wildlife.

Some Species at Risk in British Columbia are found in areas of forestry development. Sustainable forest management must consider their needs when preparing and implementing operational plans. Appropriate management of these species and their habitat is crucial in ensuring populations of flora and fauna are sustained in the DFA. In the DFA the application of landscape and stand level biodiversity management measures contribute to the maintenance of most biodiversity needs. These management approaches are "coarse filter"; i.e. they represent general measures to conserve a variety of wildlife species.

Sites of biological significance include such features as red and blue listed plant communities, rare ecosystems, protected areas, Caribou high value habitat, bald eagle or osprey nest, mineral licks, and avalanche chutes.

For more information on Species at Risk refers to the Conservation Data Center's "BC Species and Ecosystems Explorer" website: http://www.env.gov.bc.ca/atrisk/toolintro.html. This website is maintained by the Ministry of Environment.

Current Practices and Status of Indicator

Canfor has developed and implemented management strategies for Species at Risk and some Sites of Biological Significance on the DFA for two years on the DFA. BCTS has just completed a set of management strategies for their operations in the Prince George Forest District including TFL30.

Currently, there were no species at risk or sites of biological significance identified on site plans within the TFL30 DFA during the reporting period. The Registered Professional Biologist review of strategies was not required and species at risk management strategies have been updated.

Establishment of Targets and Future Practices

Most Species at Risk habitat requirements are sufficiently known to allow the development of special management areas, or prescribe activities that will not interfere with the well being of these species. The management strategies will be based on information already in place (e.g., National Recovery Teams of Environment Canada, IWMS Management Strategy) and on recent scientific literature. Management strategies will be implemented in operational plans such as site plans to ensure the protection of species' habitats.

Forecasting and Predicted Trends

Canfor and BC Timber Sales will continue to monitor for the presence of species at risk within the DFA. The management strategies are in place and will be reviewed on regular basis to determine their effectiveness

Monitoring and Reporting Procedures

An annual review of the management strategy implementation procedure will be completed and reported in the annual SFM Plan report for the operating year of April 1st to March 31st. The management strategies will be designed so a qualified professional can determine whether or not a particular strategy is implemented, not implemented, or is not applicable to the situation. Developed management strategies will be implemented within Forest Development Plans and eventually Forest Stewardship Plans as part of a continual improvement/research strategy for a particular species.

Responsibility and Continuous Improvement Opportunities

Planners will be responsible for being aware of species at risk, their habitat and plant communities at risk. Foresters responsible for preparing Site Plans must ensure the management activities prescribed in that document are consistent with the management objectives for that species. Harvesting supervisors are primarily responsible for ensuring Site Plan requirements are implemented in the field during harvesting operations. Silviculture foresters are also responsible for ensuring silviculture activities are consistent with management requirements. If problems in implementing the Site Plan objectives persist, corrective and preventative actions will be identified to improve consistency. Continual improvement will also involve increasing knowledge of the interactions between harvesting, Species at Risk, and Sites of Biological Significance.

3.13 Native Plant Species Diversity

Statement of Indicator	*Target and Variance*
Native plant species diversity index by plant associations within the DFA.	Target: refer to Table 8 Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
CSASFM Element: Species Diversity
Value: Sustained populations of flora and fauna native to the DFA.
Objective: Maintain habitat to support of flora and fauna native to the DFA

Description of Indicator

In order for entire ecosystems to function effectively and be able to recover from disturbances, (e.g. forest harvesting activities), it is necessary to retain a natural diversity of elements, which are fundamental to ecosystem recovery. To a large extent, plant species provide the basic requirements and fundamental habitat for faunal species, contribute to the recycling of nutrients, and other life sustaining elements necessary to sustain the productive capacity of the ecosystem. As a result, ecosystem resilience is strengthened if a natural diversity of plant life can be maintained throughout the defined forest area (TFL30).

A plant diversity index is a mathematical measure of species diversity in a community. Diversity indices provide more information about community composition than simply species richness (i.e., the number of species present); they also take the relative abundance of different species into account. Diversity indices provide important information about rarity and commonness of species in a community. The ability to quantify diversity in this way is an important tool for biologists trying to understand community structure. (Source: Magurran, A. E. 1988. Ecological Diversity and its Measurement. Princeton University Press, Princeton, NJ). Ecologists generally believe that resilient ecosystems equal healthy ecosystems. Maintaining the natural levels of the plant index will show that we have a resilient and diverse landbase.

Current Practices and Status of Indicator

Currently only the top 5 plant associations representing approximately 80% of the landbase are being monitored Current status and targets are shown in the following table. Current practices maintain strength in community plant composition across the defined forest area. Relative abundance of species, respective of management activities, has not been formally quantified across the identified site associations, however silviculture monitoring has provided strong indication that species composition and relative abundance are not negatively affected by forest management activities.

Current status for the plant diversity index is shown in Table 8.

Table 8. Current Status of Plant Stand Diversity Index.

Grouped Site Association	Status as of March 31, 2006	Shannon-Wiener Target	Achieved By
Sxw – Devil's club	2.511	>2.029	Annually
Sxw – Oak fern	2.558	>2.041	Annually
Sxw – Huckleberry	2.209	>1.415	Annually
Sxw – Horsetail	2.225	>2.222	Annually
Bl – Oak fern	2.426	>1.968	Annually

Forecasting and Predicted Trends

As stated previously, a plant diversity index provides an indication of the overall health and resiliency of an ecosystem. This measure is not easy to quantifiably forecast over a defined time frame, but it is important to identify what the accepted target means to SFM. From a review of current literature, it is not certain what effects would occur if plant diversity were not maintained within the natural range of variation. Several studies currently exist that investigate monitoring of plant diversity and establishing ecological benchmarks, but results from these studies depend on years of analysis and therefore are not yet available. Future trends for plant diversity will be

forecasted in this SFMP based on a logical analysis of a "what if scenario". The "what if scenario" contains two potential scenarios for analysis in order to justify the chosen target:

a) What if plant diversity is maintained above the natural range of variation?
b) What if plant diversity falls below the natural range of variation?

The natural range of variation refers to a range of values for a specified attribute that exists in natural, undisturbed ecosystems. Maintaining elements in ecological systems within the natural range of variation helps to ensure that an ecosystem is not overly stressed by disturbance and has the ability to recover from that disturbance. Maintenance of plant diversity above the natural range of variation would likely not affect other elements in an ecosystem either positively or negatively. Natural systems operate at a certain level of efficiency and exceeding this natural range would presumably not generate a surplus of returns, as the ecosystem would eventually reach a maximum return level within its natural range.

On the other hand, maintaining plant diversity below the natural range of variation would likely have noticeable impacts on the disturbed ecosystem. As diversity of plants decreases it could potentially affect the quality of habitat for wildlife. Species tend to require certain attributes during their life cycle and if the diversity of an ecosystem is decreased, these attributes may not be available. This could lead to a decrease in quality of life for society due to reduced wildlife populations within the DFA.

As relatively little research currently exists regarding plant diversity in managed sites, targets for this measure were set based on existing NIVMA plot data within the DFA or in similar ecosystems outside the DFA. This plot information is an indication of the natural state of plant diversity within TFL30. By maintaining this natural range of variation, other important ecological, economic and social attributes will also exist and continue in a more sustainable manner. Therefore, Canfor and BC Timber Sales are committed to maintaining the plant diversity targets established through this SFMP

Monitoring and Reporting Procedures

On an annual basis the silviculture co-ordinator will report on field sampling and compilation results. The effectiveness of the sampling methods and relevance of the data relative to the objectives of this indicator will be assessed at this time.

Responsibility and Continuous Improvement Opportunities

Continual improvement for this measure will focus on obtaining more localized data for the DFA. Canfor and BC Timber Sales will review current data collection options in the adjacent districts, and determine the most effective way to collect and maintain this data in the long term.

3.14 Deciduous Tree Species

Statement of Indicator	*Target and Variance*
Proportion of mature and old deciduous tree species by BEC subzone within the DFA.	Target: as per Table 9 Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion :*** Conservation of Biological Diversity
CSA SFM Element : Species Diversity
Value: Sustained populations of flora and fauna native to the DFA
Objective: Maintain habitat to support flora and fauna native to the DFA

Description of Indicator

Though not often considered of economic importance, deciduous tree species are important to the ecological balance of forest ecosystems. Deciduous tree species will often occur in early successional stands and provide numerous functions including contribution of nutrients to forest soils and providing habitat. As the forest progresses through its successional stages, the deciduous component will eventually decline, but will provide other important elements such as course woody debris and other habitat structures (i.e. standing wood debris).

The proportion of mature and old deciduous trees on the DFA is determined by comparing the amount of forested area covered by deciduous trees in the vegetation resource inventory to those that are defined as area occupied by coniferous trees. This indicator provides an estimate of the proportion of deciduous tree species within the DFA.

Current Practices and Status of Indicator

Wildlife tree patches and riparian reserves have been established within harvest areas since 1996 at an approximate ratio of 10 % of reserve area per hectare of harvested area. Many of the wildlife tree patches and riparian reserves provide mixtures of tree species including deciduous. Large-scale biodiversity reserves have been established in successive management plans to conserve non-timber forest values such as backcountry recreation and Mountain Caribou habitat. In an effort to increase the amount of large-scale reserves within lower elevation forests, the Tri Lakes Recreation Area and the McGregor River Management Zone were removed from the timber harvesting landbase. ... A large amount of deciduous trees are contained within the McGregor River Management Zone. Current status of this indicator remains unchanged from the information presented in the SFM Plan for TFL30, 2001.

Table 9. Current Status of Deciduous Tree Species.

BEC subzone	Natural Stands Current Status *	Managed Stands Current Status *	Target Managed Stands*)	Achieved by
SBS mk1	11%	14%	>6%	Every 5 year re-inventory period
SBS wk1	7%	15%	>5%	
ICH vk2	2%	4%	>1%	
ESSF (all subzones)	0%	0%	0%	
SBS vk	2%	8%	>2%	

* % deciduous species based on basal

The current status of deciduous basal area in the ESSF BEC subzone is 0% in natural and managed stand due to the lack of deciduous species in high elevation ecosystems.

Establishment of Targets and Future of Indicator

The targets for this indicator were established through the VRI attribute file. The current status percentage was obtained utilizing the deciduous species composition by BEC subzone as listed in the VRI. This measure reflects Canfor's and BC Timber Sales' commitment to maintaining ecosystem diversity.

Forecasting and probable trends of indicator

No current forecasting has been done for this indicator. However, the proportion of deciduous tree species on the DFA will be forecasted in conjunction with the timber supply analysis (which is conducted every 5 years with

the submission of the management plan for the DFA). Generally, deciduous tree species are of little commercial value with regards to timber; therefore, the emphasis has been to promote the coniferous proportion of tree species on the landscape. However, the proportion of deciduous tree species on the DFA in managed stands remains higher than in the natural forest. It is anticipated that the deciduous tree species percentages in managed forests will decrease over time to the target limits due to natural succession (mortality) and silviculture treatments, which favour coniferous tree species.

Monitoring and Reporting Procedures

This indicator will be monitored in conjunction with the timber supply analysis completed every 5 years. The Planning Forester will be responsible for reporting the results in the SFMP annual report for the operating year.

Responsibility and Continuous Improvement Opportunities

The Planning Forester will be responsible for monitoring and reporting this measure. Reassessment of the effectiveness of the measure in achieving the objective will occur after each reinventory.

3.15 Effectiveness Monitoring Plans for Selected Wildlife Species and Ecosystem Resilience

Statement of Indicator	*Target and Variance*
Effectiveness monitoring plans (wildlife) are developed and implemented for selected indicator species to keep common species common.	Target: December 31, 2007 Variance: + 3 months
Monitoring plan is developed and implemented for evaluating ecosystem resilience.	Target: December 31, 2007 Variance: + 3 months

This indicator addresses the following CSA-SFM parameters:

2) ***CCFM Criterion :*** Conservation of Biological Diversity
CSA SFM Element : Species Diversity
Value: Sustained populations of flora and fauna native to the DFA
Objective: Maintain habitat to support flora and fauna native to the DFA

Description of Indicator

To determine if productive populations of a selected species are present and well distributed throughout their habitat within the DFA, Canfor & BCTS will develop and implement an Effectiveness Monitoring Plan for one or more indicator species. These plans will help determine if current management practices and policies are successful in producing desired populations. An Effectiveness Monitoring Plan evaluates the success of meeting specific objectives and its primary focus is in monitoring the status of a population versus monitoring the habitat required to maintain the population. A successful Effectiveness Monitoring Plan is composed of the following elements (Madsen, S. et al. 1999):

- Identification of specific representative species (indicator species)
- Development of reliable and repeatable, cost effective monitoring processes
- Establishment of credible baseline population data
- Monitoring of long-term population changes
- Monitoring and sample designs
- Identification of logistical and statistical sampling problems
- Development and coordination of local and regional implementation and monitoring strategies
- Use of existing data where possible, and if dealing with migratory species, collaborate data with other jurisdictions
- Monitoring and sampling select geographical locations and populations
- Evaluation of the relationship between habitat use and condition, and population densities and trends through predictive models
- Identification of expected timelines, costs and outcomes

Current Practices and Status of Indicator

There are currently no Effectiveness Monitoring Plans for indicator species or ecosystem resilience that have been developed or implemented within the DFA.

Establishment of Targets and Future of Indicator

The target for this measure was set as December 31, 2007 because the Effectiveness Monitoring Plans for indicator species and ecosystem resilience are complex plans that will require substantial research, monitoring and sampling in order to be completed. A workplan will be developed and provided to the public advisory group for comments and involvement.

Forecasting and probable trends of indicator

These indicators differ from the majority of other indicators in that they are targeted at developing new monitoring plan for the TFL30 DFA. Therefore, the method used to forecast this measure will also differ from the typical “what if scenario” utilized for other measures. An analysis of the “what if scenario” will identify why the stated target was chosen for this measure and how it contributes to SFM in the TFL30 DFA.

As with previous “what if scenarios”, it is useful to identify two potential scenarios:

a) What if Effectiveness Monitoring Plans for selected indicator species or ecosystem resilience were developed considerably earlier than December 31, 2007?
b) What if Effectiveness Monitoring Plans for selected indicator species or ecosystem resilience were developed considerably later than December 31, 2007?

The first scenario suggests that Effectiveness Monitoring Plans for selected indicator species or ecosystem resilience would be developed much earlier than December 31, 2007. If these effectiveness plans were completed earlier than December 2007, then effectiveness monitoring would be implemented earlier and the likelihood of impact of forest development on selected wildlife and ecosystem resilience would be reduced.

If these effectiveness plans were completed later than December 2007, then effectiveness monitoring would be implemented later and the likelihood of impact of forest development on selected wildlife and ecosystem resilience would be increased. Given that forest development on the DFA is predicted to be very minimal over the next few years, there is likely very little impact of completing the effectiveness monitoring after the December 2007 date.

As previously mentioned, the idea of Effectiveness Monitoring Plans for indicator species was initiated to ensure that productive populations of a selected species are present and well distributed throughout their habitat within the DFA. Development of Effectiveness Monitoring Plans for indicator species will ensure that future forest practices do not exclude ecosystem and land base attributes that are vital to these species. Within the DFA, future trends will likely show that these plans have been developed and implemented where applicable. Once Effectiveness Monitoring Plans are developed and implemented, baseline data for indicator species will start to become available and future targets and trends will be easier to identify. Development of Effectiveness Monitoring Plans may involve predictive modeling and forecasting of population levels or ecosystem dynamics in relation to other SFM values. Until the indicator species are selected or ecosystem resilience is better defined and plans are created, these relationships will not be able to be modeled with any level of certainty.

Monitoring and Reporting Procedures
Canfor and BC Timber Sales will track progress on this indicator through updating the workplan. Progress will be provided to the public advisory group though emails and meetings.

Responsibility and Continuous Improvement Opportunities
Canfor and BC Timber Sales planners are responsible for developing and implementing the effectiveness monitoring workplan.

3.16 Distinct Habitat Types

Statement of Indicator	*Target and Variance*
The percentage of area (ha) occupied by distinct habitat types in the non-harvesting landbase.	Target: June 30, 2007 Variance: + 3 months

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion :*** Conservation of Biological Diversity
CSA SFM Element : Genetic Diversity
Value: Genetic Diversity
Objective: Maintain natural genetic diversity

2) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity.
CSA SFM Element: Forest Ecosystem Productivity
Value: Productive forest ecosystems.
Objective: Maintain forest ecosystem conditions that are capable of supporting naturally occurring species.

Description of Indicator

Maintaining a representation of a full range of ecosystem types is a widely accepted strategy to conserve biodiversity in protected area networks (e.g. Margules and Pressey 2000) and is suggested for landscapes managed for forestry (e.g. Lindenmayer and Franklin 2002). Ecosystem representation is a coarse filter approach intended to ensure a proportion of ecologically distinct ecosystem (habitat) types are maintained within both the Non-timber Harvesting Land Base (NHLB) and the Timber Harvesting Land Base (THLB). Maintaining these natural habitat types will help to ensure a natural range of species and genetic diversity is maintained across the land base. Maintenance of ecosystems will occur primarily within the NHLB as management practices do not generally occur on this land base, thereby disrupting the natural patterns of the landscape. It is documented that maintaining representative ecosystems in an unmanaged state (e.g. NHLB) is important for three reasons (Wells et al. 2003):

1) they sustain poorly understood ecological functions and species habitat requirements,
2) they act as a precautionary buffer against errors in efforts intended to sustain species in the managed forest, and
3) they provide an ecological baseline against which the effects of human activities can be compared.

Maintenance of distinct habitat types on the NHLB is important for many reasons, including the use of natural landscapes in comparison to managed landscapes and the differences in values that each land base type shows with regards to the maintenance of distinct habitat types. Unmanaged stands play an important role as a precautionary buffer against errors in efforts intended to sustain species and a variety of genes within the managed forest. There is currently insufficient knowledge available regarding management practices that will ensure all species' requirements are met within managed stands. This is particularly true of poorly known or completely unknown organisms.

Current Practices and Status of Indicator

The TFL30 DFA contains two levels of unmanaged forest: 1) at the stand level, which includes wildlife tree patches (WTPs) and riparian reserve areas, and 2) at the landscape level, which includes provincial parks and other large reserve areas that have become part of the NHLB through strategic level processes.

A draft report produced on March 31, 2006 shows the results of an ecosystem representation analysis conducted in the TFL30 by Forest Ecosystem Solutions. The results of this analysis are currently being reviewed and will be presented to the public advisory group in the fall of 2006.

The FES analysis aggregated Biogeoclimatic Ecosystem Classification (BEC) site series values for the PGTSA into many coarse filter ecosystem groups (habitat types) based on relative similarities of their indicator plant communities. Using a netdown process, the forested land base was divided into the NHLB and the THLB. The

DFA includes 31 distinct habitat types were then overlaid onto the NHLB and THLB. A query of hectares within the NHLB and THLB associated with each habitat type was completed.

Establishment of Targets and Future of Indicator

The target for this measure was set as June 30, 2007 because the ecosystem representation analysis need to be reviewed by Canfor & BCTS, then presented to the public advisory group for understanding and development into performance targets, which is expected to take one full year.

Forecasting and probable trends of indicator

This indicator was not forecasted by modeling as it was assumed to remain constant over the long term. However, it is important to identify what the accepted target means to SFM. The percent area of distinct habitat types contributes to wildlife habitat for a variety of species and overall biodiversity in the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for a measure such as this. As all identified targets are listed as values greater than an identified percent, one other scenario should be analysed:

a) What if no distinct habitat types were sustained within the DFA?

If no distinct habitat types were sustained within the DFA, ecological values could be at risk, and these could in turn affect economic and social values. Sustaining biological richness includes conservation of representative ecosystems in order to sustain the natural range of variability of ecosystems across the land base. If distinct habitat types were not conserved, these ecosystems could potentially be lost and the overall diversity of ecosystems in the DFA would decrease. Loss of distinct habitat types could also potentially affect local wildlife populations that are dependent on these ecosystems. Loss of habitat could mean that wildlife would move out of the DFA to other habitat areas, or their survival rate may decrease if other habitat is not available. Decreases in these ecological values could potentially lead to decreases in economic benefits from the forest and result in decreases in social values such as quality of life.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will track progress on this indicator through updating the workplan. Progress will be provided to the public advisory group though emails and meetings.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales planners are responsible for developing and implementing the effectiveness monitoring workplan.

3.17 Chief Forester's Standards for Seed Use

Indicator Statement	*Target and Variance*
Percent compliance with Chief Forester's Standards for Seed Use	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Conservation of Biological Diversity
   CSA SFM Element: Genetic Diversity
   Value: Genetic Diversity
   Objective: Maintain natural genetic diversity

Description of Indicator

The Chief Forester's Standards for Seed Use is a component of the Forest and Range Practices Act (FRPA). According to the Act, "The purpose of these standards is to maintain the identity, adaptability, diversity, and productivity of the Province's tree gene resources by:

a) establishing criteria for the registration of seedlots and vegetative lots used to establish a stand under section 29 of the Act, and
b) regulating the storage, selection, use and transfer of registered lots.

The Standards were established on November 20th, 2004 and became effective on April 1st, 2005. They are important to forest management as they directly affect the genetic makeup of the new plantations established within the DFA. Plantations will provide wildlife habitat and timber for future harvesting. Adherence to the Chief Foresters Standards is crucial for sustainable forest management as the standards are designed to establish healthy stands composed of ecologically and genetically appropriate trees. Planting unsuitable genetic stock could result in stands that will not meet future economic and ecological objectives.

Current Practices and Status of Indicator

Prior to the FRPA, standards for seed use existed for reforesting harvested areas. The FRPA's immediate predecessors were the standards in the *Seed and Vegetative Material Guidebook,* one of the guidebooks that were a component of the Forest Practices Code of British Columbia. The use of these standards resulted in licensees reforesting harvested areas using seedlings grown from seed genetically appropriate for those locations. Those standards have been in use until the FRPA became effective. Seed was collected either from natural stands (class B seed) or from seed orchards (class A) to create unique seedlots. A seedlot is a quantity of seed having uniformity of species, source, quality, and year of collection (*BC MOF, 1995a).* Canfor and BC Timber Sales would use a particular seedlot to grow seedlings to be planted in an area that met the conditions appropriate to that seedlot's genetic background. By choosing a seedlot that was suitable to the site it was to be planted in, the resulting plantation would be adapted to its site, local climate, and endemic forest health problems. Tracking and reporting the seedlots that were used for reforestation has been standard practice for all Licensees since 1988 when Licensees became responsible for reforestation activities on Crown land.

Currently, 100% of Canfor and BCTS areas planted within TFL30 from April 1, 2005 to March 31, 2006 were planted compliance with the Chief Forester standards for seed use.

Establishment of Targets and Future Practices

The importance of using appropriate seed and vegetative material for reforestation requires a target of 100% compliance with the Chief Forester's Standards for Seed Use. Information needed to determine appropriate seedlot selection will be tracked for each cut block and may be contained in the Site Plan. This information will include the seed planning zone for the block, elevation, latitude and longitude. Seed collection and registration will also adhere to the Standards. Forest management will have to consider seed supply prior to harvesting to ensure appropriate seed is available for reforestation. The Forest Stewardship Plan (FSPs) can be reviewed for location of future harvesting and the seed requirements determined for each planned cut block. By comparing existing seed supply with the cutblocks' seed requirements Canfor and BC Timber Sales can determine if seed needs to be collected or purchased.

Forecasting and Predicted Trends

The exact level of compliance is not easy to quantifiably forecast over a defined time frame, as it is operational in nature. However, it is important to identify what the accepted targets mean to Sustainable Forest Management. To forecast this indicator, a "what if scenario" analysis can be used to help identify the importance of the stated target to overall SFM within the DFA. The current target is set at 100% compliance with the Chief Forester's Standards for Seed Use. The following "what if scenario" is used in this analysis:

a) What if only 50% of cutblocks were reforested with seedlings that met the Chief Forester's Standards for Seed Use?

Failure to use appropriate genetic material for reforestation could have several results. Seedlings may be more prone to climate damage such as frost and drought if seed is planted outside transfer guidelines. Opportunities for enhanced growth and wood quality may be lost if class A seed is not used where possible. If 50% of plantations were faced with higher mortality and poor growth performance due to improper genetic stock, the DFA would eventually be faced with a serious impact to timber supply. There may be ecological impacts as well. Plantations established with improper seedlots may not achieve the size, health, and structure needed to provide wildlife habitat. If high mortality and slow growth occurs, the area may be not recover its hydrologic functions and ability to control soil erosion.
The resulting economic and ecological impact could be dramatic. However, as Canfor and BC Timber Sales has considerable experience in meeting existing standards, no problems are anticipated for achieving target goals.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will monitor the elevation, longitude, and latitude of their planned cutblocks. While Canfor and BC Timber Sales may collect their own seed, the Ministry of Forests and Range's Surrey Tree Seed Centre is responsible for storing and managing seed and vegetative material. Canfor and BC Timber Sales can monitor available seed and vegetative material through the Seed Planning and Registry (SPAR) system and plan their sowing requests accordingly. All reforested cutblocks must have their seedlots tracked, a process that will be achieved using databases such as GENUS. The annual submission to the Crown through RESULTS will include the seedlot(s) used for each cut block planted during that operational year. Compliance with the target will be monitored through Canfor's and BC Timber Sales' databases, EMS checklists, "Plant Wizard" and internal audits. The results will be reported annually for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales areis responsible for the monitoring, tracking, and reporting of the percentage of compliance with Chief Forester's Standards for Seed Use. Specifically, the Silviculture Forester must comply with the standards when planning sowing requests, planting prescriptions, cone collections, and registering seedlots. If compliance with the standards is not met the Ministry of Forests and Range will be notified. Use of GIS systems and improved databases may improve compliance by ensuring the best genetic material is matched to the sites planned for reforestation.

3.18 Wildlife Biodiversity Corridors

Statement of Indicator	*Target and Variance*
The area in hectares in wildlife biodiversity corridors within the DFA.	Target: ≥82 ha Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity.
CSA SFM Element: Forest Ecosystem Productivity
Value: Productive ecosystems.
Objective: Maintain ecosystem conditions that are capable of supporting naturally occurring species.

Description of Indicator

Distributing biodiversity reserves, at a variety of scales (small and large), throughout the managed forest will provide for a mix of vegetation age, structure, and composition that will support a variety of species habitat requirements. There are two levels of Biodiversity Reserves: The **stand level**, which include mapped wildlife tree patches and riparian reserve areas, and at the **landscape level**, which includes provincial parks and all other large reserve areas that are removed from the timber harvesting land base. This indicator provides for monitoring the amount of wildlife connectivity corridors throughout the DFA.

Canfor has been actively planning for wildlife movement corridors since 1999. These movement corridors provide a mosaic of early-, mid- and late-successional vegetation stages which, accommodates the needs of furbearers by giving them access to canopy cover, and promoting the use of openings and ecotones for foraging. The indicator is related to three SFM parameters and provides for ecosystem diversity, and genetic diversity and forest ecosystem productivity.

However, when natural or man-made disturbance is extensive and removes most of the canopy cover, animals associated with late-successional forests are affected by habitat change. In the light of this concern, Alpha Wildlife Research & Management was invited by Canfor to establish a connectivity corridor network to ensure animal movements across the landscape. The determination of the corridors was based on the composition and age of forest stands, as indicated on forestry maps, and their location within the landscape, i.e., riparian or upland, contiguous with other forested areas, etc. However, the adequacy of the corridor network to foster the movements of marten and other furbearers across the landscape is unknown.

Current Practices and Status of Indicator

Movement corridors are one of the key elements in Canfor's approach for managing biodiversity across landscapes. Canfor has contracted a Certified Wildlife Biologist to work in consultation with government agencies to design corridors throughout our operating areas. Movement corridors attempt to mimic natural patterns of connectivity and provide basic ecological linkages throughout the forest landscape. These corridors are both dynamic and flexible, adapting to changing demands and circumstances. Corridor characteristics vary in width, length and location in order to foster animal movement, while accounting for local biographic and physiographic landscape variation. Corridors may be managed as either permanent (usually involving non-productive land, wetlands, etc.) or shifting (involving harvestable stands). Riparian areas frequently contain the highest number of plant and animal species found in forests, and provides critical habitats, home ranges, and travel corridors for wildlife. Consequently large riparian "strings" (chains of wetlands and streams) are used as the primary ecological linkage throughout the landscapes. The movement corridors are identified on the 1:50,000 maps.

As of March 31, 2006 Canfor has established 82.36 ha of wildlife biodiversity corridors within the DFA.

Establishment of Targets and Future Practices

The amount of wildlife biodiversity movement corridors was established based on the current status on the DFA as of March 31, 2006.

Canfor and BC Timber Sales have established a target of zero ha variance to ensure some amounts of wildlife biodiversity corridors within the DFA. Movement corridors are not identified as an LRMP objective, but are mentioned throughout the LRMP as a strategy to manage for biodiversity and wildlife, particularly caribou. Hoever these wildlife biodiversity do not include the caribou corridors previously mentioned in this SFM plan.

The following measures will be applied when harvesting is proposed within a corridor:

- As part of the adaptive nature of the corridors, they may be harvested and shifted across the landscape.
- Alternative silviculture systems may be used to provide sufficient crown closure and stand structure diversity to protect animal movement.

When there is a slight encroachment of the corridor, wildlife trees / riparian management areas are used to maintain structure in the more permanent corridors.

Forecasting and Predicted Trends

Canfor and BC Timber Sales will continue to maintain the small and large-scale biodiversity reserves within the DFA. Over the long-term, it is anticipated that there will be a continual increase of areas set aside for biodiversity reserves as greater knowledge is accumulated regarding the ecological requirements to conserve ecosystem biodiversity. Canfor and BC Timber Sales recognize that large scale biodiversity reserves, may be dynamic and will be are assessed and taken into account during the timber supply analysis estimated to be every 5 years.

This indicator is not easy to quantifiably forecast, however, it is important to identify what the accepted targets mean to Sustainable Forest Management. To forecast this indicator, a “what if scenario” analysis can be used to help identify the importance of the stated target to overall SFM within the DFA. The current target is set at 89 ha of wildlife biodiversity corridor amount. The following “what if scenario” is used in this analysis:

a) What if a target of $\leq$ 10 wildlife biodiversity corridor amount was used?

10 ha or less would represent a very small area to be set aside for wildlife movement. It is unlikely to add any value to wildlife species movement within the DFA.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will continue to work together and with the public advisory group to promote the use of landscape level reserves for wildlife biodiversity corridors. Canfor and BC Timber Sales will also maintain and update spatial data of all landscape-level reserves consistent with land-use and boundary designations from Provincial Agencies. Where significant changes to the designation of reserve areas or inventories have occurred, an automated GIS query is run to assess performance relative to the stated target. Performance relative to the stated target will be assessed and reported in the annual SFM Plan report for the operating year April 1st to March 31st.

The Planning Forester is responsible to monitor updates on wildlife biodiversity corridors within the DFA.

Responsibility and Continuous Improvement Opportunities

The Canfor and BCTS Planning Forester are responsible for working together and with the public advisory group on the CSA PAG process. Opportunities for developing new landscape level reserves such as wildlife biodiversity corridors will be made in consideration of other objectives (protected species, old growth protection, species habitats and expected movement) and the current mountain pine bark beetle infestation.

3.19 Site Index

Statement of Indicator	*Target and Variance*
Site index by BEC subzone within the DFA.	Target: refer to Table 10 Variance: -5%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity.
   CSA SFM Element : Forest Ecosystem Productivity.
   Value: Productive Ecosystems.
   Objective: Maintain ecosystem conditions that are capable of supporting naturally occurring species.

Description of Indicator

Site index is a relative measure of forest site quality. It is a measure of the height growth that can be expected in 50 years (after trees reach 1.3 m in height) by a particular tree species on a given site. Site index is used in timber supply planning to predict future stand volume. Site index is used in:

1) silviculture to help make sound management decisions,
2) forest inventory to describe site quality and update inventory databases,
3) in wildlife habitat modelling to estimate the amount and size of tree attributes.

Site index is very sensitive to changes in ecological site conditions including soil nutrients, and soil moisture.

Since site index is a physical measure of the growth of trees in a stand at a specified point in time, it provides a good method to evaluate if the productive capacity of the forest is being maintained. Even though trees are just one part of the forest ecosystem, the continued productivity of the trees at a sustained level contributes to the maintenance of productivity of other parts of the forest ecosystem. For example, the continued productivity of trees on the landbase provides habitat for flora and fauna and ensures the recycling of life sustaining elements (e.g. water, carbon, and nutrients) between the atmosphere and the soil. Site index is an integral component of timber supply modelling, as stands are modelled to grow either more or less volume dependant on site index. Maintaining site index consistent with targets in Table 10 is an important test of sustainable harvest levels.

Current Practices and Status of Indicator

Site index is a measure of potential productivity of a site and is impacted greatly depending upon site disturbance. Generally, if soil productivity is reduced (through compaction or loss of organic layers/nutrients) site productivity is also reduced (site index). Current status of spruce site index is shown in Table 10. Since spruce is the main tree species within natural and managed forests on the DFA, it was the species of choice to measure site index and estimate site productivity. Equations to calculate site index of other species (pine and subalpine fir) are contained with the report entitled “Potential Site Index estimates for the Major Commercial Tree Species on TFL 30” (Thrower and Associates, 2000).

Current status is shown in the following table.

Table 10. Current Status of Site Index.

BEC Subzone	Elevation	Current Status (Average Spruce Site Index (m))	Target (Average Spruce Site Index (m))	Achieved By
SBSmk1, SBSvk, SBSwk1	Less than 1000m	**23.0**	>20.8	A 5-year rolling average.
SBSvk, SBSwk1	More than 1000m	**23.1**	>19.6	
ESSFwc3	More than 1000m	12.1	>11.5	
ESSFwk2	More than 1000m	**21.6**	>13.7	
ESSFwcp3	More than 1000m	6.0	>5.7	
ICHvk2	More than 1000m	22.4	>20.2	

- bold numbers indicate updated average based on data collected during the reporting year

Establishment of Targets and Future Practices

The data used to calculate and monitor this indicator includes stand management surveys, growth and yield permanent sample plots, NIVMA monitoring plots and any other research/ operational studies that have growth intercept collected. Data in 1999-2004 was collated by BEC subzone for the site index calculation. The data mainly included pre 1987 silviculture surveys and recent free growing surveys, which allowed for growth intercept assessment of site index. The current status of this indicator (Table 10) in bold shows that it has been updated while the others remain unchanged from the information presented in the SFM Plan for TFL30, 2001 as there was not enough sample data

Forecasting and Predicted Trends

Forecasting the effects of changing site index was done by comparing the base case in the scenario planning project to the base case in Management Plan 9. Increasing the site index has a direct impact on many indicators including volume flow over time. As site index increases the timber volume flow over time increases particularity in the long term. Volume flow remains around 400,000 m^3 for 100 years then increasing to 570,000 m^3. As the site index decrease, so does the volume flow over time.

Canfor and BC Timber Sales will continue to maintain the site index within the targets specified by ensuring soil productivity is maintained. Canfor is currently managing such that site productivity and site quality is not at risk. Site index is calculated for suitable spruce trees from permanent sample plots and older silviculture surveys based on the growth intercept method and/or site index curves. These estimates will be used to calculate the average site index by BEC subzone.

Monitoring and Reporting Procedures

The silviculture forester is responsible for collating information and sample plot data as well as calculating the average site index. This is to be reported annually in the SFM Plan annual report for the operating year of April 1 to March 31.

Responsibility and Continuous Improvement Opportunities

As stated the silviculture forester is responsible for monitoring and reporting on this indicator. It is anticipated as more field data becomes available and research continues, the targets for site index will better reflect the true forest site quality.

3.20 Soil Conservation

Statement of Indicator	*Target and Variance*
The percentage of forest operations consistent with soil conservation standards as identified in Site Plans.	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources.
CSA SFM Element: Conservation of Soil Resources.
Value: Soil Conservation.
Objective: The productive capacity of forest soils within the Timber Harvesting Land Base (THLB) is sustained.

Indicator Description

Conserving soil function and nutrition is crucial for sustainable forest management. To achieve this, forest operations have limits on the amount of soil disturbance they may create. Soil disturbance is defined in this SFM plan as disturbance caused by a forest practice on an area, including areas occupied by excavated or bladed trails of a temporary nature, areas occupied by corduroy trails, compacted areas, and areas of dispersed disturbance. Soil disturbance is expected to some extent from timber harvesting and silviculture activities, but these activities are held to soil conservation standards in Site Plans (where they are more commonly known as "soil disturbance limits"). The Site Plan prescribes strategies for each site to achieve activities and still remain within acceptable soil disturbance limits.

An objective of soil conservation standards is to ensure that site productivity is conserved and that impacts to other resource values are prevented or minimized (BC MOF 2001b). There are various soil disturbance hazards that must be considered when determining soil disturbance limits. Some of these include soil erosion, soil displacement, and soil compaction (BC MOF 2001b).

Excessive levels of soil disturbance can alter natural ecosystem functions such as water infiltration and drainage. It can also alter the type and health of the sites vegetation, potentially affecting wildlife habitat and the perceived public value of the area. The growth rate of trees can be reduced by excessive soil disturbance, which would affect the economic value derived from timber resources. With less ecosystem productivity and less economic return, social values in the DFA would also decrease due to reduced aesthetic appeal. Minimizing disturbance caused by various forestry activities conserves soil and the role it plays in the ecosystem. This indicator will measure the success of soil conservation standards achievement and that excessive soil disturbance is detected, reported, and corrected.

Current Practices and Status of Indicator

Soil information is collected as a component of site plan preparation, and soil conservation standards are established based on the soil hazards for that block. To be within those limits there are several soil conservation strategies currently used. Forest operations may be seasonally timed to minimize soil disturbance. For example, clayey soils are often harvested when frozen to reduce excessive compaction. EMS prework forms require equipment operators to be aware of soil conservation measures outlined in the site plans. Once an activity is complete the final EMS inspection assesses consistency with site plan guidelines. If required, temporary access structures are rehabilitated to the prescribed standards. Road construction within blocks is minimized, and low ground pressure equipment is used where very high soil hazards exist

Over the period April1, 2005 to March 2006 from a review of completed EMS forms and the incident tracking system, 100% of Canfor and BCTS cutblocks and mechanical site preparation blocks having activity conducted on them were consistent with soil conservation targets in the Site Plans.

Establishment of Targets and Future Practices

The target of 100% of forest operations consistent with soil conservation standards demonstrates Canfor's and BC Timber Sales' commitment to maintaining forest ecosystem conditions.

Forecasting and Predicted Trends

The target for this indicator was set at 100% in order to maintain soil productivity and Canfor and BC Timber Sales will strive to meet this standard. Data sources for calculating and monitoring this indicator include Site Plans and completed EMS prework and final harvest inspection forms. Final harvest and site prep inspections will use an ocular survey to determine if the soil conservation standards stated in the site plan were met. If the initial ocular estimate indicates that site disturbance limits may have been exceeded, a transect soil disturbance survey as defined in the *Soil Conservation Survey Guidebook* will be completed on the site to determine if the limits have actually been exceeded and rehabilitation work may be required. Ocular survey information (and transect survey data if required) will be tracked so that annual reports can be generated. Results for this indicator will be included in the annual SFMP report for the operating year.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales harvesting supervisors and silviculture foresters are responsible for monitoring, tracking, and reporting this indicator. Specifically, Harvesting Supervisors are responsible for monitoring soil disturbance caused during harvesting activities, and Silviculture Foresters are responsible for silviculture activities.

3.21 Permanent Access Structures/Land Conversion

Statement of Indicator	*Target and Variance*
The total percentage of forested land area occupied by permanent access structures.	Target: ≤ 3% Variance: +1 %
The percentage of productive forested land area converted to other non-forested areas.	Target: ≤ 0.5% Variance: + 0.2 %

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources.
CSA SFM Element: Soil Quality and Quantity.
Value: Soil Conservation.
Objective: The productive capacity of forest soils within the Timber Harvesting Land Base (THLB) is sustained.

2) ***CCFM Criterion:*** Multiple Benefits to Society.
CSA SFM Element : Timber and Non-Timber Benefits
Value : Short and long term benefits
Objective: Maintaining a flow of non-timber benefits.

3) ***CCFM Criterion:*** Forest Ecosystem Contributions to Global Ecological Cycles
CSA SFM Element: Carbon Uptake and Storage
Value: Uptake and storage of carbon in forest ecosystems
Objective: Facilitate carbon storage within the DFA

Description of Indicator

As defined by the BC Ministry of Forests and Range, a permanent access structure is "…a structure, including a road, bridge, landing, gravel pit or other similar structure, that provides access for timber harvesting, and is shown expressly or by necessary implication on a forest development plan, road permit or silviculture prescription as remaining operational after timber harvesting activities on the area are complete." Conversion to other uses would include any development project not covered under the above definition. This indicator is simply a measure of the proportion of area permanently removed from the productive forest as a result of development, in relation to the defined forest area.

As area is converted to permanent access structures (and other development), it is removed from the productive forest landbase and no longer contributes to some of the key elements of sustainable forest management. For example, as roads are constructed, the ability of the landbase to support forests that contribute to ecosystem diversity, productivity, and the conservation of soil and water resources, is either eliminated or reduced. Since permanent access structures remove productive forest area from the THLB, the increase in roads would decrease the future available timber supply and forestry economic returns. While there may be greater recreational access to the DFA, wildlife populations may decrease from an increase in hunting. Water quality and quantity may also decrease as more stream crossings are constructed, which may increase sedimentation. The cumulative effects of economic and environmental deterioration could impact social values, as society relies on a sustainable economy and environment. As such, minimizing the loss of the total forest landbase contributes to the sustainable forest management of the forest ecosystem on the defined forest area.

Current Practices and Status of Indicator

The following guidelines have been established to reduce forest land base conversion to permanent access structures

- Maintaining road widths to a minimum while providing for safe and effective access;
- Prescribing temporary road/trails (road/trail that is reclaimed to productive forest) within silviculture prescriptions where the road/trail will not be used for future access
- Using roadside harvesting methods (as opposed to landings) as a preferred method of access development.

Currently, there is 2.64% if the forested land base in permanent access structures within the DFA. From April 1, 2005 to March 31, 2006 only 0.002% (2.6 of 156,879 ha) of the productive forested land has been converted to non-forested areas.

Establishment of Targets and Future Practices

The current target of ≤3% has been determined from current baseline data as indicated previously. The annual conversion target amount of 0.5% was annual estimate and will be re-evaluated after a couple years of reporting current status amounts. Canfor and BC Timber Sales expect that current Permanent Access Structures will be maintained or potentially decrease in the future and have used the current status as the target for this measure.

Forecasting and probable trends of indicator

The ≤ 3% target is anticipated to be achieved by Canfor and BC Timber Sales. Future achievements are not easy to quantifiably forecast because this indicator is operational in nature. However, it is important to identify what the accepted target means to SFM. The amount of area that exists as permanent access contributes to ecological, economic and social values throughout the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this target identifies a value equal to or less than 3.0%, one other scenario should be identified:

a) What if considerably more than 3.0% of the forested landbase area was occupied by permanent access structures?

The predicted forecast outcomes would be the same for annual amount of conversion from a forested state to a non-forested state as noted below.

Impacts to all three aspects of SFM (ecological, economic, and social) could be expected if considerably more of the total forested landbase area within the THLB was in permanent access. Since permanent access structures remove productive forest area from the THLB, the increase in roads would decrease the future available timber supply and forestry economic returns. While there may be greater recreational access to the DFA, wildlife populations may decrease from an increase in hunting. Water quality and quantity may also decrease as more stream crossings are constructed, which may increase sedimentation. The cumulative effects of economic and environmental deterioration could impact social values, as society relies on a sustainable economy and environment.

It is not possible to have a forest industry without permanent access structures. However, this "what if scenario" analysis implies that a balance of values can be achieved through sustaining a minimal level of permanent access within the DFA. Canfor and BC Timber Sales are committed to achieving the identified target that, for now, is the maximum percentage.

Maintaining the proportion of area lost to permanent access structures is expected to remain at ≤3%. It is anticipated that once the entire forest has been accessed (one rotation), further access structures will be minimal, as the existing roads will be used in successive rotations. Conversion of the forest to other uses such as large-scale mining or agricultural use is not foreseeable.

Monitoring and Reporting Procedures

Forest cover information is owned and maintained by Canfor. The forest cover information is updated every 5 years in preparation for the timber supply analysis. Short term updates, for reporting purposes, are completed by combining the forest cover database and Canfor's and BC Timber Sales's spatially linked forest information system (GENUS). All permanent access structures (and other landbase attributes/deductions) are maintained in the forest cover database. Permanent access structures are also maintained in the GENUS data system.

Responsibility and Continuous Improvement Opportunities

Forest planners are responsible for ensuring that the over-all level of planned road development provides adequate road access but minimizes reductions to the productive forest land base. Operations personnel are responsible for developing roads and ensuring they do not exceed planned dimensions. There are several opportunities for continuous improvement of this indicator. Canfor and BC Timber Sales can standardize road class widths to the narrowest width safety and efficiency can permit. Existing permanent access structures can

be restored to the productive land base by rehabilitation methods. Future roads that are planned to be PAS can be designed and built to be temporary access structures that are returned to the net area to be reforested. Finally, alternative harvesting systems can be implemented that reduce the need for roads and landings in cut blocks.

3.22 Terrain Stability

Statement of Indicator	*Target and Variance*
The percentage of forest operations consistent with terrain management requirements as identified in Site Plans.	Target: 100 % Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion :*** Conservation of Soil and Water Resources.
CSA SFM Element : Soil Quality and Quantity
Value: Soil Conservation.
Objective: The productive capacity of forest soils within the Timber Harvesting Land Base (THLB) is sustained.

Indictor Description

It is recognised that mass wasting occurs through natural processes and is a normal part of the geological cycle; however, forest operations through harvesting and road construction can accelerate this process causing detrimental and long-term effects to soil productivity, water systems, and habitat. A terrain stability field assessment (TSFA) is an assessment that is carried out by a certified terrain stability specialist (usually a professional geo-scientist/ engineer) on areas determined at risk from mass wasting. The TSFA is intended to use professional judgement to determine levels of risk followed by recommendations to reduce or eliminate the occurrence of mass wasting as a result of forest operations. Forest operations that remain consistent with these recommendations will have fewer, if any mass wasting events caused by harvesting or road development. This indicator determines to what degree terrain stability requirements as outlined in the Site Plan are followed.

Current Practices and Status of Indicator

The entire TFL30 has been mapped with Level D Terrain Stability Overview Mapping which divides the DFA into three categories: Stable terrain; potentially unstable terrain; and unstable terrain. TSFA are completed on any harvest or road building proposal that lies within an area identified as either unstable or potentially unstable. The TSA is usually completed coincidentally with the site plan or road layout and design. The recommendations of the TSFA are then integrated into the site plan or road layout and design and carried-out in forest operations. To ensure the recommendations are carried through, Canfor and BC Timber Sales provide for internal checks prior to the development project (pre-work meeting), and after completion of the project (final inspection). Inconsistencies are reported through our Environmental Management System.

Over the last year, from a review of site plans, and road designs, no terrain stability field assessments were necessary.

Establishment of Target and Future Trends

Canfor and BC Timber Sales will continue to strive for 100% of forestry activities to be consistent with the terrain management requirements in site plans. This target was established to reflect Canfor's and BC Timber Sales' commitment to soil conservation in the DFA. The use of professional geo-scientists, engineers and other qualified personnel to conduct overview mapping and TSFA is expected to prevent future slope failure events resulting from forest operations

Forecasting and probable trends of the indicator

Canfor and BC Timber Sales will continue to ensure 100% of forest operations are consistent with the terrain stability requirements as laid out in site plans. The use of professional geo-scientists / engineers to conduct overview mapping and TSFA is expected to virtually eliminate future mass wasting events.

Monitoring and Reporting Procedures

This indicator will be monitored through the Level D Terrain Stability Overview Mapping system, review of the Site Plans, road layout and design documents. Where necessary Terrain Stability Assessments will take place. This information will be stored in the GENUS database and the percentage of indicator success for the operating year of April 1st to March 31st will be included in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities

The area co-ordinator for Canfor and the Planning Forester for BC Timber Sales will be responsible for monitoring this indicator and reporting the findings in the annual report.

3.23 Reportable Spills

Indicator Statement	*Target and Variance*
The number of "legally" reportable spills	Target: 0 reportable spills Variance: 0

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources
CSA SFM Element: Soil Quality and Quantity
Value: Soil Conservation
Objective: The productive capacity of forest soils within the Timber Harvesting Land Base (THLB) is sustained.

Description of Indicator

The use of heavy equipment for forest operations can result in accidental petroleum/ antifreeze release into the environment. As these materials can be toxic to plants and animals, their proper containment contributes to sustainable forest management. By tracking spill occurrences, guidelines and procedures can be adjusted to improve weaknesses in their handling and transportation.

This indicator monitors the number of reportable spills as a result of forest operations within the DFA. A reportable spill is defined by the BC Waste Management Act as outlined in Table 12.

Reportable Spill Substances and Volumes

Product	Minimum Volume Spilled that Must be Reported to the PEP
Petroleum Products	100 litres
Petroleum Products into Water	Any Amount
Anti Freeze	10 litres (mix)
Anti Freeze into Water	Any Amount

Current Practices and Status of Indicator

The Spill Reporting Regulation of the *BC Waste Management Act* requires any spill in excess of the reportable level for that substance be immediately reported by the person involved or an observer to the Provincial Emergency Program. Canfor and BC Timber Sales currently has procedures in place for reducing and reporting spills. EMS checklists and monitoring procedures require the proper storage, handling, and labelling of petroleum/ antifreeze products. Such measures include proper storage tank construction, the use of shut off valves, availability of spill kits, and the construction of berms where required. EMS plans also include the measures to be taken in the event of a spill.

Over the last year, no reportable spills were noted by Canfor or BCTS within the DFA.

Establishment of Targets and Future Practices

The establishment of the target was a result of the regulatory requirements and EMSs already in place. In addition to the legal requirements for 100% compliance, the target also recognizes the danger these substances pose to soil and water resources. Canfor and BC Timber Sales will continue to implement their EMS program for petroleum/anti-freeze spill prevention and if targets are not being met they will take a coordinated approach to determine procedures to do so. If a reportable spill occurs corrective and preventative actions will be identified to improve compliance. Equipment operators could receive additional training to reduce spills, and training to manage the spills if they do occur.

Forecasting and Predicted Trends

A reportable spill event is a major release of toxic materials into the environment and the subsequent damage to soil and water organisms could be extensive and costly to rehabilitate. The loss of such materials represents a significant failure in the management of petroleum and/or antifreeze, and represents serious flaws in current practices. Reportable spills would probably represent human error and suggest procedures need to be

improved. It is the intent of this indicator to monitor the success of current procedures and to reduce human errors to an absolute minimum.
It is predicted that Canfor and BC Timber Sales will have no legally reportable spills as a result of their forest operations within the DFA.

Monitoring and Reporting Procedures
Monitoring procedures are outlined in Canfor's and BC Timber Sales' standard operating procedures. The use of EMS checklists is designed to ensure fuel/antifreeze handling and storage is as per regulations and the EMS requirements. Spill events will be tracked through the EMS database and will be reported on in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities
Canfor and BC Timber Sales are responsible for monitoring, tracking and reporting this indicator. If targets are not being met there are several areas for improvement. EMS monitoring procedures could be re-examined to reduce incidents. Where possible, new technology could be implemented to prevent or manage spills or alternatives to petroleum and antifreeze could be used in machinery. Equipment operators could receive additional training to reduce spills, and training to manage the spills if they do occur

3.24 Stream Crossing Quality Index

Statement of Indicator	*Target and Variance*
Stream Crossing Quality Index (SCQI) for each watershed within the DFA.	Target: 100% of Sub-basins will have <10% SCQI high concerns Variance: -25%

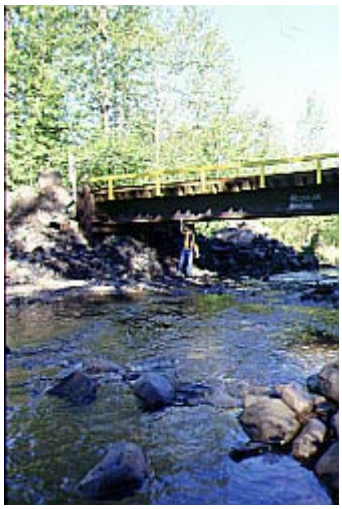
This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources.
CSA SFM Element: Water Quality and Quantity.
Value: Water Conservation.
Objective: Maintain water quality and water quantity in the Defined Forest Area (DFA).

Description of Indicator

Any stream crossing will impact water quality. By assessing the quality of the stream crossing and improving these over time, water quality impacts should be lessened. The conservation of water and soil resources is a key criterion in the framework for sustainable forest management. The stream/road interface has a large impact on water quality. Correct installation and ongoing maintenance to minimize the potential for sediment delivery into a stream is important in minimizing the impacts on water quality.

The stream crossing quality index is a measure, which indicates the potential of a stream crossing (permanent road stream crossings) to deliver sedimentation into the stream. Current watershed assessment procedures assume a high sedimentation delivery risk into the stream at each crossing. In practice some crossings have a higher sedimentation potential than others depending upon the type, age, location and soils. A high index indicates a high potential for the crossings to add sediment to the adjacent stream whereas a low index indicates that the crossings are being well managed to reduce the possibility of sediment entering the stream from the crossing. All streams receive the highest score until a stream crossing quality assessment is completed. This assumes that streams not assessed are potentially high-risk sediment sources and provides an incentive to complete the assessments in order to lower the index value. Assessments are made at the stream/road interface using a standardized scoring system (i.e. sum total score by watershed (Index) of crossing quality compared against tolerable limit)



Current Practices and Status of Indicator

The following progress has been made in the development of the stream crossing quality index since the original SFM plan (June 2001). P. Beaudry & Associates have developed a stream crossing quality index scoring methodology for Canfor. An inventory map of stream crossings has been produced for TFL30. An associated database of stream crossing information has been developed. Stream crossing sampling has been undertaken on an area covering 16 sub basins in the DFA.

Presently, fish streams and crossing structures are identified during site plan preparation. Under Canfor's and BC Timber Sales' EMS registration for the DFA, pre-work forms are completed for all projects including stream crossings, a fish stream crossing checklist is completed by contractors during installation, and an inspection form is completed by a Canfor or BC Timber Sales supervisor for all construction projects. Stream crossing installations are planned when conditions are favourable (i.e. fish windows). During installation of stream crossings, appropriate erosion control devices are installed. In addition, many stream crossing structures are inspected over time as part of Canfor's and BC Timber Sales' EMS.

Best practices for stream crossing include:
1) assessing quality of all crossings within the DFA using a crossing inventory map
2) repairing and maintaining all crossings based on SCQI limits by watershed (table 11)

Currently 73% of the Sub-basins have less than 10% of the SCQI in the high concern category. Additional restoration planning will occur in 2006 with implementation expected in the summer of 2007.

Table 11. Current Status of Stream Crossing Quality Index.

Sub-Basin	Number of crossing surveyed	Target % Crossing high	Current Status % Crossings high
Barney Creek	70	<10 %	5.71
East Olsson	39	<10 %	5.13
Herring	67	<10 %	4.48
Lower Olsson	48	<10 %	14.89
Residual D	44	<10 %	2.27
Upper Seebach	154	<10 %	5.19
Basin 4	48	<10 %	14.58
Woodall	96	<10 %	7.29
Herring	83	<10 %	10.84
Upper Seebach	300	<10 %	**6.0***
East Seebach	270	<10 %	**6.3**
Averil	157	<10 %	**11.5**
Limestone	60	<10 %	1.67
Watershed 20	62	<10 %	**21.0**
Basin A	100	<10 %	5.0
Watershed 25	22	<10 %	13.64
Upper Olsson	187	<10 %	3.2
Lower Seebach	52	<10 %	11.5
Tay Creek	35	<10 %	0.0
Horn Creek	173	<10 %	6.4
Basin C	54	<10 %	0.0
Basin 7	13	<10 %	0.0
Mokus Creek	24	<10 %	8.3
West Torpy	114	<10 %	0.0
Hubble Creek	60	<10 %	0.0
Basin F	17	<10 %	0.0

*** Bold numbers** indicate the % crossing high changes during the reporting period

Establishment of Targets and Future Practices

The stream crossing quality index is a measure, of the potential a stream crossing has to deliver sedimentation into the stream. Identifying water quality concerns will enable planners to adopt these findings into their plans thus protecting water quality. Canfor's and BC Timber Sales' commitment to SQUI assessments demonstrates their intention to reduce the potential negative effects of forest operations. Work continued in 2004 to assess further stream crossings in the remaining sub basins. In addition, restoration plans for specific sites were developed and implemented in 2005. This reduced the scores in four sub-basins as shown in bold in the table above.

Forecasting and Predicted Trends

Canfor and BC Timber Sales is committed to establishing SCQI for each watershed within the DFA. It is important to identify what the targets mean to SFM. Therefore, the use of a "what if Scenario" is beneficial in identifying anticipated future trends for the indicator. As the indicator currently has set a goal of SCQI for the entire DFA, one other scenario should be identified:

a) What if only 50% of the sub-basins had <10% SCQI high concerns?

If only 50% of the sub-basins had <10% SCQI high concerns there could be significant ecological, economic and social impacts. Water quality could be diminished due to increased sedimentation, which would negatively

affect fish habitat. If sedimentation were to increase there would be legal obligations to restore the site, which would be costly. Reduction in water quality could cause the public to lose confidence in the SFM process, as there could be a reduction in recreational values.

The above "what if scenario" helps to identify some of the potential future impacts of not achieving the stated targets for this measure. Therefore Canfor and BC Timber Sales will continue to implement a stream crossing quality index and reduce the % of high concern stream crossing within the DFA

Monitoring and Reporting Procedures

Monitoring of the indicator will be collected through TRIM data for stream crossings, GIS (road construction), EMS stream crossing checklists and interior watershed assessment report on TFL30

Responsibility and Continuous Improvement Opportunities

The harvesting supervisor will be responsible for monitoring and reporting on the progress of this indicator. Canfor and BC Timber Sales will continue to develop restoration plans for stream crossings in the sub basins above the target of <10% of high concern. As anticipated some of the stream crossings will require some restoration work to reduce the risk of sediment delivery into the stream. The harvesting supervisor and strategic planning forester is also responsible for developing and implementing a long-term stream crossing inspection schedule.

3.25 Stream Crossings Installation

Indicator Statement	*Target and Variance*
The percentage of new or deactivated stream crossings that maintain natural stream flow.	Target: 100%, Annually Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources
CSA SFM Element: Water Quality and Quantity
Value: Water Conservation
Objective: Maintain water quality in the Defined Forest Area (DFA)

Description of Indicator

When forest roads are constructed it is often necessary for roads to intersect with streams that may be fish-bearing. In order to maintain the number and diversity of fish species, stream crossings cannot be a barrier to their migration. As fish are also an important food source for other faunal species maintaining the natural stream flow contributes to the maintenance the entire stream ecosystem. Stream crossings must also consider the maximum flow rate (peak flow) that could occur in that stream. Careful consideration of culvert size must be made to ensure that the chosen culvert can manage natural high water events. If the culvert cannot handle peak flows, the water can back up and overflow the road, wash out the roadbed, and cause significant sedimentation and stream bank damage.

As roads are constructed to access areas for forest operations, it is necessary to build structures (i.e. culverts, bridges) where roads intersect with streams. This indicator will measure the success of maintaining fish movement and managing peak flow at all new stream crossings in the DFA.

Current Practices and status of Indicator

Streams and crossing structures are identified during site plan preparation. All streams are surveyed for fish bearing potential and qualified personnel determine probable peak flow volumes. The appropriate culvert size and installation procedures are then prescribed for the stream crossing. EMS pre-work forms are completed prior to their installation and the supervisor is required to perform a completion inspection of the structure. In addition, many stream crossing structures undergo scheduled inspections over time as part of EMS procedures.

Currently, from April 1, 2005 to March 31, 2006, 100% of all new Canfor and BCTS stream crossings maintained natural stream flow.

Establishment of Targets and Future Practices

Many stream crossings in the past did not fully consider fish passage or underestimated peak flow volumes. The result was barriers to fish movement and washed out roads. Canfor and BC Timber Sales recognize the importance of installing new stream crossings that maintain natural stream flows, and have set the target at 100% performance. Stream crossings will continue to be identified in Site Plans and procedures implemented to maintain their natural flow.

Forecasting and Predicted Trends

While is expected the indicator target will be achieved, the exact degree of success is not easy to quantifiably forecast. However, it is important to identify what the accepted target means to SFM. Maintaining natural processes such as stream flow is vital to sustainable forest management. A “what if scenario” analysis will identify the importance of the target for this indicator to SFM within the DFA. This indicator and the following “what if scenario” will help to substantiate the proposed target:

a) What if only 50% of new stream crossings maintained natural stream flow?

The above scenario would immediately restrict fish movement of many streams in the DFA. This typically would be seen in cases where the down-stream end of the culvert is suspended above the water channel, a point above which fish could no longer migrate. Besides the obvious impact to the fish population, all species reliant on them upstream from the culvert would be affected. Installing an improper structure that could not manage

peak flows would inevitably lead to road flooding, possible washouts, and potentially large volumes of sediment entering the stream.

Reducing road failures and maintaining fish populations will help other values of sustainable forest management. Social values may be protected through the maintenance of recreational opportunities. Reducing road failures means the general public will have continued recreational access to many areas of the DFA. These recreational pursuits may include fishing that has been maintained through proper culvert installation. Economically, significant savings can be realized by avoiding costly harvesting delays from washed out roads.

Meeting the target objective can maintain ecological, social, and economic values of sustainable forest management. Therefore, Canfor and BC Timber Sales are committed to achieving the stated target for the indicator and long term trends are anticipated to show that all new stream crossings will maintain natural stream flows.

Monitoring and Reporting Procedures

The indicator will be monitored through EMS inspections and performance will be recorded in EMS database, GENUS. The results for this indicator will be included in the annual SFMP annual report for the operating period.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible to ensure that the objectives of this indicator are met. Specifically, Harvest Supervisors are responsible to oversee the installation of bridges and culverts through EMS checklists and final inspection reports. Use of Peak Flow Indices will increase the accuracy of predicting peak flows for watersheds, allowing correct sized culverts or bridges to be installed. Completing stream surveys will provide planners with information on which streams require fish management.

3.26 Peak Flow Index

Statement of Indicator	*Target and Variance*
Peak flow index (PFI) for each watershed within the DFA.	Target: 100% Variance: - 10% variance Table 12.

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources.
   CSA SFM Element : Water Quality and Quantity
   Value: Water Conservation
   Objective: Maintain water quality and water quantity in the Defined Forest Area (DFA).

Description of Indicator

Most hydrologic impacts occur during periods of the peak stream flow in a watershed. Peak flow is the maximum flow rate that occurs within a specified period of time, usually on an annual or event basis. In the interior of British Columbia, peak flows occur as the snowpack melts in the spring. After an area has been harvested, both winter snow accumulation and spring melt rates increase. This effect is less important at lower elevations, since the snow disappears before peak flow. Harvesting at high elevations will have the greatest impact and is, therefore, of most concern. As a result, areas harvested at different elevation are weighted differently in the calculation of peak flow index. The peak flow index measures the potential effect of harvested areas on water flow in a particular watershed. Conservation of water quality in the DFA includes maintenance of the watershed level conditions within natural ranges of variation to ensure that other uses of water are not adversely affected. The peak flow index provides a method to forecast and evaluate the potential effects of future harvesting plans, and to ensure that these harvested areas do not contribute to the degradation of the water resource.

Current Practices and Status of Indicator

During 1998, P. Beaudry & Associates and Environmental Dynamics completed a watershed assessment and sediment source survey on TFL 30. The objective of the exercise was to obtain information and develop a tool to assist in two planning activities:

1) development of a cost effective and environmentally sensible watershed restoration program; and
2) assist in the forest development plans process that will minimize or mitigate negative impacts to the aquatic resources.

TFL30 was subdivided into 27 independent watersheds and an assessment and sediment source survey was completed for each of the 27 units. P. Beaudry (1999) identified ten of the 27 watersheds as having a high level of hydrologic concern. Current status of peak flow index is shown in the following table. Seven watersheds (as identified by bolding) have current status very close to the target threshold. In these sensitive watersheds limited harvesting will occur until the PFI is below the target level. The watershed assessment has been used to develop watershed management objectives that are accounted for in the timber supply analysis in Management Plan 9. P. Beaudry, a local hydrologist identified the target threshold limits in the following table. This was done as an extension to the watershed assessment report.

Currently, 100% of the watersheds are below the targets as shown in Table 12.

Establishment of Targets and Future Practices

The target of all of the watersheds will have a peak flow index was established to reflect Canfor's and BC Timber Sales' commitment to maintaining water quality and flow. Canfor's and BC Timber Sales' objectives for the conservation of the fisheries resource and aquatic habitat include planning at the watershed level to minimize impacts to hydrological systems from forest harvesting and road construction through the maintenance of riparian management areas along riparian features. Management of watersheds and hydrologic systems is accomplished through managing the rate of harvest in each watershed (water quantity regulator), the amount of road construction (water quality regulator) and by establishing riparian management areas along riparian features (water quality and quantity regulators). Through the management of these three attributes, the quality and quantity of water within each watershed will remain within the limits of natural variation over time, and the species utilizing riparian / aquatic habitats will be maintained. Canfor and BC Timber Sales are relying on the three watershed attributes in this management plan to effectively manage and conserve the water resource.

Table 12. Current Status of Peak Flow Index.

Watershed Name	PFI as of March 31/06	Target	Forecasting Results Range over 260 yr.	Achieved by
Averil	44	< 65	28 to 18	Annually
Barney Creek	31	< 37	42 to 10	Annually
Basin 20	35	< 65	40 to 29	Annually
Basin 25	43	< 80	37 to 10	Annually
Basin 27	44	< 80	41 to 13	Annually
Basin 7	41	< 80	35 to 15	Annually
East Olsson	36	< 37	30 to 14	Annually
Herring	41	< 65	37 to 19	Annually
Horn	27	< 37	30 to 12	Annually
Hubble	29	< 80	35 to 15	Annually
Limestone	46	< 80	48 to 18	Annually
Lower Olsson	39	< 65	37 to 19	Annually
Mokus	73	< 90	58 to 16	Annually
Residual A	21	< 65	28 to 18	Annually
Residual B	33	< 37	30 to 14	Annually
Residual C	38	< 65	37 to 18	Annually
Residual D	21	< 37	23 to 15	Annually
Residual E	27	< 65	35 to 16	Annually
Residual F	42	< 65	37 to 18	Annually
East Seebach	29	< 80	33 to 9	Annually
Lower Seebach	61	< 65	38 to 18	Annually
Upper Seebach	34	< 80	35 to 12	Annually
Tay Creek	33	< 80	38 to 13	Annually
Upper Olsson	29	< 80	35 to 12	Annually
Basin 4	33	< 65	35 to 16	Annually
Woodall	26	< 37	23 to 15	Annually
West Torpy	16	< 37	21 to 11	Annually

Establishment of Targets and Future Practices

The target of all of the watersheds will have a peak flow index was established to reflect Canfor's and BC Timber Sales' commitment to maintaining water quality and flow. Canfor's and BC Timber Sales' objectives for the conservation of the fisheries resource and aquatic habitat include planning at the watershed level to minimize impacts to hydrological systems from forest harvesting and road construction through the maintenance of riparian management areas along riparian features. Management of watersheds and hydrologic systems is accomplished through managing the rate of harvest in each watershed (water quantity regulator), the amount of road construction (water quality regulator) and by establishing riparian management areas along riparian features (water quality and quantity regulators). Through the management of these three attributes, the quality and quantity of water within each watershed will remain within the limits of natural variation over time, and the species utilizing riparian / aquatic habitats will be maintained. Canfor and BC Timber Sales are relying on the three watershed attributes in this management plan to effectively manage and conserve the water resource.

Forecasting and Predicted Trends

Forecasting of the peak flow index occurred as part of the original SFM plan in 2001 under the "Decision Scenario 1 – Biodiversity Guidebook" of the scenario planning project. Results of the forecasting (range of PFI) are shown in the Table 12. Generally, forecasting showed that the peak flow index was well below the target threshold level. In many cases, the forecasting predicts that PFI will fluctuate over time between the high and low value.

As forest harvesting continues within the watersheds, the expectation is that the Peak Flow Index will increase towards the threshold targets shown in Table 12. Watersheds where the Peak Flow Index is above or close to the target level require additional sensitivity analysis which will be conducted to identify the achieved by target dates.

Future forecasting of this indicator will occur as part of a sensitivity analysis over the long term (250 years) and during the timber supply analysis, which occurs in five-year intervals. Short-term projections of expected impact from the Forest Stewardship Plan (FSP) occur approximately every 2 years or as declared areas are developed.

Monitoring and Reporting Procedures

The planning forester will be responsible for ensuring that the targets are met. The interior watershed assessment report, forest cover mapping, TRIM data and the GENUS database will be used to monitor and determine the status for this measure.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for reporting the results of maintaining PFI targets to the PAG. Canfor and BC Timber Sales will be responsible for updating their forest cover databases and Planners will be responsible for ensuring future harvesting will be responsive to PFI targets.

3.27 Sediment Occurrence Mitigation

Indicator Statement	*Target and Variance*
The percentage of unnatural sediment occurrences where mitigating actions were taken.	Target: 100%, Annually Variance: -5%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Conservation of Soil and Water Resources
   CSA SFM Element: Water Quality and Quantity
   Value: Water Conservation
   Objective: Maintain water quality in the Defined Forest Area (DFA)

Description of Indicator

Sedimentation can damage water bodies by degrading spawning beds, increasing turbidity, and reducing water depths. Forest management activities can create unnatural inputs of sedimentation into water bodies. This may occur at stream crossings (see previous indicator "Stream Crossing Management"), or from roads adjacent to water bodies. In addition to the effects of roads, sedimentation may also occur from slope failures that are a result of forestry activities. Once sedimentation occurrences are detected, mitigating actions are taken to stop further damage and to rehabilitate the site. Tracking these mitigation actions contributes to sustainable forest management by evaluating where, when and how sedimentation occurs and the success of correcting it.

Current Practices and status of Indicator

Sedimentation occurrences are detected by forestry personnel during stream crossing inspections, road inspections, silviculture activities, and other general activities. While in some situations the sites may have stabilized so that further sedimentation does not occur, in other cases mitigating actions may have to be conducted. This may involve re-contouring slopes, installing siltation fences, re-directing ditch lines, grass seeding, or deactivating roads.

No unnatural known sedimentation occurrences required mitigating actions between April 1, 2005 and March 31, 2006 in the DFA.

Establishment of Targets and Future Practices

Canfor and BCTS recognize the potential damage sedimentation can inflict on water bodies and are committed to taking mitigative actions on 100% of occurrences. A variance of 5% has been established to recognize those situations where it is not operationally feasible or practical to address sedimentation incidents. Licensees and BCTS will continue monitoring field operations to ensure sedimentation does not occur, and where necessary, will continue to take prompt action to mitigate its impact if it does.

Forecasting and Predicted Trends

The indicator target is expected to be achieved, but the exact degree of success is not easy to quantifiably forecast. However, it is important to identify what the accepted target means to SFM. Correcting unnatural sedimentation problems for all known occurrences is important to conserve water quality objectives. A “what if” scenario analysis will identify the importance of the target for this indicator to SFM within the DFA. This indicator and the following “what if” scenario will help to substantiate the proposed target:

a) What if only 50% of known unnatural sedimentation occurrences received any corrective actions?

Ignoring half of the events where water bodies received sedimentation caused by forestry activities would be a willful disregard of sustainable forestry. Fish populations could be damaged by a decrease in water quality and destroyed spawning beds. Other aquatic organisms such as amphibians could suffer from the higher concentration of soil particles suspended in the water. In addition to the environmental degradation, social values would be impacted, as sedimentation is often an obvious and disturbing feature in the landscape. Failure to correct sedimentation problems could result in altered stream flows would be perceived as the careless disregard for forest and non-forest resources and should be avoided at every opportunity.

Canfor and BCTS are committed to achieving the stated target for the indicator and long term trends are anticipated to show that all known sedimentation events will be acted upon as required.

Monitoring and Reporting Procedures

All field personnel are responsible for detecting sedimentation occurrences, regardless of the location in the DFA. When sedimentation is detected, the Licensee/ BCTS that is responsible for the crossing, road, or cutblock will be notified. Canfor and BCTS will then take corrective actions and document the occurrence in their EMS database. The percentage of unnatural known sedimentation occurrences will be tracked, as well as the steps taken to rehabilitate damage. This percentage will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

While Canfor and BCTS are responsible for correcting and tracking sedimentation on their areas of activity, it is the responsibility of all field personnel to be vigilant of sedimentation, even if it is occurring at another Licensee's site. Opportunities for improvement include training field personnel to recognize sedimentation occurrences and creating sedimentation response plans so that remediation can be quick and efficient.

3.28 Net Area Reforested

Indicator Statement	*Target and Variance*
Percentage of net area regenerated within 3 years after the completion of harvesting.	Target: 100% Variance: -5%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Forest Ecosystem Contributions to Global Ecological Cycles
CSA SFM Element: Carbon Uptake and Storage
Value: Uptake and storage of carbon in forest ecosystems
Objective: Facilitate carbon uptake and storage within harvested areas

2) ***CCFM Criterion*****:** Multiple Benefits to Society
CSA SFM Element:: Timber and Non-Timber Benefits
Value: Short and long term benefits.
Objective: Maintain a flow of timber benefits.

Description of Indicator

Prompt reforestation of harvested areas is a major component of sustainable forest management. In addition to creating wildlife habitat, maintaining hydrologic processes, and providing future timber for harvesting, regenerating cutblocks can absorb significant amounts of carbon through photosynthesis. Because young plantations are typically healthy and rapidly growing, they sequester more CO_2 through photosynthesis than they release through decay. By reducing atmospheric greenhouse gases such as CO_2, regenerating cutblocks can contribute to reducing climate change. The sooner cutblocks are regenerated after the completion of harvest the sooner this process can begin. Tracking plantation establishment will allow forest managers to assess how quickly and successfully regeneration is occurring, and if possible, adjust operations to reduce the time it takes to achieve reforestation.

Current Practices and Status of Indicator

Canfor and BC Timber Sales are legally required to declare the NAR (Net Area Reforestable) of a cutblock regenerated by the date defined in the Site Plan. The NAR is the area of a cut block that must be reforested, and does not include permanent access structures (roads), wildlife tree patches, and areas of wetlands or rock. The date regeneration must be accomplished by is called the "regen" declaration date and varies depending upon the ecosystem association it is applied to. Based on ecosystem associations the regen period may be 3, 7 or more years, but most cutblocks are declared to be reforested before the regen period has expired. This prompt reforestation allows seedlings to become established before competing vegetation becomes too developed on the site. This indicator does not apply to small bark beetle regulation (BBR) blocks.

Currently, 100% (1717.6 of 1727.6ha) of net areas to be reforested have been regenerated within 3 years after the completion of harvesting by Canfor and 22% (21.4 of 97.4ha) by BCTS. None of the blocks are in non-compliance with regeneration delay due dates.

Establishment of Targets and Future Practices

Canfor has determined that 3 years is sufficient time for a cut block to be planted once harvesting is complete. Within those 3 years site preparation may be required, such as disc trenching or mounding, and seedlings have to be grown that are appropriate for that site. Compared to many Site Plans' prescribed regeneration dates, 3 years is an aggressive target to be achieved. However, events may occur that result in some cutblocks not being reforested within this period. Planting may be postponed as adjacent stands are harvested to salvage pine beetle killed timber. There may be insufficient seedlings to complete planting, or new plantations may suffer mortality from pests or extreme weather. In light of these possible events, a variance of -5% has been established.

To achieve this target, forestry operations have to be completed quickly and efficiently. Harvesting schedules, piling and burning of debris and road deactivation schedules all have to consider the targeted planting date. Silviculture foresters will have to ensure site preparation and seedling acquisition is timed to meet the 3-year target date.

Forecasting and Predicted Trends

The indicator target is achievable based on past performance by Canfor and BC Timber Sales, and the objective is anticipated to be met. However, while cutblocks may be planned to be regenerated within 3 years from the completion of harvest, the exact level of success that will be achieved is difficult to forecast. Factors such as weather, seedling availability, and ongoing beetle salvage operations may disrupt planting schedules. It is important to identify what the accepted target means to SFM. The prompt reforestation of harvested areas is vital for maintaining forest sustainability and reducing atmospheric CO_2. A "what if scenario" analysis will identify the importance of the target for this indicator:

a) What if only 50% of harvested areas were reforested within 3 years of harvesting?

Allowing 50% of harvested areas to remain unplanted after 3 years may delay the uptake of atmospheric carbon, reducing efforts to fight climate change. Waiting beyond 3 years could allow competing vegetation to become well established reducing seedling performance once they are planted. Delaying regeneration could also be detrimental to those plants and animals dependent on forest ecosystems. In the long term, timber supply may be reduced by an excessive lag between harvesting and reforestation thereby affecting economic and social values in the DFA.

Monitoring and Reporting Procedure

Planting and survey data is monitored through Canfor's and BC Timber Sales' database GENUS. All silviculture activities, including declarations of meeting regeneration dates and planting, are reported annually to the Ministry of Forests and Range through the RESULTS program. The indicator percentage will be reported in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

The Silviculture Forester is responsible for the monitoring, tracking, and reporting of this indicator. There are some opportunities for continual improvement. Canfor and BC Timber Sales may consider conducting regeneration surveys at the time of planting to reduce the time to declare regeneration. Scheduling silviculture activities should take every opportunity to reduce the time between activities. For example, site preparation could occur directly after harvesting instead of waiting for the following year.

3.29 Meeting Free Growing Dates

Indicator Statement	*Target and Variance*
Percentage of cut block area that meets Free Growing requirements as identified in Site Plans	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Forest Ecosystem Contributions to Global Ecological Cycles
CSA SFM Element: Carbon Uptake and Storage
Value: Uptake and storage of carbon in forest ecosystems
Objective: Facilitate carbon uptake and storage within harvested areas

2) ***CCFM Criterion:*** Multiple Benefits to Society
***CSA SFM Element*:** Timber and non-timber benefits.
Value: Short and long term benefits
Objective: Maintain a flow of timber benefits

Description of Indicator

A free growing stand is a stand of healthy trees of a commercially valuable species, the growth of which is not impeded by competition from plants, shrubs or other trees (BC MOF 1995b). A free growing assessment is conducted on stands based on the time frame indicated in the Site Plan. The early and late free growing dates are established based on the biogeoclimatic classification of the site and the tree species prescribed for planting after harvest. In order to fulfil mandates outlines in legislation, standards are set for establishing a crop of trees that will encourage maximum productivity of the forest resource (BC MOF 1995b). The free growing survey assesses the fulfilment of a Licensee's obligation to the Crown for reforestation.

This indicator measures the percentage of harvested blocks that meet free growing obligations across the DFA. While this percentage is important in a legal sense, as Canfor and BC Timber Sales have an obligation to meet free growing standards, it is also important for sustainable forest management. Stands that meet free growing standards are deemed to have reached a stage where their continued presence and development is more assured. Their numbers, health, and height make them less vulnerable to competition and more likely to reach maturity. Producing a free to grow stand means that the forest ecosystem will continue to develop. It means that carbon sequestration will also continue, locking up additional green house gases as cellulose in the growing plantation. As more blocks reach free to grow status, they could make a local contribution to reducing global climate change.

Current Practices and Status of Indicator

Free growing dates and standards for each harvested stand are recorded and maintained in Canfor's and BC Timber Sales' database, GENUS. Each cut block is surveyed prior to the late free growing date to ensure the free growing standards have been met and that the stand is at target heights, fully stocked, and healthy. The results of all surveys are summarized and maintained in Canfor's and BC Timber Sales' databases. If a survey indicates that the stand has not achieved free growing by the required date, corrective actions will be prescribed immediately in order to remedy the situation while still meeting the late free growing deadlines. If all free growing standards are met, Canfor and BC Timber Sales make an application to the Ministry of Forests and Range for the cut block to revert to the Crown's responsibility.

From 1987 to present, 100% of Canfor harvested areas have met the late free growing dates as outlined in the site plans. BCTS had no late free growing dates due during the April, 2005 to March 31, 2006 reporting period.

Establishment of Targets and Future Practices

The established target of 100% for this indicator ensures that all harvested areas within the DFA achieve free to grow status within the prescribed timelines. Once cutblocks reach the free to grow standard the area reverts back to Crown land and Canfor and BC Timber Sales obligations are considered complete. A performance target of 100% is achievable and it is in Canfor and BC Timber Sales best interest as the completion of silviculture obligations are an important financial benefit. Until the Crown assumes responsibility for a plantation,

Canfor and BC Timber Sales must bear the costs of managing that stand, including surveys, thinning, brushing, and, if necessary, replanting.

Forecasting and Predicted Trends

While it is anticipated that 100% of blocks will meet the indicator target, the exact level of success is not easy to forecast. However, it is important to identify what the accepted target means to SFM. By ensuring harvested blocks within the DFA meet the prescribed free growing date, forest managers are ensuring that the productive capability of the land base is conserved and that the forest resource will be available for future use. Use of a "what if scenario" is beneficial in helping to identify anticipated future trends for an indicator such as this. As the stated target for this measure is 100%, one other potential scenario will be analyzed:

a) What if only 50% of harvested blocks met the prescribed free growing date?

If only half of harvested blocks met the prescribed free growing date the sustainability of the timber resource within the DFA would be in peril. Free growing stands are considered to have a reached a state where they can continue to grow in a healthy manner, reasonably free of competition. Stands that have not reached this state may be suffering high pest mortality or competition from other species that may prevent them from becoming commercially viable crop trees. Quite simply, 50% fewer free growing blocks means there will be less regenerated area compared to our assumption used in determining the current allowable cut level and would likely decrease the future allowable cut amounts.

In addition to economic benefits, free growing stands contribute to ecological values of SFM. Achievement of free growing stands ensures that the nutrients and productivity of the site have not been significantly altered from harvest and that the land area has not been converted to another type of vegetative cover. Wildlife dependent on healthy forests also benefits from the creation of free growing stands. A free growing stand also represents an area that is actively storing carbon and contributing to the removal of carbon dioxide from the atmosphere. Having 100% of blocks meeting their free growing date means that the DFA can make a sizeable contribution in the effort to reduce atmospheric carbon dioxide.

In the long-term, failing to achieve the identified target for this measure could negatively impact economic, ecological and social values across the DFA. As the timber supply and the amount of healthy regenerating forests decline, the industries, communities and natural processes that depend on them will also suffer. In the TFL30 DFA, trends for the immediate future will likely show that free growing objectives will continue to be achieved on 100% of harvested blocks.

Monitoring and Reporting Procedures

Silviculture obligations such as free growing dates for harvested stands are recorded and maintained in Canfor's and BC Timber Sales' database, GENUS. Once free to grow status has been achieved, Canfor and BC Timber Sales must submit a report to the Ministry of Forests and Range that will update the status of the cut block on the government database. These reports must be submitted on an annual basis for all blocks surveyed that operating year. The indicator percentage will be included in the annual SFM Plan report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

It is the Silviculture Forester's responsibility to monitor, track and report this indicator. Opportunities for continuous improvement could be found in the administration of silviculture activities. Currently, non-conformances generally relates to data base tracking, survey methodology and reporting delays. These issues will be reviewed and, if necessary, a resulting action plan will be developed and implemented to minimize future negative impacts to this indicator.

3.30 Carbon Storage

Statement of Indicator	*Target and Variance*
The amount of carbon stored in forest ecosystems within the DFA	Target: TBD by June 30,2007 Variance: + 3 months

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Forest Ecosystem Contributions to Global Ecological Cycles
CSA SFM Element: Carbon Uptake and Storage
Value: Uptake and storage of carbon in forest ecosystems
Objective: Facilitate carbon storage within the DFA

Indictor Description

As a result of the 1997 Kyoto protocol, international attention has been focused on the issue of global greenhouse gas emissions. This has placed considerable pressure on the public and private sectors of society to account for the role that forests play in carbon storage and the reduction of global carbon dioxide emissions. The capacity of forest ecosystems to sequester carbon is therefore considered an important environmental value and as such has been included as an aspect of SFM within this plan. In order for carbon sequestration to be effectively represented within an ecosystem level management plan, it must be considered within the context of timber production, wildlife conservation and visual aesthetics. The following figure was taken from the CFS Forest Carbon Accounting website (http://www.carbon.cfs.nrcan.gc.ca/cbm-cfs2_e.html) and illustrates the flow of carbon in a forest ecosystem.

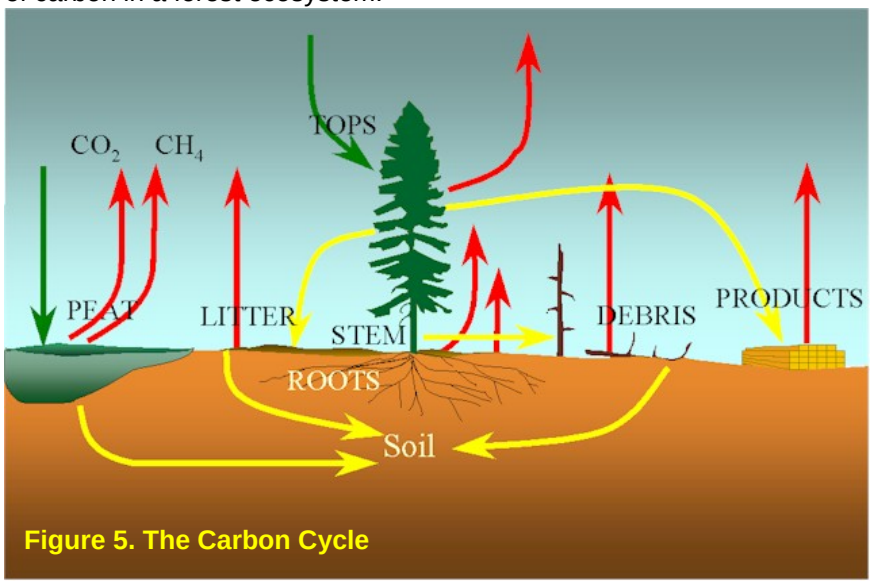


Figure 5. The Carbon Cycle

Carbon sequestration is defined as the net amount of carbon removed from the atmosphere and stored in the ecosystem each year. The calculation of average net carbon sequestration rates within a timber supply area allows for a long-term evaluation of the effects of management activities and/or natural disturbance on the rate at which the forested landscape is sequestering carbon. Average sequestration rates are based on the changes in ecosystem carbon storage over time without accounting for carbon removed in the harvested biomass. The rationale behind this is that the carbon in harvested timber will be stored in the wood products following harvest. An assessment of the carbon sequestration rate provides a measure of the rate and the direction of carbon exchange between the forest ecosystem and the atmosphere.

Current Practices and Status of Indicator

Currently carbon is uptake and storage is not monitored on the DFA. There are currently several forest level decision support tools available for assessing carbon sequestration rates. One such tool is the Canadian Forest Services Carbon Budget Model (CBM-CFS2) and another is the Forecast model developed by Kimmins (UBC. An overview of this model is presented on the CFS website at http://www.carbon.cfs.nrcan.gc.ca/cbm-cfs2_e.html. This model is a potential candidate for the TFL30 because it contains many of the fundamental requirements necessary to achieve SFM objectives identified through this measure.

Information will be gathered on carbon uptake and storage and provided to the public advisory group. Canfor and BCTS will develop a workplan for achieving target for this indicator.

Establishment of Target and Future Trends

Canfor and BC Timber Sales will continue to strive for 100% of forestry activities to be consistent with the terrain management requirements in site plans. This target was established to reflect Canfor's and BC Timber Sales'

commitment to soil conservation in the DFA. The use of professional geo-scientists, engineers and other qualified personnel to conduct overview mapping and TSFA is expected to prevent future slope failure events resulting from forest operations

Forecasting and probable trends of the indicator

This measure differs from the majority of other measures in that it is targeted at developing targets the TFL30. Therefore, the method used to forecast this measure will also differ from the typical "what if scenario" utilized for other measures. An analysis of the "what if scenario" will identify why the stated target was chosen for this measure and how it contributes to SFM in the TFL30 DFA.

As with previous "what if scenarios", it is useful to identify two potential scenarios:

a) What if a Carbon storage target is developed and implemented considerably earlier than June 30, 2007?
b) What if a Carbon storage target is developed and implemented considerably later than June 30, 2007?

The first scenario suggests that a Carbon storage target is developed and implemented considerably earlier than June 30, 2007. The most important point to make regarding this scenario is that it is realistically not achievable. As these plans have previously not been developed or implemented within the DFA, considerable research and development is required in order to produce baseline data for a preliminary Carbon storage target. In order to develop a meaningful and useful plan, scientific and operational expertise will be an important part of plan development and a certain timeframe is required in order to produce a valuable end product.

In contrast, the second scenario suggests an extension of the existing target to later than June 30, 2007. While this would ensure the inclusion of relevant scientific data and expertise, the timeline is not conducive to implementation of this SFM Plan and movement toward sustainability of the forest resource values identified by the PAG. While it is important to allow adequate time to develop useful strategies, it is also important to actively pursue these strategies in order to move forward with the SFM initiative.

The idea of a Carbon storage target to monitor forest ecosystem biomass and carbon pools was initiated to determine the capacity of forest ecosystems to sequester carbon, and the role that forests play in carbon storage and the reduction of global carbon dioxide emissions. Within the TFL30 DFA, future trends will likely show that this plan has been developed and implemented. The relationship between carbon pools and carbon monitoring is related to the forecasting initiatives planned for other measures and targets identified in this SFM Plan.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will track progress on this indicator through updating the workplan. Progress will be provided to the public advisory group though emails and meetings.

Responsibility and Continuous Improvement Opportunities

The strategic planning forester for Canfor and the Planning Forester for BC Timber Sales will be responsible for monitoring this indicator and reporting the progress and findings in the annual report.

3.31 Volume of Timber Harvested

Statement of Indicator	*Target and Variance*
Cut control volume of timber harvested (m^3/year) within the DFA.	Target: 100% Variance: +10% over each five year cut control period.

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value: Short and long term benefits.
Objective: Maintain a flow of timber benefits.

Description of Indicator

To be considered sustainable, harvesting a renewable resource can not deteriorate the resource on an ecological, social, or economic basis. Undeniably, some resource values will be incompatible; however, the resource is considered sustainable where there is a balance between the various components of sustainability. In the determination of allowable annual cut (AAC) there are various considerations that are examined which include: the long term sustainable harvest of the timber resource, community stability, wildlife use, recreational use, the productivity of the defined forest area, etc. The AAC is determined every five years by the Chief Forester of the Province of British Columbia using a number of forecasts to assess the various resource values to be managed. The Chief Forester, on behalf of the crown then makes an independent determination of the rate of harvest that is considered sustainable. This harvest level must then be met within thresholds established by the crown (as depicted in the objective). By following the AAC determination the rate of harvest is consistent with what is considered to be sustainable ecologically, socially and economically, by an independent third party.

This indicator is a simple annual summary the volume of timber harvested from the DFA. These values are determined from timber scale billings which, is the same data used by the crown to determine stumpage revenue.

Current Practices and Status of Indicator

As stated above the Chief Forester makes a determination of the rate of harvest. The licensee then by law must achieve the AAC within specified thresholds as indicated in the objective. Each truckload of wood gets scaled at an approved MoFR scale site. The MoFR uses this information to apply a stumpage rate to the wood, and monitors the volume of wood harvested and compares this to the AAC thresholds.

The current status of Canfor volume cut is shown in the following table. BCTS has cut 214,510 m3 during the periods 2000-2004 and 0 m3 in 2005.

Table 13. Current Status of Canfor Current Allowable Annual Cut.

Year	Actual Recorded Cut (m^3)	Allowable Annual Cut (m^3)	% Recorded Cut of AAC	5 Year Cut Control %
2000	285,016	328,688	86.7%	
2001	165,183	328,688	50.3%	
2002	375,231	328,688	114.2%	98.3%
2003	342,475	180,000	190.3%	
2004	155,848	180,000	86.6%	
2005	41,506	180,000	23.1%	

The primary timber demand is for coniferous sawlogs for use as dimensional lumber, with residual grades utilized for Kraft pulp. A small percentage of logs meeting peeler/veneer standards are used for plywood. The species profile from TFL 30 is predominantly a spruce/balsam mix with minor components of other coniferous species. To date, minor amounts of deciduous species have been utilized from TFL 30. Deciduous species are

not managed as a crop tree species but will remain as optional utilization. The majority of the mature deciduous species are either contained within large reserve areas, or retained as wildlife trees.

Establishment of Targets and Future Practices

A common method for establishing targets is to benchmark the current harvest levels and extrapolate to the next 5 to 10 years. However, due to the existing mountain pine beetle epidemic in the DFA, increased harvest levels make benchmarking difficult and unpredictable. The Chief Forester apportions AAC within the DFA and Canfor is committed to fulfil a 100% of their timber harvesting obligations.

Forecasting and Predicted Trends

As shown on the following figure using basecase 1b, forecasting the volume flow over time has indicated that the current AAC (201,213 m3) will be maintained for the short-term (about 5 years) and then stepping up by 64 % to 330,000 m3/year in the mid-term (10-60years) then increasing to 533,000 m3 in the long-term (beyond 60 years).

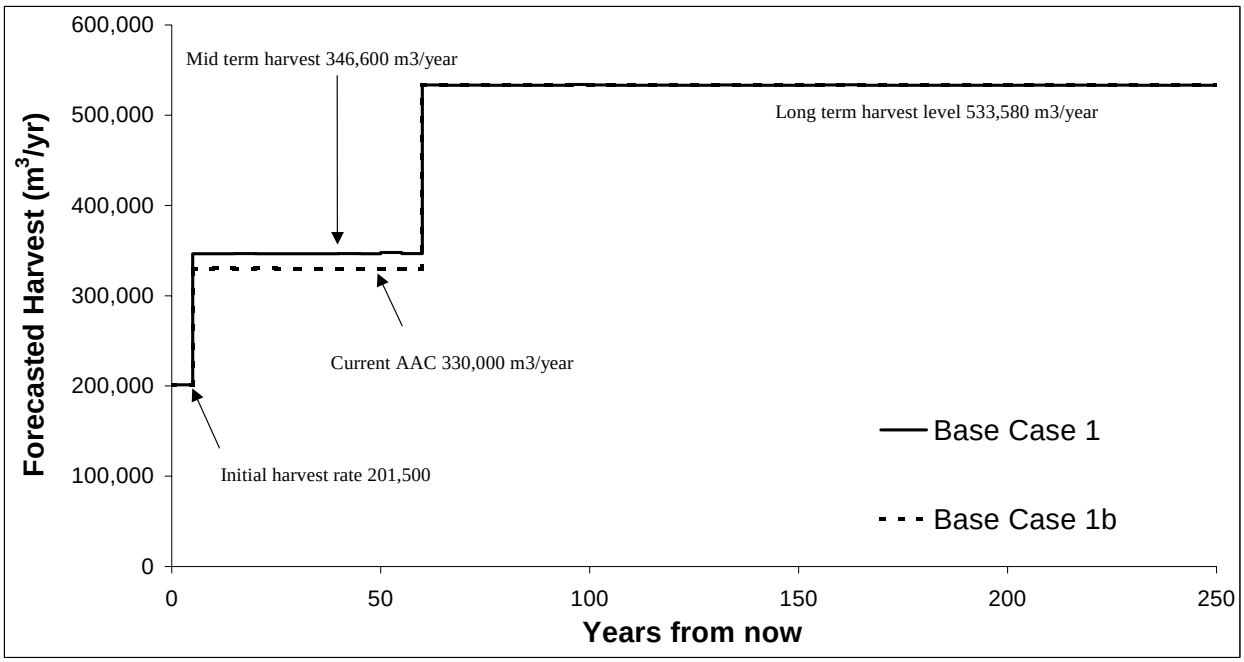


Figure 6. Forecasting Volume over Time – Scenario 1b.

The long-range forecast predicts that the AAC will be enhanced to as much as 533,000 m3/year within 70 years as future managed stands become fully available (based on the results of the indicator forecasting analysis in 2006). Another timber supply forecast would be conducted as part of the timber supply analysis for MP 10, which is due in mid 2008.

Monitoring and Reporting Procedures

The volume of timber actually harvested within the DFA will be determined annually by a review of MoFR timber scale billing summaries for the period of January 1st to December 31st each year, on an annual basis. BC Timber Sales will track the volume sold annually, and together with Canfor the cut level as a percentage of apportionment for the most recent 5-year cut control period will be reported in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities

Planning foresters are responsible for ensuring that the volume planned for harvesting will meet the desired allowable cut volume apportioned across the TSA. Canfor and BC Timber Sales will work co-operatively with the Ministry of Forests and Range to better estimate the AAC and actual harvest level on an annual basis. As better estimates of the current damage from Mountain Pine Bark Beetle are obtained, more accurate AAC determinations will be possible.

3.32 Damaging Agent Assessment

Indicator Statement	*Target and Variance*
Percentage of DFA (pre harvest and after free growing) assessed for damaging agents.	Target:100% over 10 yrs Variance: -20%.
Percentage of the DFA (pre free growing) assessed for damaging agents.	Target: 100% over 7 yrs Variance:-10%
Non-recoverable volume loss due to stand damaging agents.	Target: TBD by March 2007 Variance: + 3 months

These indicators addresses the following CSA-SFM parameters:

1). ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value : Short and Long Term Benefits
Objective: Maintaining a flow of timber benefits

Description of Indicators

Monitoring the health of the forest within the DFA play an important role in ensuring the continuous flow economic benefits are maintained. Assessment prior to harvesting and before free growing status is achieved will allow for adjustments to be made in the planning process and a greater understanding of the damaging agents which effect forest productivity.

Current Practices and Status of Indicators

These indicators are currently being developed. Pre free growing assessment should take place during the silviculture survey. Pre harvest and after free growing assessments will take place in conjunction with the site assessment process. In response to the Mountain Pine Beetle Epidemic, aerial overview flights are conducted each summer (after annual beetle flight) to identify and map infected areas across TFL 30. Ground surveys are performed in high-risk areas to gather more precise information to make treatment decisions.

Currently satellite images have been used to assess damaging agents in stands >80 years of age within the DFA. This would account for about 66% of the forest older than free growing age. Silviculture surveys over the last year have accounted for about 11% of the forest less than free growing age.

Non-recoverable volume loss on the DFA is estimated to be 3,640 m3 during the reporting period and comes from the assumptions used in Management Plan 9. Over the next several months, Canfor and BCTS will do further information gathering to recommend a target for non-recoverable loss to the public advisory group.

Establishment of Targets and Future Practices

The target for this indicator has been established at 100% to ensure that all areas are monitored for stand damaging agents within the DFA. The variance levels were established in view of this being a new indicator and will be reviewed to determine their appropriateness. The Mountain Pine Beetle epidemic is a priority at present and will remain for the short-term. Canfor and BC Timber Sales will continue conducting annual reviews of planning areas to identify areas with stand damaging agents and how this information will be integrated into the planning process.

Forecasting and Predicted Trends

It is anticipated that Canfor and BC Timber Sales will continue to meet the current target. However, it is important to identify what the accepted target means to SFM. By assessing the forest for damaging agents both as immature and mature stands forest managers are better able to reduce the spread of forest health agents, utilize timber before it deteriorates, and reforest areas with healthy young plantations. Use of a “what if scenario” is beneficial in helping to identify anticipated future trends for an indicator such as this. As the stated target for this measure is 100%, one other potential scenario will be analyzed:

a) What if no damaging agent assessments were done?

Failure to assess forest stands for damaging agents would result in insufficient data available for planning foresters to make informed decisions. Lack of damaging agent assessments could result in economic losses as forest health deteriorates and timber a volume loss as mature damaged timber is not salvaged. Damaging

agents left unchecked could result in epidemics resulting in greater economic losses. Young forests unchecked of damaging agents may result in higher mortality or poor quality timber or failure to meet Free Growing dates. As these stands die and decay, they will release carbon dioxide into the atmosphere, thereby contributing to global climate change.

Other costs may come from failing to treat damaged stands. Allowing dead and diseased stands to persist on the landscape may result in more severe wildfires that destroy or damage property in the DFA. Thus, achieving the indicator's target may protect societal values in addition to providing ecological and economic benefits.

Monitoring and Reporting Procedures

Forest health overview mapping for TFL 30 is completed each summer. Ground surveys are to be completed on high priority stands in the fall/winter of each year. Pre free growing assessments should be tied to the silviculture survey. This data will be stored in the GENUS database.

Responsibility and Continuous Improvement Opportunities

The Planning Forester is responsible for co-ordinating the detection of damaged mature timber (after free growing) and the silviculture forester is responsible before free growing. The area team coordinator is responsible for reviewing and updating volume targets each year. Canfor and BC Timber Sales are also responsible for maintaining databases such as GENUS with current forest health conditions.

3.33 Accidental Industrial Fires

Statement of Indicator	*Target and Variance*
Number of hectares (area) damaged by accidental forestry related industrial fires.	Target: < 10 ha per year Variance:+5 ha

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value : Short and Long Term Benefits
Objective: Maintaining a flow of timber benefits.

Description of Indicator

This indicator measures the number of hectares lost to industrial forest fires. As fire can result in catastrophic losses to the timber supply, wildlife, and private property, a high value has been placed on reducing the impact of these fires in the DFA. Accidental industrial fires can be caused by various sources, including escapes from the use of prescribed fire (i.e. burning slash piles) or from human induced error (e.g. machinery, cigarette smoking, etc.). Industrial fires are usually brought under control quickly due to the availability of fire fighting equipment and Canfor's and BC Timber Sales' Fire Preparedness Plan. In contrast, naturally caused fires have the potential to quickly grow in size before fire control efforts can be undertaken. However the area and extent of accidental industrial fires must be minimized throughout the DFA in order to contribute to the overall health of the forest and long-term sustainability of the resource.

Current Practices and Status of Indicator

The main cause of accidental industrial related fires in the DFA is the burning of slash piles and operating industrial machinery. Canfor and BC Timber Sales take precautions to prevent accidental fire ignitions and to reduce the spread of fires once they start. These precautions include EMS checklists and inspections of on-site fire equipment, a Fire Preparedness Plan, and fire fighting training for some personnel.

This indicator applies to accidental industrial fires originating in the DFA.

Over the last year, there was 0 hectares damaged due to accidental forestry related industrial fires originating within Canfor and BCTS operations on the DFA.

Establishment of Target and Future Practices

Targets are established from a review of past performance within the DFA. While a target of 0 ha would be the ideal, the PAG set the current target due to the Mountain Pine Beetle epidemic and human error. Canfor and BC Timber Sales are committed to minimizing the area of accidental industrial fires and will continue efforts to prevent wildfire and control their spread through EMS procedures, training, and prompt initial attack strategies as part of the fire preparedness plan.

Forecasting and Predicted Trends

This indicator is not easy to quantifiably forecast as the ignition and spread of wildfires is dependent on many factors such as weather, slopes, and forest types. However, it is important to identify what the accepted target means to SFM. Accidental forestry related fires affect ecological, economic and social values of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has the target set at less than 10 hectares, one other scenario should be identified:

a) What if there were significantly more than 10 hectares of accidental forestry related fires throughout the DFA?

If there were more than 10 hectares of accidental forestry related fires throughout the DFA ecological values may benefit due to the historic nature of ecosystems in the DFA. However economic and social values could be negatively impacted. More significantly, loss of human life and property damage may occur. Timber supply, resource values and visual quality may also be compromised, thereby affecting overall economic benefits and

social values from forests in the DFA. Failure to achieve the indicator target could also reduce quality of life values for the public within the DFA. For example, if an accidental forestry related fire destroyed a popular campsite, public recreation values could be reduced.

Negative influences from an increase in accidental forest industry related fires would likely outweigh the potential positive ecological gain. Therefore, Canfor and BC Timber Sales will continue to place high importance on minimizing the impact of accidental industrial fires. Based on historic information, accidental fires have often been less than 10 cumulative hectares across the DFA.

Monitoring and Reporting Procedures

The British Columbia Ministry of Forests and Range (MoFR) maintains a database of all fires that occur in the province, which includes their cause and their specific location. Canfor and BC Timber Sales (through the MoFR Protection Branch) may be involved in fire suppression activities for fires that occur within the DFA. Therefore, Canfor and BC Timber Sales will contact the MoFR annually in order to confirm the number of hectares reported as burned along with identification of the source of ignition. The number of hectares of accidental, industrial related fire damaged area will be reported in the annual SFM Plan report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales will work co-operatively with MoFR Forest Protection Staff to better determine the causes and monitoring of accidental industrial caused fires

3.34 Non-Timber Benefits Requirements

Statement of Indicator	***Target and Variance***
The percentage of forest operations consistent with the following non-timber benefits: visual quality, cultural heritage, and lakeshore management requirements in site plans.	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value: Short and long term benefits
Objective: Maintain a flow of non-timber benefits.

Description of Indicators

Forests can provide intangible benefits in addition to their economic and ecological values. Protection and maintenance of these values helps assure that these benefits will be available for current and future generations. Visual Quality Objective requirements address the perceived beauty of certain areas as designated by the MoFR District Manager or as contained in higher level plans. Lakeshore requirements address the valuable role waterfront plays in ecosystem diversity, recreation and aesthetics. A cultural heritage value is a unique or significant place or feature of social, cultural or spiritual importance. Maintenance of non-timber requirements is an important aspect to sustainable forest management because it contributes to respecting the social and cultural needs of people.

Tracking the success of meeting these requirements will allow Canfor and BC Timber Sales to evaluate their progress in conserving these values and the development of improved procedures as required.

Current Practices and Status of Indicator

Visually sensitive areas are defined as viewscapes that have been identified through a previous planning process. During Forest Stewardship Plan preparation, scenic areas are identified on a map and if harvesting operations are planned for an area that contains VQOs; information will be further identified in a Site Plan. Visual Impact Assessments (VIAs) are required on all areas with VQO to determine block shape, location and internal retention options. At the site level, strategies are included in the Site Plan to minimize visual impacts.

Depending on the size of the lake, the lakeshore may legally be defined as a riparian management zone and have an additional lakeshore management zone adjacent to it. This is known as a Lakeshore Management Area (LMA) and these designations establish specific management requirements, which are determined by ecological and social considerations. LMA are initially identified in the Forest Stewardship Plan. Once lakeshore requirements are identified in the site plan, there is a legal obligation for Canfor and BC Timber Sales to implement and adhere to those requirements.

Forest development plans have used an Archaeological Predictive Model to assess the potential presence of archaeological resources within proposed harvest areas or road access corridors. Where activities are proposed within zones of high archaeological potential, Canfor and BC Timber Sales conduct site level Archaeological Impact Assessments (AIAs) to identify, assess and record any archaeological resources that may be present. Management measures recommended by the archaeologist are incorporated into operational plans. Conservation strategies are implemented at the site level during harvesting operations so that all identified cultural heritage values will be conserved for future generations. Once a strategy to conserve cultural heritage values is included within a site plan, there is a legal obligation for Canfor and BC Timber Sales to implement and adhere to the strategy.

Each non-timber value undergoes harvest and subsequent silviculture inspections to ensure that these strategies are implemented as stated in the site plan.

Over the last year, 100% of Canfor and BCTS forest operations have been consistent with visual quality, cultural heritage, and lakeshore management requirements in site plans.

Establishment of Targets and Future Practices

The target of 100% was established for this indicator to reflect Canfor's and BC Timber Sales' commitment to meeting the legal and environmental goals prescribed in the site plans. Canfor and BC Timber Sales also recognizes the importance of these values to various stakeholders within the TFL30. The identification and conservation of non-timber benefits is a socially and ecologically important component of forest management. Therefore Canfor and BC Timber Sales will continue to ensure forest operations are consistent with the requirements as established in the site plans in order to achieve sustainable development that recognizes and conserves the values of visual quality, cultural heritage and lakeshores values.

Forecasting and Predicted Trends

It is anticipated that 100% of site plan requirements for this indicator will continue to be achieved. The exact level of success is not easily predicted as conditions vary from one site to another and circumstances, such as forest health and fire may arise that prevent the requirements from being achieved. However, it is important to identify what the accepted target means to SFM. Conservation of these non-timber values influences social, economic and ecological values within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for this indicator. As this indicator currently has a target set at 100%, one other scenario should be identified

a) What if only 50% consistency occurred between forest management operations and strategies outlined in the site plans with regard to visual quality, cultural heritage or lakeshore requirements?

Implementing only 50% of the site plan requirements for this indicator could have social, economic and environmental impacts. The overall timber supply would likely increase if these values were not conserved. However, visual quality and lakeshore requirements help businesses that cater to various forms of recreation. By not conserving these values businesses could lose customers dissatisfied with the state of the resource. It is safe to say a large segment of the population values the aesthetics of some landscapes and non-compliance with the site plan could negatively effect aesthetics. Also water quality, aquatic habitat and biodiversity could be compromised with 50% adherence to the lakeshore requirements. Implementing only 50% of the strategies to conserve cultural heritage values could lead to significant cultural loss to both First Nations and the general public within the DFA. Aboriginal communities may no longer become involved in development planning as potential infringement to unresolved treaty rights could occur if cultural heritage values are not fully conserved. Public confidence in the sustainable forest management process could be jeopardized if these values were not conserved.

The above "what if scenario" helps to identify some of the potential impacts of not achieving the stated targets for this indicator. Therefore, Canfor and BC Timber Sales will continue to ensure that 100% of forest operations are consistent with site plan requirements.

Monitoring and Reporting Procedures

The information that is required to monitor this indicator includes a summary of the number of forest management operations that are consistent with the site plan to conserve visual quality, cultural heritage and lakeshore values. Each of the non-timber values will be analyzed and reported separately. Canfor and BC Timber Sales will conduct pre-work meetings prior to the start of projects, monitoring inspections as the work is progressing and final inspections once the work is complete to ensure the commitments specified in the site plan are met. Each of these values will be monitored through EMS inspections and results will be recorded in the EMS database (GENUS).

Responsibility and Continuous Improvement Opportunities

Planning forest are responsible for ensuring visual quality, cultural heritage, riparian, and lakeshore evaluations are completed on areas for development. Harvesting supervisors are primarily responsible for ensuring site plan requirements are implemented in the field during harvesting operations. Silviculture foresters are responsible for ensuring silviculture activities are consistent with site plan requirements. If during implementation of the requirements problems occur actions will be taken to improve consistency. These actions may include greater supervision, additional inspections and additional training for equipment operators

3.35 Public Input Opportunity and Response to Public Concerns

Statement of Indicator	*Target and Variance*
The number of opportunities given to the public and stakeholders to express forestry related concerns and be involved in our public planning processes.	Target: ≥3 types of media annually Variance: -1
Percentage of Creating Opportunities (Canfor) and Keeping in Touch (BC Timber Sales) communication strategy requirements met.	Target: 100% Variance: -5%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion***: Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value: Short and Long term benefits
Objective: Maintaining a flow of non-timber benefits

2) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element : Public Participation
Value: Public participation in decision making processes
Objective: A clear process for wide public participation in SFM.

Description of Indicator

As public involvement is a key element of CSA-SFM, it is important to provide meaningful and effective opportunities to incorporate public input and respond to public concerns. Public values change over time making it is important to be able to efficiently solicit public feedback and where possible, incorporate this input into forest management and practices. Effective communication with the public builds collaborative working relationships and identifies issues in the early stages of the public planning process. Public plans include, forest stewardship plan, pest management plan, forest management plan, and the sustainable forest management plan.

Forestry activities can impact a wide section of the public and individual stakeholders within the DFA. This indicator was designed to monitor Canfor's and BC Timber Sales' success at providing effective opportunities to residents and stakeholders to express concerns and be proactively involved in the planning process. This involvement may include the identification of areas of interest, definitions of the nature of their interest in the land base, and any specific forestry activity that may impact their specific interests. This process ensures that when forestry activities are planned, information is exchanged in an effective and timely manner, so as to resolve potential conflicts before they occur. This process will help to identify the public values, interests and uses of the forest that will be considered within the TFL30 planning framework.

Canfor's "Creating Opportunities for Public Interest Process" management system is a communication framework. It achieves this by establishing goals that support good communication, by defining how the communications process will operate, who will be responsible, and by measuring system performance through the use of key performance indicators. This SFM indicator measures the success of meeting the communication strategy requirements as outlined in "Creating Opportunities for Public Interest".

"Keeping in Touch" (KIT) tracks communications between BC Timber Sales and all interested parties that they notify when forestry operations/ developments are to occur. These interested parties include private landowners, lodge operators, trappers, or hunting guides. Strategies have been designed to ensure that information is communicated to these individuals in a timely and efficient manner. This communication considers non-timber users and inhabitants of the DFA and realizes that forestry operations can disrupt lives and businesses. BC Timber Sales is currently in the process of enhancing its communications strategy and exploring possibilities of incorporating it into its existing woodlands information management system, Genus.

Current Practices and Status of Indicator

The following key performance indicators apply to this measure and will be applied to communication strategies:

- 100% of communications from resource user will be responded to within 30 days
- 100% of commitments made to resource users are delivered within the time frame specified

- 100% of the applicable public is sent notification of planning and development activities associated with TFL30 forest management activities.

Canfor and BCTS have used a total of 4 media types to provide public and stakeholders opportunities to express forestry related concerns and be involved in our planning processes. These include newspaper ads, notification letters, public meetings, and face-to-face meeting.

Over the last year, 100% of public commitments were met on the DFA.

Establishment of Targets and Future Practices

The indicator's target of 100% demonstrates Canfor's and BC Timber Sales' commitment to the public input aspect of the SFM process. A 5% variance was established, as there are often factors that delay a response. Information may be unavailable that is required for the response, or personnel who may be able to provide input for a response may not be present. Public input is an important aspect of the SFM process. Therefore, it is paramount to ensure that written and documented concerns are dealt with in a timely and thorough fashion. If the target is not met in the future, strategies will be developed to improve practices, or targets will be adjusted to better reflect practices within the DFA.

Forecasting and Predicted Trends

It is the intent of Canfor and BC Timber Sales to meet the target, and it is anticipated this goal will be met. The exact level of success is not easy to quantifiably forecast as it relies on unpredictable factors such as human error. However, it is important to identify what the accepted target means to SFM. The response to concerns and requests directly affects social values and indirectly affects economic values of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of 100%, one other potential scenario should be developed:

a) What if there were only 50% of Communication Strategy Requirements were met?

If there were only 50% of communication strategy requirements were met; adequate attention would not be made to valuable public input. Public input into the SFM process is required to adequately consider other resource values within the DFA. If only 50% of concerns were addressed, public participation into SFM could decrease and negative impacts to other resource values such as cultural heritage, non-timber forest resources and biological richness could potentially occur. If these other forest values are not fully realized, economic values could also potentially decrease. For example, a lodge owner may make a written enquiry to learn when hauling is occurring so he knows when to book guests. If he does not receive a response, he may lose his guests and suffer the economic consequences.

The above "what if scenario" analysis implies that a balance of values can be achieved through achievement of the established target. Therefore, Canfor will continue to comply with the communication requirements as outlined in 'Creating Opportunities for Public Interest" (Management System # 6, Canfor).

The number of opportunities given to the public and stakeholders to express forestry related concerns and be involved in the planning process directly affects social values and indirectly affects economic values of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of at least 3 opportunities, one other potential scenario should be developed:

a) What if no opportunities were given to the public or stakeholders to express forestry related concerns and be actively involved in the planning process?

If there were no opportunities given to the public to express forestry related concerns, adequate attention may not be given to valuable public input. Public input into the development planning process is required to adequately consider other resource values within the DFA. If no opportunities were given, public participation into forest development planning may decrease and impacts to other resource values such as cultural heritage, non-timber forest resources and biological richness could potentially occur. The oversight of forest planners may impact other resource users in a way that may have been accommodated if the planners had known of the multiple use. For example, the timing of forest operations may impact recreational users. If it was possible, and not done, the timing of those operations may negatively impact the value derived by recreational users.

The general public may grow disillusioned with an industry that does not adequately seek their input and may eventually not support the forest industry financially or politically. Sustainable forestry relies on the support of an informed public that believes its opinion matters on how Crown forests are to be managed.

Under the Forest and Range Practices Act, more emphasis will be placed on strategic level public input and related planning. This may result in fewer formal opportunities for site-specific public input. However, it is anticipated that Canfor and BC Timber Sales will continue to seek out public involvement in operational planning within the DFA. Initial benchmarking data will help to indicate how the future trend of this indicator is likely to proceed.

Monitoring and Reporting Procedures

The RACI Process for each aspect of communication is outlined in the "Creating Opportunities for Public Interest" document. All communications will be documented within Canfor's and BC Timber Sales' databases, which will enable tracking of all communication and responses. A summary of the percentage compliance to the communication strategies will be reported on an annual basis for the operating period of April 1 to March 31.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for monitoring, tracking and reporting this indicator. While the personnel actively responsible for doing this will vary, they must all ensure the type and number of opportunities will be tracked. Continual improvement will be focused on evaluating the effectiveness of the input at the planning level vs. the operational practices within public plans, which lead to participation and continual improvement.

3.36 Viewing of Access Plans

Indicator Statement	*Target and Variance*
Annual public review of Canfor and BC Timber Sales TFL30 road access plans.	Target: On or before October 1st of each year Variance: +1 month

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value: Short and Long Term Benefits
Objective: Maintaining a flow of non-timber benefits

Description of Indicator

Forestry roads provide access for industry and the public to large portions of the DFA. Creating, maintaining, deactivating, and closing these roads is an ongoing process that requires careful planning. Because many non-forestry users of these roads have an interest in their management therefore, it is important to provide opportunities for viewing of Canfor and BC Timber Sales current access plans. The input received from such viewings can be used to plan future access management activities.

Sustainable forest management includes non-industrial uses of the forest and access to the forest can influence ecological, economic and social values. For example, constructing a road may provide the public with access to new lakes for fishing, but it may also open areas to hunting and poaching pressure. Closing a road may protect wildlife values in an area, but a local lodge may rely on that road for recreational access. By providing a viewing of access plans and receiving input, Canfor and BC Timber Sales will be able to manage forest roads for the broadest spectrum of interests.

Current Practices and Status of Indicator

Currently, Canfor and BC Timber Sales provide the public with opportunities to review their cutblock and road access information through the forest development planning process. Many public and stakeholder interests contact Canfor and BC Timber Sales for harvest schedules and road access information for the winter. These information requests are particularly common in the late fall, most likely for hunting purposes.

Establishment of Targets and Future Practices

The target of providing an annual viewing of current access plans by October 1st was established to reflect Canfor's and BC Timber Sales' commitment to receiving input on access management. A one-month variance was established to reflect the possibility that completing access plans may run into unforeseen complications.

Canfor and BCTS participated with other licensees in the Prince George Forest District on October 24, 2005 to road access plans for the winter. An ad was placed in the local newspaper and attendance was low by the public.

Forecasting and Predicted Trends

This indicator cannot be quantifiably modelled as the target deadline is either achieved or it isn't. However, a "what if scenario" can be used to illustrate the value of the chosen target in relationship to SFM. As this indicator identifies the target as providing a viewing of Canfor's and BC Timber Sales' current access plans of the DFA, only one other scenario applies for the "what if scenario" analysis:

a) What if there isn't a viewing provided of Canfor's and BC Timber Sales' current access plans of the DFA?

Providing viewing opportunities of access plans encourages public input into the planning process. If Canfor and BC Timber Sales did not provide this opportunity, the views of the public would not be properly incorporated into forest management planning within the DFA. Access management is implemented in order to control public and industrial access to help conserve other forest resource values, including wildlife habitat, guiding and trapping, hunting, and recreation opportunities. Failure to consider the impacts of access management on these values could result in economic harm to non-forestry industries. In addition to economic impacts, social values derived from recreation could be harmed if access plans do not consider their needs.

Canfor and BC Timber Sales are committed to providing a viewing of current access plans by October 1st of each year. Comments will be considered when future access management activities are planned.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will be responsible for opportunities for the viewing of public access plans on or before October 1st. The success in achieving this indicator will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

As stated, Canfor and BC Timber Sales are responsible for the monitoring, tracking, and reporting of this indicator. If a viewing is not provided by the deadline, or within the variance period, Canfor and BC Timber Sales will review their access planning procedures and determine ways to meet the target date

3.37 Survey of Non-Timber Uses and List of Quality & Value of Non-timber Forest Products

Statement of Indicator	*Target and Variance*
Public survey of non timber uses within the DFA	Target: at least every 4 years Variance: +1 year
A list of quality and value of non-timber forest products from the DFA	Target: March 31, 2007 Variance: + 3 months

This indicator addresses the following CSA-SFM parameters

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Timber and Non-Timber Benefits
Value: Short and long term benefits.
Objective: Maintain a flow of non-timber benefits.

2) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Fair Distribution of Benefits and Costs
Value: Fair Distribution of Benefits and Costs
Objective: Maintain the distribution of benefits and costs.

Description of Indicator
As sustainable forest management pertains to the interaction of social, ecological and economic factors, forest managers must not only be cognisant of the range of different uses on the DFA, but also how these uses/values change throughout time. Since forest management activities can have both positive and negative effects on other uses, it is important to be able to recognize the wide range of uses/values for consideration in sustainable forest management planning.

This indicator measures the number of different local uses/values within the DFA as well as the intensity for each value/use. As data is collected through the public surveys possible changes can be evaluated.

Current Practices and Status of Indicator
A commercial and non-commercial use survey was undertaken with the results being mapped. There is a greater variability of non-commercial use than commercial uses. Popular non-commercial uses include camping, hiking, hunting, fishing, snowmobiling, berry picking, skiing and others. Commercial use includes trapping, guiding and forestry.

On October 2003 the PAG meeting led to recommendations that diversity index survey methodology be revisited. A PAG working group developed new methodology, which was presented to the PAG members during the June 2004 meeting. A contract was established with UNBC in March 2006 to survey users of the TFL30 for recalculation the diversity index. It is believed that several more samples will be included in this survey approach and will provide a better representation of the diversity of forest users. Results will be available for the 2006/07 annual report.

Establishment of Targets and Future Practices
Targets were established to represent Canfor and BC Timber Sales commitment to sustainable forest operations that maintain non-timber values. A commercial/non-commercial diversity index enables Canfor and BC Timber Sales to evaluate the changes in diversity of uses/values over time.

Forecasting and Predicted Trends
It is expected that Canfor and BC Timber Sales will undergo regular non-timber benefit surveys as outlined in this measure. It is worthwhile to use a "what if scenario" in order to better consider the importance of this indicator. As the indicator currently has a target of conducting a survey at least every 4 years, one other scenario should be considered:

a) What would happen if the survey of local uses/values placed on the forest were never taken?

Values/uses that are not identified through a regular survey may be overlooked and negatively effected by forest management activities if a uses/values survey were not done. This negative impact could have social, economic

and/or ecological ramifications. The public may lose confidence in the SFM process and feel their concerns are not being addressed. Without regular input from the public about non-timber benefits it would be difficult to ensure Canfor and BC Timber Sales are adapting to the changing values/uses the public places on the forest within the DFA.

The above scenario helps to identify some of the potential impacts of not achieving the stated target for this measure. Therefore, Canfor and BC Timber Sales will continue to survey the public on the non-timber benefits within the DFA in accordance with the target.

Monitoring and Reporting Procedures

Data to calculate this measure will be gathered through a public survey on a regular basis. In June of 2005 NBC was contracted to conduct the survey for TFL30. The results of the survey are to be available for the annual report.

Responsibility and Continuous Improvement Opportunities

The Planning Forester will be responsible for ensuring a commercial/non-commercial uses survey for TFL30 is undertaken on a regular basis according to the established target. Canfor's and BC Timber Sales' commitment to continuous improvement is evident in the adjustments, which have been made to the survey method to date. The results of the new methodology will be reassessed to ensure that they represent the intent of the measure.

3.38 Local Contract Value

Statement of Indicator	*Target and Variance*
Percentage of money spent on forest operations and management in the DFA provided from the North Central Interior Suppliers\Contractors – applies to Canfor only.	Target: ≥90% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Community and Sustainability
Value: Community well being.
Objective: Support opportunities for maintaining a resilient and stable community.

Description of Indicator

Forests provide many ecological benefits but they also provide substantial socio-economic benefits. In order to have sustainable socio-economic conditions for local communities associated with the DFA, local forest-related businesses should be able to benefit from the work that is required in the management of the DFA. Furthermore, for small forestry companies to contribute to and invest in the local economy there must be assurances that there will be a consistent flow of work. In the same way that larger licensees depend on a secure flow of resources to justify investment in an area, small businesses depend on a sustained flow of opportunities to develop and invest in the local community.

Local North Central Interior BC (NCI) contracts are considered to be those of which the contractor is located in the geographic area bounded by 100 Mile House in the south, Fort St. John in the north, Valemount in the east and Terrace in the west. . The total dollar value of goods and services considered to be local will be calculated relative to the total dollar value of all goods and services used. This calculation will be used to derive the percentage of money spent on forest operations and management of the DFA from suppliers in NCI BC.

Current Practices and Status of Indicator

A query of the financial data stored within Canfor's accounting system allows for an indication of the current status of this indicator and serves as a methodology to track monies spent within the DFA to benefit the North Central Interior.

Table 14. Current Status of Contract Value within the North Central Interior.

Current Status of Indicator *	Year	Target	Achieve By:
92.4%	2000	>90%	Annually
93.0%	2001	>90%	Annually
95.2%	2002	>90%	Annually
99.1%	2003	>90%	Annually
98.6%	2004	>90%	Annually
99.4%	2005	>90%	Annually

**Current status is based on a calendar year Jan.1 to Dec. 31.*

Establishment of Targets and Future Practices

The target was based on Canfor's past performance and reflects their commitment to supporting North Central Interior businesses.

Forecasting and Predicted Trends

This indicator is not easy to quantifiably forecast through the modelling process over a defined time frame. However, it is important to identify what the accepted target means to SFM. The use of a “what if scenario” can be beneficial in identifying anticipated future trends for an indicator such as this. The percentage of money spent on forest operations and management within the DFA provided from the North Central Interior suppliers is an important aspect of SFM because it directly relates to sustainability of the local economy. As the target for this indicator is a value greater than or equal to 90%, one other scenario should be analyzed:

a) What if none of the money spent in the DFA for forest operations and management was attributable to North Central Interior suppliers and contractors?

If the amount of money spent on forest operations and management on the DFA provided from the North Central Interior suppliers was 0%, two important values could be at risk. The first, and most important of these, would be a reduction in the overall economy of the North Central Interior. Utilizing services from outside of the North Central Interior reduces the overall economy and affects local people and businesses. Forest managers sometimes must look to sources outside of the North Central Interior if the goods or services they require are not available in this region. Otherwise, money spent outside the North Central Interior simply reduces the overall economy of the region.

The second risk to supporting business from outside of the North Central Interior is the lack of local knowledge and expertise that could be delivered. Businesses that are located in the North Central Interior generally conduct most of their activities in this region and therefore have a better understanding of the area and its ecology. By utilizing North Central Interior suppliers, the public and employees of the forest industry are likely to receive more valuable services based on locally applied knowledge and expertise.

Due to the identified potential impacts this indicator could have on the economy and stability of communities in the north central interior, Canfor is committed to achieving the stated target for this indicator.

Monitoring and Reporting Procedures

This indicator will be monitored and reported through Canfor's accounting system. Canfor will conduct a financial query of expenditures by postal code for suppliers and contractors within the North Central Interior compared to the total dollars spent The indicator percentage will be included in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor is responsible for the monitoring, tracking and reporting of this indicator. Specifically, accounting departments are responsible for querying the information needed to determine the percentage. The results will be monitored to ensure the target is achieved and if non-compliance occurs tendering processes will be assessed with possible plans of action developed.

3.39 Supply of Timber to Local Processing Facilities

Statement of Indicator	*Target and Variance*
Proportion of timber extracted from the DFA supplied to local processing facilities. – applies to Canfor only.	Target:≥ 95% Variance: -5%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Community and Sustainability
Value: Community well being.
Objective: Support opportunities for maintaining a resilient and stable community.

Description of Indicator

Sustainable forest management involves the balancing of ecological, social and economic values. The social and economic well being of forest-dependent communities is contingent upon a healthy and productive forest ecosystem. These resources provide the sustained flow of social and economic benefits to these communities. Canfor, through its sustainable forest management of the DFA, is committed to ensuring the sustainability of the forest ecosystem. Canfor can also play a key role in the stability and sustainability of socio-economic factors within the area by ensuring that a large proportion of the volume is processed by facilities located in the area.

This indicator provides information regarding the volume (m^3) harvest from the DFA which goes to timber processing facilities located within the boundaries of the Prince George Timber Supply Area (TSA), compared to the total volume of wood harvested from the DFA.

Current Practices and Status of Indicator

Each truckload of wood is scaled at an approved Ministry of Forest and Range scale sites. When the truckload is weighed at the mill's scale and the timber mark is recorded into Canfor's GENUS database system, Logs Production Module (LOGSPROD). Querying LOGSPROD for June 2005 to March 2006 indicates that 100% of the timber harvested was delivered to local Prince George TSA facilities.

Table 15 Percentage of Timber Supplied to Local Facilities

Year	Percentage Volume (m3) Timber
2000	100
2001	98.4
2002	99.8
2003	99.8
2004	99.6
2005	100.0

Establishment of Targets and Future Practices

The target of 95% demonstrates Canfor's commitment to supporting opportunities for maintaining resilient and stable local economies.

Forecasting and Predicted Trends

This indicator is forecast to continue to be 95% or greater of the timber harvested by processed by local Prince George TSA facilities.

Monitoring and Reporting Procedures

This indicator will be monitored through Canfor's GENUS systems-Logs Production Module (LOGSPROD) annually. The Planning Forester is responsible for compiling and presenting the results of this tracking in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities

The Planning Forester will be responsible for tracking this measure through the LOGSPROD system. On an annual basis this measure is to be reviewed. Canfor recognizes the vital role the forest plays in the stability of local economies and is committed to maintaining or exceeding the target.

3.40 Main Access Road Maintained

Indicator Statement	*Target and Variance*
Km's of main access roads maintained to a minimum standard in the spring.	Target: ≥ 200 km Variance: -10%

This indicator addresses the following CSA-SFM parameters:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Community and Sustainability
Value: Community well being.
Objective: Support opportunities for maintaining a resilient and stable community.

Description of Indicator

Roads are a necessary component of forest management as they allow access to the forest resource and its recreational potential. The presence of roads can also affect the environment through alteration of hydrological functions, the potential for erosion and mass wasting, and roads can also adversely affect wildlife populations. Roads need to be carefully planned and access needs to be closely monitored in order to achieve economic efficiency and to mitigate any detrimental effects that may occur.

This measure is a general indicator of the amount of roads that are maintained within the DFA annually to allow the public access benefits to the forest resource. A balance must be met between the value of access to the forest resource, the social costs or benefits, and the ecological costs or benefits in terms of impacts to other resource values such as wildlife. Sustainable forest management pertains to the interaction of ecological, economic and social factors. Therefore, forest managers must be aware that a range of different values and benefits can be derived from the management of forest road access.

Current Practices and Status of Indicator

Road maintenance programs are currently tracked through each Licensee Team member's internal data records. The number of roads currently being maintained in the DFA can be identified through these systems. The current status of this measure is 200 km, of which 8.6 km is maintained by BCTS and the remaining amount by Canfor. The main roads within the DFA include: North Fraser Forest Service Road (FSR), Church FSR, Pass Lake FSR, Seeback FSR, Herrick FSR, Olsson road, Otter road, Hyden road, and Bend road,

Establishment of Targets and Future Practices

Targets are established from a review of past and expected future performance within the DFA. The target reflects the commitment of Canfor and BCTS to ensure a certain amount of roads are maintained in the spring.

Forecasting and Predicted Trends

This measure is not easy to quantifiably forecast over a defined time frame because it is operational in nature. However, it is important to identify what the accepted target means to SFM. Maintenance of forest roads for public use contributes to recreation values, quality of life values and economic values derived from other uses of the forest resource in the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for a measure such as this. When forecasting a variable in this manner, it is useful to identify two potential scenarios:

a) What if only 50% (100km) of the main access roads were maintained for public use?

If only 50% of the main access roads were maintained for public use, it is anticipated that recreation opportunities would potentially decrease, certain quality of life values may decline, and economic and social values from non-timber resources may decrease due to limited public access to the forests within the DFA.

This "what if scenario" analysis implies that a balance of values can be achieved through sustaining a level of main access roads maintained for public use. Although this level has not yet been fully identified through past experience, the Licensee Team is committed to achieving the identified target and adaptively managing forest practices to achieve sustainability.

Monitoring and Reporting Procedures

Each year, Canfor and BCTS review a portion of its roads under their responsibility either by flights or by driving each identified road to ensure good working conditions. These are not formal inspections but specific information regarding maintenance or mitigation works is recorded annually during these checks. Mitigation or maintenance issues that are identified are scheduled for subsequent activities. The indicator percent will be reported in the annual SFM Plan report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for the monitoring, tracking and reporting of this indicator. Specifically, harvesting supervisors are responsible for determining the roads to review and maintain each year. Canfor and BC Timber Sales will explore the effectiveness of this indicator in determining whether the public continues to receive benefits from the forest industry.

3.41 Stumpage Paid to Government

Indicator Statement	*Target and Variance*
The percent of stumpage paid on time to Government – applies to Canfor only	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Fair Distribution of Benefits and Costs
Value: Fair Distribution of Benefits and Costs
Objective: Maintain the distribution of benefits and costs.

Description of Indicator

The payment of stumpage owing on the timber harvested by Canfor is a quantifiable indicator of how the public in the DFA is receiving a portion of the economic benefits derived from forests. It is important to note that Canfor does not control how stumpage royalties are spent across the province, or whether the public receives benefits from stumpage or not. However, it should be assumed that a portion of the royalties received from stumpage would be returned to communities within the DFA.

Forests provide many ecological benefits to areas that surround them and also generate significant socio-economic benefits. In order to ensure continual sustainable socio-economic conditions for local DFA communities, all stumpage billings will be paid on time.

BC Timber Sales contributes to socio-economic benefits to the public by way of revenues that are generated through its auctioning of timber. Relative to this indicator, BC Timber Sales will report out annually on the amount harvested and its related revenues.

Current Practices and Status of Indicator

Each month, the provincial government invoices Canfor for stumpage. This invoice is directed to the accounting and payroll departments for immediate processing.

BC Timber Sales does not pay stumpage directly; however, the organisation does generate revenue through stumpage paid by Timber Sale License (TSL) holders who have acquired the right to harvest timber awarded by BC Timber Sales. TSL holders pay stumpage to the crown based on a competitive bid process associated with the auctioning of timber.

This indicator only applies to Canfor.

Currently Canfor have paid 100% of its stumpage to Government on time.

Establishment of Targets and Future Practices

Targets are established from a review of past and expected future performance within the DFA. The target reflects the commitment of Canfor to ensure all stumpage payments are made on time to the government. The target also reflects the commitment of BC Timber Sales to report out on volume harvested and revenue generated.

Forecasting and Predicted Trends

While Canfor intends to pay 100% of stumpage on time to government, the exact level of consistency with this target is difficult to forecast. However, it is important to identify what the accepted target means to SFM. The use of a “what if scenario” can be beneficial in identifying anticipated future trends for an indicator such as this. The percent of stumpage paid annually on time is an important aspect of SFM because it indirectly relates to sustaining the local economy, and therefore certain aspects of "quality of life" for the public. As the target for this indicator is 100%, one other scenario should be analyzed:

a) What if only 50% of stumpage were paid annually on time?

If only 50% of stumpage was paid annually on time, the overall economy of the DFA could potentially be at risk. Stumpage is a payment made to the Crown by forest Licensees based on the volume of timber harvested from

Crown land. Stumpage payments are revenue for the government and this money eventually feeds back into the local economy through various government services, programs or funding opportunities. Various levels of government also finance programs and projects that improve the social conditions of the DFA. A decline in revenue may threaten these activities, possibly leading to a decline in a community's quality of life.

While Canfor has no control of how stumpage fees are spent once they are delivered to the government, payment of stumpage fees ensures that the public is ultimately receiving a portion of the economic benefits that are derived from the forest resource. Due to the impact this indicator could have on the local economy and quality of life, Canfor is committed to pay 100% of annual stumpage payments on time.

Monitoring and Reporting Procedures

The stumpage payment information that will be monitored is available through Canfor's accounting system and future tracking of this indicator will be completed through a yearly analysis of accounting records. The indicator percent will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for the monitoring, tracking and reporting of this indicator. Specifically, financial/ accounting personnel are responsible for determining the percentage of stumpage paid on time. Canfor and BC Timber Sales will explore the effectiveness of this indicator in determining whether the public continues to receive economic benefits from the forest industry.

3.42 Average Income of DFA workers

Indicator Statement	*Target and Variance*
Average income of DFA forestry sector workers compared to provincial average for forestry sector workers.	Target: ≥100% every 5 years Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Fair Distribution of Benefits and Costs
Value: Fair Distribution of Benefits and Costs
Objective: Maintain the distribution of benefits and costs

Description of Indicator

Forests provide a mix of benefits to society, including direct & indirect employment, wood products, good & services, non-market values, tourism, guiding, trapping, recreation, and many others. This indicator focuses on the economic and social benefits to society in the local community that are offered by the forest sector in the form of income. The direct employment and income is a part measure of fair distribution of costs within the local area.

Current Practices and Status of Indicator

The forest sector generally provides a fair and reasonable wage for work done in the area. Usually the forest sector benchmarks its wages against others and develops their own range based on specific company goals such as being competitive in the market place. Based on a review of the Prince George Timber Supply Review 2001 report, the average income of a forest sector worker in Prince George is $46,690. The provincial average income of a forestry and logging sector worker from 2001 StatsCan census is estimated at $42,925. The difference in average Prince George area income compared to Provincial average income is 108.7%. The next census is in 2006 and will likely be available some in the 2007-08 reporting year.

Establishment of Targets and Future Practices

Targets were established from a desire by the PAG to be at least at the provincial average regarding income.

Forecasting and Predicted Trends

This measure is not easy to quantifiably forecast through the modeling process over a defined time frame. However, it is important to identify what the accepted target means to SFM. The use of a "what if scenario" can be beneficial in identifying anticipated future trends for a measure such as this. The average income of forest sector workers in the DFA is an important aspect of SFM because it directly relates to providing benefits to the local economy, and therefore certain aspects of quality of life for the public. As the target for this measure is stated as ≥ 100%, one other scenario should be analysed:

a) What if the average income of DFA forestry sector workers compared to provincial average for forestry sector workers was considerably less than 100%?

If the average income of DFA forestry sector workers was considerable less compared to provincial average for forestry sector workers, then the workforce would probably migrate from the area and therefore the overall economy of the DFA and quality of life for the public would potentially decrease over time.

Fair and reasonable wages help boost the economy because they provide a direct economic benefit to the public. Social values such as quality of life are also tied to fair distribution of benefits.

Monitoring and Reporting Procedures

Average income data will be tracked and reported by Canfor strageic planning forester from queries of BC stats, local community data, and other sources. The indicator percent will be reported in the annual SFM Plan report for the calendar year January 1st to December 31st every five years.

Responsibility and Continuous Improvement Opportunities

The strategic planning forester with Canfor is responsible for the monitoring, tracking and reporting of this indicator. Canfor and BC Timber Sales will explore the effectiveness of locating more local dat for reporting on this indicator.

3.43 Donation to the Local Community

Indicator Statement	*Target and Variance*
Number of donations to the local community – applies to Canfor only	Target: ≥ 6 Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Fair Distribution of Benefits and Costs
Value: Fair Distribution of Benefits and Costs
Objective: Maintain the distribution of benefits and costs

Description of Indicator
This measure indicates how Canfor provides economic and social benefits to the public over and above wages, taxes and stumpage fees through donations and involvement in local community organizations. Types of support opportunities within the local community vary from providing personnel, equipment and/or facilities, to providing cash and product donations. This measure is an important component of a community's economic and social stability, but it is also difficult to quantify as support opportunities often go unrecorded.
Support opportunities help to increase awareness of sustainable forest management and its role within the DFA. This can indirectly lead to building a strong community and creating a viable labour force.

Current Practices and Status of Indicator
This indicator applies to Canfor only.

During 2005, Canfor provided several donations within the community and included such items as:

- United Way Campaign
- Rivers Day
- Scholarships (District 57, CNC)
- Doug Little Symposium Sponsor
- Spirit of the North
- PG Community foundation
- COFI – forestry education modules for schools
- Various sports event (PG minor hockey, iceman, labour classic run,
- Forestry & railway museum
- Library – youth reading club
- Chamber of Commerce – Business awards sponsor
- Drama and Dance through various schools
- Spruce City Wildlife
- and many others

As shown above there are at least 12 donations listed that Canfor has provided to the Community in 2005.

Establishment of Targets and Future Practices
Targets were established from an estimate of one major donation to the community every two months, therefore 6 a year. The target has been easily meet and should be raised to more accurate reflect the accurate donations that Canfor makes in a single year.

Forecasting and Predicted Trends
This measure is not easy to quantifiably forecast through the modeling process over a defined time frame. However, it is important to identify what the accepted target means to SFM. The use of a "what if scenario" can be beneficial in identifying anticipated future trends for a measure such as this. The number of support opportunities provided in the DFA is an important aspect of SFM because it directly relates to sustaining the local economy, and therefore certain aspects of quality of life for the public. As the target for this measure is stated as, one other scenario should be analysed:

a) What if the annual number of support opportunities provided in the DFA was considerably less than 6?

If the annual number of support opportunities provided in the DFA was considerably less than 6, the overall economy of the DFA and quality of life for the public could potentially decrease over time. Support opportunities help boost the economy because they can be an indirect economic benefit to the public. If support opportunities were less than 6 annually, local communities would not be receiving an adequate portion of the economic benefits derived from forests through the forest industry. Social values such as quality of life are also tied to annual support opportunities. Local community organizations provide a variety of public benefits and often rely on support opportunities from the forest industry to fund community events. If less than 6 support opportunities were provided annually, many of these community events might not be possible, thereby potentially decreasing the public's quality of life.

Due to the significant impact this measure could have on the local economy and the public's perceived quality of life, Canfor is committed to continue to provide support opportunities on an annual basis.

Monitoring and Reporting Procedures

Support opportunities will be tracked and reported by Canfor community relations' manager annually and reported collectively for the DFA. The donation information will be track using a spreadsheet or database and provided to the strategic planning forester for reporting. The indicator percent will be reported in the annual SFM Plan report for the calendar year January 1st to December 31st.

Due to the significant impact this measure could have on the local economy and the public's perceived quality of life, Canfor is committed to provide $\geq$ 6 support opportunities on an annual basis.

Responsibility and Continuous Improvement Opportunities

Canfor is responsible for the monitoring, tracking and reporting of this indicator. Specifically, financial/ accounting personnel are responsible for determining the support opportunities to fund in the community. Canfor and BC Timber Sales will explore the effectiveness of this indicator in determining whether the public continues to receive economic benefits from the forest industry.

Continuous improvement over the next year will include defining minimum dollar amounts level for cash donations, defining minimum levels for in-kind contributions, and expanding the indicator to include BC Timber Sales.

3.44 Loss Time Accidents

Indicator Statement	*Target and Variance*
Number of loss time accidents (days) in Woodland Operations – applies to Canfor only.	Target: 0 Variance: 0

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Multiple Benefits to Society
CSA SFM Element: Fair Distribution of Benefits and Costs
Value: Fair Distribution of Benefits and Costs
Objective: Maintain the distribution of benefits and costs

Description of Indicator

The health and safety of forest workers and members of the public is an important objective that is essential to SFM. Canfor considers employee and public safety as a primary focus of all forestry related operations. Evidence of this high priority can be seen in the company mission or policy statements. This indicator was developed to track and report out on the number of loss time workplace accidents that occur within the woodlands division. Two types of workplace accidents are the most common within the forest industry. These are loss time accidents (LTAs), and accidents where medical aid or treatment was necessary but no loss of work time was experienced by the employee. Through this indicator, only LTAs will be tracked and monitored. Monitoring and reporting the number of workplace LTAs will help Canfor identify problems with procedures and increase overall awareness in order to prevent future injuries and LTAs.

Current Practices and Status of Indicator

The current status for this measure is derived through an analysis of safety reports and a tally of all LTAs. Over the last reporting year there were 0 loss time accidents in woodlands within the DFA.

No loss time accidents occurred in the DFA during April 1, 2005 to March 31, 2006.

Establishment of Targets and Future Practices

The target for this indicator was established so that Canfor would operate toward a goal of zero woodlands loss time accidents. Canfor will continue to implement safety programs to reduce accidents and injuries in all aspects of woodland operations.

Forecasting and Predicted Trends

While Canfor will continue to strive for no loss time accidents, the exact level of success they will have in achieving this is difficult to forecast due to the unpredictable nature of forestry woodland operations. However, it is important to identify what the accepted target means to SFM. The number of loss time accidents each year relates directly to social values within the DFA. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator states a target of zero, one other scenario should be analyzed:

a) What if more than the target amount of lost time accidents in Woodland Operations occurred each year?

If a LTAs occurred each year, social values and quality of life could decrease in the DFA. Loss time accidents are usually directly related to safety issues in the workplace. If an employee's perceived risk of being injured on the job increased, there would be less incentive to do the required work. Reduced productivity would likely decrease the overall quality of life in the DFA and community stability could also decline. WCB and other related costs due to accidents in the workplace would likely increase. This would result in a potential decrease of economic values because full economic returns would not be realized from the forest resource.

Productivity and economics aside, any loss time accident has the potential to have tragic consequences for the worker and their family. The target should be achieved for no other reason then it means workers are not being injured on the job. For these reasons, Canfor is committed to maintaining safety as a high priority and will work toward achieving the stated target for this indicator.

Monitoring and Reporting Procedures

Canfor has a safety committee that is responsible for ensuring that standards are in place to promote safe work practices. All accidents are reported to a member of the safety committee once they occur and are recorded for reporting purposes. In addition to queries of accident record databases, the Workers Compensation Board may also be used as a source for DFA accident reports. The number of LTAs will be included in the SFMP annual report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor is responsible for the monitoring, tracking, and reporting of this indicator. Specifically, personnel on safety committees are to ensure all accidents are recorded in the accident record database. Reviews of the database may detect areas of concern that could be improved by changing current practices.

Continuous improvement over the next year will include look at including Canfor contractor's, BCTS staff, and expanding or replacing loss time accidents with near misses or other better indicators.

3.45 Aboriginal and Treaty Rights

Indicator Statement	*Target and Variance*
No unauthorised forestry activities within legally recognized (Provincial and Federal) treaty areas and Agreement-in Principle areas.	Target: 100% compliance Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element: Aboriginal and Treaty Rights
Value: Aboriginal and Treaty Rights
Objective: Recognition and respect for Aboriginal and treaty rights.

Description of Indicator

A treaty is a negotiated agreement that spells out the rights, responsibilities and relationships of First Nations and the Federal and Provincial governments (Government of BC, 2005). Depending on the nature of the treaty, specific First Nations will exercise a variety of rights over the area described in the treaty. Any forestry activities that occur in these areas without the permission of the appropriate First Nation peoples could have serious legal, economic, and social repercussions. Respecting Aboriginal treaty rights is a part of sustainable forest management as it protects social and economic values.

Current Practices and Status of Indicator

Two First Nation Bands have asserted Aboriginal interests in the TFL30, the McLeod Lake (Tsekani) and the Lheidli T'enneh Band. The McLeod Lake Band signed a Treaty 8 settlement agreement with the Federal and Provincial governments in 2000. None of the settlement lands are within the TFL30. The Lheidli T'enneh First Nation is currently working on developing a treaty with the Federal and Provincial government that will clarify the nature and extent of Aboriginal rights within the DFA. Canfor and BC Timber Sales have not been informed of any agreement describing treaty rights or Aboriginal rights on TFL30 because of treaty negotiations.

Establishment of Targets and Future Practices

Canfor and BC Timber Sales have set a target of no unauthorized forestry activities within legally recognized treaty areas to uphold legal, social, and economic principles of sustainable forest management. To meet the target, Canfor and BC Timber Sales will review the level of legal compliance with duly established Aboriginal and treaty rights as law and accepted by government.

Currently there is no treaty area identified and no Lheidli T'enneh First Nation has Agreement-in Principle Areas within the DFA boundaries, therefore Canfor and BCTS are in 100% compliance with not harvesting any areas within legally recognized (Provincial and Federal) treaty areas in the DFA.

Forecasting and Predicted Trends

Canfor and BC Timber Sales will respect and be 100% in compliance with duly established Aboriginal rights on the DFA.

While Canfor and BC Timber Sales will take every step possible to avoid unauthorized forestry activities within legally recognized treaty area; their exact level of success in achieving this is difficult to forecast due to the possibility of human error. However, it is important to identify what the accepted target means to SFM. Respecting the legal rights of First Nations people within the DFA is an important aspect of sustainable forest management. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator states a target of zero unauthorized activities, one other scenario should be analyzed:

a) What if there were unauthorized forestry activities within legally recognized treaty areas?

Any unauthorized forestry activity in a legally recognized treaty area could have economic repercussions for Canfor, BC Timber Sales and the First Nation people involved. If the treaty area was relied upon for economic purposes, such as logging, trapping, mushroom picking, etc, the unauthorized activity may damage these resources. The unauthorized activity may have an impact on social values. If the area in question was a site of

cultural significance to First Nation peoples, such as a village site, cemetery, or sacred place, the damage done could be irreversible to both the site and First Nation/ industry relations.

For these reasons, Canfor and BC Timber Sales are committed to preventing any unauthorized forestry activities within legally recognized treaty areas.

Monitoring and Reporting Procedures

The information that is required to monitor this indicator includes a summary of the number of unauthorized forest management operations within legally recognized treaty areas. This information is collected during EMS checklist reviews and harvesting inspections and is stored in Canfor's and BC Timber Sales' databases. The number of incidents will be included in the annual SFM Plan report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor's Strategic Planning Forester and BC Timber Sales' Planning Forester is responsible for ensuring no activities are planned within legally recognized treaty areas. The Woodlands Manager and harvesting supervisors are responsible for monitoring field operations to ensure no accidental trespasses occur. If an unauthorized activity occurs in a treaty area, the effected First Nation will be contacted immediately and, if required, steps will be taken to rehabilitate any damage. Consultation with First Nations people during Forest Stewardship planning processes will provide opportunities for both parties to determine how to best conduct forest operations in the vicinity of legally recognized treaty areas.

3.46 FSP Referral and PMP Referral to First Nations

Indicator Statement	*Target and Variance*
All Forest Stewardship Plan (FSP) and associated major amendments are referred to affected Aboriginal peoples	Target: 100% referrals Variance: 0%
Pest Management Plans (PMP) and associated major amendments are referred to affected Aboriginal bands	Target: 100% referrals Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element: Aboriginal and Treaty Rights
Value: Aboriginal and Treaty Rights
Objective: Recognition and respect for Aboriginal and Treaty Rights

Description of Indicator

This indicator is designed to evaluate the success in providing opportunities to Aboriginal peoples to be involved in forest management planning processes. Specifically, all Forest Stewardship Plans and associated major amendments are to be referred to effected Aboriginal groups for their input. Incorporation of First Nation people and their unique perspective into the forest planning process is an important aspect of SFM. This indicator will contribute to respecting the social, cultural and spiritual needs of the people who traditionally and currently use the DFA for the maintenance of traditional aspects of their lifestyle.

As pesticides may have to be used within the DFA to meet certain forestry objectives, Pest Management Plans will be prepared to outline their use. This use may include areas of interest to various First Nations peoples within the DFA and the plans need to be referred to them for input. The location and type of pesticide use may change as a result of their consultation.

This indicator will measure the success of Canfor and BC Timber Sales in having all Pest Management Plans and associated major amendments referred to affected Aboriginal bands.

Current Practices and Status of Indicator

Canfor and BC Timber Sales currently have individual working relationships with local First Nation peoples within the DFA. Currently Canfor has an approved Forest Stewardship Plan the covers the DFA. Both of the First Nation communities have had the opportunity for participation and input in the Forest Stewardship Plan development within the DFA.

In August and October 2004, Canfor sent letters out to the First Nation communities asking for their input prior to drafting the FSP for public review. In addition, First Nations were also invited to a public open house to review and comment on the plan. First Nations were then phoned to setup a meeting to review and gather comments on the draft FSP. A meeting was held with one of the Bands to further explain the contents of the FSP. No written comments were received from either of the Bands.

BC Timber Sales has an approved Forest Stewardship Plan within the Prince George Forest District, however it does not currently cover the DFA. During 2006, BC Timber Sales will be amending the approved Forest Stewardship Plan to include the DFA and will refer to the First Nations bands.

In the past, Canfor and BC Timber Sales have used a variety of pesticides to achieve forestry objectives. The main use has been to control competing vegetation on regenerating cutblocks. Historically, pesticide use was conducted under the auspices of a Pesticide Use Permit (PUP). Referrals to affected Aboriginal bands were a component of the PUP application process. On December 31, 1994, the new Integrated Pest Management Act came into effect in British Columbia. Rather than obtain PUPs, industrial users of non-high risk class pesticides are now required to prepare a Pest Management Plan (PMP) as per the requirements under the Act and its regulations. Public consultation is a requirement for PMP preparation.

In January 2005, Canfor referred the 2005 PMP to both First Nations bands. In addition, Canfor placed an ad in the local paper providing the public including First Nations the opportunity to review and provide comment.

In February 2006, BC Timber Sales referred the 2006 PMP to First Nations bands. In addition, BC Timber Sales placed an ad in the local paper providing the public including First Nations the opportunity to review and provide comment.

Establishment of Targets and Future Practices

The indicator target of 100% was established to reflect Canfor's and BC Timber Sales' commitment to providing First Nations peoples with opportunities into the management of forest lands within the DFA. All future PMP major amendments will be referred to affected Aboriginal bands giving them an opportunity to express opinions, knowledge, and concerns on the use of pesticides within the DFA and to provide input at the Forest Stewardship Plan development stage. Current practices to meet this commitment will be continued and improved where necessary to meet the indicator target.

Forecasting and Predicted Trends

This indicator is not easy to quantifiably forecast over a defined time frame. However, it is important to identify what the accepted target means to SFM. Referring all FSP and associated major amendments to effected First Nation peoples directly affects social values and indirectly affects economic values of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for this indicator. As this indicator has a stated target of referring all FSP and associated major amendments to effected Aboriginal peoples, one other potential scenario should be developed:

a) What if no FSPs or associated major amendments were referred to effected Aboriginal peoples?

If FSPs or associated major amendments were not referred to affected aboriginal bands, adequate attention may not be given to valuable Aboriginal input. Aboriginal input into the forest planning process is required to adequately consider cultural heritage values within the DFA and to ensure that forest management respects treaty rights. As some areas of cultural significance may not be in legally recognized treaty areas or widely known by the general public, the only way for the forest industry to be aware of them is from First Nation peoples themselves. Failure to refer plans to them may result in significant loss of First Nation's cultural features. Aboriginal participation in the planning processes could decrease and impacts to other resource values such as cultural heritage, non-timber forest resources and biological richness could potentially occur. Traditional knowledge could also potentially be lost if FSPs and associated major amendments are not referred to the affected Aboriginal peoples. Economically, Canfor and BC Timber Sales may lose clients if they perceive that Aboriginal peoples input is not valued.

It is anticipated that all FSP and major amendments will be referred to Aboriginal peoples, and it is hoped that First Nation people become more involved with all forest planning processes.

While Canfor and BC Timber Sales have every intention of referring all PMP and associated major amendments to affected Aboriginal bands, their exact level of success in achieving this target is difficult to forecast due to the possibility of human error. However, it is important to identify what the accepted target means to SFM. Respecting the concerns and opinions of First Nations in the DFA is an important aspect of sustainable forest management. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator states a target of 100% of all PMP and associated major amendments are to be referred to effected Aboriginal bands, one other scenario should be analyzed:

a) What if no PMP or associated major amendments were referred to effected Aboriginal bands?

The use of pesticides in the DFA without Aboriginal peoples input or knowledge could have economic and social repercussions. Aboriginal peoples have historically used many areas within the DFA for a variety of reasons. These include hunting, trapping, berry and mushroom picking and fishing. They have often had concerns over the impact pesticides may have on these resources, and have expressed their interest in being notified of pesticide use in their areas of interest. If they were not given an opportunity to participate in the PMP planning process they would lose faith in the forest industry's commitment to public consultation. The broader public may gain the perception of a forest industry using potentially dangerous substances without informing First Nation people. The negative publicity of such perceptions may impact the economy of the DFA and undermine confidence in the SFM process.

For these reasons, Canfor and BC Timber Sales are committed to referring all PMP and associated major amendments to affected Aboriginal bands.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will maintain a list of all First Nation bands and their areas of interest within the DFA. During Forest Stewardship Plan/ major amendment preparation, all effected Aboriginal groups will be contacted as per Canfor's and BC Timber Sales' communication strategies for referral. A record will be kept of each referral in Canfor's and BC Timber Sales' referral tracking systems. Canfor and BC Timber Sales will track and monitor PMP/amendment referrals to Aboriginal peoples through their referral tracking systems.

This system will be queried and the indicator percentage will be reported in the annual SFM Plan report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Planning foresters are responsible for referring all FSP and associated major amendments to the affected Aboriginal groups. They are also responsible for updating the referral tracking system to record these referrals. Canfor and BC Timber Sales will work co-operatively with First Nation peoples to solicit their involvement and input into planning processes.

Silviculture Foresters are responsible for ensuring affected Aboriginal groups are referred to in the preparation of PMP. If pesticides are used in an area of Aboriginal interest without their knowledge, the affected Aboriginal group will be contacted immediately and, if required, steps will be taken to consider their input. Information sharing with Aboriginal peoples during PMP planning processes will provide opportunities for both parties to discuss the application of pesticides in the DFA and may provide Canfor and BC Timber Sales with knowledge on how to minimize the possible negative impacts of pesticide use.

Continual improvement will mainly focus on assessing the effectiveness of these FSP and PMP input opportunities.

3.47 Heritage Conservation Act

Indicator Statement	*Target and Variance*
Percent of forest operations consistent with the Heritage Conservation Act	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element: Respect for Aboriginal Forest Values, Knowledge, and Uses
Value: Aboriginal Forest Values, Knowledge, and Uses
Objective: Incorporation of Aboriginal forest values, knowledge, and uses in forest management

Description of Indicator

The *Heritage Conservation Act* has as its stated purpose "to encourage and facilitate the protection and conservation of heritage property in British Columbia". The act prohibits activities that will damage specific heritage resources. The Act states a person must obtain a permit from the Minister of Community, Aboriginal and Women's Services before they may:

- damage or alter a burial place with historical or archaeological value;
- damage or alter First Nations rock paintings or carvings with historic or archaeological value;
- damage, alter, or remove any heritage object from a site that contains artefacts or other evidence of human habitation or use before 1846.

There are heritage resources within the DFA that are protected by the Act. Some of the more common features that are of concern for forestry operations are culturally modified trees (trees which were modified by First Nations people's use), cache pits (excavated food storage pits), and pit house sites. Measures must be taken to ensure forest operations are consistent with the Heritage Conservation Act to preserve and manage these features to meet social and cultural needs of First Nation peoples and the broader community in the DFA.

This indicator is designed to ensure that forest operations are conducted to conserve cultural features. By ensuring forest operations are consistent with legislation, Canfor and BC Timber Sales contribute to SFM by respecting important First Nations' cultural features that are a testament to their long connection to the DFA. Tracking the level of consistency will allow Canfor and BC Timber Sales to evaluate how successful this implementation is and improve procedures if required.

Current Practices and Status of Indicator

The Heritage Conservation Act was passed in 1996 and was the latest in a series of acts designed to protect British Columbia's heritage resources. Canfor and BC Timber Sales have adhered to the Act in conserving cultural resources within the DFA at a variety of planning and operational stages.

Known features protected under the Act are relatively easy to plan forest operations around. Forest Stewardship Plans have also used an Archaeological Predictive Model to assess the potential presence of unknown archaeological resources within proposed harvest areas or road access corridors. Where activities are proposed within zones of high archaeological potential, Canfor and BC Timber Sales conduct site level Archaeological Impact Assessments (AIA) to identify, assess and record any archaeological resources that may be present. Trained archaeologists identify resources that are to be protected under the Heritage Conservation Act.

Specific requirements to conserve cultural resources are prescribed in site plans. These strategies may include alteration if the appropriate site alteration permit is obtained. Harvest and subsequent silviculture inspections ensure that strategies are implemented as stated in the site plan.

From April 1, 2005 to March 31, 2006, 100% of Canfor and BCTS forest operations were consistent with the Heritage Conservation Act.

Establishment of Targets and Future Practices

The target was established by the legal requirement for all forest operations to be consistent with the Heritage Conservation Act. The target also reflects Canfor's and BC Timber Sales' commitment to manage the cultural and historic values of the DFA in accordance with the law to protect these values for future generations. Canfor and BC Timber Sales will continue to use AIA to detect unknown resources, determine if they are under the Heritage Conservation Act and will conduct forest operations in a manner consistent with the Act.

Forecasting and Predicted Trends

It is anticipated that the target of 100% of forest operations will be consistent with the Heritage Conservation Act. The exact level of success is difficult to forecast as it is operational in nature and is dependent on the nature of the site, weather, and human error. However, it is important to identify what the accepted target means to SFM. Conservation of cultural features protected under the Heritage Conservation Act primarily influences social values within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for this indicator. As this indicator currently has a target set at 100%, one other scenario should be identified:

a) What if only 50 % of forest operations were consistent with the Heritage Conservation Act?

The failure to have 100% of forest operations consistent with the Act could lead to significant cultural loss to both First Nations and the general public within the DFA. Contributions to planning processes by each group would likely be reduced. Aboriginal communities may no longer become involved if they felt their history was not conserved in accordance with the law. Members of the general public may also lose faith in the forest management and planning processes if the cultural heritage of the DFA was not recognized as an important value.

In addition to the social and cultural impacts that may occur from forest operations being inconsistent with the Heritage Conservation Act, there may be economic penalties to pay. Significant fines may be levied against Canfor and BC Timber Sales for being negligent in their responsibilities, and Canfor and BC Timber Sales may lose clients that are angered by the destruction of heritage features.

The above "what if scenario" helps to identify some of the potential future impacts of not achieving the stated target for this indicator. Therefore, Canfor and BC Timber Sales will continue to ensure that 100% of forest operations are consistent with the Act.

Monitoring and Reporting Procedures

Canfor and BC Timber Sales will continue to conduct pre-work meetings prior to the start of projects, monitoring inspections as the work is progressing and final inspections once the work is completed to ensure forest operations are consistent with the Heritage Conservation Act. These initial, in between and final checks are part of Canfor's and BC Timber Sales' EMS system and the future trend of this indicator will remain at the target of 100% if all processes and protocols are followed.

If a non-compliance with the Act occurs in the field, it will be recorded on an activity inspection form and then entered into an incident tracking database. The incident will also be reported to the Heritage Branch of the Ministry of Community, Aboriginal and Women's Services and the Ministry of Forests and Range. The indicator percentage will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Planning foresters are responsible for identifying areas of cultural heritage during the Forest Stewardship Plan development stage through the Archaeological Predictive Model. Foresters responsible for preparing road plans and site plans have to ensure that prescribed management activities are consistent with the Heritage Conservation Act. Harvesting and Silviculture supervisors are responsible for implementing the site plan requirements on the ground.

Canfor and BC Timber Sales will investigate the possibility of increasing the accuracy of predicting the presence of archaeological sites. Canfor and BC Timber Sales, in co-operation with First Nations, the public and local archaeologists, will explore the effectiveness of strategies utilized to minimize impact to cultural resource features.

3.48 Aboriginal Participation in Planning Process

Statement of Indicator	*Target and Variance*
Documented opportunities for Aboriginal peoples' participation in developing public plans.	Target: ≥ 1 meaningful face to face meeting per year Variance: 0

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development.
CSA SFM Element: Respect for Aboriginal Forest Values, Knowledge and Uses.
Value: Aboriginal forest values, knowledge and uses.
Objective: Incorporation of Aboriginal forest values, knowledge and uses in forest management.

Description of Indicator

The incorporation of Aboriginal peoples' needs into forest planning is a key aspect to sustainable forest management. As such, this indicator contributes to respecting the social, cultural heritage and spiritual needs of people who traditionally and currently use the DFA for the maintenance of traditional aspects of their lifestyle. Working with Aboriginal people to identify, define and develop management strategies for these special and unique needs, is an important component of being able to maintain elements on the landscape for the maintenance of traditional lifestyle values of Aboriginal peoples.

This indicator will list and report out on all documented opportunities provided to local Aboriginal peoples to participate in the development of forest management operational plans.

Current Practices and Status of Indicator

Public plans refer to the Management plan (5 year), the Forest Stewardship Plan (5 year) and the SFM plan (3-5 years). The target of one meeting per year with each Aboriginal people group may increase if major issues arise within the DFA.

Canfor has developed "Creating Opportunities for Public Interest" process, which is a communication framework for interested parties (including Aboriginal Peoples) to participate in the planning process and present issues of concern. BC Timber Sales has a similar process called “Keeping in Touch” that provides for tracking of communications with interested parties. Both processes include the gathering of information from the interested parties and incorporating this information into the development of public plans. Canfor and BC Timber Sales presently have working relationships with two of the local First Nations groups; the McLeod Lake Indian Band and the Lheidli T'enneh First Nation.

The McLeod Lake Indian Band is an active member of the CSA-SFM certification Public Advisory Group and this is an employee of the Lheidli T'enneh First Nations attending the meetings. Current uses of the DFA by the Lheidli T'enneh people include but are not limited to berry picking, medicinal herb gathering, fishing, hunting, and firewood gathering. More than 20 Aboriginal traditional use sites have been identified within the DFA. One of the greater challenges remains in working on the cultivation of long-term working relationships between these groups and Canfor and BC Timber Sales, which will lead to a better understanding of each other's needs and interests.

Canfor has meet with the Lheidli T'enneh Band Chief over the last year to discuss ways to more effectively provide and gather information for the development of public plans. Recently, Canfor has meet with the McLeod Lake Indian Band to Chief to discuss interest in developing joint strategies on the management around cultural heritage trails and culturally modified trees. Therefore a total of 2 face to face meeting occurred during the reporting year.

Establishment of Targets and Future Practices

The target of at least one meaningful face to face meeting with each Aboriginal group was set to facilitate opportunities for information exchange. Canfor and BC Timber Sales will continue to consult with Aboriginal people groups as forest management activities continue within the DFA. Ensuring that Aboriginal peoples within the DFA have at least one opportunity for a face to face meeting per year to provide input into the forest management planning process, thus demonstrating Canfor’s and BC Timber Sales’ commitment to respecting Aboriginal forest values, knowledge and uses.

Forecasting and Predicted Trends

As more knowledge is gained regarding the special and unique needs of Aboriginal peoples, it is anticipated that these elements will be further integrated with current and future forest management planning. As traditional ecological knowledge of Aboriginal peoples is developed, Canfor and BC Timber Sales will incorporate this information into scenarios used to forecast future forest conditions and future forest management. Without such consultation confidence in the SFMP process might be undermined and forest values may be negatively affected.

Monitoring and Reporting Procedures

Monitoring of meetings held between Aboriginal peoples and Canfor, and Aboriginal peoples and BC Timber Sales, for the purposes of input into forest management planning is the responsibility of the Strategic Planning Forester (Canfor) and Planning Forester (BC Timber Sales) who will include the total number of meetings in the SFMP annual report.

Responsibility and Continuous Improvement Opportunities

Strategic Planning Forester (Canfor) and Planning Forester (BC Timber Sales) will be responsible for developing opportunities with First Nations to get more involved in the public planning processes on the DFA. Other licensees within the two First Nations traditional territory will be approached to become involved in working together to provide joint opportunities.

3.49 Aboriginal Issues Evaluated

Statement of Indicator	*Target and Variance*
Percentage of issues raised by Aboriginal peoples evaluated by Canfor and BC Timber Sales.	Target: 100% Variance: -10%
Percentage of issues raised by Aboriginal Chief & Council or their representative developed into mutually agreed upon strategies.	Target: 100% Variance: -50%

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element: Respect for Aboriginal Forest values, knowledge and uses.
Value: Aboriginal forest values, knowledge and uses
Objective: Incorporation of Aboriginal Forest values, knowledge and uses in Forest Management.

Description of Indicator

Ensuring issues of concern raised by Aboriginal peoples as a result of forest management decisions are evaluated by Canfor demonstrates respect for their unique perspective and historical connection with the forest. Recognition of Aboriginal forest values, knowledge and uses is an important component of sustainable forest management. Monitoring issues of concern raised by Aboriginal peoples with respect to the forest operations is the intent of this indicator.

Incorporating management strategies into the planning process in order to resolve issues raised by Aboriginal leadership is a key aspect to sustainable forest management. This indicator contributes to respecting the social, cultural heritage and spiritual needs of people who traditionally and currently use the DFA for the maintenance of traditional aspects of their lifestyle.

Monitoring how issues raised by Aboriginal Chief and Council are addressed reflects Canfor's and BC Timber Sales' commitment to SFM.

Current Practices and Status of Indicator

Canfor's "Creating Opportunities for Public Interest Process" management system is a communication framework. It achieves this by establishing goals that support good communication, by defining how the communications process will operate, who will be responsible, and by measuring system performance through the use of key performance indicators. This SFM indicator measures the success of meeting the communication strategy requirements as outlined in "Creating Opportunities for Public Interest".

"Keeping in Touch" (KIT) tracks communications between BC Timber Sales and all interested parties that they notify when forestry operations/ developments are to occur. These interested parties include private landowners, lodge operators, trappers, or hunting guides. Strategies have been designed to ensure that information is communicated to these individuals in a timely and efficient manner. This communication considers non-timber users and inhabitants of the DFA and realizes that forestry operations can disrupt lives and businesses. BC Timber Sales is currently in the process of enhancing its communications strategy and exploring possibilities of incorporating it into its existing woodlands information management system, Genus.

The following key performance indicators apply to this measure and will be applied to communication strategies:

- 100% of communications from resource user will be responded to within 30 days
- 100% of commitments made to resource users are delivered within the time frame specified
- 100% of the applicable public is sent notification of planning and development activities associated with TFL30 forest management activities.

Procedures are also in place specifically for First Nation peoples to review and provide feedback on Canfor's and BC Timber Sales' forest operations. These procedures also provide timelines and lay out who is responsible for addressing the issues raised.

During the reporting period, no issues were raised by Bands regarding forest management on the DFA. Therefore no issues needed to be evaluated by Canfor and BC Timber Sales. As Canfor, BCTS and the Bands work together on the public advisory process, relationship will strengthen and issues will become more readily apparent.

Establishment of Targets and Future Practices

The indicator's target of 100% demonstrates Canfor's and BC Timber Sales' commitment to addressing issues raised by Aboriginal peoples during the SFM process. A 10% variance was established, as there are often factors that delay a response such as, difficulties Aboriginal people participating, further research may be required or insufficient understanding of the issues. All public input is an important aspect of the SFM process however, Canfor and BC Timber Sales recognize that the concerns of Aboriginal peoples deserve special attention. Therefore, it is paramount to ensure that all issues raised by Aboriginal peoples are addressed. If the target is not met in the future, strategies will be developed to improve practices, or targets will be adjusted to better reflect practices within the DFA.

Forecasting and Predicted Trends

It is the intent of Canfor and BC Timber Sales to meet the target, and it is anticipated this goal will be met. The exact level of success is not easy to quantifiably forecast as it relies on unpredictable factors such as human error. However, it is important to identify what the accepted target means to SFM. The response to issues raised directly affects social values.of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of 100%, one other potential scenario should be developed:

b) What if there were only 50% of Aboriginal issues raised were addressed by Canfor and BC Timber Sales staff?

If there were only 50% of the issues raised by Aboriginal people were addressed; adequate attention would not be made to valuable public input. Public input into the SFM process is required to adequately consider other resource values within the DFA. If only 50% of issues were addressed, public participation into SFM could decrease and losses to Aboriginal forest values uses and knowledge could be negatively impacted. Confidence in the SFM process could be jeopardized if Aboriginal peoples felt the issues of concern to them were not being addressed,

The above "what if scenario" analysis implies that a balance of values can be achieved through achievement of the established target. Therefore, Canfor will continue to comply with the communication requirements as outlined in 'Creating Opportunities for Public Interest" (Management System # 6, Canfor) particularly in its application to Aboriginal peoples. BC Timber Sales will continue to follow its communication requirements relative to Aboriginal peoples.

Monitoring and Reporting Procedures

The RACI Process for each aspect of communication is outlined in the "Creating Opportunities for Public Interest" document. All communications will be documented within Canfor's and BC Timber Sales' databases, which will enable tracking of all communication and responses. A summary of the percentage compliance with the procedures will be reported on an annual basis for the operating period of April 1 to March 31.

Responsibility and Continuous Improvement Opportunities

The Strategic Planning Forester (Canfor) and Planning Forester (BC Timber Sales) are responsible for reporting and the tracking results to ensure issues raised by Aboriginal peoples are addressed. Opportunities to improve the performance of this indicator will be discussed within the PAG and internally by Canfor and BC Timber Sales staff.

3.50 Aboriginal Strategy Incorporation

Statement of Indicator	*Target and Variance*
Incorporation of mutually agreed upon strategies to address Aboriginal peoples' values, knowledge, and uses in public plans for the DFA.	Target: 100%, Annually Variance: 0%
Percentage of forest operations consistent with mutually agreed upon strategies.	Target: 100% Variance:0%

These indicators address the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility of Sustainable Development.
CSA SFM Element: Respect for Aboriginal forest values, knowledge and uses.
Value: Aboriginal forest values knowledge and uses.
Objective: Incorporation of Aboriginal forest values, knowledge and uses in Forest Management

Description of Indicator

The development of mutually agreed upon management strategies is only the first step in SFM. Incorporation of those strategies into the public plans demonstrates recognition of Aboriginal forest values, knowledge, and uses. Public plans for these measures refers to the Management plan (5 year), the Forest Stewardship Plan (5 year) and the SFM plan (3-5 years). Monitoring adherence to these strategies is a measure of the success of these strategies to address the issues they were developed for.

These indicators will report on the incorporation and implementation of the strategies that were developed to address Aboriginal peoples issues. As these strategies are put into place tracking of forest activities compliance with these strategies will begin to determine whether these concerns are being addressed appropriately.

Current Practices and Status of Indicator

Currently, Canfor is involved in creating opportunities for interested parties (including Aboriginal Peoples) through the gathering of information from the interested parties and incorporating this information in the development of public plans. Canfor presently has working relationships with two of the local First Nations; the McLeod Lake Indian Band and the Lheidli T'enneh First Nation. Furthermore, both of these First Nation groups are involved in the CSA-SFM certification Public Advisory Group. Current uses of the DFA by the Lheidli T'enneh people include, but are not limited to, berry picking and medicinal herb gathering, fishing, hunting, firewood gathering. More than 20 aboriginal traditional use sites exist within the DFA. Canfor has provided many opportunities for Aboriginal people to provide input into our public plans as shown in the following table. Very low response has been received using newspaper and notification letters, however involvement on the PAG process has yielded a higher response.

Today no mutually agreed upon strategies to address Aboriginal peoples' values, knowledge, and uses in public plans have been developed for use in the DFA. Therefore the percentage of forest operations consistent with mutually agreed upon strategies cannot be reported out on.

One of the Bands was very interested in working on locating, geo-referencing and developing management strategies for cultural importance trails in the area.

Establishment of Targets and Future Practices

Canfor and BC Timber Sales are committed to implementing all of the mutually agreed upon strategies as stated in the public plans. This commitment is demonstrated by the target of 100% (variance 0%) for both indicators. It is anticipated that these targets will be met once mutually agreed upon strategies are in place.

Immediate focus for the future is developing a workplan to meet with the Band to discuss working together towards developing a joint management strategy for cultural trails.

Forecasting and Predicted Trends

A target of 100% has been established for this measure to reflect Canfor's and BC Timber Sales' commitment to incorporation and implementation of strategies developed as a result of Aboriginal peoples input into the planning process. It is helpful to consider a "what if scenario" for these measures to assess the importance of these measures to sustainable forest management .As the indicators currently have a target of 100%, one other scenario should be identified:

a) What if the mutually agreed upon strategies to address Aboriginal peoples' values, knowledge and uses were not incorporated into the public plans and/or forest operations were not consistent with the strategies?

If the mutually agreed upon strategies developed were not incorporated into the public plans and/or these strategies were not adhered to in forestry activities, confidence in the entire public consultation process would be jeopardized. It is possible that Aboriginal groups would not participate in the public input process if they did not perceive their concerns were being incorporated into the planning process. Forest values and uses may be diminished through forest operations.

The above "what if scenario" helps to identify some of the potential future impacts of not achieving the stated targets for this measure. Therefore, Canfor and BC Timber Sales will incorporate and implement the mutually agreed upon strategies developed through Aboriginal people's consultation.

Monitoring and Reporting Procedures

The RACI Process for each aspect of communication is outlined in the "Creating Opportunities for Public Interest" document. The strategic planning forester will approach other licensees to inquire whether there is a willingness to work together with the Band in their traditional territory. All communications will be documented within Canfor's and BC Timber Sales databases, which will enable tracking of all communication and responses. A summary of the percentage compliance with the procedures will be reported on an annual basis for the operating period of April 1 to March 31.

Responsibility and Continuous Improvement Opportunities

The Strategic Planning Forester (Canfor) and Planning Forester (BC Timber Sales) are responsible for reporting and the tracking results to ensure issues raised by Aboriginal peoples are addressed. Opportunities to improve the performance of this indicator will be discussed within the PAG and internally by Canfor and BC Timber Sales staff.

3.51 PAG Follow up Survey

Indicator Statement	*Target and Variance*
Percentage of people leaving the PAG process receiving a follow-up interview survey	Target: 100% Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CFFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element: Public Participation
Value: Public participation in decision making processes.
Objective: A clear process for wide public participation in SFM.

Description of Indicator
Public participation in the SFM planning process is essential to understanding and respecting local values and concerns. A follow -up interview in the form of a survey provides the public with an opportunity to express their satisfaction with the entire process. The information collected from these surveys can be used as part of the continuous improvement SFM process. In essence taking advantage of the hind site of those leaving the PAG committee to better the process

Current Practices and Status of Indicator
The process for addressing this measure is now in place. The PAG Facilitator oversees the follow up survey for those members leaving the PAG. Survey questions are designed to assess satisfaction with the entire PAG experience, suggestions for improvement and concerns with the SFMP process. The results of this survey are reported to the PAG and a course of action to address concerns raised is determined.

Over the last year, one PAG member has left the public advisory group process. This occurred before the formal follow-up questionaiire was in place, none the less the facilitator called the previous member and discussed reasons for leaving. Therefore, 100% of people leaving the PAG process during 2005/06 have received a follow-up interview.

Establishment of Targets and Future Practices
A target of 100% of the PAG members leaving the PAG receive a follow up interview to demonstrate Canfor's and BC Timber Sales' commitment to continuous improvement and public participation.

Forecasting and Predicted Trends
This measure is expected to achieve it's target of 100% however it is beneficial to consider what the benefits of the target mean to SFM. Therefore, the use of a "what if scenario" is useful in identifying anticipated future trends for the indicator. As the indicator currently has a target of 100%, one other scenario should be identified:
a) What if no follow up surveys were conducted with those people leaving the PAG process?

If there were no follow up surveys conducted with past PAG members then a valuable source of information may be lost. The past PAG members have developed a good understanding of the SFM process and have insight into possible improvements. Perhaps concerns and issues which PAG members only felt comfortable sharing after they had left the process would not be addressed and the opportunity for continuous improvement of the SFM process would suffer. Present PAG members might feel that public concerns are not being heard and lose confidence in the PAG process. The above scenario outlines some of the possible outcomes of not conducting PAG follow up surveys. Therefore, Canfor and BC Timber Sales will continue to comply with this measure as part of its commitment to SFM.

Monitoring and Reporting Procedures
The PAG facilitator is responsible for ensuring that the past PAG follow up surveys are completed as outlined and to report on the findings.

Responsibility and Continuous Improvement Opportunities
The follow up survey results will be reviewed by the PAG and improvements made to the SFM process where needed. The survey itself will be reviewed on a regular basis to ensure it is achieving it's objective. Continuous improvement over the next year will include expanding the indicator to include inactive members.

3.52 Number of Public Advisory Group Meetings

Indicator Statement	*Target and Variance*
Number of times Public Advisory Group (PAG) Terms of Reference reviewed	Target : ≥1 review per year Variance: 0
The number of Public Advisory Group meetings per year	Target: ≥1 meeting annually Variance: 0

This indicator addresses the following CSA-SFM parameter:

1) ***CCFM Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA SFM Element: Public Participation
Value: Public participation in decision making processes
Objective: A clear process for wide public participation in SFM

Description of Indicator

This indicator monitors the reviews of the Terms of Reference document that has been developed in consultation with the PAG, and which has been accepted for use in all future PAG meetings. The Terms of Reference document is an important part of the public participation component of this SFMP. SFM requires public participation and the PAG Terms of Reference ensure these requirements are met in a credible and transparent fashion. The Terms of Reference document will be reviewed at least once annually unless consensus from the group suggests otherwise.

The Pubic Advisory Group is necessary to ensure that sustainable forest management occurs with "…decisions that are made as a result of informed, inclusive and fair consultation with local people who are directly affected by, or have an interest in, sustainable forest management. "[1] The PAG represents a diverse range of interest specific on the DFA. As such, each member on the PAG must be able to have effective and fair interaction and communication with one another, including Canfor and BC Timber Sales, to ensure all values receive meaningful and fair consideration. The Terms of Reference document is intended to provide the necessary framework and protocol to ensure the effective input from PAG representatives.

The TFL30 PAG is made up of a diverse set of representatives that have various defined interests, values or specific uses of the forest resource within the DFA. The PAG provided valuable input into the initial development of values, indicators, measures and targets for this SFMP. PAG members helped to identify local issues and values for the DFA, which forestry managers consider during the management and planning process. The PAG will continue to provide guidance, input and evaluation throughout the SFMP process, including all aspects of implementation and continual improvement of the plan over time. This indicator provides information regarding how often the PAG will meet on an annual basis.

Current Practices and Status of Indicator

The initial Terms of Reference document was developed by the PAG and accepted as part of the SFMP process on October 30, 2000. The PAG Terms of Reference will be reviewed at least once annually to ensure it is up to date with the present day context of SFM. Canfor and BC Timber Sales will ensure that PAG members are given adequate notice as to when the Terms of Reference document will be reviewed. This review should be part of a scheduled PAG meeting so that all participants are aware of review timelines. Canfor and BC Timber Sales will maintain the Terms of Reference document so that any revisions resulting from an annual review will be made and a new document will be distributed to PAG members.

The public advisory group reviewed the terms of reference on October 2001, May 2002, April 2003, October 2003, October 2004 and December 2005.

In preparation for CSA-SFM re-certification under Z809-02, the public advisory group was asked to meet more frequently in later 2005 and early 2006. Between September 1, 2005 and April 1, 2006, the Public Advisory Group met 11 times to develop the Values, Goals, Indicators and Objectives for CSA-SFM TFL30plan.

Establishment of Targets and Future Practices

The target for the DFA PAG was established from a review of other similar PAG processes. Scheduled meetings of one or more times a year will allow opportunity for the PAG to have input into the SFMP, input and

comment regarding continual improvement of the plan and feedback regarding adaptive management processes that are developed over time. Requirements to convene the PAG will be dependent on the tasks that may require the guidance, input and/or evaluation of PAG members. One or more meetings per year are considered necessary to keep the PAG informed and up to date on issues regarding SFM in TFL30.

Forecasting and Predicted Trends

The number of PAG meetings per year affects primarily the social values identified within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for this indicator. As the target is currently set at greater than or equal to one meeting per year, one other scenario should be identified:

a) What if there were no future PAG meetings?

If there were no future PAG meetings for TFL30, social values of SFM could potentially be reduced. Without regular PAG meetings, public participation requirements would not be fulfilled. Without local public comment, the plan may not reflect the needs of the TFL30. Sustainability of the forest resource would be more difficult to achieve as locally important values might be overlooked without sufficient public input. Another potential effect of having no PAG meetings would be a reduced public acceptance of the plan and potential scepticism of the overall intent. General understanding of SFM and resulting initiatives would also likely be reduced and future goals identified by Canfor and BC Timber Sales would be more difficult to achieve.

Due to the impact this indicator could have on important social values of SFM, Canfor and BC Timber Sales are committed to achieving $\geq$ 1 PAG meetings per year.

The target of at least one annual review of the PAG Terms of Reference is expected to be met. The exact level of success in meeting this target is not easy to quantifiably forecast over a defined time frame. However, it is important to identify what the accepted target means to SFM. Annual review and maintenance of the SFMP PAG Terms of Reference to ensure a credible and transparent process primarily affects the social values identified within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at one or more reviews per year, it is important to identify one other potential scenario:

a) What if the PAG Terms of Reference document was never reviewed?

If the PAG Terms of Reference document was never reviewed, the PAG process would potentially cease to be credible and transparent. This could result in overall dissatisfaction with the PAG and reduced incentive to continue participating in the process. Without local public comment, this plan would potentially not reflect the DFA's changing values over time. Sustainability of the forest resource would then be more difficult to achieve as locally important values might be overlooked without sufficient public input. Another potential effect of never reviewing the PAG Terms of Reference could be a reduced public acceptance of the plan and potential scepticism of the overall process. General understanding of SFM and resulting initiatives may be reduced and future goals identified by Canfor and BC Timber Sales would be more difficult to achieve.

From an analysis of the "what if scenario", it is clear that a balance of values can be achieved with an annual review of the PAG terms of reference. As such, Canfor and BC Timber Sales are committed to reviewing the PAG Terms of Reference at least once a year to facilitate a consensus-based public involvement processes.

Monitoring and Reporting Procedures

As the review of the PAG Terms of Reference is set to be a part of a scheduled PAG meeting, this will be evident in the PAG meeting minutes. Reviews of the PAG Terms of Reference and any identified changes to the document will be obtained from the minutes of the annual PAG meeting. The indicator will be included in the annual SFMP report for the operating year April 1st to March 31st.

PAG meetings will be scheduled a minimum of once a year, with more meetings conducted if required. During these meetings, minutes will be recorded indicating the date of the meeting and the members in attendance, along with the items discussed during the meeting. Meeting minutes will be tracked and filed to ensure that Canfor and BC Timber Sales are meeting the target requirements. The number of meetings will be reported in the SFMP annual report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales will ensure that PAG members will be given adequate notice when the Terms of Reference document will be reviewed. Canfor and BC Timber Sales will continue to maintain the ToR documents, such that any revisions resulting from the annual review of the ToR document will be made and distributed to the PAG members. The strategic planning forester is responsible for ensuring the number of times the Terms of Reference is reviewed is included in the annual SFM Plan report.

The PAG is responsible for establishing the timeline for meetings. The Strategic Planning Forester is responsible for ensuring the number of meetings held during the operating year is included in the annual SFMP report. Canfor and BC Timber Sales will look for ways to maximize the effectiveness of future PAG meetings. One possible improvement may be to explore creating small working groups to work on specific projects and issues.

3.53 Public Sector Participation in the PAG

Indicator Statement	*Target and Variance*
Percentage of the public sectors as defined in the Terms of Reference invited to participate in the Public Advisory Group (PAG) process	Target: 100% Annually Variance: 0%

This indicator addresses the following CSA-SFM parameter:

1) ***CSA Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA Critical Element: Public Participation
Local Value: Public participation in decision making processes
Local Goal: A clear process for a wide public participation in SFM.

Description of Indicator

The TFL30 PAG is comprised of a variety of representatives that have various defined interests, values or specific uses of the forest resource within the DFA. An important component of the PAG is the representation from the various public sectors as defined in the Terms of Reference.

Their involvement in the PAG process is crucial for the success of the SFMP as they represent a broad range of interests, both commercial and non-commercial, within the DFA. They also possess experience and expertise that Canfor and BC Timber Sales can draw on in achieving the SFMP objectives. Their participation will enhance the co-operation between the forest industry and other parties interested in the management of public lands in the DFA to meet the social, economic, and ecological goals of sustainable forest management.

This indicator is designed to evaluate the success in encouraging this co-operation by tracking the percent of the public sectors, as defined in the Terms of Reference, that are invited to participate in the PAG process. The PAG cannot force participation by any organization, but it can provide the opportunity to do so through such invitations.

Current Practices and Status of Indicator

The process for inviting representatives from the defined public sectors to participate in the PAG is defined in the PAG ToR. Of the sectors described in that section, 100% were invited to participate in the PAG as outlined in the Terms of Reference document.

Establishment of Targets and Future Practices

The target was established to reflect the importance Canfor and BC Timber Sales place on the participation of the public sector in the PAG process. Those public sectors eligible for participation as defined in the Terms of Reference will continue to be invited to all future PAG meetings.

Forecasting and Predicted Trends

This indicator is not easy to forecast, as it is dependent on implementation and future improvements of this SFMP. However, it is important to identify what the accepted target means to SFM. The percentage of public sectors, as defined in the Terms of Reference, invited to participate in the PAG process may influence the success of the SFMP. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at 100%, one other scenario should be identified:

a) What if 50% of the public sectors, as defined in the Terms of Reference, were invited to participate in the PAG progress?

If only half of the eligible public sectors were invited to participate in the PAG progress, the social acceptance of the SFMP may be weakened. Without seeking the input of a diverse range of public sector interests, it may appear that the plan is overly dominated by the forest industry. In the future, a SFMP process which excluded these public sector interests could create gaps in the understanding of local concerns. It may also result in the loss of confidence in the SFM public input process if certain sectors were not included in the process.

Diverse public sector representation provides a different perspective of SFM and assists in updating the plan to reflect a wide variety of views in the DFA. A PAG that has provided an opportunity for public sector participation encourages a wide range of participation in SFM. Due to the importance in providing the opportunity for the

public sectors, as defined in the Terms of Reference, to participate in the PAG process, Canfor and BC Timber Sales are committed to achieving the target of 100%.

Monitoring and Reporting Procedures

The number of invitations made to the public sectors to participate in the PAG process will be compared to the number of public sectors outlined in the Terms of Reference. The indicator percentage will be reported in the annual SFMP report for the operating year of April 1st and March 31st.

Responsibility and Continuous Improvement Opportunities

The Terms of Reference outlines the procedure for establishing the invitation list for participating in the PAG process. The PAG SFMP steering committee is responsible for ensuring this indicator percentage is included in the SFMP annual report. Opportunities for continuous improvement may include expanding the list of public sectors in the ToR, and continuing to encourage First Nation's participation in the SFM process.

3.54 PAG and Interested Parties Satisfaction

Indicator Statement	*Target and Variance*
PAG overall satisfaction score with the meetings	Target: score of 5 annually Variance: -1
PAG overall satisfaction score with the public participation process	Target: score of 5 annually Variance: - 0.75
Percentage of PAG satisfaction with amount and timing of information presented for decision-making.	Target: 100% annually Variance: -20%
Percentage of interested parties satisfied with amount and timing of information presented for decision-making.	Target:100% every 3 yrs Variance: -40%

These indicators address the following CSA-SFM parameter:

1) ***CSA Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA Critical Element: Information for Decision Making
Local Value: Useful information for informed decision making
Local Goal: Useful and timely information to interested parties.

Description of Indicator

The PAG is one of the key elements of public involvement in the SFM process. The TFL30 PAG and interested parties provide guidance, input and evaluation during development of the SFM Plan. They are also instrumental in maintaining links to current local values and forest resource uses within the DFA. In order for the PAG to make decisions in regards to the content of the SFM Plan, such as indicators, targets, and levels of responsibility, they must have the information to support those decisions. This information must be sufficient in amount and quality and delivered in a timely manner for the PAG and interested parties to make sound decisions for the SFMP process. The information should be from varied sources so it is robust. Information provided should also be based on good science and balanced.

It is recognized that the PAG are making decisions for recommendation to Canfor and BC Timber Sales regarding the Defined Goals and Objectives as stated in the Terms of Reference (see Appendix 5). Canfor and BC Timber Sales have the responsibility to review, address, decide whether to act on the decisions by the PAG. Similarly interested parties make decisions regarding the comments or input provided to Canfor and BC Timber sales regarding the public plans on the DFA. It then is up to Canfor and BC Timber sales to review, address, decide whether to act on their input.

This indicator is intended to measure and report the level of satisfaction the PAG has with meeting and the overall participation process and PAG and interested parties have with the amount and timing of information presented for informed decision-making into the SFM plan and other public plans. While it is hoped that there will be high satisfaction with the information, it is also acknowledged that with any group of diverse backgrounds and opinions that it is difficult to achieve unanimous satisfaction in any regard. However, if the SFM Plan is to succeed, the people who are involved in its evolution must have a certain level of satisfaction with the information they are using to direct that development.

Current Practices and Status of Indicator

A survey was provided to the PAG at each of the 11 meetings in 2005/06 in order to determine their level of satisfaction. Upon review of the results and comments of the PAG Satisfaction survey it would appear that the PAG is satisfied with the meetings, facilitator and logistics. Public meeting scores are entered into a spreadsheet and graphed and comments are entered into a word document. A final meeting summary graph with comments is presented to the PAG at the next meeting and any needed continuous improvement suggestions are discussed and captured in the meeting meetings.

The average PAG satisfaction score out of 5 regarding the meeting is 4.5 and overall public participation process is 4.4. PAG satisfaction regarding the amount and timing of information presented for informed input into the SFM Plan during 2005/06 is 89%. No current status information is available for interested parities regarding the amount and timing of information presented for informed input into public plans as this is a going forward indicator.

Canfor has developed a process called "Creating Opportunities for Public Interest" which is framework for communication strategies. This measure will be tracked through this framework of procedures. PAG

satisfaction will be measured annually and the satisfaction of interested parties will be assessed every three years and reported to the PAG through the annual report.

Canfor and BCTS have yet to develop a feedback form for gathering input from interested parties regarding the amount and timing of information provided to help make comments regarding decisions. Starting in April 2007, Canfor and BCTS will have a feedback form ready and will start to gather interested party feedback. This willl be reported in the 2007/08 annual report.

Establishment of Targets and Future Practices

The target of 100% satisfaction was established to reflect Canfor's and BC Timber Sales' commitment to providing the best information possible in a timely manner to the PAG and interested parties to aid in their input into plans. The variance is a reflection of the difficulty in achieving full satisfaction in a group with diverse interests.

The PAG participants will complete evaluation forms for each PAG meeting that will survey their opinion on the minutes of previous meetings, agendas, background information, and sources of additional information. The evaluation forms will also survey their level of satisfaction with the timing of this information. An average will be calculated using the summary of the meeting evaluation forms. In the same manner, an average of interested party feedback will be used to generate an average and a document of comments.

An evaluation form will be developed and implemented for assessing public input on amount and timing of information on public plans by August 1, 2006. This will allow for reporting in the next annual report.

Forecasting and Predicted Trends

This indicator is not easy to predict, as it is dependent on diverse human opinion. However, it is important to identify what the accepted target means to SFM. The percentage satisfaction with amount and timing of information presented for informed decision-making may influence the success of the SFMP. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at 100%, one other scenario should be identified:

a) What if none of the PAG participants were satisfied with the meetings and the overall public process?
b) What if none of the PAG participants or interested parties were satisfied with the amount and timing of information presented for informed input into public plans?

If members of the PAG are dissatisfied with meeting, the overall participation process, and PAG or interested parties were dissatisfied with the amount and timing of information presented for informed input into plans then the entire SFM Plan process is questionable. The PAG was, and is, responsible for the indicators and targets for the plan. These were determined based on the quality of information presented to the PAG. If this information was deemed inadequate, then the plan and its goals may not be realistic, or achievable. This may result in lower social acceptance of the SFM Plan and less participation in the PAG. These same principles apply to interested parties perceiving that they have been provided with inadequate information for input purposes. They may lose confidence in the SFM process and the public planning process and cease to provide input.

Due to the importance of having well informed, satisfied PAG members and interested parties, Canfor and BC Timber Sales are committed to achieving the target of 100% or scores of 5. It is expected that in the future most, if not all, of the PAG participants and interested parties will be satisfied with the amount and timing of the information presented for decision making. Over time it is anticipated that the variance levels will decrease as greater experience and understanding of the SFM Plan process increases for both the public and Canfor and BC Timber Sales.

Monitoring and Reporting Procedures

The average of the summary of the PAG meeting evaluation forms will be used to determine this indicator percentage. It will be determined annually for all meetings between April 1st to March 31st and reported in the annual SFM Plan report. The same will happen with Interested Party input, however it will not be reported until the 2007/08 annual report.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for developing the evaluation forms. The Facilitator is responsible for ensuring the forms are completed after each PAG meeting, and to determine the indicator percentage based on the summary of these forms. The Strategic Planning Forester must ensure these percentages are included in the annual SFMP report.

Canfor and BC Timber Sales will look for ways to provide the best information possible to future PAG meetings and interested parties. The dissemination of information could utilize guest speakers, academics, recent scientific literature, and other sources of current knowledge.

3.55 Continuous Improvement Matrix

Indicator Statement	*Target and Variance*
Review ranking and update status of items on the Continuous Improvement Matrix	Target: 100% annually Variance: 0%
Percentage of PAG satisfaction with the progress on the Continuous Improvement Matrix	Target: Score of 5 Variance: -1
Number of items incorporated from the Continuous Improvement Matrix into the SFM plan	Target: ≥ 2 annually Variance: -1

These indicators address the following CSA-SFM parameter:

1) ***CSA Criterion:*** Accepting Society's Responsibility for Sustainable Development
CSA Critical Element: Information for Decision Making
Local Value: Useful information for informed decision making
Local Goal: Useful and timely information to interested parties.

Description of Indicator

The PAG is one of the key elements of public involvement in the SFM process. The TFL30 PAG and interested parties provide guidance, input and evaluation during development of the SFMP. They are also instrumental in maintaining links to current local values and forest resource uses within the DFA. The terms of reference provide for relevant issues to be discussed at PAG meeting. Issues that can not easily be developed into indicators or require more information are placed on a Continuous Improvement Matrix.

This indicator is intended to measure and report the level of satisfaction the PAG with progress on dealing with the issues on the continuous improvement matrix. the amount and timing of information presented for informed decision making. While it is hoped that there will be high satisfaction with the progress, it is also acknowledged that with any group of diverse backgrounds and opinions that it is difficult to achieve unanimous satisfaction in any regard. However, if the SFM Plan is to succeed, the people who are involved in its evolution must have a certain level of satisfaction with the information they are using to direct that development.

Current Practices and Status of Indicator

A continuous improvement matrix was started at the first PAG meeting in October 2005 and has continued for each subsequent meeting. A copy is provided in the Appendix along with the performance indicator matrix.

To date Canfor and BCTS, have yet to develop a workplan for ranking, updating status, or incorporating items into indicators as it was just completed at the April 2006 meeting.

Starting in September 2006, Canfor and BCTS will have a workplan ready to start working on these indicators. Progress will be reported in the 2007/08 annual report.

Establishment of Targets and Future Practices

The target of 100% satisfaction was established to reflect Canfor and BC Timber Sales' commitment to providing continuous improvement and dealing with relevant issues in a timely manner to the PAG.

Forecasting and Predicted Trends

This indicator is not easy to predict, as it is dependent on diverse human opinion. However, it is important to identify what the accepted target means to SFM. The percentage satisfaction with progress on the continuous improvement matrix may influence the success of the SFM Plan. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at 100%, one other scenario should be identified:

a) What if none of the PAG participants or interested parties were satisfied with the progress on the continuous improvement matrix?

If no members of the PAG or interested parties were satisfied with the progress on the continuous improvement matrix then the entire SFM Plan process is questionable. The PAG was, and is, responsible for the indicators and targets for the plan and the issues on the continuous improvement matrix. These were determined based

on discussions at various PAG meetings. This may result in lower social acceptance of the SFM Plan and less participation in the PAG. These same principles apply to the PAG and interested parties perceiving that they have been provided with inadequate information for decision making purposes. They may lose confidence in the SFM process and cease to provide input.

Due to the importance of having well informed, satisfied PAG members and interested parties, Canfor and BC Timber Sales are committed to achieving the targets. It is expected that in the future most, if not all, of the PAG participants and interested parties will be satisfied with the progress on the continuous improvement matrix Over time it is anticipated that the variance levels will decrease as greater experience and understanding of the SFMP process increases for both the public and Canfor and BC Timber Sales.

Monitoring and Reporting Procedures

The average of the summary of the PAG meeting evaluation forms will be used to determine this indicator percentage. It will be determined annually for all meetings between April 1st to March 31st and reported in the annual SFMP report. The same will happen with Interested Party input, however it will not be reported until the 2007/08 annual report.

Responsibility and Continuous Improvement Opportunities

Canfor and BC Timber Sales are responsible for developing the evaluation forms. The Facilitator is responsible for ensuring the forms are completed after each PAG meeting, and to determine the indicator percentage based on the summary of these forms. The Strategic Planning Forester must ensure these percentages are included in the annual SFMP report.

4.0 REPORTING

Communicating the results of monitoring is an essential element of the SFM Plan. Various public groups (community organizations, customers, provincial and federal governments) are interested in the progress towards the achievement of SFM. Communicating results to various stakeholder groups will allow for the disclosure of success and failure in forest management. What is important for the latter is a statement regarding the remedial actions that are, or will be taken (managing adaptively) to remedy the situation. This step is important in building confidence in forest management and in resource managers' abilities to manage forests in a sustainable manner. Forest operations will use monitoring information internally to gauge performance in achieving operational objectives. Details from analysis will provide useful information for resource managers in guiding remedial action to correct undesirable forest development. The public will use the results of monitoring to assess Canfor's and BC Timber Sales' commitment to SFM. The reporting out interval will be determined relative to end use and specific to each indicator. Presentation of monitoring information will be summarized and presented in a variety of formats (quantitative: tables, graphs, maps; and qualitative: written descriptions) to ensure clarity of interpretation. The format of the monitoring report will be brief so that decision-makers can easily absorb it and take the next appropriate steps. Where appropriate the report will provide a record of stakeholder input, highlighting areas of agreement and areas in which there is a range of opinion as well as the resulting decisions. A schedule will be developed for reporting on monitoring results and implementing the results of decisions to the stakeholders and the broader public where appropriate.

5.0 LINKAGES TO ADAPTIVE MANAGEMENT

Canfor Forestry Principles state that the company *"will use adaptive management to continually improve forest ecosystem management. This will require the development and implementation of collaborative research and monitoring programs."*

BC Timber Sales' Sustainable Resource Management Policy states that the organization will "*monitor, evaluate, and implement appropriate changes to promote continual improvement of environmental and SFM practices";* and will "*seek to advance knowledge of SFM science and technology and incorporate relevant measures into our overall planning process".*

An adaptive management (AM) systematic approach will be used to improve management and accommodate change by learning from the outcomes of management interventions on TFL 30. This will be done using the Canfor's and BC Timber Sales' Environmental Management Systems. More specifically, the indicators and management objectives derived from the CSA-SFM certification process will be included in the EMS Annual Environmental Programs. Subsequently, the management objectives and targets (where applicable) will be entered into Canfor's and BC Timber Sales' EMS incident tracking systems. These database systems automatically inform people that they have been assigned tasks necessary to complete certain actions and will continually send reminders until the action is completed. The progress of meeting the management objectives and targets is reviewed monthly, and the entire EMS is subject to a third-party audit annually.

Outcomes will be evaluated using AM in relation to objectives and policies and adjusted, as appropriate, in response to new information. This section describes the linkages between the scenario planning and the development and implementation of an Adaptive Management (AM) process on TFL 30. The components of AM discussed in this section include:

a) Determining SMART resource management objectives;
b) Selecting practical indicators of SFM;
c) Monitoring indicators of SFM;
d) Evaluating indicators of SFM; and
e) Adjusting management objectives based on the evaluation of indicators of SFM

5.1 SMART Resource Management Objectives

Developing meaningful objectives that are consistent with the overarching goal of sustainable forest management is of paramount importance. There needs to be a clear linkage between desired outcomes, procedures for attaining them, measurable attributes and specific points in the future when the objective is to be achieved. Objectives in this plan have been identified using the SMART principle – that is, Succinctly stated, Measurable, Achievable, Relevant, and Timebound.

5.1.1 Succinctly stated - Objectives must be succinctly stated in the simplest terms possible without being meaningless.

5.1.2 Measurable - Objectives must possess elements that allude to how progress can be measured in achieving the objective.

5.1.3 Achievable - Objectives must be reasonably achievable and consistent with need, and are supported by available human and technological resources.

5.1.4 Relevant - Objectives must be relevant as far as maintaining the desired public values consistent with the principles of good forest stewardship leading to SFM and achieving corporate objectives that allow the company to remain competitive and healthy in a global marketplace.

5.1.5 Timebound - Objectives must be time bound within a finite period during which management strategies are implemented and results obtained in order to assess whether the goal has been achieved or not.

5.2 Selecting Practical Indicators of SFM

Practical indicators play an essential role in facilitating progress toward SFM. Indicators when properly identified, measured, evaluated and assessed relative to operational objectives, allow for an objective, unbiased determination of the progress that is being made towards achieving SFM. Without a means by which progress is evaluated there is little opportunity for learning and adapting new knowledge and understanding how to achieve long term management goals. To ensure new understanding is defensible, indicators must possess

certain functional attributes, but mainly, they must be inextricably linked to operational objectives and be results based. Given the difficulty frequently encountered in comprehending the nature of criteria and indicators, and how they are best used in monitoring SFM, it is important that they are clearly defined.

With respect to Sustainable Forest Management, an indicator is defined as a quantitative or qualitative variable that can be measured or described and which when observed periodically demonstrates trends. SFM indicators are selected to reflect a specific aspect of a condition or state (of a forest), or activity that is to be undertaken to achieve an objective. SFM indicators are selected for measurement, which in turn reflects components of what is implied by sustainable forest management. Indicators are used to monitor actual performance of management strategies against predicted outcomes. Since there is a considerable investment in the process of monitoring, it is crucial that SMART indicators are selected to reflect the outcome of operational objectives. It is important to understand that a single indicator is insufficient to monitor progress toward achieving SFM.

5.3 Monitoring Indicators of SFM

Monitoring is the collection of data for comparison to an explicit standard (target or threshold) or a forecasted outcome for purposes of determining progress toward a specific goal consistent with sustainable forest management. The intent is to determine whether or not the standard or expectation of management is being met. Measuring the indicators in an operational context is critical to ensuring the SFM Plan performance is consistent with projected outcomes. If not, adaptive management strategies may be required. A unique monitoring plan and protocol will be developed for each indicator that details the acquisition of data to compare to an explicit standard. If sampling is necessary, the method selected needs to be statistically based with adequate sampling to address the issue of variation and the required limits of error. The indicators will be periodically checked to ensure they are responsive, adaptive, defensible and publicly acceptable – to provide greater support and stability for industrial operations on TFL 30.

Important considerations in defining the approaches for monitoring: parameter(s) to be measures; complexity of the task; precision required; variability of the conditions; season of measurement; sampling design; data source(s); availability of baseline data; frequency of data collection; and resource support requirements for data collection.

5.4 Evaluating SFM Progress with Indicators

The effectiveness of a monitoring plan is dependent upon earlier decisions with respect to the setting of objectives, the selection of indicators and understanding exactly what information is desired from monitoring and how it will be used. The analytical procedures that are correctly prescribed and executed convert indicator data into information and understanding about response in relation to management. There is always the possibility that incorrect assumptions can be made with respect to the degree to which forecasted values can be achieved. Data analysers and interpreters must use their judgement to objectively determine the relative achievement of objectives and progress towards sustainable forest management.

Important considerations in evaluating SFM progress: who analyzes the data; who interprets the analysis and provides the interpretative report; who provides critical review of the interpretative report.

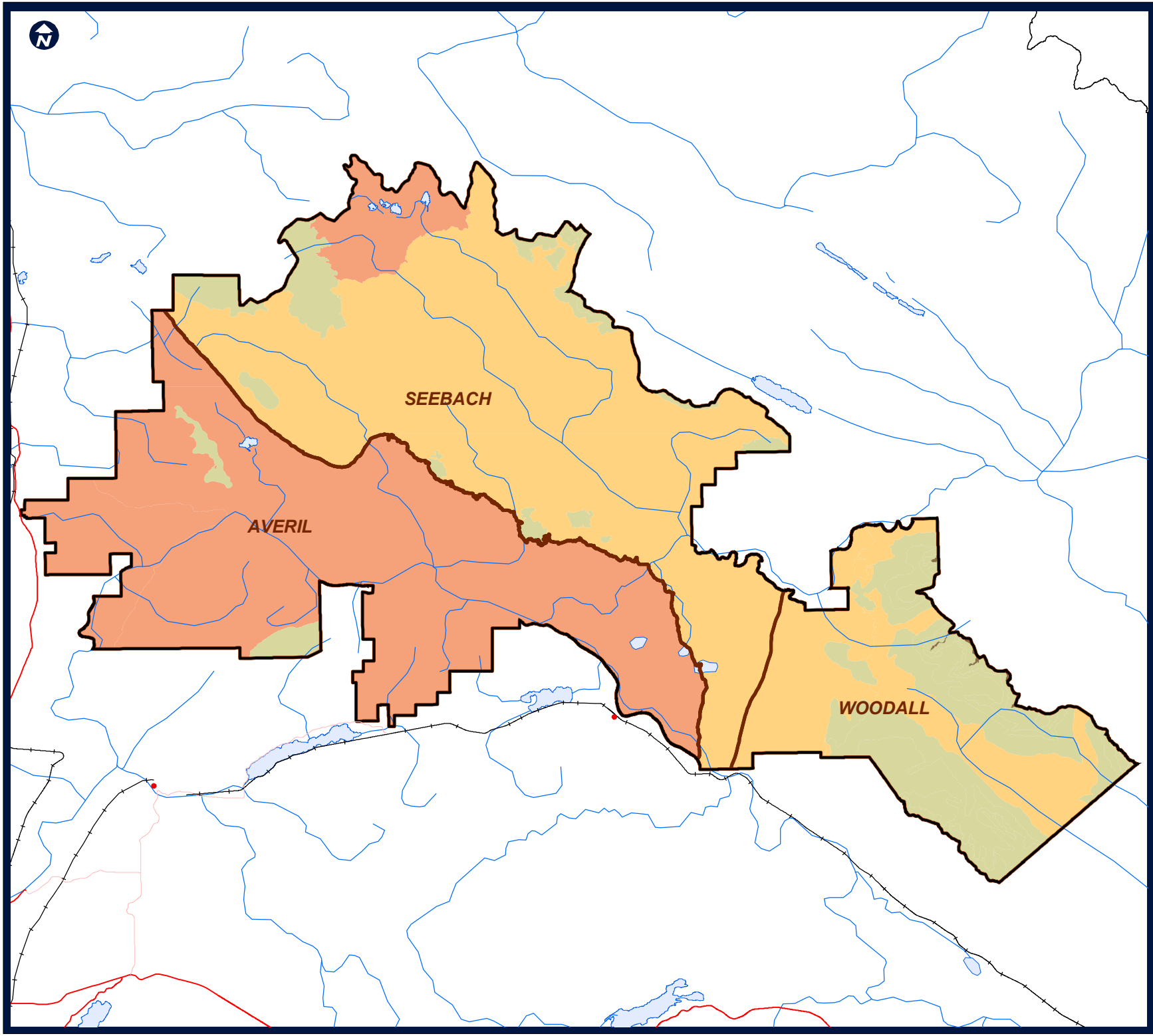
5.5 Adjusting Management Activities Based on Indicators of SFM

The main objective of monitoring and analysis of data is to determine whether or not management objectives are being met. Given that management objectives are SMART, unacceptable variance (or acceptable target values that have not been achieved) ought to alert resource managers to consider remedial action. However, the decision to respond must be based upon the analysis and assessment of all indicator information and consideration of possible outcomes if nothing is done. The difficulty that forest managers face is determining what component of management needs to be changed to bring the entire system back into alignment with acceptable ecological, social and economic variability. It is understood that the impacts of change management can potentially affect every aspect of the system so decisions must be planned carefully and thoughtfully. Applying adaptive management strategies and incorporating knowledge derived from experience and experimentation will prove invaluable in developing adaptive management approaches toward sustainable forest management. Use of AM approaches will provide deliberately designed to enhance the rate of improvement:

- by providing reliable feedback about which policies, plans, or practices are effective and which are not; and
- by increasing understanding about ecosystem function, and identifying thresholds in ecosystem.

Appendix 1

Base Map Folio



Canadian Forest Products

FSP Landscape Unit/Natural Disturbance Type

Reference Map #8

Scale: 1:375,000

0 9,600 Meters

Management Area

- Landscape Unit

Natural Disturbance Type

- NDT 1
- NDT 2
- NDT 3
- NDT 5

Water Feature

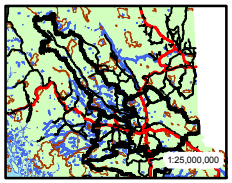
- River/Stream
- Lake

Access Management

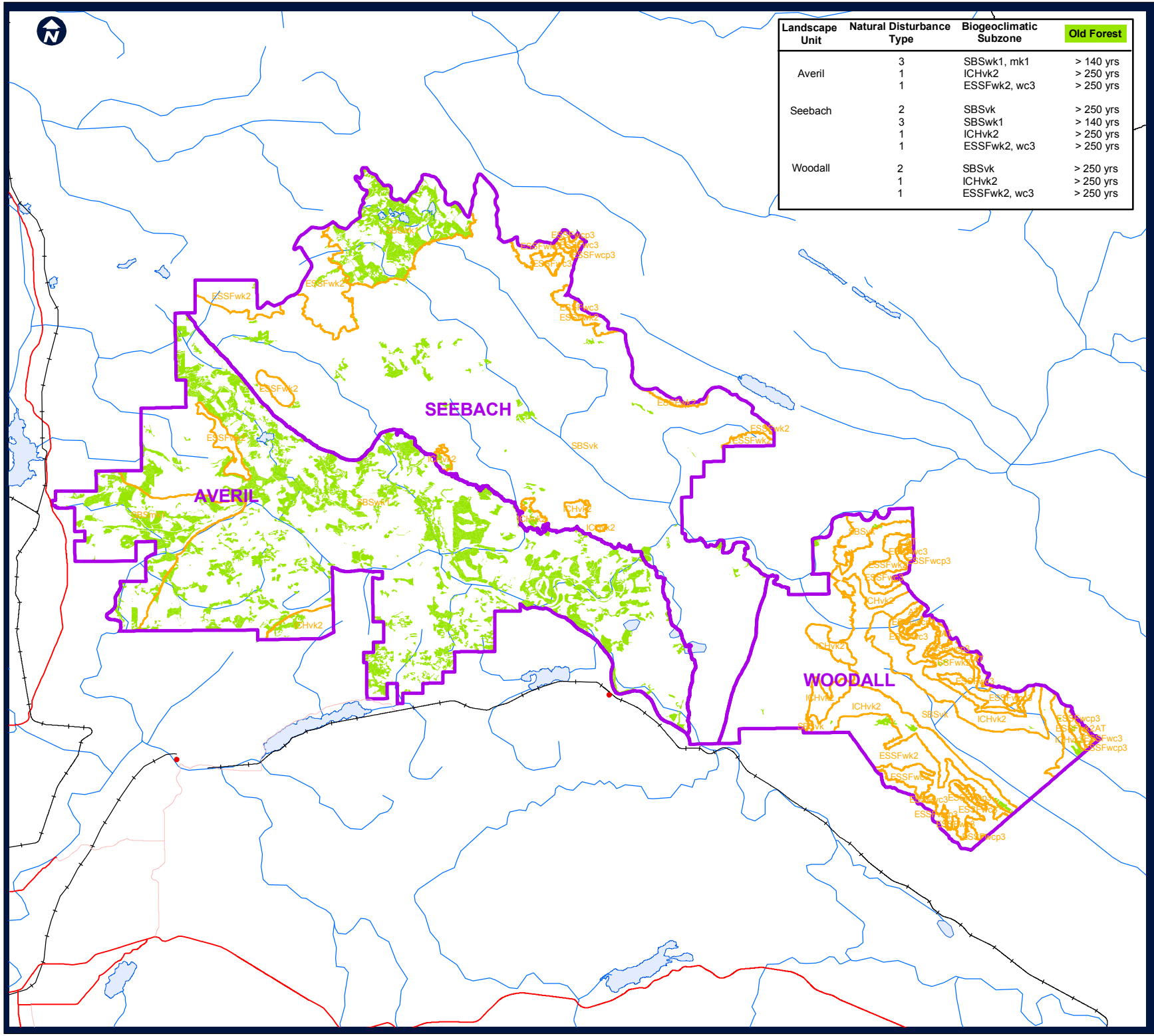
- Highway
- Secondary Road
- Rail Line

This map was developed using base data provided by government.

Keymap



Date: Jan. 11, 2006 Woodlands Information Management Team



Landscape Unit	Natural Disturbance Type	Biogeoclimatic Subzone	Old Forest
Averil	3	SBSwk1, mk1	> 140 yrs
	1	ICHvk2	> 250 yrs
	1	ESSFwk2, wc3	> 250 yrs
Seebach	2	SBSvk	> 250 yrs
	3	SBSwk1	> 140 yrs
	1	ICHvk2	> 250 yrs
	1	ESSFwk2, wc3	> 250 yrs
Woodall	2	SBSvk	> 250 yrs
	1	ICHvk2	> 250 yrs
	1	ESSFwk2, wc3	> 250 yrs

Canadian Forest Products

FSP Old Forest Area By Biogeoclimatic Unit

Reference Map #4

Scale: 1:400,000

0 10,000 Meters

Management Feature

- Old Forest Area
- Biogeoclimatic Unit
- Landscape Unit

Water Feature

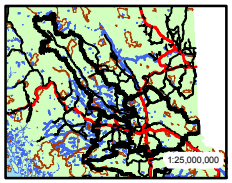
- River/Stream
- Lake

Access Management

- Highway
- Secondary Road
- Rail Line

This map was developed using base data provided by government.

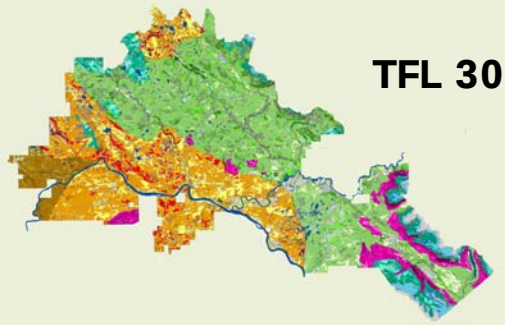
Keymap



Date: Jan. 11, 2006 Woodlands Information Management Team

Appendix 2

Scenario Planning Project Summary & Results



TFL 30

SFM Indicator Forecasting

Outline

- **Background on forest level modeling**
- **Scenarios and indicators**
- **Assumptions of the analysis**
- **Scenario comparison**
- **Discussion/questions?**

Forest Level Modeling for CSA Forecasting

"Man plans, God laughs."

Forest Level Modelling for CSA Forecasting

- Some forecast without modelling.
- TFL30 had data set readily available for modelling;
  - Allowed for more thorough investigation.
  - Deadlines reduced flexibility in terms of using any additional data sources.
- Not an AAC determination;
- Means to learn how different management approaches may impact indicators.
- Nothing carved in stone; adaptive management, continuous improvement.
- This the beginning, not the end.

Forest Level Modelling for CSA Forecasting

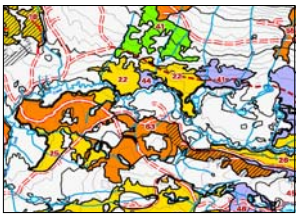
- Establish baseline(s).
- Develop scenarios.
- Compare scenarios (indicators) with base line.
- Agree on SFM scenario (can be a new scenario).

Forest Level Modelling Background
Basic Concepts

- Models grow and harvest trees in an area (TFL30 = forest estate).
- Attempt to simulate real life.
- Harvesting in models is governed by combination of many objectives (old growth retention rules, visual quality rules, timber targets etc.)
- Inventory: how much volume in the forest now.
- Growth and yield: how fast trees grow and how much volume they produce in the course of time.

Forest Level Modelling Background
Basic Concepts

- Inventory an input into forest estate models.
- Growth and yield models are inputs into forest estate models.
- Not possible to model/predict tree/forest growth as easily as some other parameters; animal science.
- Polygon



Forest Level Modelling Background
Basic Concepts

- Traditionally modeling has focused on tree and stand volume in both stand level and forest estate modeling.
- Outputs were traditionally volumes (harvest level over 250 years etc.)
- Focus has changed and other outputs - often habitat related – are desired.
- Little habitat data available – expectations from modern analyses often in conflict with this.

Forest Level Modelling Background
Sources of Uncertainty

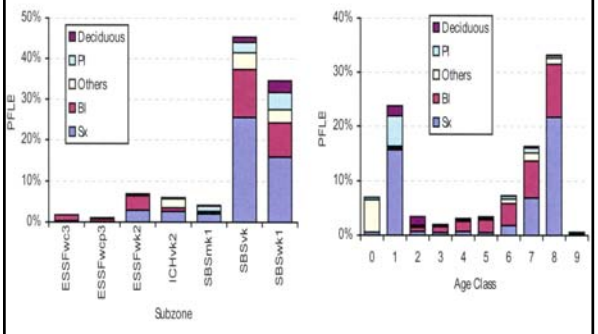
- predicting future (very far) is difficult. Ways to mitigate.
- variation in the source data; which set of yield curves? Inventory adjustments etc.
- how well the management problem is interpreted;
- how well the modeler translates that interpretation into model terms; and
- how well the modeler interprets and presents the results.

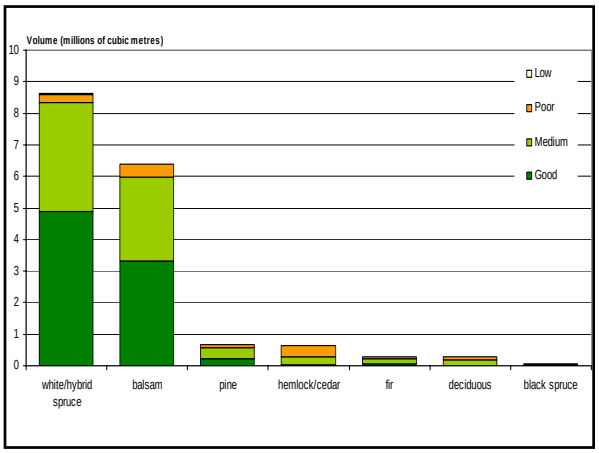
Forest Level Modelling Background
Reality of Analysis Projects

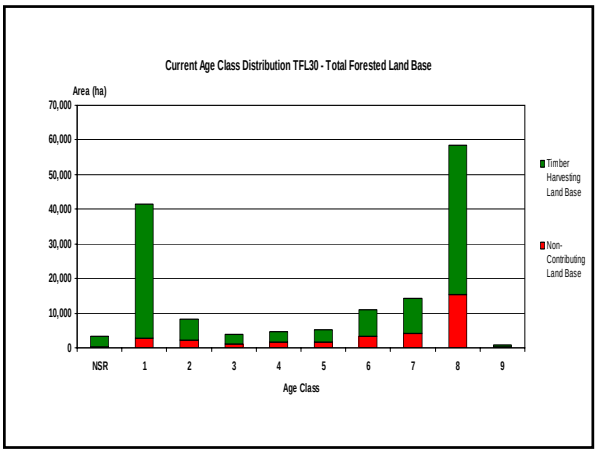
- data gathering and integration problems;
- changing rules and concepts;
- "scope creep";
- uncertainty;
- need to interpret solutions; and
- lack of funding and time.

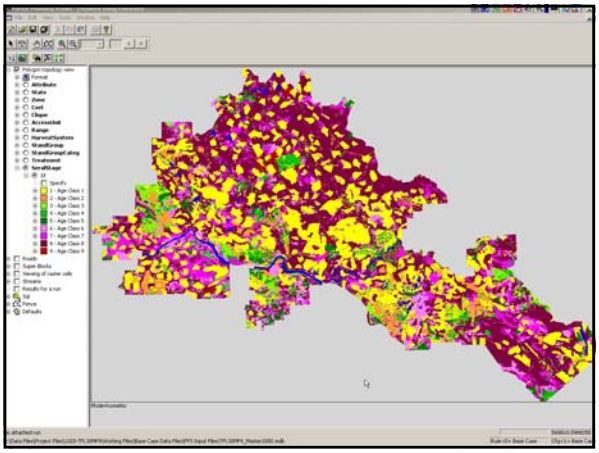
Forest Level Modelling Background
Uses for Modelling

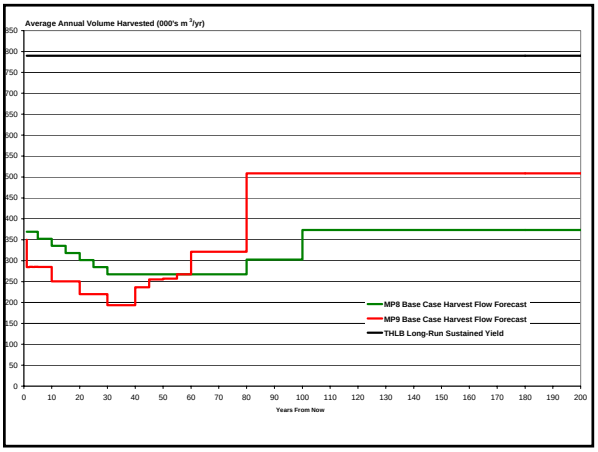
- strategic/tactical forest management planning
- sustainable forest management assessment and scenario testing
- policy and land use regulation testing
- land use objective assessment
- habitat and ecological analysis











Scenario Description

Scenario 1: Base Case 1
Current management, O, M+O LU/BEC Variant

Scenario 2: Base Case 2
Late seral by merged BEC (NDU/Delong)

Scenario 3: Enhanced Biodiversity 1
Double base case 1 seral targets, increase WTP

Scenario 4: Enhanced Biodiversity 2
Use minimum NRV as target for old, increase WTP

Scenario 5: Enhanced Biodiversity 3
Use mid point of NRV as target for old, increase WTP

Scenario 6: No Harvest; bookend
No harvest, natural disturbance on NHLB and THLB

Scenario Description

Scenario 7: Low Resilience of Ecosystems (B1)
Reduce volume growth by 20%, higher old age (20%)

Scenario 8: Maximize Timber Production (B1); bookend
No VQO, or seral targets, 10% increased yield.

Scenario 9: Increased Other Non-Timber Values (B1)
VQO objectives higher, double riparian reserves.

Indicators

Indicators

Monitoring Indicators

Indicator 5.1.J:
"The number of opportunities given to the public and stakeholders to express forestry related concerns and be involved in our planning processes."

Indicators

Some indicators are input assumptions

Indicator 1.2.a:
"The amount of Caribou Caribou Ungulate Winter Range habitat within TFL30."

Indicators

Core Forecasting Indicators

Indicator 1.1.a:
"The amount of old forest by NDU/merged BEC within the DFA OR by Landscape unit and BEC."

Indicators

Timber Harvest
Old Forest
UWR - Caribou
Ecosystem Carbon
Old Interior Forest
Early Seral Patches
Wildlife Tree Retention
Riparian Management
Seed Use
Watershed Hydrology

Base Case Assumptions

Assumptions of CSA Forecasting built on previous projects:

- MP9 (McGregor Resource Analysis Group Inc. 2001)
- **What's new in this analysis:**
- Inventory age was updated to 2005.
- Depletions updated to spring 2006.
- Mountain Pine Beetle. Harvest priority.
- Natural disturbance on NHLB.
- All scenarios start at 201,500 m^3 for the first 5 years.

Base Case Assumptions
Comparison of the Forested Land Area

	MP9	2006 SFM Indicator Analysis
Timber Harvesting Landbase (ha)	118,725	120,801
Non-Contributing Landbase (ha)	40,660	36,078
Crown Forested Landbase (ha)	159,385	156,879

Mountain Pine Beetle
All Scenarios

- What has it attacked?
- What will it attack?
- What happens to stands after attack?
- For how long is the wood usable?

Mountain Pine Beetle
All Scenarios

- What has it attacked?
  - All pine leading stands older than 80 (3,083 ha).
  - 50% of pine leading stands between 40 and 80 (115 ha).
  - Total attacked area 3,198 ha (THLB = 2,247 ha)
- What will it attack?
  - No further attack.

Mountain Pine Beetle
All Scenarios

- What happens to stands after attack?
  - Pine leading stands 80 and older (100% attack) start to decline in volume at year 4 by 10% annually until there is no volume left. If stands are not harvested by year 13 they will regenerate to natural Lodgepole pine stands with a 15-year regen delay.
  - 40-80 year-old pine leading stands will decline in volume by 5% starting at year 4 until year 13 when 50% of the volume remains. If the stands are not harvested they will stay in the harvest queue.
- For how long is the wood usable?
  - 13 Years

Mountain Pine Beetle
All Scenarios

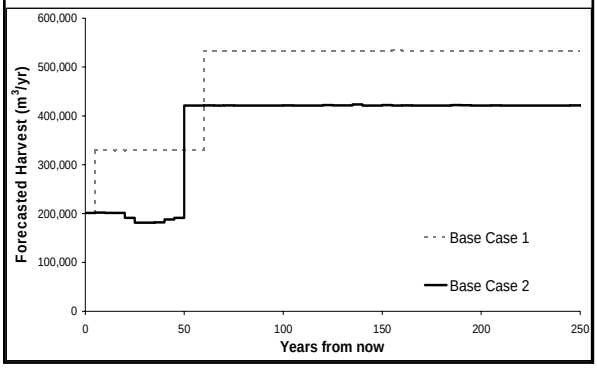
- What happens to stands after attack?
  - They start to decline in volume and will regenerate at year 13 to natural Lodgepole pine stands.
- For how long is the wood usable?
  - 13 Years

Results

Results

- Timber Harvest Forecasts
- Scenario Comparisons
  - Harvest
  - Beetle Salvage
  - Old Forest
  - Old Interior Forest
  - Ungulate winter range
  - Carbon
  - Jobs
- Indicator Overview

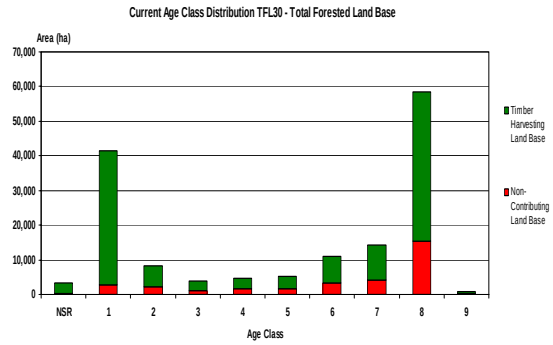
Timber Harvest Forecasts



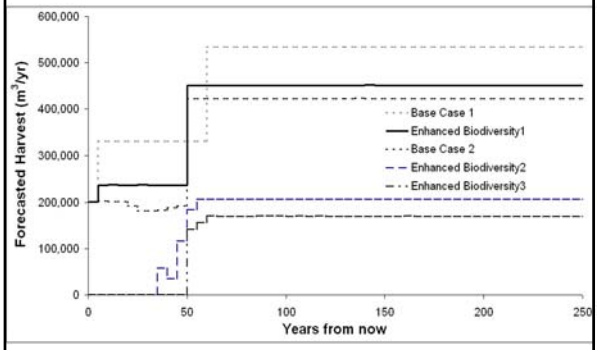
Timber Harvest Forecasts

Scenario	Short-term (m3/year)	Change from Base Case 1	Mid-term (m3/year)	Change from Base Case 1	Long-term (m3/year)	Change from Base Case 1
Base Case 1	265,520	n/a	397,644	n/a	533,263	n/a
Base Case 2	201,635	-24.1%	297,775	-25.1%	421,402	-21.0%

Timber Harvest Forecasts



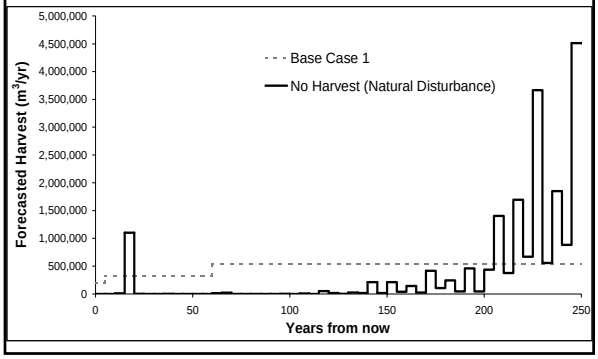
Timber Harvest Forecasts
Enhanced Biodiversity Scenarios



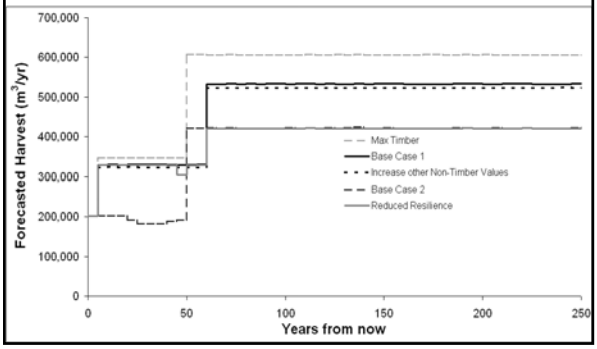
Timber Harvest Forecasts
Enhanced Biodiversity Scenarios

Scenario	Short-term (m3/year)	Change from Base Case 1	Mid-term (m3/year)	Change from Base Case 1	Long-term (m3/year)	Change from Base Case 1
Base Case 1	265,520	n/a	397,644	n/a	533,263	n/a
Base Case 2	201,635	-24.1%	297,775	-25.1%	421,402	-21.0%
Enhanced Biodiversity1	219,235	-17.4%	337,017	-15.2%	451,066	-15.4%
Enhanced Biodiversity2	0	n/a	206,291	-48.1%	206,291	-61.3%
Enhanced Biodiversity3	0	n/a	76,270	-80.8%	169,321	-68.2%

Timber Harvest Forecasts
No Harvest



Timber Harvest Forecasts
Other



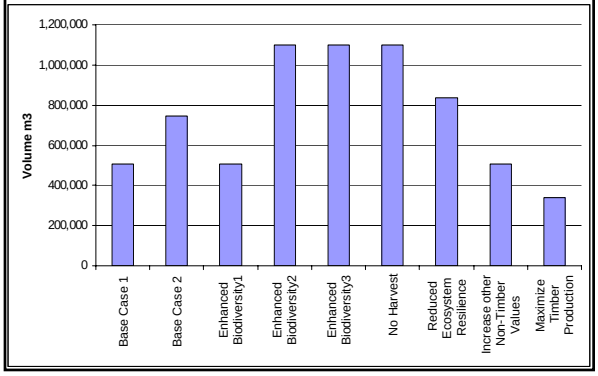
Timber Harvest Forecasts
Other

Scenario	Short-term (m3/year)	Change from Base Case 1	Mid-term (m3/year)	Change from Base Case 1	Long-term (m3/year)	Change from Base Case 1
Base Case 1	265,520	n/a	397,644	n/a	533,263	n/a
Base Case 2	201,635	-24.1%	297,775	-25.1%	421,402	-21.0%
Reduced Resilience	265,512	0.0%	358,456	-9.9%	421,100	-21.0%
Increase Non-Timber Value	262,198	-1.3%	389,617	-2.0%	522,668	-2.0%
Max Timber	273,867	3.1%	467,614	17.6%	605,973	13.6%

Timber Harvest Forecasts
Summary

Scenario	Change from Base Case 1ST	Change from Base Case 1MT	Change from Base Case 1LT
Base Case 1	n/a	n/a	n/a
Base Case 2	-24.1%	-25.1%	-21.0%
Enhanced Biodiversity1	-17.4%	-15.2%	-15.4%
Enhanced Biodiversity2	n/a	-48.1%	-61.3%
Enhanced Biodiversity3	n/a	-80.8%	-68.2%
No Harvest	n/a	n/a	n/a
Reduced Resilience	0.0%	-9.9%	-21.0%
Increase Non-Timber Value	-1.3%	-2.0%	-2.0%
Max Timber	3.1%	17.6%	13.6%

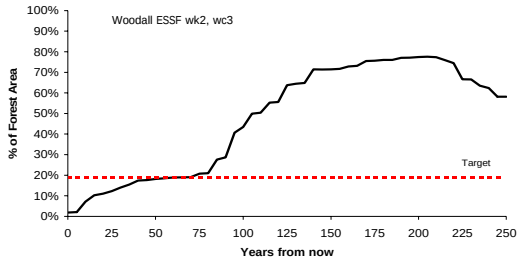
Timber Harvest Forecasts
Losses to MPB



Indicator Results
Old Forest/Base Case 1

LU	BEC	Old Age	Target %	Current Status	Target met
Averil	SBS wk1, mk1	140	11%	24%	Now
Averil	ICHvk2	250	13%	13%	Now
Averil	ESSFwk2	250	19%	**0%**	**20 years**
Seebach	SBSvk	250	9%	**8%**	**5 years**
Seebach	SBSwk1	140	11%	47%	Now
Seebach	ICHvk2	250	13%	13%	Now
Seebach	ESSFwk2, wc3	250	19%	**6%**	**25 years**
Woodall	SBSvk	250	9%	**6%**	**5 years**
Woodall	ICHvk2	250	13%	**7%**	**10 years**
Woodall	ESSFwk2, wc3	250	19%	**2%**	**65 years**

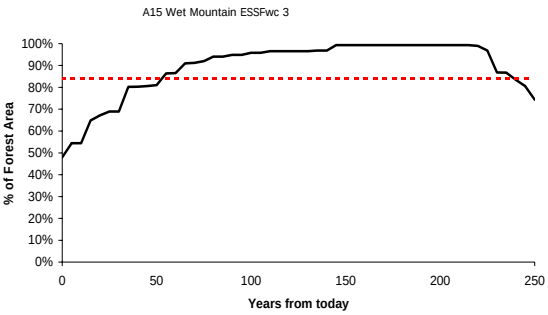
Indicator Results
Old Forest/Base Case 1



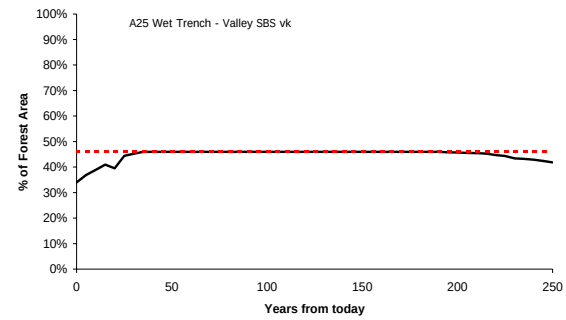
Indicator Results
Old Forest/Base Case 2

Merged Biogeoclimatic Unit	Old Age	Target	Current Status	Target met
A2 McGregor Plateau ESSFwk 2	140	26%	69%	Now
A3 McGregor Plateau SBS mk 1	120	12%	59%	Now
A4 McGregor Plateau SBS wk 1	**140**	**26%**	**23%**	**15 years**
A14 Wet Mountain ESSFwk 2	140	50%	60%	Now
A15 Wet Mountain ESSFwc 3	**140**	**84%**	**48%**	**55 years**
A16 Wet Mountain SBS wk 1	140	26%	58%	Now
A17 Wet Mountain SBS vk	140	50%	56%	Now
A22 Wet Trench - Valley ICH wk 3	140	53%	73%	Now
A23 Wet Trench - Valley ICH vk 2	140	53%	99%	Now
A24 Wet Trench - Valley SBS wk 1	140	30%	100%	Now
A25 Wet Trench - Valley SBS vk	**140**	**46%**	**34%**	**35 years**

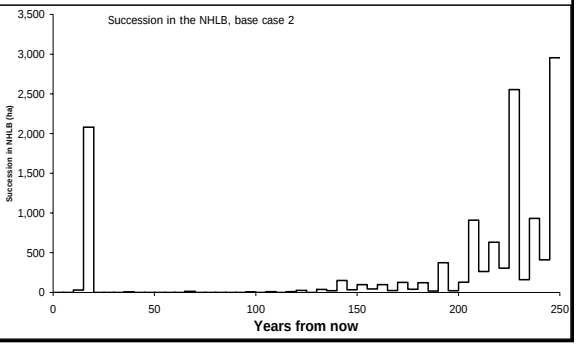
Indicator Results
Old Forest/Base Case 2



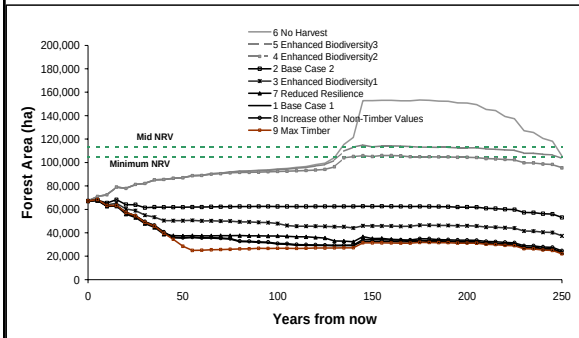
Indicator Results
Old Forest/Base Case 2



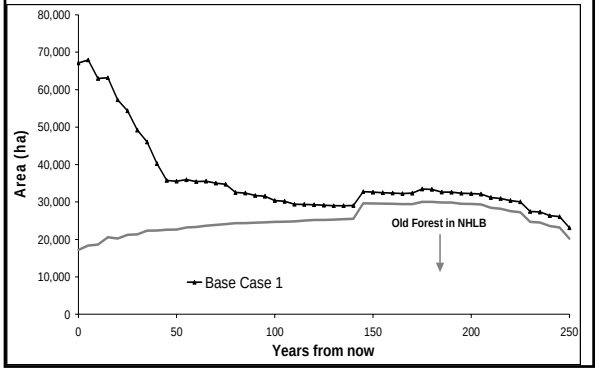
Indicator Results
Old Forest/Base Case 2



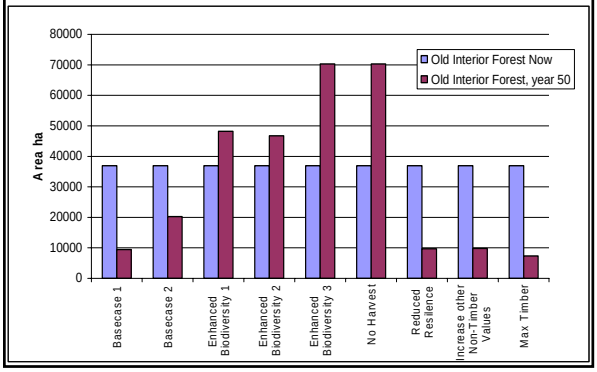
Indicator Results
Old Forest



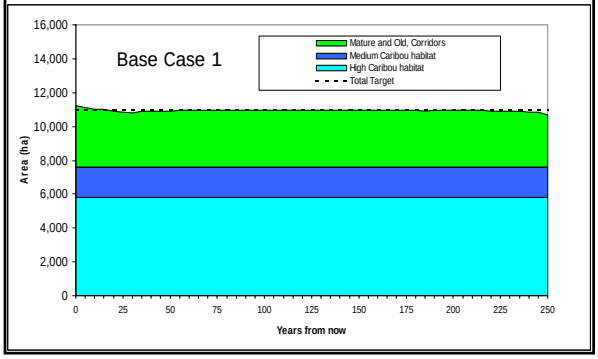
Indicator Results
Old Forest



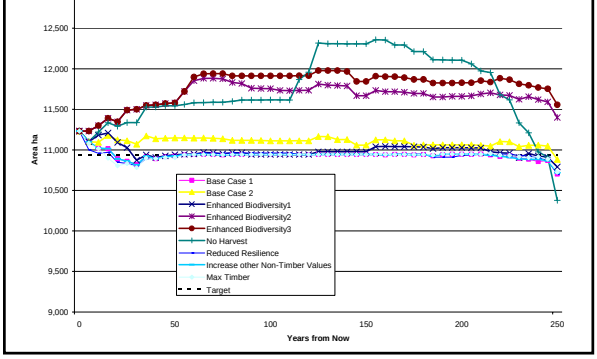
Indicator Results
Old Interior Forest



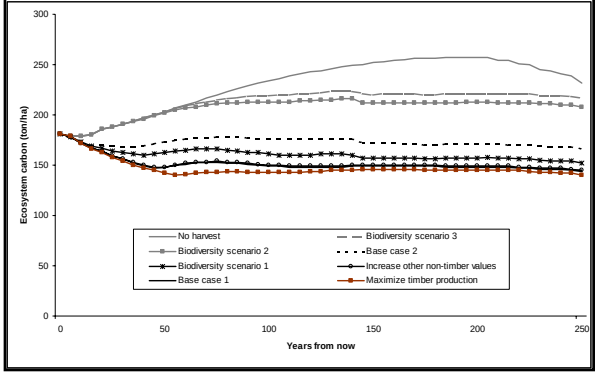
Indicator Results
Caribou Habitat



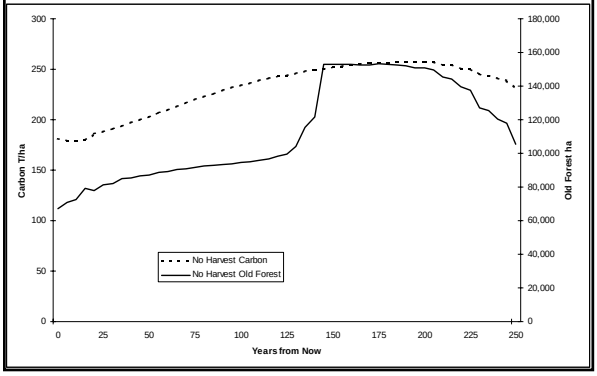
Indicator Results
Caribou Habitat



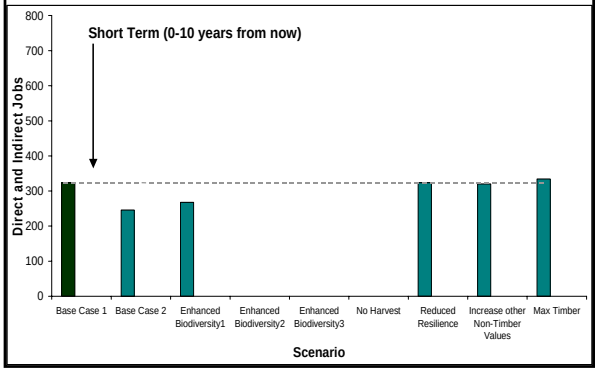
Indicator Results
Ecosystem Carbon



Indicator Results
Ecosystem Carbon



Indicator Results
Jobs



Indicator Results
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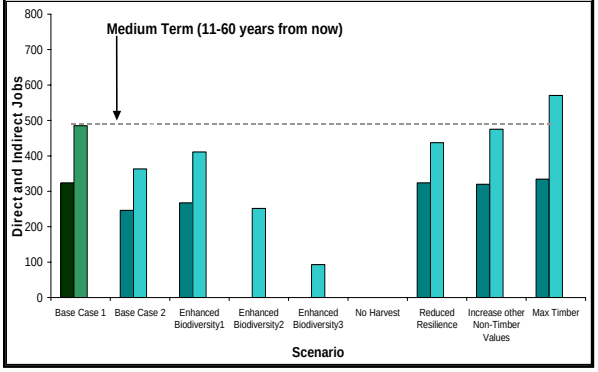

Indicator Results
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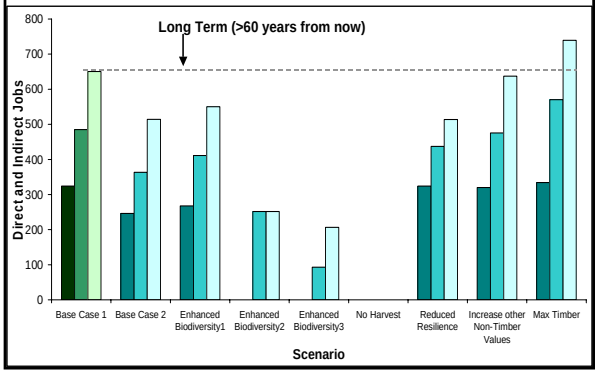

Indicator Results
Summary of Trends

Indicator	Scenario 1 Base Case 1	Scenario 2 Base Case 2	Scenario 3 Enhanced Biodiversity1	Scenario 4 Enhanced Biodiversity2	Scenario 5 Enhanced Biodiversity3	Scenario 6 No Harvest	Scenario 7 Reduced Resilience	Scenario 8 Increase other Non-Timber Values	Scenario 9 Max Timber
Timber Harvest	0	--	-	---	---	---	--	0	+
Old Forest	0	++	+	+++	+++	+++	0	0	-
Old Interior Forest	0	+	++	++	+++	+++	0	0	-
UWR -Caribou	0	+	0	++	++	++	0	0	-
Ecosystem Carbon	0	++	+	+++	+++	+++	0	0	-
Scenic Areas	0	+	+	++	++	+++	0	+	0
Wildlife Tree Retention	0	0	+	+	+	+++	0	+	0
Riparian Management	0	+	+	++	++	+++	0	+	0
Watershed Hydrology	0	+	+	++	++	+++	0	+	0
Jobs	0	++	0	0	++	0	0	0	0
Landscape Reserves	0	0	0	0	0	0	0	0	0
Ecological	0	++	+	+++	+++	+++	0	0	-
Economic	0	-	--	--	--	---	-	0	+
Social	0	?	?	?	?	?	?	?	?

Discussion/Questions

Tree Farm Licence 30

SFM Indicator Forecasting for TFL 30

Draft

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SFM Indicator Forecasting
Tree Farm Licence 30

TABLE OF CONTENTS

List of Tables

List of Figures

1 Introduction

This report contains an overview of data inputs, assumptions, baseline values, results and interpretations for the Sustainable Forest Management (SFM) indicator-forecasting project for Tree Farm Licence (TFL) 30.

2 Modelling Overview

Forests are complex ecosystems that contain intricate relationships between climate, soils, flora and fauna. Forests also grow and die over long time periods and exist over significant areas of the landscape. We are not able to comprehend all of these factors and relationships, nor do we even understand all of them yet. Models provide us a method to attempt to define what we think we understand as a simplification of reality.

Prior to reviewing the results of the modelling that was completed for TFL 30, some insight about modelling is provided that might assist with the reviewing of these results and help understand this exercise.

Modelling is a starting point not the end point: The results from a modelling exercise will not answer all of the questions that we have. The opposite will likely occur; modelling will likely raise more questions than answers.

There is generally a need for very specific answers and results from models even though they are often built on non-specific information and simple assumptions about how forests function. Models should not be depended on to provide exact results but should be used to understand relative implications of decisions that need to be made.

Modelling should start out simply to allow maximum comprehension of the problem. Complexity can be added later in future iterations as data, rules, objectives and understanding improve.

There is uncertainty associated with multiple facets of modelling. Uncertainty can occur due to variation in the source data, how well the management problem is interpreted, how well the modeler translates that interpretation into model terms, how well the model accommodates that problem, and lastly how the modeler interprets the output.

Finally, prior to describing the scenarios, it is important to understand the data and assumptions that were used in the analysis of the scenarios that were completed. As mentioned, models are tools that simulate what might occur in the future under a rigid set of rules and relationships. Modelling investigations through scenarios and forecasting test different rules and relationships to determine the likely impact or effect of those rules on the suite of indicators/measures that we are interested in.

Models tend to use information that is behind or even out of date as the process of modelling can be lengthy and once results are available the data may be several years old. Even so, the first step is to understand the data and assumptions that dictate how the model operates.

3 Data Preparation

The following information provides a description of the key data and assumptions that were used in the forecasting of scenarios presented in this report. These assumptions are mainly adopted from the data package for the timber supply analysis used to prepare management plan No. 9, the most recent management plan for TFL 30.

There are numerous other detailed assumptions that apply to these analyses and if readers are interested they could refer to the document *TFL 30 Management Plan No. 9 Timber Supply Analysis Data Inputs and Assumptions Report* created by the McGregor Resource Analysis Group Inc. in 2001.

The budget and timeline for this analysis are considerably less than that allocated to analyses for the British Columbia Timber Supply Review process. Therefore, the base case forecasts should not be construed as an update to the timber supply review for the TFL 30.

A dataset was compiled for the project using the following coverages:

- Vegetation Resource Inventory;
- Terrestrial Ecosystem Mapping;
- Caribou habitat and corridors;
- Existing and proposed roads;
- Grizzly bear habitat zones;
- Harvest systems;
- Integrated management zones;
- Landscape units;
- Natural disturbance types (NDT);
- Natural disturbance units (NDU);
- Ownership;
- Recreation emphasis areas;
- Recreation features inventory;
- Recreation sites;
- Riparian reserve zones;
- Riparian management zones;
- Slope;
- Terrain stability mapping;
- Visual landscape inventory;
- Watersheds;
- Depletion blocks up to the Spring 2006.

The inventory age was updated to year 2005. Canfor provided all the coverages. In order to facilitate modeling using the Forest Simulation and Optimization System (***FSOS***), a spatial explicit model, the dataset was processed to eliminate polygons with area smaller than 0.3 ha.

To further reduce the number of polygons, the riparian buffers and reserve zones were removed from the dataset. Through a process referred to as 'rating', the area of the resulting polygons contained within the riparian areas was then calculated, and the timber harvesting landbase in those polygons was reduced accordingly by the area of riparian buffers and reserve zones.

The result of this spatial processing was a resultant with slightly over 120,000 polygons.

3.1 Definition of the timber harvesting landbase

A timber harvesting landbase (THLB) was determined based on the area netdown logic outlined in the TFL 30 Management Plan No. 9 Timber Supply Analysis. The following describes the types of land that do not contribute to the current timber harvesting land base:

- Non-forest areas — areas incapable of growing any commercial tree species of any quality and quantity currently or into the future in their present state, such as rock, swamp, alpine areas and water bodies;
- Private lands;
- Mapped existing and proposed roads and trails.
- Existing unmapped landings;
- The 100m buffer on either side of the Giscome Portage Trail;
- Areas that currently produce insufficient merchantable yields to warrant timber harvesting from an economic perspective;
- Natural deciduous leading stands. Managed stands that are currently deciduous leading will be treated to convert to conifer leading and remains in the timber harvesting land base.
- Unstable terrain;
- Non-commercial brush;
- Areas where successful regeneration is unlikely;
- Areas providing high value Caribou habitat;
- Horseshoe, Tri-lakes and Woodall recreation areas;
- McGregor river management zone;
- Seebach riparian zone;
- Riparian reserve zone; and
- Wildlife tree patches.

To account for losses to productive land due to future road and trail construction, a percentage netdown is applied to the areas currently without access after they are harvested once.

Table 1 shows the timber harvesting land base netdown by land classification. Of the total area, about 87% is the Crown forested land base, which is the area being analyzed in this analysis. Approximately 77% of the Crown forested land base is currently managed for timber production, the rest being either reserved solely for non-timber values or considered not suitable for timber production. The overall netdown results are comparable to that of the Management Plan No.9 Timber Supply Analysis, the difference being less than 2%.

Table 1 Netdown Table

Land classification	Area (ha)	Net reduction (ha)	% of total area	% of CFLB
Total area	**180,594**			
Private land		456	0.3%	
Non-productive land		19,580	10.8%	
Existing roads and trails		2,726	1.5%	
Existing unmapped landings		952	0.5%	
Crown forest land base (CFLB)	**156,879**		**86.9%**	
Giscome Portage Trail		89		0.1%
Minimum economic yield		17,340		11.1%
Natural deciduous leading		962		0.6%
Unstable terrain		2,136		1.4%
Non-commercial brush		3,753		2.4%
Difficult regeneration		2,044		1.3%
Caribou high value habitat		3,073		2.0%
Horseshoe recreation area		336		0.2%
Tri-lakes recreation area		411		0.3%
Woodall recreation area		97		0.1%
McGregor river management zone		856		0.5%
Seebach riparian zone		211		0.1%
Riparian reserve zone		1,150		0.7%
Wildlife tree patches		3,621		2.3%
Current timber harvesting land base	**120,801**			**77.0%**
Future roads and trails		1,959		1.2%
Long-term timber harvesting land base		**118,842**		**75.8%**

4 Management Assumptions

4.1 Management Strategies for Non-Timber Values

Non-timber forest values, such as wildlife habitat and visual quality, are managed through land reservation (see Table 2) and/or applying forest cover constraints or volume retention. The forest cover constraints and volume retentions used in the analysis are summarized in this section.

- Medium value mountain caribou habitat

  Within medium value caribou habitat, at each entry 70% of the pre-harvest merchantable volume is retained. Subsequent stand re-entries will occur once the stand has recovered its original pre-harvest volume.

- Mountain caribou movement corridors

  With each caribou movement corridor, 70% of the forested area must be in a mature or older seral state at all times.

- Riparian management zones

  Within riparian management zones of S1 to S3 - rivers and creeks - a 50% volume retention is applied. 25% is used for all lakes and wetlands, and 3% for S4 streams.

- Scenic areas with established visual quality classes

  Cover constraints are applied onto each of the visually sensitive units (VSU), which were delineated based on a visual landscape inventory completed in 1994. Table 4 lists the visual quality classes, visual absorption capability classes in the TFL and associated cover constraints. The land base on which the constraints are applied is the Crown forested land base in each VSU.

- Late seral requirements

  Table 3 and Table 4 present the late seral requirements using three approaches mothat were modeled in this analysis: by landscape unit and BEC variant combination with 2/3 target draw down, by landscape unit and BEC variant combination without target draw down, and by merged biogeoclimatic unit. Only one set of requirements is applied in each scenario. Please note that even though old growth draw down is allowed by legislation in landscape units with low biodiversity emphasis, in this analysis it is applied only in one scenario.

Table 2 - Visual quality cover constraints

Visual quality class	Visual absorption capability class	Visually effective green-up height (m)	Maximum allowable disturbance (%)
Partial retention	Medium	3	10
Partial retention	Low	3	5.1
Modification	High	3	25
Modification	Medium	3	20
Modification	Low	3	15.1

Table 3 - Seral targets by landscape unit, Biogeoclimatic unit and natural disturbance type[1]

Landscape unit	NDT	BEC	Seral Stage (years)	Target % with draw down	Target %, no draw down
Averil	3	SBS wk1, mk1	Mature>100	>11%	>11%
			Old>140	>3.7%	>11%
	1	ICHvk2	Mature>100	>17%	>17%
			Old>250	>4.3%	>13%
	1	ESSFwk2	Mature>120	>19%	>19%
			Old>250	>6.3%	>19%
Seebach	2	SBSvk	Mature>100	>15%	>15%
			Old>250	>3%	>9%
	3	SBSwk1	Mature>100	>11%	>11%
			Old>140	>3.7%	>11%
	1	ICHvk2	Mature>100	>17%	>17%
			Old>250	>4.3%	>13%
	1	ESSFwk2, wc3	Mature>120	>19%	>19%
			Old>250	>6.3%	>19%
Woodall	2	SBSvk	Mature>100	>15%	>15%
			Old>250	>3%	>9%
	1	ICHvk2	Mature>100	>17%	>17%
			Old>250	>4.3%	>13%
	1	ESSFwk2, wc3	Mature>120	>19%	>19%
			Old>250	>6.3%	>19%

Table 4: Old forest targets by natural disturbance unit (NDU)

Merged Biogeoclimatic Unit	Minimum age for stands to contribute to old forest targets	Minimum Percent of the CFLB retained as old forest	Minimum Percent of the CFLB retained as old forest, leading in species other than pine
A2 NDU_McGregor Plateau_ESSF	140	26%	0%
A3 NDU_McGregor Plateau_SBSmk1	120	12%	0%
A4 NDU_McGregor Plateau_SBSvk, wk1	140	26%	0%
A15 NDU_Wet Mountain_ESSFwc3	140	84%	0%
A14 NDU_Wet Mountain_ESSFwk2	140	50%	0%
A17 NDU_Wet Mountain_SBSvk	140	50%	0%
A16 NDU_Wet Mountain_SBSwk1	140	26%	0%
A20 NDU_Wet Trench Mountain_ESSFwc3	140	80%	0%
A19 NDU_Wet Trench Mountain_ESSFwk2	140	48%	0%
A25 NDU_Wet Trench-Valley_SBSvk	140	46%	0%
A24 NDU_Wet Trench-Valley_SBSwk1	140	30%	0%

4.2 Management Assumptions for Timber Production

The following section outlines the inputs related to timber production. These inputs, except for the analysis units, are adopted from the TFL 30 Management Plan No. 9 Timber Supply Analysis.

4.2.1 Analysis units

In the TFL 30 Management Plan No.9 Timber Supply Analysis, forest stands were not aggregated into analysis units; rather the yield curves were attached for each VRI polygon. Analysis units were created in this analysis based on leading species and Biogeoclimatic zones (Table 5). Yield curves were produced for each analysis unit.

Table 5 - Analysis Unit Definitions

Analysis Unit	Leading Species	Type	Biogeoclimatic Zone
4	Spruce	Natural Stand	ESSF
5	Spruce	Natural Stand	ICH
6	Spruce	Natural Stand	SBS
7	Balsam	Natural Stand	ESSF
8	Balsam	Natural Stand	ICH
9	Balsam	Natural Stand	SBS
10	Cedar/Hemlock	Natural Stand	ESSF
11	Cedar/Hemlock	Natural Stand	ICH
12	Cedar/Hemlock	Natural Stand	SBS
13	Pine	Natural Stand	ESSF
14	Pine	Natural Stand	ICH
15	Pine	Natural Stand	SBS
17	Douglas	Natural Stand	ICH
18	Douglas	Natural Stand	SBS
201	No	NSR	ESSF
202	No	NSR	ICH
203	No	NSR	SBS
204	Spruce	Managed Stand	ESSF
205	Spruce	Managed Stand	ICH
206	Spruce	Managed Stand	SBS
207	Balsam	Managed Stand	ESSF
208	Balsam	Managed Stand	ICH
209	Balsam	Managed Stand	SBS
210	Cedar/Hemlock	Managed Stand	ESSF
211	Cedar/Hemlock	Managed Stand	ICH
212	Cedar/Hemlock	Managed Stand	SBS
213	Pine	Managed Stand	ESSF
214	Pine	Managed Stand	ICH
215	Pine	Managed Stand	SBS
217	Douglas	Managed Stand	ICH
218	Douglas	Managed Stand	SBS
219	Deciduous[2]	Managed Stand	ESSF
220	Deciduous[2]	Managed Stand	ICH
221	Deciduous[2]	Managed Stand	SBS

[2]Managed young stands that are currently deciduous leading and will be treated to convert to confer leading stands.

4.2.2 Growth and Yield

The yield curves produced by JS Thrower and Associates Ltd. for the Management Plan No.9 Timber Supply Analysis are used in this analysis. The original curves by VRI polygons were amalgamated into yield curves for each analysis unit (see Table 5) using an area-weighted approach.

4.2.3 Utilization level and minimum harvestable age

The utilization level defines the maximum stump height, minimum top diameter (inside bark) and minimum diameter at breast height by species and is used to determine merchantable volume. For pine leading stands, the utilization level is defined as minimum 10 cm top diameter, 30 cm maximum stump height and minimum 12.5 cm at breast height; for non-pine leading stands, minimum 10 cm top diameter, 30 cm maximum stump height and 17.5 cm breast height diameter.
Minimum harvestable age is the youngest age at which a stand is eligible for harvest. Minimum harvestable age is defined for each analysis unit based on the leading species and stand type (i.e., natural vs. managed) of the analysis unit (Table 6).

Table 6 - Minimum harvestable age by analysis unit

Analysis Unit (natural stand)	Minimum harvestable age (years)	Analysis Unit (managed stand)	Minimum harvestable age (years)
5	115	201	62
6	110	202	64
7	106	203	60
8	115	204	62
9	110	205	64
10	106	206	60
11	115	207	62
12	110	208	64
13	106	209	60
14	115	210	62
15	110	211	64
16	106	212	60
17	110	213	62
18	106	214	64
		215	60
		217	64
		218	60
		219	62
		220	64
		221	60

4.2.4 Unsalvaged losses

Unsalvaged losses modeled in this analysis were 3,640 m^3/year as per the Management Plan No. 9 Timber Supply Analysis.

4.2.5 Initial harvest rate and stand scheduling rules

The initial harvest rate is 201,500 m^3/year (Canfor 180,000 m3 + BCTS 21,500 m3). This harvest rate is lower than the current AAC of 330,000 m^3/year. The lower harvest rate was chosen by Canfor to reflect the need to harvest timber in the TSA, outside of the TFL due to the MPB epidemic. The relative oldest harvest rule was used to prioritize polygons for harvesting.

4.3 Mountain Pine Beetle

The current mountain pine beetle infestation is spreading in the interior of British Columbia and lodgepole pine stands in the TFL are under attack. A lodgepole pine leading stand is not a major stand type in the TFL, covering about 6,000 ha, or 5%, of the timber harvesting land base. No mountain pine beetle was modeled in the Management Plan No.9 Timber Supply Analysis. For this analysis, Canfor provided an estimate of attacked area by age class (Table 7).

Table 7 - Mountain pine beetle attack area

Leading species	Age class	Attack
Lodgepole pine	5 and above	100%
Lodgepole pine	3 and 4	50%

The assumptions related to volume loss and shelf life are summarized below:

- 100% attacked stands
  Shelf life is 13 years. During the first 3 years, the stand volume will be 100% available for harvesting. Starting from year 4, available volume declines by 10% annually until year 13 when there is no available volume left. If the stands are not harvested during the shelf life, they will be converted into naturally regenerated lodgepole pine leading stands with a regeneration delay of 15 years.

- 50% attacked stands
  Shelf life is 13 years. During the first 3 years, the stand volume will be 100% available for harvesting. Starting from year 4, available volume declines by 5% annually until year 13 when 50% of the stand volume s available. If the stands are not harvested during the shelf life, they will be stay in the harvest queue with 50% of the original stand volume available.

When scheduling stands for harvesting, the pine leading stands with age class 3 and greater have a higher harvest priority than non-pine leading stands.

4.4 Natural disturbances in the non-timber harvesting land base

Natural disturbance in the non-timber harvesting land base was not modeled in the Management Plan No.9 Timber Supply Analysis. In this analysis, natural disturbance was modeled in a simplistic fashion as follows:

- Non-pine leading stands turn into naturally regenerated stands with a regeneration delay of 15 years after they exceed 400 years of age; and
- Pine leading stands turn into naturally regenerated young stands with a regeneration delay of 15 years after they exceed 300 years old.

5 Scenario Descriptions

The following scenarios were developed with Canfor with the input from the TFL 30 public advisory group (PAG).

1. Base case 1
   Objective: to present a forecast that approximates current forest management by which all other scenarios can be compared.

   - Current management as per the most recent timber supply analysis;
   - Mature plus old requirements by landscape unit, Biogeoclimatic subzone variant and natural disturbance type as per the *Sustainable Forest Management Plan 2004/05 annual report – Tree Farm Licence 30* . Draw down on the old requirement; this means that only 1/3 of the old growth requirement must be met immediately and the full requirement must be met in 140 years.

2. Base case 1b
   Objective: to present a forecast that approximates current forest management but with no draw down on the old requirement.

   - Current management as per the most recent timber supply analysis;
   - Mature plus old requirements by landscape unit, Biogeoclimatic subzone variant and natural disturbance type as per the *Sustainable Forest Management Plan 2004/05 annual report – Tree Farm Licence 30* . No drawdown on the old requirement.

3. Base case 2
   Objective: to present an alternate forecast that approximating current forest management direction in adjoining management units by which all other scenarios can be compared.

   - Current managements as per the most recent timber supply analysis;
   - Late seral requirements by natural disturbance unit (NDU) developed by Craig Delong.

4. Enhanced biodiversity scenario 1
   Objective: to investigate the impact of increasing biodiversity objectives on selected indicators.

   On base case 1b;
   - Doubling the mature plus old growth requirements;
   - Adding equivalent of 7% of the CFLB to wildlife tree patches (WTP).

5. Enhanced biodiversity scenario 2
   Objective: to investigate the impact of significantly increasing biodiversity objectives on selected indicators.

   On base case 2
   - Applying the minimum of the natural range of variation of late seral (i.e., >140 years) requirements by NDZ;
   - Adding equivalent of 7% of the CFLB to wildlife tree patches (WTP).

6. Enhanced biodiversity scenario 3
   Objective: to investigate the impact of significantly increasing biodiversity objectives on selected indicators.

   On base case 2

- Applying the mid point of the natural range of variation of late seral (i.e., >140 years) requirements by NDZ;
- Adding equivalent of 7% of the CFLB to wildlife tree patches (WTP).

7. No harvest
   Objective: Objective: to provide a “book end” type scenario based on the exclusion of harvest.

   - No timber harvesting;
   - Natural disturbance in both the THLB and NHLB.

8. Low resilience of the ecosystem

Objective: to investigate the impact of decreasing productivity due to lower than expected ecosystem resiliency on selected indicators.

On base case 1b
- Reduce volume growth by 20%;
- Increasing the age to develop old characteristics by 20%

9. Maximizing timber production
   Objective: to provide another “book end” type scenario that could be achieved within TFL 30 if no rules, no constraints or targets other than harvesting were applied.

   On base case 1b
   - Increase the yield of managed stands by 10%
   - No VQO or old growth constraints

10. Increase other non-timber values
    Objective: To create a scenario that would reflect aspects of the quality of life. It was assumed that constraining the VQOs more than in the in the base case and increasing riparian buffers would mirror the quality of life.

    On base case 1b
    - Increase the VQO objectives one level higher (e.g., partial retention -> retention and modification -> partial retention).
    - Double the RRZ.

6 Forest Simulation and Optimization System (FSOS)

Model Name: FSOS

Model Developer: Dr. Guoliang Liu

Model Development: UBC, Hugh Hamilton Limited, Forest Ecosystem Solutions Ltd.

Model Type: Landscape Design Model

FSOS (Forest Simulation Optimization System) uses C++ programming language and can be run with both Windows 95 and higher operating systems. The model interfaces directly with Microsoft Access for data management. Although FSOS has both simulation and heuristic (pseudo-optimization) capabilities, the time-step simulation mode will primarily be used in this analysis. Time-step simulation grows the forest based on growth and yield inputs and harvests resultant polygons based on user-specified harvest rules and constraints that cannot be exceeded. Using "hard" constraints and harvest rules instead of targets (as would be applied in the heuristic mode of FSOS) gives results that are repeatable and more easily interpreted.

A formal comparison of FSOS and FSSIM using a benchmark dataset was performed and submitted to the Ministry of Forests Timber Supply Branch in 1998 (Hugh Hamilton Limited 1998a). Acceptance notification correspondence was provided to Dave Waddell (currently Systems Forester, MoF Development & Policy Section) in September 1998, authorizing FSOS for use in Timber Supply Analysis to support AAC determinations in British Columbia.

FSOS has been used on over 24 forest management units (TFLs and TSAs) from small (<15,000 ha) to very large (> 9 million ha) forests throughout BC, Alberta, Manitoba and Ontario. Some of the management units that FSOS have been used in BC include: TFL 3, TFL 18, TFL 26, TFL 37, TFL 53, Soo TSA, Sunshine Coast TSA, Queen Charlotte TSA, Kingcome TSA and Kalum TSA. FSOS has been used directly in the preparation of 5 timber supply analysis that have been accepted by the chief forester in British Columbia. It is also currently being applied to three 1,000,000 ha management units in Ontario.

7 Modeled Indicators

Based on the SFM indicator matrix only a subset of indicators was modeled. Many of the indicators in the matrix are not "modelable" with a forest level model and are therefore excluded from this list. Other measures, such as proportion of deciduous forest, may be "modelable" but are limited in terms of data available or knowledge of how these habitat features change over time. As such, they are also excluded at this time. There should be an ongoing effort to improve the knowledge and data associated with these features so that we can incorporate them into future analyses and forecasting. Some of the indicators and measures while included in the analysis may only apply as a static reduction and do not change over time. Even so these features remain relevant to this project and are described in Table 8.

Table 8: Indicators and Measures modelled in the Scenario Forecasting

Indicator	Forecasted and included in Scenarios	General Report	Modeled Target
The amount of old forest by NDU/ merged BEC within the DFA or by Landscape unit and BEC	Yes	Report forecasting old forest over time.	Yes
The amount of interior old forest by NDU/merged BEC within the DFA or by Landscape unit and BEC	Yes	Report forecasting old interior over time.	No – only reporting.
The young patch size distribution by NDU (or NDT) within the DFA.	Yes	Report forecasting over time.	No – only reporting
Trend towards the percentage of area of patches in the 101-500 ha within the Wet Trench and Wet Mountain of the young patch size distribution class 101-1000 ha.	Yes	Report forecasting over time.	No – only reporting.
The amount of Caribou Ungulate Winter Range habitat within TFL30	Yes	Assumed static as harvesting not allowed.	No – a constraint.
Peak flow index (PFI) for each watershed within the DFA.	Yes	Report forecasting over time.	Yes, not also a constraint
The amount of carbon in forest ecosystems within the DFA	Yes	Report forecasting over time.	No – only reporting
Annual volume of timber harvested (m3/year) within the DFA.	Yes	Report forecasting over time.	Yes

8 Base Case Results

8.1 Base Case 1 and Base Case 1b

8.1.1 Harvest Forecast

In this scenario, old growth requirements were applied by landscape unit, Biogeoclimatic subzone variant and natural disturbance type (see Table 3 for the requirements). Figure 1 shows the base case 1 and base case 1b harvest forecast.

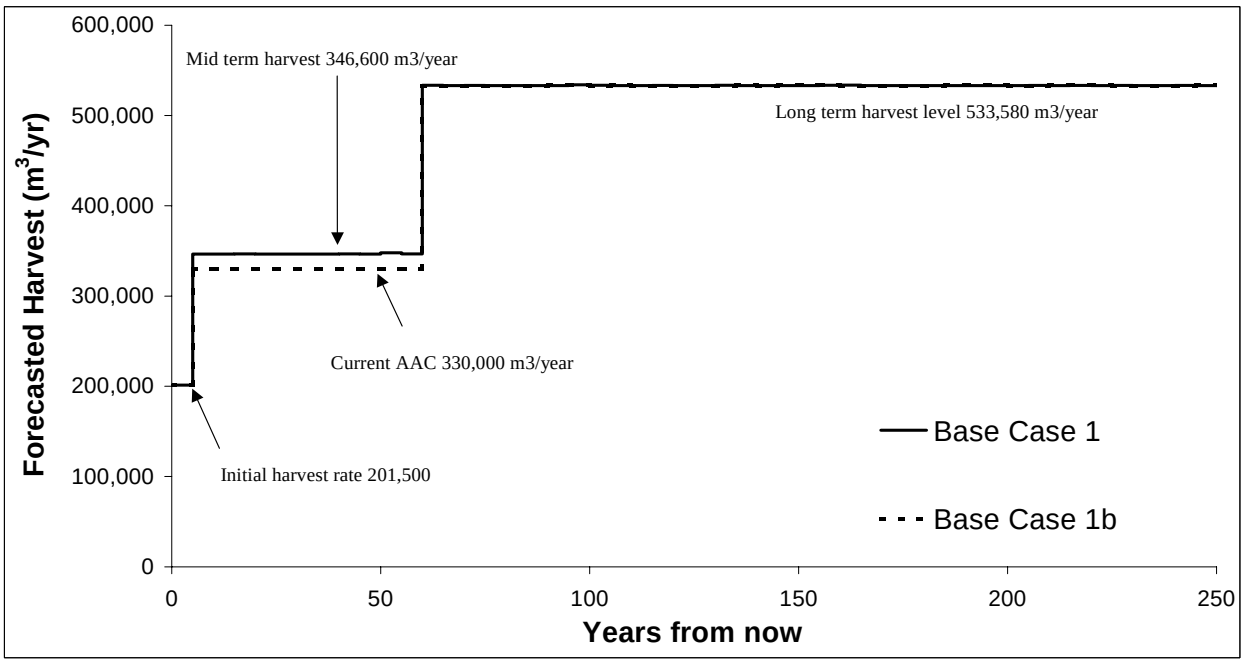

Figure 1 - Base case 1 and base case 1b harvest forecasts

As Figure 1 illustrates, after maintaining the initial harvest rate of 201,500 m^3/year for 5 years, the harvest rate can be increased to 346,600 m^3/year for base case 1 but only to 330,000 m^3/year for base case 1b. The difference in the mid-term harvest level is caused by not allowing the draw down of the old growth in base case 1b.

The mid-term harvest level can be maintained for 60 years in both cases. After that, more second rotation stands become merchantable and the harvest rate can be increased to the long-term harvest level of 533,580 m^3/year. The growing stock under these scenarios is shown in Figure 2, which indicates that merchantable growing stock is not a limiting factor. The long-term growing stock is maintained steadily at around 19 million m^3 for both base case 1 and base case 1b.

The annual harvest areas for both of these base cases are exhibit similar trends starting from between 600 and 700 ha annually at the beginning of the planning horizon and then increasing close to 1,200 ha after the first 5 years and finally stabilizing around 1,350 ha after 70 years (Figure 3).

The trends are similar also for the average harvest ages. Note small differences until the very long term (Figure 4). Base Case 1 (draw down) allows for the harvest of older stands due to less restrictive old growth requirements in the short and medium term.

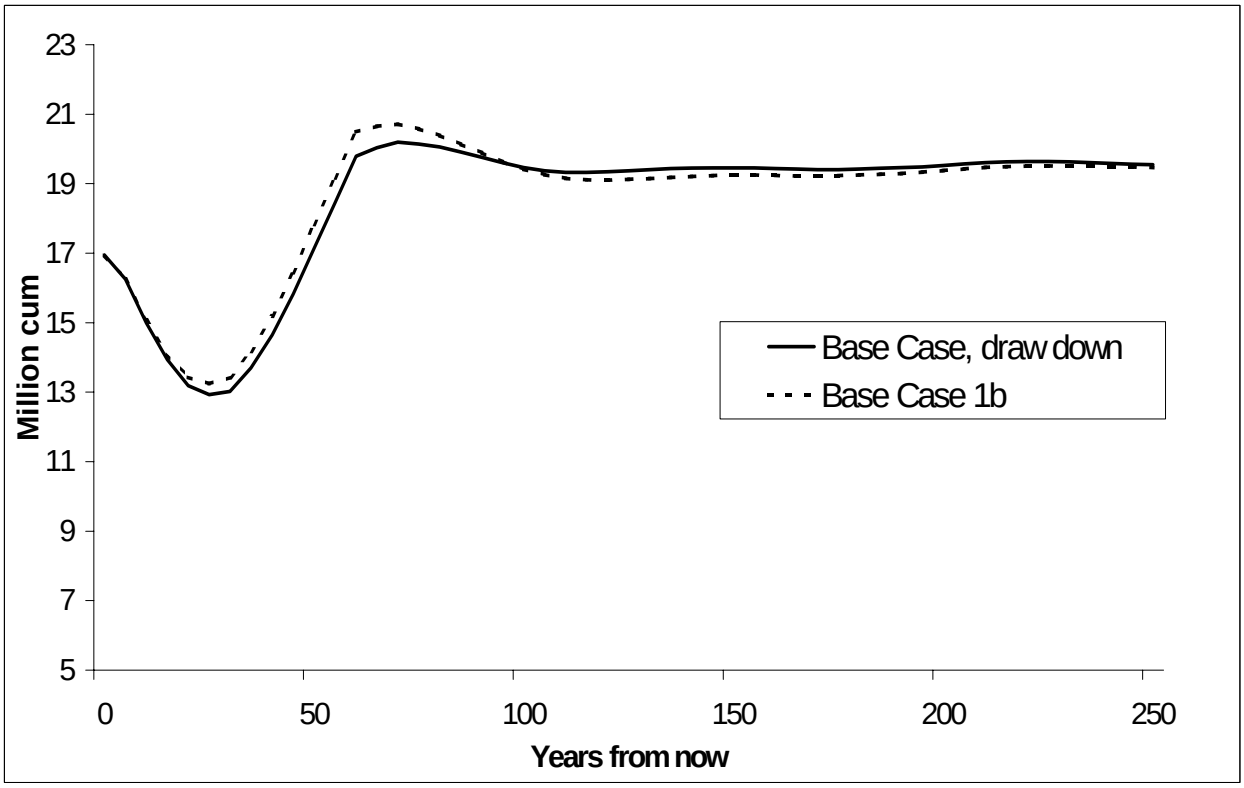

Figure 2 - Growing stock – Base case 1 and base case 1b

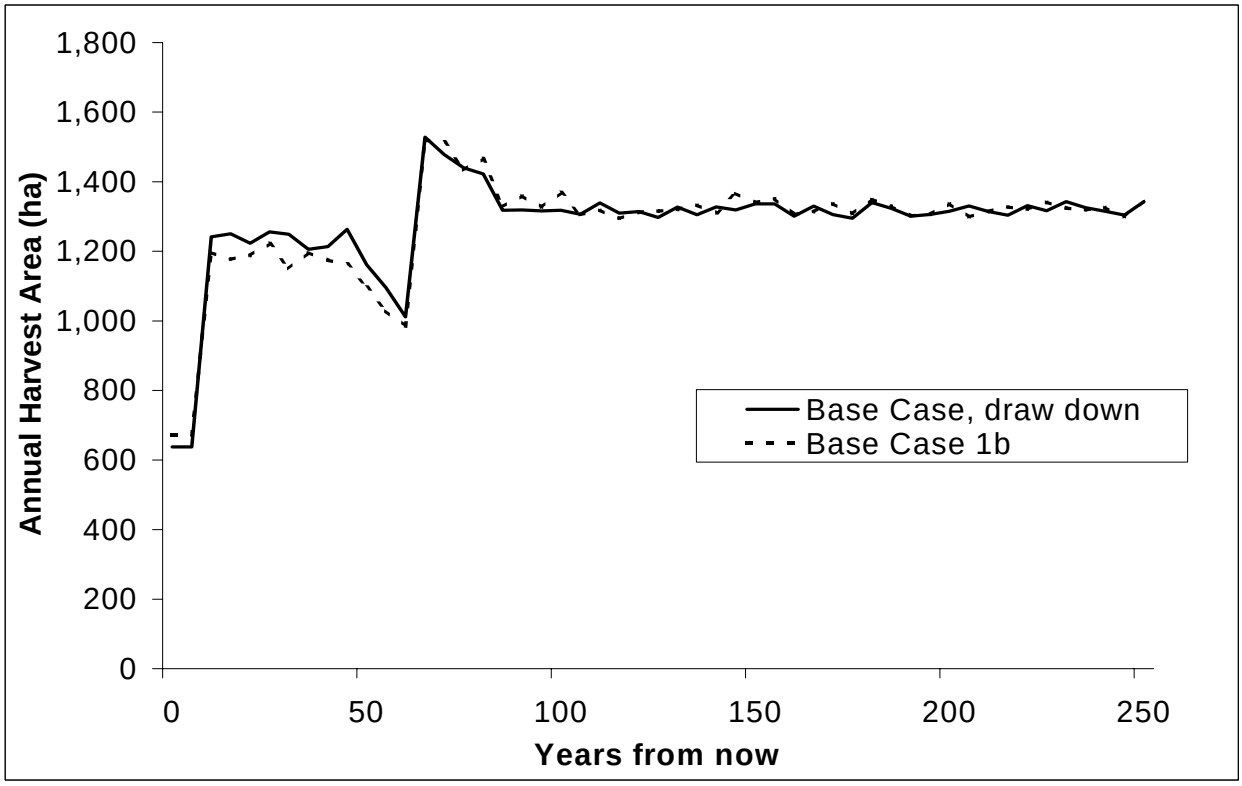

Figure 3 - Annual harvest area – Base case 1 and base case 1b

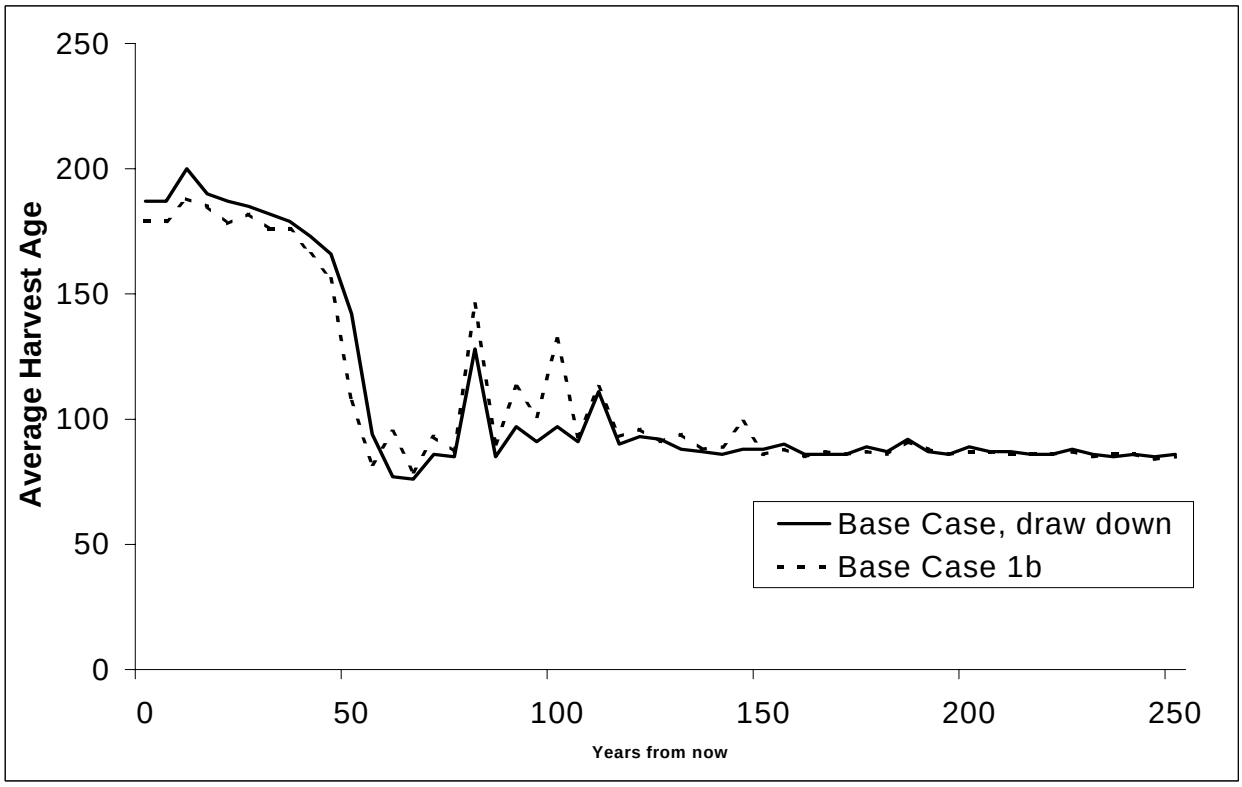

Figure 4 - Average harvest age - Base case 1 and base case 1b

8.1.2 Seral Targets

As described earlier in this document, base case 1 used landscape unit/BEC variant based mature and old and old seral targets. Table 9 illustrates the achievement of mature and old targets. All targets are currently met and continue to be met throughout the planning horizon.

Table 9 – Achievement of Mature and Old Seral Targets, Base Case 1 and Base Case 1b

Landscape unit	BEC	Mature Age	Target %	Current Status	Target met
Averil	SBS wk1, mk1	100	11%	37%	Now
	ICHvk2	100	17%	61%	Now
	ESSFwk2	120	19%	70%	Now
Seebach	SBSvk	100	15%	65%	Now
	SBSwk1	100	11%	57%	Now
	ICHvk2	100	17%	50%	Now
	ESSFwk2, wc3	120	19%	74%	Now
Woodall	SBSvk	100	15%	49%	Now
	ICHvk2	100	17%	74%	Now
	ESSFwk2, wc3	100	19%	78%	Now

Table 10 illustrates the achievement of seral old targets for base case 1 and base case 1b. Most targets are currently met or will be met within the next 25 years. The exception is Woodall/ESSFwk2, wc3 where it will take 20 years to meet the draw down old seral target (base case) and 65 years to meet the full old seral target (base case 1b) given the projected harvest forecast (Figure 6 and).

Table 10 - Achievement of Old Seral Targets, Base Case 1 and Base Case 1b

Landscape unit	BEC	Old Age	Base Case Target %	Base Case 1b Target %	Current Status	Base Case Target Met	Base Case 1b Target Met
Averil	SBS wk1, mk1	140	3.7%	11%	24%	Now	Now
	ICHvk2	250	4.3%	13%	13%	Now	Now
	ESSFwk2	250	6.3%	19%	0%	20 years	20 years
Seebach	SBSvk	250	3%	9%	8%	Now	5 years
	SBSwk1	140	3.7%	11%	47%	Now	Now
	ICHvk2	250	4.3%	13%	13%	Now	Now
	ESSFwk2, wc3	250	6.3%	19%	6%	Now	25 years
Woodall	SBSvk	250	3%	9%	6%	Now	5 years
	ICHvk2	250	4.3%	13%	7%	Now	10 years
	ESSFwk2, wc3	250	6.3%	19%	2%	20 years	65 years

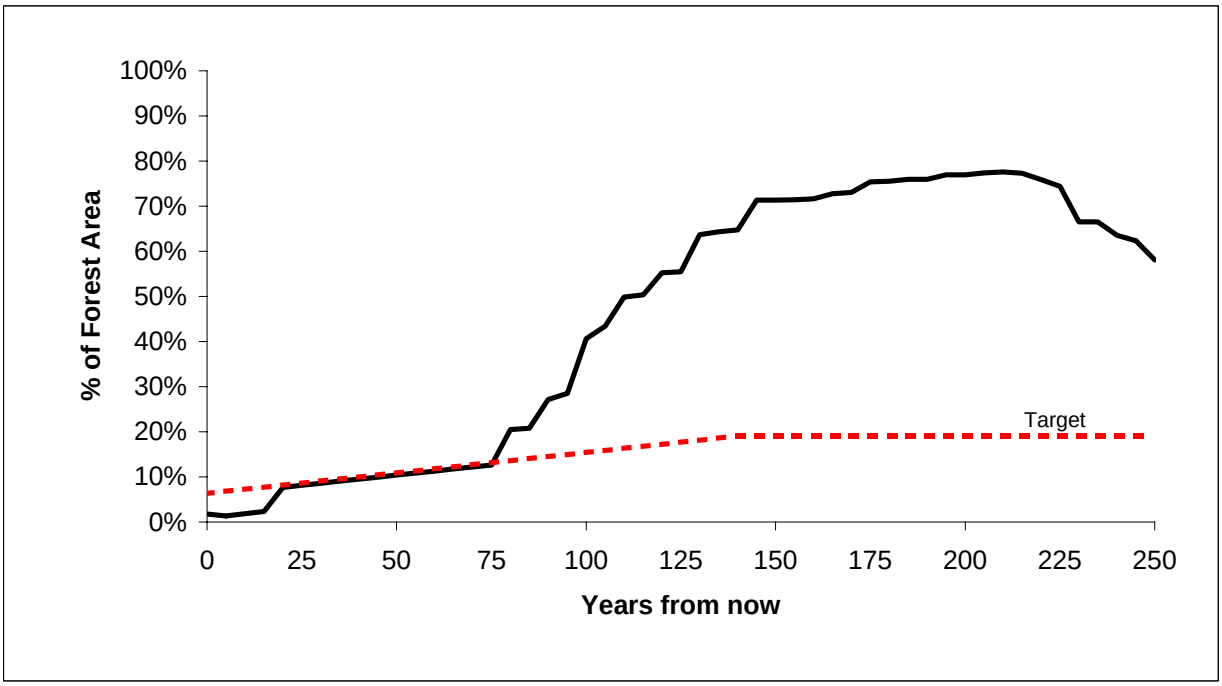

Figure 5 - Old Forest over the Planning Horizon, Woodall/ESSFwk2, wc3, base case 1

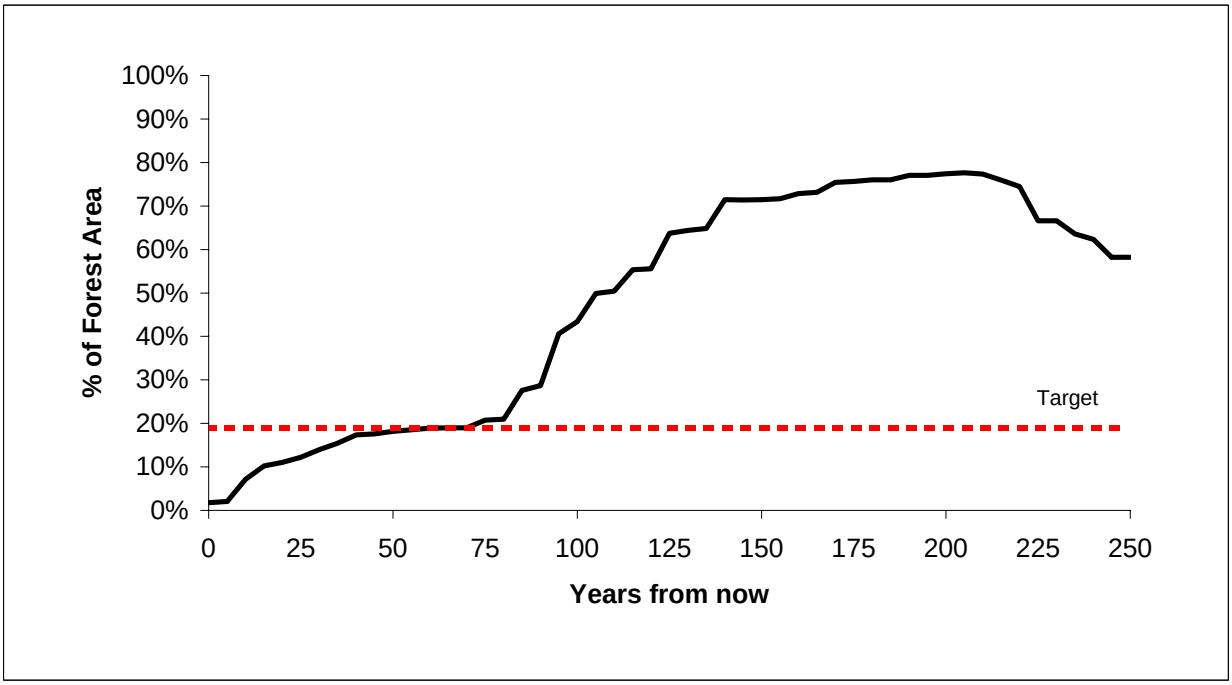

Figure 6 – Old Forest over the Planning Horizon, Woodall/ESSFwk2, wc3, base case 1b

8.1.3 Old Interior Forest

Table 17 illustrates the current area of old interior forest and a forecasted area 50 years from now for base case 1. The summaries are presented by the merged biogeoclimatic unit for the sake of consistency. Note that the forecasted result is an outcome of the harvest schedule and no spatial targets were applied in the model to achieve any specific amount of old interior forest.

Table 11 – Old interior forest, current status and status 50 years from now. Base case 1 and base case 1b.

Merged Biogeoclimatic Unit	Target Total Old Forest Area (ha)	Target Old Interior %	Target Old Interior ha	Current Old Interior %	Current Old Interior ha	Old Interior in 50 Years %	Old Interior in 50 Years ha	Old Interior in 50 Years %	Old Interior in 50 Years ha
						Base Case 1		Base Case 1b	
A2 NDU_McGregor Plateau_ESSF	137	40%	55	190%	260	11%	15	5%	7
A3 NDU_McGregor Plateau_SBSmk1	816	25%	204	282%	2,301	2%	13	1%	12
A4 NDU_McGregor Plateau_SBSvk, wk1	13,397	10%	1,340	35%	4,635	3%	430	4%	507
A15 NDU_Wet Mountain_ESSFwc3	2,479	40%	992	48%	1,192	79%	1,957	83%	2,049
A14 NDU_Wet Mountain_ESSFwk2	3,907	40%	1,563	92%	3,612	64%	2,484	77%	3,006
A17 NDU_Wet Mountain_SBSvk	28,952	25%	7,238	66%	18,983	4%	1,278	7%	2,025
A16 NDU_Wet Mountain_SBSwk1	1,273	25%	318	139%	1,768	24%	310	24%	310
A20 NDU_Wet Trench Mountain_ESSFwc3	29	40%	11	105%	30	77%	22	105%	30
A19 NDU_Wet Trench Mountain_ESSFwk2	935	40%	374	109%	1,019	70%	657	105%	983
A25 NDU_Wet Trench-Valley_SBSvk	10,342	25%	2,585	30%	3,117	5%	511	5%	509
A24 NDU_Wet Trench-Valley_SBSwk1	1	10%	0	0%	0	0%	0	0%	0
TFL 30	**62,266**	**n/a**	**14,680**	**n/a**	**36,916**	**n/a**	**7,677**	**n/a**	**9,439**

8.1.4 Early Seral Patch Size Distribution

Table 13 and Table 13 illustrate the current early seral patch size distribution and a forecasted early seral patch size distribution 50 years from now for base case 1 and base case 1b. The summaries are presented by the merged biogeoclimatic unit for the sake of consistency. Note that the forecasted result is an outcome of the harvest schedule and no spatial targets were applied in the model to achieve any specific patch size distribution.

Table 12 – Early seral patch size distribution, current status and status 50 years from now. Base case 1.

	Young Forest Patch Size Class (ha)				
Natural Disturbance Sub Unit	**< 50**	**50-100**	**100-500**	**500-1000**	**> 1000**
NDU_McGregor Plateau, Targe (%)t	**10%**	**5%**	**45%**		**40%**
Current Patch Size Distribution (%)	3%	3%	3%		90%
Year 50 Patch Size Distribution (%)	14%	4%	21%		61%
NDU_Wet Mountain, Target (%)	**20%**	**10%**	**60%**		**10%**
Current Patch Size Distribution (%)	7%	7%	22%		64%
Year 50 Patch Size Distribution (%)	22%	9%	32%		37%
NDU_Wet Trench (%)	**20%**	**10%**	**60%**		**10%**
Current Patch Size Distribution (%)	6%	4%	1%		89%
Year 50 Patch Size Distribution (%)	17%	5%	10%		68%

Table 13 – Early seral patch size distribution, current status and status 50 years from now. Base case 1b.

	Young Forest Patch Size Class (ha)				
Natural Disturbance Sub Unit	**< 50**	**50-100**	**100-500**	**500-1000**	**> 1000**
NDU_McGregor Plateau, Target (%)	**10%**	**5%**	**45%**		**40%**
Current Patch Size Distribution (%)	3%	3%	3%		90%
Year 50 Patch Size Distribution (%)	19%	6%	17%		58%
NDU_Wet Mountain, Target (%)	**20%**	**10%**	**60%**		**10%**
Current Patch Size Distribution (%)	7%	7%	22%		64%
Year 50 Patch Size Distribution (%)	25%	11%	20%		45%
NDU_Wet Trench, Target (%)	**20%**	**10%**	**60%**		**10%**
Current Patch Size Distribution (%)	6%	4%	1%		89%
Year 50 Patch Size Distribution (%)	13%	5%	10%		71%

8.1.4.1 Patch Size Distribution within the 100 – 1,000 ha Patch Size Class

The TFL 30 public advisory group has set another early seral patch size distribution target. It is desirable to have 75 % of the patches in the 100 – 1,000 ha patch size class distributed in such a way that 75% would be between 100 and 500 ha in size, and 25% between 500 and 1,000 ha in size. These targets apply only to Wet Mountain and Wet Trench. Table 14 illustrates the distribution of patches within the 100 to 1,000 ha patch size class for Base Case 1 and Base Case 1b.

Table 14 – Distribution of Patches within the 100 to 1,000 ha Patch Size Class, Base Case 1and Base Case 1b

Scenario	**Natural Disturbance Sub Unit**	**Area in 100 to 1000 ha Patches**	**Area in 100 to 500 ha Patches**		**Area in 500 to 1,000 ha Patches**	
	NDU_Wet Mountain	**ha**	**ha**	**% of total**	**ha**	**% of total**
	Current	3,912	3,001	77%	911	23%
Base Case 1	Year 50	3,494	2,182	62%	1,312	38%
Base Case 1b	Year 50	2,143	2,143	100%	0	0%
	NDU_Wet Trench	**Ha**	**Ha**	**% of total**	**Ha**	**% of total**
	Current	110	110	100%	0	0
Base Case 1	Year 50	742	742	100%	0	0
Base Case 1b	Year 50	828	828	100%	0	0

8.1.5 Peak Flow Index

For the ease of modelling the peak flow index (PFI) was translated to equivalent weighted clearcut area (ECA) for each watershed. The ECAs were weighted depending on whether they were located below or above the H60 line. ECAs were used in the modelling as constraints, i.e., the ECA value cannot exceed the target value. In some cases the target values are exceeded at the beginning of the planning horizon. This is caused by the existing forest/watershed condition (Figure 7). As an example, Table 15 shows all achieved ECA values for all watersheds over the planning horizon for Base Case 1.

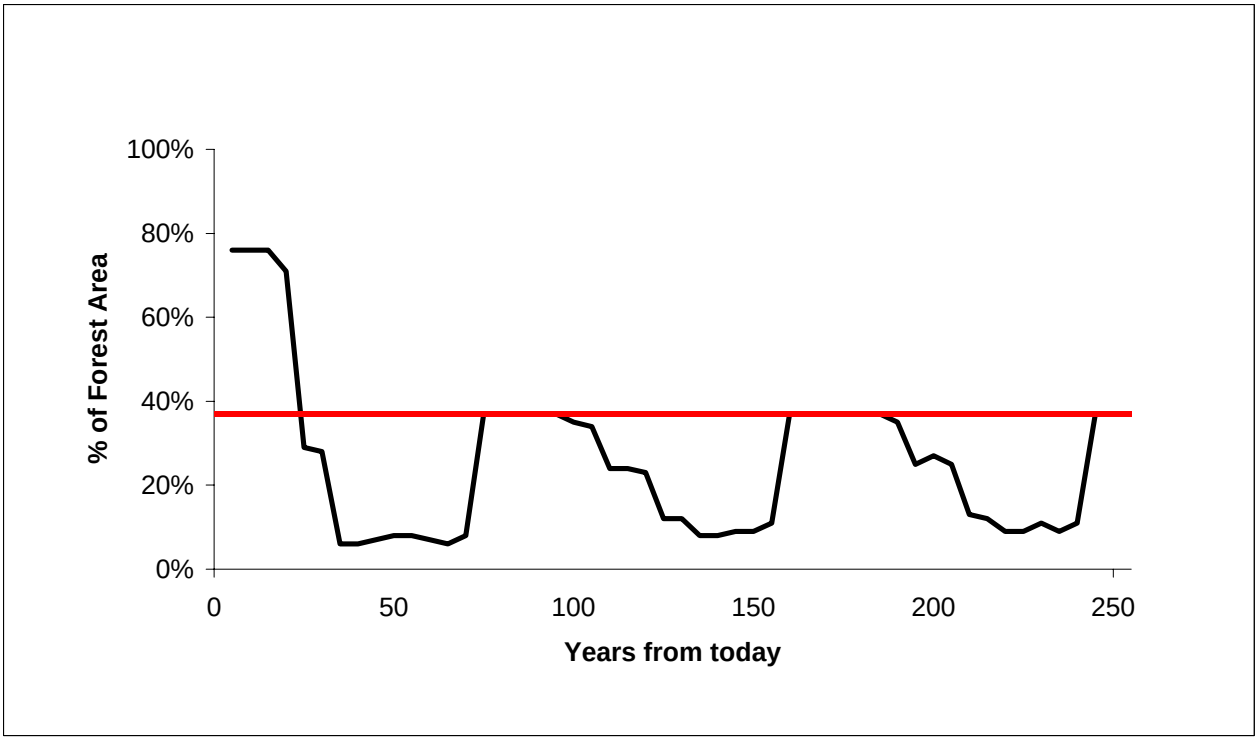

Figure 7 – ECA over the planning horizon in Barney Creek

Table 15 – Achieved ECA, base case 1

		Year																								
Watershed		**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**210**	**220**	**230**	**240**	**250**
	MaxECA	**Achieved ECA**																								
Watershed_Basin_20	0.65	0.39	0.43	0.27	0.16	0.18	0.27	0.22	0.28	0.23	0.37	0.33	0.16	0.21	0.27	0.23	0.26	0.23	0.3	0.29	0.2	0.13	0.28	0.29	0.36	0.29
Watershed_Basin_25	0.8	0.45	0.33	0.26	0.22	0.35	0.51	0.44	0.31	0.24	0.22	0.21	0.21	0.51	0.56	0.52	0.29	0.21	0.23	0.18	0.13	0.32	0.54	0.54	0.43	0.32
Watershed_Basin_27	0.8	0.32	0.24	0.19	0.21	0.35	0.4	0.36	0.28	0.21	0.16	0.2	0.24	0.32	0.4	0.41	0.26	0.13	0.1	0.19	0.21	0.36	0.39	0.46	0.41	0.32
Watershed_Basin_4	0.65	0.36	0.4	0.24	0.2	0.3	0.33	0.33	0.21	0.14	0.33	0.36	0.22	0.31	0.36	0.32	0.18	0.31	0.37	0.39	0.3	0.22	0.41	0.39	0.28	0.25
Watershed_Basin_7	0.8	0.79	0.79	0.32	0.07	0.04	0.07	0.1	0.11	0.37	0.72	0.74	0.05	0.02	0.08	0.11	0.07	0.68	0.71	0.7	0.25	0.03	0.07	0.11	0.11	0.08
Watershed_Basin_Averil Creek	0.65	0.47	0.38	0.29	0.34	0.31	0.33	0.39	0.44	0.32	0.24	0.21	0.35	0.34	0.43	0.39	0.43	0.26	0.18	0.2	0.27	0.35	0.36	0.42	0.42	0.44
Watershed_Basin_Barney Creek	0.37	0.76	0.76	0.29	0.06	0.07	0.08	0.06	0.37	0.37	0.37	0.34	0.12	0.08	0.09	0.11	0.37	0.37	0.37	0.25	0.25	0.12	0.09	0.09	0.37	0.37
Watershed_Basin_East Olsson	0.37	0.27	0.34	0.27	0.27	0.23	0.2	0.36	0.37	0.31	0.16	0.24	0.27	0.24	0.36	0.37	0.37	0.32	0.17	0.23	0.27	0.23	0.25	0.3	0.26	0.3
Watershed_Basin_East Seebach	0.8	0.22	0.33	0.36	0.27	0.19	0.1	0.11	0.18	0.19	0.19	0.25	0.3	0.19	0.11	0.19	0.2	0.18	0.25	0.32	0.35	0.32	0.21	0.21	0.26	0.29
Watershed_Basin_Herring Creek	0.65	0.4	0.49	0.47	0.37	0.26	0.11	0.16	0.29	0.33	0.28	0.33	0.38	0.27	0.18	0.19	0.34	0.3	0.23	0.3	0.41	0.33	0.15	0.22	0.33	0.41
Watershed_Basin_Horn Creek	0.37	0.26	0.28	0.27	0.25	0.23	0.15	0.2	0.22	0.16	0.16	0.2	0.3	0.24	0.24	0.21	0.22	0.12	0.16	0.19	0.31	0.27	0.21	0.28	0.26	0.32
Watershed_Basin_Hubble Creek	0.8	0.37	0.42	0.29	0.22	0.26	0.34	0.33	0.2	0.29	0.37	0.39	0.21	0.3	0.37	0.33	0.19	0.33	0.38	0.36	0.28	0.23	0.36	0.37	0.29	0.24
Watershed_Basin_Limestone Creek	0.8	0.65	0.59	0.25	0.16	0.18	0.27	0.19	0.13	0.47	0.44	0.28	0.21	0.21	0.27	0.19	0.31	0.44	0.46	0.21	0.11	0.21	0.3	0.23	0.17	0.41
Watershed_Basin_Lower Olsson	0.65	0.58	0.56	0.34	0.24	0.19	0.19	0.2	0.38	0.42	0.4	0.25	0.25	0.21	0.25	0.21	0.47	0.39	0.27	0.2	0.24	0.21	0.22	0.24	0.32	0.49
Watershed_Basin_Lower Seebach	0.65	0.6	0.54	0.3	0.25	0.27	0.18	0.3	0.4	0.41	0.33	0.21	0.27	0.28	0.37	0.33	0.55	0.4	0.32	0.2	0.29	0.28	0.25	0.35	0.37	0.51
Watershed_Basin_Mokus Creek	0.9	0.8	0.58	0.3	0.17	0.1	0.12	0.5	0.49	0.51	0.36	0.31	0.18	0.12	0.39	0.5	0.58	0.39	0.31	0.24	0.2	0.15	0.14	0.43	0.46	0.62
Watershed_Basin_Resid A	0.65	0.29	0.26	0.14	0.15	0.24	0.28	0.19	0.11	0.23	0.24	0.22	0.18	0.28	0.27	0.19	0.15	0.23	0.26	0.18	0.1	0.26	0.29	0.26	0.17	0.2
Watershed_Basin_Resid B	0.37	0.66	0.57	0.31	0.15	0.21	0.24	0.28	0.21	0.37	0.37	0.37	0.25	0.27	0.3	0.33	0.21	0.37	0.37	0.37	0.32	0.28	0.3	0.33	0.27	0.25
Watershed_Basin_Resid C	0.65	0.64	0.5	0.27	0.2	0.22	0.28	0.33	0.3	0.46	0.38	0.24	0.2	0.23	0.31	0.34	0.36	0.36	0.36	0.19	0.13	0.21	0.28	0.34	0.31	0.47
Watershed_Basin_Resid D	0.37	0.2	0.17	0.1	0.1	0.13	0.11	0.18	0.24	0.26	0.13	0.07	0.12	0.14	0.16	0.26	0.26	0.18	0.12	0.08	0.12	0.13	0.14	0.25	0.3	0.34
Watershed_Basin_Resid E	0.65	0.48	0.48	0.17	0.03	0.26	0.28	0.23	0.1	0.03	0.37	0.38	0.09	0.27	0.29	0.14	0.04	0.33	0.37	0.38	0.14	0.16	0.28	0.26	0.11	0.08
Watershed_Basin_Resid F	0.65	0.53	0.57	0.39	0.23	0.14	0.14	0.24	0.3	0.49	0.34	0.44	0.19	0.1	0.13	0.31	0.26	0.38	0.45	0.31	0.26	0.17	0.19	0.28	0.37	0.35
Watershed_Basin_Tay Creek	0.8	0.34	0.28	0.3	0.39	0.5	0.41	0.25	0.18	0.14	0.23	0.21	0.43	0.51	0.45	0.28	0.21	0.13	0.21	0.22	0.2	0.5	0.49	0.39	0.25	0.25
Watershed_Basin_Upper Olsson	0.8	0.24	0.29	0.26	0.34	0.33	0.23	0.17	0.26	0.25	0.21	0.23	0.37	0.35	0.25	0.23	0.27	0.22	0.18	0.24	0.36	0.4	0.38	0.3	0.33	0.29
Watershed_Basin_Upper Seebach	0.8	0.24	0.3	0.29	0.33	0.27	0.23	0.21	0.27	0.24	0.15	0.2	0.38	0.33	0.26	0.31	0.29	0.22	0.15	0.28	0.36	0.39	0.34	0.28	0.33	0.3
Watershed_Basin_West Torpy	0.37	0.17	0.19	0.16	0.13	0.11	0.07	0.07	0.1	0.12	0.16	0.14	0.14	0.1	0.09	0.1	0.11	0.12	0.16	0.2	0.18	0.13	0.12	0.17	0.18	0.2
Watershed_Basin_Woodall Creek	0.37	0.26	0.24	0.13	0.16	0.26	0.28	0.24	0.23	0.22	0.18	0.16	0.19	0.28	0.33	0.36	0.23	0.23	0.17	0.16	0.14	0.19	0.3	0.32	0.35	0.33

8.1.6 Carbon

Figure 9 shows the forecasted average ecosystem carbon per hectare over the planning horizon. Note that ecosystem carbon tends to follow the same trend as the old forest (Figure 9). The result shown in Figure 9 is for Base Case 1b. Old forest tends to retain carbon. Old forest as presented in Figure 9 was defined using Delong's NDU based old forest definitions.

Figure 8 – Ecosystem Carbon for Base Case 1 and Base Case 1b.

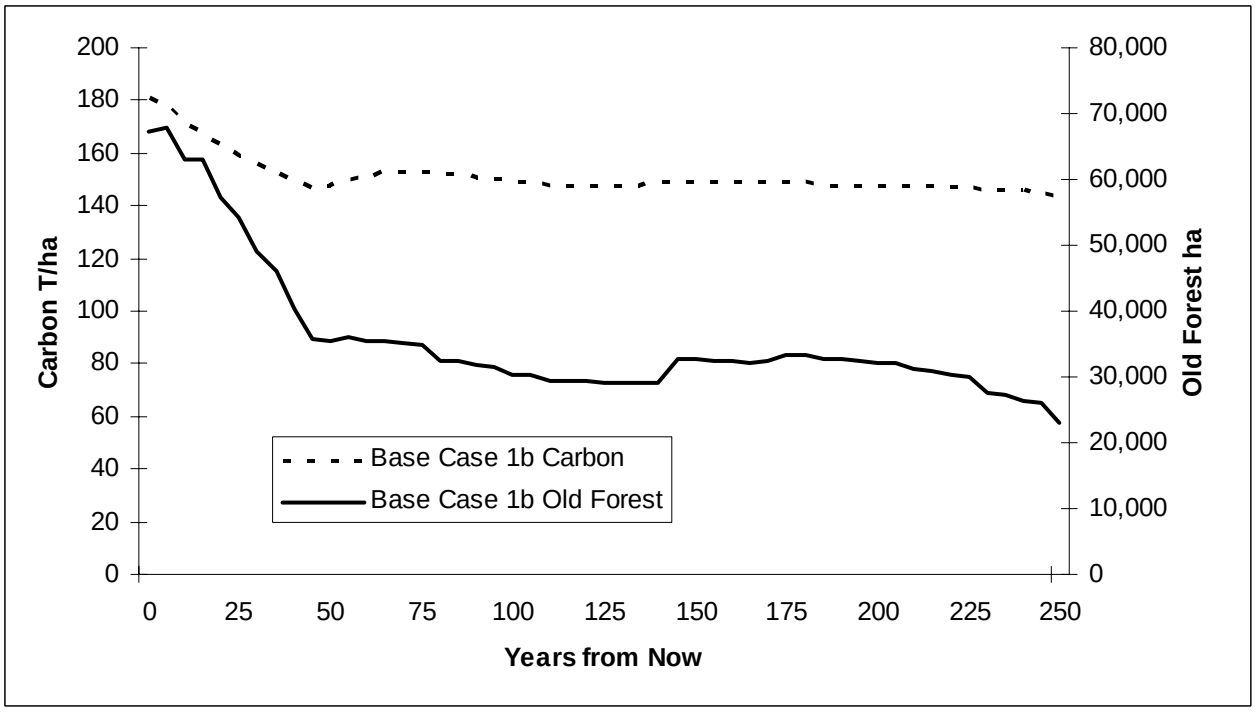

Figure 9 – Ecosystem carbon in the forest land over the planning horizon.

8.2 Base Case 2

8.2.1 Harvest Forecast

In this scenario, the late seral requirements by natural disturbance units (NDU) developed by Craig Delong (see Table 4 for the requirements) were applied to replace the mature plus old and old requirements that were applied in base case 1 and base case 1b. The harvest forecast, related growing stock, harvest area and age of this scenario are shown in Figure 11, Figure 12 and Figure 13.

When applying the late seral targets by NDU, higher percentage of the land base needs to be in the old forest condition. The results of base case 2 reflect the impact of this difference when compared to base case 1 and base case 1b.

The harvest flow in base case 2 is generally lower than that in base case 1 or 1b because more stands are constrained by the late seral requirements. After the initial harvest rate of 201,500 m^3/year for the first 5 years, the short-term and mid-term harvest rate could be increased to 346,600 m^3 in base case 1 and to the current AAC of 330,000 m^3/year for base case 1b. In the base case 2, the mid-term harvest rate had to be reduced to 181,500 m^3/year, which is 10% lower than the initial harvest rate. The long-term harvest level in base case 2 is 21% lower than that in base case 1 and base case 1b. Note that due to lower short and mid term harvest rates, base case 2 achieves its long-term harvest rate 15 years earlier.

The growing stock of base case 2 shows a similar pattern as that of base case 1 and base case 1b. However, the long-term growing stock is approximately 3 million m^3, or 15 %, higher.

The average harvest area in base case 2 is smaller than that in base case 1 or base case 1b due to a lower harvest rate.

The overall trend of the average harvest age is similar in the three base cases. Base case 2 has a significant spike in average harvest age at year 140. This is caused by the fact that in 140 years all areas currently younger than 10 years of age will be old enough to meet the old seral requirement (the age of "old" is mainly 140 in the NDUs within the TFL). They release other older stands for harvesting from the old seral constraints. These currently young areas cover more than 20% of the THLB in the TFL.

In base case 1 or 1b, such a spike in harvest age does not occur due to less constraining old seral targets and multiple definitions of old ages (i.e., some BEC/LU combinations define 250 as old while other BEC/LU combinations define old as 140 years). In base case 1 and 1b, less stands are constrained by the mature plus old and old constrains and the constrained stands are released for harvesting in a steadier manner.

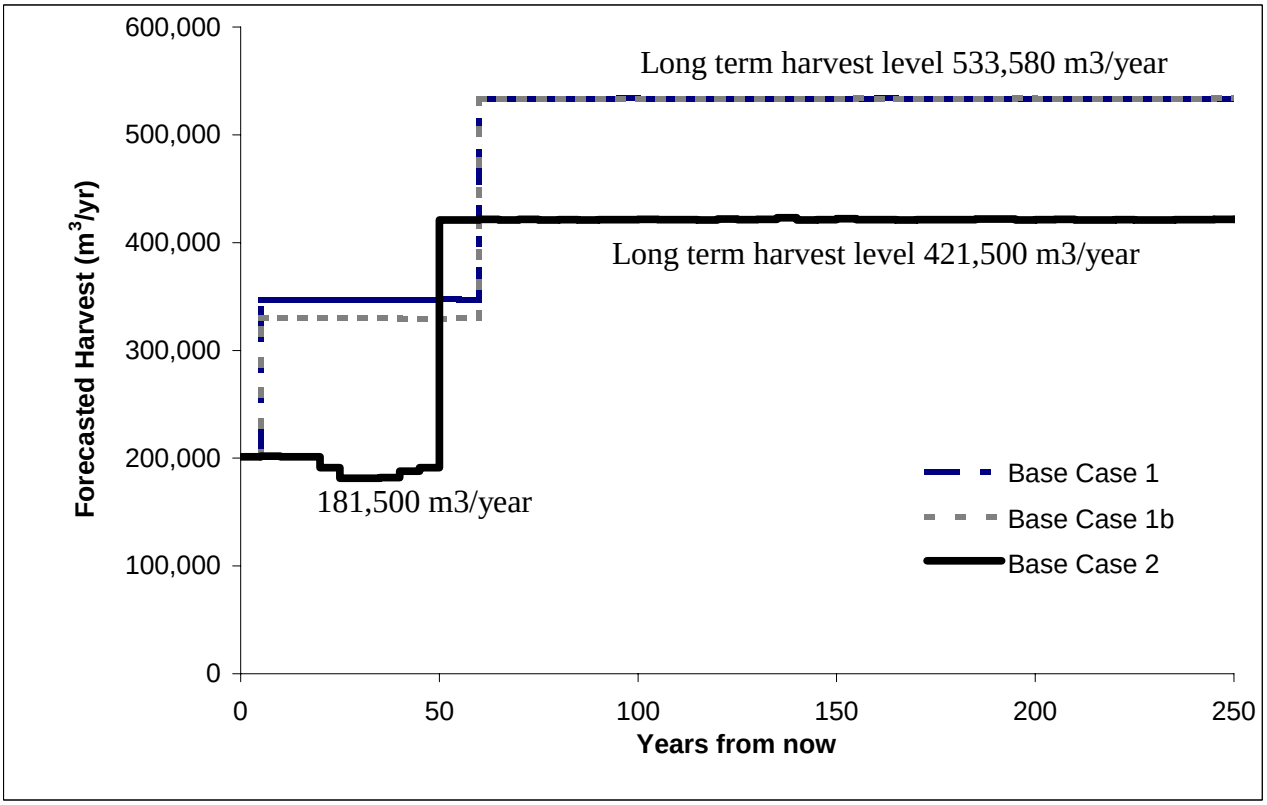

Figure 10 - Harvest forecast – base case 2

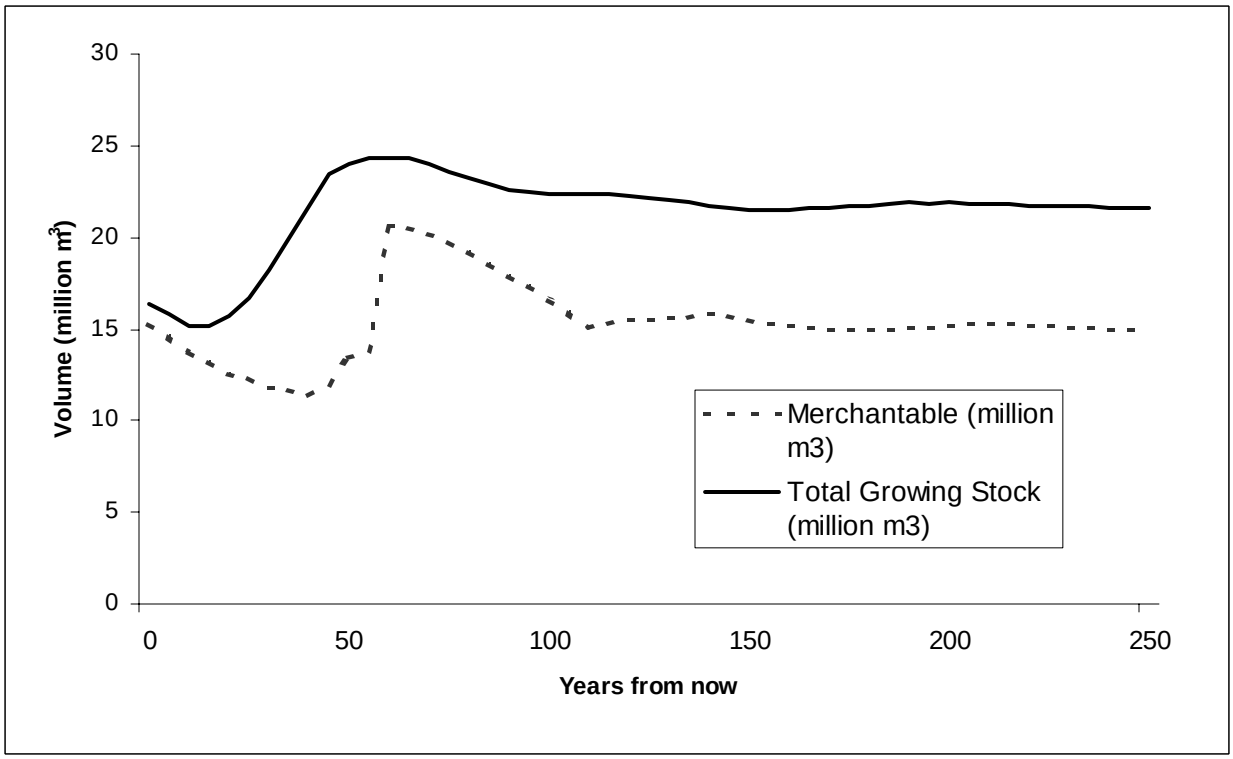

Figure 11 - Growing stock – base case 2

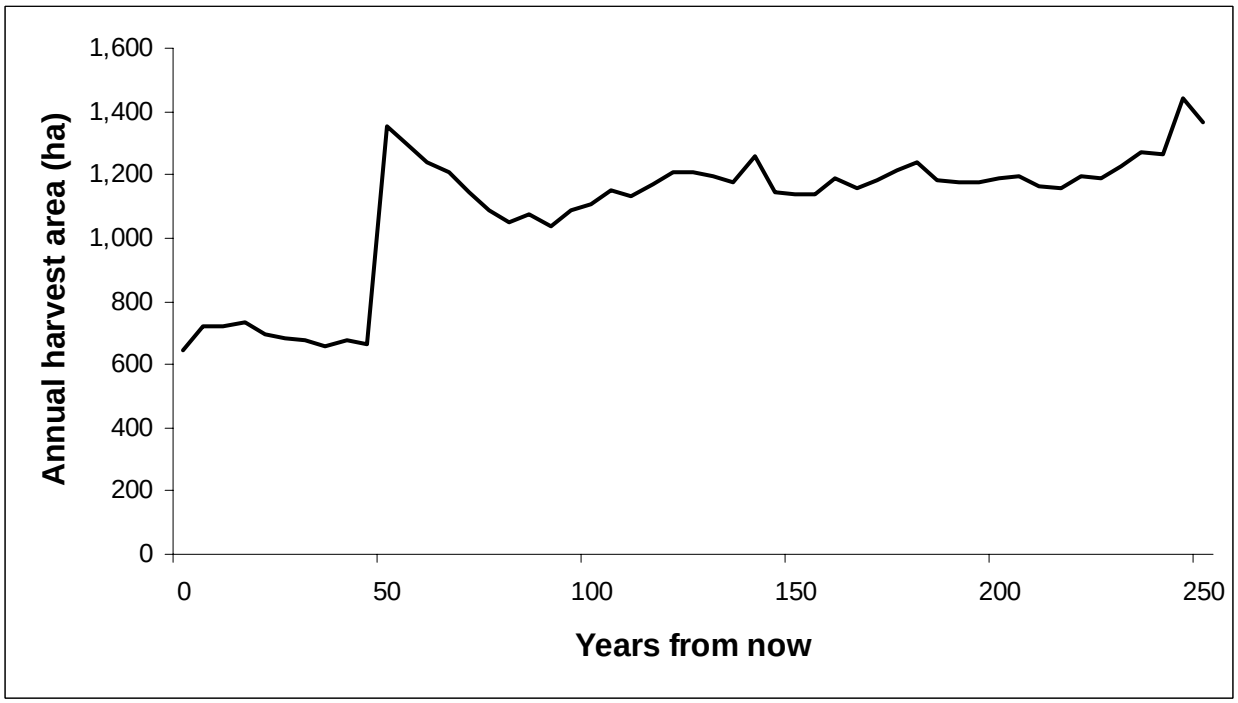

Figure 12 - Annual harvest area – base case 2

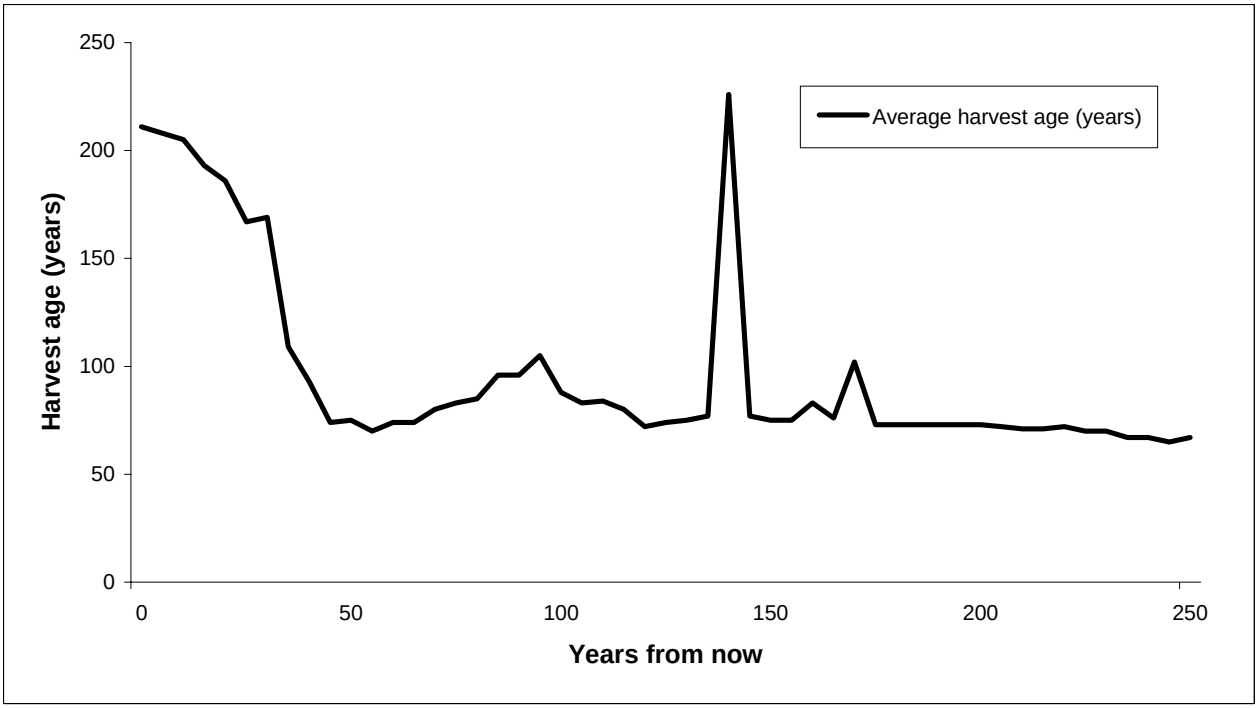

Figure 13 - Average harvest age – base case 2

8.2.2 Seral Targets

Base case 2 used a merged biogeoclimatic unit based old seral targets. Table 16 illustrates the achievement of old forest targets in base case 2. Most targets are currently met and continue to be met throughout the planning horizon. The targets for A4 McGregor Plateau SBS wk 1, A15 Wet Mountain ESSFwc 3 and A25 Wet Trench - Valley SBS vk are not currently met. As Table 16 illustrates, they will be met in 15, 55 and 35 years respectively. Figure 14, Figure 15 and Figure 16 illustrate the area of old forest for these merged biogeoclimatic units. Note the fall below the target level at the end of the planning horizon. This is caused by succession in the NHLB as depicted in Figure 17.

Table 16 – Achievement of Old Seral Targets, Base Case 2

Merged Biogeoclimatic Unit	Old Age	Target	Current Status	Target met
A2 McGregor Plateau ESSFwk 2	140	26%	69%	Now
A3 McGregor Plateau SBS mk 1	120	12%	59%	Now
A4 McGregor Plateau SBS wk 1	140	26%	23%	15 years
A14 Wet Mountain ESSFwk 2	140	50%	60%	Now
A15 Wet Mountain ESSFwc 3	140	84%	48%	55 years
A16 Wet Mountain SBS wk 1	140	26%	58%	Now
A17 Wet Mountain SBS vk	140	50%	56%	Now
A22 Wet Trench - Valley ICH wk 3	140	53%	73%	Now
A23 Wet Trench - Valley ICH vk 2	140	53%	99%	Now
A24 Wet Trench - Valley SBS wk 1	140	30%	100%	Now
A25 Wet Trench - Valley SBS vk	140	46%	34%	35 years

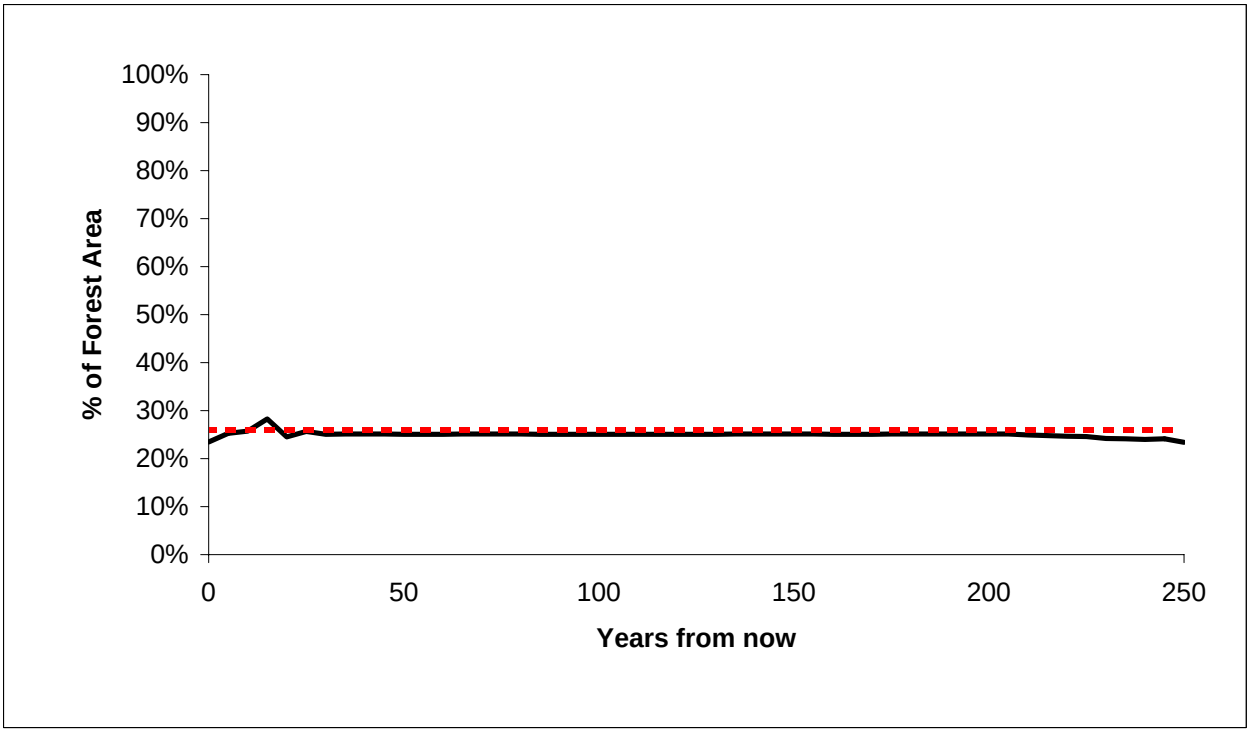

Figure 14 – Old forest in A4 McGregor Plateau SBS wk 1

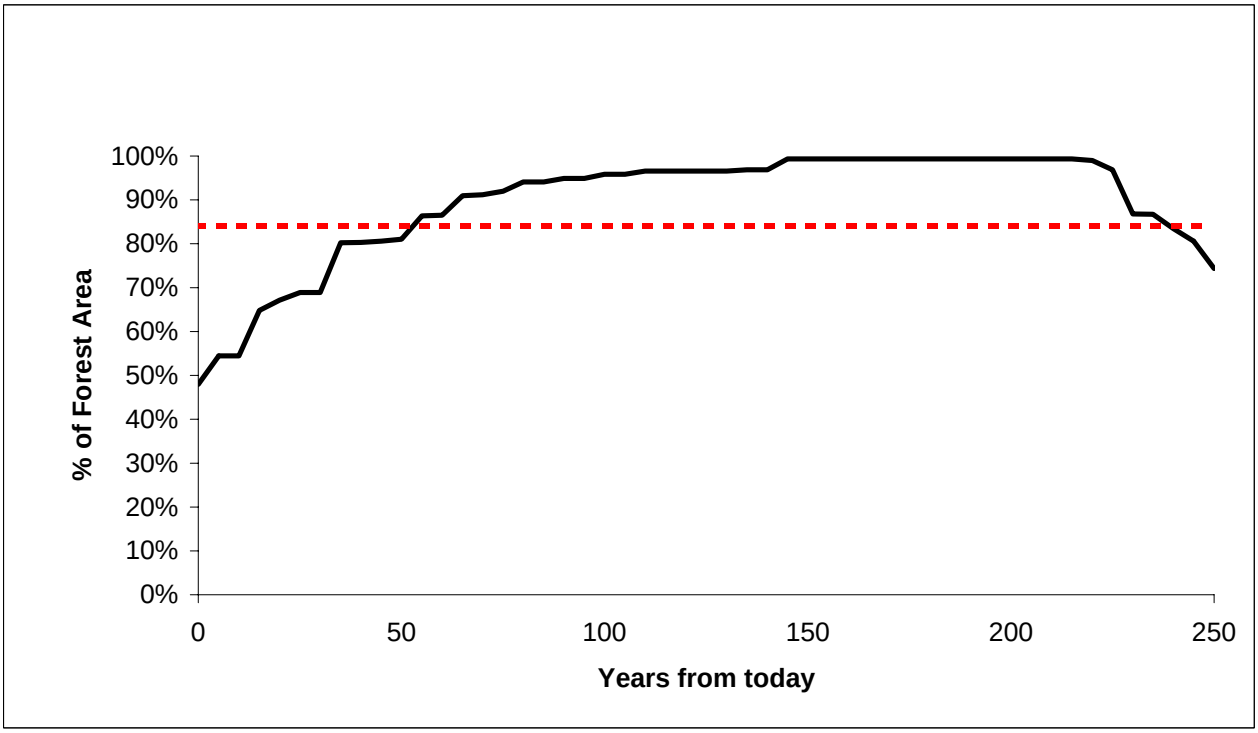

Figure 15 – Old forest in A15 Wet Mountain ESSFwc 3

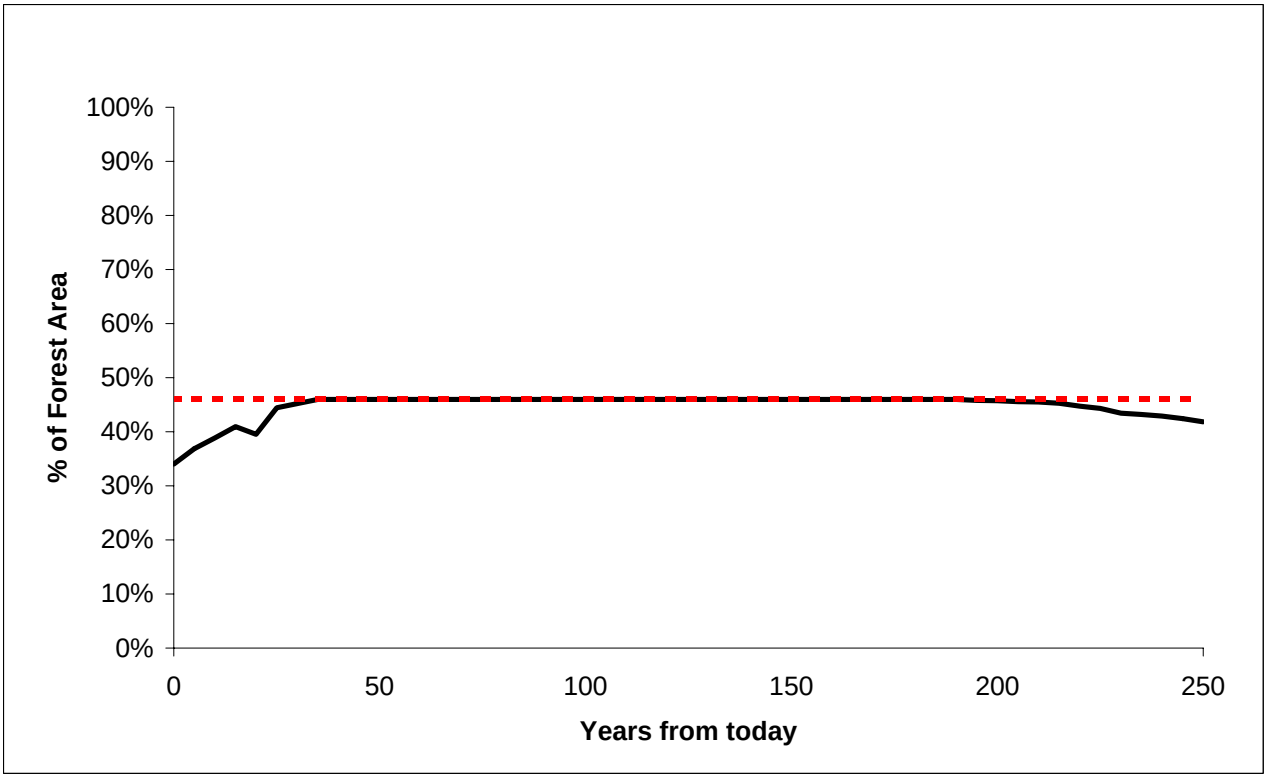

Figure 16 – Old forest A25 Wet Trench - Valley SBS vk

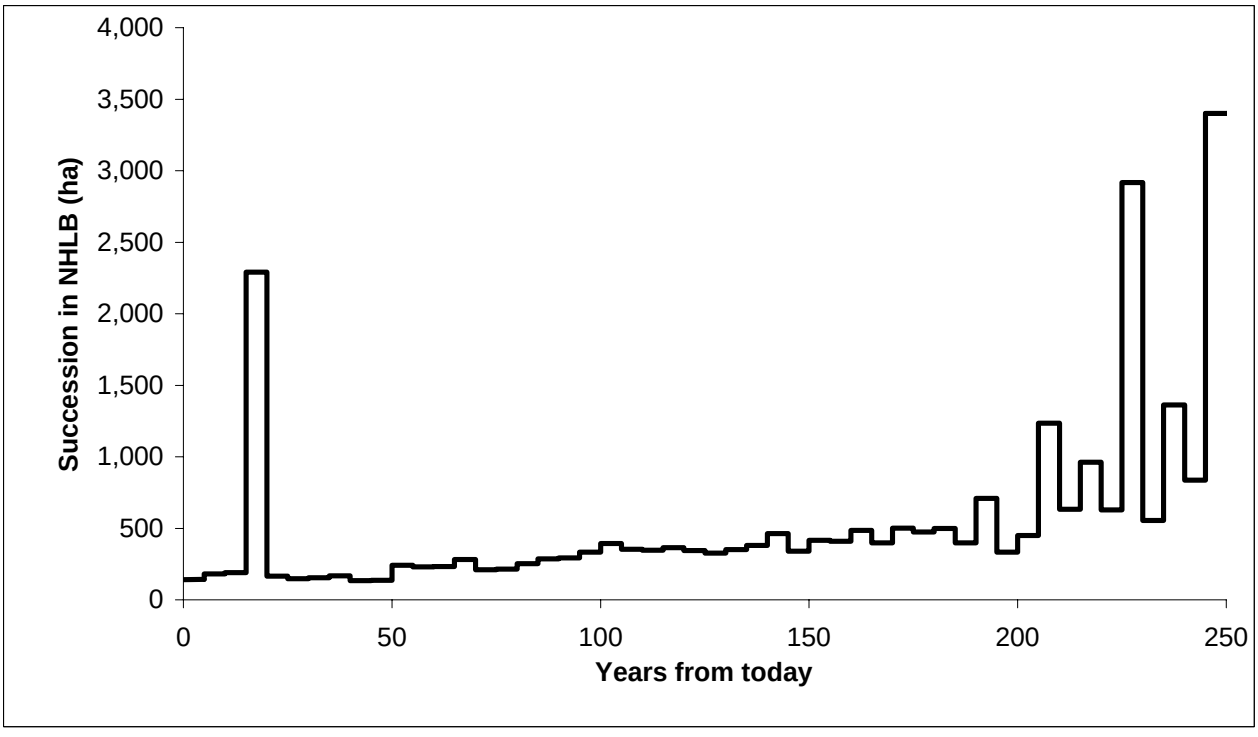

Figure 17 – Succession in the NHLB, base case 2

8.2.3 Old Interior Forest

Table 17 illustrates the current area of old interior forest and a forecasted area 50 years from now for base case 2. Note that the forecasted result is an outcome of the harvest schedule and no spatial targets were applied in the model to achieve any specific amount of old interior forest.

Table 17 – Old interior forest, current status and status 50 years from now. Base case 2.

Merged Biogeoclimatic Unit	Target Total Old Forest Area (ha)	Target Old Interior %	Target Old Interior ha	Current Old Interior %	Current Old Interior ha	Old Interior in 50 Years %	Interior Old in 50 Years ha
A2 NDU_McGregor Plateau_ESSF	137	40%	55	190%	260	6%	8
A3 NDU_McGregor Plateau_SBSmk1	816	25%	204	282%	2,301	1%	4
A4 NDU_McGregor Plateau_SBSvk, wk1	13,397	10%	1,340	35%	4,635	22%	2,905
A15 NDU_Wet Mountain_ESSFwc3	2,479	40%	992	48%	1,192	80%	1,987
A14 NDU_Wet Mountain_ESSFwk2	3,907	40%	1,563	92%	3,612	57%	2,243
A17 NDU_Wet Mountain_SBSvk	28,952	25%	7,238	66%	18,983	33%	9,548
A16 NDU_Wet Mountain_SBSwk1	1,273	25%	318	139%	1,768	27%	342
A20 NDU_Wet Trench Mountain_ESSFwc3	29	40%	11	105%	30	77%	22
A19 NDU_Wet Trench Mountain_ESSFwk2	935	40%	374	109%	1,019	52%	486
A25 NDU_Wet Trench-Valley_SBSvk	10,342	25%	2,585	30%	3,117	26%	2,698
A24 NDU_Wet Trench-Valley_SBSwk1	1	10%	0	0%	0	0%	0
TFL 30	**62,266**	**n/a**	**14,680**	**n/a**	**36,916**	**n/a**	**20,244**

8.2.4 Early Seral Patch Size Distribution

Table 18 illustrates the current early seral patch size distribution and a forecasted early seral patch size distribution 50 years from now for base case 2. Note that the forecasted result is an outcome of the harvest schedule and no spatial targets were applied in the model to achieve any specific patch size distribution.

Table 18 – Early seral patch size distribution, current status and status 50 years from now. Base case 2.

	Young Forest Patch Size Class (ha)				
Natural Disturbance Sub Unit	**< 50**	**50-100**	**100-500**	**500-1000**	**> 1000**
NDU_McGregor Plateau	**10%**	**5%**	**45%**		**40%**
Current Patch Size Distribution (%)	3%	3%	3%		90%
Year 50 Patch Size Distribution (%)	25%	12%	39%		25%
NDU_Wet Mountain	**20%**	**10%**	**60%**		**10%**
Current Patch Size Distribution (%)	7%	7%	22%		64%
Year 50 Patch Size Distribution (%)	36%	13%	51%		0%
NDU_Wet Trench-Valley	**20%**	**10%**	**60%**		**10%**
Current Patch Size Distribution (%)	6%	4%	1%		89%
Year 50 Patch Size Distribution (%)	24%	14%	30%		32%

8.2.4.1 Patch Size Distribution within the 100 – 1,000 ha Patch Size Class

The TFL 30 public advisory group has set another early seral patch size distribution target. It is desirable to have 75 % of the patches in the 100 – 1,000 ha patch size class distributed in such a way that 75% would be between 100 and 500 ha in size, and 25% between 500 and 1,000 ha in size. These targets apply only to Wet Mountain and Wet Trench. Table 19 llustrates the distribution of patches within the 100 to 1,000 ha patch size class for Base Case 2.

Table 19 – Distribution of Patches within the 100 to 1,000 ha Patch Size Class, Base Case 2

Scenario	Natural Disturbance Sub Unit	Area in 100 to 1000 ha Patches	Area in 100 to 500 ha Patches		Area in 500 to 1,000 ha Patches	
	NDU_Wet Mountain	**ha**	**ha**	**% of total**	**ha**	**% of total**
	Current	3,912	3,001	77%	911	23%
Base Case 2	Year 50	2,127	2,127	100	0	0%
	NDU_Wet Trench	**Ha**	**Ha**	**% of total**	**Ha**	**% of total**
	Current	110	110	100%	0	0%
Base Case 2	Year 50	1,423	1,423	100%	0	0%

8.2.5 Peak Flow Index

For the ease of modelling the peak flow index (PFI) was translated to equivalent clearcut area (ECA). The ECAs were weighted depending whether they were located below or above the H60 line. ECAs were used in the modelling as constraints, i.e., the ECA value cannot exceed the target value.

8.2.6 Carbon

Figure 18 shows the forecasted average ecosystem carbon per hectare over the planning horizon. Note that ecosystem carbon tends to follow the same trend as the old forest. Old forest tends to retain carbon. Base case 2 retains more old forest and carbon compared to base case 1 and base case 1b as depicted in Figure 18.

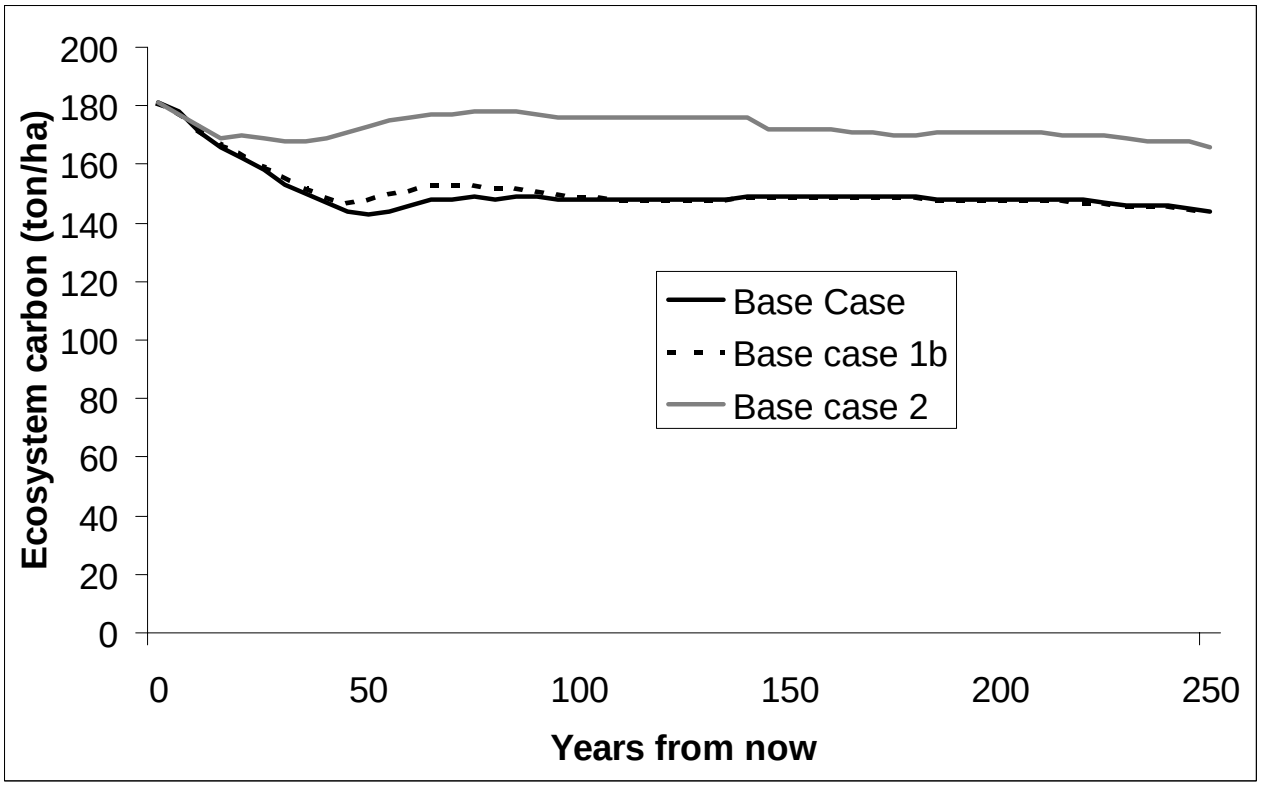

Figure 18 – Ecosystem carbon, base case 2 and base case 1

9 Scenario Analysis Results

9.1 Scenario Harvest Forecasts

9.1.1 Enhanced Biodiversity Scenarios 1, 2 and 3

All these scenarios increased the biodiversity targets through higher old forest and WTP requirements. As expected the harvest forecast is sensitive to increased biodiversity, which shows in Figure 19. Note that the biodiversity objectives in base case 2 were more constraining and had a greater impact on harvest than those of the enhanced biodiversity scenario 1. Biodiversity scenario 1 doubled the mature and old, and old seral requirements of base case 1.

Enhanced biodiversity scenario 2 applied the minimum of the natural range of variation of late seral requirements by NDZ while enhanced biodiversity scenario 3 applied the mid point of the natural range of variation of late seral requirements by NDZ. Harvest forecast was constrained significantly in both scenarios by the increased biodiversity objectives. Table 20 further illustrates the differences in harvest forecasts between the scenarios. Note that the enhanced biodiversity scenarios 2 and 3 do not allow any harvest until years 35 and 50 respectively.

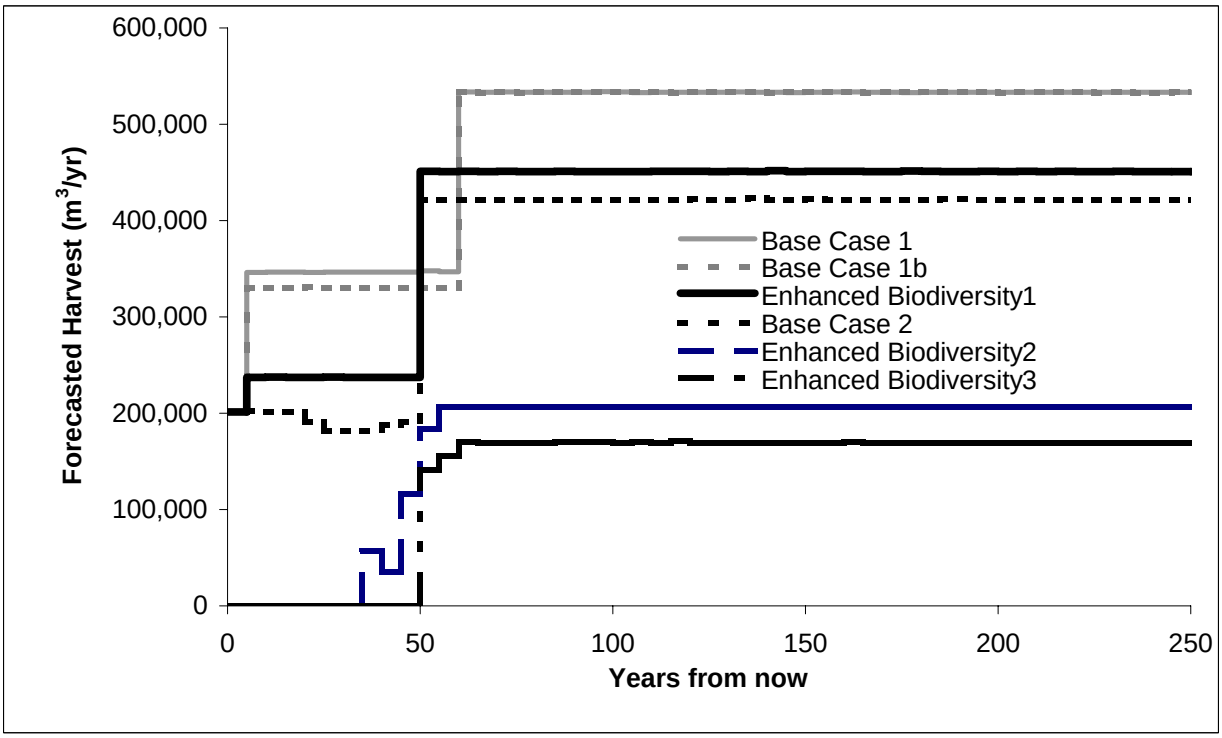

Figure 19 – Enhanced biodiversity scenarios compared to both base cases

Table 20 – Enhanced biodiversity scenarios compared to base case 1 and base case 2

Scenario	Short-term (m3/year)	Change from Base Case 1	Mid-term (m3/year)	Change from Base Case 1	Long-term (m3/year)	Change from Base Case 1
Base Case 1	273,830	n/a	408,831	n/a	533,263	n/a
Base Case 1b	265,520	-3.0%.	397,644	-2.7%	533,263	0%
Base Case 2	201,635	-26.4%	297,775	-27.2%	421,402	-21.0%
Enhanced Biodiversity1	219,235	-19.9%	337,017	-17.6%	451,066	-15.4%
Enhanced Biodiversity2	0	n/a	206,291	-73.4%	206,291	-61.3%
Enhanced Biodiversity3	0	n/a	76,270	-81.3%	169,321	-68.2%

9.1.2 Reduced Ecosystem Resilience, Maximize Harvest and Increase Other Non-timber Values

The differences from base case 1 were small in the short and medium term for these scenarios. However, the differences were more notable in the long term particularly for the maximize timber production and reduced ecosystem resilience scenarios. The long-term harvest forecast was 13.7% higher and 21.0% lower in these scenarios respectively.

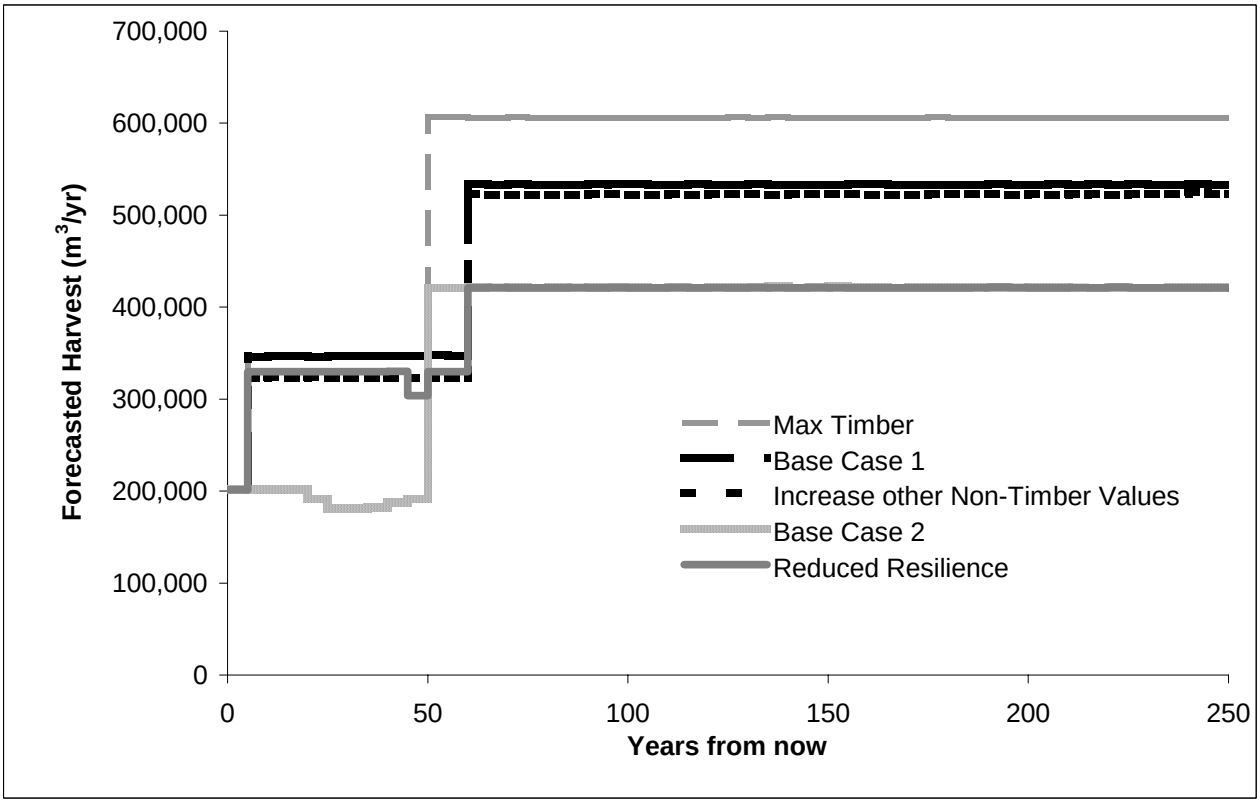

Figure 20 - Reduced Ecosystem Resilience, Maximize Harvest and Increase Other Non-timber Values

Table 21 - Reduced Ecosystem Resilience, Maximize Harvest and Increase Other Non-timber Values

Scenario	Short-term (m3/year)	Change from Base Case 1	Mid-term (m3/year)	Change from Base Case 1	Long-term (m3/year)	Change from Base Case 1
Base Case 1	265,520	n/a	397,644	n/a	533,263	n/a
Reduced Resilience	265,512	-3.0%	358,456	-12.3%	421,100	-21.0%
Increase Non-Timber Value	262,198	-4.2%	389,617	-4.7%	522,668	-2.0%
Max Timber	273,867	0%	467,614	14.4%	605,973	13.7%

9.1.3 No Harvest Scenario

This scenario assumed no harvest, however, both the THLB and NHLB were assumed to be subject to natural disturbance. Figure 21 illustrates the natural disturbance "harvest" compared to the base case 1b harvest forecast.

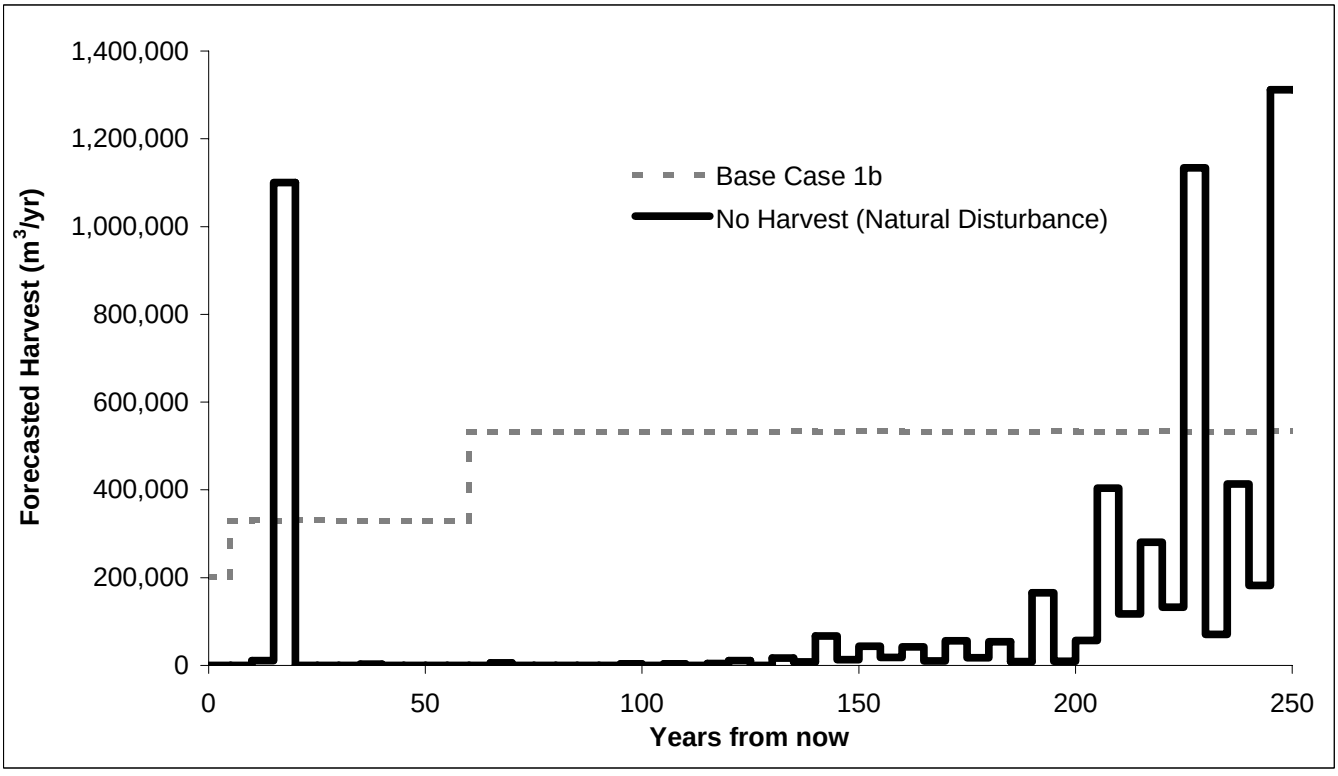

Figure 21 – Assumed natural disturbance volume in the no harvest scenario

9.1.4 Summary

Table 22 summarizes the harvest forecasts for all scenarios.

Table 22 – Harvest forecast summary for all scenarios

Scenario	Short-term (m3/year)	Change from Base Case 1	Mid-term (m3/year)	Change from Base Case 1	Long-term (m3/year)	Change from Base Case 1
Base Case 1	273,830	n/a	408,831	n/a	533,263	n/a
Base Case 1b	265,520	-3.0%.	397,644	-2.7%	533,263	0%
Base Case 2	201,635	-26.4%	297,775	-27.2%	421,402	-21.0%
Enhanced Biodiversity1	219,235	-19.9%	337,017	-17.6%	451,066	-15.4%
Enhanced Biodiversity2	0	n/a	206,291	-73.4%	206,291	-61.3%
Enhanced Biodiversity3	0	n/a	76,270	-81.3%	169,321	-68.2%
No Harvest	0	n/a	0	n/a	0	n/a
Reduced Resilience	265,512	-3.0%	358,456	-12.3%	421,100	-21.0%
Increase Non-Timber Value	262,198	-4.2%	389,617	-4.7%	522,668	-2.0%
Max Timber	273,867	0%	467,614	14.4%	605,973	13.7%

9.2 Losses to MPB

All scenarios attempt to harvest all MPB susceptible pine stands by prioritizing the harvest of these stands. However, no biodiversity or other constraints can be violated through MPB harvest scheduling. The more constrained the harvest is during the next 15 years; the more volume is lost the MPB as illustrated in Figure 22.

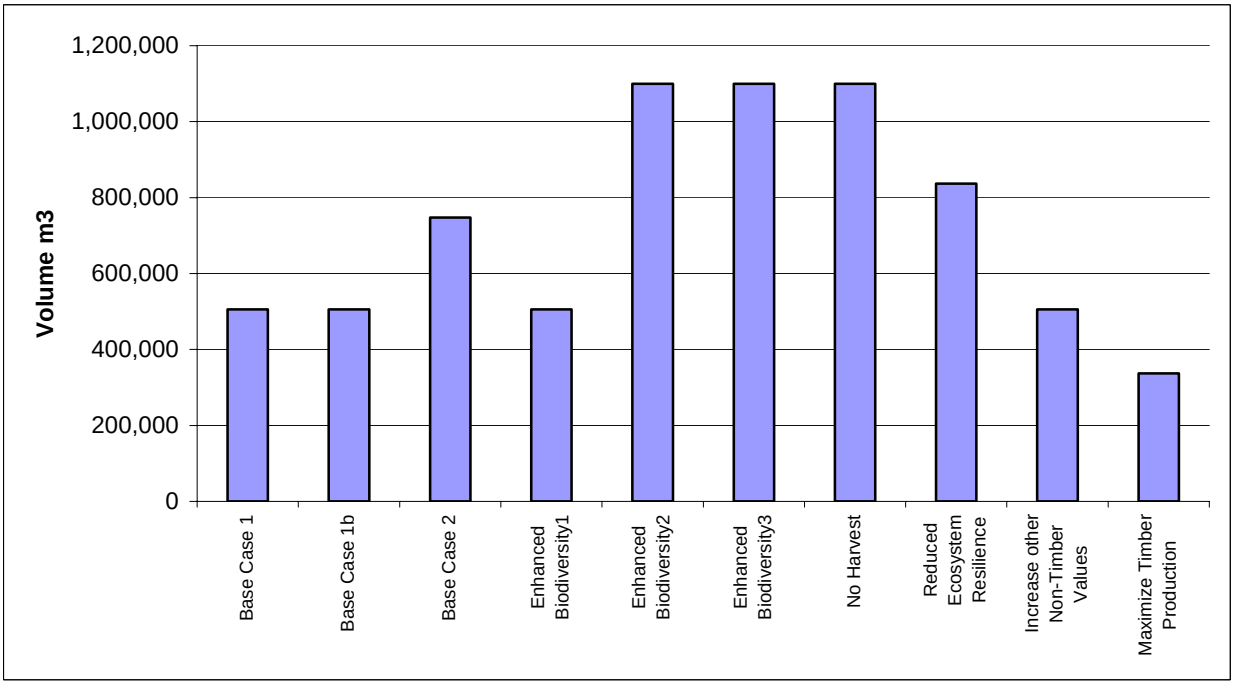

Figure 22 – Estimated losses to MPB in different scenarios

9.3 Old Forest

Figure 23 illustrates the area of old forest achieved for each scenario. Old forest was defined using Delong's definitions for merged biogeoclimatic NDUs for comparison purposes. As expected the higher old forest objectives resulted in more old forest over time. The no harvest scenario produced the largest amount of old forest and the maximum timber production scenario produced the smallest. Note that the differences between the maximum timber production scenario and base case 1 and 1b are not large. This is caused by the fact that in base case 1 and 1b most of the old growth objectives in the long term can be met from the NHLB as illustrated inFigure 24.

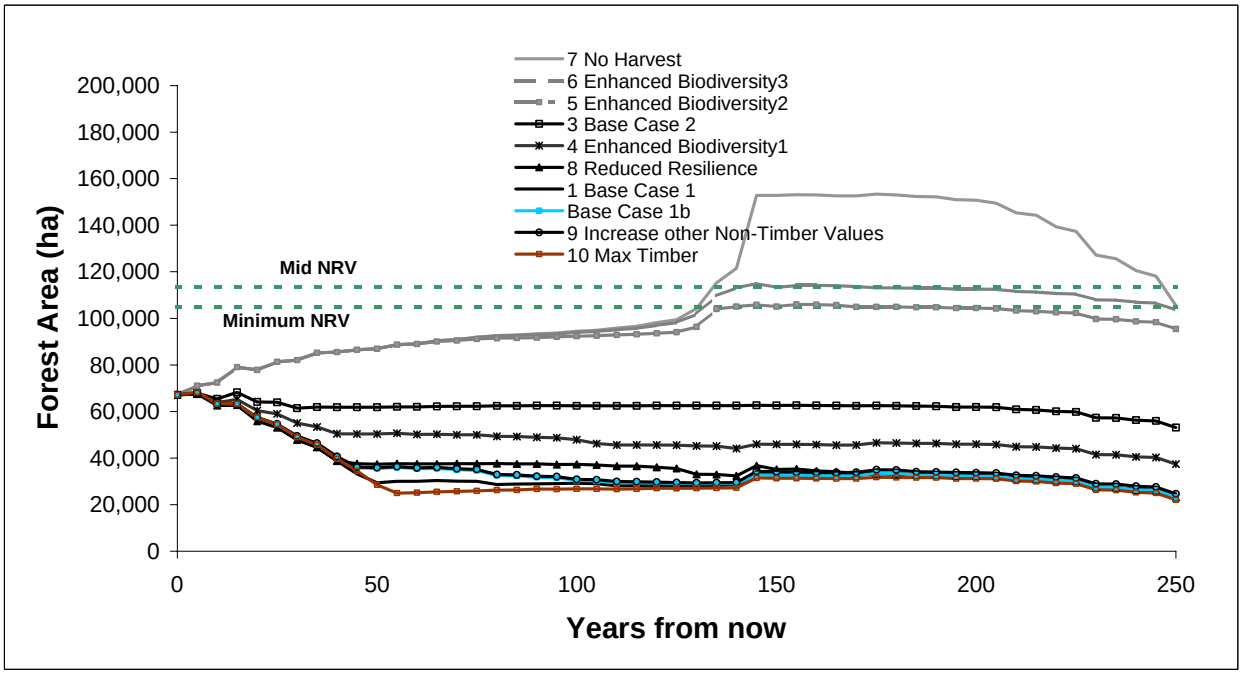

Figure 23 – Old forest comparison

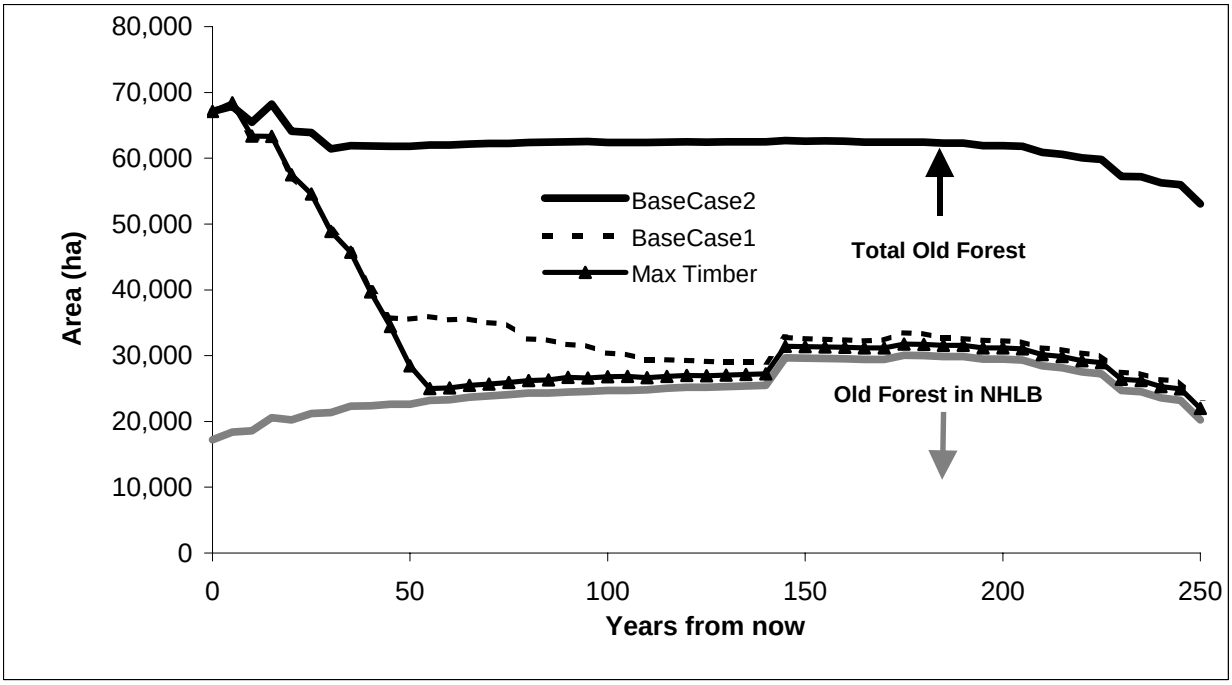

Figure 24 – Old growth achieved in the NHLB

9.3.1 Old Interior Forest

shows the comparison of old interior forest between scenarios.

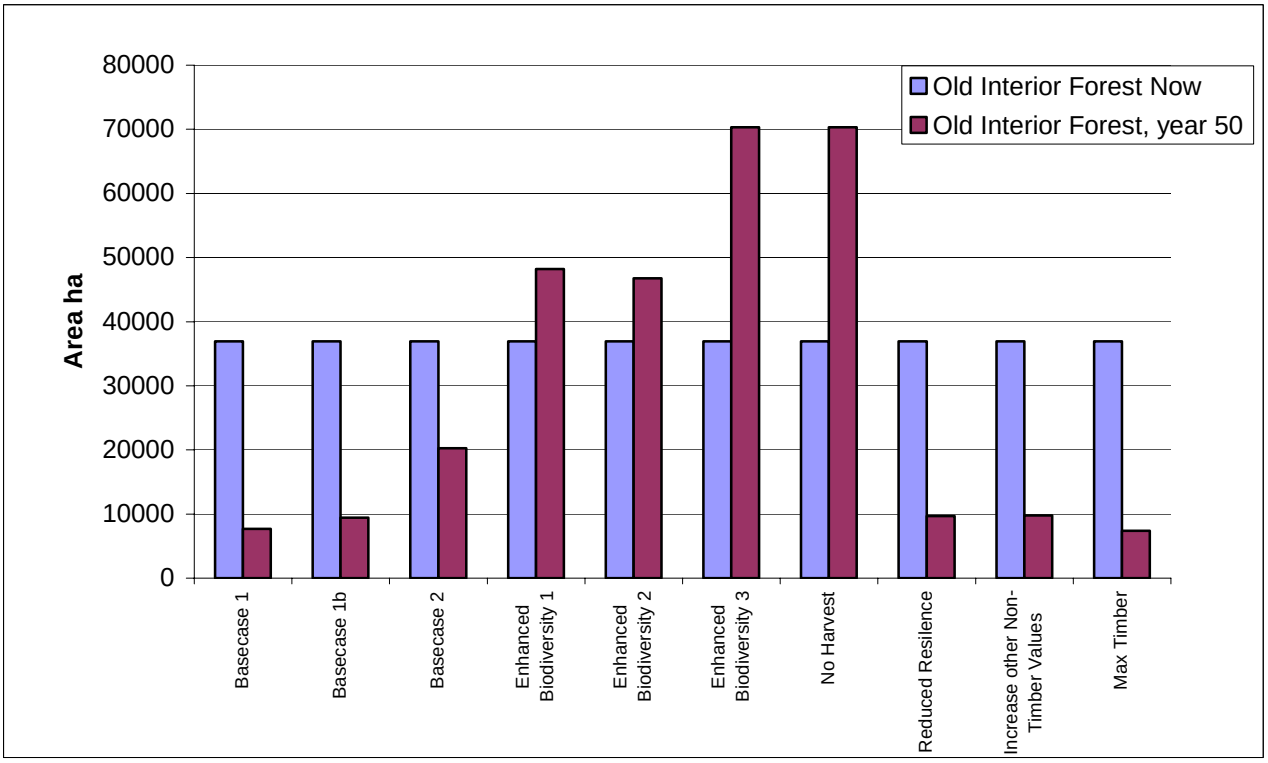

Figure 25 – Old interior forest comparison

9.4 Early Seral Patch Size Distribution

Table 23 illustrates the current early seral patch size distribution and a forecasted early seral patch size distribution 50 years from now for all scenarios. Note that the forecasted result is an outcome of the harvest schedule and no spatial targets were applied in the model to achieve any specific patch size distribution.

Table 23 – Early seral patch size distribution, current status and status 50 years from now, all scenarios.

	Natural Disturbance Sub Unit	Young Forest Patch Size Class (ha)				
		< 50	50-100	100-500	500-1000	> 1000
Scenario	**NDU_McGregor Plateau Target**	**10%**	**5%**	**45%**		**40%**
	Current Patch Size Distribution (%)	3%	3%	3%		90%
Base Case 1	Year 50 Patch Size Distribution (%)	14%	4%	21%		61%
Base Case 1b		19%	6%	17%		58%
Base Case 2		25%	12%	39%		25%
Enhanced Bio 1		24%	11%	55%		10%
Enhanced Bio 2		29%	18%	37%		16%
Enhanced Bio 3		40%	13%	46%		0%
No Harvest		40%	13%	46%		0%
Low Resilience		13%	5%	12%		70%
Max Timber		19%	6%	17%		58%
Other Values		19%	6%	17%		58%
Scenario	**NDU_Wet Mountain Target**	**20%**	**10%**	**60%**		**10%**
	Current Patch Size Distribution (%)	7%	7%	22%		64%
Base Case 1	Year 50 Patch Size Distribution (%)	22%	9%	32%		37%
Base Case 1b		25%	11%	20%		45%
Base Case 2		36%	13%	51%		0%
Enhanced Bio 1		27%	15%	41%		16%
Enhanced Bio 2		80%	20%	0%		0%
Enhanced Bio 3		80%	20%	0%		0%
No Harvest		80%	20%	0%		0%
Low Resilience		24%	14%	36%		26%
Max Timber		24%	11%	20%		45%
Other Values		25%	10%	20%		45%
Scenario	**NDU_Wet Trench-Valley Target**	**20%**	**10%**	**60%**		**10%**
	Current Patch Size Distribution (%)	6%	4%	1%		89%
Base Case 1	Year 50 Patch Size Distribution (%)	17%	5%	10%		68%
Base Case 1b		13%	5%	10%		71%
Base Case 2		24%	14%	30%		32%
Enhanced Bio 1		17%	6%	16%		61%
Enhanced Bio 2		57%	6%	0%		37%
Enhanced Bio 3		57%	6%	37%		0%
No Harvest		57%	6%	37%		0%
Low Resilience		16%	3%	19%		62%
Max Timber		13%	5%	10%		71%
Other Values		15%	5%	10%		71%

9.4.1.1 Patch Size Distribution within the 100 – 1,000 ha Patch Size Class

The TFL 30 public advisory group has set another early seral patch size distribution target. It is desirable to have 75 % of the patches in the 100 – 1,000 ha patch size class distributed in such a way that 75% would be between 100 and 500 ha in size, and 25% between 500 and 1,000 ha in size. These targets apply only to Wet Mountain and Wet Trench. Table 24 llustrates the distribution of patches within the 100 to 1,000 ha patch size class for all scenarios.

Table 24 – Distribution of Patches within the 100 to 1,000 ha Patch Size Class, all scenarios

Scenario	Natural Disturbance Sub Unit	Area in 100 to 1000 ha Patches	Area in 100 to 500 ha Patches		Area in 500 to 1,000 ha Patches	
	NDU_Wet Mountain	**ha**	**ha**	**% of total**	**ha**	**% of total**
	Current	3,912	3,001	77%	911	23%
Base Case 1	Year 50	3,494	2,182	62%	1,312	38%
Base Case 1b		2,143	2,143	100%	0%	0%
Base Case 2		2,127	2,127	100%	0%	0%
Enhanced Bio 1		3,629	2,135	59%	1,494	41%
Enhanced Bio 2		0	n/a	n/a	n/a	n/a
Enhanced Bio 3		0	n/a	n/a	n/a	n/a
No Harvest		0	n/a	n/a	n/a	n/a
Low Resilience		3,454	2,231	65%	1,223	35%
Max Timber		3,397	2,108	62%	1,290	38%
Other Values		2,133	2,133	100%	0	0%
Scenario	**NDU_Wet Trench**	**Ha**	**Ha**	**% of total**	**Ha**	**% of total**
	Current	110	110	100%	0	0%
Base Case 1	Year 50	742	742	100%	0	0%
Base Case 1b		828	828	100%	0	0%
Base Case 2		1,423	1,423	100%	0	0%
Enhanced Bio 1		1,193	1,193	100%	0	0%
Enhanced Bio 2		310	310	100%	0	0%
Enhanced Bio 3		310	310	100%	0	0%
No Harvest		310	310	100%	0	0%
Low Resilience		1,526	1,526	100%	0	0%
Max Timber		1,295	1,295	100%	0	0%
Other Values		774	774	100%	0	0%

9.5 Caribou Habitat

In this analysis, caribou habitat consisted of high value habitat, medium value habitat and caribou movement corridors. High value caribou habitat was removed from the THLB and as such there was no harvesting in these areas in any of the scenarios. Medium value caribou habitat was restricted to partial harvesting for all scenarios. Only 30% volume removal was allowed and re-entry was restricted until the stands recovered their pre-harvest volumes. In the mountain caribou movement corridors harvesting was restricted for all scenarios, except the maximum timber harvest scenario, in such a way that in each caribou movement corridor, 70% of the forested area had to be in a mature or older seral state at all times.

Due to the analysis assumptions/constraints outlined above, all scenarios remained at the target level of caribou habitat or above throughout the planning horizon with some exceptions (Figure 26). In some scenarios mortality due to the MPB reduced the caribou habitat below the target level at the beginning of the planning horizon. Natural disturbance, as modeled in this analysis reduced the caribou habitat at the end of the planning horizon (Figure 26).

The scenarios with least harvest (enhanced biodiversity 2 and 3, and no harvest scenario) resulted in the highest amount of caribou habitat as expected. All the other scenarios produced approximately the target levels with the exceptions discussed above.

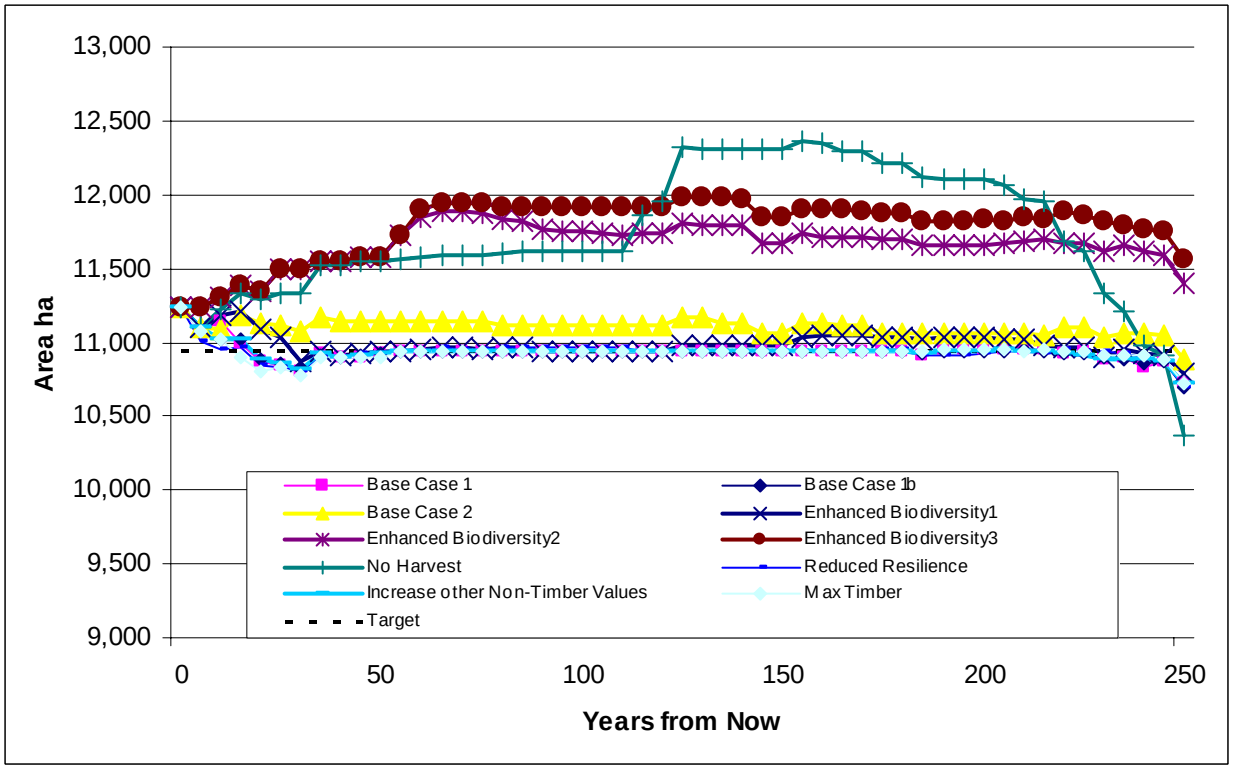

Figure 26 – Caribou habitat over the planning horizon.

9.6 Carbon

Figure 27 shows the forecasted average ecosystem carbon per hectare over the planning horizon for all scenarios. As the ecosystem carbon tends to follow the same trend as the old forest, those scenarios with more old forest also exhibit higher ecosystem carbon levels.

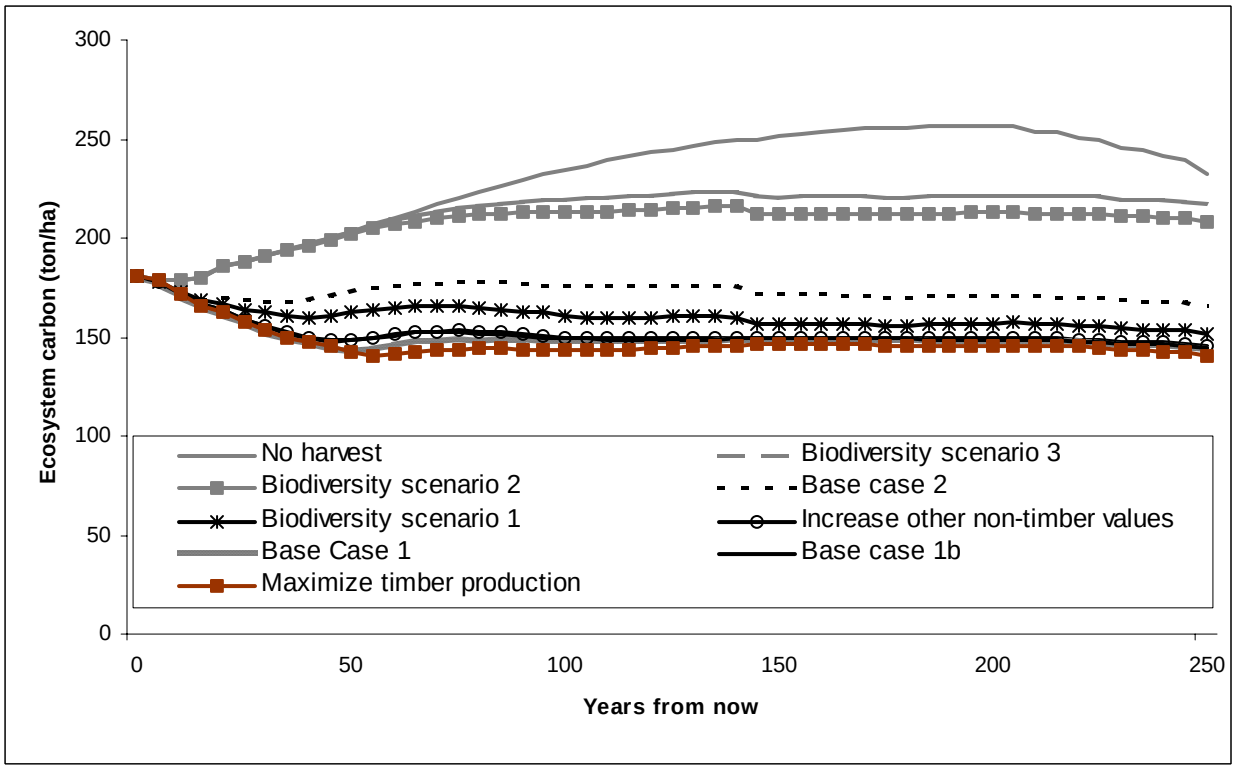

Figure 27 – Ecosystem carbon comparison

9.7 Direct and Indirect Employment (AAC related)

Figure 28 illustrates predicted short and medium term employment (direct and indirect) levels resulting from forecasted harvest for all scenarios. The employment levels are based on a generalized multiplier of 1.22 for the Price George TSA used in the MoF timber supply review in 2000. The figure below is only for purposes of comparison and intended to show relative differences between different scenarios.

Higher harvest levels may not result in predicted increases in employment levels locally as milling capacity may become a limited factor. Also, lower harvest levels tend to decrease AAC related employment levels; however, employment in other areas, such as tourism may increase. These kinds of potential changes are not reflected in the employment forecast.

As expected, higher harvest levels result in more AAC related direct and indirect jobs. Scenarios with no harvest in the short term have no harvest related jobs.

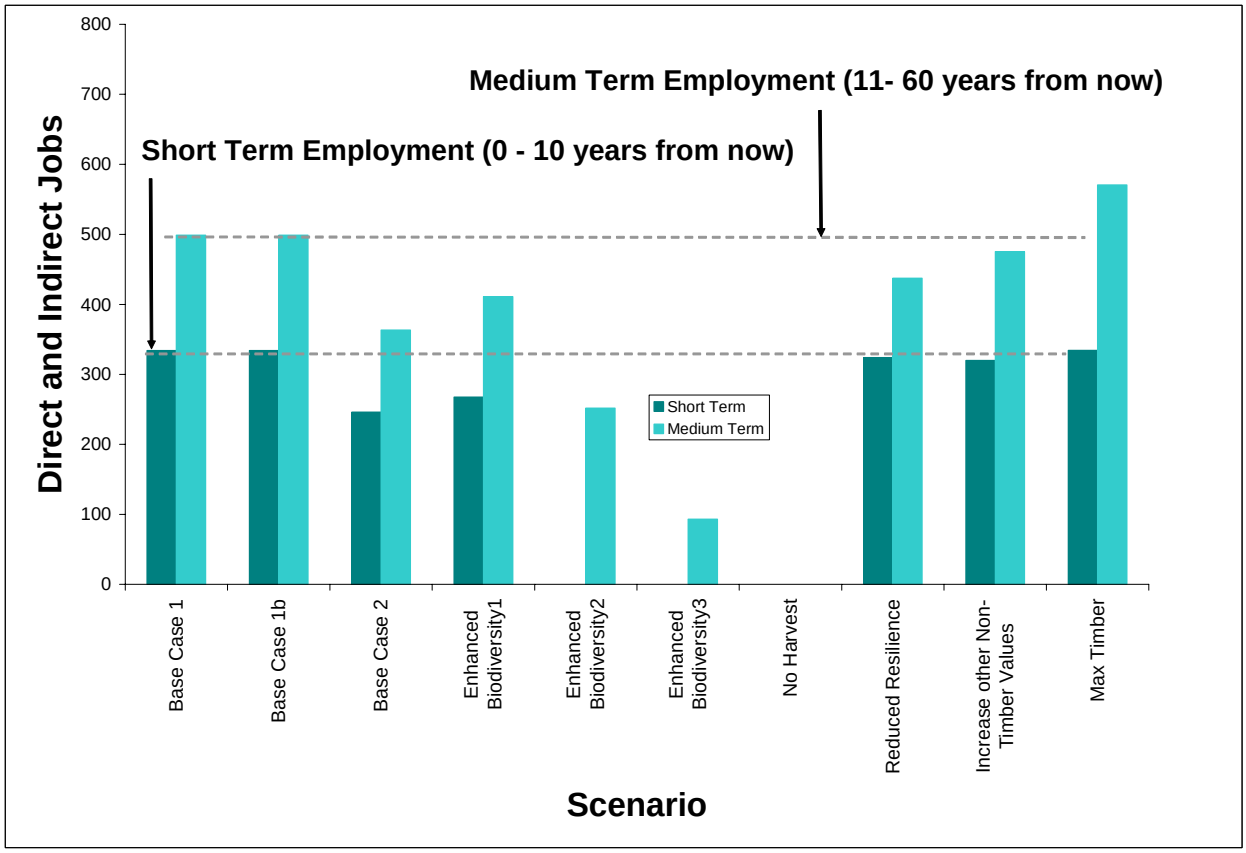

Figure 28 - Direct and indirect short and medium-term employment (AAC related, average Prince George TSA multipliers, MOF 2000)

9.8 Summary

Table 25 summarizes the analysis results by assigning minus signs (-), plus signs (+), or no change sign (0) on each scenario depending how they compared to base case 1. Some of the results are implied: peak flow indices were not compared between different scenarios. However, all scenarios with the exception of the maximum timber production scenario had to meet the peak flow constraints. When constructing Table 25, it was further assumed that less harvesting generally favored watershed hydrology, while increased harvesting acted in an opposite way.

In some scenarios WTPs and riparian buffers were increased, however, in others, such as no harvest scenario, it was assumed that no harvesting increaser WTPs and improved riparian hydrology as well.

Early seral patch distributions were left out of the summary table as it is difficult to assess whether one scenario is clearly better or worse than other scenarios.

Predicted losses to the MPB and predicted employment levels for different scenarios were included in the summary table, while recognizing that they are not indicators as specified by the PAG.

Table 25 – Summary of Analysis Results

Indicator	Base Case 1	Base Case 1b	Base Case 2	Enhanced Biodiversity 1	Enhanced Biodiversity 2	Enhanced Biodiversity 3	No Harvest	Reduced Ecosystem Resilience	Increase other Non-Timber Values	Maximize Timber Production
Harvest	0	-	- -	-	- - -	- - -	- - -	-	-	+
Old Forest	0	+	+ +	+	+ +	+ + +	+ + +	+	+	-
Old Interior Forest	0	+	+ +	+	+ +	+ + +	+ + +	+	+	-
Losses to MPB	0	0	- -	0	- - -	- - -	- - -	- -	0	+
Wildlife Tree Patches	0	+	+ +	+	+ +	+ + +	+ + +	+	+	-
Riparian Management	0	+	+ +	+	+ +	+ + +	+ + +	+	+	-
Watershed Hydrology	0	+	+ +	+	+ +	+ + +	+ + +	+	+	-
Caribou Habitat	0	0	+	0	+ + +	+ + +	+ + +	0	0	0
Retained Ecosystem Carbon	0	+	+ +	+	+ +	+ + +	+ + +	n/a	+	-
Employment	0	-	- -	-	- - -	- - -	- - -	-	+	-

10 Conclusions

The development of a credible plan for sustainable forest management (SFM) within a management unit requires a temporal assessment of potential forest management strategies. As much as possible, this assessment should be based on the best available quantitative information for each of the ecological, economic and social values of interest in the management unit.

Under the Sustainable Forest Management Framework currently being used by Canfor Ltd., tactical planning involves the analysis and interpretation of how operational practices are contributing to the achievement of strategic level objectives on the land base. A set of Criteria and Indicators (C&I) and associated measures of sustainability identify the specific resources and targets that define the desired future forest condition (DFC). Forecasting is an activity that assists forest practitioners and decision makers in long-term planning for SFM by evaluating the effects of management practices on the DFC and in identifying practices that will be effective in meeting specific management targets over the long-term.

The goal of this project was to provide analysis services in forecasting the outcomes of several forest management strategies to support Canfor in its effort to fulfill certification requirements for TFL 30 by the Canadian Standards Association (CAN CSA Z809).

There are many criteria and indicators in the TFL 30 SFM plan; however, many of them cannot be currently forecast through modelling due to lack of data. Particularly, we do not have information on how some specific indicators may behave or develop in the future. The first task in the project was to develop a list of indicators that could be modelled using traditional forest estate modelling techniques.

Next several base case scenarios were developed. The role of the base cases was to represent current forest management in the TFL and surrounding management units. Also, one of the base cases, base case 1, was used as the benchmark against which all the other scenarios were compared.

Analyses that predict the development of indicators many decades into the future have number of uncertainties associated with them. Most predictions are made based on past development of indicators and it is never certain whether the indicators develop the same way in the future as they have in the past. For some indicators there are no past data, however, predictive models are still being used for these indicators in forecasting. For all the above reasons, it is important that these kinds of analyses are taken as giving direction, rather than forecasting a certain course of development.

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Appendix 3

Performance Matrix

&

Continuous Improvement Matrix

TFL30
Sustainable Forest Management Criteria and Elements Matrix

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
1. Conservation of Biological Diversity	1.1 Ecosystem Diversity	A. Well balanced and functioning ecosystems. ***PAG Consensus***	i. Maintain landscapes that support the natural diversity, variety and pattern of ecosystems. ***PAG Consensus***	1.1a The amount of old forest by landscape unit/Natural Disturbance Type within the DFA.	Targets set as per the "Provincial non-spatial old growth order"	0%	The Provincial non-spatial old growth order can be found at the following website: http://srmwww.gov.bc.ca/rmd/oldgrowth/ Run scenario using natural range of variability and variance with the objective of setting new target and variance based on natural variability. ***PAG Consensus***
				1.1b The amount of interior old forest by NDU/merged BEC within the DFA.	Targets set as per the "Landscape Biodiversity Objectives for the PG TSA"	0%	Landscape Biodiversity Order (LBO) for the PGTSA can be found at the following website: ftp://ftpprg.env.gov.bc.ca/pub/outgoing/requests/Oct2004_PG%20TSA_Biodiversity_Order. Bigger interior forest areas are preferred to a lot of smaller ones. Run Scenario with higher targets with more variance. ***PAG Consensus***
				1.1c The young patch size distribution by NDU within the DFA.	Targets set as per the "Landscape Biodiversity Objectives for the PG TSA"	-75%	***PAG Consensus (one abstention)***
				1.1d Trend towards the percentage of area of patches in 101-500ha range within the Wet Trench and Wet Mountain of the young patch size distribution class 101-1000ha.	75%	-5%	***PAG Consensus (one abstention)***
				1.1e The amount in hectares of landscape-level biodiversity reserves within the DFA.	≥ the (existing hectares) set aside as per the latest Management Plan	0%	***PAG Consensus***
				1.1f The average percent stand level retention in harvested areas within the DFA.	Target: > 7% Annually within the DFA (minimum of 3.5% by block, no maximum %)	0%	***PAG General Agreement with two dissensions***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				1.1g Percentage of site plans that have CWD retention within the natural range appropriate for the site.	100%	0%	Site may be updated to a different ecological unit as new information becomes available. CWD also includes recruitment. ***PAG Consensus***
				1.1h Percentage of cut blocks consistent with coarse woody debris requirements in operational plans.	100%	0%	***PAG Consensus***
	1.2 Species Diversity	A. Sustained populations of flora and fauna native to the DFA. ***PAG Consensus***	i. Maintain habitat to support flora and fauna native to the DFA. ***PAG Consensus***	1.2a The amount in hectares of Caribou Ungulate Winter Range habitat within TFL30.	7171 ha in high value habitat and 5459 ha in corridors	0%	Caribou populations to be monitored and actions taken as appropriate. ***PAG Consensus***
				1.2b The percentage of forest operations consistent with approved provincial Species at Risk Notice/ Orders applicable to TFL30.	100% Annually	0%	Currently doesn't apply on the DFA. ***PAG Consensus***
				1.2c The amount of Species at Risk habitat within TFL30.	TBD	TBD	Includes fisher, wolverine and grizzly bear
				1.2d The percentage of forest operations consistent with riparian reserve requirements as identified in site plans.	100% Annually	0%	***PAG Consensus***
				1.2e Percent of appropriate personnel trained to identify Species at Risk and their habitat.	100%	0%	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				1.2f Percentage of forest operations consistent with Species at Risk management strategies applicable to TFL30.	100%	0%	***PAG Consensus***
				1.2 g Native plant species diversity index by plant associations within the DFA.	Sxw- devil's Club >2.03 Sxw – Oak fern > 2.04 Sxw–Huckleberry> 1.42 Sxw – Horsetail > 2.22 Bl – Oak fern > 2.04	0 0 0 0 0	Only the top 5 plant associations representing around 80% of the landbase are currently being monitored. ***PAG General Agreement with one dissension***
				1.2 h Proportion of mature and old deciduous tree species by BEC subzone within the DFA.	SBS mk1 > 1% SBS wk1 > 5% ICH vk2 > 2% ESSF > 0% SBS vk> 3%	0%	Measured every 5-year re-inventory period. Over time improve the database for younger deciduous trees. ***PAG Consensus***
				1.2 i Effectiveness Monitoring Plans (Wildlife) are developed and implemented for selected indicator species to keep common species common	31-Dec-07	(+3 months)	***PAG Consensus***
	1.3 Genetic Diversity	A. Genetic Diversity. ***PAG Consensus***	i. Maintain natural genetic diversity. ***PAG Consensus***	1.3a The amount of landscape-level biodiversity reserves within the DFA.	Hectares set aside to maintain natural forest conditions across the DFA as per the latest Management Plan	0%	May be required to harvest in landscape reserves due to fires/pests. If this is the case, bring back to the PAG for discussion. Reserves and appropriate/representative areas within corridors will act as benchmarks for natural genetic diversity. ***PAG Consensus***
				1.3b The percentage area of distinct habitat types in the non-harvesting landbase.	TBD Based on ecosystem representation analysis	TBD	***PAG Consensus*** *(Target & Variance not addressed)*
			ii. Sustain natural genetic diversity on harvested areas. ***PAG Consensus***	1.3c The average percentage of stand-level retention in harvested areas within the DFA.	≥ 7% Annually within the DFA (minimum of 3.5% by block, no maximum %)	0%	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
			iii. Sustain natural genetic diversity of trees on harvested areas. ***PAG Consensus***	1.3d Percent compliance with Chief Forester's Standards for Seed Use.	100%	0%	***PAG Consensus***
	1.4 Protected Areas and Sites of Special Biological Significance	A. Sites of Special Biological Significance. *PAG Consensus*	i. Sites of special biological significance are identified and appropriately managed. *PAG Consensus*	1.4a Percent of appropriate Canfor, BCTS and contractor personnel trained to identify sites of biological significance.	100%	0%	Include spawning habitat, moose wallows, etc. ***PAG Consensus***
				1.4b Percentage of forest operations consistent with sites of biological significance management strategies as identified in site plans.	100%	0%	Report annually the number and type of sites in and out of blocks found by the various operational layout or surveys and share this information with the PAG. ***PAG Consensus***
		B. Protected Areas. ***PAG Consensus***	i. Protected Areas are identified and appropriately managed. ***PAG Consensus***	1.4c Hectares of unauthorized forestry related harvesting or road construction within Protected Areas.	0 ha	0 %	***PAG Consensus***
2.0 Maintenance and Enhancement of Forest Ecosystem Conditions and Productivity	2.1 Forest Ecosystem Resilience	A. Resilient Forest Ecosystems. ***PAG Consensus***	i. Well-balanced ecosystems that largely support natural processes. ***PAG Consensus***	2.1a The amount of old forest by landscape unit/Natural Disturbance Type within the DFA.	Targets set as per the "Provincial non-spatial old growth order"	0%	***PAG General Agreement with two dissensions and 1 abstention***
				2.1b The amount of interior old forest by NDU/merged BEC within the DFA.	Targets set as per the "Landscape Biodiversity Objectives for the PG TSA"	0%	***PAG General Agreement with two dissensions and 1 abstention***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				2.1c The young patch size distribution by NDU within the DFA.	Targets set as per the "Landscape Biodiversity Objectives for the PG TSA"	0%	***PAG General Agreement with two dissensions and 1 abstention***
				2.1d Monitoring plan is developed and implemented for evaluating ecosystem resilience.	31-Dec-07	(+3 months)	***PAG Consensus***
	2.2 Forest Ecosystem Productivity	A. Productive Forest Ecosystems. ***PAG Consensus***	i. Maintain forest ecosystem conditions that are capable of supporting naturally occurring species. ***PAG Consensus***	2.2a The amount of Caribou Ungulate Winter Range habitat within TFL30.	100% Annually	0%	***PAG Consensus***
				2.2b The percentage of forest operations consistent with approved provincial Species at Risk Notice/ Orders applicable to TFL30.	100% Annually	0%	Currently doesn't apply on the DFA. ***PAG Consensus***
				2.2c The amount of landscape-level biodiversity reserves within the DFA.	Hectares set aside to maintain natural forest conditions across the DFA as per the latest Management Plan	0%	***PAG Consensus***
				2.2d The amount of wildlife/biodiversity corridors within the DFA.	Hectares in wildlife/biodiversity corridors TBD	-5%	***PAG Consensus***
				2.2e The percentage of forest operations consistent with riparian reserve requirements as identified in site plans.	100% Annually	0%	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				2.2f The percentage area of distinct habitat types in the non-harvesting landbase.	TBD Based on ecosystem representation analysis	TBD	
				2.2g Site index by BEC subzone within the DFA.	See table in annual report for targets	-5%	***PAG Consensus***
				2.2h The amount of Species at Risk habitat within TFL30.	TBD	TBD	
3 Conservation of Soil and Water Resources	3.1 Soil Quality and Quantity	A. Soil Conservation. ***PAG Consensus***	i. The productive capacity of forest soils within the Timber Harvesting Land Base (THLB) is sustained. ***PAG Consensus***	3.1a The percentage of forest operations consistent with Soil Conservation Standards.	100% Annually	0%	Soil Conservation website: http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/soil/soil-toc.htm ***PAG Consensus***
				3.1b The percentage of the Productive Forest Land converted to total permanent access structures.	≤3%	+1%	Ensure example is included in SFM plan or annual report. ***PAG Consensus***
				3.1c The percentage of forest operations consistent with terrain management requirements as identified in operational plans.	100% Annually	0%	***PAG Consensus***
				3.1d The number of Legally Reportable Spills.	0 Annually	0	Look into reporting of spill of greater than ½ of legal limits. ***PAG Consensus***
	3.2 Water Quality and Quantity	A. Water Conservation. ***PAG Consensus***	i. Water quality and quantity in TFL30 is sustained. ***PAG Consensus***	3.2a The percentage of forest operations consistent with riparian management requirements as identified in operational plans.	100% Annually	0%	Discussion around working towards a landscape view around riparian management and targets. ***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				3.2b Stream Crossing Quality Index (SCQI) for each watershed within TFL30.	TBD	TBD	Report out on number of stream crossing (old, new, deactivated) by SCQI. ***PAG Consensus*** *(Target and variance not addressed)*
				3.2c The percentage of all new or deactivated stream crossings that shall maintain natural stream flow.	100% Annually	0%	***PAG Consensus***
				3.2d The percentage of stream crossing that are installed or removed consistent with erosion control plans or other procedures	100% Annually	-5%	***PAG Consensus***
				3.2e Peak flow index (PFI) for each watershed within TFL30.	100% Annually As per the targets in the PFI table in the annual report	-10%	***PAG Consensus***
				3.2f The number of Legally Reportable Spills.	0 Annually	0	Report out on any spills in the riparian management area. ***PAG Consensus***
				3.2g The percentage of unnatural sediment occurrences where mitigating actions were taken.	100% Annually	-10% over 2 years	Report out on actual number of sediment occurrences. ***PAG Consensus***
4.0 Forest Ecosystem Contributions to Global Ecological Cycles	4.1 Carbon Uptake and Storage	A. Uptake and storage of carbon in forest ecosystems. ***PAG Consensus***	i. Facilitate carbon uptake within the DFA. ***PAG Consensus***	4.1a Percent of net area regenerated within 3 years after the completion of harvesting.	100%	-5%	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				4.1b Percent of cut block area that meets Free Growing requirements as identified in site plans (SP).	100%	0%	May be at odds with going to a more natural regeneration and other objectives. ***PAG Consensus***
			ii. Facilitate carbon storage within the DFA. ***PAG Consensus***	4.1c The amount of carbon stored in forest ecosystems within the DFA.	TBD	TBD	***PAG Consensus (on indicator only)***
	4.2 Forest Land Conversion	A. Forest Land. ***PAG Consensus***	a. Minimize industrial conversion of forested land to non-forested area. ***PAG Consensus***	4.2a The percentage of the Productive Forest Land converted to total permanent access structures.	≤3%	+1%	***PAG Consensus***
				4.2b The percentage of the Productive Forest Land converted to other non-forested area.	≤0.5%	+0.2%	Report out on the types of conversions. ***PAG Consensus***
5. Multiple Benefits to Society	5.1 Timber and Non-Timber Benefits	A. Short and Long term benefits. ***PAG Consensus***	i. Maintain a flow of timber benefits. ***PAG Consensus***	5.1a Cut control volume of timber harvested (m3/per cut control period) within the DFA.	≤100% (Over each 5 year cut control period)	+10%	Current timber flow in TFL30 is part of a bigger picture in the PG TSA. Add a section explaining this within the Introduction of the SFM plan. ***PAG Consensus***
				5.1b Percent of net harvested area regenerated within 3 years after the completion of harvesting.	100%	-2%	***PAG Consensus***
				5.1c Percent of net harvested area that meets Free Growing requirements as identified in site plans (SP).	100%	0%	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				5.1d % of the DFA (pre harvest and after free growing) assessed for damaging agents.	100% Over a 10-year period	-20%	Overview assessment on an annual basis. ***PAG Consensus (One abstention)***
				5.1e % of the DFA (pre free growing) assessed for damaging agents.	100% Over a 7-year period	-10%	***PAG Consensus***
				5.1f Non-recoverable volume loss due to stand damaging agent.	≤ TBD	TBD	Target to come from forecasting analysis Applies to THLB and unplanned losses. ***PAG Consensus (Target & Variance not addressed)***
				5.1g Number of hectares (area) damaged by accidental forestry-related industrial fires.	<10 ha Annually	0 ha	Escapes from prescribed fires not included. ***PAG Consensus***
			ii. Maintain a flow of non-timber benefits. ***PAG Consensus***	5.1h The percentage of forest operations consistent with the following non-timber benefits: visual quality, cultural heritage, riparian, and lakeshore management requirements in site plans.	100% Annually	0%	Report out separately by non-timber benefits. ***PAG Consensus***
				5.1i The number of opportunities given to the public to express forestry-related concerns and be involved in our planning processes.	≥ 3 types of media Annually	-1	Add details in SFM plan. ***PAG Consensus (Comments not addressed)***
				5.1j Percentage of Creating Opportunities (Canfor) and Keeping in Touch (KIT - BCTS) communication strategy requirements met.	100% Annually	-5%	Add details in SFM plan. ***PAG Consensus*** *(Comments not addressed)*
				5.1k Annual public review of Canfor and BCTS TFL30 road access plans.	October 1, each year	Nov 1, each year	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				5.1m Public survey of non-timber uses within the DFA.	At least every 4 years	+1 year	Refer to the list of non-timber uses recorded in the meeting minutes of February 13, 2006. Ensure the survey results are analysed to determine the impact of forest operations on non-timber values. Report out on the number of non-timber ventures benefiting from the DFA. ***PAG Consensus***
	5.2 Community and Sustainability	A. Community well being. ***PAG Consensus***	i. Support opportunities for maintaining a resilient and stable community. ***PAG Consensus***	5.2a Percent of money spent on forest operations and management on the DFA contracted to North Central Interior suppliers\contractors.	≥ 90% Annually	0%	Applies to Canfor only ***PAG Consensus***
				5.2b Proportion of timber extracted from the DFA supplied to local processing facilities.	≥ 95% Annually	-5%	Applies to Canfor only. ***PAG Consensus***
				5.2c Kms of main access roads maintained to a minimal standard (liability) in the spring.	≥ TBD/km	-10%	Main access roads to be identified in the SFMP and recognizing that some access may be managed to meet other values. Standards as per road permits. ***PAG Consensus***
	5.3 Fair Distribution of Benefits and Costs	A. Fair Distribution of Benefits and Costs. ***PAG Consensus***	i. Encourage the Fair Distribution of Economic, Ecological, and Social Benefits and Costs. ***PAG Consensus***	5.3a Stumpage paid on time to Government.	100%	0%	Canfor and BCTS report out the amount harvested. Canfor report out on stumpage paid and BCTS on revenue generated. ***PAG Consensus***
				5.3b Average income of DFA forestry sector workers compared to provincial average for forestry sector workers.	≥ provincial average for forestry sector workers	$0	Applies to Canfor only. ***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				5.3c A list of quantity and value of non-timber forest products from the DFA.	On or before March 31, 2007	+3 months	***PAG Consensus***
				5.3d Number of donations to the local community.	≥ 6	0	Applies to Canfor only ***PAG Consensus***
				5.3e Number of loss time accidents and deaths associated with the DFA	0 Annually	0	Applies to Canfor only Canfor to report out on accidents/near misses that occur on the DFA. ***PAG Consensus***
6. Accepting Society's Responsibility for Sustainable Development	6.1 Aboriginal and Treaty Rights	A. Aboriginal and Treaty Rights. *PAG Consensus*	i. Recognition and respect for Aboriginal and treaty rights. *PAG Consensus*	6.1a No unauthorized forestry activities within legally recognized and Agreement in Principle areas (Province and Federal) treaty areas.	100%	0%	Buffer around treaty areas. ***PAG Consensus (Comments not addressed)***
				6.1b All FSP and associated major amendments are referred to affected aboriginal bands.	100%	0%	***PAG Consensus***
				6.1c Pesticide Management Plans and associated major amendments are referred to affected aboriginal bands.	100%	0%	***PAG Consensus***
	6.2 Respect for Aboriginal Forest Values, Knowledge, and Uses	A. Aboriginal Forest Values, Knowledge, and Uses. ***PAG Consensus***	i. Incorporation of Aboriginal Forest Values, Knowledge, and Uses in Forest Management. ***PAG Consensus***	6.2a Percentage of forest operations consistent with the Heritage Conservation Act.	100% Annually	0%	***PAG Consensus***
				6.2b Documented opportunities for Aboriginal peoples participation in developing public plans.	≥1 meaningful face-to-face meeting per Aboriginal peoples per year	0	Public plans include Management plan (5yr), forest stewardship plan (5yr), SFM plan (3-5yrs). Target may be higher if major issues arise on the DFA. ***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				6.2c Percentage of issues raised by Aboriginal peoples evaluated by Canfor and BCTS.	100% Annually	-10%	***PAG Consensus***
				6.2d Percentage of issues raised by Aboriginal Chief & Council or their representative developed into mutually agreed upon strategies.	100% Annually	-50%	Over time the intent is to decrease the variance. ***PAG Consensus***
				6.2e Incorporation of mutually agreed upon strategies to address Aboriginal peoples' values, knowledge, and uses in public plans for the DFA.	100% Annually	0%	***PAG Consensus***
				6.2f Percentage of forest operations consistent with mutually agreed upon strategies.	100% Annually	0%	Starts after mutually agreed upon strategies are in place. ***PAG Consensus***
	6.3 Public Participation	A. Public participation in decision making processes. ***PAG Consensus***	i. A clear process for wide public participation in SFM. ***PAG Consensus***	6.3a PAG general satisfaction with public participation process.	Score of 5	-1	Objective comment: PAG desires the process to be inclusive, effective, and mutually agreed upon. ***PAG Consensus***
				6.3b. PAG overall satisfaction with public participation process.	Score of 5	-0.75	***PAG Consensus***
				6.3c. Number of times PAG Terms of Reference reviewed.	≥ 1 Annually	0	***PAG Consensus***
				6.3d. Number of PAG meetings.	≥ 1 Annually	0	***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				6.3e. Percentage of the public areas as defined in the ToR invited to participate in the PAG process.	100% Annually	0%	Attendance by public area will be shared with the PAG during the annual reporting. Includes also those removed from the ToR. ***PAG Consensus***
				6.3f. Percentage of people leaving the PAG process getting a follow-up interview survey.	100%	0%	Results and proposed improvements will be shared with the PAG. ***PAG Consensus***
				6.3g. The number of opportunities given to the public and stakeholders to express forestry related concerns and be involved in our planning processes.	≥ 3 Annually	-1	Canfor has developed a process called Creating Opportunities to track this indicator. BCTS has developed a process called Keeping In Touch (KIT) to track this indicator. ***PAG Consensus***
				6.3h. Percentage of communication strategy requirements met.	100% Annually	-5%	Communication strategies are on an individual basis. ***PAG Consensus***
	6.4 Information for Decision Making	A. Useful information for informed decision making. ***PAG Consensus***	i. Useful and timely information to interested parties. ***PAG Consensus***	6.4a Percentage of PAG satisfied with amount and timing of information presented for informed decision-making.	100% Annually	-20%	Information should be from varied sources so it is robust and should be based on good science. Satisfied is an average of PAG responses. ***PAG Consensus***
				6.4b Percentage of interested parties satisfied with amount and timing of information presented for informed decision-making.	100% Every 3 years	-40%	Survey of Creating Opportunities database group. ***PAG Consensus***
	6.5 Continuous Improvement & Adaptive Management. ***PAG Consensus***	A. Continuous improvement ***PAG Consensus***	i. Continuous improvement that is responsive to research, experience, and public input. ***PAG Consensus***	6.5a Review ranking and update status of items in the Continuous Improvement Matrix.	100% Annually	0%	Includes reporting on the items in the CI matrix. ***PAG Consensus***

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target	Variance	Comments
				6.5b PAG satisfaction with the progress on the Continuous Improvement Matrix.	Score of 5	-1	Measured as a mean of those responding. ***PAG Consensus***
		B. Adaptive Management ***PAG Consensus***	i. Adaptive management that is responsive to research, experience, and public input. ***PAG Consensus***	6.5c Number of items incorporated from the Continuous Improvement Matrix.	≥ 2 Annually	-1	***PAG Consensus***

Canfor Tree Farm License 30

Continuous Improvement Matrix

March 25, 2006 - Version 1.7

The purpose of this matrix is to capture issues presented by PAG members that can contribute to the continuous improvement of sustainable forest management but are either outside the scope of the PAG process or cannot be addressed by Canfor at the present time. These issues are to be reviewed at annual PAG meetings for further discussion and prioritization.

No.	Performance Matrix Ref.	Description of Issue	Suggested Strategies	Suggested Dates
1.	6.1b & 6.1c	Improve referral process for First Nations		
2.	ToR G.1.a	Attempt to find members and alternates for the following sectors: Non-Timber Forest Products, Hunting/Fishing – Commercial, Timber Sales Users, Union/Labour		
3.	6.2c	Meet with local First Nations to discuss best communication pathways regarding public processes.		
4.	6.2e	Develop strategies addressing Aboriginal Forest values, knowledge, and uses (for example, Culturally Modified Trees, cultural use, etc.) with local First Nations.		July 2006
5.	6.2	Cultural Heritage coverage for the DFA.		January 2007
6.	1.4a	Look at including antique forests to 1.4.a. Definition needed. (Consult with Trevor Goward, Dave Radies, and Craig DeLong)		
7.	1.1a & 1.1b	Once old and interior old forests are identified and mapped along with Canfor's choice of old and interior old forests, Canfor will provide these maps to the public to review and request input on the value of each old and interior old forest.		
8.	1.1b	Obtain additional information about the significance and value of buffers.		
9.	1.1	Canfor to add goal to the following indicator and develop further: The percentage area of each distinct habitat types in the non-harvesting landbase; Target: Based on ecosystem representation analysis.	Canfor will share concepts with the intent of developing indicators with the PAG. This will likely involve a presentation and more information.	January 2007
10.	1.2d	Report out on the research that Canfor is supporting on riparian management.		
11.	1.2h	Investigate either adding in Alder as a plant association or as a separate indicator.		
12.	2.2	Canfor to develop an indicator regarding a management regime based on natural disturbance.		Spring 2007
13.	5.1	Canfor to report out by species on the volume of merchantable tree species that are currently not harvested and assess their potential economic benefit.		Spring 2007
14.	3.1A.i	Commit to working with researchers to develop more direct measurements of soil productivity and bring back to PAG for discussion.		
15.	4.2	Evaluate to determine which forested land would be or is naturally reverting to a non-forested state.		
16.	5.2c	Develop an access management plan.		
17.	3.2	Develop an indicator addressing stream, non-classified drainage (NCD), and sub-surface water flow diversion.		
18.	3.2	Develop an indicator addressing stream drainage patterns.		
19.	2.0	Identify and document the rate of natural succession without interference by humans.		

Appendix 4

Glossary of Terms and Acronyms

TFL30 - Sustainable Forest Management Plan
Public Advisory Group Glossary of Terms

A

***AAC Apportionment*:** the distribution of the AAC for a TSA among timber tenures by the Minister in accordance with Section 10 of the Forest Act.

Abiotic factors: the non-living components of the environment, such as air, rock s, soil, water, peat, and plant litter.

Aboriginal (Source CSA): "'aboriginal peoples of Canada' [which] includes Indian, Inuit, and Métis peoples of Canada" (Constitution Act, 1982, Subsection 35 (2)).

Aboriginal Resource site/unit (Source CSA): an investigated unit identified by the aboriginal communities/bands that provides resources for food or culture uses (e.g. ceremonies). Each site is described by its band, location and resource type, use and quality on a monthly basis. This information is confidential and not released without a band's permission.

Aboriginal Rights (Source CSA): "rights that some Aboriginal peoples of Canada hold as a result of their ancestors' long-standing use and occupancy of the land".
Note: *"The rights of certain Aboriginal peoples to hunt, trap, and fish on ancestral lands are examples of Aboriginal rights. Aboriginal rights vary from group to group depending on the customs, practices, and traditions that have formed part of their distinctive cultures". (The State of Canada's Forests 2001/2002).*

Aboriginal title (Source CSA): "a legal term that recognizes the interest of Aboriginals in the land. It is based on their long-standing use and occupancy of the land as descendants of the original inhabitants of Canada" *(The State of Canada's Forests 2001/2002).*

Access management plan: an operational plan identifying the requirements for all road construction, reconstruction, maintenance, and deactivation.

Accreditation (Source CSA): the procedure by which the Standards Council of Canada (SCC) gives formal recognition that a registrar (certifier) is deemed competent to carry out specific tasks.

Active floodplain: the level area with alluvial soils adjacent to streams that is flooded by stream water on a periodic basis and is at the same elevation as areas showing evidence of flood channels free of terrestrial vegetation, recently rafted debris or fluvial sediments newly deposited on the surface of the forest floor or suspended on trees or vegetation, or recent scarring of trees by material moved by flood waters.

Adaptive management: adaptive management rigorously combines management, research, monitoring, and means of changing practices so that credible information is gained and management activities are modified by experience.

Adaptive management (Source CSA): a learning approach to management that recognizes substantial uncertainties in managing forests and incorporates into decisions experience gained from the results of previous actions

Additive effects: effects on biota of stress imposed by one mechanism, contributed from more than one source (e.g., sediment-related stress on fish imposed by sediment derived from stream bank sources and from land surface sources). (See also cumulative effects).

Administrative law: the branch of the law which deals with the actions of government vis a vis the public.

Administrative review: an appeal of a determination under Sections 127-129 of the Forest Practices Code of British Columbia Act.

Advanced regeneration: trees that have become established naturally under a mature forest canopy and are capable of becoming the next crop after the mature crop is removed.

Adverse slope: an uphill incline for hauling or skidding of logs or other loads.

Aerial photography: photos taken from the air at regular, spatial intervals and used in photo interpretation to provide much information about forests and landforms.

Afforestation: the establishment of trees on an area that has lacked forest cover for a very long time or has never been forested.

Age class: any interval into which the age range of trees, forests, stands, or forest types is divided for classification. Forest inventories commonly group trees into 20-year age classes.

Aggradation: accumulation of sediment in a stream channel on an alluvial fan or on a floodplain. Also applied to sediment accumulation on slopes.

Aggregated retention: retaining trees in patches throughout a cutblock or cutting unit.

Airtanker: a fixed-wing aircraft fitted with tanks and equipment for dropping suppressants or retardants.

Alienation: any land that has had its "right-to-use" transferred from the Crown through grant, lease, or permit or has a special interest noted, as in reserves. Land so designated may be permanent or temporary.

All-aged stand: see uneven-aged stand.

Allowable Annual Cut (AAC): The allowable rate of timber harvest from a specified area of land. The chief forester sets AACs for timber supply areas(TSAs) and tree farm licences (TFLs) in accordance with Section 8 of the Forest Act.

Amortization: a procedure by which the capital cost of projects, such as roads or bridges, is written off over a specified period of time as the timber volumes developed by the projects are harvested and extracted.

Anadramous: fish that breed in fresh water but live their adult life in the sea. On the Pacific coast, anadramous fish include all the Pacific salmon, steelhead trout, some cutthroat trout and Dolly Varden char, lampreys and eulachons.

Analysis unit: the basic building blocks around which inventory data and other information are organized for use in forest planning models. Typically, these involve specific tree species or type groups that are further defined by site class, geographic location or similarity of management regimes.

Animal Unit Month (AUM): the amount of forage required for one month by an average animal of the genus Bos (i.e., a cow) aged 6 months or older.

Aquatic habitat: habitat where a variety of marine or freshwater flora and fauna occur for long periods throughout the year. Examples include tide pools, estuaries, bogs, ponds and potential underwater diving areas.

Archaeological site: a location that contains physical evidence of past human activity and that derives its primary documentary and interpretive information through archaeological research techniques. These resources are generally associated with both the pre-contact and post-contact periods in British Columbia. These resources do not necessarily hold direct associations with living communities.

Artificial regeneration: establishing a new forest by planting seedlings or by direct seeding (as opposed to natural regeneration).

Aspect: the direction toward which a slope faces.

Auditor (Source CSA): a person qualified to undertake audits. Note: For SFM registration audits, auditors are qualified according to the requirements set out in CAN-P-14B and CAN-P-1518.

Available timber (see also Operable timber): timber which is available for harvest after due recognition of constraints to protect the environment and other forest uses.

Available volumes: the portion of total inventory volumes that is available for harvesting after all management constraints on timber harvesting have been considered, including definition of the timber harvesting land base, age of tree merchantability, deferrals and any other priorities or constraints on timber harvesting.

Average long term yield: the annual average of the total yield over the next 200 years minus unsalvaged losses. This figure is generally greater than the long run sustained yield due to the influence of cutting old growth timber in the first few decades.

Avoidable waste: the volume of timber left on the harvested area that should have been removed in accordance with the utilization standards in the cutting authority. It does not include the volume of timber that could not be removed because of physical impediments, safety considerations, or other reasons beyond the control of the licensee. Avoidable waste volumes are billed monetarily, as well as for cut control.

Azimuth: the horizontal angle or bearing of a point measured from the true (astronomic) north. Used to refer to a compass on which the movable dial (used to read direction) is numbered in 360. (See: Bearing and Compass).

B

Backlog: a Ministry of Forests term applied to forest land areas where silviculture treatments such as planting and site preparation are overdue. Planting is considered backlog if more than 5 years have elapsed since a site was cleared (by harvesting or fire) in the interior and more than 3 years on the coast of British Columbia.

Backlog area: an area from which the timber was harvested, damaged or destroyed before October 1, 1987 and that in the district manager's opinion is insufficiently stocked with healthy well spaced trees of a commercially acceptable species.

Backpack sprayer: spray unit with plastic containers on a backpack frame. Used by individual operator to apply chemicals, such as herbicides.

Backspar trail: a bladed or non-bladed pathway over which mobile backspar equipment travels.

Bank full height: that elevation which characterizes the cross-sectional area of the active stream channel.

Bareroot seedling: stock whose roots are exposed at the time of planting (as opposed to container or plug seedlings). Seedlings are grown in nursery seedbeds and lifted from the soil in which they are grown to be planted in the field.

Basal area per hectare: the area of the cross-section of tree stems near their base, generally at breast height and including bark, measured over 1 ha of land.

Base case: the current socioeconomic conditions related to the existing forest land management strategy and the expected socioeconomic conditions if the strategy remains unchanged.

Baseline information: information collected to provide a standard against which future measurements can be compared.

Basic silvicultural practices: maintenance of the productivity of forest sites, restocking of denuded forest lands with commercial tree species within three years for areas west of the Coast Range and five years for areas in the Interior, protection against damage by fire, insects and diseases to predetermined standards.

Basic silviculture: harvesting methods and silviculture operations including seed collecting, site preparation, artificial and natural regeneration, brushing, spacing and stand tending, and other operations that are for the purpose of establishing a free growing crop of trees of a commercially valuable species and are required in a regulation, pre-harvest silviculture prescription or silviculture prescription.

Bearing: a direction on the ground or on a map defined by the angle measured from some reference direction: this may be true (geographic) north, magnetic north, or grid north.

Bed load: particulates that are transported along the channel bottom in the lower layers of streamflow by rolling and bouncing.

Benefit/cost analysis: a technique for comparing alternate courses of action by an assessment of their direct and indirect outputs (benefits) and inputs (costs). Benefits and costs are usually defined in economic and social terms.

Biodiversity (biological diversity): the diversity of plants, animals, and other living organisms in all their forms and levels of organization, including genes, species, ecosystems, and the evolutionary and functional processes that link them.

Biodiversity (biological diversity) II (Source CSA): "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" (Environment Canada, *Canadian Biodiversity Strategy*).

Biogeoclimatic classification system: a hierarchical classification system of ecosystems that integrates regional, local and chronological factors and combines climatic, vegetation and site factors.

Biogeoclimatic unit: part of the biogeoclimatic ecosystem classification system. The recognized units are a synthesis of climate, vegetation and soil data and defined as classes of geographically related ecosystems that are distributed within a vegetationally inferred climatic space.

Biogeoclimatic zone: a geographic area having similar patterns of energy flow, vegetation and soils as a result of a broadly homogenous macroclimate.

Biological control: the use of biotic agents such as insects, nematodes, fungi, and viruses for the control of weeds and other forest pests.

Biological herbicide: a naturally occurring substance or organism which kills or controls undesirable vegetation. Preferred over synthetic chemicals because of reduced toxic effect on the environment.

Biological legacies: features which remain on a site or landscape after a natural disturbance. These legacies include live and dead trees, coarse woody debris, soil organic matter, plants, fungi, micro-organisms and seeds.

Biomass: the dry weight of all organic matter in a given ecosystem. It also refers to plant material that can be burned as fuel.

Biosphere: that part of the earth and atmosphere capable of supporting living organisms.

Biota: all living organisms of an area, taken collectively.

Birddog aircraft: an aircraft carrying the person (air attack officer) who is directing fire bombing action on a wildfire.

Bladed trail: a constructed trail that has a width greater than 1.5 m and a mineral soil cutbank height greater than 30 cm.

Blowdown (windthrow): uprooting by the wind. Also refers to a tree or trees so uprooted.

Blue-listed species: see sensitive/vulnerable species.

Bole: trunk of a tree.

Bonus bid: means a bid

(a) Tendered in order to acquire the right to harvest timber under an agreement under this Act,
(b) Calculated on a dollar value per cubic metre of competitive species and forest products harvested and measured in compliance with the agreement, and
(c) Payable from time to time in accordance with the agreement

Botanical forest products: prescribed plants or fungi that occur naturally on Crown forest land. There are seven recognized categories: wild edible mushrooms, floral greenery, medicinal products, fruits and berries, herbs and vegetables, landscaping products and craft products.

Breast height: the standard height, 1.3 m above ground level, at which the diameter of a standing tree is measured.

Broadcast burning: a controlled burn, where the fire is intentionally ignited and allowed to proceed over a designated area within well-defined boundaries, for the reduction of fuel hazard after logging or for site preparation before planting. Also called slash burning.

Browse: shrubs, trees and herbs that provide food for wildlife.

Brush rake: a blade with teeth at the bottom, attached to a cat or skidder, used in mechanical site preparation. It penetrates and mixes soil and tears roots.

Brushing: a silviculture activity done by chemical, manual, grazing, or mechanical means to control competing forest vegetation and reduce competition for space, light, moisture, and nutrients with crop trees or seedlings.

Bucking: cutting a felled tree into specified log lengths for yarding and hauling; also, making any bucking cut on logs.

Buffer strip: a strip of land (often including undisturbed vegetation) where disturbance is not allowed or is closely monitored to preserve or enhance aesthetic and other qualities along or adjacent to roads, trails, watercourses and recreation sites.

Buffer zone: see Pesticide buffer zone.

Burning permit: a permit required under Section 110 of the Forest Act, municipal bylaw, or letter-patent for authorizing open burning within 1 km of a forest during the fire season, for purposes other than cooking or obtaining warmth.

C

Cable logging: a yarding system employing winches, blocks, and cables.

Cambium: a single layer of cells between the woody part of the tree and the bark. Division of these cells results in diameter growth of the tree through formation of wood cells (xylem) and inner bark (phloem).

Campfire: a fire, not bigger than 1 m in height and 1 m in diameter, built for the purpose of cooking or providing warmth.

Canadian Forest Fire Weather Index (FWI) System: A subsystem of the Canadian Forest Fire Danger Rating System. The components of the FWI System provide numerical ratings of relative fire potential in a standard fuel type (i.e. a mature pine stand) on level terrain, based solely on consecutive observations of four fire weather elements measured daily at noon (1200 hours local standard time or 1300 hours daylight saving time) at a suitable fire weather station; the elements are dry bulb temperature, relative humidity, wind speed, and precipitation. The system provides a uniform method of rating fire danger across Canada.

Canopy: the forest cover of branches and foliage formed by tree crowns.

Canopy closure: the progressive reduction of space between crowns as they spread laterally, increasing canopy cover.

Capability mapping: a habitat interpretation for a species which describes the greatest potential of a habitat to support that species. Habitat potential may not be reflected by the present habitat condition or successional stage.

Carbon balance: the concentration of carbon released into the atmosphere compared to the amounts stored in the oceans, soil and vegetation.

Carrying capacity: the average number of livestock and/or wildlife that can be sustained on a management unit, compatible with management objectives for the unit. It is a function of site characteristics, management goals, and management intensity.

Catchment basin: a hole dug adjacent to a culvert inlet to allow coarser particles to settle out.

CCFM: Canadian Council of Forest Ministers

Certificate of registration (registration certificate) (Source CSA): the official document issued by a registrar to an organization upon successful completion of the registration process, including the registration audit.

Certification/registration (Source CSA): the result of a successful registration audit to this Standard, whereby the registrar issues a certificate of registration and adds the organization's registration to a publicly available list maintained by the registrar. The certification process is described in Annex A.

Certified pesticide applicator: an individual certified (through examination) by the Pesticide Management Branch to use or supervise the use of pesticides in a specific management category.

Certifier (registrar) (Source CSA): an independent third party that is accredited by the Standards Council of Canada as being competent to register organizations with respect to nationally and internationally recognized standards.

Chain: a measuring tape, often nylon, 50 m or 75 m in length, used to measure distances. This term is derived from an old unit of measurement: (80 Ch=1 mile).

Characteristic visual landscape: the naturally appearing landscape within a scene or scenes being viewed.

Chlorosis: blanched or yellowish coloring in plants caused by nutrient or light deficiency.

Choker: a noose of wire rope used for skidding or yarding logs. See Highlead system.

Christmas tree permit: a legal document that authorizes the holder to harvest, or grow and harvest, Christmas trees on Crown land.

Class A streams: see Fisheries stream Class A.

Classified areas: areas based on provincial criteria and classification systems which will be identified and mapped according to the Regulations and Field Guides of the Forest Practices Code: riparian management areas, lakeshore management areas, and wildlife habitat areas. These areas, established by a district manager in consultation with a designated B.C. Environment official, guide operations on a site-specific basis and require a combination of forest practices.

Cleaning: a release treatment made in a stand not past the sapling stage to free the favored trees from less desirable species of the same age that overtop them or are likely to do so.

Clearcut: an area of forest land from which all merchantable trees have recently been harvested.

Clearcutting: the process of removing all trees, large and small, in a stand in one cutting operation.

Clearcutting silvicultural system: a system in which the crop is cleared from an area at one time and an even-aged, replacement stand is established. It does not include clearcutting with reserves. Clearcutting is designed so that most of the opening has full light exposure and is not dominated by the canopy of adjacent trees (this produces an open area climate). The minimum size of a clearcut opening is generally considered to be 1 ha.

Clearcutting with reserves: a variation of the clearcut silvicultural system in which trees are retained, either uniformly or in small groups, for purposes other than regeneration.

Climax forest: a forest community that represents the final stage of natural forest succession for its environment.

Clinometer: a simple instrument for measuring vertical angles or slopes. In forestry, used to measure distance and tree heights.

Clone: a plant which is genetically identical to the parent plant. Produced asexually, e.g., from cuttings or suckers.

Close utilization: maximum stump height of 30 cm; minimum top dib of 10 cm. See: Utilization standards.

Closed canopy: the description given to a stand when the crowns of the main level of trees forming the canopy are touching and intermingled so that light cannot reach the forest floor directly.

Coarse filter approach: an approach to maintaining biodiversity that involves maintaining a diversity of structures within stands and a diversity of ecosystems across the landscape. The intent is to meet most of the habitat requirements of most of the native species. (see also Fine filter approach).

Coarse Woody Debris (CWD): sound and rotting logs and stumps that provide habitat for plants, animals, and insects and a source of nutrients for soil development.

Coast: that geographic area west of the Cascade Mountains, as officially delineated by the Cascade Mountains Administrative Line through British Columbia from Washington state to Alaska, including the lower Fraser River area south of Hell's Gate (south of Boston Bar), taking in the Coquihalla, Silverhope, and Skagit River drainages lying east of the line, but excluding the portions of the Kalum Forest District and Cariboo Forest Region lying west of the line.

Codominant: in stands with a closed canopy, those trees whose crowns form the general level of the canopy and receive full light from above, but comparatively little from the sides. In young stands, those trees with above average height growth.

Commercial thinning: a silviculture treatment that 'thins' out an overstocked stand by removing trees that are large enough to be sold as products such as poles or fence posts. It is carried out to improve the health and growth rate of the remaining crop trees.

Community watersheds: watersheds that have a drainage area no greater than approximately 500 km2, and that are licensed for community water use by the Water Management Branch of the Ministry of Environment, Lands and Parks. They include municipal and other waterworks and water user communities. Water user communities, as defined in the Water Act, have six or more licensed water users (registered with the Water Management Branch) extracting water from the same source. The district manager, in agreement with a designated Environment official, may identify other watersheds as community watersheds.

Compartment: a geographic unit defined for the purposes of forest administration and inventory. The boundaries follow permanent physical features or legal demarcation where appropriate.

Compass: instrument used to determine the direction of magnetic north. See Bearing and Azimuth.

Competing vegetation: vegetation that seeks and uses the limited common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth.

Compliance (Source CSA): the conduct or results of activities in accordance with legal requirements.

Component (Source CSA)t: an individual section of the SFM system, e.g., policy, planning, implementation and operation, checking and corrective action, or management review.

Composition: the proportion of each tree species in a stand expressed as a percentage of either the total number, basal area or volume

of all tree species in the stand.

Cone rake: a device for collecting cones from a standing tree. It is lowered, usually from a helicopter, over the crown of a tree. Cones or cone-bearing branches are removed and retrieved by the machine.

Conformance (Source CSA): meeting non-legal requirements such as policies, work instructions, or standards (including this Standard).

Conifer: cone-bearing trees having needles or scale-like leaves, usually evergreen, and producing wood known commercially as 'softwoods'.

Conifer release: to 'release' established coniferous trees from a situation in which they have been suppressed by thinning out undesirable trees and shrubs which have overtopped them. Carried out to improve the growth of the coniferous trees released. See Brushing.

Conk: a hard, fruiting body containing spores of a wood-decaying fungus.

Consensus option: a management option that has a broad base of community and interest group support.

Consequences, potential: a component of risk rating. Potential consequences are the detrimental events that could result from a hazard event.

Conservation: management of the human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. It includes the preservation, maintenance, sustainable utilisation, restoration and enhancement of the environment.

Conservation biology: the discipline that treats the content of biodiversity, the natural processes that produce it and the techniques used to sustain it in the face of human-caused environmental disturbance.

Container seedling: seedling grown in small container in a controlled environment. See: Plug and bareroot seedling.

Continual improvement (Source CSA): the ongoing process of enhancing SFM performance, resulting from experience and the incorporation of new knowledge in line with the organization's SFM policy and from the application of the SFM requirements.

Contour map: a topographic map which portrays relief by means of lines which connect points of equal elevation.

Contractual framework: where forest practices are primarily regulated by contracts.

Control points: a system of points with established positions or elevations, or both, which are used as fixed references in positioning map features.

Conventional ground skidding: any combination of rubber-tired or tracked skidding equipment.

Conventional logging: any combination of mechanical or hand felling and rubber-tired or tracked skidding equipment. In the interior, cable logging is not considered conventional; on the coast, it is.

Coordinated Resource Management Plan (CRMP): a specific type of sub-unit plan. To date it has been used mainly for managing Crown and alienated grazing lands. This plan involves consultation with resource agencies and resource users in establishing objectives in the management and development of a specific area.

Coppice (coppicing): the tendency of certain tree and brush species (such as red alder and bigleaf maple) to produce a large number of shoots when a single or few stems are mechanically removed but the root system left intact.

Cord: 128 cubic feet of stacked round wood (whole or split, with or without bark) containing wood and airspace, with all the pieces of similar length and lined up on approximately the same direction. Example: a pile of firewood 4'x4'x8'.

Corduroy: logs placed transversely along a road, usually with branches intact, and covered with fill material, to "float" the road over soft subsoils.

Corrective action (Source CSA): action to eliminate the cause of a detected nonconformity or other undesirable situation. **Note:** *There can be more than one cause for a nonconformity. Corrective action is taken to prevent recurrence, whereas preventive action is taken to prevent occurrence.*

Corridor: a band of vegetation, usually older forest, which serves to connect distinct patches on the landscape. Corridors are part of the Forest Ecosystem Network (FEN) and by providing connectivity permit the movement of plant and animal species between what would otherwise be isolated patches.

Critical wildlife habitat: part or all of a specific place occupied by a wildlife species or a population of such species and recognized as being essential for the maintenance of the population.

Critical winter range: forested habitat, usually stands of mature or old-growth conifers, which provides deer and elk with resources critical to survival during severe winters.

Crop tree: a tree in a young stand or plantation selected to be carried through to maturity until an interim or final harvest.

Cross-ditch: a ditch excavated across the road at an angle and at a sufficient depth, with armoring as appropriate, to divert both road surface water and ditch water off or across the road.

Cross-drain culvert: a culvert used to carry ditch water from one side of the road to the other.

Crown: the live branches and foliage of a tree.

Crown class: see Codominant, Dominant, Intermediate or Overtopped.

Crown closure: the condition when the crowns of trees touch and effectively block sunlight from reaching the forest floor.

Crown density: the amount, compactness or depth of foliage of a tree crown.

Crown land: land that is owned by the Crown. Referred to as federal Crown land when it is owned by Canada, and as provincial Crown land when owned by a province.

Cruise: the systematic measurement of a forested area designed to estimate to a specified degree of accuracy the volume of timber it contains, by evaluating the number and species of trees, their sizes and conditions.

CSA: Canadian Standards Association

Cull: trees or logs or portions thereof that are of merchantable size but are rendered unmerchantable by defects.

Culmination age: the age at which the stand, for the stated diameter limit and utilization standard, achieves its maximum average rate of volume production (the Mean Annual Increment, or MAI) is maximized.

Cultural diversity: the variety and variability of human social structures, belief systems and strategies for adapting to biological situations and changes in different parts of the world.

Cultural heritage resources: archaeological sites, First Nations traditional use sites, and structural features and landscape features of cultural or historic significance. As defined in the Forest Act, a cultural heritage resource is an object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to the Province, a community or an aboriginal people.

Culture: the sum of ways of living built up by a group of human beings, which is transmitted from one generation to another.

Culvert: a transverse drain pipe or log structure covered with soil and lying below the road surface.

Cumulative effects: effects on biota of stress imposed by more than one mechanism (e.g., stress in fish imposed by both elevated suspended
sediments concentrations in the water and by high water temperature).

Cut: the excavation required to lower the natural ground line to the desired road profile.

Cut-and-fill: system of bench construction on hillslopes to produce road rights-of-way and landings whereby convex slopes are excavated and concave slopes (gullies) are filled; also, excavation of the upslope side of the right-of-way, and fill on the down slope side. (so called half-bench construction).

Cut bank: the excavated bank from a ditch line to the top of the undisturbed slope of a road.

Cut control: a set of rules and actions specified in the Forest Act that describes the allowable variation in the annual harvest rate either above or below the allowable annual cut approved by the chief forester.

Cut period: the interval between major harvesting operations in the same stand.

Cutblock: a specific area, with defined boundaries, authorized for harvest.

Cutblock adjacency requirements: integrated resource management requirements that specify the desired spatial relationships among cutblocks.

Cut slope: the face of an excavated bank required to lower the natural ground line to the desired road profile.

Cutting authority: as defined in the Forest Practices Code of British Columbia Cutblock and Road Review Regulation a cutting permit or an application for a cutting permit or a timber sale licence or a timber sale licence that has been advertised.

Cutting cycles: the planned, recurring interval of time between successive cuttings in a crop or stand.

Cutting permit: a legal document that authorizes the holder to harvest trees under a licence issued under the Forest Act.

Cutting plan: a plan for harvesting the timber from an area defined within a cutting permit. This plan must be approved by the Forest Service before operations may begin.

D

Damaged timber: timber that has been affected by injurious agents such as wind (as in the case of blowdown), fire, insects, or disease.

Danger tree: a live or dead tree whose trunk, root system or branches have deteriorated or been damaged to such an extent as to be a potential danger to human safety.

DBH (diameter at breast height): the stem diameter of a tree measured at breast height, 1.3 m above the ground.

Deactivation: measures taken to stabilize roads and logging trails during periods of inactivity, including the control of drainage, the removal of sidecast where necessary, and the re-establishment of vegetation for permanent deactivation.

Debris flows: mixture of soil, rock, wood debris and water which flows rapidly down steep gullies; commonly initiate on slopes greater than 30 %, but may run out onto footsteps of low gradient.

Debris initiation and transport hazard: the relative risk of gully wall failure and/or debris movement in gully channels, as tempered by the stream runout distance.

Deciduous: perennial plants which are normally leafless for some time during the year.

Declination (magnetic): the angle between true (geographic) north and magnetic north (direction of the compass needle). Declination varies from place to place and can be 'set' on a compass for a particular location.

Deferred area: an area specified in a higher level plan where timber harvesting or other forest development activities have been postponed for a period of time or that the district manager has determined should not be harvested or otherwise developed until a higher level plan for the area is completed.

Deficit forest: a forest in which existing stands cannot provide enough harvest volume to maintain the harvest at the level of long run sustained yield until the stands created when existing stands are cut become available for harvest. See also Surplus forest.

Defined forest area (DFA) (Source CSA): a specified area of forest, including land and water (regardless of ownership or tenure) to which the requirements of this Standard apply. The DFA may or may not consist of one or more contiguous blocks or parcels.

Defoliator: an agent that damages trees by destroying leaves or needles.

Deforestation: clearing an area of forest on a non-temporary basis for another use. Clearcutting (even with stump removal), if shortly followed by reforestation for forestry purposes, is not deforesting.

Deforestation II (Source CSA): “clearing an area of forest for another long-term use” *(The State of Canada’s Forests 2001/2002*).

Degradation: the diminution of biological productivity or diversity.

Deleterious substance: any substance that, if added to water, would degrade or alter the quality of the water so that it becomes deleterious to fish or fish habitat, or becomes unsuitable for human consumption or any other purpose for which it is legally licensed (such as irrigation and livestock watering).

Depletion: an income tax allowance reflecting the purchase price paid for merchantable timber, usually on fee simple land. Also, a term used to refer to the process of harvesting your growing stock.

Designated area: an identifiable geographic unit of the forest land base that requires a specific combination of forest practices to adequately protect important resource values.

Designated heritage trail: a heritage trail designated under the Heritage Conservation Act.

Designated official: not a defined term in the Forest Practices Code of British Columbia Act. However, commonly used to refer to a person designated by name or title to be a designated energy, mines and petroleum resources official, designated environment official, or designated forest official.

Designated skid road/skid trail: a pre-planned network of skid roads or skid trails, designed to reduce soil disturbance and planned for use in subsequent forestry operations in the same area. Multiple passes by tracked or rubber-tired skidders or other equipment are anticipated.

Designated wilderness: see Wilderness area.

Desired future stand condition: a description of the characteristics of the future stand.

Desired plant community: a plant community that produces the kind, proportion, and amount of vegetation necessary for meeting or exceeding the land use plan or plan objectives established for an ecological site. The desired plant community must be consistent with the site's capability to produce the desired vegetation through management, land treatment, or a combination of the two.

Determination: any act, omission, decision, procedure, levy, order or other determination made under the Forest Practices Code of British Columbia Act or the Regulations or Standards made under that act by an official or a senior official.

Detrimental soil disturbance: changes caused by forest practices in the physical, chemical, or biological properties of the soil, including the organic forest floor and the mineral soil extending from the surface to the depth at which the unweathered parent material is encountered. Such changes may result in a loss of productive growing site, reduced site productivity, or adverse impacts on resource values.

Development: the advancement of the management and use of natural resources to satisfy human needs and improve the quality of human life. For development to be sustainable it must take account of social and ecological factors, as well as economic ones, of the living and non-living resource base, and of the long-term and short-term advantages and disadvantages of alternative actions.

Development objectives: the short-term (often 5-year) planning objectives for a specific management area.

Development plan: a specific plan outlining harvesting, road construction, protection, and silviculture activities over the short-term (often 5 years) in accordance with the approved forest management plan.

Dewatering: condition in stream channel when all the water flow occurs within the permeable streambed sediments, so no surface water is left; common in small streams with considerable accumulations of gravel.

DFA: Defined forest area

DFA-related worker (Source CSA): any individual employed by the organization to work for wages or a salary who does not have a significant or substantial share of the ownership in the employer's organization and does not function as a manager of the organization.

Diameter limit: the removal of trees from a stand, based on the criterion of diameter. Generally, trees of less than a predetermined diameter are left unharvested.

Diameter tape: a graduated tape based on the relationship of circumference to diameter which provides direct measure of tree diameter when stretched around the outside of the tree, usually at breast height. See DBH.

DIB (diameter inside bark): the diameter of a tree or log excluding bark thickness.

Dibble: a tool used to make holes in the ground for planting tree seedlings.

Difficult site: forest sites with environmental conditions that are unfavorable for tree establishment and growth.

Direct seeding: the application of tree seed to a denuded area to regenerate it with commercially valuable species.

Disc trencher: a machine designed for mechanical site preparation. It provides continuous rows of planting spots rather than intermittent patches as provided by patch scarifiers. Consists of scarifying steel discs equipped with teeth.

Discretionary authority: the power to make a decision where the choice of whether to make a decision is that of the decision maker.

Dispersed retention: retaining individual trees scattered throughout a cutblock.

District manager: the manager of a Forest Service district office, with responsibilities as outlined in the Forest Act, Ministry of Forests Act, and Range Act.

Disturbance: a discrete event, either natural or human-induced, that causes a change in the existing condition of an ecological system.

Ditch block: a blockage that is located directly downgrade of a cross-drain culvert or cross-ditch and designed to deflect water flow from a ditch into a cross-drain culvert.

DOB (diameter outside bark): the diameter of a tree or log including bark thickness.

Dominant: trees with crowns extending above the general level of the canopy and receiving full light from above and partly from the side; taller than the average trees in the stand with crowns well developed.

Dot grid: a transparent sheet of film (overlay) with systematically arranged dots, each dot representing a number of area units. Used to determine areas on maps, aerial photos, plans, etc.

Down-rated bridges: bridges whose carrying capacity has been reduced.

Drag scarification: a method of site preparation that disturbs the forest floor and prepares logged areas for regeneration. Often carried out by dragging chains or drums behind a skidder or tractor.

Drainage basin: area of the earth's surface from which surface drainage all flows to a single outlet stream (a watershed in North America).

Drainage structures: include metal and wooden culverts, open-faced culverts, bridges, and ditches.

Drainage system: a system designed to control the flow of water within a road prism.

Drawdown: the process of reducing allowable annual cuts to a sustainable level.

Duff: the layer of partially and fully decomposed organic materials lying below the litter and immediately above the mineral soil. It corresponds to the fermentation (F) and humus (H) layers of the forest floor. When moss is present, the top of the duff is just below the green portion of the moss.

Dust palliatives: chemicals or compounds applied to road surfaces to reduce dust created by traffic.

E

Ecological balance: a state of dynamic equilibrium within a community of organisms in which genetic, species and ecosystem diversity remain relatively stable, subject to gradual changes through natural succession.

Ecological classification: an approach to categorizing and delineating, at different levels of resolution, areas of land and water having similar characteristic combinations of the physical environment (such as climate, geomorphic processes, geology, soil and hydrologic function), biological communities (plants, animals, microorganisms and potential natural communities) and the human dimension (such as social, economic, cultural and infrastructure).

Ecological health: both the occurrence of certain attributes that are deemed to be present in a healthy, sustainable resource, and the absence of conditions that result from known stresses or problems affecting the resource.

Ecological integrity: the quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future.

Ecological reserve: areas of Crown land which have the potential to satisfy one or more of the following criteria:

- areas suitable for scientific research and educational purposes associated with studies in productivity and other aspects of the natural environment;
- areas which are representative of natural ecosystems;
- areas in which rare or endangered native plants or animals may be preserved in their natural habitat; and
- areas that contain unique geological phenomena.

Ecological units: areas of land with similar biological, geological, and climatic environments.

Ecologically suitable species: coniferous or deciduous tree species that are naturally adapted to a site's environmental conditions, including the variability in these conditions that may occur over time.

Economically operable: forest stands for which log prices exceed harvesting costs, including profit and return to capital.

Ecoregion classification: the ecoregion classification system is used to stratify B.C.'s terrestrial and marine ecosystem complexity into discrete geographical units at five different levels. The two highest levels, Ecodomains and Ecodivisions, are very broad and place B.C. globally. The three lowest levels, Ecoprovinces, Ecoregions and Ecosections, are progressively more detailed, narrow in scope and relate segments of the province to one another. They describe areas of similar climate, physiography, oceanography, hydrology, vegetation and wildlife potential.

Ecosystem: a functional unit consisting of all the living organisms (plants, animals, and microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size-a log, pond, field, forest, or the earth's biosphere-but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem, old-growth ecosystem, or range ecosystem.

Ecosystem II (Source CSA): a dynamic complex of plants, animals, and micro-organisms and their non-living environment, interacting as a functioning unit. Note: “The term ‘ecosystem’ can describe small-scale units, such as a drop of water, as well as large-scale units, such as the biosphere” (Environment Canada, Canadian Biodiversity Strategy).

Ecosystem integrity: the soundness or wholeness of the processes and organisms composing the ecosystem.

Ecosystem management: the use of an ecological approach to achieve productive resource management by blending social, physical, economic and biological needs and values to provide healthy ecosystems.

Ecosystem productivity: the ability of an ecosystem to produce, grow or yield products - whether trees, shrubs or other organisms.

Ecotone: a transition area between two adjacent ecological communities usually exhibiting competition between organisms common to both.

Edatope: refers to a specific combination of soil moisture regime and soil nutrient regime.

Edge: the outer band of a patch that has an environment significantly different from the interior of the patch.

Edge/area ratio: length of forest edge per cutblock area.

Edge effect: habitat conditions (such as degree of humidity and exposure to light or wind) created at or near the more-or-less well-defined boundary between ecosystems, as, for example, between open areas and adjacent forest.

Element: an identifiable component, process or condition of an ecosystem.

Element II (Source CSA): a concept used to define the scope of each CCFM SFM criteria. Each CCFM SFM criterion contains several elements. The CSA SFM elements were derived from the national-scale elements developed by the CCFM for more specific local applications. The elements serve to elaborate and specify the scope of their associated criterion (see Figure 1).

End haul: to move excavated material from one section of the road to another or to a disposal site, during road construction or modification.

Endangered species: see Threatened or endangered species.

Endemic species: a species whose natural occurrence is confined to a certain region and whose distribution is relatively limited.

Entrainment: mobilization, by flowing water, of sediment or organic debris from the bed or banks of a stream channel.

Entrenched: a legislative requirement which previously may only have been required by contract or policy.

Environment (Source CSA): the surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and the interrelations of these elements.

Environmental rehabilitation: measures undertaken to remedy environmental damage done to the land.

Environmentally sensitive areas (ESAs): areas requiring special management attention to protect important scenic values, fish and wildlife resources, historical and cultural values, and other natural systems or processes. ESAs for forestry include potentially fragile, unstable soils that may deteriorate unacceptably after forest harvesting, and areas of high value to non-timber resources such as fisheries, wildlife, water, and recreation.

Erosion: The wearing away of natural (earth) and unnatural (embankment, slope protection, structure, etc.) surfaces by actions of external forces. Generally refers to the wearing away of the earth's surface by flowing water. *From "Certified Professional in Erosion and Sediment Control Exam Workbook", Jan 28 2005 Glossary Amendment*

Even-aged: a forest stand or forest type in which relatively small (10-20 year) age differences exist between individual trees. Even-aged stands are often the result of fire, or a harvesting method such as clearcutting or the shelterwood method.

Even-aged silvicultural system: a silvicultural system that is designed to regenerate and maintain an even-aged stand. Clearcutting, seed tree, and shelterwood are even-aged systems.

Even-aged stand: a stand of trees consisting of one or two age classes. Even-aged stands are often the result of fire, or a harvesting method such as clearcutting or shelterwood.

Even flow: in harvest scheduling, the requirement that the harvest level in each period be equal to the harvest level in the preceding period.

Evergreen: never entirely without green foilage, leaves persisting until a new set has appeared.

Excavated trail: a constructed trail that has a width greater than 1.5 m and a mineral soil cutbank height greater than 30 cm.

Extension services: assistance provided to woodland operators. May include help with the preparation of forest management plans, cutting permits, marking trees for selective cutting, and guidance in carrying out slash disposal, site preparation, planting, etc.

Existing visual condition: the present level of landscape alteration caused by resource development activities and expressed in terms of the visual quality objective categories.

F

Falldown effect: a decline in timber supply or harvest level associated with the transition from harvesting the original stock of natural mature timber over one rotation to harvesting at a non declining level (typically equal to the annual increment) after conversion to a forest with a balanced age class structure.

Feller-buncher: a harvesting machine that cuts a tree with shears or a saw and then piles it.

Felling and bucking: the process of cutting down standing timber and then cutting it into specific lengths for yarding and hauling.

Fertilization: the addition of fertilizer to promote tree growth on sites deficient in one or more soil nutrients. Also used to improve the vigor of crop trees following juvenile spacing or commercial thinning.

Fill: material used to raise the desired road profile above the natural ground line.

Fill bank: the fill material used to shape a road from the outer edge of the travelled portion to its intersection with the existing ground profile.

Fill-in planting: planting required to supplement poorly stocked natural regeneration or to replace seedlings that have died on previously planted sites.

Fill slope: the face of an embankment required to raise the desired road profile above the natural ground line.

Fine filter approach: an approach to maintaining biodiversity that is directed toward particular habitats or individual species that might fall through the coarse filter. These habitats may be critical in some way and the species threatened or endangered.

Fire danger: an assessment of both fixed and variable factors of the fire environment, which determine the ease of ignition, rate of spread, difficulty of control, and the fire impact.

Fire hazard: the potential fire behavior for a fuel type, regardless of the fuel type's weather-influenced fuel moisture content or its resistance to fireguard construction. Assessment is based on physical fuel characteristics, such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

Fire impact(s): the immediately evident effect of fire on the ecosystem in terms of biophysical alterations (e.g., crown scorch, mineral soil erosion, depth of burn, fuel consumption).

Fireline: that portion of the fire upon which resources are deployed and actively engaged in suppression action. In a general sense, the working area around a fire.

Fire management: the activities concerned with the protection of people, property and forest areas from wildfire and the use of prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social and economic criteria.

Fire retardant: a substance that by chemical or physical action reduces flammability of combustibles.

Fire risk: the probability or chance of fire starting determined by the presence and activities of causative agents.

Fire season: the period(s) of the year during which firs are likely to start, spread and do damage to values-at-risk sufficient to warrant organized fire suppression; a period of the year set out and commonly referred to in fire prevention legislation. In B.C. the fire season is considered to extend from April 1 to October 31.

Fire suppressant: an agent directly applied to burning fuels to extinguish the flaming and smoldering or glowing stages of combustion.

Fire suppression: all activities concerned with controlling and extinguishing a fire following its detection. Synonymous with fire control.

Fire Weather Index (FWI): Canadian Forest Fire Weather Index System

Firebreak: see Fuelbreak.

Fireguard: a strategically planned barrier, either manually or mechanically constructed, intended to stop a fire or retard its rate of spread and from which suppression action is carried out to control a fire; the constructed portion of a control line.

First order stream: stream originating in a seepage zone or spring, with no entering tributaries; the most headward channels in the drainage network.

First pass: the first of two or more planned entries over a specific period of time (usually one rotation) to harvest timber.

Fish-bearing waters: lakes, streams, and ponds that have resident fish populations.

Fisheries-sensitive zones: side and back channels, valley wall ponds, swamps, seasonally flooded depressions, lake littoral zones and estuaries that are seasonally occupied by over- wintering anadramous fish.

Fisheries stream class A: streams or portions of streams that are frequented by anadromous salmonids and/or resident game fish or regionally significant fish species; or streams that have been identified for fishery enhancement in an approved fishery management plan.

Fixed area plot sampling method: a controlled cruise method where small plots of a fixed size are used to sample a portion of a forest area to obtain information (such as tree volume) that can be used to describe the whole area.

Flood discharge criteria: the volume of flood that a bridge or culvert must be designed to accommodate.

Floodplain: a level, low-lying area adjacent to streams that is periodically flooded by stream water. It includes lands at the same elevation as areas with evidence of moving water, such as active or inactive flood channels, recent fluvial soils, sediment on the ground surface or in tree bark, rafted debris, and tree scarring.

Fluvial processes: all processes and events by which the configuration of a stream channel is changed; especially processes by which sediment is transferred along the stream channel by the force of flowing water.

Flyrock: rock displaced by blasting and propelled beyond recoverable limits.

Foliar analysis: chemical evaluation of the status of plant nutrients or the plant-nutrient requirements of a soil by the analysis of leaves or needles.

Forage: grasses, herbs and small shrubs that can be used as feed for livestock or wildlife.

Ford: a dip constructed in the roadbed at a stream crossing, instead of a culvert or bridge. The streambed must be of erosion-resistant material, or such material must be placed in contact with the streambed.

Forecast (Source CSA): an explicit statement of the expected future condition of an indicator.

Forest: as defined by the Forest Practices Code of British Columbia Act includes all of the following - forest land, whether Crown land or private land; Crown range; Crown land or private land that is predominantly maintained in one or more successive stands of trees, successive crops of forage, or wilderness.

Forest II (Source CSA): an ecosystem dominated by trees and other woody vegetation growing more or less closely together, its related flora and fauna, and the values attributed to it.

Forest Appeals Commission (FAC): the Forest Appeals Commission is the independent appeal body established under the Forest Practices Code of British Columbia Act to hear appeals from certain enforcement determinations.

Forest condition (Source CSA): the state of the forest ecosystem as determined by a range of variables associated with forest structure, composition, and processes.

Forest cover: forest stands or cover types consisting of a plant community made up of trees and other woody vegetation, growing more or less closely together.

Forest cover map: a map showing relatively homogeneous forest stands or cover types, produced from the interpretation of aerial photos and information collected in field surveys. Commonly includes information on species, age class, height class, site, and stocking level.

Forest cover type: a descriptive term used to group stands of similar characteristics and species composition (due to given ecological factors) by which they may be differentiated from other groups of stands.

Forest development plan: an operational plan guided by the principles of integrated resource management (the consideration of timber and non timber values), which details the logistics of timber development over a period of usually five years. Methods, schedules, and responsibilities for accessing, harvesting, renewing, and protecting the resource are set out to enable site-specific operations to proceed.

Forest Development Review Committee (FDRC): the group made up of government organizations, stakeholders, licensees, and the general public that is responsible for reviewing development plans.

Forest ecology: the relationships between forest organisms and their environment.

Forest Ecosystem Network (FEN): a planned landscape zone that serves to maintain or restore the natural connectivity within a landscape unit. A forest ecosystem network consists of a variety of fully protected areas, sensitive areas, classified areas, and old-growth management areas.

Forest fire: any wildfire or prescribed fire that is burning in forest, grass, alpine or tundra vegetation types.

Forest floor: layers of fresh leaf and needle litter, moderately decomposed organic matter, and humus or well-decomposed organic residue.

Forest floor displacement hazard: a ranking of the potential adverse impacts on forest productivity resulting from removal of the accumulated organic matter that constitutes the forest floor. It is determined in accordance with procedures set out in the Ministry of Forests' publication "Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook," as amended from time to time.

Forest health: a forest condition that is naturally resilient to damage; characterized by biodiversity, it contains sustained habitat for timber, fish, wildlife, and humans, and meets present and future resource management objectives.

Forest health agents: biotic and abiotic influences on the forest that are usually a naturally occurring component of forest ecosystems. Biotic influences include fungi, insects, plants, animals, bacteria, and nematodes. Abiotic influences include frost, snow, fire, wind, sun, drought, nutrients, and human-caused injury.

Forest health treatments: the application of techniques to influence pest or beneficial organism populations, mitigate damage, or reduce the risk of future damage to forest stands. Treatments can be either proactive (for example, spacing trees to reduce risk of attack by bark beetles) or reactive (for example, spraying insecticides to treat outbreaks of gypsy moth).

Forest interior conditions: conditions found deep within forests, away from the effect of open areas. Forest interior conditions include particular microclimates found within large forested areas.

Forest inventory: an assessment of forest resources, including digitized maps and a database which describes the location and nature of forest cover (including tree size, age, volume and species composition) as well as a description of other forest values such as soils, vegetation and wildlife features.

Forest land (Assessment Act): land which has as its highest and best use the growing and harvesting of trees, including land which is being managed in accordance with a forest management plan approved under regulations, but does not include a farm.

Forest land (Ministry of Forests): provincial forests and other unalienated Crown lands for which the Ministry of Forests is responsible, including both forested lands and non-forested lands such as tundra, wetlands, rangelands, deserts, rock, and ice.

Forest land (B.C. Assessment Authority): land having as it's highest and best use the growing and harvesting of trees.

Forestland (Source CSA): land supporting forest growth or capable of doing so, or, if totally lacking forest growth, bearing evidence of former forest growth and now in disuse.

Forest landscape: a portion of the land that the eye can see in one glance and in which the forest is the most dominant element.

Forest licence: a forest licence allows orderly timber harvest over a portion of a sustained yield management unit, and the timely reforestation of harvested areas according to a strategic resource management plan prepared by the Forest Service for each timber supply area. The licence has a term of 15 to 20 years, generally replaceable every five years (some are non-replaceable) and operating areas that shift over time. Once an area is harvested and reforested the licensee moves to another part of the timber supply area. A forest licence specifies an annual allowable cut, requires a management and working plan, and specified management activities.

Forest management: the practical application of scientific, economic and social principles to the administration and working of a forest for specified objectives. Particularly, that branch of forestry concerned with the overall administrative, economic, legal and social aspects and with the essentially scientific and technical aspects, especially silviculture, protection and forest regulation.

Forest management cycle: the phases that occur in the management of a forest including harvesting, site preparation, reforestation, and stand tending.

Forest management plan: a general plan for the management of a forest area, usually for a full rotation cycle, including the objectives, prescribed management activities and standards to be employed to achieve specified goals. Commonly supported with more detailed.

Forest mensuration: the measurement of volume, growth and development of individual trees and stands, and the various products obtained

from them.

Forest officer: a person employed by the B.C. Ministry of Forests who is designated by the minister, chief forester, or regional manager to be a forest officer, through name or title.

Forest operations: All mechanical actions which include: raod, harvesting and silviculture activities.

Forest planning model: an analytical model (usually computer-based) that successively harvests and grows collections of forest stands over a period of several decades according to specific data and management assumptions.

Forest practice: (1) Any activity that is carried out on forest land to facilitate the use of forest resources, including but not limited to timber harvesting, road construction, silviculture, grazing, recreation, pest control, and wildfire suppression. (2) A term defined in the Forest Practices Code of British Columbia Act. Activities include timber harvesting, road construction, road maintenance, road deactivation, silviculture treatments, grazing, fire use, control and suppression, and other similar activities, provided these activities are carried out on Crown forest land, range land, or private land subject to a tree farm licence or woodlot licence by government, a tenure holder or a person engaged in a commercial enterprise (e.g., mining). Further explanation is contained in the definitions section of the act.

Forest Practices Advisory Council (FPAC): Cabinet may by regulation establish a Forest Practices Advisory Council to periodically review the Forest Practices Code and recommend changes.

Forest Practices Board (FPB): the Forest Practices Board is t he "public watchdog" agency established under the Forest Practices Code of British Columbia Act to audit the activities of both the forest industry and the government.

Forest Practices Code (FPC): the Forest Practices Code is a term commonly used to refer to the Forest Practices Code of British Columbia Act, the regulations made by Cabinet under the act and the standards established by the chief forester. The term may sometimes be used to refer to field guides as well. It should be remembered that unlike the act, the regulations and standards, field guides are not legally enforceable.

Forest profile: the range of forest conditions that exists across the landscape, including such factors as timber species, quality, condition and age, location, elevation, topography, accessibility, and economic viability.

Forest renewal: the renewal of a tree crop by either natural or artificial means. Forest resources: a defined term in the Forest Practices Code of British Columbia Act meaning resources and values associated with forests and range including, without limitation, timber, water, wildlife, fisheries , recreation, botanical forest products, forage, and biological diversity.

Forest Service road: a road constructed, modified or maintained by the minister under the provisions of the Forest Act or declared a Forest Service road. Forest Service roads are used to provide access to managed forest land.

Forest tree breeding: the genetic study of trees to solve some specific problem or to produce a specially desired product.

Forest tree improvement: the control of parentage combined with other silvicultural activities (such as site preparation or fertilizing) to improve the overall yield and quality of products from forest lands.

Forest type: a group of forested areas or stands of similar composition (species, age, height, and stocking) which differentiates it from other such groups.

Forest type labels: the symbols which are used to code information about forest types on a forest cover map, such as site, disturbance, age and height class, species, stocking.

Forest type lines: lines on a map or aerial photo outlining forest types.

Forest yield: see Allowable Annual Cut.

Forest yield regulation: the administrative and technical process which facilitates yield control (regulation), often narrowly interpreted as a process that ensures regular and sustained forest yields.

Forested Plant Community: A unit of vegetation with a relatively uniform species composition and physical structure that includes a forest canopy. Forested plant communities tend to have characteristic environmental features such as bedrock geology, soil type, topographic position, climate, and energy, nutrient and water cycles.

Forester: a person engaged in the profession of forestry. In some countries the term is restricted to those who received formal post-secondary education in forestry or who possess the equivalent qualifications. A forester may or may not be a Registered Professional Forester, which is a legally-recognized title.

Forestry: the science, art and practice of managing and using for human benefit the natural resources that occur on and in association with forest lands.

Fragmentation: the process of transforming large continuous forest patches into one or more smaller patches surrounded by disturbed areas. This occurs naturally through such agents as fire, landslides, windthrow and insect attack. In managed forests timber harvesting and related activities have been the dominant disturbance agents.

Free-growing: young trees that are as high or higher than competing brush vegetation with one metre of free-growing space surrounding their leaders. As defined by legislation, a free growing crop means a crop of trees, the growth of which is not impeded by competition from plants,

shrubs or other trees. Silviculture regulations further define the exact parameters that a crop of trees must meet, such as species, density and size, to be considered free growing.

Free-growing assessment: the determination for whether young trees have attained free- growing status.

Free use permits: an agreement entered into under Part 3, Division 8 of the Forest Act, which provides for the cutting and utilization of Crown timber for very specific purposes, free of stumpage assessment.

Freshet: high stream flow, usually confined to the stream channel and caused by a regularly recurring hydrological phenomenon (e.g., the snowmelt freshet) (regional term).

Fruiting body: the reproductive part of a fungus that contains or bears spores. Also known as a conk.

Fry: the young stage of fishes (i.e., less than one year old), particularly after the yolk sac has been absorbed.

Fuelbreak: an existing barrier or change in fuel type (to one that is less flammable than that surrounding it), or a wide strip of land on which the native vegetation has been modified or cleared, that act as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire.

Fuel management: the planned manipulation and/or reduction of living or dead forest fuels for forest management and other land use objectives (such as hazard reduction, silvicultural purposes, wildlife habitat improvement) by prescribed fire, mechanical, chemical or biological means and/or changing stand structure and species composition.

Fuelwood: trees used for the production of firewood logs or other wood fuel.

Full bench cut: forming the roadway entirely in cut.

Full-tree harvesting: a tree harvesting process that includes removing the trunk, branches and in some instances the roots from a forested site. In Canada this process is used to control root diseases.

G

Genetic diversity: variation among and within species that is attributable to differences in hereditary material.

Genetically improved seed and/or vegetative propagules: seed or propagule that originate from a tree breeding program and that have been specifically designed to improve some attribute of seeds, seedlings, or vegetative propagules selection.

Genotype: the entire genetic constitution, or the sum total of genes of an organism, in contrast to the phenotype.

Geographic information system (GIS): a computer system designed to allow users to collect, manage and analyze large volumes of spatially referenced information and associated attribute data.

Geotextile filter fabric: a synthetic material placed on the flat, under road fill, with the primary functions of layer separation, aggregate confinement, and distribution of load.

Girdling: to kill a tree by severing or damaging the cambium layer and interrupting the flow of food between the leaves and the rest of the tree. A method of 'brushing' carried out using a hatchet or special tool to cut through the bark and cambium of the tree.

Goal: goals provide general purpose and direction. They are the end result of ultimate accomplishment toward which an effort is directed. They generally should reflect perceived present and future need. They must be capable of being effectively pursued.

Grading: classifying timber, lumber or logs according to quality or end-use.

Grapple yarder: a machine used in harvesting to bring logs into a landing. The grapple closes like teeth around the log and is controlled by the machine operator.

Grazing lease: a lease of Crown land issued for grazing purposes under the Land Act.

Grazing schedule: sets out the class and number of livestock that can use an area described in the schedule, the dates the livestock can use the area and other prescribed information.

Grazing season: a period during which livestock may graze on Crown land under a grazing licence or grazing permit.

Green tree retention: the reservation of live trees of a specific species and size from harvesting, to achieve a site-specific objective.

Greenbelt: an extensive area of largely undeveloped or sparsely occupied land associated with a community set aside to contain development, preserve the character of the countryside and community and provide open space.

Greened-up : a cutblock that supports a stand of trees that has attained the green-up height specified in a higher level plan for the area, or in the absence of a higher level plan for the area, has attained a height that is 3 m or greater, and if under a silvicultural prescription, meets the stocking requirements of that prescription, or if not under a silviculture prescription, meets the stocking specifications for that biogeoclimatic ecosystem classification specified by the regional manager.

Gross total volume: volume of the main stem of the tree including stump and top. Volume of the stand including all trees.

Ground-based systems: logging systems that employ ground-based equipment such as feller-bunchers, hoe chuckers, skidders, and forwarders.

Ground truthing: the use of a ground survey to confirm the findings of an aerial survey or to calibrate quantitative aerial observations.

Groundwater: water below the level of the water table in the ground; water occupying the sub-surface saturated zone.

Group selection: see Selection silvicultural system.

Growing stock: the sum of all trees in a forest or specified part of it.

Grubbing and retention: removal of stumps, roots, embedded logs, organics, and unsuitable soils before or concurrently with subgrade construction.

Guidebooks: part of the Forest Practices Code but not included in the legislation. Guidebooks support the Regulations and Standards by stipulating detailed tolerances and evaluation criteria and by providing recommended procedures, processes, and results. Guidebooks may also contain new guidelines and recommendations which are still being tested or are awaiting formal approval. Specifications provided by guidebooks become legally enforceable when inserted in plans, prescriptions, and contracts.

Guideline: an optional practice or new practice not currently in the Forest Practices Code. Although guidelines are generally voluntary, the implication is that practitioners will use these concepts and principles in meeting their resource objectives.

Gully assessment procedure: a procedure for determining gully sediment and debris transport potential, and suggested management strategies.

H

Habitat: the place where an organism lives and/or the conditions of that environment including the soil, vegetation, water, and food.

Habitat enhancement: any manipulation of habitat that improves its value and ability to meet specified requirements of one or more species.

Habitat management: management of the forest to create environments which provide habitats (food, shelter) to meet the needs of particular organisms.

Hack and squirt: a method of conifer release and juvenile spacing where the bark of a tree is cut (hack) and herbicides are injected (squirt) to kill the tree.

Hardwoods: trees which are generally deciduous, broad leafed species such as oak, alder or maple.

Harvest cut: the felling of the mature crop of trees either as a single clearcut or a series of regeneration cuttings.

Harvest forecast: the flow of potential timber harvests over time. A harvest forecast is usually a measure of the maximum timber supply that can be realized, over time, for a specified land base and set of management assumptions.

Harvest pattern: the spatial distribution of cutblocks and reserve areas across the forested landscape.

Harvest rate: the rate at which timber is harvested, commonly expressed as an (AAC).

Harvest schedule: a document listing the stands to be harvested year or period, usually showing types and intensities of harvests for each stand, as well as a timetable for regenerating currently non-productive areas.

Harvesting: the practice of felling and removing trees or the removal of dead or damaged trees from an area.

Harvesting method: the mix of felling, bucking, and yarding (skidding) systems used in logging a st and of timber.

Harvesting prescription: detailed plan on how, when, and where timber will be harvested from an area.

Harvesting system: the mix of felling, bucking and yarding systems used in logging a stand of tim ber.

Hauling: a general term for the transportation of logs from one point to another, usually from a landing to the mill or shipping point.

Hazard: a state that may result in an undesired event, the cause of risk. Hazard can apply to the probability of tree mortality or damage by an insect or disease and also represents material or fuel that will ignite and burn.

Hazardous or danger tree: a tree or any component of a tree that has sufficient structural infirmity to be identified as having a high risk of falling and causing personal or property damage.

Hazards, potential: a component of risk rating. Potential hazards are the detrimental events that could result from inappropriate harvesting practices.

Healthy ecosystem: an ecosystem in which structure and functions allow the maintenance of biodiversity, biotic integrity and ecological processes over time.

Heartwood: the inner core of a woody stem composed of nonliving cells and usually differentiated from the outer wood layer (sapwood) by its darker colour. See Cambium.

Height class: any interval into which the range of tree heights is divided for classification and use, commonly 3 m, 5 m, or 10 m classes.

Height/diameter curve: a graphic representation of the relationship between individual tree heights and diameters used to determine tree volumes in localized areas.

Helitack: initial attack on wildfires involving the use of helicopters and trained crews, deployed as a complete unit.

Helitanker: a helicopter equipped with a helitank - a specially designed tank used for transporting and dropping suppressants or retardants.

Helitorch: a specialized drip torch, using a gelled fuel, slung and activated from a helicopter.

Herbicide: chemical substances or living organisms (called bioherbicides) used to kill or control vegetation such as brush, weeds, and competing or undesirable trees.

Heritage areas: sites of historical, architectural, archaeological, paleontological, or scenic significance to the province.

Heritage trail: a trail having cultural significance by reason of established aboriginal use or use by early immigrants.

Highgrading: the removal of only the best trees from a stand, often resulting in a residual stand of poor quality trees.

High hazard (forest health): physical characteristics (including tree species, composition, age, and size) and biogeoclimatic factors that make a forest highly susceptible to attack by damaging agents.

High sensitivity areas: areas having special concerns, issues, or the potential for negative impacts on resource values, including any soils with high hazard or very high hazard for compaction, erosion, mass wasting, or displacement.

High value stream: as defined in the Forest Practices Code of British Columbia Cutblock and Road Review Regulation a high value fish-bearing stream and a stream in a community watershed.

Higher level plan: strategic or operational plans that provide direction to any lower level of plans, prescriptions or forest practices.

Higher level plans include:

- a plan formulated pursuant to Section 4(c) of the Ministry of Forests Act,
- a management plan as defined in the Forest Act,
- an objective for a resource management zone,
- an objective for a landscape unit or sensitive area,
- an objective for a recreation site, recreation trail or interpretive forest site, and
- a plan or agreement declared to be a higher level plan by the minister or the lieutenant governor.

Plans which might be declared to be a higher level plan by the minister or the lieutenant governor include plans such as Land Resource Management Plans and Local Resource Use Plans.

Highlead system: logging system that uses cables rigged to a spar high above the ground so that one end of the logs can be lifted during yarding.

Hip chain: a device used to measure distance by means of an anchored filament wrapped around a wheel that revolves as you walk (handy for measuring distances on your own).

Historical variation: the range of the spatial, structural, compositional and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

Hoe-chucking: a logging system that uses an excavator or hoe to yard logs to the roadside and/or landing.

Human dimension: an integral component of ecosystem management that recognizes people are part of ecosystems, that people's pursuits of past, present, and future desires, needs and values (including perceptions, beliefs, attitudes and behaviours) have and will continue to influence ecosystems and that ecosystem management must include consideration of the physical, emotional, mental, spiritual, social, cultural and economic well-being of people and communities.

Human impact or influence: a disturbance or change in ecosystem composition, structure or function caused by humans.

Humus: a general term for the more or less decomposed plant and animal residues in the lower organic soil layer.

Hydrology: the science that describes and analyzes the occurrence of water in nature, and its circulation near the surface of the earth.

Hydroseeding: the application of seed in a water slurry that contains fertilizer, a soil binder and/or mulch.

Hypsometer: a simple instrument, often a stick or other straight edge, used to measure the heights of trees on the basis of similar angles.

Immature: trees or stands that have grown past the regeneration stage, but are not yet mature.

Immature timber: stands of timber where the age of the leading species in a stand is less than the specified cutting age. Cutting ages are established to meet forest management objectives. Usually stands with lodgepole pine and whitebark pine or a deciduous species as the leading species are considered as immature timber when the stand age is less than 81 years. Otherwise, all stands having conifers other than lodgepole pine and whitebark pine as the leading species are immature when the stand age is less than 121 years.

Impact assessment: a study of the effect of resource development on other resources.

Improvement cutting: the removal of trees of undesirable species, form or condition from the main canopy of the stand to improve the health, composition and value of the stand.

Increment: the increase in diameter, basal area, height, volume, quality or value of individual trees or stands during a given period.

Increment borer: a tool used to extract a core of wood from a living tree for the purpose of studying the annual growth rings of the tree.

Increment core: that part of the cross section of a tree extracted by an increment borer. Used to determine tree age and growth pattern.

Incremental silviculture: a Ministry of Forests term that refers to the treatments carried out to maintain or increase the yield and value of forest stands. Includes treatments such as site rehabilitation, conifer release, spacing, pruning, and fertilization. Also known as intensive silviculture. See Basic silviculture.

Independent (impartial) (Source CSA): free from bias. Note: A registrar is not considered independent (impartial) if, in the two years preceding an audit, it or any of its personnel, subcontractors, or related bodies provide or have provided assistance or consulting services to the organization being audited and, as a result of the audit, certified (see definition of Related body).

Indicator (Source CSA): a variable that measures or describes the state or condition of a value (see Figure 5).

Indicator species: species of plants used to predict site quality and characteristics.

Industrial operation: operations such as land clearing, timber harvesting, timber processing, mechanical site preparation and other silvicultural treatments, mining, and road construction.

Initial attack: the action taken to halt the spread or potential spread of a fire by the first fire fighting force to arrive at the fire.

Initial mature inventory: that portion of the existing total mature forest inventory which is available for harvest. This portion reflects all management constraints that are necessary to protect the environment and other forest uses and varies with the constraints identified for each option.

Inner gorge: a stream reach or portion of stream that is bounded by steep hillslopes (> 40% sideslope) and terminates upslope into more gentle topography.

Inoperable lands: lands that are unsuited for timber production now and in the foreseeable future by virtue of their: elevation; topography; inaccessible location; low value of timber; small size of timber stands; steep or unstable soils that cannot be harvested without serious and irreversible damage to the soil or water resources; or designation as parks, wilderness areas, or other uses incompatible with timber production.

Insloping: shaping the road surface to direct water onto the cut side of the road. Integrated resource management (IRM): the identification and consideration of all resource values, including social, economic, and environmental needs, in land use and development decision making. It focuses on resource use and land use and management, and is based on a good knowledge of ecological systems, the capability of the land, and the mixture of possible benefits.

Integrated resource use: a decision making process whereby all resources are identified, assessed and compared before land use or resource management decisions are made. The decisions themselves, whether to approve a plan or carry out an action on the ground, may be either multiple or single use in a given area. The application of integrated resource management results in a regional mosaic of land uses and resource priorities which reflect the optimal allocation and scheduling of resource uses.

Intensive silviculture: See Incremental silviculture.

Interested party (Source CSA): an individual or organization interested in and affected by the activities of the management of a DFA.

Interior: the geographic area east of the Cascade Mountains, as officially delineated by the Cascade Mountains Administrative Line through British Columbia from Washington state to Alaska, including the portions of the Kalum Forest District and Cariboo Forest Region lying west of the line, but excluding the lower Fraser River area south of Hell's Gate (south of Boston Bar), taking in the Coquihalla, Silverhope, and Skagit River drainages lying east of the line.

Interior conditions: at a point where edge effects no longer influence environmental conditions within a patch, interior conditions are achieved. For coastal B.C. forests, the edge effect is generally felt for a distance equivalent to 2 to 4 times average tree height into the stand. The effects usually involve light intensity, temperature, wind, relative humidity and snow accumulation and melt. See Edge effect.

Intermediate: intermediate trees have crowns below, but still extending into, the general level of the canopy and receive a little direct light from above but none from the sides.

Interpretive forest site: a designated forest site and ancillary facilities developed by the Ministry of Forests to interpret, demonstrate, or facilitate the discussion of the natural environment, forest practices, and integrated resource management.

Inter-tree distance: the distance between tree boles, usually used in the context of thinning. Recommended guidelines for inter-tree distances are established for different thinning programs depending on site variables, the species and age of trees, and management objectives.

Inventory, forest: a survey of a forest area to determine such data as area, condition, timber, volume and species for specific purposes such as planning, purchase, evaluation, management or harvesting.

ISO 14001 (Source CSA): an internationally recognized environmental management system standard published in 1996 by the International Organization for Standardization. The ISO 14001 Standard has been approved as a National Standard of Canada by the Standards Council of Canada.

J

Joint administration: a term referring to the joint powers of the Ministry of Forests, Ministry of Environment, Lands and Parks and the Ministry
of Energy, Mines and Petroleum Resources to enforce the Forest Practices Code. It is also used to refer to the involvement of the Ministry of Forests and the Ministry of Environment, Lands and Parks in certain aspects of strategic and operational planning.

Judicial review: a review of a decision by a court authorized and conducted under the Judicial Review Procedure Act primarily concerned with the fairness of the procedures used to make a decision, whether or not the decision maker was acting within his or her jurisdiction , and errors of law.

Juvenile spacing: a silvicultural treatment to reduce the number of trees in young stands, often carried out before the stems removed are large enough to be used or sold as a forest product. Prevents stagnation and improves growing conditions for the remaining crop trees so that at final harvest the end-product quality and value is increased. Also called precommercial thinning.

K

Key area: a relatively small area selected because of its location, use, or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management.

Key species: forage species that must, because of their high degree of use, be considered in the management program.

Keystone species: a species that plays an important ecological role in determining the overall structure and dynamic relationships within a biotic community. A keystone species presence is essential to the integrity and stability of a particular ecosystem.

L

Ladder fuels: fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to the ease of torching and crowning.

Lake: a naturally occurring static body of water greater than 2 m in depth and greater than 1 ha in size, or a licensed reservoir.

Lakeshore management area: the lands directly adjacent to a lake, in which forest practice standards are designed to maintain the unique combination of fish, wildlife, water, and recreation values that occur on and around lakes.

Land and Resource Management Plan (LRMP): a strategic, multi-agency, integrated resource plan at the subregional level. It is based on the principles of enhanced public involvement, consideration of all resource values, consensus-based decision making, and resource sustainability.

Land-use planning: the process by which decisions are made on future land uses over extended time periods, that are deemed to best serve the general welfare.

Landform: a landscape unit that denotes origin and shape, such as a floodplain, river terrace, or till plain.

Landing: an area modified by equipment that is designed for accumulating logs before they are transported.

Landing pile or cull pile: an area of piled slash, logging residue, and stumps, created as a result of harvesting operations and the construction of roads and landings.

Landscape: the fundamental traits of a specific geographic area, including its biological composition, physical environment and anthropogenic or social patterns.

Landscape ecology: the study of the distribution patterns of communities and ecosystems, the ecological processes that affect those patterns
and changes in pattern and process over time.

Landscape inventory: see Visual landscape inventory.

Landscape level: a watershed, or series of interacting watersheds or other natural biophysical (ecological) units, within the larger Land and Resource Management Planning areas. This term is used for conservation planning and is not associated with visual landscape management and viewscape management.

Landscape sensitivity: a component of the landscape inventory that estimates the sensitivity of the landscape based on: the visual prominence
of importance of features; conditions that affect visual perception; and social factors that contribute to viewer perceptions.

Landscape unit: a planning area, up to 100 000 ha in size, based on topographic or geographic features such as a watershed or series of watersheds. They are established by the Ministry of Forests' district manager in consultation with a designated B.C. Environment official to ensure Crown land in a provincial forest and private land in a tree farm licence or woodlot licence are managed and used in accordance with Section 2 of the Forest Practices Code of British Columbia Act.

Landscape unit objectives: objectives established for a landscape unit to guide forest development and other operational planning. Landscape objectives are established by the Ministry of Forests' district manager and a designated B.C. Environment official.

Large Organic Debris (LOD): entire trees or large pieces of trees that provide channel stability or create fish habitat diversity in a stream channel.

Large woody debris: a large tree part, conventionally a piece greater than 10 cm in diameter and 1 m in length.

Leader: the length of tree stem from the top of the tree down to the first set of branches, representing one year of growth and reflecting the tree's vigor and the site's growing potential.

Leave trees: all trees, regardless of species, age, or size, remaining on a harvested area as a result of a predetermined silviculture prescription to address a possible range of silviculture or resource needs.

Legally Reportable Spill: a release or discharge into the environment of a substance in an amount equal to or greater than quantity spilled. *From Jan 28 2005 Glossary Amendment*

Substance	Quantity Spilled*
Gasoline, diesel, engine oil, hydraulic oil	100 L
Antifreeze (undiluted)	5 L
Battery acid	5kg
Grease	100 L
Paints and solvents	100 L

**Amounts taken from provincial Spill Reporting Regulation, Jan 1, 2005.*

Licence to cut: an agreement under the Forest Act allowing a person who purchases or occupies land, and who does not otherwise have the right to harvest Crown timber from the land, to cut and/or remove timber on the land.

Licensee: means a party required to prepare a forest development plan under the *Forest Practices Code of B.C. Act* or a forest stewardship plan under the *Forest and Range Practises Act*. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

Lightning detection system: a network of electronic field sensors linked to a central computer to detect, triangulate, plot the location of and record cloud-to-ground lightning flashes in real time over a predetermined area.

Limiting factor: a factor present in an environment in such short supply that it limits growth or some other life process.

Linear developments: straight line industrial development that is typical of power lines, highways, gas lines, and seismic activities.

Litter layer: the layer of organic debris, mainly bark, twigs, and leaves, on the forest floor.

Littoral zone: the shore zone between the high and low water mark.

Livestock: as defined in theRange Act and Silviculture Planning Regulations means animals of the genus Bos, horses, mules, asses, sheep and goats, but does not include wildlife designated under the Wildlife Act, exotic game animals, buffalo, swine or poultry but does include llamas.

Local Resource Use Plan (LRUP): a plan approved by a district manager for a portion of a timber supply area or tree farm licence that provides management guidelines for integrating resource use in the area. Such a plan may become a higher level plan if declared to be so by the Ministers or Cabinet.

Log boom: floating logs tied together in rafts to be towed by boat to their destination.

Logging: see Harvesting.

Logging (cutting) plan: a map, along with a written plan, describing the road building, harvesting, and other related operations that are submitted for a forest officer's approval to ensure that the applicable standards and obligations stat ed in the Pre-Harvest Silviculture Prescription and the harvesting agreement are met.

Logging trail: a narrow, temporary path used by harvesting equipment.

Long Run Sustainable Yield (LRSY): the long run sustainable yield for any Timber Supply Area (TSA) is equal to the culmination of mean annual increment weighted by area for all productive and utilizable forest land types in that TSA including all not satisfactorily restocked, disturbed stocking doubtful, and potentially usable non-commercial cover.

Long term (Source CSA): in the context of making forecasts regarding forest structure and composition, at a minimum, twice the average life expectancy of the predominant trees in a DFA, up to a maximum of 300 years.

Lopping: chopping branches, tops and small trees after felling into lengths such that the resultant slash will lie close to the ground.

Lopping and scattering: lopping the slash created after felling and spreading it more or less evenly over the ground without burning.

Loss factors: reductions made to gross timber volumes to allow for decay, waste, and breakage.

Low Ground Pressure (LGP) machines: machines that exert a total ground pressure of less than 43.4 KPa (6.3 pounds per square inch).

M

Major culvert: a stream culvert having a pipe diameter of 2000 mm or greater, or a maximum design discharge of 6 m3/sec or greater.

Managed forest land: forest land that is being managed under a forest management plan utilizing the science of forestry.

Management plan: a management plan or management and working plan approved under a tree farm licence, woodlot licence, pulpwood agreement or forest licence. Contains inventory and other resource data.

Management area: stands or forest types that require similar management practices and can be grouped for treatment as a management unit.

Management assumptions: approximations of management objectives, priorities, constraints and other conditions needed to represent forest management actions in a forest planning model.

Management option: a prescription of management activities over time that will achieve specified management objectives.

Management plan: detailed long-term plan for a forested area. Contains inventory and other resource data.

Management unit plan: the third level of planning in the Ministry of Forests hierarchical planning system. A plan prepared for a Timber Supply
Area which takes into account regional goals and land use interactions. Management unit plans provide a basis for Forest Service programs. The annual allowable cut for the management unit is calculated on the basis of the management unit plan.

Management zone: the outer portion of a riparian management area situated adjacent to a stream, lake, or wetland and established to conserve and maintain the productivity of aquatic and riparian ecosystems when harvesting is permitted.

Map folio: a series of maps bound together, often produced as overlays of information, e.g., soils, fish, water, forest, and wildlife.

Marine-sensitive zones: herring spawning areas, shellfish beds, marsh areas, aquaculture sites, juvenile salmonid rearing areas, and adult salmon holding areas.

Mass wasting: movement of soil and surface materials by gravity.

Mature: trees or stands that are sufficiently developed to be harvestable.

Mature timber: stands of timber where the age of the leading species in a stand is greater than the specified cutting age. Cutting ages are established to meet forest management objectives. Usually stands with lodgepole pine or a deciduous species as the leading species are classified as mature timber when the stand age is greater than 80 years. Otherwise, all stands having conifers other than lodgepole pine and whitebark pine as the leading species are mature when the stand age is greater than 120 years.

Maximum density: the maximum allowable stand density above which stands must be spaced to a target density of well-spaced acceptable stems to achieve free-growing status.

Mean Annual Increment (MAI): the average annual increase in volume of individual trees or stands up to the specified point in time. The MAI changes with different growth phases in a tree's life, being highest in the middle years and then slowly decreasing with age. The point at which the MAI peaks is commonly used to identify the biological maturity of the stand and its readiness for harvesting.

Mechanical site preparation: any activity that involves the use of mechanical machinery to prepare a site for reforestation.

Mechanized access and use: refers to access and use by, for example, mountain bikes and other bicycles, hang gliders, and other human-powered mechanized equipment. Associated facilities include aircraft landing facilities, boat docks, and heliports.

Mechanized stand tending treatment: any stand tending activity that involves the use of mechanical machinery to treat a stand.

Memorandum of understanding (MOU): an agreement between ministers defining the roles and responsibilities of each ministry in relation to the other or others with respect to an issue over which the ministers have concurrent jurisdiction.

Merchantable timber: a tree or stand that has attained sufficient size, quality and/or volume to make it suitable for harvesting.

Merchantable volume: the amount of sound wood in a single tree or stand that is suitable for marketing under given economic conditions.

Meridian line: a north-south reference line often appearing on maps. Meridian lines are also etched into the bearing plate on a compass.

Microclimate: generally the climate of small areas, especially insofar as this differs significantly from the general climate of the region. Stands often create microclimates.

Microsite: a small area which exhibits localized characteristics different from the surrounding area. For example, the microsites created by a rock outcrop with thin soils, or the shaded and cooled areas created on a site by the presence of slash.

Mineral soil: soil consisting predominately of, and having its properties determined by, inorganic matter. Usually contains less than 20 per cent organic matter.

Minimum utilization standard: included in every licence authorizing the harvesting of timber, a standard which is expressed as a maximum stump height, diameter at stump height, and top diameter and which can vary by species and timber supply area (and supply blocks within timber supply areas).

Mixed stand: a stand composed of two or more tree species.

Modified burning zone: a zone within or adjacent to a smoke-sensitive area that requires special considerations and burning techniques, even under favourable conditions, to maintain air quality within a smoke-sensitive area.

Monoculture: in general, even-aged, single-species forest crops.

Mortality: death or destruction of forest trees as a result of competition, disease, insect damage, drought, wind, fire and other factors (excluding harvesting).

Motorized access and use: refers to access and use by, for example, float planes, helicopters, fixed-wing aircraft, motorboats, motor bikes, all-terrain vehicles, snowmobiles, and motorized equipment.

Multiple use: a system of resource use where the resources in a given land unit serve more than one user.
Multiple use can be effected in three ways:

- different uses of adjacent sub-areas which together form a composite multiple use area;
- the alternation in time of different uses on the same areas; and
- more than one use of an area at one time.

In multiple use planning, where differing resource uses are conducted at the same time on the same area and conflicts between users will occur, one resource is determined to be the dominant use and all other secondary uses are integrated only in-so-far as they are compatible with the first. Often multiple use planning sacrifices the production of the individual resources in favour of the over-all mix of resource uses that brings the greatest social and economic benefits.

Multiple Use Sustained Yield Calculation (MUSYC): a linear programming forest planning model developed by the United States Forest Service. MUSYC is currently used as the British Columbia Forest Service's standard forest planning model for carrying out TSA timber supply computer analysis.

Mycorrhiza: a rootlet of a higher plant modified through integral association with a fungus to form a constant structure which differs from either component but is attached to the root system and functions somewhat as a rootlet. It is usually considered to be beneficial to the associated plant.

N

Natural boundary: the visible high water mark of any lake, stream, or other body of water where the presence and action of the water are so common and usual and so long continued in all ordinary years as to mark upon the soil of the bed of the lake, river stream, or other body of water a character distinct from that of the banks, both in vegetation and in the nature of the soil itself.

Natural disturbance regimes: the historic patterns (frequency and extent) of fire, insects, wind, landslides and other natural processes in an area.

Natural Forest Area: means an area in the mountain pine beetle infested units which is in a stage of transition and could be in one or more of the following stages: old forest; dying forests; dead forests; or, young natural forests (which have not been harvested). *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

Natural justice: a set of procedures designed to ensure that decisions are made fairly.

Natural range barrier: a river, rock face, dense timber or any other naturally occurring feature that stops or significantly impedes livestock movement to and from an adjacent area.

Natural regeneration: the renewal of a forest stand by natural seeding, sprouting, suckering, or layering seeds may be deposited by wind, birds
or mammals.

Natural resource: means land, water and atmosphere, their mineral, vegetable and other components, and includes flora and fauna on or in them.

Naturally resistant seed sources: tree species or provenances that have been shown to exhibit increased resistance to some specific pest, over that of the species or provenance that would normally be used in artificial regeneration in a particular situation.

Net down procedure: The process of identifying the net land base, which is the number of hectares of forest land which actually contribute to the allowable annual cut. The process involves "netting down" the TSA gross area to the TSA gross forest area then to the TSA net forest area. Areas and/or volumes are sequentially deleted or reduced from the gross land base for a number of considerations, including: private ownership, non- forest or non-productive, environmentally sensitive, unmerchantable and inaccessible.

Net land base: see Net down procedure.

Net present value (NPV): a stand's present worth before harvesting once costs associated with its establishment and tending have been subtracted.

Net volume: volume of the main stem excluding stump and top as well as the defective and decayed wood of trees or stands.

New forestry: a philosophy or approach to forest management that has as its basic premise the protection and maintenance of ecological systems. In new forestry the ecological processes of natural forests are used as a model to guide the design of the managed forest.

Non-designated wilderness: Areas within the provincial forest that have been zoned as wilderness through approved integrated resource management plans including regional land-use plans and Land and Resource Management Plans (LRMPs).

Non-forest land: land not primarily intended for growing or supporting a forest.

Non-timber resource values: values within the forest other than timber which include but are not limited to biological diversity, fisheries, wildlife, minerals, water quality and quantity, recreation and tourism, cultural and heritage values, and wilderness and aesthetic values.

Non-timber resources: resources other than timber, such as recreation, aesthetics, wildlife, fish, forage, range, water, and soils.

Normal forest: an outdated concept, drawing on the idea of a norm or standard forest structure against which existing forest structures can be compared. A normal forest is a forest composed of even-aged fully-stocked stands representing a balance of age classes such that for a specified rotation period, one age class can be harvested in each year. At the end of the rotation, the stands that were harvested first in the cycle would be ready for harvesting again.

Not Satisfactorily Restocked (NSR): productive forest land that has been denuded and has failed, partially or completely, to regenerate either naturally or by planting or seeding to the specified or desired free growing standards for the site.

No-work zones: areas in which equipment and people are not allowed during forestry operations, usually for safety or ecological reasons.

Noxious weeds: any weed so designated by the Weed Control Regulations and identified on a regional district noxious weed control list.

Nurse log: a larger and decomposing fallen log which acts as a germination substrate for tree species establishing in the understory. Such logs provide moisture, nutrients and often some degree of elevation above other potentially competing vegetation on the forest floor.

O

Objective: the end result(s) that must be achieved through management at any given administrative level. Objectives are quantified and indicate time and agency responsibility.

Objective II (Source CSA): a broad statement describing a desired future state or condition of a value (see Figure 5).

Old Forest: means > 140 year old stands*, from available forest inventory sources, for all natural disturbance units with the exception of:

- the Moist Interior – plateau sub-unit – all biogeoclimatic variants; and,
- the Omineca Valley – SBSdk, SBSdw3, BWBSdk1, SBSmc2, SBSmk1; and,
- the McGregor Plateau – SBSmk1 and SBSmh;

- where old forests will be considered to be those stands >120 years.

*In the ICH units, it is realized that the definition of old forest requires more discussion and a process will be developed in 2005 to deal with this issue. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

Old growth: old growth is a forest that contains live and dead trees of various sizes, species, composition, and age class structure. Old-growth forests, as part of a slowly changing but dynamic ecosystem, include climax forests but not sub-climax or mid-seral forests. The age and structure of old growth varies significantly by forest type and from one biogeoclimatic zone to another.

Old-growth attributes: structural features and other characteristics of old-growth forests, including: large trees for the species and site; wide variation in tree sizes and spacing; accumulations of large dead standing and fallen trees; multiple canopy layers; canopy gaps and understory patchiness; elements of decay such as broken or deformed tops or trunks and root decay; and the presence of species characteristic of old growth.

Old-growth management areas: areas which contain, or are managed to replace, specific structural old-growth attributes and which are mapped out and treated as special management areas.

Old Interior Forest: means an area of "old forest" or "natural forest area" which buffered from younger age classes or disturbance. The baseline analysis for this objective used 200m as the buffered distance to calculate the amount of old interior forest. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

Operable forest: that portion of the production forest that, under current market conditions, can be harvested at a profit.

Operable land: all lands that are not considered inoperable lands (see Inoperable lands).

Operable timber: see also Timber operability. Available timber that can be economically logged with present harvesting methods after consideration of access, timber quality and market price.

Operability line: a line drawn on a map to differentiate between areas that are operable and those that are not, given status quo harvesting and reforestation technology. Inoperable areas are not economically viable to harvest without seriously impairing the site or other resource values. The operability line is used to determine the operable land base in long-run, sustained yield calculations.

Operating area: geographic sub-units of timber supply areas that have been assigned to individual major licensees for the purposes of long-term planning. The boundaries are subject to change as the timber profile within a timber supply area changes over time.

Operational cruise: an estimate, to a specified degree of accuracy, of the volume of timber on an area to be harvested.

Operational plans: within the context of area-specific management guidelines, operational plans detail the logistics for development. Methods, schedules, and responsibilities for accessing, harvesting, renewing, and protecting the resources are set out to enable site-specific operations to proceed. Operational plans include a forest development plan, logging plan, access management plan, range use plan, silviculture prescription, stand management prescription and 5 year silviculture plan.

Option: a set of assumptions representing a possible management direction. Options are constructed as a normal part of a planning process in order to provide a framework for analysis and to facilitate management decision-making.

Organic soil: soil containing a high proportion (greater than 20 or 30 percent) of organic matter.

Organization (Source CSA): a company, corporation, firm, enterprise, authority, or combination thereof, whether incorporated or not, public or private, that has its own functions and administration and that, for the purposes of this Standard, applies for certification. Note: For organizations with more than one operating unit (for example, a division), a single operating unit may be defined as an organization.

Orthophoto: a completely rectified copy of an original photograph. All variations in scale and displacements, due to relief, have been eliminated, hence the name ortho (correct) photography. Orthorphoto and orthophoto map are synonymous, an orthophoto is, very simply, a photo map.

Outslope: to shape the road surface to direct water away from the cut slope side of the road.

Overlanding: placing road construction fill over organic soil, stumps and other plant materials, corduroy or geotextiles, any of which is required to support the fill.

Overlay: a transparent sheet (either clear or mylar matte film material) accompanying a map, on which information, colouring, or symbols are entered so that when the overlay is placed on the map the effect is identical to having entered the overlay information on the map, itself.

Overmature: in even-aged management, those trees or stands past the mature stage.

Overstorey: that portion of the trees in a forest of more than one storey forming the upper or uppermost canopy layer.

Overtopped: trees with crowns entirely below the general level of the crown cover receiving little or no direct light from above or from the sides.

Overtopping: vegetation higher than the favored species, as in brush or deciduous species shading and suppressing more desirable coniferous trees.

P

Partial cutting: a general term referring to silvicultural systems other than clearcutting, in which only selected trees are harvested. Partial cutting systems include seed tree, shelterwood, selection, and clearcutting with reserves.

Pass: in timber harvesting, one of a planned sequence of harvesting operations designed to harvest a management unit over an extended period of time in discrete phases, so that the size of individual cutblocks and the total area harvested in any one pass does not exceed prescribed limits.

Patch: a stand of similar-aged forest that differs in age from adjacent patches by more that 20 years. When used in the design of landscape patterns, the term refers to the size of either a natural disturbance opening that led to even-aged forests or an opening created by cutblocks. *From the "Biodiversity Guidebook (Sept 1995)" and released as part of the Feb 18 2005 Glossary Amendment*

Patch cutting: a silvicultural system that creates openings less than 1 hectare in size and is designed to manage each opening as a distinct even-aged opening.

Patch logging: a modification of the clearcutting system whereby patches of from about 5 to 200 hectares are logged as single settings and separated for as long as practicable (preferably until the regeneration is adequately shading the forest floor) by living forest. This secures the optimum dispersal of seed and avoids the high fire hazard represented by large continuous areas of slash.

Pathological rotation age: the maximum rotation age through which a stand of trees may be grown without significant volume loss from disease. The stand age at which annual volume loss from disease equals annual volume increment.

Peace officer: a person employed for the preservation and maintenance of public peace, typically a police officer, police constable, mayor, sheriff or sheriff officer, warden, corrections officer, or any other permanent employee of a penitentiary, prison, or correctional centre.

Performance-based logging: "performance-based logging" means approval of future logging activities contingent upon a company's current practices. Until a company is in compliance with the Forest Practices Code the Government may refuse to enter into a new or replacement agreements, approve new logging plans, and issue new cutting permits.

Periodic harvest (periodic cut): the removal of several years' accumulated AAC in one year or other period.

Permanent access structure: a structure, including a road, bridge, landing, gravel pit or other similar structure, that provides access for timber harvesting, and is shown expressly or by necessary implication on a forest development plan, access management plan, logging plan, road permit or silviculture prescription as remaining operational after timber harvesting activities on the area are complete.

Permanent Access Structure: an un-rehabilitated road, excavated or bladed trail, landing, pit, or quarry, which no longer contributes to the Timber Harvesting Land base (THLB). *From Jan 28 2005 Glossary Amendment*

Permanent bridge: a bridge having all its major components constructed of st eel, concrete, or pressure-treated timber.

Personnel (Source CSA): management, contractors, and DFA-related workers employed by the organization.

Pest: any forest health agent designated as detrimental to effective resource management.

Pest incidence: a measurement of the presence and magnitude of pests within a given area.

Pesticide: any substance or mixture of substances (other than a device) intended for killing, controlling, or managing insects, rodents, fungi, weeds, and other forms of plant or animal life that are considered to be pests as defined under the B.C. Pesticide Control Act.

Pesticide buffer zone: a strip of land between the 10 m pesticide-free zone and the pesticide treatment area for preventing entry of pesticides or pesticide residues by drift, runoff, or leachate into the pesticide-free zone.

Phenotype: an organism as observed by its visible characteristics, resulting from the interaction of its genotype with the environment.

Phloem: a layer of tree tissue just inside the bark that conducts food from the leaves to the stem and roots. See Cambium.

Pioneer plants: a succession term for plants capable of invading bare sites, such as a newly exposed soil surface, and persisting there, i.e., 'colonizing' until supplanted by invader or other succession species.

Pitch tubes: a tubular mass of resin that forms on the surface of bark at bark-beetle entrance holes.

Planned grazing system: a system approved by the regional manager or district manager respecting the use of land for grazing and the dispersal of livestock over land.

Planning: the determination of the goals and objectives of an enterprise and the selection, through a systematic consideration of alternatives, of the policies, programs and procedures for achieving them. An activity devoted to clearly identifying, defining, and determining courses of action, before their initiation, necessary to achieve predetermined goals and objectives.

Planning horizon: the time period which will be considered in the planning process.

Planning term: the term of the actual plan before it must be updated.

Plant community: an assemblage of plants occurring together at any point in time, thus designating no particular ecological status.

Plant harvesting: the collection of plant life including, but not limited to, bark, berries, boughs, branches, burls, cones, conks, ferns, flowers, grasses, herbs, fungi, lichens, mosses, mushrooms, roots, sedges, shrubs, sprays and twigs.

Planting: establishing a forest by setting out seedlings, transplants or cuttings in an area.

Plot: a carefully measured area laid out for experimentation or measurement.

Plug: a seedling grown in a small container under carefully controlled (nursery) conditions. When seedlings are removed from containers for planting, the nursery soil remains bound up in their roots. See Bareroot seedling.

Plus tree: a phenotype judged (but not proven by test) to be unusually superior in some quality or qualities such as an exceptional growth rate relative to the site, desirable growth habit, high wood quality, exceptional apparent resistance to disease and insect attack or to other adverse locality factors.

Point sampling: a method of selecting trees for measurements and of estimating stand basal area at a sample location or point sample. Also called plotless cruising, angle count method, Bitterlich method. A 360 degree sweep is made with an angle gauge about a fixed point and the stems with breast height diameters appearing larger than the fixed angle subtended by the angle gauge are included in the sample.

Policies: statements on how the authority is to achieve its goals and objectives with regard to a specific subject area or class of subject areas, e.g., a policy for development on floodplains.

Polygon: a closed geometric entity used to graphically represent area features with associated attributes.

Potentially unstable soil area: any area where there is a moderate to very high likelihood of slope failure following conventional road construction or timber harvesting.

Precommercial thinning: see Juvenile spacing.

Pre-harvest silviculture assessment (or survey): the survey carried out on a stand prior to logging to collect specific information on the silvicultural conditions such as planting survival, free-growing status, stocking, etc. See: Silviculture survey.

Pre-Harvest Silviculture Prescription (PHSP): a document that applies site-specific field data and develops forest management prescriptions for areas in advance of logging. Replaced under the Forest Practices Code by Silviculture Prescriptions.

Prescribed burning: the knowledgeable application of fire to a specific unit of land to meet predetermined resource management objectives.

Prescription: a course of management action prescribed for a particular area after specific assessments and evaluations have been made.

Preservation: the action of reserving, protecting or safeguarding a portion of the natural environment from unnatural disturbance. It does not imply preserving an area in its present state, for natural events and natural ecological processes are expected to continue. Preservation is part of, and not opposed to, conservation.

Preventive action (Source CSA): action to eliminate the cause of a potential nonconformity or other undesirable situation. Note: There can be more than one cause for a potential nonconformity. Preventive action is taken to prevent occurrence, whereas corrective action is taken to prevent recurrence.

Prime mover: heavy equipment used to tow other machines such as disc trenchers for site reparation.

Prism: an optical instrument used as an angle gauge, consisting of a thin wedge of glass which establishes a fixed (critical) angle of projection in a point sample.

Private woodlot owner (Source CSA): an individual, or a group of individuals, who privately owns forestland. For the purposes of this Standard, private woodlots are those recognized as “woodlots” by the woodlot owner association in each province.

Problem forest type: non-merchantable forest types, including: stands of unfavourable stocking (i.e., dense small trees), low productivity sites
and decadent stands with high waste and breakage.

Procedure: a particular way of accomplishing an objective; generally refers to the method rather than the result. Procedures are usually developed to describe the methods for implementing policy.

Proclamation date: the date on which a statute has legal effect.

Production forest: the forest used for production of various commodities , for example timber.

Productive forest land: forest land that is capable of producing a merchantable stand within a defined period of time.

Productivity (Source CSA): the natural ability of a forest ecosystem to capture energy, support life forms, and produce goods and services.

Professional engineer, professional geoscientist: a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia.

Professional forester: see Registered professional forester.

Protected areas: areas such as provincial parks, federal parks, wilderness areas, ecological reserves, and recreation areas that have protected designations according to federal and provincial statutes. Protected areas are land and freshwater or marine areas set aside to protect the province's diverse natural and cultural heritage.

Protected Areas (Source CSA): an area protected by legislation, regulation, or landuse policy to control the level of human occupancy or activities. Note: “Categories of protected areas include protected landscapes, national parks, multiple use management areas, and nature (wildlife) reserves” (The State of Canada’s Forests 2001/2002). *From March 16 2005 Glossary Amendment and CSA*

Protection forest: forest maintained on steep, unstable slopes to prevent accelerated erosion.

Protocol agreements: an agreement between two or more ministries or two or more areas of the same ministry stating the role of each party in relation to the other or others with respect to an issue, or issues over which the parties have concurrent jurisdiction.

Provenance: the geographical area and environment to which the parent trees and other vegetation are native, and within which their genetic constitution has been developed through natural selection.

Provincial forest: forest land designated under Section 4 of the Forest Act. The Lieutenant Governor in Council may designate any forest land as a provincial forest. The uses of provincial forests include timber production, forage production, forest recreation, and water, fisheries and wildlife resource purposes.

Provincial forest inventory: a description of the quantity and quality of forest trees, non-wood values, and many of the characteristics of the land base compiled from statistical data for the forest lands of the province.

Pruning: the manual removal, close to or flush with the stem, of side branches, live or dead, and of multiple leaders from standing, generally plantation-grown trees. Pruning is carried out to improve the market value of the final wood product by producing knot-free wood for the improvement of the tree or its timber.

Public: the entire population of British Columbia, including all organizations, companies, and groups.

Public hearing: a hearing formally advertised and convened to afford any person who deems their interest in property to be affected by a proposal an opportunity to be heard by the Forest Service. The Forest Service is not required to follow the tenor of the statements made at the hearing. A public hearing must be convened in respect of tree farm licence applications.

Public highway: a highway for which public money has been spent and which is dedicated to public use by a plan deposited in the Land Titles Office for the district in which the road is situated.

Public involvement: the procedures for obtaining and considering the views of the general public in planning and decision-making processes.

Public Sustained Yield Unit (PSYU): a portion of a TSA. and area of Crown land, usually a natural topographic unit determined by drainage areas, managed for sustained yield by the Crown through the Ministry of Forests. It includes all Crown lands within the currently established boundaries of the unit and excludes federal lands, provincial parks, experimental forest reserves, gazetted watersheds and tree farm licences. Crown land designated as a public sustained yield unit under Section 6 of the Forest Act.

Pulpwood agreement: a pulpwood agreement allows the holder of a wood-fibre processing facility to harvest Crown pulp timber, if sufficient quantities of raw material are not available to the holder from other sources. An agreement covers a 25-year term, may be replaceable every ten years and applies to a large area in one or more timber supply areas. Harvesting authority is provided through a timber sale licence where the licensee is responsible for all operational planning, development, basic silviculture and forest protection.

Q

Quasi-judicial: a decision made by a government official or tribunal which involves the application of policy to a particular set of facts requiring the exercise of discretion and the application of the principles of natural justice.

R

Rain-on-snow events: rainstorms that result in large amounts of surface runoff due to the combined effects of heavy rainfall and snow melt. Rapid snow melt is caused by heat supplied from the warm air that is characteristic of intense rainstorms and by heat released during condensation of moisture from the air onto the snow surface.

Range development: any practice, treatment or structure designed to achieve plant community, production and integrated resource management goals.

Range enhancement: any treatment, development, or structure designed to achieve or maint ain the desired plant community.

Range of variability: the spectrum of conditions possible in ecosyst em composition, structure and function considering both temporal and spatial factors.

Range readiness: the stage of plant growth at which grazing may begin under a specific management plan without permanent damage to vegetation or soil.

Range type: a defined area with specific physical characteristics, which differs from other areas in its ability to produce distinctive kinds and amounts of vegetation and in its response to management.

Range use plan: an operational plan that describes the range and livestock management measures that will be implemented to ensure that range resources are protected and that the management objectives for other identified resource values are achieved.

Rangelands: a broad category of land characterized by native plant communities that are often associated with grazing. Rangelands are managed by ecological rather than agronomic methods.

Rapattack: a method of initial attack whereby firefighters are transported to the fire in a specially-equipped helicopter, from which they descend during a hover by means of rappelling down a rope fitted with a mechanical device to control the rate of descent. In this way fire crews can be transported to fires which would otherwise pose difficult access problems.

Rappel crew: an initial attack crew which rappels from a helicopter to access fires.

Rate-of-cut: the proportion of the watershed area allowed to be cut each year.

Rate of Spread (ROS): the speed at which a fire extends its horizontal dimensions, expressed in terms of distance per unit area of time. Generally thought of in terms of a fire's forward movement or head fire rate of spread, but also applicable to backfire and flank fire rate of spread.

Reach: a length of stream channel, (lake or inlet) exhibiting, on average, uniform hydraulic properties and morphology.

Reconnaissance: the field examination of a proposed road location to determine its feasibility and possible impact on other resources, and to lay out the proposed centreline.

Recreation: any physical or psychological revitalization through the voluntary pursuit of leisure time. Forest recreation includes the use and enjoyment of a forest or wildland setting, including heritage landmarks, developed facilities, and other biophysical features.

Recreation feature: a biological, physical, cultural or historic feature that has recreational significance or value.

Recreation feature objective: a resource management objective which reflects how a recreational feature or features will be managed, protected, or conserved.

Recreation feature significance: the quality, uniqueness, and availability of a recreation feature as classified in the recreation inventory.

Recreation features inventory: one component of the Recreation Inventory. The identification, classification, and recording of the types and locations of biophysical recreation and cultural features, existing and potential recreation activities, feature significance and feature sensitivity.

Recreation inventory: the identification, classification and recording of recreation features, visual landscapes, Recreation Opportunity Spectrum
(ROS), recreation features of rivers and specific point locations of recreation sites, trails, caves etc.

Recreation Opportunity Spectrum (ROS): a mix of outdoor settings based on remoteness, area size, and evidence of humans, which allows for a variety of recreation activities and experiences. The descriptions used to classify the settings are on a continuum and are described as: rural, roaded resource, semi-primitive motorized, semi-primitive non- motorized, and primitive.

Recreation Opportunity Spectrum objectives: resource management objectives in approved integrated resource management plans, reflecting the desired Recreation Opportunity Spectrum setting to provide for specific types of recreation opportunities and experiences.

Recreation resource: a recreation feature, a scenic or wilderness feature or setting that has recreational significance or value or a recreation facility.

Recreation site: a site and its ancillary facilities developed by the B.C. Ministry of Forests for recreation or to protect a recreation resource.

Recreation trail: a trail and its ancillary facilities developed by the B.C. Ministry of Forests for recreation or to protect a recreation resource.

Recreation value: see Recreation resource.

Red-listed species: see Threatened or endangered species.

Referral: the process by which applications for permits, licences, leases, etc., made to one government agency by an individual or industry are given to another agency for review and comment.

Reforestation: the natural or artificial restocking (i.e., planting, seeding) of an area with forest trees. Also called forest regeneration.

Regeneration: the renewal of a tree crop through either natural means (seeded on-site from adjacent stands or deposited by wind, birds, or animals) or artificial means (by planting seedlings or direct seeding).

Regeneration delay: the maximum time allowed in a prescription, between the start of harvesting in the area to which the prescription applies,
and the earliest date by which the prescription requires a minimum number of acceptable well-spaced trees per hectare to be growing in that area.

Regeneration Performance Assessment (RPA): a sampling survey carried out to collect field data on the height growth, competition, and stocking of young stands (5-10 years).

Regeneration survey: carried out to determine the initial restocking of a site. It is used to describe the number of trees on a site that have reached acceptable standards.

Regional plan: the second level of planning in the Ministry of Forests hierarchical planning system. The regional forestry plan contains forest management alternatives based on a detailed analysis of timber supply within the region. Regional priorities for integrated use are identified and taken into account in setting production goals for timber, range, and forest recreation.

Regional Resource Management Committee (RRMC): a committee comprised of senior regional representatives of government agencies responsible for or affected by resource management decisions who meet in each of the six regions in British Columbia on a regular or periodic basis to consider resource management problems.

Regionally important species: the regionally identified sensitive/vulnerable (blue-listed) species and those species not at risk but which require
identification and protection of habitat critical at specific periods of their life cycle, and which are thus essential to the maintenance of their populations (e.g., moose, deer, and mountain goat).

Registered Professional Forester (RPF): a person registered under the Foresters Act, who performs or directs works, services, or undertakings that require specialized knowledge, training, and experience in forestry.

Registrar/certifier (Source CSA): an independent third party that is accredited by the Standards Council of Canada as being competent to register organizations with respect to nationally and internationally recognized standards.

Registration applicant (Source CSA): an organization that has applied to an accredited registrar for certification to this Standard.

Registration audit (Source CSA): a systematic and documented verification process used to obtain and evaluate evidence objectively in order to determine whether the organization meets the SFM requirements set out in this Standard.

Registration/certification (Source CSA): the result of a successful certification process in conformance with this Standard, whereby the registrar issues a certificate of registration and adds the organization's certification to a publicly available list maintained by the registrar (see Annex A).

Regulated unit: a Special Sale Area (SSA) describes a Crown area not under sustained yield management on which timber may be sold at the discretion of the Minister of Forests. It is not planned that the allowable annual cut on these units will be maintained in perpetuity.

Reinventory: the complete restratification of an area on recent, mid-scale aerial photographs based on extensive field work.

Related body (Source CSA): a body linked to the registrar/certifier by common ownership or directors, contractual arrangement, a common name, informal understanding, or other means such that the related body has a vested interest in the outcome of an audit or has the potential ability to influence the outcome of an audit.

Release: freeing a tree or group of trees from more immediate competition by cutting or otherwise eliminating growth that is overtopping or closely surrounding them.

Remediation: measures undertaken in respect to an area of land to remedy contravention of the Forest Practices Code.

Remote Automatic Weather Station (RAWS): a weather station at which the services of an observer are not required. A RAWS unit measures selected weather elements automatically and is equipped with telemetry apparatus for transmitting the electronically recorded data via radio, satellite or by a landline communication system at predetermined times on a user-requested basis.

Remote sensing: any data or information acquisition technique that utilizes airborne techniques and/or equipment to determine the characteristics of an area.

Reportable erosion event: a natural or man-made disturbance to the forest land base which is causing or will likely cause substantial environmental impacts, or which is a threat to life or property.

***Reportable Spills*:** Any amount of the above substances released into a stream, lake, wetland or moving water is reportable. *From Jan 28 2005 Glossary Amendment*

Reserve: an area of forest land that, by law or policy, is not available for harvesting. Areas of land and water set aside for ecosystem protection, outdoor and tourism values, preservation of rare species, gene pool, wildlife protection etc, and includes old growth management areas, parks and protected areas". *From Jan 28 2005 Glossary Amendment*

Reserve zone: the inner portion of a riparian management area situated adjacent to a stream, lake, or wetland and established to conserve and maintain the productivity of aquatic and riparian ecosystems when harvesting is not permitted.

Reserved trees: trees specifically reserved from harvesting and often referenced in Pre Harvest Silviculture Prescriptions or cutting authorities or by map notations.

Reserves: the retention of live or standing dead trees, pole size or larger, on site following harvest for purposes other than regeneration. Reserves can be uniformly distributed as single trees or left in small groups, and they can be used with any silvicultural system.

Residual basal area: the basal area per hectare of acceptable trees left standing after harvest.

Residual stand structure: the age class or height structure of the stand or remaining trees after harvesting.

Residuals (residual trees): trees left standing after harvesting.

Residue: the volume of timber left on the harvested area which meets or exceeds the size requirements but is below the log grade requirements of the minimum utilization standards in the cutting authority. It is part of the allowable annual cut for cut control.

Resilience: the ability of an ecosystem to maintain diversity, integrity and ecological processes following disturbance.

Resistance to control: the relative ease of establishing and holding a fireguard and/or securing a control line as determined by the difficulty of
control and resistance to fireguard construction.

Resource features: localized resource values or sites of special interest, such as caves, raptor-nesting trees, mineral licks, heritage sites, and recreation trails.

Resource folio: a collection of resource capability and forest inventory maps, other resource data, interpretations, and management objectives for each resource sector. General prescriptions are developed to achieve the stated integrated use of objectives. A resource folio forms the basis for the timber licensee's development plan or working plan.

Resource industry: an industry based on the primary resources obtained from agriculture, fisheries, forestry or mining.

Resource Management Zone (RMZ): an area established by the chief forester in accordance with any policy direction from Cabinet or designated ministers. Resource management zones are used to implement broad land use policy, as provided in land and resource management plans or other Cabinet-level directives. An RMZ might include a major travel corridor which has scenic values or an area managed for intensive timber production s uch as Crown land in a provincial forest and private land in a tree farm licence or woodlot licence that must be managed and used in accordance with the requirements of Section 2 of the Forest Practices Code of British Columbia Act.

Resource Management Zone objectives: provide strategic direction on a regional or subregional scale (1:100 000 to 1:250 000 map scale). The chief forester is authorized by the Ministers of the Ministry of Forests, Ministry of Environment, Lands and Parks, and Ministry of Energy, Mines and Petroleum Resources to establish RMZs and associat ed objectives, in consultation with other resource agencies.

Resource values: products or commodities associated with forest lands and largely dependent on ecological processes. These include, but are not limited to, water quality and quantity, forage, fish, wildlife, timber, recreation, energy, minerals, and cultural and heritage resources.

Restoration: the return of an ecosystem or habitat to its original community structure, natural complement of species and natural functions.

Retention: retaining or saving a portion of the original stand in a cluster or clump. Retention visual quality objective: a visual landscape strategy derived from landscape analysis which applies to areas of high landscape value (for example, continuously forested or steep slopes facing important viewpoints or recreation use areas, foreground areas adjacent to important viewpoints or recreation use areas, and certain shorelines). Forest management activities may be present, but should not be noticed by the average viewer. Some visual change may be discernible, but should not be recognized as being different from existing natural features in the landscape.

Right-of-way: the strip of land over which a power line, railway line, road, etc., extends.

Riparian: an area of land adjacent to a stream, river, lake or wetland that contains vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas.

Riparian Management Area (RMA): a classified area of specified width surrounding or adjacent to streams, lakes, riparian areas, and wetlands. The RMA includes, in many cases, adjacent upland areas. It extends from the top of the streambank (bank full height) or from the edge of a riparian area or wetland or the natural boundary of a lake outward to the greater of: 1) the specified RMA distance, 2) the top of the inner gorge, or 3) the edge of the flood plain. Where a riparian area or wetland occurs adjacent to a stream or lake, the RMA is measured from the outer edge of the wetland.

Riparian management zone: the area within and adjacent to riparian and other wetlands required to meet the structural and functional attributes of
riparian ecosystems.

Riprap: an apron of coarse rock installed over the fillslope to prevent erosion.

Risk: the probability of an undesirable event occurring within a specified period of time. With regard to insect populations, risk involves components to evaluate the likelihood of an outbreak, the likelihood of trees being attacked (susceptibility) or the likelihood of trees being damaged (vulnerability). In fire prevention, risk involves those things or events that cause fires to start (including the physical igniting agents and people).

Risk rating (assessment): the process of identifying the degree of risk that timber harvesting imposes on adjacent and downslope social, economic, and forest resource values. The severity of each potential hazard and the magnitude of the potential consequences that correspond to each hazard provide the overall risk associated with harvesting a site.

Road deactivation: measures taken to stabilize roads and logging trails during periods of inactivity, including the control of drainage, the removal of sidecast where necessary, and the re-establishment of vegetation for permanent deactivation.

Road location line: the marked location of proposed roads.

Road permit: an agreement entered into under Part 8 of the Forest Act to allow for the construction or modification of a forest road to facilitate access to timber planned for harvest.

Road prism: the area of the ground containing the road surface cut slope and fill slope.

Rotation: the planned number of years between the formation or regeneration of a tree crop or stand and its final cutting at a specified stage of maturity. Can be based on physical, biological, pathological or economic criteria.

Rotation age: the age at which a stand is considered mature and ready for harvesting.

Roundwood: sections of tree stems, with or without bark. Includes logs, bolts, posts, and pilings.

RPF: see Registered Professional Forester.

Rules: informal working term for draft forest practices requirements proposed for the Forest Practices Code. Following review and public input, Rules may be incorporated into the Forest Practices Code of British Columbia Act or in Regulations under the Act.

S

Salmonid: a fish of the fish family Salmonides; for example salmon, trout and chars.

Salvage harvesting: logging operations specifically designed to remove damaged timber (dead or in poor condition) and yield a wood product.
Often carried out following fire, insect attack or windthrow.

Sanitation treatment: tree removal or modification operations designed to reduce damage caused by forest pests and to prevent their spread.

Sapling: a loose term for a young tree no longer a seedling but not yet a pole, about 1 - 2 m high and 2 - 4 cm DBH, typically growing vigorously and without dead bark or more than an occasional dead branch. Also, a young tree having a DBH greater than 1 cm but less than the smallest merchantable diameter.

Sapwood: the light-coloured wood that appears on the outer portion of a cross-section of a tree. See Cambium.

Scaling: the measuring of lengths and diameters of logs and calculating deductions for defect to determine volume.

Scalping: site preparation method which exposes favorable mineral soil for tree seedlings to be planted in.

Scarification: a method of seedbed preparation which consists of exposing patches of mineral soil through mechanical action.

SCC: Standards Council of Canada

Scenic area: any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the district manager.

Screefing: removal of herbaceous vegetation and soil organic matter to expose a soil surface for planting.

Second growth: a forest or stand that has grown up naturally after removal of a previous stand by fire, harvesting, insect attack or other cause.

Second pass: the next entry to harvest timber after green-up (or other recovery objective) occurs.

Secondary channel: subordinate channel in a stream reach with more than one channel; minor channel in a floodplain.

Sediment: Fragmentary material that originates from the weathering of rocks and is transported by, suspended in, or deposited by water. *From "Certified Professional in Erosion and Sediment Control Exam Workbook", Jan 28 2005 Glossary Amendment*

Sedimentation: Gravitational deposit of transposed material in flowing or standing water (i.e. the deposition of eroded material). *From "Certified Professional in Erosion and Sediment Control Exam Workbook", Jan 28 2005 Glossary Amendment*

Seedlot: a quantity of cones or seeds having the same species, source, quality and year of collection.

Seed orchard: a plantation of specially selected trees that is managed for the production of genetically improved seed.

Seed source: the locality where a seedlot was collected. If the stand from which collections were made was exotic, the place where its seed originated is the original seed source.

Seed tree silvicultural system: an even-aged silvicultural system in which selected trees (seed trees) are left standing after the initial harvest to provide a seed source for natural regeneration. Seed trees can be left uniformly distributed or in small groups. Although regeneration is generally secured naturally, it may be augmented by planting. Seed trees are often removed once regeneration is established or may be left as reserves.

Seed trees: trees selected to be left standing to provide seed sources for natural regeneration. Selection is usually on the basis of good form and vigor, the absence of serious damage by disease, evidence of the ability to produce seed, and wind firmness.

Seedbed: in natural regeneration, the soil or forest floor on which seed falls; in nursery practice, a prepared area over which seed is sown.

Seedling: a young tree, grown from seed, from the time of germination to the sapling stage, having a DBH equal or less than 1 cm.

Seedlots: seed from a particular collection event, either from a single tree collection or a pooling of seed from many trees.

Seepage zone: an area on a hillslope or at the slope base where water frequently or continuously springs to the surface.

Seismic line: a constructed trail used for seismographic exploration.

Selection silvicultural system: a silvicultural system that removes mature timber either as single scattered individuals or in small groups at relatively short intervals, repeated indefinitely, where the continual establishment of regeneration is encouraged and an uneven-aged stand is maintained. As defined in the Forest Practices Code of British Columbia Operation Planning Regulation, group selection removes trees to create openings in a stand less than twice the height of mature trees in the stand.

Selective logging: removal of certain trees in a stand as defined by specific criteria (species, diameter at breast height, or height and form). It is analogous to high grading. Not to be confused with the selection silvicultural system.

Semi-permanent bridge: a bridge having a substantial proportion of its components constructed of steel, concrete, or timber that has been pressure-treated with a suitable preservative.

Senior official: a senior official means:

- a district manager or regional manager,
- a person employed in a senior position in the Ministry of Forest, Ministry of Environment, Lands, and Parks or the Ministry of Energy, Mines and Petroleum Resources, who is designated by name or title to be a senior official for the purposes the Act by the minister of that ministry.

Sensitive areas: small areas designated to protect important values during forest and range operations. These areas, established by a Ministry of Forests district manager in consultation with a designated B.C. Environment official, guide operations on a site-specific basis and require a combination of forest practices. Sensitive areas will be mapped by resource agencies, and include regionally significant recreational areas, scenic areas with high visual quality objectives, and forest ecosystem networks.

Sensitive areas objectives: to adequately manage, protect, and conserve the resources of the area. Sensitive areas may be designated under the Forest Practices Code of British Columbia Act, through a planning process, or by the Ministry of Forests district manager and designated B.C. Environment official (for example, forest ecosystem networks and the setting of visual quality objectives for sensitive scenic areas).

Sensitive resource area: an identifiable geographic unit of the forest land base that requires a specific combination of forest practices to adequately protect important resource values.

Sensitive slopes: any slope identified as prone to mass wasting.

Sensitive soils: forest land areas that have a moderate to very high hazard for soil compaction, erosion, displacement, mass wasting or forest floor displacement.

Sensitive/vulnerable species: species identified as "blue listed" by the Ministry of Environment, Lands and Parks, these are indigenous species that are not threatened butare particularly at risk.

Sensitive watershed: a watershed that is used for domestic purposes or that has significant downstream fisheries values, and in which the quality of the water resource is highly responsive to changes in the environment. Typically, such watersheds lack settlement ponds, are relatively small, are located on steep slopes, and have special concerns such as extreme risk of erosion.

Seral stage: any stage of development of an ecosystem from a disturbed, unvegetated state to a climax plant community.

Settlement pond: larger than a catchment basin and preferably with lower velocity waterflows that enable suspended sediment to settle before the flow is discharged into a creek.

SFM: Sustainable forest management

SFM performance (Source CSA): the assessable results of SFM as measured by the level of achievement of the targets set for a DFA.

SFM policy (Source CSA): a statement by the organization of intentions and principles in relation to SFM, which provides a framework for objectives, targets, practices, and actions.

SFM requirements (Source CSA): the public participation, performance, and system requirements found in Clauses 4, 5, 6, and 7.

SFM system (Source CSA): the structure, responsibilities, practices, procedures, processes, and time frames set by a registrar for implementing, maintaining, and improving SFM (see Figure 2).

Shade tolerance: the capacity of a tree or plant species to develop and grow in the shade of, and in competition with, other trees or plants.

Shearing: in Christmas tree culture, to prune the branches to make dense foliage and give the tree a conical shape.

Shelterwood silvicultural system: a silvicultural system in which trees are removed in a series of cuts designed to achieve a new even-aged stand under the shelter of remaining trees.

Short-term operational plans (Source CSA): annual or five-year plans.

Sidecast: moving excavated material onto the downslope side of a temporary access structure, excavated or bladed trail, or landing during its construction.

Sills: a single structural member used as a foundation to transfer the loads from the bridge superstructure to the supporting soil.

Silvics: the study of the life history, requirements and general characteristics of forest trees and stands in relation to the environment and the practice of silviculture.

Silvicultural system: a process that applies silviculture practices, including the tending, harvesting, and replacing of a stand, to produce a crop of timber and other forest products. The system is named by the cutting method with which regeneration is established. The six classical systems are seed tree, shelterwood, selection, and clearcut.

Silviculture: the art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

Silviculture prescription: a site-specific integrated operational plan to carry out one or a series of silviculture treatments.

Silviculture regime: a series of site-specific silviculture treatments planned over time.

Silviculture survey: a sampling procedure to determine silvicultural conditions such as planting survival, free-growing status, stocking, etc., leading to management decisions. See: Pre-Harvest Silviculture Assessment.

Silviculture treatment: any silviculture activity on forest stands to meet stand-specific objectives.

Silviculture treatments: activities that ensure the regeneration of young forests on harvested areas and enhance tree growth and improve wood
quality in selected stands.

Single tree selection: see Selection silvicultural system.

Site: an area described or defined by its biotic, climatic, and soil conditions in relation to its capacity to produce vegetation; the smallest planning unit.

Site class: the measure of the relative productive capacity of a site for a particular crop or stand, generally based on tree height at a given age and expressed as either good, medium, poor or low.

Site index: an expression of the forest site quality of a stand, at a specified age, based either on the site height, or on the top height, which is a more objective measure.

Site preparation: the treatment of the soil and ground vegetation to prepare the soil surface as a favorable seedbed for either naturally or artificially disseminated seed or for planted seedlings.

Site productivity: the inherent capabilities of a site to produce or provide the commodities or values for which the area will be managed in accordance with Section 4 of the Ministry of Forests Act, that is, timber, forage, recreation, fisheries, wildlife, and water.

Site rehabilitation: the conversion of the existing unsatisfactory cover on highly productive forest sites to a cover of commercially valuable species.

Site sensitivity: an assessment of the susceptibility of a site to soil-degrading processes, such as soil compaction, erosion, mass wasting, and forest floor displacement.

Site-specific: pertaining to a specific planning unit.

Sites of Biological Significance: Sites which support red & blue listed plant communities and rare ecosystems and include feature such as bald eagle or osprey nests, mineral licks, species at risk habitats and others provided by government*. From March 16 2005 Glossary Amendment.*

Situation Report (SITREP): an itemized list and/or written account, usually issued on a daily basis, detailing the status of various fire-related activities. A SITREP generally contains information on fire occurrence and area burned to date, fire suppression resources committed to going fires and resources on standby, number of fires in the various stages of control, fire danger class, fire weather forecast and forest closures (if any).

Skid road: a bladed or backhoe-constructed pathway where stumps are removed within the running surface as necessary. Skid roads are suitable only for tracked or rubber-tired skidders bringing trees or logs from the felling site to a landing.

Skid trail: a random pathway travelled by ground skidding equipment while moving trees or logs to a landing. A skid trail differs from a skid road in that stumps are cut very low and the ground surface is mainly untouched by the blades of earth moving machines.

Skidder: a wheeled or tracked vehicle used for sliding and dragging logs from the stump to a landing.

Skidding: the process of sliding and dragging logs from the stump to a landing, usually applied to ground-based as opposed to highlead operations.

Skyline: a type of cable logging system in which a skyline is stationary and a carriage moves along it carrying logs above the ground, from the felling site to the landing.

Slash: the residue left on the ground as a result of forest and other vegetation being altered by forest practices or other land use activities.

Slide: a mass movement process in which slope failure occurs along one or more slip surfaces and in which the unit generally disintegrates into a jumbled mass en route to its depositional site. A debris flow or torrent flow may occur if enough water is present in the mass.

Slope failure: see Slide.

Slope processes: all processes and events by which the configuration of the slope is changed; especially processes by which rock, surficial materials and soil are transferred downslope under the dominating influence of gravity.

Slope stability: susceptibility of a slope to erosion and slides.

Slump: a mass movement process in which slope failure occurs on a usually curved slip surface and the unit moves downslope as an intact block, frequently rotating outward. Slumps appear as discrete block movements, often in place, whereas slides usually break up and travel downslope.

Small Business Forest Enterprise Program (SBFEP): this program permits the Ministry of Forests to sell Crown timber competitively to individuals and corporations who are registered in the SBFEP.

Small-scale forestry: in general, non-industrial forestry operations. In B.C., small-scale forestry operations are carried out by woodlot licensees,
Indian bands, municipalities and private landowners.

Smoke management: the scheduling and conducting of a prescribed burning program under predetermined burning prescriptions and firing techniques that will minimize the adverse effects of the resulting smoke production in smoke-sensitive areas.

Smoke-sensitive area: an area that has been identified in which smoke accumulations may cause a safety or public health hazard, or may unreasonably deny aesthetic enjoyment to the public.

Snag: a standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Soil Conservation Standards: standards from the Forest Practices Code Soil Conservation Guidebook that have been adopted in legislation to protect soils (as per *Section 35 and 36* of the *Forest Planning and Practices Regulation* of the *Forest and Range Practices Act)*. The objectives of the soil conservation standards are:

- To limit the extent of soil disturbance, caused by harvesting and silviculture activities that negatively affect the physical, chemical, and biological properties of the soil.
- To conduct forest practices in a manner that addresses the inherent sensitivity of a site to soil-degrading processes to minimize detrimental soil disturbance, landslides, soil erosion, and sediment delivery to streams.
- To limit the area of productive forest land that is occupied by permanent roads, landings, pits, quarries, and trails to the minimum necessary to safely conduct forest practices.

Softwoods: cone-bearing trees with needle or scale-like leaves such as Douglas-fir, western red cedar and ponderosa pine.

Soil: the naturally occurring, unconsolidated mineral or organic material at the surface of the earth that is capable of supporting plant growth. It extends from the surface to 15 cm below the depth at which properties produced by soil-forming processes can be detected. The soil-forming processes are an interaction between climate, living organisms, and relief acting on soil and soil parent material. Unconsolidated material includes material cemented or compacted by soil-forming processes. Soil may have water covering its surface to a depth of 60 cm or less in the driest part of the year.

Soil displacement hazard: a soil displacement hazard as determined in accordance with procedures set out in the Ministry of Forests' publication
"Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook," as amended from time to time.

Soil disturbance: disturbance caused by a forest practice on an area covered by a silviculture prescription or stand management prescription including areas occupied by excavated or bladed trails of a temporary nature, areas occupied by corduroyed trails, compacted areas, and areas of dispersed disturbance.

Soil disturbance hazard: an assessment of the susceptibility of a soil to adverse impacts on its productive capability due to soil compaction, soil
puddling, surface erosion, mineral soil displacement, mass wasting, or forest floor displacement.

Soil erosion: the wearing away of the earth's surface by water, gravity, wind, and ice.

Soil pit: an excavation into the mineral soil of sufficient depth to allow assessment of variability in soil physical properties within a defined area of land.

Soil productivity: the capacity of a soil, in its normal environment, to support plant growth.

Soil verification pit: an excavation into the mineral soil of sufficient depth to allow assessment of the soil properties used to evaluate soil

productivity and sensitivity to forest management-related disturbances. This generally requires an excavation 90 cm deep unless a watertable, compact soil, or bedrock is encountered closer to the soil surface, in which case the depth to one of these layers is the minimum depth of pit required.

Spacing: the removal of undesirable trees within a young stand to control stocking, to maintain or improve growth, to increase wood quality and value, or to achieve other resource management objectives.

Special forest products: as defined under Section 1 of the Forest Act and B.C. Regulation 355/87, these are: poles; posts; pilings; shakes; shingle bolts; Christmas trees; building logs; mining timbers, props, and caps; cribbing; firewood and fuel logs; hop poles; orchard props; car stakes; round stakes, sticks, and pickets; split stakes, pickets, palings, and lagging; and shake bolts, blocks, and blanks.

Special sale area: see Regulated unit.

Species: a singular or plural term for a population or series of populations of organisms that are capable of interbreeding freely with each other but not with members of other species. Includes a number of cases:

- endemic species: a species originating in, or belonging to, a particular region. Both "endemic" and "indigenous" are preferred over "native."
- exotic species: a species introduced accidentally or intentionally to a region beyond its natural range. "Exotic" is preferred over "alien," "foreign" and "non-native.'
- subspecies: a subdivision of a species. A population or series of populations occupying a discrete range and differing genetically from other subspecies of the same species.

Species at risk:

a) any wildlife species that, in the opinion of the Deputy Minister of Environment, Lands and Parks, or a person authorized by that deputy minister, is threatened, endangered, sensitive or vulnerable,
b) any threatened and endangered plants or plant communities identified by the Deputy Minister of Environment, Lands and Parks, or any person authorized by that deputy minister, as requiring protection and
c) regionally important wildlife as determined by the Deputy Minister of Environment, Lands and Parks or a person authorized by that deputy minister.

Species at Risk in the DFA: Provincial identified wildlife, endangered and threatened species as identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC's - Federal), animal species and forested plant communities listed as red and blue by the B.C. Conservation Data Center (CDC) and plant species listed as red by the CDC. *From March 16 2005 Glossary Amendment*

Species composition: the percentage of each recognized tree species comprising the forest type based upon the gross volume, the relative number of stems per hectare or basal area.

Species conversion: a change from one tree species to another.

Species diversity index: A diversity index is a mathematical measure of species diversity in a community. Diversity indices provide more information about community composition than simply species richness (i.e., the number of species present); they also take the relative abundances of different species into account. Diversity indices provide important information about rarity and commonness of species in a community. The ability to quantify diversity in this way is an important tool for biologists trying to understand community structure. (Magurran, A. E. 1988. Ecological Diversity and its Measurement. Princeton University Press, Princeton, NJ).

Spot burning: a modified form of broadcast burning in which only the larger accumulations of sl ash are fired and the fire is confined to these spots.

Spring: a flow of ground water emerging naturally onto the earth's surface and used as a domestic water source within a community watershed. The watershed area of a spring is defined as the total recharge area of the spring.

Stabilized road width: the width of the traveled portion of the road that has been surfaced with material of sufficient strength and quantity to support the intended traffic.

Stagnant: of stands whose growth and development have all but ceased due to poor site and/or excessive stocking.

Stand: a community of trees sufficiently uniform in species composition, age, arrangement, and condition to be distinguishable as a group from the forest or other growth on the adjoining area, and thus forming a silviculture or management entity.

Stand composition: the proportion of each tree species in a stand expressed as a percentage of the total number, basal area or volume of all tree species in the stand.

Stand conversion: changing the species composition of a stand to more desirable tree species which are less susceptible to damage or mortality from certain insects or diseases.

Stand density: a relative measure of the amount of stocking on a forest area. Often described in terms of stems per hectare.

Stand development: the part of stand dynamics concerned with changes in stand structure over time.

Stand dynamics: the study of changes in forest stand structure over time, including stand behavior during and after disturbances.

Stand level: the level of forest management at which a relatively homogeneous land unit can be managed under a single prescription, or set of treatments, to meet well-defined objectives.

Stand management prescription: a site-specific plan describing the nature and extent of the silviculture activities that will occur on a free-growing stand to facilitate the achievement of, among others, social, economic, and environmental objectives.

Stand model: a computer model that forecasts the development of a forest stand, usually in terms of stand attributes such as mean diameter or height.

Stand strategy: a documented plan of stand treatments to achieve management objectives during the life of a particular stand.

Stand structure: the distribution of trees in a stand, which can be described by species, vertical or horizontal spatial patterns, size of trees or tree parts, age, or a combination of these.

Stand table: a summary table showing the number of trees per unit area by species and diameter class, for a stand or type. The data may also be presented in the form of a frequency distribution of diameter classes.

Stand tending: a variety of forest management treatments, including spacing, fertilization, pruning, and commercial thinning, carried out at different stages during a stand's development.

Stand types: see Stand, Stand structure.

Standard: the required level or measure of practice established by authority of the Forest Practices Code and referenced in legislation.

Standard II (Source CSA): a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or specifications for activities or their results, aimed at the achievement of the optimum degree of consistency in a given context. Note: Standards should be based on the consolidated findings of science, technology, and experience and should be aimed at the promotion of optimum community benefits.

Standing: status held by a person or group which allows the person or group to challenge or appeal a particular decision.

Statutory framework: where forest practices are primarily regulated by legislation.

Stewardship: caring for land and associated resources and passing healthy ecosystems to future generations.

Stocking: a measure of the area occupied by trees, usually measured in terms of well- spaced trees per hectare, or basal area per hectare, relative to an optimum or desired level.

Stocking class: a numeric code representing a range of stems per hectare, sometimes estimated by crown closure on aerial photographs, e.g. stocking class 1 is mature with 76+ stems/ha of > 27.5 cm DBH; class 2 is mature with < 76 stems/ha; class 0 is immature.

Stocking plan: a plan that provides objectives and strategies for land allocation and/or resource management, including regional plans, subregional plans, and local resource plans.

Stocking standard: the required range of healthy, well-spaced, acceptable trees.

Stocking survey: the determination of the stocking of an area of both well-spaced and total trees; also used to generate an inventory label.

Strategic plan: a plan that provides objectives and strategies for land allocation and/or resource management, including regional plans, subregional plans, and local resource plans.

Strategy: a broad non-specific statement of an approach to accomplishing desired goals and objectives.

Strategy II (Source CSA): a coordinated action set designed to meet established targets.

Stream: a watercourse, having an alluvial sediment bed, formed when water flows on a perennial or intermittent basis between continuous definable banks.

Stream bank: the rising ground bordering a stream channel.

Stream channel: the streambed and banks formed by fluvial processes, including deposited organic debris.

Stream class: the British Columbia Coastal Fisheries/Forestry Guidelines defines three stream classes:

- Stream Class A includes streams or portions of streams that are frequented by anadromous salmonids and/or resident sport fish or regionally significant fish species; or streams identified for fishery enhancement in an approved fishery management plan; stream gradient is usually less than 12 percent.
- Stream Class B includes streams or portions of streams populated by resident fish not currently designated as sport fish or regionally significant fish; stream gradient is usually 8-20 percent.
- Stream Class C includes streams or portions of streams not frequented by fish; stream gradient is usually greater than 20 percent.

Stream culvert: a culvert used to carry stream flow in an ephemeral or perennial stream channel from one side of the road to the other.

Stream gradient: the general slope, or rate of vertical drop per unit of length of a flowing stream.

Streambed: the bottom of the stream below the usual water surface.

Streamside Management Zone (SMZ): the land, together with the vegetation that supports it, immediately in contact with the stream and sufficiently close to have a major influence on the total ecological character and functional processes of the stream. (see also Riparian Management Area)

Stumpage: is the fee that individuals and firms are required to pay to the government when they harvest Crown timber in British Columbia. Stumpage is determined through a complex appraisal of each stand or area of trees that will be harvested for a given timber mark. A stumpage rate ($ per m3) is determined and applied to the volume of timber that is cut (m3). Invoices are then sent to individuals or firms

Subgrade: the material movement necessary to construct the roadway, excluding surfacing.

Substructure: the part of a bridge that supports the superstructure and carries all the applied lateral and vertical loads; includes caps, sills, piles, and posts, each comprising elements known as abutments and piers.

Subsurface drainage: water flow through permeable soil or rock beneath the surface of the land.

Sub-unit plan: the fourth level of planning in the Ministry of Forests hierarchical planning system. The aggregation of a number of courses of action in map and written form designed to achieve sub-unit objectives. Normally centered on watersheds.

Succession: the gradual supplanting of one community of plants by another, the sequence of communities being termed a sere and each stage seral.

Suitability mapping: a habitat interpretation that describes the current potential of a habitat to support a species. Habitat potential is reflected by the present habitat condition or successional stage.

Superstructure: the part of a bridge found above or supported by the caps or sills, including the deck, girders, stringers, and curbs.

Supply block: an area of Crown land that is relatively homogeneous with respect to forest characteristics, access development and management concerns. Supply blocks are the next smaller timber management unit within a Timber Supply Area.

Surface soil erosion: means for an area where a forest practice has been carried out, the movement of soil particles from the area by wind, gravity or water at a rate that is greater than that which would have occurred had the forest practice not been carried out.

Surplus forest: a forest in which existing stands can provide more harvest volume than is needed to maintain the harvest at the level of long run sustained yield until the stands created when the existing stands are cut become available for harvest. See also deficit forest.

Sustainability: the concept of producing a biological resource under management practices that ensure replacement of the part harvested, by regrowth or reproduction, before another harvest occurs.

Sustainable development: preservation and protection of diverse ecosystems-the soil, plants, animals, insects and fungi while maintaining the
forest's productivity.

Sustainable forest management: management regimes applied to forest land which maintain the productive and renewal capacities as well as the genetic, species and ecological diversity of forest ecosystems.

Sustainable forest management (SFM) (Source CSA): management “to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social, and cultural opportunities for the benefit of present and future generations” *(The State of Canada’s Forests 2001/2002*).

Sustained yield: a method of forest management that calls for an approximate balance between net growth and amount harvested.

Switchback: a horizontal road curve used for surmounting the grade of a step hill, usually with a small radius (15-10 m) and curving 180 degrees.

System road: a permanent road required for long-term management of the forest.

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Target (Source CSA): a specific statement describing a desired future state or condition of an indicator. Targets should be clearly defined, time-limited, and quantified, if possible (see Figure 5).

Target stocking standards: the number of well-spaced acceptable trees per hectare that will, in normal circumstances, produce an optimum free-growing crop; the standards at which silviculture treatments are aimed.

Temporary access structure: a structure that would be a permanent access structure except that it is not shown on a forest development plan, access management plan, logging plan, road permit or silviculture prescription as remaining operational after the completion of timber harvesting activities.

Temporary bridge: a bridge having most of its major components constructed of untreated wood.

Temporary tenures: non-alienated lands on which the timber is alienated to private interests, but where the Crown retains ownership of the lands. These lands include timber licences, timber leases and timber berths as well as pulp licences and pulp berths, including those now in tree farm licences under Schedule "A."

Tending: any operation carried out for the benefit of a forest crop or an individual thereof, at any stage of its life. It includes operations both on the crop itself and on competing vegetation but not site preparation or regeneration cuttings.

Tenure: the holding, particularly as to manner or term (i.e., period of time), of a property. Land tenure may be broadly categorized into private lands, federal lands, and provincial Crown lands. The Forest Act defines a number of forestry tenures by which the cutting of timber and other user rights to provincial Crown land are assigned.

Tenure (Source CSA): the terms under which a forest manager or owner possesses the rights, and assumes the responsibilities, to use, harvest, or manage one or more forest resources in a specified forest area for a specified period of time. **Note:** Private ownership of forestland is the strongest form of tenure, as the rights and obligations rest solely with the forest owner. Forest tenures of public land in Canada fall into two main categories: area-based and volume-based. Area-based tenures not only confer timber-harvest rights but also usually oblige the tenure holder to assume forest management responsibilities. Volume-based tenures normally give the holder the right to harvest specific volumes of timber in areas specified by the landowner or manager, but can also oblige holders to assume forest management responsibilities.

Tenure holder: an individual, group, or company that holds a licence agreement as defined in Section 10 of the Forest Act or Section 3 of the Range Act.

Tenure management plan: a plan that relates to the management, development and use, by the holder of a licence or permit granted under the
Range Act, of t he Crown range to which t he licence or permit applies, including the man agreement and use, affecting Crown range, of the following land: to which a licence or permit is made appurtenant, land which is subject to an agreement under section 17 of the Range Act, and unfenced land used for grazing purposes in common with Crown range to which a licence or permit applies.

Terrain: the physical features of a tract of land.

Terrain hazard assessment: an assessment or characterization of unstable or potentially unstable slopes on forested lands. A determination of the relative potential of landslide initiation and the type of landslide that may occur on different types of terrain, based on the data obtained from a review of available maps, photos, site data, and field observations.

Terrain stability risk: a combined assessment of both the likelihood of landslide initiation and an order of magnitude estimate of the amount of landslide debris that might enter a stream or of the potential lengths of scour of a stream by a landslide.

Thinning: a cutting made in an immature crop or stand primarily to accelerate diameter increment but also, by suitable selection, to improve the average form of the trees that remain.

Threatened or endangered habitats: ecosystems that are:

- restricted in their distribution over a natural landscape (e.g., freshwater wetlands within certain biogeoclimatic) or are restricted to a specific geographic area or a particular type of local environment; or
- ecosystems that were previously widespread or common but now occur over a much smaller area due to extensive disturbance or complete destruction by such practices as intensive harvesting or grazing by introduced species, hydro projects, dyking, and agricultural conversion.

Threatened or endangered species: species identified as red listed by the Ministry of Environment, Lands and Park s; these are indigenous species that are either threatened or endangered.

Timber: trees, whether standing, fallen, living, dead, limbed, bucked or peeled.

Timber cruising: the collection of field data on forests commonly by the measurement and recording of information in sample plots. Includes the measurement and estimation of volumes of standing trees.

Timber harvesting land base: the portion of the total area of a management unit considered to contribute to, and be available for, long-term timber
supply. The harvesting land base is defined by reducing the total land base according to specified management assumptions.

Timber licence: area-based tenures which revert to the government when merchantable timber on the area has been harvested and the land reforested. Many of these licences have been incorporated into tree farm licences.

Timber management prescriptions: recommended forest management practices, usually pertaining to the sub-unit and operational levels of planning.

Timber mark: a hammer indentation made on cut timber for identification purposes.

Timber operability (see also Operable timber): in a planning context, the term refers to the economic suitability of timber for harvesting. Parameters to consider in assessing operability include: terrain, timber quality, timber size, operating season, labour costs, development costs, and transportation costs. In the Environmental Protection Area program, operability refers to freedom from harvesting constraints which include environmental protection and other forest uses.

Timber sale licence: an agreement entered into under Part 3, Division (3) of the Forest Act. A timber sale licence usually defines a specific volume of timber to be harvested from a specific area. In special circumstances, an allowable annual cut (AAC) is specified. Allows the orderly harvest of relatively small volumes of timber by:

- operators with small cuts;
- operators registered under the Small Business Forest Enterprise Program or others with temporary cutting rights; and
- holders of pulpwood agreements.

Timber supply: the available timber categorized by species, end-use, and relative value.

Timber supply analysis: an assessment of future timber supplies over long planning horizons (more than 200 years) by using timber supply models for different scenarios identified in the planning process.

Timber Supply Area (TSA): an area defined by an established pattern of wood flow from management units to the primary timber-using industries.

Timber Supply Block (TSB): a division of a timber supply area.

Timber supply model: an analytical model (usually computer-based) that simulates the harvest and growth of collections of forest stands over
several decades according to specific data and management assumptions.

Timber utilization: the dimensions and quality of timber that is actually cut and removed from an area.

Tolerance: the ability of an organism or biological process to subsist under a given set of environmental conditions. The range of these under which it can subsist, representing its limits of tolerance, is termed its ecological amplitude. For trees, the tolerance of most practical importance is their ability to grow satisfactorily in the shade of and in competition with other trees.

Top height: the average height of the hundred trees of largest diameter per hectare.

Top management (Source CSA): persons with decision-making authority regarding SFM policy, resource allocation, and planning in the DFA.

Topographic break: a distinct change in the slope of the land.

Topography: the physical features of a geographic area, such as those represented on a map, taken collectively; especially, the relief and contours of the land.

Total chance planning: early planning over an entire development area for the best overall realization of all objectives identified by broader planning.

Total resource plan: a plan for long-term forest management over an entire area, such as a watershed. The plan identifies known resource values, capabilities and sensitivities; confirms or refines management objectives for those values; and establishes detailed management guidelines by which to achieve those objectives on the ground.

Trade-off: a management decision whereby there is a reduction of one forest use in favour of another, such as a reduced timber yield in favour of improved wildlife habitat. In some cases, a management decision favouring one use in one location, is offset by a reverse decision favouring another use in another location.

Treatment prescription: operational details required for carrying out individual silviculture activities such as site preparation and planting.

Treatment season: the season or year the planned treatment activity will be carried out.

Treatment unit: the geographic unit of productive forest land area designated in a prescription for a specific silviculture activity or series of treatments.

Tree Farm Licence (TFL): TFLs are privately managed Sustained Yield Units. TFLs are designed to enable owners of Crown-granted forest lands and old temporary tenures or the timber licences which replace them, to combine these with enough unencumbered Crown land to form self-contained sustained yield management units. These licences commit the licensee to manage the entire area under the general supervision of the Forest Service. Cutting from all lands requires Forest Service approval through the issuance of cutting permits. TFLs should not be confused with Certified Tree Farms under the Taxation Act, though some Certified Tree Farm land (Crown-granted) may comprise a part of the TFL. A TFL has a term of 25 years.

Tree Length**:** The average height of co-dominant tree within a stand. *From March 8, 2005 Glossary Amendment*

Tree-length harvesting system: a method of harvesting that includes felling a tree, cutting of the top and delimbing it before transport to a mill.

TSA plan: the overall forest management plan developed for a TSA. The TSA Plan establishes the overall direction for the management of the timber, range and recreation resources under Forest Service jurisdiction in the TSA.

Turnout: a widening in the roadway where a vehicle may pull or park to allow other vehicles to pass safely.

U

Underplanting: planting young trees under the canopy of an existing stand.

Understorey: any plants growing under the canopy formed by other plants, particularly herbaceous and shrub vegetation under a tree canopy.

Uneven-aged silvicultural system: a silvicultural system designed to create or maintain and regenerate an uneven-aged stand structure. Single-tree and group selection are uneven-aged silvicultural systems.

Uneven-aged stand: a stand of trees containing three or more age classes. In a balanced uneven-aged stand, each age class is represented

by approximately equal areas, providing a balanced distribution of diameter classes.

Unmanaged forest land: forest land that is not subject to management under a forest management plan.

Unmerchantable: of a tree or stand that has not attained sufficient size, quality and/or volume to make it suitable for harvesting.

Unrecovered timber: timber as described in the Provincial Logging Residue and Waste Management Procedures Manual.

Unrecovered volume: timber that is within the cutting specifications of the minimum utilization standards of the cutting authority and not removed from the area.

Unsalvaged losses: the volume of timber destroyed by natural causes such as fire, insect, disease or blowdown and not harvested, including the timber actually killed plus any residual volume rendered non-merchantable.

Unstable or potentially unstable terrain: an area where there is a moderate to high likelihood of landslides.

Uplands: terrain not affected by water table or surface water or else affected only for short periods so that riparian (hydrophilic) vegetation or aquatic processes do not persist.

Urban forestry: the cultivation and management of trees and forests for their present and potential contributions to the physiological, sociological and economic well-being of urban society.

Utilization (of forage and browse): the level of forage and browse use on a site. For herbaceous species, it is measured as a percentage of the current year's growth removed; for browse species, it is measured as a percentage of stem ends removed.

Utilization standards: the dimensions (stump height, top diameter, base diameter, and length) and quality of trees that must be cut and removed from Crown land during harvesting operations.

V

Value (Source CSA): a DFA characteristic, component, or quality considered by an interested party to be important in relation to a CSA SFM element or other locally identified element (see Figure 5).

Values-at-risk: the specific or collective set of natural resources and man-made improvements/developments that have measurable or intrinsic worth and that could or may be destroyed or otherwise altered by fire in any given area.

Variable area plot sampling method: a method of timber cruising commonly used for industrial timber cruising in which sampling area (plot size) varies with tree diameter.

Variable retention (dispersed, aggregate): a relatively new silvicultural system that follows nature's model by always retaining part of the forest after harvesting. Standing trees are left in a dispersed or aggregated form to meet objectives such as retaining old growth structure, habitat
protection and visual quality. Variable retention retains structural features (snags, large woody debris, live trees of varying sizes and canopy levels) as habitat for a host of forest organisms. There are two types of variable retention:

- Dispersed retention - retains individual trees scattered throughout a cutblock,
- Aggregate (group) retention - retains trees in clumps or clusters.

The main objectives of variable retention are to retain the natural range of stand and forest structure and forest functions. With retention systems, forest areas to be retained are determined before deciding which areas will be cut. This system offers a range of retention levels. The system also provides for permanent retention of trees and other structures after regeneration is established. Variable retention can be implemented with a range of harvesting systems and can be combined with traditional silvicultural systems such as shelterwood or selection.

Vegetative lot: a quantity of vegetative material or vegetative propagules having the same species, source and year of collection.

Vegetative material: plant parts or tissues used to produce vegetative propagules through asexual means.

Vegetative propagules: plants produced through asexual means.

Vehicle side-tracking: the lateral displacement of vehicles on a curve caused by the length of the vehicle maneuvering through the turn; the wider path that the rear of a vehicle takes when negotiating a curve.

Ventilation Index (VI): a term commonly used in air pollution meteorology. The VI is a numerical value relating to the potential of the atmosphere to disperse airborne pollutants from a stationary source (such as smoke from a prescribed fire). It is calculated by multiplying the mixing height by the average wind speed in the mixed layer.

Very unstable terrain: terrain units classified as being in Terrain Class V in the coastal terrain stability classification, or as having a very high mass wasting hazard according to the Mass Wasting Hazard Assessment Key for interior sites. For these areas there is a high likelihood that slope failures will follow harvesting or conventional road building.

Veteran: in growth and yield, a tree that is at least 30 years older than the age of the main stand. In multi-layered or complex-layered stands, a tree that is at least 100 years older than the oldest sample tree of the main stand.

Viewshed: a physiographic area composed of land, water, biotic, and cultural elements which may be viewed and mapped from one or more viewpoints and which has inherent scenic qualities and/or aesthetic values as determined by those who view it.

Visual Absorption Capability (VAC): the relative capacity of a landscape to absorb land-use alterations and still maint ain its visual integrity.

Visual green-up: see Green-up.

Visual impact assessment: an evaluation of the visual impact of resource development proposals on forest landscape.

Visual landscape analysis: the process of recommending visual quality objectives based on the visual landscape inventory and social factors.

Visual landscape inventory: the identification, classification, and recording of the location and quality of visual resources and values.

Visual landscape management: the identification, assessment, design, and manipulation of the visual features or values of a landscape, and the
consideration of these values in the integrated management of provincial forest and range lands.

Visual quality: the character, condition, and quality of a scenic landscape or other visual resource and how it is perceived, preferred, or otherwise valued by the public.

Visual Quality Objective (VQO): an approved resource management objective that reflects a desired level of visual quality based on the physical and sociological characteristics of the area; refers to the degree of acceptable human alteration to the characteristic landscape.

Visual sensitivity: a component of the visual landscape inventory that estimates the sensitivity of the landscape based on the visual prominence or importance of features, conditions that affect visual perception, and social factors that contribute to viewer perceptions.

Visually sensitive areas: viewsheds that are visible from communities, public use areas, and travel corridors, including roadways and waterways,
and any other viewpoint so identified through referral or planning processes.

Volume table: a table showing the estimated average tree or stand volume based on given tree measurements, usually diameter and height.

Vulnerable species: see Sensitive/vulnerable species.

W

Waste: the volume of timber left on the harvested area that should have been removed in accordance with the minimum utilization standards in the cutting authority. It forms part of the allowable annual cut for cut-control purposes.

Waste area: a pre-approved site for disposal of excavations.

Waterbar: a shallow ditch dug across a road at an angle to prevent excessive flow down the road surface and erosion of road surface materials. A small excavation across a road to collect an d divert roadway surface water flow.

Water bomber: see Airtanker.

Water management: the planned development, distribution and use of water resources.

Water quality: the physical, chemical and biological properties of water.

Water resources: the supply of water in a given area or basin interpreted in terms of availability of surface and underground water.

Watercourse: a natural stream or source or supply of water, whether usually containing water or not, such as a lake, river, creek, spring, ravine swamp, and gulch.

Watershed: an area of land that collects and discharges water into a single main stream through a series of smaller tributaries.

Watershed assessment: evaluates the present state of watersheds and the cumulative impact of proposed development on peak flows, suspended sediment, bedload, and stream channel stability within the watershed.

Watershed integrity: refers to a stable overall physical condition of the watershed (bedrock, landforms, soils, drainage ways) within which transfers of energy, matter and, especially of water occur. It is prerequisite for the security of forest and stream ecosystems.

Watershed management: the planned use of drainage basins in accordance with predetermined objectives.

Weeding: a release treatment in stands during the seedling stage that eliminates of suppresses undesirable vegetation regardless of crown position.

Wetland: a swamp, marsh or other similar area that supports natural vegetation that is distinct from adjacent upland areas.

Wilderness: an area of land generally greater than 1000 ha that predominantly retains its natural character and on which the impact of man is transitory and, in the long run, substantially unnoticeable.

Wilderness area: a part of the provincial forest designated by order in council as a wilderness area.

Wildfire: an unplanned or unwanted natural or human-caused fire, or a prescribed fire that threatens to escape its bounds.

Wildland urban interface: a popular term used to describe an area where various structures (most notably private homes) and other human developments meet or are intermingled with forest and other vegetative fuel types.

Wildlife: raptors, threatened species, endangered species, game, and other species of vertebrates prescribed as wildlife by regulation.

Wildlife habitat areas: units of habitat recommended for the maintenance, enhancement, or restoration of red-listed wildlife, threatened, and endangered habitats, and those species identified as being regionally important.

Wildlife management: the application of scientific and technical principles to wildlife populations and habitats to maintain such populations (particularly mammals, birds and fish) essentially for recreational and/or scientific purposes.

Wildlife trees: dead, decaying, deteriorating, or other designated trees that provide present or future habitat for the maintenance or enhancement of wildlife.

Wildling: a seedling naturally reproduced outside of a nursery, used in reforestation.

Windrow: an accumulation of slash, branchwood and debris on a harvested cutblock created to clear the ground for regeneration. Also refers to an accumulation of fill or surfacing material left on the road shoulder as a result of grading operations.

Windthrow: see Blowdown.

Winter range: a range, usually at lower elevation, used by migratory deer, elk, caribou, moose, etc., during the winter months and typically better defined and smaller than summer range.

Wolf tree: a dominant tree, which is often a remnant from a previous stand, having a broad crown and many limbs.

Woodlot: the wooded portion of a private property upon which small-scale forestry operations are carried out.

Woodlot licence: an agreement entered into under Part 3, Division 5 of the Forest Act. It is similar to a Tree Farm Licence but on a smaller scale, and allows for small-scale forestry to be practiced in a described area (Crown and private) on a sustained or perpetual yield basis.

Working plan: See Management and Working Plans.

X

No definitions to-date

Y

Yarding (yarding systems): in logging, the hauling of felled timber to the landing or temporary storage site from where trucks (usually) transport it to the mill site. Yarding methods include cable yarding, ground skidding, and aerial methods such as helicopter and balloon yarding.

Yield Analysis: the study of forest yield over time using mathematical models and inventory data.

Yield curve: a representation of stand volume, usually as a function of stand age, in graphical or tabular form.

Young Forest: means forested areas which are between 0 and 20 years old. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

Z

No definitions to-date

Sources of Definitions

Definitions given here are a compilation of general terms used in Ministry of Forests reports, Brochures and correspondence. They are intended for staff, students, general public and interest groups. Definitions provided in an official document, such as an Act or Regulation, shall apply in those instances.

http://www.for.gov.bc.ca/hfd/library/documents/glossary/

Definitions have been based on a variety of resource material documented in the bibliography at the end of this document.

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Canfor TFL 30 SFMP PAG
List of Acronyms

Updated to August 16, 2005

As presented by the BC Ministry of Forests from their webpage

A

AAC	Allowable Annual Cut
AAP	Assessment Action Plan
ABCPF	Association of BC Professional Foresters
ADM	Assistant Deputy Minister
AE	Acid Equivalent
AFIRM	Analysis Framework for Integrated Resource Management
AFIS	Automatic Filing Index System
AG	Attorney General
AGM	Annual General Meeting
AIA	Archaeological Impact Assessment
AIF	Area Inclusion Factor
AIFM	ASEAN Institute of Forest Management
AIT	Agreement on Internal Trade
ALEP	Active Living Environment Program
ALIC	Assistant t Deputy Minister's Land Information Council
ALR	Agricultural Land Reserve
AMV	Average Market Value
AOA	Archaeological Overview Assessment
AOI	Area of Interest
APSC	Aboriginal Policy Steering Committee
AR	Annual report
ARCS	Administrative Records Classification System
ARS	Automatic Repeater Station
ARWG	Armillaria Research Working Group
ASFIT	Allied Science Forester in Training
ASP	Average Selling Price
ASSCS	Automated Silviculture Survey Compilation System
ASTTBC	Association of Applied Science Technicians and Technologists of BC
AT	Alpine Tundra (Biogeoclimatic Zone)
ATLAS	A Tactical Landscape Analysis System
ATT	Attribute
ATU	Activity Treatment Unit
ATV	All Terrain Vehicle
AU	Analysis Unit
AUM	Animal Unit Month

B

B&W	Brushing & Weeding
B/L	Backlog
BA	Basal Area
BAF	Basal Area Factor
BBGIS	Bulletin Board, Geographic Information System
BBTS	Building Better Training S kills
BC	British Columbia
BCAL	British Columbia Assets and Land Corporation

BCARS	BC Archive and Records Services
BCBC	British Columbia Building Corporation
BCEIN BC	Environmental Information Network
BCFA	British Columbia Forestry Alliance
BCFCSN	BC Forestry Continuing Studies Network
BCFS	British Columbia Forest Service
BCGEU	BC Government Employees Union also BC Government Employees Union
BCGMA	BC Government Managers Association
BCGS	British Columbia Geographic System (of mapping)
BCLI	BC Land Inventory
BCLRB	BC Labour Relations Board
BCNU	BC Nurses Union
BCTS	British Columbia Timber Sales Program (previous SBFEP)
BCTMP	Bleached Chemi-Therm al Mechanical Pulp
BCTSDA	BC Tree Seed Dealers Association
BCUC	British Columbia Utilities Commission
BCWF	BC Wildlife Federation
BCWSAC	British Columbia Weed Science Advisory Committee
BCYBTU	BC & Yukon Building Trades Union
BEC	Biogeoclimatic Ecosystem Classification
BEO	Biodiversity Emphasis Options
BEP	Break Even Point
BG	Bunch Grass (Biogeoclimatic Zone)
BGC	Biogeoclimatic
BLF	Branch Landscape Forester
BN	Briefing Note
BR	Brushing
BR	Base Rate
BRIFM	Backlog Restoration Intensive Forest Management
Btk	Bacillus thuringiensis Berliner var. kurstaki
BUI	Build Up Index
BWBS	Boreal White & Black Spruce (Biogeoclimatic Zone)
BZ	Buffer Zone

C

C/C	Crown Closure
CADD	Computer Aided Drafting and Design
CAI	Current Annual Increment
CAM	Computer Assisted Mapping
CAMP	Coordinate Access Management Plan
CAS	Coast Appraisals
CASI	Compact Aerial Spectrographic Imagery
CATI	Computer Assisted Telephone Interview
CBT	Computer Based Training
CC	Clearcut
CCF	Crown Competition Factor
CCFM	Canadian Council of Forest Ministers
CCLCRMP	Central Coast Land and Coastal Resource Management Plan
CCLUP	Cariboo-Chilcotin Land Use Plan
CCLUPIR	Cariboo-Chilcotin Land Use Plan Integration Report
CCMAR	Client, Credit Management, Accounts Receivable
CCREM	Canadian Council of Resource and Environment Ministers
CCSD	Cabinet Committee on Sustainable Development
CDF	Coastal Douglas fir (Biogeoclimatic) Zone
CDI	Cost Driver Initiative
C&E	Compliance and Enforcement
CEAC	Chip Export Advisory Committee

CEO	Chief Executive Officer
CEP	Communications, Energy and Paper Workers Union
CF	Chief Forester
CFA	Canadian Forestry Association
CFBC	Consulting Foresters of BC
CFD	Cancellation and Forfeiture of Deposit
CFFG	Coastal Fish Forestry Guidelines
CFS	Canadian Forest Service
CHIPS	Corporate and Human Resource Information and Payroll System
CHRIS	Cultural Heritage Resources Inventory System
CHRS	Cultural Heritage Resources
CIF	Canadian Institute of Forestry
CIS	Central Invoicing - MOF, Revenue
CISMP	Critical Incident Stress Management Program
CLC	Canadian Labour Congress
CLI	Client Management - MOF, Revenue
CLI	Canada Land Inventory
CLIB	Common Land Information Base
CLIFF	Ministers Referral Letters
CLISP	Corporate Land Information Strategic Plan
CLMA	Coast Lumber Manufacturers Association
CLMS or CMS	Client Management System
CLR	Crown Land Registry
CLRIS	Crown Land Registry Information System
CLS	Canadian Lumber Standards
CMT	Culturally Modified Trees
CO	Communications Officer
Code	Forest Practices Code
COFI	Council of Forest Industries of BC
CONSEP	Cone & Seed Processing
C.O.R.E.	Commission on Resources and the Environment
CORE	Conservation, Outdoor Recreation Education Program
CP	Cutting Permit
CPPA	Canadian Pulp & Paper Association
CPS	Cabinet Planning Secretariat
CPU	Central Processing Unit
CRB	Community Resource Board
CRII	Corporate Resources Inventory Initiative
CRIS	Contractor Reference Information System
CRLUPS	Cariboo Region Landscape Unit Planning Strategy
CRMP	Coordinated Resource Management Plan
CSAC	Coast Scaling Advisory Committee
CSS	Correspondence Services Section
CSSP	Clayoquot Sound Scientific Panel
CT	Commercial Thinning
CTCSS	Central Tone Control Squelch System
CTO	Cumulative Time Off
CU	Close Utilization
CVDF	Cowichan Valley Demonstration Forest
CVP	Comparative Value Pricing
CVTP	Comparative Value Timber Pricing
CWAP	Coastal Watershed Assessment Procedure
CWD	Coarse Woody Debris
CWG	Community Watershed Guidelines
CWH	Coastal Western Hemlock (Biogeoclimatic) Zone

D

DAC	Diameter over Age Curve
DBC	Bulkley/Cassiar Forest District
DBH	Diameter Breast Height
DBMS	Data Base Management System
DBO	Boundary Forest District
DCB	Cranbrook Forest District
DCE	Distributing Computing Environment
DCH	Chilcotin Forest District
DCK	Chilliwack Forest District
DCL	Clearwater Forest District
DCO	Columbia Forest District
DCR	Campbell River Forest District
DDC	Data Distribution Centre
DDC	Dawson Creek Forest District
DDS	Data Delivery System
DEM	Digital Elevation Map
DFN	Fort Nelson Forest District
DFO	Department of Fisheries and Oceans
DFZ	Disturbance-Free Zone
DHO	Horsefly Forest District
DI	Disturbance
DI	Diversity index
dib	Diameter Inside Bark
DIN	Invermere Forest District
DJA	Fort St. James Forest District
DJO	Fort St. John Forest District
DKI	Kispiox Forest District
DKL	Kootenay Lake Forest District
DKM	Kalum Forest District
DKO	Kamloops Forest District
DLA	Lakes Forest District
DLI	Lillooet Forest District
DM	Deputy Minister
DM	District Manager
DMC	Mid-Coast Forest District
DME	Merritt Forest District
DMH	100 Mile House Forest District
DMK	Mackenzie Forest District
DMO	Morice Forest District
DMRL	Deputy Minister's Referral Letters
DNC	North Coast Forest District
dob	Diameter Outside Bark
DOS	Disk Operating System
DP	Development Plan
DPA	Deferred Planning Area
DPE	Penticton Forest District
DPG	Prince George Forest District
DPM	Port McNeill Forest District
DQC	Queen Charlotte Forest District
DQL	Quesnel Forest District
DRA	Armillaria Root Disease
DRC	Diameter at Root Collar
DRV	Robson Valley Forest District
DSA	Salmon Arm Forest District
DSB	Disease Stem Blister Rust

DSC	Sunshine Coast Forest District
DSD	Disturbed Stocking Doubtful
DSH	Diameter at Stump Height
DSI	South Island Forest District
DSQ	Squamish Forest District
DSS	Decision Support Systems
DTM	Digital Terrain Map, Digital Terrain Modeling
DVA	Vanderhoof Forest District
DVE	Vernon Forest District
DW2B DWB	Decay, (unavoidable) Waste & Breakage
DWC	Delivered Wood Cost
DWL	Demonstration Woodlot
DWL	Williams Lake Forest District

E

E&T	Economics & Trade Branch
EARP	Environmental Assessment Review Process (federal)
ECA	Equivalent Clearcut Area
ECW	Expert Committee on Weeds
EDD	Extended Data Dictionary - MOF, Information Systems
EDI	Electronic Data Interchange
EFMPP	Enhanced Forest Management Pilot Project
EFP	Enhanced Forestry Program
EGAF	Extended Grid Area File
EKIDC	East Kootenay Insect and Disease Committee
EKWUS	East Kootenay Wildland Use Strategy
ELF	Eliminate Legal-size Folders (government-wide cost-cutting measure)
ELUC	Environment and Land Use Committee
E.M.B.E.R.	Ecosystem Maintenance Burning Evaluation and Research
EMS	Export Management System - MOF, Economics + Trade
ENFOR	Energy from the Forest
EPA	Environmental Protection Area
EPF	Environmental Protection Forest
EPS	Essential Planning systems
ERA	Enforcement, Administrative Review & Appeal Tracking System
ERDZ	Enhanced Resource Development Zone
ESA	Employment Systems Review
ESR	Environmentally Sensitive Area
ESSF	Englemann Spruce Subalpine Fir (Biogeoclimatic Zone)
ETO	Earned Time Off
ETV	Emergency Transport Vehicle (Biogeoclimatic Zone)
EVC	Existing Visual Condition
EWN	Early Warning Note

F

FABC	Forest Alliance of BC
FAC	Forest Appeals Commission
FAMAP	Forest Atlas Mapping Automation Project
FAMS	Forest Asset Management System
FAO	Food and Agriculture Organization (United Nations)
FAOP	Financial Administration Operating Policy
FAR	Forest Archives Manager
FBM	Foot Board Measure

FBM/HA	Foot Board Measure per Hectare
FBP	Fires Behaviour Prediction
FC	Forest Cover
FCAP	Forest Cover Attribute Processing System
FCB	Forests Communications Branch
FCI	Forest Cover Inventory
FCS	Friends of Clayoquot Sound - also FOCS
FCSBC	Forestry Continuing Studies Network of BC
FDP	Forest Development Plan
FDP	Federal Development Plan
FE	Fertilization
FEN	Forest Ecosystem Network
FEP	Forestry Enhancement Program
FERIC	Forest Engineering Research Institute of Canada
FG	Free Growing
FHC	Forest Health Committee
FIDS	Forest Insect and Disease Survey
FINSIL	Stand Level Financial Silviculture
FIP	Forest Inventory Planning
FIPDBF	Forest Inventory Planning Data Base File
FIR	Forest Inventory Reporting System
FIT	Forester-In-Training
FIZ	Forest Inventory Zone
FL	Forest Licence
FLM	Forest Landscape Management
FLMP	Forest Land Management Plan
FMA	Forest Management Agreement
FMIS	Financial Management Information System
FN	First Nation
FNFC	First Nations Forestry Council
FNS	First Nations Summit
FOI	Freedom of Information
FORCAN	Forestry Canada (federal government department)
FORGIS	Forest Resource Geographic Information system
FPB	Forest Practices Board
FPC	Forest Practices Code
FPO	Forest Pre-Organization
FR	Forest Renewal
FRAS	Forest Resource Analysis System
FRBC	Forest Renewal BC
FRC	Forest Resources Commission
FRDA	Forest Resources Development Agreement
FRGIS	Forest Resource GIS Section
FRIC	Forest Resources Inventory Committee
FRIP	Forest Renewal Initiatives Program
FRIT	Forest Revenue Inspection Team
FRM	Forest Resource Management
FRP	Forest Renewal Plan
FRPA	Forest Range and Practices Act
FRRA	Forest and Range Resource Analysis
FRRRA	Forest, Range and Recreation Resource Analysis
FSAC	Forest Sector Advisory Committee
FSIS	Forest Sector Initiatives Section
FSR	Forest Service Road
FSRRI	Forest Service Recreation Resources Inventory
FSP	Forest Stewardship Plan
FSS	Forest Sector Strategy
FSSC	Forest Sector Strategy Committee
FSSIM	Forest Service Simulator (TSR) Modelling
FTA	Forests Tenure Administration
FTAS	Forest Tenure Administration System
FTP	File Transfer Protocol

FTE	Full-Time Equivalent
FTG	Free To Grow
FUP	Free Use Perm it
FWDP	Forest Worker Development Program
FWI	Fire Weather Index
FYDP	Five Year Development Plan

G

G&Y	Growth & Yield
GAP	Gully Assessment Procedure
GAS	General Appraisal System
GATT	General Agreement on Tariffs and Trades
GAUS	Grid Area Unit System
GBPU	Grizzly Bear Population Unit
GDP	Gross Domestic Product
GEF	Grazing Enhancement Fund
GEMS	Government Electronic Mail System
GIS	Geographic Information System
GISCST	Geographic Information System Client Support Team
GISSC	Geographic Information System Steering Committee
GISWG	Geographic Information System Working Group
GLIDE	Government Land Information Data Exchange
GMA	Government Managers Association
GMOP	General Management Operating Policy
GPS	Global Positioning System
GPSD	Government Personnel Services Division (now PSERC-Public Service Employee Relations Commission)
GRNSD	Global Research Network on Sustainable Development
GRT	General Range Types
GST	Goods and Services Tax (federal)
GST	Government Support Team
GTG	Growth Type Group
GUI	Graphic User Interface

H

ha	Hectare
HAA	MOF Aboriginal Affairs Branch
HAS	MOF Audit Services Branch
HBD	MOF Business Design
HBR	Harvest Billing Reporting
HBS	Harvest Billing System
HCO	MOF Communications Branch
HCP	MOF Corporate Policy and Planning Branch
HCTF	Habitat Conservation Trust Fund
HDBS	Harvest Database System
HEN	MOF Enforcement
HET	MOF Economics and Trade Branch
HFC	MOF Forest Community Transition Secretariat
HFD	MOF Forestry Division Services Branch
HFP	MOF Forest Practices Branch
HFS	MOF Financial Services
HHR	MOF Human Resources Branch
HIA	High Intensity Area

HIS	MOF Information Systems
HNS	Nursery and Seed Operations Branch
HPR	MOF Protection Branch
HRE	MOF Research Branch
HRI	MOF Resources Inventory Branch
HRMS	Human Resources Management System
HRS	Harvest Revenue System
HTC	MOF Tree Seed Centre
HTH	MOF Resource Tenures and Engineering Branch
HTML	Hyper Text Mark-up Language
HTS	MOF Timber Supply Branch
HVA	MOF Revenue Branch – Valuation

IAAC	Interior Advisory Appraisal Committee
IAC	Information Access
IALE	International Association of Landscape Ecologists
IAM	Interior Appraisal Manual
IAMC	Inter Agency Management Committee
IAR	Income Assistance Recipient (formerly Social Assistance Recipient)
IAS	Interior Appraisal System
IATA	International Air Transport Association
IBM	Mountain Pine Beetle
ICH	Interior Cedar Hemlock (Biogeoclimatic) Zone
IDD	Integrated Data Dictionary
IDF	Interior Douglas fir (Biogeoclimatic) Zone
IEF	Information Engineering Facility
IFFWG	Interior Fish, Forestry, Wildlife Guidelines
IFHC	Interior Forest Harvesting Council
IFHSC	Interior Forest Harvesting Subcommittee
IFMIS	Integrated Fire Management Information System
IFPA	Innovative Forest Practices Agreement
IGDS	Intergraph Graphic Digital System
ILMA	Interior Lumber Manufacturer's Association
ILWU	International Longshoremen's & Warehousemen's Union
IM	Interim Measures
IMA	Interim Measures Agreement
IMG	Information Management Group
IMG	Interim Management Guidelines
INCOSADA	Integrated Corporate Spatial and Attribute Database
IO	Industry Outstanding
IPC	International Poplar Commission
IPM	Integrated Pest Management
IPM	Inventory Project Management
IPT	Interagency Planning Teams
IR	Indicated Rate
IRM	Integrated Resource Management
IRMP	Integrated Resource Management Plan
IRMZ	Integrated Resource Management Zone
IRPC	Integrated Resource Planning Committee
IRT	Interface Response Teams
IRWA	International Right of Way Association
ISAC	Interior Scaling Advisory Committee
ISB	Information Systems Branch
ISDD	Integrated Spatial Data Dictionary
ISIS	Integrated Silviculture Information System
ITG	Inventory Type Group
ITIC	Interior Tree Improvement Council

ITP	Inventory Training Plan
I.U.	Intermediate Utilization
IVMA	Integrated Vegetation Management Association of BC
IWA	International Woodworkers of America
I.W.A.	Canada Industrial, Wood & Allied Workers of Canada
IWAP	Interior Watershed Assessment Procedure
IWIFR	Integrated Wildlife-Intensive Forestry Research
IWMP	Integrated Watershed Management Plan
IWWR	Institute for Wetland and Waterfowl Research

J

JAD	Joint Application Design
JS	Juvenile Spacing
JUMAC	Joint Union Management Advisory Committee
JV	Journal Voucher

K

KBLUP	Kootenay/Boundary Land Use Plan
KBLUPHLP	Kootenay/Boundary Land Use Plan Higher Level Plan
KCTA	Kootenay Christmas Tree Association
KDEDC	Kaslo and District Economic Development Committee
KSA	Knowledge, Skills and Ability
KSF	Key Success Factors
KWCC	Kootenay Weed Control Committee

L

L/C	License to Cut
LAC	Limits of Acceptable Change
lai/ha	Litres of Active Ingredient per Hectare
LAN	Local Area Network
LCCFCO	Lake Cowichan Combined Fire Control Organization
LBOM	LAN-Based Object Management
LHAL	Learning how adults learn
LHO	Lost Harvesting Opportunity
LIA	Low Intensity Area
LICC	Land Information coordinating Committee
LII Land	Information Infrastructure
LIICC	Land Information and Inventory coordinating Committee
LIM	Land Information Management
LIMF	Land Information Management Framework
LIS	Land Inventory System
LISC	Land Information Strategic Council
LLSP	Log and Lumber Selling Price
LMS	Leave Management System
LMU	Land Management U nit
LOD	Large Organic Debris
LOS	Local Office System
LP	Linear Programming
LPI	Logging Productivity Index

LRC	Land Reserve Commission (replaces FLC)
LRF	Lumber Recovery Factor
LRIICC	Land and Resource Inventory and Information coordinating Committee
LRMP	Land and Resource Management Plan
LRSY	Long Run Sustained Yield
LRUP	Local Resource Use Plan
LSO	Licensed Science Officer
LSR	Landscape Sensitivity Rating
LU	Landscape Unit
LUCO	Land-Use Coordination Office
LUS	Local Use Study

M

MAC	Minister's Advisory Committee
MAI	Mean Annual Increment
MASD	Maximum Allowed Site Degradation
mb	Megabyte
mbf	Thousand Board Feet
MCDM	Multi-Criterion Decision Maker
MDF	Medium Density Fibreboard
MDI	Multiple Document Interface Application
MDM	Maps Distribution Management
MDWR	Mule Deer Winter Ranges
MEA	Monitoring Enforcement Auditing
MELP	Ministry of Environment, Lands and Parks (also MOELP)
MET	Monitoring & Enforcement Teams
MFBM	Thousand Board Feet
MFU	Managed Forest U nit
MH	Mountain Hemlock (Biogeoclimatic) Zone
MILAP	Modified Industry and Labour Adjustment Program
ML	Holder of a Major Licence
MLA	Member o f the Legislative Assembly
MLSIS	Major License Silviculture Information System
MM	Maximum Modification
MMFBM	Million Board Feet
MO	Minister's Office
MO	Ministry Outstanding
MOELP	Ministry of Environment, Lands and Parks (also MELP)
MOF	Ministry of Forests
MORT	Ministry of Roads and Trees
MOU	Memorandum of Understanding
MP	Management Plan
MPC	Ministry Partnership Committee
MPRP	Major Project Review Process
MR	Modified Road
MRC	Modified River Compatible Alteration
MRI	Modified River Incompatible Alteration
MRL	Ministers Referral Letters (also CLIFF)
MS	Montane Spruce (Biogeoclimatic) Zone
MSP	Mechanical Site Preparation
MSS	Manager, Systems Services
MSY	Maximum Sustained Yield
MSYT	Managed Stand Yield Tables
MU	Management Unit
MUSYC	Multiple Use Sustained Yield Calculator
MVI	Mean Value Index
MWP	Management and Working Plan
MZ	Management Zone

N

NA	Not Applicable
NAD	North American Datum (number refers to year)
NAD83	North American Datum 1983
NAPP	National Aerial Photography Program
NC	Non-Commercial
NCBr	Non-Commercial Brush
NCC	Non-Commercial Cover
NDT	Natural Disturbance Type
NEC	Nechako Environmental Coalition
NEED	New Employment Expansion & Development
NGO	Non-Governmental Organization
NICC	Northern Interior Cruising Committee
NILS	Northern Interior Lumber Manufacturer s Society
NIVMA	Northern Interior Vegetation Management Association
NoFC	Northern Forest Centre
NP	Non-Productive
NPBr	Non-Productive Brush
NPV	Net Present Value
NR	Natural Roaded
NR	Not Recommended
NRL	Non-Recoverable Losses
NSC	Northern Silviculture Committee
NSR	Not Satisfactorily Restocked
NT	Not Tested
NTDB	National Topographic Data Base
NTS	National Topographic System of mapping
NTZ	No Treatment Zones

O

OAF	Operational Adjustment Factors
OC	Operating Cost
OCC	Organization, Classification & Compensation
OCG	Office of the Comptroller General
ODMT	Object Distribution Management
ODMT	Operations Division Management Team
OG	Old Growth
OGMA	Old Growth Management Area
OGSI	Old Growth Site Index
OGSP	Old Growth Strategy Project
OHSC	Occupational Health and Safety Committee
OIC	Order-in -Council
ONP	Old Newspaper
OPRG	Operational Planning Review Group
ORC	Outdoor Recreation Council of BC
ORCS	Operational Records Classification System
OSB	Oriented Strand Board
OSP	Official Settlement Plan
OTT	Old Temporary Tenure
OV	Office Vision

P

P	Primitive
PA	Protected Areas
PA	Pulpwood Agreement
PABAT	Protected Areas Boundary Advisory Team
PAC	Pesticide Advisory Committee
PACT	Protected Areas Coordinating Team
PAFS	Print and File system
PAS	Protected Areas Strategy
PAYCERT	Payment Certification
PC	Personal Computer
PCAMS	Personal Computer Acquisition Management System
PCT	Pre-Commercial Thinning
PEA	Professional Employees Association
P.Eng	Professional Engineer
PFG	Post Free-Growing
PFT	Problem Forest Types
PFZ	Pesticide-Free Zone
PHA	Pulpwood Harvesting Area
PHSP	Pre-Harvest Silviculture Prescription
PIA	Pre-Inventory Assessment
PIM	Pacific International Mapping
PL	Planting, Lodgpole Pine
PLANTS	Planning Timber Supply
PLIC	Provincial Land and Information Council
P.L.U.M.	Present Land Use Map
PMAC	Pest Management Advisory Committee
PMP	Pest Management Plan
PMP	Program Management Plan
PMR	Private Mark Registry
PMS	Personal Management System
POC	Point Of Commencement
POI	Point Of Intersection
POT	Point Of Termination
POYS	Pests of Young Stands
PP	Ponderosa Pine (Biogeoclimatic) Zone
PPMS	Personal Performance Management System
PPP(3P)	Probability Proportionate to Prediction
PPR	Program Planning Review
PPS	Probability Proportionate to Size
PPWP	Planning Phases Working Group
PR	Pruning
PR	Partial Retention
PRIC	Public Relations in Charge
PROFS	Professional Office Systems
PRTSM	Price Responsive Timber Supply Model
PSA	Public Service Act
PSAB	Public Service Appeal Board
PSEC	Public Sector Employee's Council
PSERC	Public Service Employee Relations Commission
PSP	Permanent Sample Plot
PSR	Provincial Summary Reporting
PSYU	Public Su stained Yield Unit
PUP	Pesticide Use Permit

Q

QRMS	Quartech Records Management System

R

R	Rural
R&D	Research and Development
RAD	Recreation Activity-Day
RAM	Random Access Memory
RAN	Rainforest Action Network
RBS	Range Billing System
RCEST	Road Cost Estimating
RCMA	Recreation and Conservation Management Areas
RCT	Regional Command Team
RCO	Regional Communications Officer
RD	Regeneration Delay
REA	Resource Emphasis Areas
REFAC	Regional Employees Forest Awareness Committee
REGEN	Regeneration
RESGEN	Results Generation, Resultants Generator
RFP	Request for Proposal
RHRO	Regional Human Resource Officers
RIB	Reforestation Information Bank
RIB	Resources Inventory Branch
RIC	Resources Inventory Committee
RIS	Range Inventory Strata
RIS	Range Improvement System
RISI	Resource Information Systems Inc.
RIWG	Recreation Inventory Working Group
RWG	Regional Implementation Working Group (as in WRP)
RKA	Kamloops Forest Region
RMA	Riparian Management Assessment
RMA	Resource Management Agreement
RMIS	Records Management Information System
RMP	Resource Management Plan
RMT	Resource Management Team
RMU	Recreation Management U nit
RMZ	Riparian Management Zone
RMZ	Resource Management Zone
RN	Roaded Natural
RNE	Nelson Forest Region
ROM	Read-Only Memory
ROS	Recreation Opportunity Spectrum
RPA	Regeneration Performance Assessment
RPAC	Regional Public Affairs Committee
RPAT	Regional Protected Area Team
RPF	Registered Professional Forester
RPG	Prince George Forest Region
RPR	Prince Rupert Forest Region
RRA	Range Reference Area
RRAC	Regional Research Advisory Committee
RRB	Regional Resource Board
RRL	Roaded Resource Land
RRMP	Revenue Risk Management Plans

RRZ	Riparian Reserve Zone
RTL	Roads, Trails and Landings
RUD	Recreation User-Day
RUP	Range Use Perm it
RVA	Vancouver Forest Region
RVQC	Recommended Visual Quality Class
RVQO	Recommended Visual Quality Objective

S

S & R	Scale & Royalty (account)
SAR	Scale Administration Revenue
SAR	Scenic Attractiveness Rating
SAS	Statistical Analysis System
SAT	Spatial Analysis Team
SAWSIM	Sawmill Simulator (model)
SB/ST	Small Business/Special Tenures
SBB	Spruce Bark Beetle
SBE	Small Business Eligibility
SBFEP	Small Business Forest Enterprise Program
SBPS	Sub-Boreal Pine Spruce (Biogeoclimatic) Zone
SBR	Small Business Reporting
SBS	Sub-Boreal Spruce (Biogeoclimatic) Zone
SB/ST	Small Business/Special Tenures
SCS	Scale Administration Revenue
SCS	Scaling Control System
SDI	Stand Density Index
SDM	Statutory Decision Makers
SEA	Slope, Elevation and Aspect
SEA	Socio-Economic Impact Assessment
SEF	Sustainable Environment Fund
SEIDAMS	System of Experts for Intelligent Data Management (Canadian Forest Service)
SEMS	Silviculture Electronic Mapping System
SEPT	Spatially Explicit Planning Tool
SI	Site Index
SIA	Silviculture Information Access
SIBC	Silviculture Institute of BC
SIBEC	Site Index Biogeoclimatic Ecosystem Classification
SIC	Standard Identification Codes
SIFMC	Southern Interior Fire Management Committee
SIL	Survey Intensity Level
SilvRx	Silviculture Prescription
SIMFOR	Simulates Forest Management & Stand Development
SISCO	Southern Interior Silviculture Committee
SITCA	Southern Interior Timber and Cruising Association
SIWG	Silviculture Interpretations Working Group
SLBC	Stand Level Biodiversity Management
SMECC	Smoke Management and Expenditure Control Committee
SMOOP	Statement of Management Objectives, Options and Procedures
SMP	Stand Management Prescription
SMR	Soil Moisture Regime
SMTP	Senior Managers Training Program
SNR	Soil Nutrient Regime
SOA	Special Operating Agency
SOCA	Spotted Owl Conservation Area
SOFA	Shuswap-Okanagan Forestry Association
SOI	Statement of Interest Area
SOI	Statement of Intent
SOP	Standard Operating Procedures

SP	Silviculture Prescription
SP	Site Preparation
SP	Site Plan
SPAR	Seed Planning and Registry Information System
SPH	Stems Per Hectare
SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
SPR	Seedling Planning and Registry
SPS	Stand Prognosis System/Stand Projection System
SPWG	Site Productivity Working Group
SPWG	Strategic Planning Working Group
SR	Satisfactorily Restocked
SRMZ	Special Resource Management Zone
SRTS	Scale Return Tracking System
SSS	Seedling Survival System
ST	Stand Tending
STG	Seed Transfer Guidelines
STIP	Spatial Tools Implementation Plan
STOB	Standard Object (of expenditure)
SU	Standards Unit (in silviculture)
SU	Survey
SUP	Special Use Permit
SVIFWTI	South Vancouver Island Forest Workers Training Initiative
SVWA	Slocan Valley Watershed Alliance
SYLVER	Silviculture on Yield, Lumber Value and Economic Return

T

TAMS	Technology Asset Management System
TAS	Tenure Administration System
TASS	Tree and Stand Simulator
TBA	To Be Announced
TCC	Technical Coordinating Committee
TCH	Trans-Canada Highway
TDC	Takla Development Corporation
TEAC	Timber Export Advisory Committee
TFL	Tree Farm Licence
TG	Type Group
THG	Timber Harvesting Guidelines
THLB	Timber Harvesting Land Base
TIA	Timber Information Access
TIPS	Topical Information Program System
TIPSY	Table Interpolation Program for Stand Yield Information
TIRRMP	Trench Integrated Renewable Resource Management Plan
TL	Timber Licence
TLUA	Traditional Land Use Area
TMR	Timber Mark Registry
TNAC	Treaty Negotiation Advisory Committee
TR	Target Rate
TREES	the Recognition for Employee Efforts and Suggestions
TREWG	Technical Review and Evaluation Working Group
TRIM	Terrain Resources Information Mapping
TRIM	Terrain Resource Information Management Program
TRIM	Timber Resource Inventory Model
TRP	Total Resource Plan
TSA	Timber Supply Area
TSAS	Timber Supply Analysis System
TSB	Timber Supply Block
TSB	Timber Supply Branch

TSHL	Timber Sale Harvesting Licence
TSL	Timber Sale Licence
TSM	Terrain Stability Mapping
TSP	Temporary Sample Plot
TSR	Timber Supply Review
TTA	Timber Tenure Access
TTT	Takla Track and Timber
TU	Treatment Unit
TUS	Traditional Use Study

U

U	Urban
UBCIC	Union of BC Indian Chiefs
UBCM	Union of BC Municipalities
ULC	Underwriters Laboratories of Canada
UNCED	United Nations Conference on Environmental Development
UNEVEN	Uneven-aged Whole Stand Model
UREP	Use, Recreation and Enjoyment of the Public
USFS	United States Forest Service
USSCS	Uneven-aged Silviculture Survey Compilation System
UTM	Universal Transverse Mercator, used for location references.
UWR	Ungulate Winter Range

V

VAC	Visual Absorption Capability
VAC	Volume Over-Age Curves
VDYP	Variable Density Yield Projection
VEG	Visually Effective Green-up
VEGINV	Vegetation Inventory Working Group
VG	Vegetation Management
VI	Value Index
VILUP	Vancouver Island Land Use Plan
VIWG	Vegetation Inventory Working Group
VLM	Visual Landscape Management
VLMU	Visual Landscape Management Unit
VLU	Visual Landscape Unit
VPT	Viewpoint Number
VQO	Visual Quality Objective
VRI	Vegetation Resources Inventory
VSA	Visually Sensitive Area
VSR	Visual Sensitivity Rating
VYDP	Variable Yield Depletion Plan

W

WADF	West Arm Demonstration Forest
WAP	Watershed Assessment Procedure
WAWA	West Arm Watershed Alliance
WCB	Workers Compensation Board
WCWC	Western Canada Wilderness Committee

WG	Working Group
WGS	World Geodetic System (number refers to year)
WHA	Wildlife Habitat Area
WHL	Western Hemlock Looper
WHMIS	Workplace Hazard Management Information System
WinTIPSY	Windows version of the Table Interpolation Program for Stand Yields
WKFA	West Kootenay Forest Alliance
WL	Woodlot Licence
WLK	Walker
WOSFOP	Wood Supply and Forest Productivity Model
WP	Working Plan
WRP	Watershed Restoration Plan
WSA	Wood Supply Agreement
WSCA	Western Silviculture Contractors Association
WSSPA	Well-Spaced Stems per Hectare
WT	Wildlife Trees
WTC	Wildlife Tree Committee
WTP	Wildlife Tree Patches

X

None to-date

Y

None to-date

Z

None to-date

Appendix 5

TFL30 Public Advisory Group Membership List

&

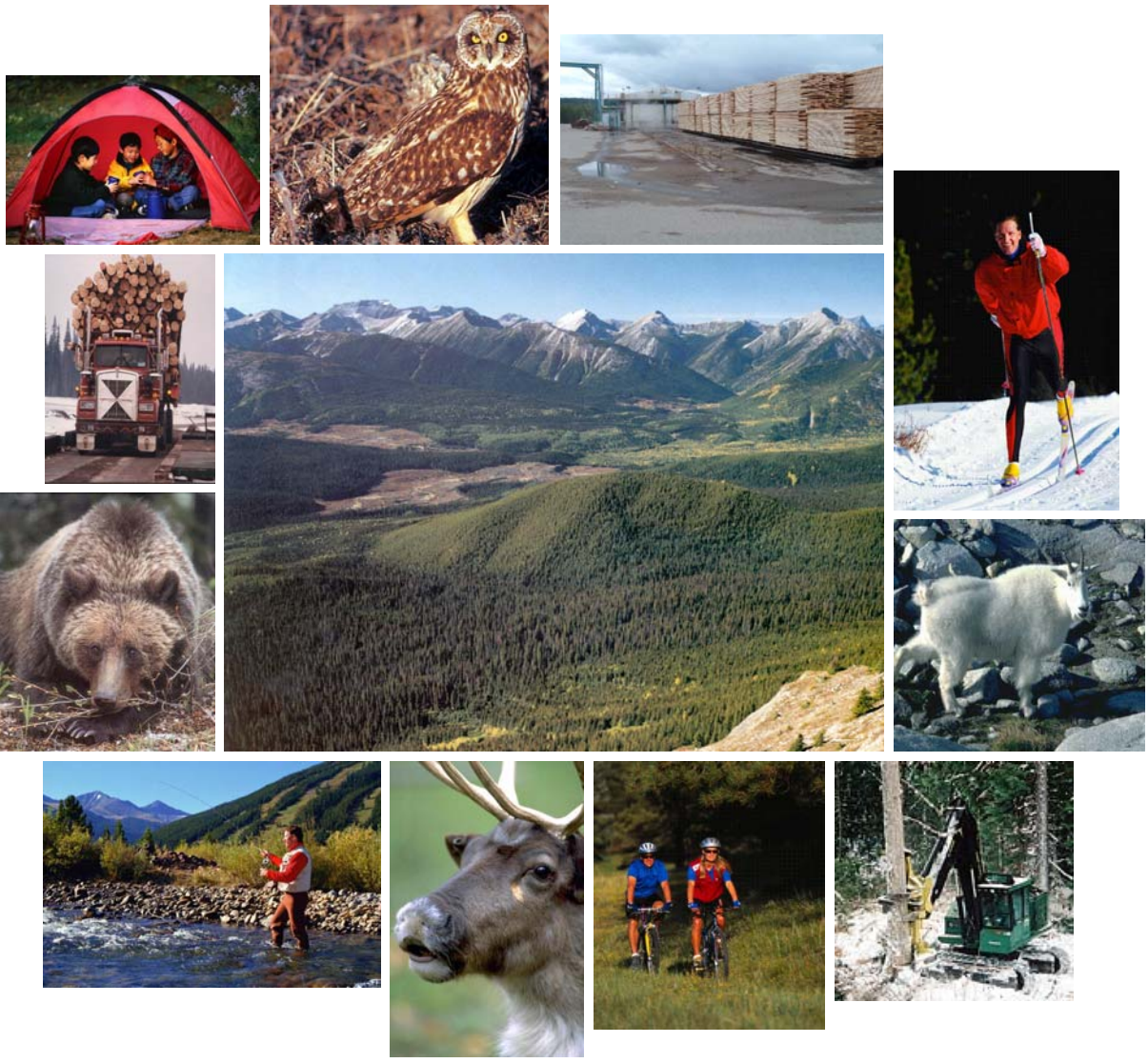
Terms of Reference

CSA Public Advisory Group (TFL 30)

Area	Member	Alternate
Agriculture/Ranching	Anne Migvar	
Environment	Sandra Kinsey	
Forestry Contractor - General	David Kim	Leone Watt **(inactive)**
Historical/Cultural	Jo Graber	
Hunting, fishing- commercial	Roy Pattison **(inactive)**	
Hunting, fishing- recreational	Adrien Voyer	Les Husband
Lheidli T'enneh Nation	Chief Dominic Frederick	Brian Toth
McLeod Lake Indian Band	Ryan Bichon	Ray Vallee
Public Interest	Doug Beckett	
Recreation- commercial		
Recreation- non-commercial	Dave King	
Recreation- non-commercial (motorized)	Lee Sexsmith	Peter Dawley
Small Business Forestry Enterprise Program	Roy Nagel (M) **(inactive)**	
Local Community	Dave Stevenson	Betty Abbs
Small Business- non-forestry	Denis Pelletier	Patience Rakochy
Trapping	Len Shankel	
Union/Labour	Neil Meagher **(inactive)**	

Sustainable Forest Management Plan

BCTS
BC Timber Sales
Prince George Business Area



TFL30 Public Advisory Group

Terms of Reference

Approved December 1, 2005
(Revised March 9, 2006)

A. BACKGROUND

Canadian Forest Products Ltd (Canfor) has had an interest in forestry certification since 1993 and was one of the first participants in developing the Canadian Standards Association (CSA) Sustainable Forest Management System standard. As early as 1996, the company conducted a preliminary audit against both the CSA standard and the Forest Stewardship Council (FSC) Principles and Criteria at one of its Prince George, British Columbia operations.

In July 1999 Canfor formally announced its sustainable forestry certification plans. These included a commitment to the International Organization for Standardization (ISO) Environmental Management System standard - ISO 14001- at all forestry operations. In January 2000 Canfor achieved registration under this standard for all the company's forestry operations (except for those recently acquired in the purchase of all the shares of Northwood Inc.). Canfor also announced that it would seek both CSA and FSC certification, and selected KPMG as its registrar and certifier.

The initial program to certify Canfor's area-based forest tenures under the Canadian standard (CAN/CSA-Z809-96) included the Forest Management Agreement area (FMA 990037) in Grande Prairie, Alberta, as well as the company's Tree Farm Licenses in B.C. on Vancouver Island at Englewood (TFL37) and in northern BC at Chetwynd (TFL48). The total annual timber volume harvested from these tenures is about 2.16 million m^3. Each of these areas received CSA certification in 2000.

In Prince George, the Tree Farm Licenses (TFL) 30 encompasses 180,000 ha. The main neighboring communities are Prince George and Bear Lake. The attached map (Appendix 1) shows the area covered.

BC Timber Sales (BCTS) is an independent organization within the BC Ministry of Forests. It was created to develop Crown timber for auction to establish market price and capture the value of the asset for the public. The vision of BCTS is to be "an effective timber marketer generating wealth through sustainable resource management."

BCTS has twelve Business Areas and an operational presence in 33 locations across BC. The organization currently manages 13% of the provincial annual cut. Following the conclusion of the timber reallocation initiative, BCTS' share will increase to approximately 20% in the 2006/07 fiscal year. The BCTS provincial annual cut includes a portion of harvest volume in the Prince George Business Area (PGBA) associated with TFL #30 that amounts to 21,312 m3 annually.

BCTS is committed to certification of its forestry operations. For the Prince George Business Area, BCTS achieved registration of its Environmental Management System to the ISO 14001 standard in the fall of 2005. Concurrently, and through a collaborative effort with other licensees (including Canfor), BCTS also achieved certification of its Sustainable Forest Management Plan (SFMP) to the CSA 2002 standard (Prince George Forest District Portion of the Prince George Business Area not including TFL#30). BCTS

remains committed to certifying its forestry operations and is working collaboratively with Canfor in certifying its forestry operations on TFL#30.

The CSA standard requires a significant level of public participation to assist in developing a sustainable forest management (SFM) plan for certification. The terms of reference presented here include the goals, operating rules, timelines and so on for this task, and have been developed and adopted by the Public Advisory Group members.

B. DEFINED GOAL & OBJECTIVES

The Goal of the PAG is comprehensive, continuing public and First Nation participation in Canfor's and BCTS (Prince George Business Area) forest planning process for Canfor's Tree Farm License 30.

The PAG will represent the diverse range of interests in the Defined Forest Area (DFA) and, as related to CSA certification:

1) "Shall have the opportunity to work with the organization to
   a) Identify and select values, objectives, indicators and targets, based on the CSA SFM elements and any other elements of relevance to the DFA;
   b) Develop alternative strategies to be assessed;
   c) Assess alternative strategies and select the preferred one;
   d) Review the SFM plan;
   e) Design monitoring programs, evaluate results, and recommend improvements; and
   f) Discuss and resolve any issues relevant to SFM in the DFA;
2) Provide input on a communication strategy to provide feedback to interested parties about the defined forest area, particularly the results of performance evaluations related to the critical elements of the CSA Standard;
3) Receive regular information and updates on the Sustainable Forest Management Plan for TFL 30; and
4) Annually provide advice on mechanisms or methods to improve communications and effective input in the SFM plan.

In addition, through their participation in the PAG process, members "can expect to enhance their knowledge of SFMP in general and of other interests and values related to local forests. They also gain a valuable opportunity to be involved in the decision-making for the local forests." (Section 5.1, CSA Z809-02)

C. Operating Rules

1) Ground rules/ conduct - The PAG and its members agree to work by the following ground rules:
   a) Follow a speakers' list, with no interruptions.
   b) Where representatives for an interest area have missed meetings, the PAG's past decisions will not be revisited.

c) Meetings will start and end on time.

2) Meeting agenda and dates:
   a) Meeting agendas:
      i) Agendas will address the needs of the CSA Certification.
      ii) Input on upcoming meeting agendas will be obtained during each PAG meeting.
      iii) Ten minutes will be allocated at the end of each PAG agenda for public presentations.
      iv) Any one interested in making a presentation for greater than 10 minutes must contact Canfor, BCTS (Prince George Business Area), or the facilitator for approval prior to the meeting. All requests and responses will be reported to the PAG.
      v) Canfor, BCTS (Prince George Business Area), and the facilitator will finalize the meeting agenda.
   b) Meeting frequency:
      i) Meetings will be held approximately every 3 to 4 weeks until the pre-audit phase is complete for CSA certification.
      ii) Semi-annual meetings will be held:
         - After CSA certification has been received; and
         - For an annual review of the CSA SFM plan.
      iii) Additional meeting(s) may be called as seen necessary.
   c) Meeting dates - will be confirmed jointly between Canfor, BCTS (Prince George Business Area), and the PAG.
   d) Meeting notices and agendas:
      i) At least two weeks advance notice of meeting dates will be given.
      ii) Generally, the next meeting date will be confirmed at each PAG meeting.
   e) Meeting Location:
      i) Meetings will be held at a time and place most suitable to the members of the group and may vary in time or place to satisfy members' requirements.
      ii) Suggested meeting location(s) is, when possible, the Prince George Civic Centre.
   f) Material, if available, will be provided for review in advance of meetings.
   g) Name - TFL 30 Public Advisory Group (PAG).

D. Timelines

The following summarizes past activities and future key dates for preparing and maintaining the TFL30 SFM plan for CSA SFM Certification.

Past activities included:

1) Initiate PAG Meeting for CSA Certification	September, 2000
2) Complete pre-audit input	February, 2001
3) Post Audit review update	May, 2001
4) Certification audit	June, 2001
5) CSA SFM Certification	July, 2001
6) Registration audits	December 2001 & June 2002

7) Re-registration audit June, 2003

Future activities and key dates include:

1) Public Advisory Group Meeting	Fall, 2003 & Spring, 2004
2) Annual 3rd Party Assessment audit	June, 2004
3) Public Advisory Group Meeting	Fall, 2004 & Spring, 2005
4) Annual 3rd Party Assessment audit	June, 2005
5) Public Advisory Group Meeting using CAN-Z809-02	October 2005 – May 2006
6) 3rd Party Registration audit under CAN-Z809-02	June, 2006

E. Communication and Information

1) Internal to PAG:
   a) Canfor and BCTS (Prince George Business Area) will ensure meeting minutes are distributed following each meeting.
   b) Canfor and BCTS (Prince George Business Area) will provide the PAG with information as it applies to the function and business of the PAG. Confidential business information such as financial or human resource information may be deemed sensitive or proprietary and may not be released.

2) External:
   a) An annual update will be included in the Annual Report [prepared by Canfor and BCTS (Prince George Business Area)], which is distributed beyond Canfor, BCTS (Prince George Business Area) and the PAG. The PAG is to provide feedback on the report.
   b) Only authorized members of the Advisory Group are to speak on behalf of the PAG as agreed to by the group, Canfor, and BCTS (Prince George Business Area).
   c) When communicating with the media, interest groups or the public at large, specific comments will not be attributed to any individual PAG member without his/her prior consent.
   d) If a PAG member wishes to respond to the media, they are to speak on behalf of the interest they represent only and:
      i) Will be respectful of other members and other interest groups; and
      ii) Will not characterize the suggestions or positions of other members or groups in their discussions with the public or media.

3) Internal to Canfor:
   a) Input from the PAG will be reported monthly at the Woodlands Managers meeting.
   b) Implementation reports and updates will be reported every month at the Strategic Planning Team meetings.

4) Internal to BCTS (Prince George Business Area):
   a) Input from the PAG will be reported monthly at BCTS Area Management meetings.
   b) Implementation reports and updates will be reported every month at BCTS Sustainable Forest Management System Committee meetings.

F. Meeting Expenses and Logistics

1) Meeting Expenses (applies to anyone traveling 50 km or more one way):
   a) Travel costs to meetings will be reimbursed at $0.41/km.
   b) Only the member or the alternate is to claim expenses.
   c) Expense forms for the above need to be submitted to Canfor for reimbursement.

G. Roles and Responsibilities

1) PAG Structure:
   a) Members include one representative from each of the following areas:
      Environment
      McLeod Lake Indian Band
      Lheidli T'enneh First Nation
      Forestry contractors (big & small)
      Agriculture/Ranching
      Historical/cultural
      Hunting/Fishing - recreational
      Local Community
      Recreation - commercial
      Recreation - non-commercial, motorized
      Recreation - non-commercial, non-motorized
      Trapping
   b) In addition to the above members, advisors from the following may assist the group:
      BCTS (Prince George Business Area)
      Canfor
      Department of Fisheries and Oceans
      McGregor Model Forest Association
      Ministry of Forests & Range
      Ministry of Environment
      Ministry of Agriculture and Lands – Integrated Land Management Bureau
      Ministry of Energy, Mines and Petroleum Resources
      Socio-economic expertise, as needed
      Other expertise as needed
   c) Quorum for meetings will consist of at least a minimum of 2/3rd of active members.
   d) When members become inactive, the PAG will review the membership and make recommendations to Canfor and BCTS (Prince George Business Area).

2) PAG Member's Role:
   a) To provide input as related to the Defined Goals (see above) as related to the CSA planning processes;
   b) To be prepared, informed and ready for meetings;
   c) To be responsible for reaching consensus and decision making for the PAG;
   d) To act as a liaison between PAG and others from the interest area they are representing;

e) To attend meetings regularly;
f) To ensure that the alternate is informed, up-to-date and prepared prior to the alternate participating in a PAG meeting. This includes providing the alternate with a summary of past meetings in a timely, effective fashion;
g) Initial members will be appointed to the PAG by:
    i) All names of potential representatives to be compiled by Canfor and BCTS (Prince George Business Area);
    ii) Potential representatives for each interest area to discuss and agree as to who will stand as member and alternate, if desired; and
    iii) If the potential representatives cannot select a member or alternate for the interest area, then the existing PAG group will make a recommendation to Canfor and BCTS (Prince George Business Area);
h) Members will be considered inactive when more than 2 consecutive meetings are missed without a valid reason and an alternative is not sent in their place;
i) Inactive representatives or alternatives may be replaced;
j) To replace a member, the existing member or the PAG may make recommendations to Canfor and BCTS (Prince George Business Area) for a potential new representative; and
k) Canfor and BCTS (Prince George Business Area) will confirm appointment of member.

3) Alternate's Role:
    a) An alternate may be appointed for each member.
    b) When an alternate attends on behalf of the member, the alternate agrees to work according to the Terms of Reference.
    c) When the alternate is attending on behalf of the member, the alternate is to come informed, up-to-date and prepared for discussions based on briefing by member.
    d) The alternate and member may both attend the same PAG meeting but only one person will participate in decision making.

4) Observers Role:
    a) The public is welcome to observe the PAG meetings.
    b) Observers may participate in discussions at the discretion of the facilitator.
    c) Will not take part in reaching consensus or decision-making of the PAG.

5) Role of Canfor and BCTS (Prince George Business Area):
    a) To review and consider the recommendations from the PAG;
    b) To make decisions regarding sustainable forest management and certification;
    c) To report to PAG on how recommendations were addressed or not, and provide the rationale for their decisions;
    d) To ensure that meeting minutes are compiled and circulated; and
    e) Not to take part in reaching the consensus process or the decision-making of the PAG.

6) Advisor's Role:
    a) To actively provide information, participate in discussions and provide support to the PAG group;

b) To clarify technical information for the PAG group; and
c) Not to take part in reaching the consensus process or the decision-making of the PAG.

7) Facilitator's Role:
a) To ensure that meetings address agenda topics;
b) To ensure that all members have an equitable opportunity to participate in the meeting;
c) To assist the group in reaching consensus through providing support in summarizing and clarifying issues, recommendations, etc.;
d) Not to take a position on issues; and
e) Not to take part in reaching the consensus process or the decision-making of the PAG.

H. Conflict of Interest:

The PAG recognizes that a conflict of interest could occur if there is a potential for a member (or his or her alternate) to personally and directly benefit from specific recommendations from the PAG. Therefore, if a PAG member or alternate has a perceived or real conflict of interest that could result in a potential exclusive personal economic benefit in relation to his or her input to the Defined Goal & Objectives, that member or alternate, other PAG members and alternates, or Canfor and BCTS (Prince George Business Area) must state the potential conflict. The PAG, Canfor and BCTS (Prince George Business Area) will then decide on what actions are needed.

Potential actions could include asking the member or alternate to:
i) Serve as an observer for the relevant specific issue(s) and recommendation(s);
ii) Take a leave from the PAG (length of term to be defined); or
iii) Carry on with normal participation.

I. Decision Making and Methodology

1. The group agrees to work as follows:
a) Every effort shall be made to achieve consensus.
b) Consensus is defined as no member having substantial disagreement on an issue.
c) Consensus may consist of agreement on a summary of the different perspectives on an issue. This summary would then be forwarded to Canfor and BCTS (Prince George Business Area).
d) When consensus is not reached on a specific issue, the general agreement and dissenting perspectives to be forwarded to Canfor and BCTS (Prince George Business Area).
e) Decisions on specific issues will be considered general agreement, unless agreed otherwise, until there is consensus on the full set of recommendations.

J. Dispute Resolution Mechanism

1. Process Issues – The facilitator will resolve process issues.
2. Technical Issues:
   a) The members will work to identify the underlying issues and work towards a solution in a positive friendly environment.
   b) The members will seek compromise, alternatives and clarification of information as needed.
   c) The members will commit to arriving at the best solution possible.

K. Review of and Revisions to Terms of Reference

The PAG will review the Terms of Reference at least annually.

The approval of and revisions to the Terms of Reference requires the approval of the PAG members, Canfor, and BCTS (Prince George Business Area).