

Fort Saint James Sustainable Forest Management Plan

November 5, 2005

Prepared by:



Public Advisory Group



TAKLA TRACK & TIMBER LTD.
an affiliate of Takla Forest Management Inc.

Preface

The Sustainable Forest Management Plan for Fort St. James was prepared according to the Canadian Standards Association Sustainable Forest Management Standard CAN/CSA-Z809-02.

Several authors and many reviewers contributed in developing key components of this plan. Preparation of this plan was coordinated by:

| Forest Company / BCTS | Name & Title | Signature |
|---|--|------------------|
| Canadian Forest Products Ltd. Prince George Operations | Peter Baird, RPF Strategic Planning Manager | |
| Canadian Forest Products Ltd. Houston Operations | Kevin Horsnell, RPF Woodlands Manager | |
| Takla Track and Timber | Gerry Fraser, RPF Operations Manager | |
| Apollo Forest Products Ltd. | Mike Bell Woodlands Manager <i>On behalf of Apollo Forest Products Ltd., Winton Global, Lakeland Mills Ltd, L&M Lumber Ltd, and Ta Da Chun Timber Ltd.</i> | |
| Stuart Lake Lumber | Andy Little Woodlands Manager | |
| Carrier Lumber Ltd. | Terry Kuzma, RPF Woodlands Manager | |
| BCTS – Stuart Nechako Business Area | Rick Sommer, RPF Timber Sales Manager | |

We would like to thank the Public Advisory Group members for their continued contributions to SFM.

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Executive Summary

This Sustainable Forest Management Plan (SFMP) is the combined efforts of several major licensees and the Fort St. James portion of the Stuart-Nechako British Columbia Timber Sales to achieve Canadian Standards Association (CSA) certification to the CSA Z809-02 standard. The signatories to the plan are:

- Apollo Forest Products
- BC Timber Sales - Stuart Nechako
- Canadian Forest Products Ltd. - Prince George and Houston operations
- Carrier Lumber Ltd.
- Stuart Lake Lumber Ltd.
- Takla Track and Timber Ltd. (managed in this plan by Canfor - Prince George)

The Licensees and BC Timber Sales 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 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 SFMPs and resulting operations, 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 Fort St. James Sustainable Forest Management Plan is dependent upon the commitment of the Licensees and BCTS to meet these objectives.

1.0 Introduction

The forests of northern British Columbia have been a source of natural resources for a variety of uses for generations. In the past century, forests have been chiefly valued for their economic potential. However, society is increasingly coming to realize that forests provide a wider set of values that include social and environmental benefits. The forest industry recognizes that the management of a broader range of values from the forest can occur without detriment to its economic potential. This concept is known as "**Sustainable Forest Management**" (SFM) and has been defined as 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).

To recognize and achieve this wider set of values, SFM requires that these values be considered in operational decision making and implemented during forest operations. This can only be accomplished through a carefully planned management system that ensures both public participation and forest operations are carried out in a systematic and predictable manner that guarantees continual improvement.

Sustainable forest management has attracted the attention of consumers of forest products who are increasingly demanding that the goods they purchase be derived from forests that are managed on a sustainable basis. This demand has resulted in the emergence of forest certification as a dominant factor in the forest industry to assure the public that the management of forests satisfies standards that are considered critical to sustain forest values. The forest industry of British Columbia (BC) is a part of a much larger global forest product marketplace and has increasingly become aware of the importance of certification to maintain its position in this economy. The Fort St. James Sustainable Forest Management Plan (SFMP) was developed to achieve Canadian Standards Association (CSA) certification to the CSA Z809-02 standard and to provide forest managers with a management system to meet SFM objectives.

The Fort St. James SFMP is a working document and will continue to evolve and expand as forestry practices and socio-economic forest values change over time.

1.1 The Fort St. James SFMP & CSA Certification

The primary purpose of the Fort St. James SFMP is to provide an intensive planning document that will meet CSA SFM certification and provide a framework for the participating Licensees and BCTS to implement SFM. The Canadian Standards Association is a not-for-profit membership based association serving business, industry, government and consumers in Canada and the global marketplace. The CSA developed a Sustainable Forest Management Standard in 1996 that was revised in 2002. The Standard describes the requirements for SFM on a Defined Forest Area (DFA) that must be met to achieve certification. This Standard was prepared by the Technical Committee on Sustainable Forest Management and has been approved as a National Standard by the Standards Council of Canada.

The general requirements for sustainable forest management as defined in the Standard are:

- a) compliance with relevant legislation on the Defined Forest Area (DFA);
- b) appropriate values, objectives, indicators, and targets that clearly address the Canadian Council of Forest Ministers (CCFM) SFM criteria and SFM elements in the Standard;
- c) ongoing and meaningful public participation;
- d) progress towards or achievement of performance targets; and
- e) continual improvement in performance.

The Standard provides SFM specifications that include public participation, performance, and system requirements that must be met to achieve certification. These specifications were the framework for the development of the For St. James SFMP.

2.0 The Defined Forest Area

The SFMP, like most forest management plans, is generally prepared for a specified area of forest, including land, water, and range, to which the SFMP is applied. This plan defines the Fort St. James SFMP Area Under The Plan (AUTP) as the Crown forest land base contained within the traditional operating areas of the signatory Licensees and BCTS. A map of the AUTP can be found in Appendix 1.

The DFA for each Licensee/BCTS is delineated by their traditional operating areas (see Appendix 2 for a map of Licensee/BCTS Operating Areas). The following table will serve to define the DFA for each Licensee/BCTS. The DFA is defined as the Crown forested land base within each operating area excluding woodlots, private land, protected areas and parks.

Table 1. Defined Forest Areas for Each Signatory Fort St. James Licensee/BCTS

| Licensee/BCTS | Fort St. James Licensee DFA Areas (gross ha) | % of Total DFA |
|----------------------------------|--|----------------|
| Apollo Forest Products Ltd. | 236,838.8 | |
| Canfor Ltd. – PG & Vanderhoof | | |
| Canfor Ltd. - Houston | | |
| Carrier Lumber Ltd. | 41,605.9 | |
| BC Timber Sales | 316,810.6 | |
| Stuart Lake Lumber Ltd. | 72,901.4 | |
| Takla Track & Timber | 134,291.4 | |
| Total Fort St. James AUTP | 1,817,987.9 | 100% |

2.1 Biophysical Description

The PG TSA is located in the north-central interior of BC, cover approximately 7.5 million hectare of area and is subdivided into three Forest Districts: 1) Fort St. James, 2) Vanderhoof, and 3) Prince George.

The Fort St. James AUTP is comprised of a relatively isolated and sparsely populated land area of approximately 3.174 million hectares (LRMP 1999). This land base contains a diversity of landscapes from the rolling northern interior plateau in the southern portion of the AUTP to the extremely mountainous and largely un-roaded landscapes in the north. The Fort St. James AUTP contains many rivers and lakes, several which are highly valued for tourism and recreational purposes. The AUTP also covers portions of three major river systems: the Skeena to the northwest, the Fraser in the south and the Peace in the eastern portion of the AUTP (LRMP 1999).

An abundance of wildlife is present in the Fort. St. James AUTP, including moose, mule and white tailed deer, elk, cougar, sheep, mountain goat, black and grizzly bear, coyote, wolf and the woodland caribou (LRMP 1999). The area also supports a diversity of small furbearers including beaver, otter, mink, muskrat, fisher, wolverine and marten, and is home to over 173 bird species. Along with these important species of wildlife, the AUTP supports a diversity of wildlife habitat crucial for the long-term survival of resident wildlife species.

Forests within the AUTP consist of primarily lodgepole pine and spruce, with balsam fir at higher elevations and scattered patches of aspen. There are some areas of Douglas fir, primarily along the southern portion of the AUTP as this comprises the northern-most range for the species. The Fort St. James AUTP also contains significant mineral values including jade, gold, and copper.

2.1.1 Natural Disturbance / BEC

The AUTP landscape has also been divided into "Natural Disturbance Units" (NDUs) based on a history of frequent wildfires throughout the Fort St. James area. As referenced by Craig DeLong (2002), the underlying assumption of natural disturbance unit classification is that the biota of a

forest is adapted to the conditions created by natural disturbances such as fire, wind, and insects. This SFMP uses NDUs for several of its landscape level objectives. The NDUs in the AOTP are:

- 1) **Moist Interior (sub-unit Plateau)**
- 2) **Moist Interior (sub-unit Mountain)**
- 3) **Omenica (sub-unit Valley)**
- 4) **Omenica (sub-unit Mountain)**
- 5) **Northern Boreal (sub-unit Mountain)**

NDUs are further divided into "biogeoclimatic ecosystem classification" (BEC) zones. BEC considers the vegetation potential on a site (bio), the use of soils and geology (geo), and the overriding climatic factors. There are 14 BEC zones in British Columbia, with each zone divided into subzones and variants. There are 5 BEC zones in the AOTP:

- 1) **Sub-Boreal Spruce (SBS)**
- 2) **Engelmann Spruce- Subalpine Fir (ESSF)**
- 3) **Interior Cedar- Hemlock (ICH)**
- 4) **Alpine Tundra (AT)**
- 5) **Boreal White and Black Spruce (BWBS)**

See Appendix 3 and 4 for maps of the Fort St. James DFA NDUs and BEC zones.

Forest management in the AOTP is based on the concepts of NDUs and BECs. By basing forest management decisions on the ecology of a site, the changes associated with forest operations should be more consistent with the patterns and structures of natural disturbance.

As research and technology advance in the field of forestry, land classifications and divisions continue to evolve. This SFMP will consider these changes through future adaptive management processes.

2.1.2 Mountain Pine Bark Beetle

The southern portion of AOTP is currently experiencing a substantial infestation of the mountain pine bark beetle (*Dendroctonus ponderosae*), and this infestation continues to encroach further north into the AOTP each year. The mountain pine beetle is an insect that is a natural part of forest ecosystems in the central interior. The causes for the current infestation across the central interior of BC are complex. Fire suppression activities, from a natural disturbance perspective, have interrupted natural cycles of large uncontrolled wildfires. Due to the absence of these events a large supply of mature lodgepole pine (the viable host for the beetle) was made available through much of the central interior, including the Fort St. James AOTP. Historically, cold weather in late October and early November kept mountain pine beetle populations relatively controlled. However, in the last decade warmer weather patterns have developed, resulting in a massive explosion in the pine beetle population across most of central BC.

The exponential growth of beetle populations is affecting both current and future timber supply, as well as causing the decline in the aesthetic qualities of some forest landscapes as large areas of forest die. From an economic perspective, the forest industry is particularly concerned with the utilization of infested timber. If beetle killed trees are not harvested soon after their demise, their wood quality will progressively deteriorate until it becomes unsuitable for use in lumber production. As a result, harvest levels have increased in the AOTP in an attempt to capture the economic value of this timber before it is lost. The Fort St. James AOTP is part of the larger Prince George Timber Supply Area (TSA), occupying approximately 42% of the TSA area. The PG TSA annual allowable cut (AAC) was increased by 2.9 million cubic meters in order to salvage the beetle killed timber. However, this increase in harvesting must be balanced with maintaining other values of SFM. Through the SFMP, management strategies will be developed and implemented to attempt to reduce the impacts of the pine beetle epidemic and restore

infested stands to productive forests. The Fort St. James SFMP is one of three SFMPs developed within the Prince George TSA (others include the Vanderhoof SFMP and the Prince George SFMP). In conjunction with these other plans, the Fort St. James Licensees and BCTS are committed to management regimes that will allow for beetle management that is sustainable and that will promote the overall health of the forest land base.

2.2 Socio-Economic Description

The Fort St. James AOTP had a population of 4,015 according to the 1996 Census (LRMP, 1999). This population is entered primarily within the communities of Fort St. James, Tachie, Yekooche Village, Middle River, Takla Landing and Bear Lake. The largest center in the AOTP is the community of Fort St. James, with a 1996 Census population of 2,209. Fort St. James is located on Highway 27 along the southern shores of Stuart Lake, and is the service center for the smaller communities and remote residences scattered throughout the AOTP. First Nations' communities contribute significantly to the economic and community stability of the AOTP (LRMP 1999).

The Fort St. James economy relies heavily on the forest industry. An estimated 40% of the labor force are directly or indirectly involved in some aspect of forestry, including logging, woodlands, silviculture and milling (LRMP 1999). There are several sawmills and a few value-added operations in the AOTP, with over 50 logging and silviculture contractors also operating within the AOTP. More wood is transported out of the AOTP than remains within its boundaries, with an estimated 55% of wood harvested destined for processing outside the AOTP (LRMP 1999).

Guiding, trapping, outfitting and recreational tourism are also commercial activities taking place within the AOTP. The land base within the AOTP boasts a variety of pristine landscapes and water features, making it a desired vacation destination for many residents of northern BC, southern BC, Canada and even internationally. Visitors to the area are increasing annually by an estimated 15% (LRMP 1999). These include European, American and out-of-Province Canadians.

2.2.1 First Nations

The Fort St. James LRMP area encompasses parts of the traditional territories of four Aboriginal peoples, and is the subject of four land claims. The following are First Nation's communities that have interests in the DFA: McLeod Lake, Nak'azdli, Takla, Tsay Keh Dene band, Tl'azt'en, Yekooche, Gitxsan, Nat'oot'en and Lheidli T'enneh.

As First Nations have historic, cultural, and economic ties to the AOTP, it is important they have an opportunity to provide input into management decisions developed for the AOTP. In appreciation of their association with the AOTP, the participating Licensees and BCTS prepared this SFMP by providing First Nations with the opportunity to participate in its development.

3.0 Developing the SFMP

The Fort St. James SFMP was developed to outline how the participating Licensees/ BCTS will conduct forest management within the AOTP to meet the goals of SFM and to achieve certification under the CSA Z809-02 Standard. This section will provide background information on the Licensees and BCTS who are part of the SFMP and the public participation process, with emphasis on the Public Advisory Group (PAG). It will also provide an introduction to the values, objectives, indicators, and targets that will address the Canadian Council of Forest Ministers (CCFM) SFM criteria and SFM elements in the Standard.

3.1 The Forest Industry

The forestry sector dominates the economy within the Fort St. James Forest District and accounts for 40 percent of basic sector employment. There are 3 major sawmills, as well as smaller primary breakdown facilities and a value-added manufacturing operation.

The Prince George TSA has an Annual Allowable Cut (AAC) of approximately 14,944,000 m³ as of October 1, 2004. Currently, the Fort St. James Forest District has an approximate annual harvest level of 3.6 million cubic meters per year. The combined AAC volumes as percentages of the total AAC apportionment to the AUTP are as follows:

Table 2. Annual Allowable Cut Apportionment – Fort St. James Area Under The Plan

| Licensee Apportionment for the PG TSA | PGTSA AAC (m ³) | Percent of PGTSA AAC (%) | Estimated Annual Harvest in the AUTP (m ³) | Estimated Percent of AAC in the AUTP (%) |
|---|-----------------------------|--------------------------|--|--|
| Apollo Forest Products Ltd. & Associated Companies FL.A18156, A18171, A18163, A17842, and NRFL. A64418 | 1,116,477 | 7.8% | 316,746 | 10.6% |
| Canfor Ltd. FL.A18157, A18165, A18167, A40873 | 3,725,218 | 24.9% | 600,000 | 20.1% |
| Stuart Lake Lumber FL.A18169 | 201,978 | 1.4% | 201,978 | 6.8% |
| BCTS | 2,794,588 | 18.7% | 914,637 | 30.6% |
| Carrier Lumber Ltd. FL.A18158 | 253,027 | 1.7% | 40,000 | 1.3% |
| Canfor Ltd. NRFL. A33801 | 200,000 | 1.3% | 200,000 | 6.7% |
| Takla Track & Timber Ltd. NRFL.A27823 | 200,000 | 1.3% | 200,000 | 6.7% |
| <i>Other Non-Signatory Harvesting rights</i> | 6,452,712 | 38.6% | 415,000 | 13.9% |
| <i>Small Scale Salvage licensees</i> | 0 | 0 | 100,000 | 3.3% |
| TOTAL | 14,944,000 | 100.0% | 2,988,361 | 100.0% |

The estimate of annual harvest in column 4 of Table 2 is taken from a combination of sources. For Licensees whose forest tenure is based within the Fort St. James Forest District, the estimated annual harvest is the TSA apportioned AAC for each licence. The remainder of the Licensees/BCTS have annual harvest rates that are not specific to the Fort St. James Forest District. For this reason, their estimated annual harvest is based on either historic levels of harvest in Fort St. James, or based on an estimate of future harvest levels.

3.2 The Signatories

The Signatories to this SFMP all possess "volume based" timber tenure allocations in the Fort St. James Forest District. "Volume based" tenures, as opposed to "area based" tenures, have no "fixed area" but allow the tenure holder to harvest a specified volume of timber in the larger Timber Supply Area.

Several Licensees operating under volume based tenures within the Fort St. James Forest District and BCTS combined their efforts to develop a cooperative SFMP for the Fort St. James AUTP. They recognized that SFM certification would help maintain or expand their client base while achieving the positive goals of SFM.

The signatory parties are committed to the development, implementation, and maintenance of the SFMP. The signatories are:

- Apollo Forest Products
- BC Timber Sales - Stuart Nechako
- Canadian Forest Products Ltd. - Prince George and Houston operations
- Carrier Lumber Ltd.
- Stuart Lake Lumber Ltd.
- Takla Track and Timber Ltd. (managed in this plan by Canfor - Prince George)

Each company and BCTS has existing initiatives that will contribute to the overall SFM strategy. These may 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 SFMP.

Sections 3.1.1 to 3.1.7 detail background information for each of the signatories to the plan. Where a signatory makes reference to their operating areas as the DFA, these signatories will be seeking CSA certification by December 31, 2007. Other signatories to the plan will be supplying indicator status data to the other signatories on an annual basis, but they will not be seeking CSA certification in the near future.

3.1.1 Apollo Forest Products Ltd.

The DFA for Apollo Forest Products Ltd. is defined by the operating areas assigned to the following Companies/Forest Licenses in the Fort St. James Forest District:

- Apollo Forest Products Ltd. (FL A18156),
- Winton Global Ltd. (FL A18171),
- Lakeland Mills Ltd. (FL A18163),
- L&M Lumber Ltd. (FL A17842), and
- Ta Da Chun Timber Ltd. (NRFL A64418),

as well as the planning cells allocated to the Sinclair Group in Fort St. James (split between Winton Global, Lakeland Mills Ltd., and L&M Lumber Ltd.)

Refer to the map in Appendix 2 depicting the **DFA** for Apollo Forest Products Ltd.

Apollo Forest Products Ltd. (Apollo) is 100% owned by the Anderson and Stewart Families of Prince George (The Sinclair Group of Companies). The Sinclair Group also has controlling shares in both Lakeland Mills and Winton Global located in Prince George, as well as a 50% partnership in L&M Lumber located in Vanderhoof. Through an administration agreement between Apollo and the associated Sinclair companies, Apollo manages each company's forestry activities relating to their operations within the Fort St. James Forest District.

Apollo also has a partnership agreement with the Nak'azdli First Nation in TI'oh Forest Products Ltd – a joint venture valued added processing facility. The forest licence for Ta Da Chun Timber Ltd. (A64418) is tied to this facility. Apollo manages the forestry activities relating to this forest licence on behalf of the Nak'azdli First Nation.

Apollo Forest Products Ltd., along with the associated companies, are committed to Sustainable Forest Management, responsible stewardship of the environment and forest management certification. Certification initiatives already achieved by Apollo Forest Products Ltd. include development and implementation of an Environmental Management System to meet the ISO 14001 requirements.

Environmental Policy

Apollo Forest Products Ltd. is committed to responsible stewardship of the environment throughout our Woodlands operation.

We will:

- Meet or exceed all applicable legislation and regulations.
- Set and review objectives and targets annually.
- Strive towards continual improvement.
- Endeavour to prevent pollution.
- Conduct regular audits and reviews of our Environmental Management System.

3.1.2 British Columbia Timber Sales (BCTS)

The **DFA** for BCTS is defined by its Fort St. James operating areas identified on the map in Appendix 2.

The Small Business Forest Enterprise Program (SBFEP) was initially established in 1978 to help diversify and strengthen British Columbia's forest industry. In June 2001, the Ministry of Forests was directed by government to develop a plan to make the Small Business Forest Enterprise Program more effective and put it on a commercial footing. Since then, significant work has been undertaken to achieve these outcomes. A new program and organization – **BC Timber Sales** – has replaced the SBFEP. The transformation of the small business program is part of widespread policy and organizational change across the Ministry of Forests targeted at revitalizing British Columbia's forest industry. BC Timber Sales (BCTS) was fully implemented on April 1, 2003. BCTS has been set up as an independent organization within the Ministry of Forests, with financial independence from regional and district operations. The new organization will sell timber competitively through auction and has been set up to handle an increase in the volume sold.

The transformation of the SBFEP into the BCTS program also amalgamated a number of forest districts into twelve larger BCTS business areas each with a main timber sales office. The Stuart-Nechako Business Area of BC Timber Sales geographically encompasses the Fort St. James and Vanderhoof forest districts. The administrative, planning and management center for the business area is the Timber Sales Office (TSO) located in Vanderhoof. In addition to the TSO, field teams are located in Fort St. James and Vanderhoof.



ENVIRONMENTAL POLICY

BC Timber Sales (BCTS) manages and administers timber harvesting and related forest management activities on BCTS timber sale licences and related tenures that are sold on Crown forest land throughout British Columbia.

It is the policy of the Stuart-Nechako Business Area 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 for setting and reviewing environmental objectives and targets.
- Monitor and evaluate key BCTS forestry operations.
- Endeavour to prevent or mitigate undesired environmental impacts associated with BCTS forestry operations.
- Communicate BCTS business activities and policies to all staff and make them available to the public.

Original Signed by
Ian Hamann,
Timber Sales Manager
Stuart-Nechako Business Area

Date: February 1, 2005

3.1.3 Canadian Forest Products Ltd (Canfor)

The **DFA** for Canfor is defined by its Fort St. James operating areas identified on the map in Appendix 2.

Canfor is a leading integrated forest products company based in Vancouver, BC. It is the largest producer of softwood lumber and one of the largest producers of northern softwood kraft pulp in Canada. The company also produces paper, plywood, remanufactured lumber products, oriented strand board (OSB) and several other wood products.

Since 1999, Canfor has retained an International Organization for Standardization (ISO) 14001 certification of its environmental management system for its forest operations. Canfor also retains certification under the CSA standard for sustainable forest management for its Tree Farm Licenses in Chetwynd, Englewood, and Prince George, BC, and for its Forest Licenses at Fort St. John, Houston, and Fort Nelson, BC. The company also maintains certification of part of its forest operations in the Prince George TSA to the Sustainable Forestry Initiative (SFI)[®] standard.

Environment Policy (*February, 2005*)

Canfor is committed to responsible stewardship of the environment throughout our operations.

We will:

- Comply with or exceed legal requirements
- Comply with other environmental requirements to which the company is committed
- Achieve and maintain sustainable forest management
- 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

3.1.4 Carrier Lumber Ltd. (Carrier)

The **DFA** for Carrier is defined by its Fort St. James operating areas identified on the map in Appendix 2.

Carrier Lumber Ltd. of Prince George is an integrated forest company that has considerable experience in forestry operations and manufacturing of forest products in the Prince George area.

Carrier Lumber Ltd.'s experience with milling began in 1951 with small bush mills, specializing in salvage and remote operations. Carrier Lumber Ltd. quickly established a reputation for innovative technology and the ability to undertake difficult projects. In 1976, Carrier built its Tabor Mill facility located in Prince George's BCR Industrial site. The facility consists of a two-line dimensional sawmill that directly employs over 130 people from the local community. Today, Carrier Lumber Ltd. remains one of the few privately owned, independent operations in the Central Interior.

Carrier Lumber Ltd. is committed to Sustainable Forest Management, responsible stewardship of the environment and forest management certification. Carrier Lumber Ltd. has developed and implemented an Environmental Management System to meet the ISO 14001 requirements.

Environmental Policy (*September 2003*)

Carrier Lumber Ltd., in the establishment and maintenance of its environmental management system, is committed to:

- Continual improvement and to the prevention of pollution in its forest practices.
- Compliance with all applicable environmental laws and regulations as a minimum standard.
- Providing the framework for setting and reviewing environmental objectives and targets.
- Documenting, implementing, maintaining and communicating our policy throughout our company.
- Ensuring the Environmental Policy is available to the public.

3.1.6 Stuart Lake Lumber Company Ltd.

The **DFA** for Stuart Lake Lumber Company Ltd. is defined by its Fort St. James operating areas identified on the map in Appendix 2.

Stuart Lake Lumber Company Ltd. (SLL) is a family owned and managed company that has been operating in Fort St. James since 1944. Since its early beginnings in Fort St. James, the company has expanded through the same family ownership, from a small operation, to an integrated forest operation, which makes a major contribution to the employment base and economy in Fort St. James. SLL produces dimension lumber and sells it both internationally and locally.

Stuart Lake Lumber's sawmill complex is located 6.5 kilometers north of Fort St. James in the BC Rail Industrial Site. The traditional operating area of the company includes the area south of Cunningham Lake, between Stuart Lake and Grassham Lake, and two areas east of the North Road. Stuart Lake Lumber's goal is to obtain Canadian Standards Association Certification in December 2006.

Sustainable Forest Management (SFM) Policy

Stuart Lake Lumber Company Ltd. is committed to working towards achieving and maintaining sustainable forest management by following the principles listed below:

- Meet or exceed all relevant legislation
- Respect Aboriginal and treaty rights

- Provide for public participation
- Provide participation opportunities for Aboriginal peoples with respect to their rights and interests in SFM
- Provide conditions and safeguards for the health and safety of the DFA-related workers and the public
- Improve knowledge about the forest and SFM and to monitor advances in SFM science and technology and incorporate them where applicable
- Demonstrate continual improvement in SFM

3.1.7 Takla Track & Timber Ltd.

The **licensee operating area** for Takla Track & Timber Ltd. is defined by its Fort St. James operating areas identified on the map in Appendix 2.

Takla Track & Timber (TTT) holds Forest License A27823 (Term 1990-2010) with an Allowable Annual Cut of 200,000 m³. The Forest License operates in the Takla Lake and Sustut River areas of the PG TSA. TTT is owned by seven shareholders - Canfor, Dunkley, Lakeland, L&M, The Pas, Stella Jones, and Sustut Holdings (Necoslie, Tl'azt'en, Takla). Takla Forest Management Inc. (TFMI) is a wholly owned subsidiary of Takla Track & Timber that manages all the activities (planning, logging, hauling, silviculture, rail reload) required to deliver logs from the Forest License area to the shareholder's mills.

3.3 Public Advisory Group

One of the general requirements of the CSA SFM Z809-02 Standard is for "ongoing and meaningful public participation". Public participation is a crucial part of SFM in BC as it recognizes the right of members of the public to be involved with the management of publicly owned forests. By participating in the process, citizens can express their views on how public forests are to be managed, and they can enhance their knowledge of SFM.

One of the public participation strategies suggested in the CSA SFM Z809-02 Standard is the formation of a local group of interested and affected parties to provide input on an ongoing basis. This strategy provided the base for the formation of a Public Advisory Group (PAG) whose purpose is to achieve the following CSA SFM Z809-02 Standard's public participation requirements.

Interested parties shall have the opportunities to work with the organization to:

- i) identify and select values, objectives, indicators, and targets, based on the CSA SFM elements and any other elements of relevance to the DFA;
- ii) develop alternative strategies to be assessed;
- iii) assess alternative strategies and select the preferred one;
- iv) review the SFM plan;
- v) design monitoring programs, evaluate results, and recommend improvements; and
- vi) discuss and resolve any issues relevant to SFM in the DFA.

The Licensees/BCTS established a PAG in the fall of 2004 to assist with developing this SFMP. To promote participation in the PAG, in October 2004 the Licensees/BCTS sent a letter of invitation to approximately 275 individuals as well as five First Nations in the Fort St. James Forest District, advertised in two local newspapers, and hosted an Open House.

Between November 2004 and October 2005, the PAG met on 10 occasions, with an average of 10 public members at each meeting, to undertake the work necessary to develop the SFMP. By the end of 2004 they had developed a Terms of Reference. The door was, and still is, open to any member of the public and First Nations to participate at the PAG meetings.

After completing the Terms of Reference in December 2004, the PAG began work on the SFMP's Criteria and Elements Performance Matrix. The Licensees/BCTS also created a Continuous Improvement Matrix to assist itself and the PAG in tracking issues that could not be addressed at the current time. After completing the SFMP's Criteria and Elements Performance Matrix in May 2005, the PAG met in October 2005 to review the Forecasting Analysis and decide on an option, and to provide comments on the SFMP to the Licensees/BCTS.

See Appendix 5 for a list of the Fort St. James PAG participants, Appendix 6 for the approved PAG Terms of Reference.

4.0 SFM Performance Requirements

The CSA SFM Z809-02 Standard provides a clear set of requirements a SFMP must meet in order to achieve certification. The Standard recognizes that successful implementation of SFM requires both a strong process and comprehensive content. To achieve this, the CSA SFM Z809-02 Standard requires that "values, objectives, indicators, and targets" in the plan clearly address the Canadian Council of Forest Ministers (CCFM) SFM "criteria" and CSA SFM "elements" in the Standard. This section will explain these concepts and how they are related to one another.

4.1 Criteria and Elements

The most broadly accepted forest values created to this point in time are found in the Canadian Council of Forest Ministers (CCFM) criteria and elements. The CSA SFM Z809-02 Standard uses these criteria and elements as a framework for identifying values and to provide consistency in determining local forest values across Canada. The CSA SFM Z809-02 Standard defines criterion and element as follows:

Criterion: A category of conditions or processes by which sustainable forest management may be assessed; characterized by a set of related indicators which are monitored periodically to assess change (Montreal Process 1995). Criteria are meant to be broad management objectives that are proven through the repeated, long-term measurement of associated indicators.

Element: A concept used to define the scope of each CCFM criterion. Each CCFM criterion contains several elements that serve to elaborate and specify the extent of their associated criterion.

The CCFM Criteria and CSA SFM Elements are outlined in Table 3.

Table 3. CCFM Criteria and CSA SFM Elements

| CCFM Criterion | CSA SFM Element |
|--|---|
| 1 - Conservation of Biological Diversity | <ul style="list-style-type: none"> • 1.1 - Ecosystem Diversity • 1.2 - Species Diversity • 1.3 - Genetic Diversity • 1.4 - Protected Areas and Sites of Special Biological Significance |
| 2 - Maintenance and Enhancement of Forest Ecosystem Condition and Productivity | <ul style="list-style-type: none"> • 2.1 - Forest Ecosystem Resilience • 2.2 - Forest Ecosystem Productivity |
| 3 - Conservation of Soil and Water Resources | <ul style="list-style-type: none"> • 3.1 - Soil Quality and Quantity • 3.2 - Water Quality and Quantity |
| 4 - Forest Ecosystem Contributions to Global Ecological Cycles | <ul style="list-style-type: none"> • 4.1 - Carbon Uptake and Storage • 4.2 - Forest Land Conversion |
| 5 - Multiple Benefits to Society | <ul style="list-style-type: none"> • 5.1 - Timber and Non-timber Benefits • 5.2 - Communities and Sustainability • 5.3 - Fair Distribution of Benefits and Costs |

| | |
|--|---|
| 6 - Accepting Society's Responsibility for Sustainable Development | <ul style="list-style-type: none"> • 6.1 - Aboriginal and Treaty Rights • 6.2 - Respect for Aboriginal Forest Values, Knowledge and Uses • 6.3 - Public Participation • 6.4 - Information for Decision-making |
|--|---|

4.2 Values, Objectives, Indicators, and Targets

Using the above Criteria, the Fort St. James PAG needed to identify one or more specific *values* for each element. For each value at least one *objective* had to be defined that described the future condition of that value. Also, each value required one or more *indicator(s)* identified for it. Once an indicator was identified, it in turn needed a *target*. These terms, as defined by the CSA SFM Z809-02 Standard, are as follows:

Value: a characteristic, component, or quality considered by an interested party to be important in relation to a CSA SFM Element or other locally identified element. Example: When considering the CSA Element "*Species Diversity*", a AUTP related value could be "*Sustainable populations of flora and fauna native to the AUTP (natural abundance and distribution of species within their natural range)*".

Objective: a broad statement describing a desired future state or condition of a value. Example: One objective for the value "*Sustainable populations of flora and fauna native to the AUTP (natural abundance and distribution of species within their natural range)*" could be to "*Maintain a range of temporal and spatial distribution of all natural habitats necessary to support native self sustaining populations*".

Indicator: a variable that measures or describes the state or condition of a value. Indicators should be quantitative where possible. Example: Using the previous value and objective, an indicator could be "*The percent of wildlife trees and/or wildlife tree patches associated with areas harvested annually by licensee as measured across the AUTP*".

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. Example: For the above wildlife tree retention indicator, the target could be ">7% by licensee".

One of the Fort St. James PAG's major roles was to help select the indicators to be included in the SFMP. This involved defining what is to be measured and why it is important. During this process the PAG applied a set of quality criteria when assessing proposed indicators. This set included:

- a) Measurability - targets can only be set for indicators that can be measured;
- b) Predictability - indicators whose future levels can be predicted with reasonable accuracy are needed;
- c) Relevance - indicators should be clearly applicable to their associated values;
- d) Understandability - indicators should be simple, clear, and easy to understand;
- e) Validity - indicators should be consistent with the scientific understanding of the value they measure and should be technically valid (objectively obtained, documented, comparable and reproducible); and
- f) Feasible- the process of monitoring indicators should be practical, cost-effective and efficient.

The Licensees, BCTS, and the PAG have established an extensive set of indicators and targets that will be further analysed in Section 5.0 (refer to Appendix 7 for the Fort St. James SFMP Matrix). The next step is to design and evaluate strategies to achieve all identified targets. The process of evaluating a strategy includes an analysis of current management practices and a forecast of the indicator's success in achieving the target in the future.

4.3 Current Management Practices and Forecasts

4.3.1 Current Management Practices

An assessment of the current management practices associated with each indicator will help determine how these practices contribute to SFM. For each indicator in this SFMP if the indicator and its associated target involve activities that are occurring in the forest today, the current management practice is briefly described. Continuing on with the wildlife tree retention example from the previous section, a description of current management practices may be the following:

"Stand level retention, including wildlife trees and wildlife tree patches, is managed by each Licensee and BCTS in the DFA on a site-specific basis. During the development of a cut block, retention areas are delineated based on a variety of factors. Stand level retention generally occurs along riparian features and will include non-harvestable and sensitive sites if they are present in the planning area. Stand level retention also aims to capture a representative portion of the existing stand type to contribute to ecological cycles on the land base. Retention level in each block is documented in the associated Site Plan, recorded in the Licensee's/ BCTS's database systems and reported out in RESULTS on an annual basis."

This information may include tables detailing the historic trends in meeting the indicator target if applicable. Extrapolating past management practices into the present may not always be a reliable method of predicting the future success of that practice in meeting an indicator's target. However, it is useful in providing a base for developing forecasts where specific modeling information is unavailable or insufficient.

Numerical data defining the current status of each indicator is not included in the text of this plan, as this data will not remain static. Therefore, a table of all indicators and their current status for the applicable reporting period is attached to the plan in Appendix 8 so it can be updated independently of the plan text. Data pertaining to the performance of the CSA SFM indicators developed for the Fort St. James SFMP will also be collated in an annual report separate from this document.

4.3.2 Forecasting and Scenario Analysis

The CSA SFM Z809-02 Standard requires explicit forecasts for all indicators. As each indicator is designed to measure a different value within the DFA, 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. Many of the indicators in this SFMP were forecasted by the latter 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 wildlife tree retention indicator and target used in previous examples, a forecast using the "what if" scenario analysis could be as follows:

"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 no stand level retention was 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. Future research and analysis of historical planning may help to identify this point of maximum benefit. If no stand level retention was prescribed, it is expected that biodiversity values would diminish. Wildlife productivity may decline, ecosystem and genetic diversity could decrease and natural patterns across the landscape may 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 might 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, the Licensees and BCTS are committed to achieving the indicator target and will strive to continually improve practices, as new information becomes available. Within the Fort St. James DFA, future trends suggest that stand level retention will remain constant or potentially decrease due to the current mountain pine beetle epidemic."

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.

4.4 Adaptive Management

The concept of "sustainability" is based on the idea that a value is maintained over time. If the management of the AUTF forests is to be sustainable, forest managers must be able to adapt plans and practices to respond to the inevitable changes to the forest resource. The CSA SFM Z809-02 Standard recognizes this and requires SFM systems to be based on the principle of "adaptive management, which enables and encourages the improvement of management actions and practices based on knowledge gained from experience" (CSA, 2002). Adaptive management is used to achieve continual improvement. This is accomplished by regularly monitoring, recording, and assessing the indicators and then modifying forecasts, activities, and plans based on this information.

4.4.1 Monitoring

Monitoring of indicators involves the collection of data to verify the achievement of targets. For each indicator in the SFMP a monitoring strategy will be identified. In many cases, established Licensee/ BCTS EMS frameworks, standard operating procedures, and tracking systems will fill this role.

Collecting the data is the first step. The second is to record the information in such a manner that it can be retrieved for analysis and evaluation. All Licensees and BCTS maintain databases of some form, from traditional paper filing systems to electronic GIS databases such as GENUS rmt. For continual improvement to occur, the recording of monitoring information must be timely, complete, and accurate. Failure to do so will reduce the quality of analysis, evaluation, and adjustment that is required for SFM to succeed.

4.4.2 Analysis, Evaluation and Continual Improvement

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 (if any) 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 analysing data must be objective when determining if changes are required to either the indicators or the strategies used to achieve targets. Cooperation between the PAG and the Licensees/ BCTS is important for continuous improvement of sustainable forest management performance.

4.4.3 Annual Reporting

Communicating the results of the monitoring and analysis stages is important for the process of adaptive management. Without knowledge of the results of indicator performance, the Licensees/ BCTS and the PAG will be unable to recognize problems or take steps to improve them in a timely manner.

The annual report will describe the success in meeting the indicator targets over the AOTP. The report will be available to the public and will allow for full disclosure of forest management activities, successes and failures. It will include the identification of management practices that are not meeting targets and proposed actions to improve and adaptively manage forestry in the AOTP. By creating an annual report, sustainable forest management can be viewed by the public as an open, evolving process that is taking steps to meet the challenge of managing the forests of the Fort St. James AOTP for the benefit of present and future generations.

5.0 SFMP Indicators, Targets and Strategies

In the following sections, each indicator and target developed by the PAG for the Fort St. James DFA is discussed in detail. For each indicator the CSA SFM parameters that it addresses are identified (the CCFM criterion, the CSA SFM element, the value, and the objective). These are followed by descriptions of the indicator, current practices, and a discussion of how the targets were established and how they are to be met. For each indicator a forecast is made of how the target will impact SFM, particularly its ecological, economic, and social values. Finally, a brief discussion of the monitoring and reporting procedures is made, including a description of who is responsible for these activities.

Indicator 1 - Relative Abundance of Ecosystems

| Indicator Statement | Target and Variance |
|--|---|
| Relative abundance of ecosystems (Number / types of habitats). | <u>Target:</u> Within 1 year of predictive ecosystem mapping (PEM) completion, develop ecosystem representation targets. <u>Variance:</u> None |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.1: Ecosystem Diversity Value: Diversity of natural ecosystems that will support function of natural processes for future generations. Objective: Maintain natural diversity/distribution.</p> <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.2: Species Diversity Value: Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). Objective: Ensure habitat for species where ecologically appropriate and maintain a range of</p> |
|---|

temporal and spatial distribution of natural habitats necessary to support native self-sustaining populations.

CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity.

CSA SFM Element 2.1: Forest Ecosystem Resilience

Value: Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions.

Objective: Maintain ecosystems to support natural processes.

Description of Indicator

The relative abundance of ecosystems in the DFA is a measure of its biological richness as each type of ecosystem supports its own community of flora and fauna. Maintaining a representation of a full range of ecosystem types is a widely accepted strategy to conserve biodiversity. This indicator is intended to measure the success of the Licensees/BCTS to develop ecosystem representation targets within 1 year of the completion of predictive ecosystem mapping (PEM). PEM is the stratification of a landscape into map units, according to a combination of ecological features, primarily climate, physiography, surficial material, bedrock geology, soil, and vegetation (Government of BC, 2001a). The PEM planned for the Fort St. James DFA will stratify the landscape according to biogeoclimatic ecosystem classification (BEC), sub-divided by ecosections, biogeoclimatic subzone/variant, site Series, and certain site modifiers using geographic information systems (GIS) and computer modeling.

Once the PEM is completed, the Licensees/BCTS will be able to determine representation targets based on the relative abundance of each BEC subzone/variant unit in the DFA. The development of these targets is important to sustainable forest management because it enables forest managers to plan forestry operations in a manner that does not diminish the natural diversity and resilience of ecosystems in the DFA. If the natural diversity of ecosystems is maintained it is more likely native populations of flora and fauna will be self-sustaining.

Current Practices and Status of Indicator

The predictive ecosystem mapping of the Fort St. James DFA is to be completed by March 31, 2006. The requirements of this indicator will be completed by March 31, 2007.

Up until the completion of PEM, the FSJ licensees/BCTS, within the DFA have used BEC and resource inventory. However, neither provide the site level detail offered by PEM.

Establishment of Targets and Future Practices

The Licensees and BCTS established a target of one year after PEM completion to develop ecosystem representation targets. It was determined that one year was sufficient to complete scientifically valid targets that will accurately reflect current ecosystem representation. It was also felt that one year was not excessive and that the implementation of the targets could commence in a timely manner.

Ecosystem representation targets will be developed for the entire DFA, including parks/protected areas, Timber Harvesting Land Base (THLB) and Non-Harvestable Land Base (NHLB).

Forecasting and Predicted Trends

The target of developing ecosystem representation targets within one year of the completion of PEM is expected to be achieved. The exact level of success is difficult to forecast, as it is dependent on unpredictable factors such as human oversight and technological restraints. However, it is important to identify what the accepted target means to sustainable forest management. Completing ecosystem representation targets in a timely fashion is important for SFM because it will ultimately influence ecosystem diversity. 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 completion within one year of PEM, one other scenario should be identified:

- a) What if it took considerably longer than one year to develop ecosystem representation targets

after the completion of PEM in the DFA?

If it took considerably more time than one year to complete ecosystem representation targets, ecological values could be at risk, and these in turn could affect economic and social values. Establishing representation targets will ultimately contribute to the maintenance of the natural range of variability across the land base. Failure to have such targets established in a timely manner may result in the inadvertent loss of some rare ecosystems, or significantly reduce their area. Loss of this habitat may then reduce the population of plants and wildlife dependant on these sites. This reduction in species richness could then impact non-timber users of the DFA who may value these resources for economic and recreational uses.

Monitoring and Reporting Procedures

The indicator will be tracked and monitored by the Licensees/BCTS. This is a DFA target and will be reported out on a DFA basis. The success in meeting the target will be reported in the annual SFMP for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

The Licensees/BCTS are responsible for ensuring ecosystem representation targets are completed by the target date once PEM is completed. Opportunities for improvement may be found in ways to advance PEM technology, or in additional testing the validity of PEM by ground testing PEM predictions.

Indicator 2 - Old Forest by Natural Disturbance Unit

| Indicator Statement | Target and Variance |
|---|---|
| Maintain "old forest" within each NDU (merged BEC). | <p><u>Target:</u> Maintain average percent of total old forest and not go below minimal natural variation (<i>As per the "Landscape Biodiversity Objectives for the PG TSA"</i>).</p> <p><u>Variance:</u> Within the range of natural variation as per the <i>"Landscape Biodiversity Objectives for the PG TSA"</i>.</p> |

This indicator addresses the following CSA-SFM parameters:

| |
|--|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.1: Ecosystem Diversity Value: Diversity of natural ecosystems that will support function of natural processes for future generations. Objective: Maintain natural diversity/ distribution.</p> <p>CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.1: Forest Ecosystem Resilience Value: Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions. Objective: Maintain the diversity of ecosystem conditions.</p> <p>CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles CSA SFM Element 4.1: Carbon Uptake and Storage Value: Carbon Uptake and Storage. Objective: Maintain processes that take carbon from the atmosphere and store it in forest ecosystems.</p> |
|--|

Description of Indicator

This indicator is intended to quantify the amount of the landscape occupied by "old forests" at a point in time. Old forests (late seral) are defined as forests older than 140 years from available forest inventory sources, for all Natural Disturbance Units (NDUs) with the exception of:

- the Moist Interior- plateau sub-unit- all biogeoclimatic ecosystem classification (BEC) variants
- the Omenica Valley SBSdk, SBSdw3, BWBSdk1, SBSmc2, SBSmk1
- the McGregor Plateau- SBS mk1 and SBSmh

where old forests are considered to be those stands >120 years (Landscape Biodiversity Objectives for the Prince George Timber Supply Area (PG TSA)).

Maintenance of late seral stage stands is crucial for forest management to conserve landscape ecosystem biodiversity and resilience. Old forests often contain unique plant and animal communities that contribute to ecological productivity and forest resilience. Old forests often represent large volumes of stored carbon. Their maintenance helps manage levels of atmospheric carbon that is contributing to climate change.

As harvesting usually targets older stands, forest management must consider how harvesting affects the distribution and percentage of seral stands across the landscape. The current Mountain Pine Beetle epidemic presents its own challenges as older pine leading stands are the most susceptible to infestation. By ensuring the target percentage of old forest by NDU/ BEC within the DFA is met, the long-term viability of those plant and animal species that depend on these forest types will be maintained. Forest ecosystems will also be more resilient by meeting the targets as a diverse ecosystem with representations from all its variations is more able to adjust to change and disturbances.

Current Practices and Status of Indicator

The Landscape Objective Working Group (LOWG), which has representation from the Ministry of Sustainable Resource Management (MSRM), Ministry of Forests and Range (MOFR) and timber licensees, aided MSRM in the development of landscape biodiversity objectives and old forest retention requirements for the Prince George TSA, which includes the Fort St. James DFA. These objectives utilized NDU research conducted by DeLong (2002), and as such, old forest retention objectives have been established for each NDU that occurs within the Fort St. James DFA. The current status of late seral forest within the DFA exceeds the specified targets as per the Prince George TSA Landscape Biodiversity Objectives (refer to Table 4). It is apparent that harvesting activities can continue throughout the DFA as long as levels of old seral are closely monitored to ensure the targets are continually achieved or exceeded.

Table 4. Old Forest in the DFA and Associated Targets

| Unit Label | Natural Disturbance Unit | Merged Biogeoclimatic Units | Current Status as of June 21 st , 2004* % | Target (%) | Target Non-pine Leading (%) | Variance (%) | Forecasting Results (ranging over 260 years) |
|------------|---------------------------|--------------------------------------|--|------------|-----------------------------|--------------|--|
| E1 | Moist Interior | ESSF mv1, ESSF mv3, ESSF mvp1 | 49.2% | >41% | 33% | 0% | xx% |
| E2 | Moist Interior | SBS dk | 55.8% | >17% | 13% | 0% | xx% |
| E3 | Moist Interior | SBS mc2 | 60.5% | >17% | 10% | 0% | xx% |
| E4 | Moist Interior | SBS mk1, SBS wk3 | 39.4% | >12% | 4% | 0% | xx% |
| E5 | Moist Interior | SBS dw3 | 51.8% | >12% | 6% | 0% | xx% |
| E6 | Northern Boreal Mountains | ESSF wvp, ESSF mcp, ESSF mc, ESSF wv | 89.9% | >37% | - | 0% | xx% |
| E7 | Northern Boreal Mountains | SWB mks SWB mk | 80.5% | >37% | - | 0% | xx% |

| | | | | | | | |
|------------|---------------------------|-----------------|-------------|------|---|----|-----|
| E8 | Northern Boreal Mountains | SBS mc2 | 80.6% | >26% | - | 0% | xx% |
| E9 | Omenica Mtn. | ESSF mv | 94.9% | >58% | - | 0% | xx% |
| E10 | Omenica Mtn. | ESSF mc | 84.2% | >41% | - | 0% | xx% |
| E11 | Omenica Mtn. | ESSF mv3 | 70.2% | >41% | - | 0% | xx% |
| E12 | Omenica Valley | SBS dk, SBS dw3 | part of A13 | >16% | - | 0% | xx% |
| E13 | Omenica Valley | ICH mc1 | 91.1% | >23% | - | 0% | xx% |
| E14 | Omenica Valley | BWBS dk1 | 67.5% | >16% | - | 0% | xx% |
| E15 | Omenica Valley | SBS mc2 | 75.6% | >16% | - | 0% | xx% |
| E16 | Omenica Valley | SBS mk1 | 49.5% | >16% | - | 0% | xx% |
| E17 | Omenica Valley | SBS wk3 | 41.6% | >16% | - | 0% | xx% |

*The current status is from the PG TSA Licensees' Memorandum of Understanding on the Order Establishing Landscape Objectives for the Prince George Timber Supply Area, Appendix 9

A landscape analysis has been conducted across the TSA with the results mentioned above. This analysis was completed in 2004, so a new analysis is required for 2005. Some Licensees have also been conducting their own analyses to ensure compliance on their part, but the targets are measured across NDUs/merged BEC, not across operating areas.

Establishment of Targets and Future Practices

Targets for this measure were derived from the Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area. Forest Development Plans (FDPs) or Forest Stewardship Plans (FSPs) will be analyzed to ensure they are consistent with the targets. Proposed harvesting will be adjusted if necessary to ensure compliance with targets, and will be reliant on the degree of surplus of old forest that exists (See the *LLOWG Memorandum of Understanding* for more information in Appendix 9).

Forecasting and Predicted Trends

To be completed once the scenario forecasting is complete (October 15, 2005)

Monitoring and Reporting Procedures

This is a DFA/NDU specific indicator and the responsibility for monitoring and reporting this indicator will occur primarily through the LLOWG. The LLOWG will convene on a yearly bases to update the current and future amount of old forest, and the Licensee apportionment (update harvested blocks, newly planned blocks, aging of forest, and Licensee operating area changes). The data produced by the LLOWG will be used to assess current and anticipated future status of old forest targets. Licensees/BCTS will propose recruitment strategies if targets cannot be met as required. Although the LLOWG group will meet on an annual basis, the analysis will be completed as required by the Prince George TSA Landscape Biodiversity Objectives Reporting Protocol (See Appendix 10).

Responsibility and Continuous Improvement Opportunities

Each signatory Licensee/BCTS has the following responsibilities:

- 1) to provide a representative to participate in the Licensee LOWG (LLOWG)
- 2) to submit, as requested by LLOWG, an update of newly planned blocks
- 3) to submit, as requested by LLOWG, an update of blocks that have been harvested
- 4) to prepare plans that maintain old forest and old interior forest objectives and trend positively toward meeting young patch size distributions, wherever possible
- 5) as requested by other signatory Licensees/BCTS, to collaborate in the planning of old forest, old interior forest or young forest patches along licensee operating area boundaries
- 6) to collaborate in planning recruitment strategies for NDU/BEC units, where old forest or old interior forest targets cannot be met in the short term, and
- 7) to support the LLOWG by providing funding and/or resources, for projects that have been approved by the signatories, to facilitate implementation, monitoring and adaptive management of the landscape objectives.

In addition to these responsibilities, the LLOWG Team will look for opportunities for continual improvement. Substantial loss of old forests in some units is expected due to mortality from the mountain pine beetle infestation and resulting salvage activities. Therefore, the LLOWG has developed a surrogate for old growth, which will include a portion of dead pine stands that contain as many old growth attributes as possible. These surrogate stands are classified as Natural Forest Areas (NFAs). The Licensees/BCTS have identified the use and value of NFAs as a surrogate to old growth as a possible opportunity for continual improvement.

Indicator 3 - Old Interior Forest

| Indicator Statement | Target and Variance |
|---|---|
| Maintain "old interior" forest conditions within each NDU (merged BEC). | <p><u>Target:</u> Greater than or equal to the targets set as per the "Landscape Biodiversity Objectives for the PG TSA", as per above target.</p> <p><u>Variance:</u> As per the Landscape Biodiversity Objectives for the PG TSA.</p> |

This indicator addresses the following CSA-SFM parameters:

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|--|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.1: Ecosystem Diversity Value: Diversity of natural ecosystems that will support function of natural processes for future generations. Objective: Maintain natural diversity/ distribution.</p> <p>CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.1: Forest Ecosystem Resilience Value: Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions. Objective: Maintain the diversity of ecosystem conditions.</p> |
|--|

Description of Indicator

Old interior forest conditions are achieved where 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 habitat needs. 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 and resilience is maintained in the DFA by creating habitat for plants and animals 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. For example, old interior forests provide habitat for Pileated Woodpeckers that feed on forest pest insects.

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 TSA, which includes the Fort St. James DFA. These objectives were established by MSRM 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/Merged BEC that occurs within the Fort St. James DFA. The baseline analysis for the establishment of landscape biodiversity objectives across the Prince George TSA used 200 meters as the buffered distance from younger age classes to calculate the amount of old interior forest.

Table 5 describes the minimum percent of old forest (Indicator 2) that must be old interior condition.

Table 5. Fort St. James DFA Old Interior Forest Requirements

| Unit Label | Natural Disturbance Unit | Merged Biogeoclimatic Units | Minimum percent of the Old Forest required in Table 4 that must be Old Interior Forest (%) | Current Status as of June 21 st , 2004 (%) | Variance (%) |
|------------|--------------------------|--|--|---|--------------|
| E1 | Moist Interior | ESSF mv1 ESSF mv3 ESSF mvp1 | 40% | 46.6% | 0% |
| E2 | Moist Interior | SBS dk | 10% | 65.3% | 0% |
| E3 | Moist Interior | SBS mc2 | 10% | 137.7% | 0% |
| E4 | Moist Interior | SBS mk1 SBS wk3 | 25% | 77.4% | 0% |
| E5 | Moist Interior | SBS dw3 | 25% | 129.1% | 0% |
| E6 | N. Boreal Mountains | ESSF wvp ESSF mcp ESSF mc ESSF wv | 40% | 90.2% | 0% |
| E7 | N. Boreal Mountains | SWB mks SWB mk | 40% | 68.5% | 0% |
| E8 | N. Boreal Mountains | SBS mc2 | 25% | 104.7% | 0% |
| E9 | Omenica Mtn. | ESSF mv | 40% | 58.9% | 0% |
| E10 | Omenica Mtn. | ESSF mc | 40% | 79.8% | 0% |
| E11 | Omenica Mtn. | ESSF mv3 | 40% | 73.1% | 0% |
| E12 | Omenica Valley | SBS dk SBS dw3 | 25% | results combined with A13 | 0% |
| E13 | Omenica Valley | ICH mc1 | 40% | 172.9% | 0% |
| E14 | Omenica Valley | BWBS dk1 | 25% | 171.6% | 0% |
| E15 | Omenica Valley | SBS mc2 | 25% | 228% | 0% |
| E16 | Omenica Valley | SBS mk1 | 25% | 95.7% | 0% |
| E17 | Omenica Valley | SBS wk3 | 25% | 74.3% | 0% |

*The current status is from the PG TSA Licensees' Memorandum of Understanding on the Order Establishing Landscape Objectives for the Prince George Timber Supply Area, Appendix 9

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). As stands age, Licensees and BCTS will have to demonstrate how the dynamics of old interior forest will change and be managed. 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

The current amount of non-pine forest for interior old forest is uncertain. It is suspected that there may be a smaller percentage of non-pine leading forests that meet the interior old forest requirement than is indicated in Table 5. The LLOWG will endeavor to achieve a representative sample of the current pine leading and non-pine leading forests. This measurement's benchmark should be determined through the adaptive management framework. It is predicted that the current Mountain Pine Bark Beetle epidemic will continue and as such adaptive management will be required to keep these objectives current.

Monitoring and Reporting Procedures

This is a DFA/NDU specific indicator and the responsibility for monitoring and reporting this indicator will occur primarily through the LLOWG. The LLOWG will convene yearly to update the current and future

amount of old interior forest and the licensee apportionment (update harvested blocks, newly planned blocks, aging of forest, and licensee operating area changes). The data produced by the LLOWG will be used to assess current and anticipated future status of old forest targets. Licensees/BCTS will propose recruitment strategies if targets cannot be met as required. Although the LLOWG group will meet on an annual basis, the analysis will be completed as required by the PG TSA Landscape Biodiversity Objectives Reporting Protocol (see Appendix 10).

Responsibility and Continuous Improvement Opportunities

The responsibilities of each signatory licensee/BCTS for achieving old interior forest objectives are the same as those outlined in the previous indicator (*Old Forest by Natural Disturbance Unit*).

In addition to these responsibilities, the LLOWG Team will look for opportunities for continual improvement. Substantial loss of old interior forests in some units is expected due to mortality from the mountain pine beetle infestation and resulting salvage activities. Therefore, the LLOWG has developed a surrogate for old growth, which will include a portion of dead pine stands that contain as many old growth attributes as possible. These surrogate stands are classified as Natural Forest Areas (NFAs). The Licensee Team has identified the use and value of NFAs as a surrogate to old growth and interior old growth as a possible opportunity for continual improvement.

Indicator 4 - Young Patch Size Distribution

| Indicator Statement | Target and Variance |
|---|---|
| Maintain a variety of young patch sizes in an attempt to approximate natural disturbance. | <p><u>Target:</u> As per the "Landscape Biodiversity Objectives for the PG TSA".</p> <p><u>Variance:</u> As per the "Landscape Biodiversity Objectives for the PG TSA".</p> |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range.)</p> <p>CSA SFM Element 1.1: Ecosystem Diversity</p> <p>Value: Well-balanced and functioning ecosystems that support natural processes.</p> <p>Objective: Maintain landscapes that support natural processes.</p> |
| <p>CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity</p> <p>CSA SFM Element 2.1: Forest Ecosystem Resilience</p> <p>Value: Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions.</p> <p>Objective: Maintain the diversity of ecosystem conditions.</p> |

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 clearcut harvesting. Patches may be created from a single disturbance event or through a combination of events such as 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

| Patch Size Categories: |
|-------------------------------|
| a) < 50 hectares |
| b) 51-100 hectares |
| c) 101-1000 hectares |
| d) > 1000 hectares |

mechanism and therefore influences the distribution and size of forest patches over much of the 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 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 disturbance 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) has representation from the Ministry of Sustainable Resource Management (MSRM), the Ministry of Forests and Range (MOFR) and timber licensees. This group aided MSRM in the development of landscape biodiversity objectives for patch size distribution for the Prince George TSA, which includes the Fort St. James DFA. These objectives utilized NDU research conducted by DeLong (2002). Young forest patch size distribution objectives have been established for each NDU that occurs within the Fort St. James DFA. Table 6 describes the patch size class distribution by Natural Disturbance Unit (NDU) in the Fort St. James DFA.

Table 6. Young Forest Patch Size Classes by NDU in the Fort St. James DFA

| Natural Disturbance Unit | Patch Size Category | Current Status June 21, 2004* | Target (%) | Trend | Future Condition (2010) |
|---------------------------|---------------------|-------------------------------|------------|-------------|-------------------------|
| Moist Interior Plateau | ≤ 50 ha | 13.6% | 5% | Away | 17.2% |
| | 50-100 | 14.9% | 5% | Away | 18.1% |
| | 100-1000 | 27.1% | 20% | Away | 27.1% |
| | >1000 | 44.4% | 70% | Away | 37.6% |
| Moist Interior Mountain | ≤ 50 ha | 20.2% | 40% | Toward | 40.7% |
| | 50-100 | 28.5% | 30% | Away | 24.0% |
| | 100-1000 | 2.4% | 10% | Away | 27.2% |
| | >1000 | 48.9% | 20% | Toward | 8.0% |
| Omenica Valley | ≤ 50 ha | 13.9% | 5% | Toward | 13.7% |
| | 50-100 | 20.4% | 5% | Toward | 16.8% |
| | 100-1000 | 39.0% | 30% | Toward | 35.1% |
| | >1000 | 26.7% | 60% | Toward | 34.4% |
| Omenica Mountain | ≤ 50 ha | 19.9% | 10% | Toward | 15.4% |
| | 50-100 | 26.4% | 10% | Toward | 23.7% |
| | 100-1000 | 40.0% | 30% | Toward | 33.7% |
| | >1000 | 13.6% | 40% | Toward | 27.2% |
| Northern Boreal Mountains | ≤ 50 ha | 69.6% | 5% | No change | 69.6% |
| | 50-100 | 27.2% | % | No change | 27.2% |
| | 100-1000 | 3.2% | 30% | No change | 3.2% |
| | >1000 | 0.0% | 60% | No change | 0.0% |

The methodology used by the LOWG to calculate young patch included review of current patch size distribution on maps of each Forest District within the Prince George TSA. Each patch that was 0-20 years old was buffered according to the specifications outlined in the following table. Patches that touched, intersected or overlapped were considered to be one larger patch and buffered according to the combined patch area.

Table 7. Buffering Methodology Used in Calculating LOWG Young Patch Size

| Patch Size Category | Distance Required to Separate Patches |
|---------------------|---------------------------------------|
| <50 ha | 150m |
| 51 - 100 ha | 200m |
| 101 - 500 ha | 400m |
| 501 - 1000 ha | 600m |
| >1001 ha | 800m |

As harvesting continues, it is anticipated that the distribution of patches in the appropriate size ranges will be achieved. As the table demonstrates, while current trends will take most patch size distributions toward targets, others will actually be further from achieving objectives due to previous harvesting patterns and the effects of the current infestation of mountain pine bark beetle.

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 DeLong (2002). Specific factors will limit how effective the Licensees and BCTS 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 the mountain pine beetle epidemic. Specific attention will have to be made to change current trends for those NDU patch sizes that are trending away from targets due to Mountain Pine Beetle infestations. The LLOWG has committed to providing rationale to MSRM for those units and patch sizes that are not trending toward targets when patch size distribution information is updated.

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 it creates excessive patches (either alone or by linking existing cutblocks). This will be particularly challenging in areas of high mountain pine beetle infestation. Future practice will involve connecting small and medium patches to create larger patches in order to trend toward larger patch sizes.

Forecasting and Predicted Trends

To be completed once the scenario forecasting is complete (October 15, 2005)

Monitoring and Reporting Procedures

This indicator has a DFA/NDU specific target and will be monitored and reported through the Licensee Landscape Objective Working Group (LLOWG). Data sources used in the monitoring process include forest cover inventory, NDU maps, adjacent licensee planning and harvest history information, and database data. Forest cover inventory information with updates from Licensees and BCTS based on harvesting activities will be reported according to the PG TSA Landscape Biodiversity Objectives Reporting Protocol to ensure forest management is moving toward patch size targets identified through the LLOWG and this SFMP.

Responsibility and Continuous Improvement Opportunities

The responsibilities of each signatory Licensee/ BCTS for achieving patch size targets are the same as those outlined in the previous two indicators (old forest and old interior forest).

Indicator 5 - Large Opening Design

| Indicator Statement | Target and Variance |
|--|---|
| Percent of openings (> 100 ha) harvested annually that meet the large opening design criteria. | <p>Target: >80% of openings.</p> <p>Variance: -10%</p> |

This indicator addresses the following CSA-SFM parameters:

CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).

CSA SFM Element 1.1: Ecosystem Diversity

Value: Diversity of natural ecosystems that will support function of natural processes for future generations.

Objective: Maintain natural diversity/ distribution.

CCFM Criterion: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity

CSA SFM Element: Forest Ecosystem Productivity

Value: A productive forest ecosystem.

Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.

Description of Indicator

Forests in the Fort St. James DFA have historically been shaped by large-scale disturbance events such as wildfires. These fires often created large openings that varied in shape and size, creating a mosaic of stands across the landscape. Forest managers when planning large harvesting openings try to emulate the characteristics of wildfire created stands. To help this planning process, large opening design criteria have been developed that allow planners to assess their harvest designs.

For the purpose of this SFMP, an "opening" consists of the combined area of immediately adjacent planned cut blocks (harvest boundary is identified), harvested cut blocks (<20 years from harvest date), internal and external reserve patches and non-harvested areas within the opening. The design criteria pertains to openings larger than 100 ha. Openings less than 100 ha will be designed on legal requirements for WTP retention.

The design criteria include 3 measures: Shape Index, Reserve Size and Location, and Connectivity.

- **Shape Index**- is a measure of the perimeter of an opening (edge) compared to the area harvested.
- **Reserve Size and Location**: targets for reserve size and location will depend on the opening size. Generally, the larger the opening, the larger the reserves should be, with more of the reserves internally located.
- **Connectivity**: examines the connectivity of reserves between harvest areas for providing travel routes and hiding cover for a variety of wildlife.

See Appendix 11 for a more detailed description of these design criteria. This indicator is important for SFM in that it attempts to recreate landscape patterns that have historically existed in the DFA. By recreating these patterns, habitat characteristics that flora and fauna of the area have become dependant upon are maintained. By applying the design criteria, harvesting patterns should create a mosaic of stands that maintain the natural diversity, productivity and distribution of forest types, and the natural processes that rely on them.

Current Practices and Status of Indicator

The large opening design criteria were developed by Licensees/BCTS as an initiative to be implemented through the SFMP. As such, there is no current status to report for this indicator. Prior to this SFMP, large openings were designed as part of patch size analyses in relation to natural disturbance patterns in the DFA and this theory will be adopted and expanded with the implementation of the large opening design criteria.

Establishment of Targets and Future Practices

The target of >80% of large openings that meet the large opening design criteria has been established to reflect the importance the Licensees and BCTS place on maintaining ecosystem diversity. A higher target may not be possible, as previous harvesting patterns, forest health concerns, and site specific characteristics may hamper opening design. Future practice will involve the implementation of the large

opening design criteria as part of forest planning exercises. These criteria will then be implemented in the field and conformance with the criteria assessed through post harvest inspections.

Forecasting and Predicted Trends

The target of having >80% of large openings harvested annually meeting large opening design criteria is expected to be achieved. The exact level of success is difficult to forecast, as it is dependent on unpredictable events such as forest health factors and site specific constraints. However, it is important to identify what the accepted target means to sustainable forest management. Harvesting patterns that attempt to emulate historic disturbance patterns will ultimately influence ecosystem diversity. 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 >80% consistency, one other scenario should be identified:

- a) What if considerably less than 80% of openings greater than 100ha harvested annually did not meet the large opening design criteria?

If considerably less than 80% of openings greater than 100ha harvested annually did not meet the large opening design criteria, ecological and social values of SFM may be impacted. The application of the large opening design criteria is an attempt to create harvesting patterns that emulate some of the characteristics of historic wildfire disturbance. These wildfires often created stands with large amounts of edge, internal unburned remnant patches, and bands of residual timber that afforded wildlife travel corridors. The flora and fauna in the DFA are adapted to these patterns and rely on them for certain habitat requirements. Failure to recreate these characteristics may impact these species, affecting overall ecosystem diversity. With reduced ecosystem diversity, there may be resulting negative impacts to social values. The public’s intrinsic value with the landscapes of the DFA could be negatively affected and this could further lead to hesitation regarding the implementation of this SFMP and the impacts related to SFM.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. Therefore, individual Licensees and BCTS will track and monitor the number of large openings harvested annually that are consistent with the design criteria. Specifically Licensees/BCTS will assess plans for the operating year and determine the success of achieving the indicator target of >80%. Where possible, harvest schedules will be adjusted to meet the target. At the end of the operating year, Licensees/BCTS are also responsible for determining the indicator percent and including it in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for monitoring, tracking and reporting this indicator. Areas for improvement will focus on maximizing the number of large openings that meet the design criteria, and supporting research into natural disturbance patterns.

Indicator 7 - Plant Species Diversity Index

| Indicator Statement | Target and Variance |
|--|--|
| The number of site association groups identified in Table 6, achieving plant diversity index baseline targets within managed stands. | <p>Target: Annually, maintain the plant diversity index, for each site association group where the baseline target is known, above the baseline target for the site association group.</p> <p>Variance: 0%</p> |

This indicator addresses the following CSA-SFM parameters:

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|--|
| CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). |
|--|

CSA SFM Element: Species Diversity

Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution).

Objective: Ensure habitat for species where ecologically appropriate.

Description of Indicator

Forestry operations can have a dramatic influence over the composition of plants and trees within managed stands. In order for ecosystems to function effectively and maintain their ability to recover from disturbances (such as forest harvesting) they must retain the natural diversity of communities, particularly plants. Plant diversity indices provide a way to measure this diversity.

A plant diversity index is defined as a mathematical measure of species diversity in a community. Diversity indices provide more information than simple counts of the number of species present as they consider the relative abundance of different plants in an area. The diversity of plant species also directly correlates to genetic diversity within a plant community. By using plant diversity indices, forest managers will gain important information about the rarity or commonness of species in a community, which in turn will allow them to plan activities that are consistent with the objectives of SFM. A plant diversity index also provides forest managers with an assessment of plant diversity within managed stands that can be compared against stated targets.

The Plant Diversity index utilized in the Fort St. James AOTP is the Shannon-Wiener Index:

Shannon-Wiener Index: Calculate the total of all individuals (or percent cover) and determine the proportion that each species contributes to the total (p_i). Multiply the proportion of species by the natural log of the proportion. The sum of all the species values is the Plant Diversity Index.

$$H = -\sum_{i=1}^S (p_i)(\ln p_i)$$

Where: H = index of plant diversity, S = the number of species, p_i = the proportion of the total sample belonging to the i th species, and \ln = the natural log

Using plant diversity indices will allow forest managers to assess the levels of plant diversity within manage stands and compare these levels against target standards.

Current Practices and Status of Indicator

Plant diversity indices are not widely used in the AOTP. Data for this measure was taken from information collected for Canfor by Timberline Forest Inventory Consultants Ltd. The following information is from the Canfor 2004-05 SFI annual report for the Fort St. James Forest District:

Table 6. Shannon-Wiener Plant Diversity Index Data for the Fort St. James DFA

| Grouped Site Association | Current Status as of March 31 st , 2005 Mean Shannon-Wiener Index | Shannon-Wiener Target |
|--------------------------|---|-----------------------|
| BI - Oak fern | 2.911 | > 1.968 |
| BI - Rhododendron | 2.853 | > 1.810 |
| PISb - Feathermoss | 3.006 | > 1.286 |
| Sxw - Devil's club | 3.045 | > 2.029 |
| Sxw - Horsetail | 2.753 | > 2.216 |
| Sxw - Huckleberry | 3.297 | > 1.415 |
| Sxw - Oak fern | 3.052 | > 2.041 |
| Sxw - Twinberry | 3.119 | > 2.212 |
| SxwFd - dry | 3.238 | > 2.062 |
| SxwFd - wet | 2.707 | > 1.517 |

Establishment of Targets and Future Practices

Baseline targets were determined for each site association group present in the Fort St. James AOTP by establishing natural regeneration plots within areas that have been affected by a natural disturbance and are of a similar age (see Timberline 2004). Baseline targets have not been established for ALL plant association groups, only those that contributed to the top ten groups (by planned harvest) within Canfor's legacy operating areas. **NEED TO ADD SOME VERBAGE TO THIS SECTION TO INDICATE CONTINUOUS IMPROVEMENT AND LOCALIZATION.**

Forecasting and Predicted Trends

Plant diversity indices can provide an indication of the health and resiliency of an ecosystem, but it is difficult to quantifiably forecast their results. It is also uncertain what effects would occur if plant diversity is not maintained within the natural range of variation. However, it is important to identify what the target means to SFM in the Fort St. James AOTP. Future trends for plant diversity will be forecasted in this SFMP based on a logical analysis of a "what if" scenario:

- a) What if plant diversity falls below the natural range of variation?

Maintaining plant diversity below the natural range of variation would likely have some impacts on disturbed ecosystems. As diversity of plants decreases it could potentially affect the quality of habitat for wildlife. Species requiring specific plants for survival may suffer if their abundance declines. Reduced plant diversity may also affect nutrient cycling within a disturbed area. This may lead to poorer performance of regenerating trees that could in turn potentially reduce the long-term economic value of timber from the AOTP.

Due to the importance plant diversity may have on the ecological and economic values within the AOTP, the Licensees and BCTS are committed to maintaining the plant diversity targets for this indicator.

Monitoring and Reporting Procedures

The source of the data to monitor this indicator has been Northern Interior Vegetation Management Association (NIVMA) permanent sample plots that are randomly distributed through the DFA. Permanent sample plots are re-measured on a fixed schedule, with new plots added over time if needed, or if funds are available. The indicator will use new NIVMA information, as it becomes available.

If NIVMA is discontinued, the Licensees and BCTS will consider monitoring the indicator by collecting information during regular silviculture surveys. This may include implementing the same methodology as used in the Timberline report. Once a survey procedure is developed, a monitoring and reporting plan will be developed and initiated as required.

Responsibility and Continuous Improvement Opportunities

Individual Licensees and BCTS will determine personnel to be responsible for monitoring, tracking, and reporting this indicator. Areas for improvement may include considering other indices that may provide an alternate view of plant diversity.

Indicator 8 - Ungulate Winter Range Objectives

| Indicator Statement | Target and Variance |
|--|--|
| Percentage of cutblocks and roads harvested that are consistent with legally established ungulate winter range objectives. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.2: Species Diversity Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution). Objective: Ensure habitat for species where ecologically appropriate.</p> <p>CCFM Criterion: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.2: Forest Ecosystem Productivity Value: A productive forest ecosystem. Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.</p> |
|---|

Description of Indicator

Ungulates such as mule deer and caribou are found in many parts of the Fort St. James DFA. They are often dependent on suitable winter range conditions in order to survive the severe winters that can occur in the DFA. As such, Ungulate Winter Ranges were established to ensure important foraging sites were managed in an appropriate manner.

An "Ungulate Winter Range (UWR)" is an area that contains habitat that is necessary to meet the winter habitat requirements of an ungulate species. As many UWRs can be directly and indirectly affected by forest harvesting activities, it is important that Licensees and BCTS in the Fort St. James DFA track their location and implement management objectives. UWRs contain unique habitat features; therefore UWR management contributes to ecosystem diversity. Maintaining ungulate populations may enhance species diversity, including carnivore species such as wolves, cougars, and bears that rely on them for prey. Strengthening predator/ prey linkages may also conserve ecosystem productivity, as energy moves through the different trophic levels found in forest ecosystems.

Current Practices and Status of Indicator

A memorandum of Understanding (MOU) on the Establishment of Ungulate Winter Ranges and Related Objectives was developed in August of 2003. The Ministry of Forests, the Ministry of Water, Land and Air Protection (MWLAP), and the Ministry of Sustainable Resource Management (MSRM) created the MOU to meet UWR objectives across the province to support the Forest Practices Code and the new Forest and Range Practices Act (FRPA). In November of 2003 the Deputy Minister of WLAP signed the order outlining the management objectives to maintain ungulate winter ranges. In Fort St. James, all cutblocks approved post implementation of the UWR orders, will be consistent with the management guidelines in the approved Orders for Ungulate Winter Range (#U7-002 and #U7-003). These orders prescribe specific objectives to maintain mule deer and caribou winter range, to provide high suitability snow interception, cover, and foraging opportunities.

More information on the MOU and respective Orders can be found at the Government of BC website http://wlapwww.gov.bc.ca/wld/uwr/ungulate_app.html

Establishment of Targets and Future Practices

All cutblocks approved post implementation of the UWR orders will be consistent with the management guidelines in the approved Order for Ungulate Winter Ranges #U7-002 (Mule deer) and #U7-003 (Mountain caribou). The orders prescribe specific objectives to maintain ungulate winter range, to provide high suitability snow interception, cover, and foraging opportunities.

Forecasting and Predicted Trends

All harvested cutblocks are expected to be consistent with legally established Ungulate Winter Range objectives. The exact level of consistency is difficult to forecast as conditions depend on variables such as human oversight. However, it is important to identify what the accepted target means to SFM. Conservation of ungulate 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% of cutblocks harvested were consistent with legally established ungulate winter range objectives?

Having only 50% of harvested cutblocks consistent with UWR objectives could lead to significant impacts to SFM values. The winter feeding habits of mule deer and mountain caribou are selective and failure to manage their winter range properly could result in an increase in winter mortality. For example, harvesting and road construction performed inconsistently with the UWR orders could reduce forage opportunities that ungulates 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 ungulate populations could potentially reduce forest productivity, as they are important consumers of grasses and other browse species and are a prey source for wolves, bears, and other carnivores.

The "what if scenario" helps to identify some of the potential future impacts of not achieving the stated targets for this indicator. Therefore, the Licensees and BCTS will continue to ensure that 100% of all cutblocks harvested are consistent with legally established ungulate winter range objectives. The indicator will remain at the target of 100% if all processes and protocols are followed.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. As such, the Licensees/BCTS will conduct: 1) pre-work meetings prior to the start of projects; 2) monitoring inspections as the work is progressing; and 3) final inspections once the work is complete, to ensure the commitments specified in the Site Plan are met in all harvested blocks. These initial, interim and final checks are part of each Licensee's/BCTS's Environment Management System (EMS) or other internal tracking system such as Standard Operating Procedures (SOPs). 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 issues can be tracked and mitigated as required. Any non-conformances with legal obligations regarding ungulate winter range management will be reported to the appropriate agency as soon as the incident is detected.

The percentage of harvested blocks, consistent with ungulate winter range objectives will be reported in the annual SFMP report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for being aware of the location of ungulate winter range as specified in Schedule A of the Order for Ungulate Winter Range # U7-002 and 003 and the management objectives outlined in those Orders. When preparing Site Plans, Licensees/BCTS must ensure the management activities prescribed in the plan are consistent with the management objectives in each respective Order as it applies to a particular cutblock. Opportunities for improvement may focus on training for personnel preparing Site Plans to gain more understanding of ungulate winter range objectives.

Indicator 9 - Species at Risk Notices & Orders

| Indicator Statement | Target and Variance |
|---|--|
| The percentage of cutblocks and roads harvested consistent with approved provincial Species at Risk Notice/ Orders requirements as identified in operational plans. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.2: Species Diversity Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution). Objective: Ensure habitat for species where ecologically appropriate.</p> <p>CCFM Criterion: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.2: Forest Ecosystem Productivity Value: A productive forest ecosystem. Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.</p> |
|---|

Description of Indicator

The indicator is intended to monitor the consistency between forest operations with approved provincial Species at Risk Notice/ Orders requirements as identified in operational 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. Under Section 7 of the FRPA (BC Reg. 14/04), the DFA has one Species at Risk Order, "Category of Species at Risk", which took effect in May 2004. This Provincial Order provides a list of species at risk that may be affected by forest or range management on Crown land and require protection in addition to that provided by other mechanisms (Government of BC, 2004b). This order is shown in more detail in Appendix 12. The DFA also has one Notice, "Indicators of the Amount, Distribution, and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Fort St. James Forest District", designed to manage caribou and mountain goat in the DFA (Government of BC, 2004b). This notice is shown in more detail in Appendix 13.

Current Practices and Status of Indicator

Current practice is for all forest operations to be consistent with all FRPA Section 7 Notices and Orders.

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 operational plans was established in recognition of the high value all Licensees/BCTS place on Species at Risk management. Operational plans such as Site Plans will continue to prescribe the most recent management techniques for Species at Risk for the areas they cover. Forestry operations will be supervised and reviewed to ensure any Species at Risk requirements in operational plans are achieved on the ground.

Forecasting and Predicted Trends

All forest operations are expected to be consistent with Species at Risk requirements as identified in operational plans. The long-term success of the Species at Risk objectives is difficult to predict, as 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 as identified in operational plans?

If only 50% of forest operations were consistent with the Species at Risk Notice/Orders requirements 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, the Licensees and BCTS will continue to ensure that 100% of all forest operations are consistent with approved provincial Species at Risk Notice/Orders requirements in operational plans. The indicator will remain at the target of 100% if all processes and protocols are followed.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. Licensee/BCTS will monitor harvesting to ensure consistency with approved provincial Species at Risk Notices/Orders. Areas of inconsistency will be noted and reported in the SFMP annual report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensee/BCTS are responsible for keeping informed and passing on management strategies to field staff. In addition, Foresters responsible for preparing Site Plans must ensure the management strategies included in the site plan are consistent with approved Species at Risk Notice/ Orders requirements. If there are problems in implementing the Site Plan management strategies, action will be taken to improve consistency. These actions may include more intensive supervision and additional training for equipment operators. Continual improvement will also involve increasing knowledge of the interactions between harvesting and Species at Risk.

Indicator 10 - Management Strategies for Specified Wildlife and Plant Species

| Indicator Statement | Target and Variance |
|---|--|
| Indicator 10: Develop management strategies for legally identified wildlife species, CDC ranked blue and red listed species, not already managed under UWR, regionally important species, species at risk, and IWMS, that occur within the DFA and that are likely to be affected by industrial activity. | <p><u>Target:</u> Within 1 year of plan endorsement</p> <p><u>Variance:</u> 0%</p> |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion: Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element: Species Diversity</p> <p>Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and</p> |
|--|

distribution).

Objective: Ensure habitat for species where ecologically appropriate.

Description of Indicator

This indicator involves the development of management strategies for wildlife and plant species identified in the DFA that may be impacted by industrial forestry activities. Legally identified wildlife include those species identified through FRPA Section 7 Notices as described in the previous indicator (indicator #9). In the Fort St. James DFA, there are currently two legally identified wildlife species: caribou and mountain goat. CDC ranked blue and red listed species not already managed under UWR, regionally important species, Species at Risk, and IWMS are all wildlife and plant species or plant communities that have been identified, but there are currently no legal obligations regarding management for these species within the DFA. This indicator is designed to develop management strategies for both categories of wildlife/plants in the DFA within one year of the endorsement of the SFMP if the wildlife/plant species will be impacted by industrial forestry activities.

The following descriptions apply to the above mentioned categories of wildlife and/or plants:

- 1) Legally Identified Wildlife: Wildlife species that have been identified through FRPA Section 7 Notices/Orders as requiring special management as identified in the Notice/Order.
- 2) CDC Ranked Blue and Red Listed Species:
 - a) Red Listed Animal Species and Forested Plant Communities: 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.
 - b) 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.
- 3) Identified Wildlife Management Strategy:
 - a) Regionally Important Wildlife: This category includes species that are considered important to a region of British Columbia, rely on habitats that are not otherwise protected under the FRPA, and may be adversely impacted by forest or range practices.
 - b) Species at Risk: This category includes endangered, threatened, or vulnerable species of vertebrates and invertebrates, and endangered or threatened plants and plant communities that are negatively affected by forest or range management on Crown land and are not adequately protected by other mechanisms.

Some of these above listed species in British Columbia are found in areas of industrial forestry development. Therefore, 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.

Current Practices and Status of Indicator

Development and implementation of management strategies for legally identified wildlife, CDC ranked blue and red listed species, regionally important species and Species at Risk that occur within the DFA (that do not already have strategies in place) requires knowledge of how many forest dependant species inhabit a managed area. Legally identified wildlife species are easily considered with regards to this indicator in the Fort St. James DFA (through FRPA Section 7 Notices/Orders) and currently there are two species to manage for. Wildlife and plants that are included in the remaining categories have been

identified through the use of the BC Conservation Data Center's "BC Species and Ecosystems Explorer" website: <http://srmwww.gov.bc.ca/atrisk/toolintro.html>, maintained by the Ministry of Sustainable Resource Management. The following tables outline all flora, fauna and plant communities identified through this database for the Fort St. James DFA. Management strategies as identified by this indicator will be completed for all identified species that are likely to be affected by industrial forestry activities within the DFA.

Table 8. Species at Risk Flora within the Fort St. James Defined Forest Area by Listing

| Scientific Name | Common Name | Global Status* | Provincial Status* | COSEWIC Listing* | BC Status | IWMS Listing |
|---------------------------------|-------------------------|-------------------|----------------------|------------------|-----------|--------------|
| <i>Astragalus bourgovii</i> | Bourgeau's milk-vetch | Secure | Vulnerable | - | Blue | - |
| <i>Chenopodium atrovirens</i> | dark lamb's quarters | Secure | Critically imperiled | - | Red | - |
| <i>Polemonium boreale</i> | northern Jacob's ladder | Secure | Imperiled/vulnerable | - | Blue | - |
| <i>Polemonium elgans</i> | elegant Jacob's ladder | Apparently secure | Imperiled/vulnerable | - | Blue | - |
| <i>Polystichum kruckebergii</i> | Kruckeberg's holly fern | Apparently secure | Imperiled/vulnerable | - | Blue | - |
| <i>Stuckenia vaginata</i> | sheathing pondweed | Secure | Imperiled/vulnerable | - | Blue | - |
| <i>Woodsia alpina</i> | alpine cliff fern | Apparently secure | Imperiled/vulnerable | - | Blue | - |

*definitions provided after tables

The search on the BC Species and Ecosystems Explorer website was performed on August 18, 2005.

Table 9. Species at Risk Fauna within the Fort St. James Defined Forest Area by Listing

| Scientific Name | Common Name | Global Status* | Provincial Status* | COSEWIC Listing* | BC Status | IWMS Listing |
|--------------------------------------|--|--|--|---|-----------|-----------------------|
| <i>Acipenser transmontanus</i> pop.3 | White Sturgeon (Lower Fraser River population) | Species Apparently Secure, Population Critically Imperiled | Imperiled | Endangered (2003) | Red | - |
| <i>Grus canadensis</i> | Sandhill crane | Secure | Breeding Vulnerable to Apparently Secure | Not At Risk (1979) <i>G. canadensis tabida</i> assessed | Blue | - |
| <i>Gulo gulo luscus</i> | Wolverine, <i>luscus</i> species | Species Apparently Secure, Population Apparently Secure | Vulnerable | Special Concern (2003) | Blue | Identified (May 2004) |
| <i>Martes pennanti</i> | Fisher | Secure | Imperiled / Vulnerable | - | Blue | - |
| <i>Rangifer tarandus</i> pop. 15 | Caribou (northern mountain population) | Species Secure, Population Apparently Secure | Vulnerable to Apparently Secure | Threatened / Special Concern (May 2002) | Blue | Identified (May 2004) |
| <i>Salvelinus confluentus</i> | Bull Trout | Vulnerable | Vulnerable | - | Blue | - |
| <i>Salvelinus malma</i> | Dolly Varden | Secure | Vulnerable to Apparently Secure | - | Blue | - |

| | | | | | | |
|---------------------|--------------|-------------------|------------|----------------------------|------|-----------------------|
| <i>Ursus arctos</i> | Grizzly Bear | Apparently Secure | Vulnerable | Special Concern (May 2002) | Blue | Identified (May 2004) |
|---------------------|--------------|-------------------|------------|----------------------------|------|-----------------------|

*definitions provided after tables

Species are those that breed in Fort St. James Forest District, migrant species are not listed.

The search on the BC Species and Ecosystems Explorer website was performed on August 18, 2005.

Table 10. Plant Communities at Risk in the Fort St. James Defined Forest Area by Listing

| Scientific Name | Common Name | Ecosystem Classification Unit | Provincial Rank | BC Status |
|---|--|--|-------------------------|-----------|
| <i>Amelanchier alnifolia</i> / <i>Elymus trachycaulus</i> | saskatoon / slender wheatgrass | SBS dk/81 | Imperiled | Red |
| <i>Carex lasiocarpa</i> / <i>Drepanocladus aduncus</i> | slender sedge / common hook moss | BWBS dk 1/ Wf05, ICH dk/ Wf05, ICH mc1/ Wf05, ICH mc2/ Wf05, ICH mw1/ Wf05, ICH mw3/ Wf05, ICH vk1/ Wf05, ICH wk1/ Wf05, ICH wk2/ Wf05, IDF dk1/ Wf05, IDF dk3/ Wf05, IDF dk4/ Wf05, IDF dm2/ Wf05, MSdk/ Wf05, MSdm1/ Wf05, MSdm2/ Wf05, SBPS dc/ Wf05, SBPS mk/ Wf05, SBPS xc/ Wf05, SBS dk/ Wf05, SBS mc2/ Wf05, SBS mk1/ Wf05, SBS wk1/ Wf05, SWB / Wf05 | Vulnerable | Blue |
| <i>Danthonia intermedia</i> / <i>Cladina rangiferina</i> | timber oatgrass / reindeer lichen | ESSF mv3 | Critically Imperiled | Red |
| <i>Picea engelmannii x glauca</i> / <i>Spiraea douglasii</i> - <i>Rosa acicularis</i> | hybrid white spruce / hardhack - prickly rose | SBS dw3 / 06 | Vulnerable to Imperiled | Blue |
| <i>Picea spp.</i> - <i>Abies lasiocarpa</i> / <i>Lysichiton americanus</i> | spruces- subalpine fir / skunk cabbage | SBSvk / 10, SBS wk1 / Ws11, SBS wk2 / Ws11, SBS wk3 / Ws11 | Vulnerable | Blue |
| <i>Pinus contorta</i> / <i>Juniperus communis</i> / <i>Oryzopsis asperifolia</i> | lodgepole pine / common juniper / rough leaved ricegrass | SBS dk/ 02 | Vulnerable | Blue |
| <i>Pinus contorta</i> - <i>Picea mariana</i> / <i>Pleurozium schreberi</i> | lodgepole pine- black spruce/ red stemmed feathermoss | SBPS dc/ 04, SBPS dw2/ 07, SBPS dw3/ 05 | Vulnerable | Blue |
| <i>Pinus contorta</i> / <i>Polystichum kruckebergii</i> - <i>Aspidotis densa</i> | lodgepole pine/ Kruckeberg's holly fern- Indian's dream | SBS mw / 00 | Critically Imperiled | Red |
| <i>Pinus contorta</i> / <i>Vaccinium membranaceum</i> / <i>Cladina spp.</i> | lodgepole pine / black huckleberry/ reindeer lichens | SBS vk / 09, SBS wk1 / 02, SBS wk2 / 02, SBS wk3 / 02 | Vulnerable | Blue |
| <i>Poa secunda</i> - <i>Elymus trachycaulus</i> | Sandberg's bluegrass - slender wheatgrass | SBS dk 82 | Critically imperiled | Red |
| <i>Populus balsamifera ssp. trichocarpa</i> / <i>Cornus stolonifera</i> - <i>Rosa acicularis</i> | black cottonwood / red osier dogwood- prickly rose | SBS dk / 08 | Imperiled | Red |
| <i>Pseudotsuga menziesii</i> - <i>Picea engelmannii x glauca</i> / <i>Ptilium crista-castrensis</i> | Douglas fir - hybrid white spruce/ knight's plume | SBS mk1 / 04, SBS mw / 04, SBS wk1 / 04 | Vulnerable | Blue |
| <i>Pseudotsuga menziesii</i> - <i>Picea engelmannii x glauca</i> / <i>Rubus parviflorus</i> | Douglas-fir - hybrid white spruce/ thimbleberry | SBS dh1 / 06, SBS dw1 / 06, SBS mh / 01, SBS mh / 05, SBS mh / 06, SBS vk / 03, SBS wk3 / 03, SBS wk3a / 01, SBS wk3a / 03 | Vulnerable | Blue |
| <i>Pseudotsuga menziesii</i> - <i>Pinus contorta</i> / <i>Cladonia spp.</i> | Douglas-fir lodgepole pine / clad lichens | SBS dw1 / 02, SBS dw2 / 02, SBS dw3/ 02, SBS mh / 02, SBS mh / 03 | Vulnerable | Blue |
| <i>Pseudotsuga menziesii</i> / <i>Pleurozium schreberi</i> - <i>Hylocomium splendens</i> | Douglas-fir / red stemmed feathermoss- step moss | IDF dk3 / 05, IDF dk4 / 07, IDF xm / 06, IDF sm / 06, SBS dk / 04 | Vulnerable | Blue |
| <i>Salix sitchensis</i> / <i>Carex</i> | Sitka willow / Sitka | ICH / Ws06, SBS wk1 / Ws06, SBS | Vulnerable | Blue |

| | | | | |
|---|---|----------------------------|------------|------|
| <i>sitchensis</i> | sedge | wk2 / Ws06, SBS wk3 / Ws06 | | |
| <i>Tsuga heterophylla</i> / <i>Arctostaphylos uva-ursi</i> / <i>Cladonia spp.</i> | western hemlock / kinnikinnick / cladonia lichens | ICH mc1 / 02, ICH mc2 / 02 | Vulnerable | Blue |

Results reflect a 2004 review of plant community Conservation Status Ranks. Biogeoclimatic Site Units 01 and up indicate the community is part of the BC Ministry of Forests site series classification. The search on the website was performed on August 18, 2005.

A plant community is a unit of vegetation with a relatively uniform species composition and physical structure. Plant communities also tend to have characteristic environmental features such as bedrock geology, soil type, topographic position, climate and energy, nutrient and water cycles (Conservation Data Center 2001). Table 11 identifies the plant communities deemed as “at risk” by the Conservation Data Center within the Fort St. James DFA. Rare plant communities are, almost without exception, climax (old) plant communities. Younger successional stages are quite often considered to be different plant communities, though they eventually develop into climax plant communities. For more information on successional status of the plant communities listed in Table 11, see the Conservation Data Center’s website (<http://srmwww.gov.bc.ca/cdc/>).

DEFINITIONS (in relation to above tables):

- 1) **COSEWIC** (Committee on the Status of Endangered Wildlife in Canada) definitions as of May 2004:
Endangered: A wildlife species facing imminent extirpation or extinction
Threatened: A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk: A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

2) Global and Provincial Status

Critically Imperiled: At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.

Secure: Common; widespread and abundant.

Establishment of Targets and Future Practices

Within one year of the SFMP endorsement was chosen as the date to have completed the development of management strategies because it would allow sufficient time to develop strategies but also expedite the process to complete them in a timely manner.

Most wildlife/plant habitat requirements for the above listed categories are sufficiently known to allow the development of special management areas, or prescribe activities that will not interfere with the well being of wildlife/plant species. 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 through operational plans to ensure the protection of species’ habitats.

Forecasting and Predicted Trends

The Licensees and BCTS have established one year from the SFMP endorsement date as the deadline for the development of wildlife/plant management strategies for the DFA and at this time the deadline is expected to be met. As this indicator cannot be quantifiably forecasted it is important to identify what the accepted target means to Sustainable Forest Management. To forecast these indicators, 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 for this indicator is set at achieving development of management strategies

for legally identified wildlife, CDC ranked blue and red listed species, regionally important species, and Species at Risk within one year of the SFM plan endorsement. As such, the analysis may be based on:

- a) What if management strategies for legally identified wildlife, CDC ranked blue and red listed species, regionally important species, and Species at Risk were developed 5 years after endorsement of the SFM plan?

Failure to develop management strategies for these categories of wildlife/plants by the target date may result in forest operations that do not adequately manage for wildlife/plants, thereby possibly resulting in an overall loss of species diversity in the DFA. Extending the timeframe to develop management strategies may ensure the inclusion of relevant scientific data and expertise, but the timeline is not conducive to implementation of this SFMP 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. A delay in management strategy development could result in forest practices that are not conducted based on the best available information on "wildlife/plant species" and therefore may impact those species in the long term. The end result could mean fewer natural and suitable habitats to maintain flora and fauna native to the DFA. Therefore, the Licensees and BCTS are committed to completing management strategy development within one year of the plan's endorsement.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level.

Interim Measures: Until management strategies are developed, available and fully implemented, categories of wildlife/plants identified through this indicator will be managed through the following:

- Consult with wildlife/plant specialists when a Site Plan has been identified as impacting one of these species.
- Protect wetlands and other water bodies adjacent to forest operations with riparian management practices.
- No harvesting or constructing roads within Class A Parks, Protected Areas, or ecological reserves.
- Be consistent with the objectives of Wildlife Habitat Areas, Ungulate Winter Ranges, and General Wildlife/Plant Species Measures where established by government.
- The Licensees and BCTS are committed to training appropriate staff on how to identify and manage for wildlife/plant species as identified in Tables 9, 10 and 11 in the DFA.

Review of management strategy implementation procedures will be completed and reported out in the SFMP annual 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 should be implemented, should not implemented, or is not applicable to the situation.

Responsibility and Continuous Improvement Opportunities

Once management strategies are in place, Licensees/BCTS will be responsible for ensuring all applicable staff have the proper training to incorporate the required management strategies into operational plans. Foresters responsible for preparing Site Plans must ensure the management strategies in the Site Plan are complied with. Continual improvement may involve increasing overall Licensee/BCTS knowledge of the interactions between harvesting and species identified through these indicators. Continual improvement will also involve refinement of tables 9, 10 and 11 to include only those species in the Fort St. James DFA that are affected by industrial forestry activities.

Indicator 12 - Species at Risk

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|----------------------------|
| Percentage of cutblocks and harvested that are consistent with management strategies for | Target: 100% |

| | |
|---|---------------------|
| identified wildlife and CDC blue and red listed species | <u>Variance:</u> 0% |
|---|---------------------|

This indicator addresses the following CSA-SFM parameters:

CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).

CSA SFM Element 1.2: Species Diversity

Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution).

Objective: Ensure habitat for species where ecologically appropriate.

Description of Indicator

Site Plans are the site-specific plans that prescribe harvesting and silviculture activities for a cutblock. They are developed prior to harvesting and address management concerns for the area to be harvested. As such, they are a crucial component of forest management. Identified wildlife and blue and red listed species have been discussed previously in this document (see previous section - *Management Strategies for Wildlife and Plant Species*). If there are Identified wildlife or blue and red listed species identified in, or in proximity to areas to be harvested it will be the Site Plan that will describe the appropriate activities that must be performed to manage those species. By tracking the number of harvested cutblocks that are consistent with prescribed management activities, Licensees and BCTS will be able to evaluate the success of those activities over time. They will also be able to evaluate the consistency of their procedures, and compare them to guidelines and other Licensee approaches to managing identified wildlife or blue and red listed species.

Current Practices and Status of Indicator

Legally identified wildlife are currently being managed for through FDPs/FSP and Site Plans, but no management strategies have yet been developed for blue and red listed species. As mentioned in the previous indicator, there are currently two identified wildlife species in the Fort St. James DFA, the caribou and the mountain goat. Site Plans prescribe appropriate management activities where required, but management for these species is primarily determined through operational plans such as FDPs/FSPs. However, there has not been a coordinated effort to track these harvested blocks, or evaluate the number of blocks that failed to achieve consistency with prescribed management strategies.

Establishment of Targets and Future Practices

The target states that 100% of harvested blocks, within the reporting period, with identified wildlife or blue and red listed species will be consistent with management strategies. As these are species and plant communities that are in some manner under threat, every opportunity to protect them must be made. Where they have been developed, management strategies for identified wildlife or blue and red listed species will continue to be incorporated at the FDP/FSP and Site Plan level. For those species whose management strategies are still being developed, qualified professionals will be consulted as required. Training key personnel directly involved with operational forest management activities to identify blue and red listed species will improve the percentage of plans that properly manage those species. This training will concentrate on field staff who are collecting site level information and creating the FDP/FSP or Site Plan document. Other key staff includes those who review and seal Forest Development Plans, Forest Stewardship Plans, and Site Plans.

Forecasting and Predicted Trends

Planning for identified wildlife or blue and red listed species is an important aspect of forest management in the DFA. The exact level of consistency between harvested blocks and implementation of management strategies for any identified wildlife or blue and red listed species 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 only 50% of blocks harvested with identified wildlife or blue and red listed species were consistent with management strategies?

If only 50% of blocks harvested were consistent with management strategies in the DFA, this may eventually lead to serious damage for any identified wildlife or blue and red listed species. As these are species that are by definition particularly sensitive to disturbance or are in low numbers, harvested blocks that fail to be consistent with identified management strategies could result in considerable impact on overall populations. Ecologically, the overall species diversity of the DFA could potentially be reduced. As the objective of this indicator is to ensure habitat for species where ecologically appropriate, strategies specific to managing these habitats must be met. Failure to do so may threaten the sustainability of the most sensitive species in the DFA.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. Licensees/ BCTS will monitor consistency with management strategies for identified wildlife and blue or red listed species through review of FDPs/FSPs, Site Plans and final harvesting inspections. This information is tracked and retained by Licensees and BCTS in databases such as GENUS or filed in an appropriate manner. The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If a harvested block fails to be consistent with management strategies where identified wildlife or blue and red listed species have been documented, then corrective and preventative actions will be implemented to ensure appropriate mitigative measures are prescribed. The training of key operational personnel to identify blue and red listed species in the field and keeping current with ongoing research could improve the consistency between management strategies and inclusion of these strategies in plans for harvest areas.

Indicator 14 - Stand Level Retention

| Indicator Statement | Target and Variance |
|---|---|
| Percent wildlife trees and/or wildlife tree patches associated with areas harvested annually by licensee as measured across the DFA | <p><u>Target:</u> >7% by Licensee</p> <p><u>Variance:</u> 0%</p> |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element: Species Diversity</p> <p>Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution).</p> <p>Objective: Ensure habitat for species where ecologically appropriate.</p> |
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element: Genetic Diversity</p> <p>Value: Genetic Diversity</p> <p>Objective: Maintain natural genetic diversity.</p> |

Description of Indicator

Stand level retention consists primarily of individual wildlife trees, and wildlife tree patches (WTPs), including riparian management areas. WTPs are forested patches of timber within or immediately

adjacent to a harvested cutblock. Stand retention provides a source of habitat for wildlife, to sustain local genetic diversity, or to protect important landscape or habitat features. Maintenance of habitat through stand level retention contributes to species diversity by conserving a variety of seral stages, structure and unique features at the stand level that many species rely on. These features may include coarse woody debris (CWD) for cover, shrubs for browse, and live or dead standing timber for cavity sites. Stand level retention areas may also help to conserve critical habitat components that support residual populations, aid the re-introduction of populations expatriated by disturbance, and contribute to overall ecosystem function (Bunnell et al. 1999).

Stand level retention that represents natural forest stands within the prescribed area will contribute to the maintenance of the natural range of variability in ecosystem function, composition, genetics and structure. Properly planned stand level reserves can enable forestry-related disturbed sites to recover more quickly and mitigate the effects of the disturbance on local wildlife.

Stand level retention in harvested stands also contribute to a landscape level pattern that attempts to recreate aspects of wildfire disturbance. As a result of a fire event, large areas may be burned and undamaged or lightly burned patches may exist in areas within the burn boundary. Residual unburned patches vary substantially in size, shape and composition. Thus it is essential to design stand level retention to maintain the variability of these characteristics.

Current Practices and Status of Indicator

Stand level retention, including wildlife trees and wildlife tree patches, is managed by each Licensee and BCTS in the DFA on a site-specific basis. During the development of a cut block, retention areas are delineated based on a variety of factors. Stand level retention generally occurs along riparian features and will include non-harvestable and sensitive sites if they are present in the planning area. Stand level retention also aims to capture a representative portion of the existing stand type to contribute to ecological cycles on the land base. Retention level in each block is documented in the associated Site Plan, recorded in the Licensee's/ BCTS's database systems and reported out in RESULTS on an annual basis.

Establishment of Targets and Future Practices

The target for this indicator was established based on past practice for the Fort St. James Licensees/BCTS and on FRPA requirements. Past practice has shown that Licensees/BCTS are maintaining an average of 7% or more retention within harvested areas on an annual basis. FRPA, through the Forest Planning and Practices Regulation also requires that Licensees/BCTS retain greater than or equal to 7% retention based on all areas harvested within a 12-month period.

It is anticipated that the larger the cut block design, the more retention will be associated with the block. Salvage blocks initiated through beetle infestation or blowdown 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 no stand level retention was 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. Future research and analysis of historical planning may help to identify this point of maximum benefit. If no stand level retention was prescribed, it is expected that biodiversity values would diminish. Wildlife productivity may decline, ecosystem and genetic diversity could decrease

and natural patterns across the landscape may 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 might 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, the Licensees and BCTS are committed to achieving the indicator target and will strive to continually improve practices, as new information becomes available. Within the Fort St. James DFA, future trends suggest that stand level retention will remain constant or potentially decrease due to the current mountain pine beetle epidemic.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. As such, information for stand level retention is found in Site Plans and Licensee/ BCTS information tracking systems such as GENUS rmt or Inform. Stand level retention will be measured within the Fort St. James Forest District by Licensee cut block area. The average of all cut blocks harvested between April 1st and March 31st of each year must have >7.0% retention.

Annually, stand retention data will be updated as future blocks are harvested, and then reviewed to ensure targets are being achieved. The results will be reported to Licensees/BCTS and the Public Advisory Group (PAG) as part of the SFMP annual report.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for the monitoring tracking and reporting of this indicator.

A possible opportunity for continual improvement would rely on developing strategies to assess the effectiveness associated with wildlife and biodiversity objectives through stand level retention. The Licensees and BCTS will encourage research to evaluate the success of previous stand level retention in order to improve future WTP design.

Indicator 15 - Thinning/Spacing Prescriptions & Conifer Density

| Indicator Statement | Target and Variance |
|---|--|
| Percentage of thinning and spacing prescriptions implemented annually that specify a post-treatment conifer density greater than the original planting density. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.3: Genetic Diversity Value: Genetic Diversity Objective: Maintain natural genetic diversity.</p> |
|--|

Description of Indicator

Thinning and spacing are silviculture treatments performed on young plantations to reduce the overall number of competing tree stems. This reduction is usually performed when the natural germination of conifers has been so great that the number of trees is too high for the stand to reach its growth potential. In the Fort St. James DFA, this usually occurs in plantations where lodgepole pine has regenerated, as this species has evolved to produce high numbers following a disturbance event, especially fire.

When a block is identified for thinning/spacing, a prescription is prepared describing the post-treatment conifer density. This density should be higher than the density the block was planted at for several reasons. Forests in the Fort St. James DFA (particularly pine forests) were initiated by a natural disturbance event that established conditions suitable for large numbers of young seedlings to become established. Over time, disease, pests, and competition reduced the number of trees until a more stable mature density was established. If too few trees are present in the early stages of the plantation, the subsequent losses due to pests/ disease may result in mature stands that have too few trees, representing a genetic and economic loss. Higher post-treatment conifer densities may also result in higher wood quality as inter tree competition will promote smaller branches and less juvenile wood. This improved wood quality is expected to provide higher economic returns in the future when these plantations are harvested.

The Licensees and BCTS recognize the ecological and environmental values to be gained by having a post-treatment conifer density greater than the original planting density. This indicator is intended to ensure this practice is implemented throughout the DFA.

Current Practices and Status of Indicator

Thinning and spacing prescriptions have been prepared for high-density conifer stands for many years. Each Licensee and BCTS has applied their own standards in these prescriptions for post-treatment conifer density. The result is there has been no overall consistency in spacing/thinning densities, although most have been equal to or exceeded the planting density.

Establishment of Targets and Future Practices

The target of 100% of thinning/spacing prescriptions implemented annually that specify a post-treatment conifer density greater than the planting density was established to meet ecological and economic values of SFM within the DFA. Future silviculture treatment prescriptions will establish target densities in excess of the planting density, and will reflect the forest health conditions of the stand, the species being thinned, and the anticipated future economic value of that plantation.

Forecasting and Predicted Trends

The target of 100% of thinning/spacing prescriptions that will specify a post-treatment conifer density greater than the planting density is expected to be met. The exact level of success in achieving this 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 target means to SFM. 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 only 50% of thinning and spacing prescriptions implemented annually specified a post-treatment density greater than the original planting density?

Failure to have 100% of thinning/spacing prescriptions specify a post treatment density greater than the original planting density may result in long-term ecological and economic problems. Some young forest stands may suffer high mortality from forest health issues such as stem rusts. If higher densities are not present, this mortality may reduce the number of trees to a point where the genetic diversity is unacceptably reduced. Wildlife may have fewer trees for shelter, nesting sites, and feeding. Economically, if there are insufficient trees to offset mortality, there will be fewer trees to harvest at the end of the rotation. This may threaten the future economic values of the DFA.

To maintain the genetic diversity, ecological structure, and economic potential from regenerated forest stands in the DFA, the Licensees and BCTS will strive to ensure the indicator target is met.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. Spacing/thinning prescription information is tracked and retained by Licensees and BCTS in databases such as GENUS or filed in an appropriate manner. Licensees/BCTS will monitor consistency with the

indicator target through a review of treated blocks on an annual basis. The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator and for ensuring that thinning/spacing prescriptions are prepared in accordance with this indicator. Licensees/BCTS are also responsible for overseeing contractors and for ensuring the prescription standards are met in the field. Opportunities for improvement may be found in sponsoring or reviewing scientific research that examines the impact of forest health on young plantations and the role spacing/thinning may play in meeting ecological and economic objectives.

Indicator 16 - Forest Activities within Protected Areas/Parks

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|--|
| Percent of harvest activities that are within protected areas and parks. | <u>Target:</u> 0% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameter:

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| 1) CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.4: Protected Areas and Sites of Biological Significance Value: Protected Areas Objective: Protected Areas identified through Government processes will be respected. |
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Description of Indicator

Protected Areas are areas protected by legislation, regulation, or land-use policy to control the level of human occupancy or activities (Canadian Standards Association, 2002). Categories of Protected Areas identified by the State of Canada's Forests 2001/2002 include protected landscapes, Parks, Multiple-use Management Areas, and nature (wildlife) reserves (Canadian Standards Association 2002). As forest harvesting activities may occur near these areas, the chance exists for harvesting or road construction to happen within these sites. In addition to being an obvious violation of legislation, such an act could also damage sites and organisms that were set aside for protection. Such an event would be a serious failure of sustainable forest management. Tracking the percent of harvest activities that are within protected areas and parks will allow forest managers to determine if there are flaws in the planning and implementation of harvesting activities.

In terms of this indicator, harvesting activities include new harvesting and road building within the DFA.

Current Practices and Status of Indicator

Current practice is to adhere to all legislative requirements, including the respecting of protected areas and parks. Using GIS and spatial databases, operational and site plans are developed and reviewed to ensure no harvesting activities are planned within protected areas or parks. EMS and other tracking system checklists and active supervision of road construction and harvesting are currently used to ensure operational plans are implemented correctly in the field and harvesting activities occur outside of protected areas and parks.

Establishment of Targets and Future Practices

A target of 0% of harvesting activities within protected areas or parks has been established, as there should be no tolerance for errors of this nature. Operational plans have to be prepared with the knowledge of the locations of reserves, and plan implementation must be supervised to ensure objectives are met. Licensees and BCTS will monitor the location of protected areas and parks over time and implement the necessary EMS or other tracking system procedures to ensure proper planning locations, field activities and harvesting operations take place away from Protected Area/Park boundaries.

Forecasting and Predicted Trends

Licensees and BCTS have established a target of 0% of harvesting activities within protected areas and parks 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 target means to SFM. 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% of harvesting activities within protected areas or parks. As such, the following “what if scenario” is used in this analysis:

- a) What if a target of <5% of harvesting activities that are within protected areas or parks was established?

In the terms of landscape level biodiversity, <5% of harvesting activities that are within protected areas or parks would represent a very small area to be harvested or disturbed. However, ecologically it could be quite serious. The area disturbed by harvesting activity within a protected area or a park could be an extremely rare plant community or important habitat for a Species at Risk. Harvesting activities in protected areas or parks could create access to previously inaccessible sites that may then suffer from wildlife poaching, all terrain vehicle use, and other human activities that may be detrimental to these protected sites.

Ensuring the target of 0% of harvesting activities within protected areas or parks is met will help ensure the ecological function of landscape level reserves and preserve the values that society has placed on them.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis by Licensees/BCTS. Monitoring will occur with ongoing supervision of harvesting operations and as a component of EMS and other inspections. The Licensees/BCTS will ensure digital data for protected areas and parks are updated as necessary. The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If harvesting activities occur within a protected area or park, the appropriate agencies will be notified. Improvements in operational and site plan development and implementation, either by training, increased supervision or other methods may be adopted if required.

Indicator 17 - Wildlife Habitat Guidelines

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|--|
| Percentage of cutblocks and roads harvested that are consistent with established guidelines for wildlife habitat features. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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| 1) CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.4: Protected Areas and Sites of Biological Significance Value: Sites of Biological Significance Objective: Sites of Biological Significance are identified and appropriately managed. |
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Description of Indicator

Legally established Wildlife Habitat Features are identified under the Government Actions Regulation of the Forest and Range Practices Act (FRPA) of British Columbia. Section 70-2 of the Forest Planning Practices Regulation of the FRPA states:

"An authorized person who carries out a primary forest activity must ensure that the primary forest activity does not damage or render ineffective a wildlife habitat feature" (Government of BC, 2004c).

Site Plans are the site-specific plans that prescribe harvesting and silviculture activities for a cutblock. They are developed prior to harvesting and address management concerns for the area to be harvested. If there are wildlife habitat features in or adjacent to an area to be harvested, the Site Plan must be consistent with the guidelines established for that area to be compliant with legislation and to protect sites of biological significance in the DFA.

By tracking the number of harvested cutblocks that are consistent with established guidelines for wildlife habitat features, Licensees and BCTS will be able to evaluate the success of those activities over time. They will also be able to evaluate the consistency of procedures by comparing them to the guidelines and other Licensee approaches to managing sites of biological significance.

Current Practices and Status of Indicator

Currently, there are no identified wildlife habitat features within the Fort St. James DFA. However, when and where wildlife habitat features are encountered within cutblocks prior to harvest, site level management strategies will be developed and implemented.

Establishment of Targets and Future Practices

A target of 100% of cutblocks harvested that are consistent with established guidelines for wildlife habitat features was established to meet legal and ecological requirements of SFM. As they are developed, management guidelines for wildlife habitat features will be included in and implemented through the appropriate Site Plans.

Forecasting and Predicted Trends

It is anticipated that there will be no problems in achieving the indicator target. The exact level of consistency with established guidelines for wildlife habitat features in cutblocks harvested is not easy to quantifiably forecast over a defined time frame, as it may be subject to human oversight. However, it is important to identify what the accepted target means to SFM. 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 only 50% of cutblocks harvested were consistent with established guidelines for wildlife habitat features?

As harvesting and silviculture activities are directed by Site Plans, failure to have consistency between harvested blocks and wildlife habitat feature guidelines within these plans could lead to the degradation of wildlife habitat features. As these are features that are by definition particularly sensitive to disturbance or are in low numbers, having half of the cutblocks harvested in the DFA fail to follow established guidelines for them could result in considerable impact on the areas and the species that depend on them. Ecologically, the overall species diversity of the DFA could be reduced. As the objective of this indicator is appropriately manage sites of biological significance, guidelines specific to managing these sites must be followed. Failure to do so may threaten the sustainability of the most sensitive species in the Fort St. James DFA.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis by each Licensee/BCTS. Licensees/ BCTS will monitor consistency with established guidelines for wildlife habitat features through review of Site Plans and subsequent final harvest inspections. This information is tracked and retained by Licensees and BCTS in databases such as GENUS or filed in an appropriate manner. The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If a harvested cutblock fails to be consistent with established guidelines for wildlife habitat features then corrective and preventative actions will be identified to ensure appropriate mitigative measures are prescribed. The training of key operational personnel to identify sites of biological significance, specifically wildlife habitat features, and ongoing research should help improve the consistency between cutblocks harvested and management strategies prescribed in Site Plans.

Indicator 18 - Map of Sites of Biological Significance

| Indicator Statement | Target and Variance |
|--|--|
| Develop a DFA map for sites of biological significance; including Ungulate Winter Ranges, known habitats of red and blue listed species and plant communities, and sites of unusual or rare forest conditions. | <p><u>Target:</u> Within one year of endorsement of the plan.</p> <p><u>Variance:</u> 6 months</p> |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.4: Protected Areas and Sites of Biological Significance</p> <p>Value: Sites of Biological Significance</p> <p>Objective: Sites of biological significance are identified and appropriately managed.</p> |
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Description of Indicator

Sites of biological significance include Ungulate Winter Ranges (UWRs) (*see indicator # 8 for information on UWRs*), sites that support red and blue listed plant communities and rare ecosystems (*see indicator #11 for a list of these communities*), and sites of unusual or rare forest conditions. The latter can not be identified from current established lists, but may be unique to the DFA and warrant identification. 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.

The protection of all forest components is an integral aspect of SFM, which recognizes the value of all organisms to the health of the forest ecosystem. By developing a map for sites of biological significance, forest managers will have a better tool for identifying these areas when planning forest activities and ensure appropriate management actions are prescribed.

Current Practices and Status of Indicator

Individual Licensees and BCTS use a variety of maps, Geographic Information Systems (GIS) and databases to identify sites of biological significance. However, to date there has not been one map consistently used that shows all these areas in the DFA.

Establishment of Targets and Future Practices

The target of one year to produce a DFA map of biological significance was determined to be a time period that would allow for a comprehensive and accurate map to be developed in a timely manner. A 6-month variance was established to allow for additional pertinent data to be included that might arise during the map's development. Future practices will involve the implementation of this map coverage during forest planning exercises and subsequent field activities in order to adequately identify and manage sites of biological significance, including sites already identified through other processes (e.g. UWRs).

Forecasting and Predicted Trends

The Licensees and BCTS anticipate the DFA map for sites for biological significance will be completed by the target date. This indicator will not be easy to quantifiably forecast over a defined time frame, as the

number of sites come from a myriad of sources and delays may occur in consolidating the information. However, it is important to identify what the accepted target means 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 one year of the commencement of the plan for a DFA map for sites of biological significance to be developed. The following “what if scenario” is used in this analysis:

- a) What if it took significantly longer than one year from the endorsement of the SFMP to develop a DFA map for sites of biological significance?

Development of this map in a time frame that is significantly longer than one year from commencement of the SFMP may result in forest activities being planned for sites of biological significance that the planner was unaware of. This may result in the degradation or destruction of unique plant communities and the wildlife that depend on them for habitat.

In addition to potential damage to sites of biological significance, there are other possible impacts to SFM. Society's opinion of industrial forestry could be lowered, and possibly lead to product boycotts that could harm the financial viability of the industry. Society may also suffer more non-quantifiable spiritual losses if it felt it was witnessing the destruction of sites of biological significance.

The Licensees and BCTS realize the potential losses to the ecological, economic, and societal values from a failure to manage sites of biological significance properly could be unacceptable. The development of a DFA map for sites of biological significance in a timely manner will aid the identification and management of these areas.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed by the Licensee/BCTS group. Licensees and BCTS will track the progress of the map's development once the SFMP is endorsed. This progress will be reported in the annual SFMP report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for initiating the development of the DFA map for sites of biological significance. Areas for improvement may be found in training key personnel in identifying and managing the presence of sites of biological significance.

Indicator 19 – Management Strategies for Sites of Biological Significance

| Indicator Statement | Target and Variance |
|--|--|
| Develop a management strategy for each biological significance site classification type within the DFA that is likely to be affected by industrial forestry activities | <u>Target:</u> Within 6 months of completion of the biological significance map <u>Variance:</u> 6 months |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.4: Protected Areas and Sites of Biological Significance Value: Sites of Biological Significance Objective: Sites of biological significance are identified and appropriately managed.</p> |
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Description of Indicator

This indicator evaluates the success of developing specific management strategies for each identified site of biological significance (that does not already have one legally established) within the DFA that is likely to be affected by industrial forestry activities. As discussed in the previous indicator, various sites of biological significance potentially exist in the Fort St. James DFA. The Licensees/BCTS have set a target

date of 6 months after the completion of the sites of biological significance map (*see previous indicator*) to develop management strategies for these sites.

This indicator is important for SFM because once these strategies are in place, Site Plans will describe the actions needed to achieve these strategies on a site-specific basis. On the ground practices can only manage sites of biological significance if the strategies for their management are in place and are ready for implementation.

Current Practices and Status of Indicator

Many sites of biological significance have management strategies in place. These include Ungulate Winter Ranges, and protected areas. The DFA map of sites of biological significance is intended to provide a comprehensive view of all sites, including areas that may not currently have management strategies developed. The sites that will require management strategies to be developed are to be identified on this map which has not been developed yet. Therefore, the map's development will influence the progress of this indicator.

Establishment of Targets and Future Practices

The target of developing management strategies for sites of biological significance within 6 months of the completion of the sites of biological significance map was determined to be a sufficient amount of time to properly prepare effective strategies. Strategies will be developed in accordance with legislative requirements and current research data. A variance of 6 months has been set to allow for unforeseen delays in strategy development. Once the strategies are completed it is anticipated they will be included in site plans and implemented in the field where required.

Forecasting and Predicted Trends

It is anticipated that all sites of biological significance will have management strategies developed within 6 months of the completion of the sites of biological significance map. The exact level of success in meeting the target is difficult to forecast as it is subject to information collecting and analysis. However, it is important to identify what the accepted target means to SFM. 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 6 months from the completion of the biological significance map:

- a) What if it required significantly longer than 6 month to develop a management strategy for each site of biological significance upon completion of the biological significance map?

If it required significantly longer than 6 months to develop management strategies for each site of biological significance upon completion of the map, the chance may exist for one or more of the sites to be damaged by industrial forestry activities in the interim. While some sites may have well established management strategies, others may not. Planners may not be aware of the best method for conserving and protecting these areas if they are not fully identified and management strategies are not developed. Species that depend on these sites may also suffer from their degradation.

In addition to reduction in ecological values, there are other potential impacts. As sites of biological significance may receive general public use, their potential degradation could result in their social value decreasing. Failures to implement strategies may also cause delays in harvesting operations, resulting in potentially negative economic repercussions.

As the above scenario suggests, failure to achieve the indicator target could impact ecological, social, and economic values of sustainable forest management. As such, the Licensees and BCTS are committed to achieving 100% consistency with the target.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed by the Licensee/BCTS group. Licensees and BCTS will monitor the progress of strategy development once the sites map is complete. The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for initiating the development of management strategies and monitoring their progress. Improvement opportunities may arise from the support of current research into management of sites of biological significance.

Indicator 20 – Adherence to the Management Strategies for Sites of Biological Significance

| Indicator Statement | Target and Variance |
|---|------------------------------|
| Percentage of cutblocks and roads harvested that adhere to the management strategies for the mapped sites of biological significance. | Target: 100% Variance: 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.4: Protected Areas and Sites of Biological Significance</p> <p>Value: Sites of Biological Significance</p> <p>Objective: Sites of biological significance are identified and appropriately managed.</p> |
|---|

Description of Indicator

This indicator evaluates the consistency between harvested cutblocks/roads and specific management strategies for sites of biological significance. As discussed in previous indicators, various sites of biological significance potentially exist in the Fort St. James DFA and the Licensees/BCTS plan to develop management strategies for those sites that do not already have legally established management strategies. Management strategies are of little use if they are not included in Site Plans, which prescribe their implementation in the field, and then reviewed post harvest to ensure consistency. This indicator will therefore help meet the SFM objective of appropriately managing sites of biological significance.

Current Practices and Status of Indicator

This indicator is intended to evaluate adherence to strategies developed for areas identified on the DFA biological significance map (*see indicator #18*) in all harvested cutblocks and roads. While the biological significance map has not been created yet, all Licensees and BCTS currently have systems in place to evaluate the content of Site Plans to ensure they adhere to existing management strategies for sites of biological significance and to ensure harvested cutblocks and roads are consistent with these strategies. Remaining strategies will be developed within 6 months of the map's completion (*see indicator #19*) and included in Site Plans and subsequent harvested cutblocks and roads as required.

Establishment of Targets and Future Practices

Ensuring harvested cutblocks and roads adhere to management strategies developed for mapped sites of biological significance is important to meeting the goals of SFM. For this reason the Licensees/BCTS established a target of 100% of cutblocks and roads harvested to adhere to these strategies, with a 0% variance. Licensees/BCTS will continue to evaluate and review Site Plans prior to their implementation in the field to ensure the appropriate management strategies are included. Harvested cutblocks and roads will be assessed through final harvest inspections to ensure adherence to any prescribed management strategies.

Forecasting and Predicted Trends

The indicator target is anticipated to be met. However, it is important to identify what the accepted target means to SFM. 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 only 50% of cutblocks and roads harvested adhered to the management strategies for the mapped sites of biological significance

Failure to adhere to management activities in half of cutblocks and roads harvested may cause detrimental impacts to identified sites of biological significance within the DFA. As sites of biological significance are by definition particularly sensitive to disturbance or are in low numbers, a few harvested blocks that fail to adhere to management strategies could result in considerable impact on the overall number of these sites and the species that depend on them.

There may be other potential impacts to values of SFM besides ecological ones. As sites of biological significance may receive general public use, failure to adhere to management strategies could result in overall social values decreasing. Sites of biological significance that are damaged due to lack of adherence to management strategies may require costly remediation or rehabilitation, thereby also impacting the DFA's economic values.

As the above scenario suggests, failure to achieve the indicator target could impact ecological, social, and economic values of sustainable forest management. As such, the Licensees and BCTS are committed to achieving the 100% target.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis by each Licensee and BCTS. Licensees/BCTS will monitor consistency with management strategies for mapped sites of biological significance through review of Site Plans and final harvest inspections. Site Plan and final harvest information is tracked and retained by Licensees and BCTS in databases such as GENUS or filed in an appropriate manner. The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If harvested cutblocks and roads do not adhere with the management strategies for mapped sites of biological significance, corrective and preventative actions will be identified to improve consistency. Improvements in Site Plan development and review and tracking of post harvest information will be adopted as required.

Indicator 21 – Conversion of Non-Forest Types (cutblock level)

| Indicator Statement | Target and Variance |
|---|--|
| Percentage of cutblocks harvested having mappable non-forested types (> 0.5 ha) that are artificially converted to forested types through afforestation treatments. | <u>Target:</u> 0% <u>Variance:</u> +20% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range). CSA SFM Element 1.4: Protected Areas and Sites of Biological Significance Value: Sites of Biological Significance Objective: Maintain naturally occurring non-forested types.</p> <p>CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles CSA SFM Element 4.2: Forest Land Conversion Value: Maintenance of total forest land. Objective: Maintain naturally occurring non-forested (non-treed) types.</p> |
|---|

Description of Indicator

Many cutblocks contain mappable non-forested types. For this SFMP "mappable" refers to areas greater than 0.5 ha. Non-forested types include wetlands, rock outcrops, grasslands, brush, or other areas that are not dominated by trees. These types may be valuable sites for wildlife, or may represent unique and

unusual features that should be preserved in their non-forested state. If these types are not identified as being excluded from a planting area, they may be planted, either intentionally or non-intentionally, and converted to forest.

Sustainable forest management seeks to maintain the landscape diversity of the DFA and this indicator is intended to achieve this by preventing the afforestation of naturally occurring non-forested types.

Current Practices and Status of Indicator

All Licensees and BCTS prepare planting contracts that describe areas to be planted. This is usually completed through maps and contract schedules that list particular block stratum to be planted. While most Licensees and BCTS do not have formal policies preventing the planting of naturally occurring non-forested types, it is not common practice to do so. Planting these sites is not legally required (unless the Site Plan included them in the Net Area to Reforest), and it would be uneconomical to pay for the afforestation of sites where trees are likely not suitable to grow.

Establishment of Targets and Future Practices

In order to maintain naturally occurring mappable non-forested types in cutblocks, the Licensees and BCTS have established a target of 0% of these sites to be artificially converted to forest types through afforestation treatments. Licensees and BCTS will establish policies for Site Plan development to ensure these areas are not included in the Net Area to Reforest, and they will ensure planting contracts clearly identify these areas to be excluded from the planting area in all harvested cutblocks.

Forecasting and Predicted Trends

The indicator target is anticipated to be met. However, it is important to identify what the accepted target means to SFM. 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 0%:

- a) What if 50% of mappable non-forested types (>0.5 ha) within cutblocks were artificially converted to forested types through afforestation treatments?

Mappable non-forested types within cutblocks may represent valuable habitats that should remain un-forested. Some shallow wetlands could be drained and converted to forest cover, but these sites can be important waterfowl and amphibian habitat and should be preserved. Grass/ shrub plant communities may be important foraging areas for ungulates and bears. In addition to their ecological value, these areas may also have social value. Open meadows/wetlands may be valuable hunting or berry picking areas, or popular camping sites. Others may be valued for their aesthetics. These non-forested types are part of the mosaic of ecosystems in the DFA, and should be maintained as a part of SFM.

As the above scenario suggests, failure to achieve the indicator target could impact ecological, and social values of sustainable forest management. As such, the Licensees and BCTS are committed to achieving the stated target.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. The locations of mappable non-forested types (>0.5ha) within cutblocks is included in the Site Plans for those cutblocks. Site Plan and planting information is tracked and retained by Licensees and BCTS in databases such as GENUS or filed in an appropriate manner. Licensees/BCTS will determine the indicator percent after the completion of planting and include the information in the annual SFMP report for the operational year April 1st to March 31st

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If mappable non-forested types are planted, corrective and preventative actions will be identified to improve the achievement of this indicator in the future. Improvements in Site Plan development and planting supervision will be adopted if required.

Indicator 22 – Conversion of Non-Forest Types (Landscape level)

| Indicator Statement | Target and Variance |
|---|----------------------------------|
| Existing areas of non-forested types artificially converted to forested types | Target: 0 ha. Variance: 0 ha. |

This indicator addresses the following CSA-SFM parameters:

| |
|--|
| <p>CCFM Criterion: Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element: Protected areas and sites of biological significance.</p> <p>Value: Sites of biological significance.</p> <p>Objective: Maintain naturally occurring non-forested types.</p> |
| <p>CCFM Criterion: Forest ecosystem contributions to global ecological cycles.</p> <p>CSA SFM Element: Forest Land Conversion</p> <p>Value: Maintenance of total forest land.</p> <p>Objective: Maintain naturally occurring non-forested (non-treed) types.</p> |

Description of Indicator

The Fort St. James DFA contains a variety of non-forested types that exist at the landscape level. These types may be wetlands, rock outcrops, grasslands, brush, or other areas that are not dominated by trees. These types may be valuable sites for wildlife, or may represent unique and unusual features that should be preserved in their non-forested state.

Sustainable forest management seeks to maintain the landscape diversity of the DFA and this indicator is intended to achieve this by preventing the afforestation of naturally occurring non-forested types.

Current Practices and Status of Indicator

All Licensees and BCTS prepare planting contracts that describe areas to be planted. This is usually done through maps and contract schedules that list planting stratum. While most Licensees and BCTS do not have formal policies preventing the planting of naturally occurring non-forested types, it is not common practice to do so. Planting these sites is not legally required (unless the Site Plan included them in the Net Area to Reforest), and it would be uneconomical to pay for the reforestation of sites where trees are probably not suitable to grow.

Establishment of Targets and Future Practices

In order to maintain naturally occurring non-forested types, the Licensees and BCTS have established a target of 100% of these sites to remain unplanted. Licensees and BCTS will establish policies to ensure these areas are not included in the Net Area to Reforest of harvested blocks and adjacent cutblocks, and they will ensure planting contracts clearly identify these areas to be excluded from the planting area.

Forecasting and Predicted Trends

The indicator target is anticipated to be met. However, it is important to identify what the accepted target means to SFM. 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 only 50% of existing areas of non-forested types are artificially converted to forested types?

Existing non-forested types within cutblocks may represent valuable habitats that should remain without trees. Seasonal wetlands could be converted to forest cover, but these sites can be important waterfowl and amphibian habitat and should be preserved. Grass/ shrub plant communities may be important

foraging areas for ungulates and bears. In addition to their ecological value, these areas may also have social value. Open meadows/ wetlands may be valuable hunting or berry picking areas, or popular camping sites. Others may be valued for their aesthetics. These non-forested types are part of the mosaic of ecosystems in the DFA, and should be maintained as a part of SFM.

As the above scenario suggests, failure to achieve the indicator target could impact ecological and social values of sustainable forest management. As such, the Licensees and BCTS are committed to achieving 100% consistency with the target.

Monitoring and Reporting Procedures

The locations of existing areas of non-forested types are identified in Forest Development Plans/Forest Stewardship Plans and other operational plans. Planting information is tracked and retained by Licensees and BCTS in databases such as GENUS or filed in an appropriate manner. Licensees/ BCTS will determine the indicator percent and include the information in the annual SFMP report for the operational year April 1st to March 31st

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If existing areas of non-forested types are planted, corrective and preventative actions will be identified to improve consistency. Improvements in operational plan development and planting supervision will be adopted if required.

Indicator 23 - Coarse Woody Debris

| Indicator Statement | Target and Variance |
|--|--------------------------------|
| Percent of audited cutblocks harvested where post harvest CWD levels are within the acceptable natural range of variability (as stated in m ³ /ha). | Target: 100% Variance: -10% |

This indicator addresses the following CSA-SFM parameters:

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|---|
| <p>CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.2: Forest Ecosystem Productivity Value: A productive forest ecosystem. Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.</p> <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.1: Soil Quality and Quantity Value: Soil distribution and productivity. Objective: Maintain a natural balance (distribution), dynamic cycles, and productivity.</p> <p>CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles CSA SFM Element 4.1: Carbon Uptake and Storage Value: Carbon uptake and storage. Objective: Maintain processes that take carbon from the atmosphere and store it in forest ecosystems.</p> |
|---|

Description of Indicator

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 (BC Ministry of Forests, 2000). CWD content in the Fort St. James DFA is managed in conjunction with the *Forest and Range Practices Act* (FRPA) requirements to retain material that is greater than 7.5cm in diameter at one end. CWD is a vital component of a healthy functioning forest ecosystem in that it provides habitat for plants, animals and insects. It contributes to forest ecosystem and soil productivity by being an important source

of soil nutrients and aiding in soil moisture retention. CWD can also provide on-site storage of carbon and contribute to the natural processes of the carbon cycle. These processes are needed for managing atmospheric carbon dioxide levels contributing to climate change.

Targets for CWD requirements are identified in operational plans, typically 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.

Current Practices and Status of Indicator

In the Fort St. James DFA, 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.

Establishment of Targets and Future Practices

The target of 100% of audited cutblocks harvested to have CWD levels within the acceptable natural range of variability reflects the importance Licensees and BCTS place on this indicator. A 10% variance has been established to account for the natural range of CWD variability in the DFA. Some cutblocks, due to their pre-harvest conditions or forest health issues, may be unable to meet the CWD targets on a site by site basis.

Future practice will involve an analysis of a sample set of blocks (audited blocks) to determine the average levels of coarse woody debris. These averages will be compared to benchmarks, which will identify natural ranges of variation for coarse woody debris within the DFA. This information will be monitored, tracked and reported out annually to the public.

The intention of audited cutblocks is that >50% of the cutblocks harvested during the reporting period will have post harvest CWD assessments completed. The results of each assessment will be compared to the benchmarks identified in the table below:

Table 11. Natural Levels of Coarse Woody Debris in British Columbia Forests

| Zone | Moisture | # of Samples | Average total volume (m3/ha) | Range (m3/ha) |
|------|----------|--------------|------------------------------|----------------|
| ESSF | Dry | 5 | 59.93 | 4.95 - 84.94 |
| ESSF | Mesic | 6 | 80.63 | 33.95 - 200.59 |
| ESSF | Wet | 6 | 111.84 | 80.18 - 281.8 |
| SBS | Dry | 64 | 120.54 | 4.17 - 387.08 |
| SBS | Mesic | 954 | 222.78 | 1.37 - 932.14 |
| SBS | Wet | 129 | 230.67 | 3.64 - 661.04 |

Source: *Coarse Woody Debris volumes by size and decay class for BC Forests, June 1997, Qiwei Lang.*

The table above represents the most current benchmarks for natural levels of CWD in BC forests. As more precise information becomes available, this table will be updated.

Forecasting and Predicted Trends

The target of 100% of audited cutblocks harvested where post harvest CWD levels are within the acceptable natural range of variation is expected to be achieved. 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 target means to sustainable forest management. Coarse woody debris levels can influence ecosystem productivity and diversity 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 100%, one other scenario should be identified:

- a) What if only 50% of audited cutblocks harvested had post harvest CWD levels within the acceptable natural range of variability (as stated in m^3/ha)

If only 50% of cutblocks harvested had coarse woody debris levels within the natural range of variability there could be several negative impacts to ecosystem health and soil productivity. 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 productivity and diversity of the forest ecosystem. Therefore, all Licensees and BCTS are committed to meeting the target of 100% of audited, harvested cutblocks to have CWD levels within the natural range of variability.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. Licensees and BCTS will conduct 1) pre-work meetings at the start of projects, 2) monitoring inspections as the work is progressing and 3) final inspections once the work is complete to ensure the CWD commitments specified in the Site Plan are met. These initial, interim and final checks are part of each Licensee's/BCTS Environment Management System (EMS), or similar tracking system. 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 audited cutblocks harvested that meet target CWD levels will be reported in the annual SFMP report for the operating year April 1st to March 31st.

Post harvest CWD surveys will be completed as per the following:

- Sample post harvest CWD in the dispersed area of the block only. Avoid plot locations within the roadside work area.
- Option of utilizing transects or fixed radius plots.
- Fixed radius plots can be completed in conjunction with Waste and Residue surveys.
- Fixed radius plot size of 11.28 m radius = 400 m² per sample plot.
- All pieces > 7.5 cm in diameter within the sample plot will be tallied.
- The length, and end diameters will be noted as well as stump height and diameter.
- CWD for the entire block will be estimated from the sample plots.
- For every 10 ha. of harvest area, 1 post harvest CWD plot will be completed – up to a maximum of 10 per block.
- CWD plots will be measured under snow free conditions.

Responsibility and Continuous Improvement Opportunities

Individual Licensees and BCTS are responsible for monitoring, tracking and reporting coarse woody debris levels in harvested 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 piles 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.
- Mountain pine beetle killed stands may provide high opportunities for CWD recruitment.

Indicator 24 - Soil Disturbance Levels

| Indicator Statement | Target and Variance |
|---|---|
| Percent of cutblocks harvested where the soil disturbance limits identified in the Site Plan are exceeded (typically 5% on sensitive soils and 10% on other soils). | <p><u>Target:</u> 0%</p> <p><u>Variance:</u> 0%</p> |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.2: Forest Ecosystem Productivity Value: A productive forest ecosystem. Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.</p> <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.1: Soil Quality and Quantity Value: Soil distribution and productivity. Objective: Maintain a natural balance (distribution), dynamic cycles, and productivity.</p> |
|---|

Description of Indicator

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 can 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 or silviculture activities, but these activities are held to soil disturbance limits identified in Site Plans (under FRPA, these disturbance limits are referred to as soil conservation standards). The Site Plan prescribes strategies for each site to achieve forest management activities, such as timber harvesting, and still remain within acceptable soil disturbance limits within the Net Area to Reforest (NAR).

An objective of soil disturbance limits is to ensure that site productivity is conserved and that impacts to other resource values are prevented or minimized (BC MOF 2001a). 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 2001a). Minimizing disturbance caused by harvesting activities conserves soil and the role it plays in the ecosystem. This indicator will measure the success of meeting soil disturbance limits and will ensure that excessive soil disturbance is detected, reported, and corrected where required.

Current Practices and Status of Indicator

Soil information is collected as a component of Site Plan preparation, and soil disturbance limits are established based on the soil hazards for that block. To be within soil disturbance limits, there are several soil conservation strategies currently used. Forest operations may be seasonally timed to minimize soil disturbance. For example, clay soils are often harvested when frozen to reduce excessive

compaction. EMS or other tracking system pre-work forms require equipment operators to be aware of soil conservation measures outlined in the Site Plans. Once an activity is complete, the final EMS or other tracking system inspection form assesses the 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 disturbance hazards exist

Establishment of Targets and Future Practices

The target for this indicator was set at 0% of cutblocks having soil disturbance limits exceeded within the DFA. Soil disturbance limits have been in place since the creation of the Forest Practices Code and recognize the reality that some soil disturbance will occur from forest operations, but that this disturbance must be contained to certain levels (typically 5% on sensitive soils and 10% on other soils). In order to maintain soil and forest ecosystem productivity the Licensees and BCTS will strive to meet these specified limits.

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. The conservation of soil contributes to biodiversity of ecosystems through conservation of site productivity. Scientific research on the effects of soil disturbance is extensive in British Columbia, but it is not possible to predict when and where soil disturbance limits may be exceeded. Therefore, the use of a “what if scenario” is beneficial in identifying potential impacts to SFM if the target is not achieved. As the target for this indicator is set at 0% of cutblocks exceeding soil disturbance limits, the analysis of one other potential scenario is useful:

- a) What if soil disturbance significantly exceeds maximum soil disturbance limits?

There could be serious impacts to the DFA's soil resources if maximum soil disturbance limits are exceeded. Soil disturbance in the Fort St. James DFA includes soil displacement, surface soil erosion, soil compaction and mass wasting. These disturbances occur in varying amounts, but it is important to note that the concentration of disturbances is a key factor to overall site productivity. Dispersal of disturbance across a site is fundamental in lowering the overall impact. While it is impossible to conduct forestry activities without a certain amount of soil disturbance, exceeding soil disturbance limits could eventually affect ecological, economic and social aspects of SFM. Excessive levels of soil disturbance may alter natural ecosystem functions such as water infiltration and drainage. It may also alter the type and health of vegetation on site, potentially affecting wildlife habitat and the perceived public value of the area. The growth rate of trees may be reduced by excessive soil disturbance, which could then affect the economic value derived from timber resources. With decreased ecosystem productivity and less economic return, social values in the DFA could also in turn decrease due to reduced aesthetic appeal and decreased recreation value from visual influences or potential wildlife declines.

Failure to achieve soil disturbance limits could potentially have extensive negative impacts on SFM values across the DFA. Licensees and BCTS will work to ensure that 0% of all harvested cutblocks exceed prescribed soil disturbance limits.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be monitored by individual Licensees and BCTS. Data sources for calculating and monitoring this indicator include Site Plans and completed EMS or other tracking system pre-work and final harvest inspection forms. Final harvest 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 if rehabilitation work is 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 of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking, and reporting this indicator. If soil disturbance exceeds prescribed limits, the Ministry of Forests and Range will be notified and a rehabilitation plan will be developed. The growing number of beetle killed stands will likely increase soil moisture and may result in a higher potential for soil disturbance. A better understanding of the interaction between harvesting these stand types and the effect on their soils is necessary. The Licensees and BCTS will further investigate this indicator as more information is learned from the influence of mountain pine beetle.

Indicator 25 - Permanent Access Structures

| Indicator Statement | Target and Variance |
|-----------------------------|---|
| Permanent access structures | <p>Target: Less than 5% of the gross cutblock area harvested annually within the DFA (based on a 5-year rolling average).</p> <p>Variance: 0%</p> |

This indicator addresses the following CSA-SFM parameters:

CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity**CSA SFM Element 2.2: Forest Ecosystem Productivity**

Value: A productive forest ecosystem.

Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.

CCFM Criterion 3: Conservation of Soil and Water Resources**CSA SFM Element 3.1: Soil Quality and Quantity**

Value: Soil distribution and productivity.

Objective: Maintain a natural balance (distribution), dynamic cycles, and productivity.

CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles**CSA SFM Element 4.2: Forest Land Conversion**

Value: Maintenance of total forest land.

Objective: Protect forestlands (within our jurisdiction) from deforestation or conversion to non-forests.

Description of Indicator

This indicator measures the amount of area developed as permanent access structures (PAS) within cutblocks, in relation to the area harvested during the same period. Permanent access structures are areas permanently converted to non-forested land and include roads, bridges, landings, gravel pits, or other similar structures that provide access for timber harvesting. Area that is converted to non-forest, as a result of permanent access structures and other development, is removed from the productive forest land base and no longer contributes to the forest ecosystem. Roads and associated stream crossings have the potential to increase risk to water resources through erosion and sedimentation. As such, minimizing the amount of land converted to roads and other structures protects the forest ecosystem as a whole.

Current Practices and Status of Indicator

Current practice by Licensees and BCTS contractors within the Fort St. James DFA is to minimize the amount of Permanent Access Structures within cutblocks. The primary harvest method utilized in the DFA is roadside harvesting, which eliminates the need for landings to be established. However, it is important for operators to identify enough road area so that wood can be processed efficiently and cost effectively. Licensees and BCTS are currently meeting the identified target and will continue to meet this target in the future.

Establishment of Targets and Future Practices

The current target of <5% has been determined from an analysis of past practice and legislative requirements. A 5-year rolling average will be used to account for annual fluctuations that may occur from differences in block size, location, topography, and harvesting systems.

Future practice will not change drastically from an operational viewpoint, but Licensees/BCTS will monitor, track and report out this indicator on an annual basis.

Forecasting and Predicted Trends

The <5% target is anticipated to be achieved by all Licensees and BCTS. 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 within a cutblock 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 <5%, one other scenario should be identified:

- a) What if considerably more than 5% of the gross cutblock area harvested annually was occupied by permanent access structures (based on a 5-year rolling average)?

Impacts to all three aspects of SFM (ecological, economic, and social) could be expected if considerably more than 5% of the annual cutblock area within the DFA was PAS. Since permanent access structures remove productive forest area from the THLB, the increase in roads could decrease the future available timber supply and forestry economic returns. Water quality and quantity may also decrease as more stream crossings could potentially be constructed, which may in turn 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. Licensees and BCTS are committed to achieving the identified targets.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. All cutblock information is maintained within Licensee/ BCTS databases such as GENUS. Each year the databases are queried to report the overall area of road that has been constructed that year and presented as a percent of the area harvested within the same period. The query will be used by Licensees/BCTS to ensure that the total amount of cutblock roads, compared to the gross cutblock area is maintained within the target. The operational year is between April 1st and March 31st, and the above information will be contained in the annual SFMP report for that period.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS 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. Licensee/BCTS operations personnel and contractors are responsible for developing roads and to ensure they do not exceed target levels. There are several opportunities for continuous improvement of this indicator. Licensees 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 amount of inblock roads and landings.

Indicator 26 - Road Related Erosion Events

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|----------------------------|----------------------------|
|----------------------------|----------------------------|

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|--|---------------------|
| Percent of road related soil erosion events that introduce sediment into a stream identified in annual road inspections that are addressed | <u>Target:</u> 100% |
| | <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

CCFM Criterion 3: Conservation of Soil and Water Resources

CSA SFM Element 3.1: Soil Quality and Quantity

Value: Soil distribution and productivity.

Objective: Maintain a natural balance (distribution), dynamic cycles, and productivity.

CCFM Criterion 3: Conservation of Soil and Water Resources

CSA SFM Element 3.2: Water Quality and Quantity

Value: Water quality and quantity.

Objective: Maintain water quality (sedimentation and water temperature) and quantity within natural range of seasonal variation.

Description of Indicator

Sedimentation can damage streams by degrading spawning beds, increasing turbidity, and reducing water depths. Forest management activities can potentially create unnatural inputs of sedimentation into water bodies. This may occur from roads adjacent to streams, from ditches delivering sediment to stream channels, or from ruts on road surfaces. Licensees and BCTS conduct annual road inspections to monitor the condition of the roads and to ensure sedimentation of streams is not occurring. 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 usually detected by forestry personnel conducting road inspections. 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. Current practice have not involved actively tracking and reporting out to the public the percentage of road related soil erosion events that have been addressed.

Establishment of Targets and Future Practices

All Licensees and BCTS recognize the potential damage sedimentation can inflict on streams and are committed to taking mitigative actions on 100% of occurrences. Licensees and BCTS will continue to perform annual road inspections 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. As the current target is 100%, one other scenario will be analysed:

- a) What if only 50% of road related soil erosion events that introduce sediment into a stream identified in annual road inspections were addressed?

Ignoring half of the events where water bodies received sedimentation caused by road related soil erosion events would be a willful disregard of sustainable forestry. Erosion represents the loss of soil quantity and quality. In addition to the loss of soil productivity, fish populations could be damaged by a decrease in water quality and destroyed spawning beds due to sedimentation. Other aquatic organisms such as amphibians could suffer from the higher concentration of soil particles suspended in the water. In

In addition to the environmental degradation, social values may also be impacted, as sedimentation is often an obvious and disturbing feature in the landscape. Failure to correct sedimentation problems would be perceived as the careless disregard for non-forest resources and should be avoided at every opportunity.

The Licensees and BCTS are committed to achieving the stated target for the indicator and it is anticipated that all known road related soil erosion events that introduce sediment into a stream will be acted upon as required.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. Licensee/BCTS personnel conducting road inspections are responsible for detecting sedimentation occurrences. The responsible Licensee/BCTS will then take corrective actions and document the occurrence in their EMS or other tracking system database. The percentage of road related soil erosion events that introduce sediment into a stream that are addressed 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

Licensees and BCTS are responsible for correcting and tracking erosion events on their areas of activity. Opportunities for improvement include training field personnel to recognize sedimentation occurrences and creating sedimentation response plans so that remediation can be quick and efficient.

Indicator 27 - Fish Stream Crossings & Sediment Control

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|---|
| Percentage of fish stream crossings planned and installed to a reasonable design and sediment control standards. | <u>Target:</u> 100% annually <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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| <p><i>CCFM Criterion 3: Conservation of Soil and Water Resources</i> <i>CSA SFM Element 3.2: Water Quality and Quantity</i> <i>Value:</i> Water quality and quantity. <i>Objective:</i> Maintain water quality at stream crossings.</p> |
|--|

Description of Indicator

The conservation of water resources is an important SFM objective. Forestry roads can potentially have a large impact on water quality and quantity when they intersect with streams, particularly through sedimentation events. Sedimentation can affect fish, fish habitat, and spawning beds. Sedimentation is also a natural part of streams and lakes as water must pass over soil in order to enter a water body. When stream crossings (bridges, culverts) are installed to a reasonable design and to sediment control standards the level of sedimentation may be minimized to help sustain the natural range of variation within the stream.

This indicator will track the number of fish stream crossings that are planned and installed to a reasonable design and to sediment control standards. By tracking this indicator, the success of installing stream crossings can be assessed, and, if required, steps can be taken to improve designs and standards.

Current Practices and Status of Indicator

Licensees and BCTS currently install fish stream crossings to specified design and sediment control standards. EMS or other tracking system pre-work forms, monitoring forms and final inspection forms are also used to ensure all fish stream crossings are installed to a reasonable design and sediment control standard.

Establishment of Targets and Future Practices

All Licensees and BCTS recognize the potential damage poorly installed fish stream crossings can inflict on streams and are committed to installing 100% of crossings to a reasonable design and sediment control standard. Current practices will be continued where they meet the target of this indicator, and modified where required, or if new technology becomes available to reduce potential impacts to fish bearing streams.

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. Installing fish stream crossings in an appropriate manner is important to conserve water quality and biodiversity objectives. This indicator and the following “what if scenario” will help to substantiate the proposed target:

- a) What if only 50% of fish stream crossings are planned and installed to a reasonable design and to sediment control standards?

Failure to install 50% of fish stream crossings in a proper manner could potentially negatively impact water quality and a variety of organisms dependent on that water. Increases to sedimentation may occur, thereby causing turbidity and the potential destruction of spawning beds. Other aquatic organisms such as amphibians may also suffer from a higher concentration of soil particles suspended in the water if sedimentation levels increased due to poor crossing design or installation. In addition to potential environmental impacts, social values of SFM could also potentially be impacted, as sedimentation is often an obvious and disruptive feature in the landscape. Sedimentation issues might be perceived by the public as a disregard for non-forest resources and should therefore be mitigated or avoided through proper installation of stream crossings and implementation of sufficient monitoring and inspection programs.

The Licensees and BCTS are committed to achieving the stated target for the indicator and it is anticipated that all fish stream crossings planned and installed will be done so to reasonable design and sediment control standard.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. Crossings on fish streams will continue to be documented through EMS or other tracking system inspections done at the time of crossing installation and recorded in databases such as GENUS, or in other information management systems. 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

Licensees and BCTS are responsible for all aspects of this indicator. All fish stream crossings will be installed under the supervision of Licensees/BCTS to ensure it is done to design and sediment control standards. Opportunities for improvement of this indicator include training equipment operators and other personnel involved with stream crossing installation in methods of sediment control.

Indicator 28 - Stream Crossing Inspections

| Indicator Statement | Target and Variance |
|--|---|
| Percentage of stream crossing inspections and resulting mitigation measures completed according to schedule. | <u>Target:</u> 100% annually <u>Variance:</u> -10% |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity Value: Water quality and quantity. Objective: Maintain water quality at stream crossings.</p> |
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Description of Indicator

Regular stream crossing inspections are necessary to ensure crossings are in good condition and are not posing a threat to water quality or to traveler safety. These inspections may find some stream crossings are causing sediment to enter the stream channel, which may damage fish habitat and other aquatic life. If a stream crossing is found to be in need of mitigation measures to prevent sedimentation or to repair the structure, those measures are scheduled for action and completed at a later date. This indicator is intended to monitor the success of completing these mitigation measures according to schedule.

Detecting and correcting forest management and operational related issues is a component of SFM and continuous improvement. This indicator will allow Licensees and BCTS to evaluate how well this process occurs and make improvements where necessary.

Current Practices and Status of Indicator

Stream crossings, such as bridges and culverts, are regularly inspected to ensure they are in good condition and do not pose a threat to water quality or road safety. All Licensees and BCTS schedule these inspections to their own criteria, but in all cases if problems are detected they are scheduled for mitigation actions. This may involve re-contouring slopes, installing siltation fences, re-directing ditch lines, grass seeding, or deactivating roads. It may also require the repair or replacement of the crossing structure itself. Current practice has not been to actively track the percentage stream crossing inspections and resulting mitigation measures that were completed according to schedule.

Establishment of Targets and Future Practices

All Licensees and BCTS recognize the importance of completing mitigation measures on schedule for stream crossings on 100% of occurrences. Licensees and BCTS will continue to perform stream-crossing inspections to ensure they do not pose a threat to water quality or road safety, and will strive to have mitigation measure completed according to schedule. Future practice will not involve substantial change to current practices. However, the percent of stream crossing inspections and resulting mitigation measures completed according to schedule will be monitored, tracked and reported out to the public in the SFMP annual report.

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. This indicator and the following "what if scenario" will help to substantiate the proposed target:

- a) What if only 50% of mitigation measures resulting from stream crossing inspections were completed according to schedule?

If only half of the mitigation measures were completed on time there may be significant risk to water quality from the remaining stream crossings. Sedimentation problems may begin, or become worse if prompt action is not taken where deemed necessary. If the stream crossing itself is in danger of failure, such as a culvert that has becoming plugged, there may be a sudden and large input of sediment if the road were to wash out. By completing required mitigation measures at stream crossings on schedule these events can be prevented or minimized and help maintain water quality in the DFA.

In addition to potential environmental degradation, failure to mitigate issues at stream crossings on schedule may also pose a threat to public safety. Forestry roads are used for a wide range of recreational pursuits, and proper maintenance of crossings is needed to sustain social forestry values.

The Licensees and BCTS are committed to achieving the stated target for this indicator and it is anticipated that all mitigation measures resulting from stream crossing inspections will be completed according to schedule.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. The Licensee or BCTS responsible for a given stream crossing will schedule any mitigation measures required and document their completion in their EMS or other tracking system databases, incident tracking systems or appropriate filing system. The percentage of mitigation measures completed according to schedule will be tracked, as well as the steps taken to meet those measures. 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

Licensee/BCTS personnel conducting stream crossing inspections are responsible for detecting potential problems and for reporting these concerns. Licensees and BCTS are also responsible for scheduling and supervising the mitigation measures and for ensuring the completion dates are included in the appropriate database. Opportunities for improvement include training Licensee/BCTS field personnel to recognize potential problems at stream crossings. Field personnel should also be encouraged to be vigilant for identifying issues at all stream crossings, regardless of whose responsibility they may be.

Indicator 29 - Risk Ranking for Stream Crossings

| <u>Indicator Statement</u> | <u>Target and Variance</u> |
|--|---|
| Creation of a DFA risk ranking system for assessing stream crossings | <u>Target:</u> April 1 st , 2006 <u>Variance:</u> +3 months |

This indicator addresses the following CSA-SFM parameters:

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| <p><u>CCFM Criterion 3: Conservation of Soil and Water Resources</u> <u>CSA SFM Element 3.2: Water Quality and Quantity</u> <u>Value:</u> Water quality and quantity. <u>Objective:</u> Maintain water quality at stream crossings.</p> |
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Description of Indicator

Previous indicators have discussed the importance of managing stream crossings in a manner that maintains water quality and quantity. By creating a risk ranking system for assessing stream crossings, forest planners will be able to ensure those stream crossings that present the greatest risk to water quality can be inspected more often than lower risk crossings. Crossings over valuable fish bearing streams, crossings with higher traffic, and older crossings may also warrant more attention than lower risk crossings. Assessing risks and planning according to those risks will help maintain water quality in a proactive manner consistent with SFM.

The intention of this indicator is to develop a DFA risk ranking system for assessing stream crossings by April 1st, 2006.

Current Practices and Status of Indicator

Currently, Licensees and BCTS assess stream crossing risk according to their own criteria. However, some common assessment attributes include the class of stream, its fish bearing capacity, the stream crossing type (bridge or culvert), the age of the structure, the amount of use it receives, and previous problems with the stream crossing. Despite potential similarities currently used in assessing stream crossings, there is presently no consistent risk ranking system for the DFA that is used by all Licensees or BCTS.

Establishment of Targets and Future Practices

All Licensees and BCTS recognize the importance of functioning stream crossings and are committed to creating a DFA risk ranking system for their assessment by April 1st, 2006. A three-month variance has been established to allow for unforeseen delays in data collection or assessment. Once the risk ranking system is in place, all stream crossings in the Fort St. James DFA will be managed in accordance with their assessed risk to water quality as determined by the risk ranking standard.

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. This indicator and the following “what if scenario” will help to substantiate the proposed target:

- a) What if a risk ranking system for assessing stream crossings was not developed for the DFA by April 1st, 2006?

If the risk ranking system was not created by April 1st, 2006, the consistency and efficiency of assessing and managing stream crossings would continue to vary between individual Licensees/BCTS. Some stream crossings may have their risk inaccurately assessed and eventually result in sedimentation and decreased water quality. Managing stream crossings according to an established ranking system will standardize this procedure across the DFA and promote proactive forest management that is conducive to SFM. Delays in developing the risk ranking system will delay this consistent proactive approach to assessing stream crossings in the DFA.

The Licensees and BCTS are committed to achieving the stated target for the indicator and it is anticipated the risk ranking system will be completed by April 1st, 2006.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level by the Licensee/BCTS group. Development of the risk ranking system will be initiated and monitored by the Licensees and BCTS. The progress and success in meeting the indicator target date will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

The Licensees and BCTS are responsible for meeting the target date of April 1st, 2006. Opportunities for improvement will arise once the risk ranking system is implemented and the accuracy of the system can be assessed.

Indicator 30 - Conformity to the Risk Ranking System

| Indicator Statement | Target and Variance |
|--|---|
| Conformity to the DFA risk ranking system developed for assessing stream crossing. | <u>Target:</u> April 1, 2007 <u>Variance:</u> 6 months |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity Value: Water quality and quantity. Objective: Maintain water quality at stream crossings.</p> |
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Description of Indicator

The previous indicator discussed the importance of creating a risk ranking system for assessing stream crossings in the DFA. Assessing risks and planning according to those risks in a consistent manner by the Licensees/BCTS will help maintain water quality in a proactive manner conducive to SFM. However, the risk ranking system is of little use on its own unless Licensees/BCTS in the DFA conform to this system and ensure all actions in the field reflect the recommendations generated by the risk ranking system.

This indicator is intended to ensure conformity of Licensees/BCTS to the developed DFA risk ranking system by April 1st, 2007.

Current Practices and Status of Indicator

Because the DFA risk ranking system for assessing stream crossings has not been developed, there is no current practice to report for this indicator. The implementation of this indicator is dependant upon the development and completion of the risk ranking system, which is targeted for April 1st, 2006.

Establishment of Targets and Future Practices

All Licensees and BCTS recognize the importance of assessing stream crossings in a consistent manner and are committed to conforming to the DFA risk ranking system by April 1st 2007. A six-month variance has been established to allow for unforeseen difficulties in transitioning and implementing this system within each Licensee/BCTS operation. Once the risk ranking system is developed and in place, Licensees/BCTS will work towards assessing all stream crossings in the Fort St. James DFA in accordance with the risk ranking standard, and will achieve conformity with this system by April 1st, 2007.

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. This indicator and the following "what if scenario" will help to substantiate the proposed target:

- a) What if conformity to the DFA risk ranking system was not achieved by April 1st, 2007?

If conformity to the risk ranking system was not achieved by April 1st, 2007, the consistency and efficiency of assessing and managing stream crossings would continue to vary between individual Licensees/BCTS. The monitoring, tracking and reporting of stream crossing assessments would not be consistent among Licensees/BCTS and future indicators of water quantity and quality may be more difficult to assess based on these differences. Further, differences in assessing risks around stream crossing could lead to some stream crossings having their risk inaccurately assessed, eventually resulting in potential sedimentation and decreased water quality. Managing stream crossings as a group according to an established ranking system will standardize this procedure across the DFA and promote proactive forest management that is conducive to SFM. Delays in conforming to the risk ranking system will delay this consistent proactive approach to assessing stream crossings in the DFA.

The Licensees and BCTS are committed to achieving the stated target for the indicator and it is anticipated that Licensees/BCTS will conform to the risk ranking system by April 1st, 2007.

Monitoring and Reporting Procedures

The Licensees and BCTS will monitor the development and implementation of the risk ranking system and will ensure conformity to this system once it is completed. The progress and success in meeting the indicator target date will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

The Licensees and BCTS are responsible for ensuring conformance to the DFA risk ranking system. Opportunities for improvement will arise once the risk ranking system is implemented and the accuracy of the system can be assessed.

Indicator 31 - Permanent Crossing Structures & Fish Passage

| Indicator Statement | Target and Variance |
|---|---|
| Percentage of permanent crossing structures installed on fish streams that will allow for adequate fish passage (<i>dependant on the presence/absence of fish</i>). | <u>Target:</u> 100% annually <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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| CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity |
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Value: Water quality and quantity.

Objective: Maintain water quality at stream crossings.

Description of Indicator

When forest roads are constructed it is often necessary to build permanent crossing structures (i.e. culverts, bridges) over 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. Barriers to fish passage include, but are not limited to, obstructions in culverts, placement of culverts above a stream creating an impassible step, and collapsed culverts. As fish are also an important food source for other faunal species, the success of these structures (to provide for fish migration) contributes to the maintenance of these other species in the DFA. It is the intention for all new fish-stream crossings to allow for adequate fish passage.

Current Practices and Status of Indicator

Streams and crossing structures are identified during operational plan preparation. The streams are surveyed for their potential for bearing fish and qualified personnel determine their probable peak flow volumes. The appropriate culvert size and installation procedure is then prescribed for the stream crossing. EMS or other tracking system pre-work forms are completed prior to crossing installation and the Licensee supervisor completes an inspection form at the time of completion. In addition, many stream crossing structures are inspected over time as part of Licensee's/BCTS EMS or other tracking system procedures.

Current practices include ensuring that adequate fish passage exists on all crossings on fish bearing streams. However, this data is not formally tracked and reported out.

Establishment of Targets and Future Practices

Prior to the implementation of the Forest Practices Code, many stream crossings did not always consider fish passage. The result was permanent crossing structures that became barriers to fish movement. The Licensees and BCTS recognize the importance of installing stream crossings that allow for fish passage, and have set the target at 100% of new structures to achieve this annually. Stream crossings will continue to be identified in operational plans and procedures implemented to ensure fish passage is maintained. The percentage of crossings that allow for adequate fish passage will be monitored, tracked and reported out to the public annually through the SFMP annual report.

Forecasting and Predicted Trends

While the indicator target is expected to 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. This indicator and the following "what if scenario" will help to substantiate the proposed target:

- a) What if only 50% of new permanent stream crossing structures installed allowed for adequate fish passage?

The above scenario would immediately restrict fish movement in many streams in the DFA. If fish species are not able to travel certain stream channels, migration patterns could be lost and populations would likely decline. Animal species reliant on fish movements upstream of a barrier could also be negatively affected. Failures in fish populations or restrictions of fish movement may also impact recreational fishing opportunity. Decreases in fish populations due to poor migration may cause fishing closures throughout the DFA. Barriers to fish passage may inhibit fish from reaching certain watersheds or lakes, thereby negatively affecting future recreational fishing of those water systems.

Meeting the target objective can maintain ecological values and social values of sustainable forest management. Therefore, the Licensees and BCTS are committed to achieving the stated target for the indicator and long term trends are anticipated to show that all new fish stream crossings will allow for adequate fish passage.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed by each individual Licensee/BCTS operation. The indicator will be monitored through EMS or other tracking system inspections and performance will be recorded in databases such as GENUS or Inform. The percentage of crossings that will allow for fish passage will be included in the SFMP annual report for the operating period of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for installing new crossings that meet the objectives of this indicator. Specifically, Licensees/BCTS are responsible to oversee the installation of bridges and culverts through EMS or other tracking system checklists and final inspection reports. Completing stream surveys will provide Licensees/BCTS with information on which streams require fish management.

Indicator 32 - Riparian Management Area Commitments

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|--|
| Percent of cutblocks harvested that are consistent with riparian management commitments. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity Value: Water quality and quantity. Objective: Maintain water quality (sedimentation and water temperature) and quantity within natural range of seasonal variation.</p> |
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Description of Indicator

Riparian areas occur next to the banks of streams, lakes, and wetlands and include both the area dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence on it (BC Ministry of Forests 1995a). Riparian Management Areas (RMAs) consist of a Riparian Management Zone (RMZ) and where required by legislation, a Riparian Reserve Zone (RRZ). The width of these zones is determined by attributes of streams, wetlands, lakes, and adjacent terrestrial ecosystems. Maintaining RMAs provides for the conservation of riparian and aquatic environments, which are key for the survival of species (flora and fauna) that are dependent on riparian conditions. RMAs frequently contain large numbers of flora and fauna species and provide for critical habitats, home ranges and travel corridors for wildlife. In addition, RMAs also function to conserve water quantity and quality features by reducing the risk induced by forest harvesting activities directly affecting the watercourses.

This indicator is intended to ensure that the riparian management area commitments made by Licensees/BCTS are actually implemented on the ground. Maintenance of riparian values is an important aspect to sustainable forest management because riparian features are vital for maintaining water quality and quantity. They are also diverse and sensitive habitats that support a wide range of plants and animals. Riparian features are also well appreciated by residents and visitors in the DFA for recreation purposes and overall aesthetics.

Current Practices and Status of Indicator

Riparian values are generally identified through the planning process, with specific management strategies incorporated into Site Plans. Implementation of these strategies is verified on the ground during harvesting operations and through final harvest inspections. Riparian values are initially identified on a map during the preparation of the FDP/FSP. The FDP/FSP outlines broad riparian management area commitments that are prescribed in greater detail in site specific Site Plans. The level of compliance

with commitments in operational plans is monitored through EMS or other tracking system inspections and recorded in databases such as GENUS or Inform.

All Licensees and BCTS have managed riparian management areas according to legislated requirements for several years. This management will continue through Site Plan commitments and implementation of strategies during harvesting operations.

Establishment of Targets and Future Practices

The target of 100% was established to reflect the Licensees' and BCTS's commitment to meeting the riparian management area obligations for their operating areas. The identification and conservation of riparian values is a socially and ecologically important component of forest management. Thus, Licensees and BCTS will continue to ensure harvesting operations will be consistent with all identified riparian requirements.

Forecasting and Predicted Trends

All harvesting operations are expected to be compliant with riparian management commitments in Site Plans. However, the exact level of consistency is difficult to forecast. Conservation of riparian values influences ecological, economic and social values within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As the indicator currently has a target of 100%, one other scenario should be identified:

- a) What if there was only 50% compliance to riparian management area commitments?

Complying with only 50% of riparian management area commitments could lead to significant ecological, economic and social impacts. In an ecological sense, aquatic habitat, biological richness, water quality and species diversity could all be negatively influenced. As a result, economic values could also decrease as healthy ecosystems support sustainable economic values. Social values could also decrease in response to the negative influence on ecological and economic values. If riparian habitat is decreased, wildlife populations may also be impacted, thereby reducing recreational hunting values. Fishermen, canoeists, kayakers, and others value riparian areas for shelter, camping, and aesthetics. These users may have their recreational experiences diminished by poorly conducted forestry operations in riparian management areas.

There could be several potential future impacts of not achieving the stated target for this indicator. Therefore, the Licensees and BCTS are committed to meeting the target by ensure riparian commitments are implemented on the ground. The indicator will remain at the target of 100% if all processes and protocols are followed.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. Licensees and BCTS 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 Site Plans are achieved in harvested blocks. These initial, interim and final checks are part of each Licensee's and BCTS's EMS or other such tracking system. If a non-conformance with the Site Plan occurs in a harvested block, 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. Any non-conformances with legal obligations to riparian management (such as a reserve being harvested) will be reported to the Ministry of Forests and Range as soon as the incident is detected.

The percent consistency with riparian management area commitments made in the Site Plan and implementation in harvested blocks will be reported in the annual SFMP report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for ensuring that Site Plan commitments are communicated to operational staff and implemented in all harvested blocks. Licensees/BCTS are therefore responsible for ensuring riparian commitments are implemented in the field during harvesting operations. If problems in implementing Site Plan riparian objectives in harvested blocks occur, preventative and corrective actions will be identified to improve consistency. Improvements in operational plan implementation will be adopted if required.

Indicator 33 - Benchmarks for Water Quality and Quantity

| Indicator Statement | Target and Variance |
|---|---|
| Establish long term benchmarks for water quality and quantity | <p>Target: Within 1 year of plan approval, develop and implement a system to monitor long term water quality and quantity</p> <p>Variance: 6 months</p> |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity Value: Water quality and quantity. Objective: Development of alternative systems to maintain water quality and quantity - research.</p> |
|--|

Description of Indicator

Evaluating water quality and quantity in the DFA can only occur if there are initial benchmarks to compare future measurements to. Establishing these benchmarks will allow for long-term monitoring and analysis of water quality and quantity. This monitoring and analysis may result in determining the effects (if any) of forestry operations on the DFA's water, or it may detect the effects of other industrial/natural activities.

Establishing water quality/ quantity benchmarks is conducive to SFM as it recognizes that natural processes and resources fluctuate with time, and that some trends can only be observed over long time periods. If industrial forestry is affecting the DFA's water, the indicator will help determine where and how this may be occurring.

Current Practices and Status of Indicator

There are currently no benchmarks for water quality established in the DFA.

Establishment of Targets and Future Practices

The target of one year from the date of plan approval to establish benchmarks was established to reflect the Licensees' and BCTS's commitment to monitoring water quality and quantity in the DFA. Future practices will incorporate the monitoring of water quality and quantity in relation to established benchmarks to ensure sustainability of the water resource.

Forecasting and Predicted Trends

The one year target is expected to be met. However, the exact level of consistency is difficult to forecast. The use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As the indicator currently has a target of 1 year from the date of plan approval to develop and implement a system to monitor long-term water quality and quantity, one other scenario should be identified:

- a) What if it took 5 years to develop and implement a system to monitor long-term water quality and quantity?

If it took 5 years to implement the monitoring system, there could be delays in detecting negative trends in water quality and quantity. If industrial forestry activities are influencing water quality and quantity, the delays may mean actions to correct problems will also be delayed. The benchmarks may also prove that the steps Licensees and BCTS are taking to manage water resources are successful. This information

will help validate the efforts they have taken in regards to water stewardship and possibly strengthen their client base and the overall economy of the DFA.

By not achieving the target of establishing a system for determining long-term benchmarks for water quality and quantity within one year of plan approval, licensees and BCTS can not adequately ensure sustainability of water quality and quantity. Therefore, the Licensees and BCTS are committed to meeting the identified target.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level. Licensees and BCTS will monitor the progress of establishing long-term benchmarks for water quality and quantity and report to the PAG as the process evolves. The progress will also be reported in the annual SFMP report for the operating year April 1st to March 31st, as well as the success in meeting the target date.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for initiating any required projects to develop and establish long-term benchmarks for water quality and quantity and for ensuring the proper funding is available. Areas for improvement may include the application of existing hydrologic research to analysis trends in water quality and quantity, or initiating new research into the water cycles of the DFA.

Indicator 34 - Reforestation Timing

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|---|
| Percentage of blocks >1.0ha harvested 3 years prior to the reporting period that have been reforested. | <u>Target:</u> 90% <u>Variance:</u> -20% |

This indicator addresses the following CSA-SFM parameters:

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|--|
| <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity Value: Healthy watersheds. Objective: Maintain healthy watersheds (quantity within the natural range of variability).</p> <p>CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles CSA SFM Element 4.1: Carbon Uptake and Storage Value: Carbon uptake and storage. Objective: Maintain processes that take carbon from the atmosphere and store it in forest ecosystems.</p> <p>CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles CSA SFM Element 4.2: Forest Land Conversion Value: Maintenance of total forest land. Objective: Protect forestlands (within our jurisdiction) from deforestation or conversion to non-forests.</p> |
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Description of Indicator

Prompt reforestation of harvested areas is a major component of sustainable forest management. In addition to creating wildlife habitat, new plantations help maintain hydrologic processes and contribute to the broader health of watersheds. Trees interact with water in many ways- they intercept it, transpire it, and shade it, all of which contribute to watershed function.

Regenerating cutblocks can also absorb significant amounts of carbon through photosynthesis. Because young plantations are typically healthy and rapidly growing, they sequester more CO₂ through photosynthesis than they release through decay. By reducing atmospheric greenhouse gases such as

CO₂, regenerating cutblocks can contribute to reducing climate change. The sooner cutblocks are regenerated after the completion of harvest the sooner this process can begin.

Reforestation also represents a commitment to keeping the land as forest and helps maintain the total forest land base in the DFA. Prompt reforestation will ensure trees are quickly re-established and discourages the area's conversion to non-forests. 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

Licensees and BCTS are legally required to declare the NAR (Net Area Reforestable) of a cutblock regenerated by a date defined in the Site Plan. The NAR is the area of a cutblock 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. For some ecosystem associations the date may as long as 7 years after harvest, 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.

Establishment of Targets and Future Practices

The Licensees and BCTS have determined that 3 years is sufficient time for a cutblock to be planted once harvesting is complete and that 90% of all harvested areas will achieve this goal. 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 Plan prescribed regen dates, 3 years is an aggressive target to be achieved. 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 -20% 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 target planting date. Licensees/BCTS will ensure site preparation and seedling acquisition is timed to meet the 3-year reforestation target date.

Forecasting and Predicted Trends

While planting 90% of harvested blocks within 3 years from the completion of harvest is expected, 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. Therefore, it is important to identify what the accepted target means to SFM. A "what if scenario" analysis will identify the importance of the target for this indicator:

- a) What if only 50% of harvested blocks >1.0ha were reforested within 3 years of harvesting?

Allowing 50% of harvested areas to remain non-forested after 3 years may delay the uptake of atmospheric carbon, reducing efforts to fight climate change. It may also influence water flows and watershed health. Waiting beyond 3 years to reforest harvested blocks could allow competing vegetation to become well established, thereby potentially reducing crop performance once areas are reforested. Delaying reforestation could also be detrimental to those plant and animal species dependent on forest ecosystems. In the long term, timber supply may be reduced from an excessive lag between harvesting and reforestation, which could ultimately affect economic and social values in the DFA.

Monitoring and Reporting Procedure

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. All reforestation and survey data is monitored in Licensee/BCTS databases such as GENUS or Inform. The

indicator percent will be reported in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for the monitoring, tracking, and reporting of this indicator. Scheduling silviculture activities should take every opportunity to reduce the time between harvest and reforestation activities. For example, site preparation could occur directly after harvesting instead of waiting for the following year. Opportunities for continual improvement will include tightening silviculture timelines so that the target is achieved and even exceeded where possible.

Indicator 35 – Watershed Peak Flow Index

| Indicator Statement | Target and Variance |
|--|---|
| The percent of watersheds achieving baseline targets for the peak flow index | <p><u>Target:</u> Annually, 85% of the watersheds will be below the baseline target</p> <p><u>Variance:</u> +/- 15%</p> |

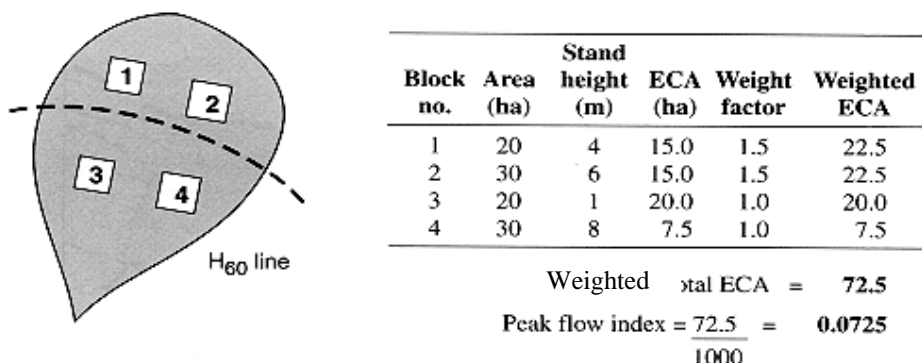
This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 3: Conservation of Soil and Water Resources</p> <p>CSA SFM Element 3.2: Water Quality and Quantity</p> <p>Value: Healthy watersheds.</p> <p>Objective: Maintain healthy watersheds (quantity within the natural range of variability).</p> |
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Description of Indicator

Peak flow is the maximum flow rate that occurs within a specified period of time, usually on an annual or event basis. The peak flow index is a measure that indicates the potential effect of harvested areas on water flow in a particular watershed. The H60 line is the elevation for which 60% of the watershed area is above. The table below shows how the peak flow index is calculated for a hypothetical watershed.

Figure 1. Peak Flow Index Calculations (source: B.C. Ministry of Forests, 2001b)



The ECA or "Equivalent Clearcut Area" is calculated from the area affected by logging and the hydrologic recovery of that area due to forest re-growth. After an area has been harvested, both winter snow accumulation and spring melt rates increase. This effect is less important at low 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 elevations are weighted differently in the calculation of peak flow index.

Most hydrologic impacts occur during periods of the peak stream flow in a watershed. In the interior of British Columbia, peak flows occur as the snowpack melts in the spring.

With regards to the conservation of water quality in the AOTP, it is important to be able to maintain the watershed level conditions within natural ranges of variation to ensure that other users 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

Current status needs to be added.

Establishment of Targets and Future Practices

The Licensees and BCTS have established a target of 85% of watersheds will achieve baseline targets for the peak flow index, with a +/- 15% variance. The target and variance were established to reflect the fact that factors other than harvesting may influence peak flows. These may include forest health events such as the current mountain pine beetle epidemic and wildfire, in which licensees/BCTS cannot actively control potential impacts to peak flows.

Baseline targets for this indicator will result from a watershed analysis of the AOTP.

Forecasting and Predicted Trends

While it is expected the indicator target will be achieved, the results if it is not are difficult to predict. However, it is important to identify what the accepted target means to SFM. A "what if scenario" analysis will identify the importance of the target for this indicator to SFM within the AOTP. This indicator and the following "what if scenario" will help to substantiate the proposed target:

- a) What if only 50% of watersheds annually are below the baseline target for peak flow indices?

If peak flows greatly exceed targets there could potentially be negative impacts to ecological values within the AOTP. Above target peak flows may result in excessive erosion and failures at downstream culverts and bridges. This may in turn degrade fish habitat by causing sedimentation and scouring of spawning beds. Reduced fish habitat may then lead to reduced wildlife populations if they are dependent on fish as a food source, and reduced recreational fishing opportunity if populations severely decline. Social values of SFM may also be reduced if only 50% of watersheds are below baseline targets for peak flow, as drinking water quality could potentially be compromised by high peak flows.

Maintaining water flows within the range of natural variability is an important component of sustainable forest management. Therefore, the Licensees and BCTS are committed to achieving the peak flow targets for this indicator.

Monitoring and Reporting Procedures

This indicator has a DFA/Watershed specific target and will be managed on a DFA level. Once a project to determine baseline targets for Peak Flow Indices is developed, the Licensees/ BCTS will create systems to monitor future planned harvesting to achieve them. Licensees/BCTS will then be responsible for ensuring targets are met. This may be achieved by using several sources of information such as forest cover and biogeoclimatic maps that are updated either by the Provincial Government or by Forest Licensees under contract with the Government. These data sources are usually only updated/replaced in five to 10 year intervals. Adjacent site information is obtained from other Licensees that share the same land base. Databases such as GENUS, or similar systems, will be maintained to provide up to date planning information.

To monitor this indicator, a watershed analysis will be conducted each year. This analysis will be used to determine the success in meeting this indicator's target. The indicator percent will be included in the annual SFMP report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for ensuring the indicator target is met. The Licensees and BCTS will be responsible for updating their forest cover databases and for ensuring future harvesting will be responsive to PFI targets (See *indicator #36*). Continuous improvement opportunities may be found in developing hydrologic models for the DFA watersheds to more accurately forecast the effects of harvesting on peak flows.

Indicator 36 - Watershed Reviews

| Indicator Statement | Target and Variance |
|--|------------------------------|
| Percent of watershed reviews completed where the baseline target is exceeded, and new harvesting is planned. | Target: 100% Variance: 0% |

This indicator addresses the following CSA-SFM parameters:

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|--|
| <p>CCFM Criterion 3: Conservation of Soil and Water Resources CSA SFM Element 3.2: Water Quality and Quantity Value: Healthy watersheds. Objective: Maintain healthy watersheds (quantity within the natural range of variability).</p> |
|--|

Description of Indicator

The concepts of peak flow indices (PFI) and baseline targets are discussed in detail in the previous indicator. If PFI targets are exceeded, potentially detrimental impacts to water quality and quantity could occur if harvesting in these watersheds continues. This indicator is intended to ensure that where PFI targets are exceeded, the watersheds have a review completed if new harvesting is planned in the watershed. Following the review, harvesting in the affected watershed will be planned in a manner that will help meet the baseline targets in the future.

Current Practices and Status of Indicator

Watersheds in the DFA have not currently been managed to meet baseline targets for their peak flow indices, as these targets have not been fully established. Licensees/BCTS plan to initiate a project to determine these baseline targets and once they have been established, the Licensees and BCTS can take steps to monitor watersheds in accordance with peak flow objectives. Watershed reviews will be scheduled as necessary once PFI baseline data acquisition is completed.

Establishment of Targets and Future Practices

The Licensees and BCTS have established a target of 100% of watersheds that exceed baseline targets will have a watershed review completed wherever new harvesting is planned. This target reflects the importance the Licensees and BCTS place on maintaining water quality and quantity in the DFA. Once PFI targets are established, required watershed reviews will be completed by qualified hydrologists who will evaluate the potential risk of continuing to harvest in a given watershed. Depending on the results of the review, Licensees/BCTS may adjust harvest design, scheduling, and silviculture systems to mitigate any hydrologic impacts created by the harvest operations.

Information will be given to the hydrologists to review and create recommendations.

Forecasting and Predicted Trends

While it is expected the indicator target will be achieved, the results are difficult to predict. However, it is important to identify what the accepted target means to SFM. This indicator and the following "what if scenario" will help to substantiate the proposed target:

- a) What if only 50% of watersheds that exceed their baseline target for peak flows have a review completed wherever new harvesting is planned?

As discussed in indicator #35, if peak flows greatly exceed targets there could be negative impacts to the DFA's ecological and social values, primarily related to water quality and potential fish habitat. If only 50% of the watersheds that exceed their baseline target peak flows have a review completed where new harvesting is planned, those watersheds that do not receive review run the risk of deteriorating further. A watershed review would help to identify potential causes of increased peak flows. Therefore, the primary method of assigning mitigative measures for these watersheds is by conducting a review prior to more harvesting activity taking place. As such, it is important that Licensees/BCTS attain the identified target.

Monitoring and Reporting Procedures

This indicator has a DFA/Watershed specific target and will be managed at the DFA/Watershed level. Once the baseline targets for the peak flow indices have been developed, the Licensees/ BCTS will develop systems to monitor peak flow indices in watersheds within the DFA.

Watersheds that have exceeded their baseline PFI targets will have a watershed review conducted by a qualified professional if new harvesting is planned within the watershed. This report will be used to monitor and report out on this indicator in the annual SFMP report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

It is the Licensees/ BCTS responsibility to ensure reviews are completed for watersheds that exceed their baseline peak flow targets. Continuous improvement opportunities may be found in developing hydrologic models for the DFA watersheds to more accurately forecast the effects of harvesting on peak flows.

Indicator 37 - Free Growing Obligations

| Indicator Statement | Target and Variance |
|---|--|
| Percent of standards units declared annually that meet free growing requirements on or before the late free growing date. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

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|---|
| <p>CCFM Criterion 4: Forest Ecosystem Contributions to Global Ecological Cycles CSA SFM Element 4.1: Carbon Uptake and Storage Value: Carbon uptake and storage. Objective: Maintain processes that take carbon from the atmosphere and store it in forest ecosystems.</p> |
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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 standards units based on a time frame indicated in the Site Plan. A Standards Unit (SU) is defined in the Stocking and Free Growing Survey Procedures Manual (BC MOF 2002) as:

"an area that is managed through the uniform application of a silvicultural system, stocking standards, and soil conservation standards. These standards are used to determine if legal regeneration, free growing, and soil conservation obligations are met."

The early and late free growing dates are established based on the biogeoclimatic ecosystem classification of the site and the tree species prescribed for planting after harvest.

In order to fulfil mandates outlined 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 standards units that annually meet free growing obligations across the DFA. While this percentage is important in a legal sense, as Licensees/ BCTS have an obligation to meet free growing standards, it is also important for sustainable forest management. Standard units that meet free growing standards are deemed to have reached a stage where their continued presence and development is more assured. They are in numbers, health, and height that 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 significant local contribution to reducing global climate change.

Current Practices and Status of Indicator

Free growing dates and standards for each standards unit are recorded and maintained in each Licensee's and BCTS's database, such as GENUS. Each cutblock is surveyed prior to the late free growing date to ensure the free growing standards have been met and that the stand of trees is at target heights, fully stocked, and healthy. The results of all surveys are summarized and maintained in Licensee/BCTS databases. If a survey indicates that the standards unit 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, the Licensee/BCTS makes an application to the Ministry of Forests and Range for the standards unit to revert to the Crown's responsibility.

Establishment of Targets and Future Practices

The target for this indicator has been established at 100% to ensure that all standards units within the DFA achieve free-to-grow status within prescribed timelines. Once standards units reach the free to grow standard, the area reverts back to Crown land and all Licensee/BCTS obligations are considered complete. A performance target of 100% is not only achievable, it is in the Licensee's/BCTS's best interest as the completion of silviculture obligations is an important financial benefit. Until the Crown assumes responsibility for a plantation, the Licensee or BCTS must bear the costs of managing that stand, including surveys, thinning, brushing, and, if necessary, replanting. Future practice will involve Licensees/BCTS continuing to meet free to grow obligations and this data will be reported out to the public annually.

Forecasting and Predicted Trends

While it is anticipated that 100% of standards units 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 standards units within the DFA meet the prescribed free growing date, forest managers are ensuring that the productive capability of the forested land base is conserved and that the forest resource will be available for future use. A "what if scenario" is beneficial in helping to identify the importance of meeting the specified target 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 standards units met the prescribed free growing requirements on or before the late free growing date?

If only half of standards units met the prescribed requirements on or before their free growing dates, the sustainability of the timber resource within the DFA could potentially be in peril. Free growing stands are considered to have 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 standards units means there will be 50% less area to harvest in the future.

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 species dependent on healthy forests also benefit 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 standards units meeting their free growing dates means that the DFA may potentially make a significant contribution to 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. If the timber supply and the amount of healthy regenerating forests decline, the industries, communities and natural processes that depend on them may also suffer. In the Fort St. James DFA, trends for the immediate future will likely show that 100% of standards units will meet the prescribed free growing requirements on or before the late free growing date.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. Silviculture obligations such as free growing dates for standards units are recorded and maintained in Licensee/BCTS databases such as GENUS. Once free to grow status has been achieved, the Licensee/BCTS must submit a report to the Ministry of Forests and Range that will update the status of the standards units on the government database. These reports must be submitted on an annual basis for all standards units surveyed that operating year. The indicator percent will be included in the annual SFMP report for the operating year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

It is Licensees/BCTS responsibility to monitor, track and report this indicator. Opportunities for continuous improvement could be found in the administration of silviculture activities. Currently, failure to meet free to grow objectives 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.

Indicator 39 - Visual Quality Requirements

| Indicator Statement | Target and Variance |
|--|--|
| Percent of cutblocks and roads harvested, in known scenic areas, which have visual assessments completed and implemented according to the recommendations. | <u>Target:</u> 100% <u>Variance:</u> None |

This indicator addresses the following CSA-SFM parameters:

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|---|
| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.1: Timber and Non-Timber Benefits Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits. Objective: Protect aesthetic values by ensuring that development proposals within designated scenic areas have a visual quality assessment completed.</p> |
|---|

Description of Indicator

Forests can provide intangible benefits in addition to their economic and ecological values. The perceived beauty of certain areas in the DFA is one of these benefits and must be considered in forest management. The protection and maintenance of visual quality helps give assurance that these values will be available for current and future generations. A scenic area is defined by the Ministry of Forests as any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the district manager (BC MOF 2001c). Established scenic areas have specified Visual Quality Objectives (VQO) attached to them in order to manage each scenic landscape appropriately. A VQO is defined as a resource management objective established by the district manager or contained in a higher-level plan; these objectives reflect the desired level of visual quality based on the physical characteristics and social concern for the area (BC MOF 2001c). The five categories of VQOs commonly used are:

- 1) Preservation – No visible timber harvesting activity.
- 2) Retention – Timber harvesting activities are not visually evident.
- 3) Partial Retention – Activities are visual, but remain subordinate.
- 4) Modification – Activities are visually dominant, but have characteristics that appear natural.
- 5) Maximum Modification – Activities are dominant and out of scale, but appear natural in the background.

Cutblocks and roads that are planned within established scenic areas may require some form of visual assessment such as a site line analysis, a visual simulation package or a visual impact assessment. Visual assessments are conducted in order to prescribe management strategies to conserve visual resources where present. Recommendations generated by visual assessments are incorporated into Site Plans and then implemented in the field during harvesting activities.

This indicator is designed to ensure that visual assessments are completed in all planned harvest areas that fall within identified scenic areas and to ensure that recommendations from visual assessments are implemented on the ground. The maintenance of visual quality in known scenic areas is an important aspect of sustainable forest management because it contributes to overall landscape condition and social acceptance of industrial forestry. Monitoring the success of visual assessment completion and implementation of recommendations in harvested cutblocks will help ensure that visual quality is conserved for future generations.

Current Practices and Status of Indicator

During FDP/FSP preparation, known scenic areas are identified and if harvesting operations are planned, visual assessments are completed in order to incorporate required management strategies in site level plans. Visual assessments may help determine block shape, location and internal retention options. At the site level, management strategies are included in the Site Plan to incorporate the recommendations of visual assessments and mitigate potential visual impacts if they exist.

Establishment of Targets and Future Practices

The target for this indicator has been established at 100% because the identification and conservation of visual quality is important to various stakeholders within the Fort St. James DFA. Licensees and BCTS will continue to conduct visual assessments for cutblocks located in identified scenic areas and prescribe management activities based on the recommendations of the visual assessment where required. Future practices will incorporate legislation changes as they occur and Licensees/BCTS will actively track and report out this indicator to the public.

Forecasting and Predicted Trends

It is anticipated that visual assessments will be conducted for all blocks and roads planned for harvest within scenic areas and that 100% of all visual assessments will be implemented according to recommendations. However, 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 recommendations from being achieved. As such, it is important to identify what the accepted target means to SFM through the use of a "what if scenario". Conservation of visual quality primarily influences social and economic values within the DFA. As this indicator currently has a target set at 100%, one other scenario should be identified:

- a) What if only 50 % of cutblocks and roads harvested, in known scenic areas, had visual assessments completed and implemented according to the recommendations?

If only 50 % of cutblocks and roads harvested, in known scenic areas, had visual assessments completed and implemented according to the recommendations, social and economic impacts could occur within the DFA. Although the overall timber supply would likely increase if only 50% of visual quality requirements were met, it would be at the cost of other economic and social values. Visual quality helps businesses that cater to various forms of recreation including lodges, guiding and hunting, fishing and backcountry tours. By not conserving all identified visual values, these businesses could potentially lose customers

dissatisfied with the state of the visual resource. Social values attributed to visual quality could also decrease if only 50% of cutblocks and roads harvested, in known scenic areas, had visual assessments completed and implemented according to the recommendations. Visual values are particularly difficult to quantify, as one's idea of beauty is individual. However, the public would likely place a high value on visual quality aspects of harvested landscapes.

Licensees and BCTS will continue to ensure that 100% of cutblocks and roads harvested, in known scenic areas, have visual assessments completed and implemented according to the recommendations. This will be achieved through detailed development planning, 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 recommendations specified in visual assessments are implemented. These initial, intermediate and final checks are part of each Licensee's and BCTS's EMS or other tracking system and the future trend of this indicator will remain at the target of 100% if all processes and protocols are followed.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. Monitoring will be completed through a review of all cutblocks and roads that are located within scenic areas and identified for harvest in the reporting year to ensure all visual assessments were completed where required. An analysis of the Site Plans developed for these areas will also be conducted to ensure that the recommendations from visual assessments are included in these plans. Finally, a review of harvest inspections will be completed to ensure the recommendations in the Site Plan were followed in the field. The performance of this indicator will be included in the annual SFMP report for the operating period of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for identifying potential visual concerns at the FDP development stage and any harvesting that may affect them. Foresters preparing operational plans are responsible for ensuring that visual assessments are completed and that recommendations are incorporated into Site Plans. Licensees/BCTS are also responsible for ensuring that forest operations in the field are consistent with visual quality recommendations as identified in Site Plans.

The Licensees and BCTS realize that the high level of mortality of pine forests in scenic areas may impact the visual quality of some landscapes. Opportunities for rehabilitation of visual landscapes affected by the mountain pine beetle may be an area of continual improvement in the DFA.

Indicator 40 - Archaeological Assessments

| Indicator Statement | Target and Variance |
|--|------------------------------|
| Percent of blocks and roads harvested that are consistent with recommendations contained in site level archaeological assessments. | Target: 100% Variance: 0% |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.1: Timber and Non-Timber Benefits Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits. Objective: Percent of blocks harvested annually that follow recommendations contained in site level Archaeological Impact Assessments.</p> |
| <p>CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development CSA SFM Element 6.2: Respect for Aboriginal Forest Values, Knowledge, and Uses Value: Interests of Aboriginal people. Objective: Manage for cultural values, and incorporate aboriginal knowledge in forest management</p> |

Description of Indicator

The Fort St. James DFA is rich in archaeological resources from its long history of First Nations and European inhabitation. In order to determine the presence of archaeological features, Licensees/BCTS conduct archaeological assessments, including reconnaissance surveys, interim archaeological assessments or field based archaeological assessments. Archaeological resources in the Fort St. James DFA are usually of First Nation origin, but an archaeological assessment is not biased toward Aboriginal features. Archaeological features that relate to non-Aboriginal people may include artifacts from historical trappers and prospectors, or evidence of old trails and remnants from inhabitants of old lakeside cabins. Features such as these are also identified in archaeological assessment and management strategies are developed where appropriate to conserve cultural heritage for both Aboriginal and non-Aboriginal interests.

The protection of archaeological resources assures they will be identified, assessed and recorded for present and future generations. These resources often incorporate First Nation's heritage and spiritual sites, but they can also involve features protected and valued by non-aboriginal people. Maintenance of archaeological sites and cultural heritage values is an important aspect to sustainable forest management because it contributes to respecting the social and cultural needs of people who traditionally and currently use the DFA for a variety of reasons.

This indicator is designed to ensure that the recommendations from site level archaeological assessments are implemented on the ground during harvesting of roads or cutblocks. Tracking the indicator's success will allow Licensees and BCTS to evaluate how successful this implementation is and improve procedures if required.

Current Practices and Status of Indicator

FDPs/FSPs use 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, Licensees and BCTS conduct site level archaeological assessments to identify, assess and record any archaeological resources that may be present. In addition, in some cases, reconnaissance surveys are completed where the archaeological potential is moderate or low. Management measures are prescribed in Site Plans based on the results of the archaeological assessment and these management measures are implemented at the site level during harvesting operations. If a non-conformance with the Site Plan occurs in the field, this information is recorded on an activity inspection form and then entered into an incident tracking database or other similar system.

Once a strategy to conserve archaeological resources is included within a Site Plan, there is a legal obligation for the Licensee/ BCTS to implement and adhere to the strategy. Final harvest inspections ensure that these strategies are implemented in harvested cutblocks and roads as stated in the Site Plan.

Establishment of Targets and Future Practices

The target for this indicator was established at 100% with a 0% variance because the identification and conservation of archaeological resources is paramount to First Nations, other stakeholders and the public. Licensees and BCTS will continue to take measures to ensure all Site Plans for harvested blocks and roads follow the recommendations contained in site level archaeological assessments and that these recommendations are also implemented in the field. Future practices will also ensure that licensees actively monitor, track and report performance to the public on an annual basis.

Forecasting and Predicted Trends

It is anticipated that the target of 100% of harvested blocks and roads will follow recommendations contained in site level archaeological assessments. The exact level of success is difficult to forecast as it is operational in nature and is dependent on the nature of the site, and human induced error. Conservation of archaeological resources primarily influences social values within the DFA. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator currently has a target set at 100%, one other scenario should be identified:

- a) What if only 50% of blocks and roads harvested followed recommendations contained in site level archeological assessments?

Implementing only 50% of recommendations contained in site level archaeological assessments 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 as a result. Aboriginal communities may no longer become involved in development planning as potential infringement of unresolved treaty rights could occur if cultural heritage values are not fully conserved. Members of the general public may also lose faith in forest management and planning processes if the cultural heritage of the Fort St. James DFA was not recognized as an important value.

Due to the social importance of archaeological resources, the Licensees and BCTS will continue to ensure that 100% of recommendations from archaeological assessments are implemented on the ground during cutblock and road harvesting. They 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 complete to ensure the commitments specified in operational plans are met. These initial, intermediate and final checks are part of each Licensee's and BCTS's EMS or other tracking system and the future trend of this indicator will remain at the target of 100% if all processes and protocols are followed.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. The information that is required to monitor this indicator includes a summary of the number of cutblock and road harvesting activities that are consistent with archaeological assessment recommendations. This information is collected during EMS or other tracking system checklist reviews and through harvesting inspections, and is stored in Licensee and BCTS databases such as GENUS or Inform. The indicator percent will be included in the annual SFMP report for the operational year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for identifying areas of archaeological potential during the FDP/FSP development stage through an Archaeological Predictive Model. Foresters responsible for preparing Site Plans have to ensure that prescribed management activities are consistent with any archaeological assessment recommendations. Licensees/BCTS are also responsible for implementing Site Plan requirements on the ground and for ensuring any failures to achieve recommendations are tracked in associated databases. Corrective and preventative actions will be identified and implemented to improve consistency where required.

Licensees and BCTS will investigate the possibility of increasing the accuracy of predicting the presence of archaeological sites. Licensees and BCTS, in cooperation with First Nations, the public and local archaeologists, will continue to expand their awareness of archaeological values, and explore the effectiveness of strategies utilized to minimize overall impacts to these valuable resources.

Indicator 41 - Communication with Interested Individuals

| Indicator Statement | Target and Variance |
|--|---|
| Percent of individuals who have expressed an identified interest in forest planning are communicated with. | <p><u>Target:</u> Annually, 100%</p> <p><u>Variance:</u> -10%</p> |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.1: Timber and Non-Timber Benefits Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits. Objective: Maintain opportunities to access non-timber benefits by ensuring that individuals and stakeholders who have expressed an identified interest in the planning area (guides, trappers,</p> |
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| recreationists, water licensees, mining tenure holders etc) are specifically communicated with during forest planning. |
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Description of Indicator

Licensees and BCTS maintain a list of individuals who have expressed an interest in forest planning that they notify when forestry operations/ developments are to occur. This list may include individuals who responded to the Licensees'/ BCTSs' general notification (*see indicator #43*). These interested parties may be private landowners, lodge operators, trappers, hunting guides, recreationists, mining tenure holders, and water licensees. Communication of planned forestry activities to these individuals should be done 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. As sustainable forest management includes non-timber values, it is important that the forest industry works with these individuals to minimize impacts and to plan operations that consider their concerns. This indicator is intended to measure the success in communicating with individuals who have expressed an interest in forest planning, and, if necessary, improve that communication.

Current Practices and Status of Indicator

Licensees and BCTS contact various stakeholders and members of the public when forestry operations are planned or ready to commence in a given area. Typically this communication is done by letter, but contact is also made by telephone or face to face meetings. There are specific strategies and protocols to direct this communication to ensure the right information is supplied to all interested parties at the right time. Licensees and BCTS use a variety of tracking systems to record this communication but have not historically reported out the percentage of communication strategies that have met requirements.

Establishment of Targets and Future Practices

The Licensees recognize the importance of meeting communication strategies and have set a target of 100% to reflect this commitment. A -10% variance has been established because occasionally contact cannot be made with some interested parties. This may be the result of changes in addresses, absentee stakeholders, or outdated contact information.

Communication strategies will be mutually agreed upon by the Licensees/ BCTS and the interested individuals to ensure information is received in a timely manner. Specific issues will have their own communication strategies developed. For example, stands with forest health concerns (such as bark beetles) that are adjacent to private land may have their management discussed with the landowner.

Licensees and BCTS will continue to try and keep contact lists accurate and up to date and will strive to communicate with all identified interested individuals when required. Future practice will include monitoring, tracking and reporting this indicator to the public on an annual basis.

Forecasting and Predicted Trends

It is the intent of all Licensees and BCTS 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. Communication with interested individuals directly affects social values and indirectly affects economic values of SFM. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator has a stated target of 100%, one other potential scenario should be developed:

- a) What if only 50% of individuals who have expressed an identified interest in forest planning are communicated with annually?

If only 50% of identified interested parties are communicated with annually, a variety of interested parties may be unaware of the commencement of forest operations and forestry plans. This could potentially damage the economic interests of some of these parties. For example, a lodge may plan to take clients to a lake for fishing. Unfortunately, a Licensee failed to notify them that harvesting was occurring adjacent to the lake and the fishing experience was diminished. Socially, there may be impacts as well. Forestry operations can involve large machinery, large volumes of logging trucks, and high noise levels.

All of these can be serious intrusions for people using the forest for recreational purposes, or for nearby landowners. Communication can prepare them for these activities and allow them to make comments if they wish to question the planned forestry operations.

The above “what if scenario” analysis implies that a balance of values can be achieved through meeting communication strategy requirements. Therefore, Licensees and BCTS will continue to communicate with identified interested individuals to respect the needs of other inhabitants and stakeholders in the DFA.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. The Licensees and BCTS will track and monitor this indicator using EMS or other tracking system protocols and databases such as GENUS or Inform. For every area in which forestry operations occur, the list of appropriate interested parties that were contacted in accordance with communication requirements will be reviewed. This information will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking, and reporting this indicator. Opportunities to improve the performance of this indicator may be linked to ongoing technological changes in communication, such as the use of email and websites. Licensees/ BCTS may also explore the opportunities of coordinating their communication strategy requirements and share information on stakeholders and interested parties.

Indicator 43 - Expression of Interest

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
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| General notification to request expression of interest (newspaper ad). | <u>Target:</u> Annual notification. <u>Variance:</u> None |

This indicator addresses the following CSA-SFM parameters:

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| <p><i>CCFM Criterion 5: Multiple Benefits to Society</i> <i>CSA SFM Element 5.1: Timber and Non-Timber Benefits</i> <i>Value:</i> Acceptable and feasible mix of a healthy forest industry and non-timber benefits. <i>Objective:</i> Maintain opportunities to access non-timber benefits by ensuring that individuals and stakeholders who have expressed an identified interest in the planning area (guides, trappers, recreationists, water licensees, mining tenure holders etc) are specifically communicated with during forest planning.</p> |
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Description of Indicator

As discussed in indicator #41, Licensees and BCTS maintain a list of individuals who have expressed an interest in forest planning that they notify when forestry operations/ developments are planned or are to occur. In order to provide an opportunity for individuals to be included in this communication list, Licensees and BCTS have committed to publishing a general notification to request expression of interest in a local newspaper. Interested individuals can respond to the notification by contacting the Licensee/BCTS and informing them of their desire to be included in future communication.

As sustainable forest management includes non-timber values, it is important that the forest industry works with interested individuals to plan operations that consider their concerns. This indicator is intended to measure the success in publishing the annual general notification to request expression of interest.

Current Practices and Status of Indicator

The Licensees and BCTS currently publish notifications to request expression of interest in forest planning in local newspapers that serve the Fort St James DFA when a FDP/FSP is created or amended. Through this advertisement process, all stakeholders and members of the public that have identified an interest in forest planning are communicated with in a timely manner.

Establishment of Targets and Future Practices

The Licensees and BCTS recognize the importance of providing people with the opportunity to be involved with forest planning and have set a target of annually publishing a general notification to engage an expression of interest in forest planning from the public to meet this commitment. The notification will be published annually by each signatory to the SFMP, or group of signatories, to expand on the current opportunities available for public involvement in forest planning initiatives.

Future practices will implement this annual add in order to engage the public annually rather than only when a FDP/FSP is developed or amended.

Forecasting and Predicted Trends

It is the intent of all Licensees and BCTS to meet the indicator 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. Therefore, the use of a “what if scenario” is beneficial in identifying what the accepted target means to SFM. As this indicator has a stated target of providing an annual notification, one other potential scenario should be developed:

- a) What if Licensees/ BCTS did not publish an annual general notification to request expression of interest?

Allowing the public to express their concerns and comments about forestry activities is a major component of SFM. Without annual notification to request expression of interest, the public may not be actively engaged to comment about forestry activities. This can not occur if the Licensees/ BCTS are unsure of who to communicate with. The annual general notification allows for the development of a list of interested individuals who wish to be informed of, or participate in, forest planning issues. It also ensures that the public feels more open in approaching a licensee/BCTS to discuss planning issues because they are notified and invited to participate on an annual basis. Failure to develop open communication with the local public could potentially lead to forestry activities that compromise other non-timber interests or concerns.

As such, Licensees and BCTS are committed to publishing an annual general notification to request expression of interest in forest planning in the DFA.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. The Licensees and BCTS will track and monitor this indicator using EMS or other tracking system protocols and databases such as GENUS or Inform. Each signatory licensee will publish a newspaper add annually or will collaborate with other licensees to publish a joint add. A copy of this add will be kept on file and any associated correspondence with members of the public will be documented and tracked for reporting purposes. Performance of 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

Licensees and BCTS are responsible for publishing their notification and reporting their success in doing so. Opportunities to improve the performance of this indicator may be linked to ongoing technological changes in communication, such as the use of email and websites. Licensees/ BCTS may also explore the opportunities of further coordinating their notifications with other Licensees.

Indicator 44 - Personal Notification

| Indicator Statement | Target and Variance |
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| Annual personal notification to every "known" non-timber licensed tenure holder. | <u>Target:</u> 100% <u>Variance:</u> 0% |
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This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.1: Timber and Non-Timber Benefits Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits. Objective: Maintain opportunities to access non-timber benefits by ensuring that individuals and stakeholders who have expressed an identified interest in the planning area (guides, trappers, recreationists, water licensees, mining tenure holders etc) are specifically communicated with during forest planning.</p> |
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Description of Indicator

As discussed in indicators #41 and #43, communication with the public in regards to forest planning is a crucial component of sustainable forest management. Among the individuals that may be affected by forestry activities, non-timber licence tenure holders are of particular interest, as their commercial livelihoods depend on the cooperation of the forest industry. Known non-timber licence tenure holders include hunting guides, trappers, water users, mining interests, and range licensees that have been identified through their tenure identification.

It is an important aspect of SFM that the forest industry works with non-timber tenure holders to plan operations that consider their concerns. The indicator is intended to ensure the Licensees/ BCTS send an annual personal notification to every known non-timber licensed tenure holder that may be influenced by their operations. This notification will be in the form of a letter that informs the licensee of the communication opportunities they may use to express concerns in regards to planned forest activities.

Current Practices and Status of Indicator

The Licensees and BCTS have sent notifications to non-timber licensed tenure holders for many years as part of their Forest Development Plan/ Forest Stewardship Plan development process. These notifications vary, but they all inform the licensee that they may provide comments on proposed harvesting activities. The decision to act upon the opportunity to provide comments rests with the licensed tenure holder.

Establishment of Targets and Future Practices

The Licensees and BCTS recognize the importance of providing people with the opportunity to be involved with forest planning and have set a target of annually personally notifying known non-timber licenced tenure holders to meet this commitment. Future practice will incorporate this annual notification so that participation in planning by non-timber tenure holders becomes regular practice and does not just occur when a FDP/FSP or amendment is submitted to government.

Forecasting and Predicted Trends

It is the intent of all Licensees and BCTS to meet the indicator 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. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator has a stated target of providing an annual notification to 100% of known non-timber licensed tenure holders, one other potential scenario should be developed:

- a) What if Licensees/ BCTS sent an annual personal notification to only 50% of "known" non-timber licensed tenure holder?

Allowing the public to express their concerns and comments about forestry activities is a major component of SFM. Licensed tenure holders in particular should have opportunities to provide input into forest planning, as they stand to suffer economically if their concerns are not considered. Failure to send 50% of tenure holders a personal notification may result in forestry activities that damage resources they

depend on. For example, a trapper that is unaware of planned harvesting may lose traps and trails to harvesting operations that were equally unaware of their existence.

Besides economic values that may be lost, social values may also be at risk from poor communication with non-timber tenure holders. Many of these individuals value the lifestyles their tenures provide, and would see their loss as significant as the economic impacts. Therefore, Licensees and BCTS are committed to sending an annual personal notification to every "known" non-timber licensed tenure holder.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target. The Licensees and BCTS will track and monitor this indicator using EMS or other tracking system protocols and databases such as GENUS or Inform. For every area in which forestry operations occur, the list of known non-timber licensed tenure holders that were contacted in accordance with personal notification requirements will be reviewed. This information will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for personal notification of non-timber tenure holders and reporting their success in doing so. Opportunities to improve the performance of this indicator may be linked to ongoing technological changes in communication, such as the use of email and websites. Licensees/BCTS may also explore the opportunities of coordinating their notifications with other Licensees to prevent duplication.

Indicator 45 - Marten and Moose Management

| Indicator Statement | Target and Variance |
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| Develop management strategies for marten and moose. | <u>Target:</u> Within 1 year of plan endorsement <u>Variance:</u> 6 months |

This indicator addresses the following CSA-SFM parameters:

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| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.2: Species Diversity Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution). Objective: Ensure habitat for species where ecologically appropriate.</p> <p>CCFM Criterion 2: Maintenance and Enhancement of Forest Ecosystem Condition and Productivity CSA SFM Element 2.2: Forest Ecosystem Productivity Value: A productive forest ecosystem. Objective: Conserving forest ecosystem productivity by maintaining ecosystem conditions (habitats) that are capable of supporting naturally occurring species.</p> |
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CCFM Criterion 5: Multiple Benefits to Society**CSA SFM Element 5.1: Timber and Non-Timber Benefits**

Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits.

Objective: Develop management strategies for resources or non-timber values of commercial interest.

Description of Indicator

The pine marten (*Martes americana*) and the moose (*Alces alces*) are two mammals found throughout the forested areas of the Fort St. James DFA. Although neither is a legally identified Species at Risk, they are highly valued species that contribute to the ecological and social values of SFM in the DFA.

The pine marten is a small carnivore similar to a weasel, and prefers older coniferous forests for its habitat. An important carnivore, it is also a species valued by the trapping industry. The moose is an important prey species for wolves, bears, and cougars, and is also a main food source for scavengers such as wolverines. Moose also have a high social value, as they are widely hunted by residents of the DFA and visitors to the area, and admired as a symbol of the Canadian wilderness. Maintaining both of the species will help to conserve forest ecosystem productivity, as these species are important components of predator/ prey systems in the DFA.

This indicator is intended to measure the success of the Licensees and BCTS to develop management strategies for these species within one year of the SFMP endorsement. By successfully meeting this goal, these important species will be better managed to ensure they will continue to meet the ecological and social values of SFM.

Current Practices and Status of Indicator

Moose and marten have historically been managed by hunting and trapping regulations under the *Wildlife Act* and by site specific activities such as the construction of debris piles for marten denning habitat. There have not been strategies developed for the overall management of these species in regards to how industrial forestry is conducted in the DFA.

Establishment of Targets and Future Practices

The development of management strategies will be completed within one year of the SFMP endorsement. This date was chosen because it allows sufficient time to develop meaningful strategies.

The management strategies will be based on information already available and on recent scientific literature. A Fort St. James District research project may also be conducted, which will focus on mapping and verification of marten and moose habitat and management strategies may be generated from this research. Once developed, management strategies will be implemented in Site Plans to ensure the protection of species' habitats.

Forecasting and Predicted Trends

The Licensees and BCTS have established one year from the SFMP endorsement date as the deadline for the development of management strategies for marten and moose and at this time the deadline is expected to be met. As this indicator cannot be quantifiably forecasted it is important to identify what the accepted target means 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. As the current target states a timeline of one year after SFMP endorsement, the analysis is based on:

- a) What if it took considerably longer than one year from the date of plan endorsement to develop management strategies for marten and moose?

Failure to develop management strategies for marten and moose by the target date may result in forest operations that do not adequately manage for these species to the standards of the PAG. This may result in the loss of valuable moose/ marten habitat and possibly result in an overall loss of species diversity in the DFA. Although current management accounts for values associated with flora and fauna in the DFA,

a delay in development of these management strategies could result in forest practices that are not conducted based on the best available information on marten/ moose, and therefore may impact those species in the long term. Therefore, the Licensees and BCTS are committed to completing management strategy development within one year of the plan's endorsement.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed by the Licensee/BCTS group. An annual review of the management strategy development process will be completed and reported in the annual SFMP report for the operating year of April 1st to March 31st. 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 Site Plans.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for ensuring management strategies are developed by the one year deadline. Continual improvement will also involve increasing knowledge of the interactions between harvesting and marten/moose populations.

Indicator 46 - Known Subsistence Uses, Recreational/ Cultural Trails/ Sites & Spiritual Sites.

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|---|---|
| Percent of cutblocks and roads harvested that have incorporated information of known subsistence uses, recreational/cultural trails/sites, or spiritual sites that have been brought forward. | <u>Target:</u> 100% <u>Variance:</u> 20% |

This indicator addresses the following CSA-SFM parameters:

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| <p><i>CCFM Criterion 5: Multiple Benefits to Society</i> <i>CSA SFM Element 5.1: Timber and Non-Timber Benefits</i> <i>Value:</i> Acceptable and feasible mix of a healthy forest industry and non-timber benefits. <i>Objective:</i> Conserve known subsistence uses (berries, hunting, fishing, medicinal plants).</p> |
| <p><i>CCFM Criterion 5: Multiple Benefits to Society</i> <i>CSA SFM Element 5.1: Timber and Non-Timber Benefits</i> <i>Value:</i> Acceptable and feasible mix of a healthy forest industry and non-timber benefits. <i>Objective:</i> Respect recreational/ cultural trails/ sites, spiritual sites.</p> |

Description of Indicator

Many areas of the Fort St. James DFA are used for subsistence uses such as berry picking, mushroom picking, hunting, fishing, and medicinal plant collection. Both First Nations' communities and non-First Nations' inhabitants of the DFA may rely on these areas to supply a portion of their dietary and medicinal requirements. Many areas in the DFA are also enjoyed for their recreational, cultural, or spiritual values. While some of these sites may be protected due to their archaeological significance, there may be others that are too recent to benefit from legislative protection, or do not possess any tangible evidence of their importance. These sites may include ski trails or ATV trails used to access favorite fishing and camping sites. Or, they may be areas of spiritual significance for First Nations, such as a mountain or lake. In the case of the latter, there may be no archaeological proof of this significance, but the lack of such physical evidence should not exclude these areas from proper management for their defined value.

Cutblock and road harvesting activities may occur in the same areas as these subsistence or recreation/cultural/spiritual sites, and if they are not conducted properly, can severely damage or destroy these resources. Sustainable forest management must consider non-forestry use of the DFA land base, and these non-timber resource sites should be considered in site plans to meet this aspect of SFM.

This indicator is intended to measure the success of road and cutblock harvesting activities to incorporate information of known subsistence uses and information of known recreation/cultural/spiritual sites that have been brought forward. Site level plans that direct harvesting activities are dependent upon users of subsistence sites and recreation/cultural/spiritual sites to supply the Licensees and BCTS with the information needed to manage them appropriately. These users are encouraged to take advantage of communication strategies, such as responding to the notifications discussed in indicators #43 and #44, as well as other opportunities to provide input to forest planning.

Current Practices and Status of Indicator

The Licensees and BCTS currently provide opportunities for members of the public to provide input at the Forest Development Plan/Forest Steward Plan stage. Users of subsistence sites and recreation/cultural/spiritual sites can provide comments at this stage, and throughout the planning process. When information on these non-timber resources is brought forward, site level plans will incorporate the information and prescribe management activities during road and cutblock harvesting where possible.

While concerns about known non-timber resource sites are currently addressed by Licensees/BCTS, they have not formally tracked and reported out this information to the public.

Establishment of Targets and Future Practices

The Licensees and BCTS recognize the importance of subsistence uses and recreation/cultural/spiritual sites for many of the residents of the DFA and have set a target of having all harvested cutblocks and roads incorporate information of these known non-timber resource uses. However, in some cases non-timber resources are not able to be managed fully during harvesting activities due to natural circumstances (ie: forest health, natural disturbance). Due to this possibility and the uncertainty of the current mountain pine beetle epidemic, there has been a 20% variance established. Licensees/BCTS will expand opportunities for the public to bring forward non-timber resource site information through annual notifications, and will store this knowledge in a manner that can be accessed by personnel preparing site level plans. Future practices will also include monitoring, tracking and reporting out this indicator on an annual basis.

Forecasting and Predicted Trends

It is the intent of all Licensees and BCTS to meet the indicator 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 oversight. Therefore, the use of a “what if scenario” is beneficial in identifying what the accepted target means to SFM. As this indicator has a stated target of 100% of cutblocks and roads harvested that have incorporated information of known subsistence uses, recreational/cultural trails/sites or spiritual sites that have been brought forward, one other potential scenario should be analysed:

- a) What if only 50% of cutblocks and roads harvested incorporated information of known subsistence uses, recreational/cultural trails/sites or spiritual sites that have been brought forward?

Consideration of non-forestry uses in the DFA is a major component of SFM. Failure to incorporate knowledge of known subsistence uses or recreation/cultural/spiritual sites that have been brought forward into cutblocks and roads harvested in the DFA could have two potential negative impacts. First, the non-timber resources themselves may be damaged, and the people relying on them for sustenance or social use may no longer enjoy them to the same degree. Secondly, those who bring information forward may question the whole process of public consultation if they see their concerns ignored. SFM relies on public participation in forest planning, and that public has to be confident that management practices will reflect their input. This confidence may not develop if only 50% of cutblocks and roads harvested incorporate information of known subsistence uses, recreational/cultural trails/sites or spiritual sites that have been brought forward.

While it may be unfeasible for all information of known non-timber resources to be incorporated during cutblock and road harvesting activities (hence the variance), the Licensees and BCTS are committed to meeting the indicator target to protect non-timber resources and uses in the DFA, where possible.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. The Licensees and BCTS will track and monitor this indicator using EMS or other tracking system protocols and databases such as GENUS or Inform. All knowledge of known subsistence sites and recreation/cultural/spiritual sites will be stored in the applicable database. Site level plans will be reviewed to ensure the information is incorporated where applicable. The success in meeting the indicator target will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for providing opportunities for people to bring forward information on subsistence sites and recreation/cultural/spiritual sites, and for storing this information in an appropriate manner. Personnel preparing site level plans are responsible for reviewing this information and incorporating it where applicable. Licensees and BCTS are responsible for a review of site level plans to determine the success in incorporating this knowledge. Opportunities for improvement may be linked to developing management techniques that can protect or enhance non-timber uses while maintaining economic benefits of harvesting activities.

Indicator 48 - Contracts Serviced by North Central British Columbia

| Indicator Statement | Target and Variance |
|---|--|
| Percent of operational forestry contract value in dollars within the DFA serviced by north central British Columbia | <u>Target:</u> 90%- achieved annually (Excluding BCTS) <u>Variance:</u> -10% months |

This indicator addresses the following CSA-SFM parameters:

| |
|--|
| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.2: Communities and Sustainability Value: Sustainable communities. Objective: To promote economic development opportunities for local people and businesses.</p> |
|--|

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 companies to contribute to and invest in the local economy there must be assurances that there will be a consistent flow of work. This indicator is intended to measure the percent of forestry contract value (\$) within the DFA serviced by north central BC businesses. This amount will indicate the commitment the Licensees are making towards maintaining the economic sustainability of the region.

The north central interior is defined in this SFMP as the land base that includes communities from 100 Mile House to Fort St. John (south to north) and Terrace to Valemount (west to east). The total dollar value of operational forestry contracts considered to be serviced by north central BC will be calculated relative to the total dollar value of all operational forestry contracts. This calculation will be used to derive the percentage of money spent on operational forestry contracts in the DFA from suppliers in north central BC.

Current Practices and Status of Indicator

A query of the financial data stored within the Licensee's individual accounting systems 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. In order to be meaningful, this financial data will be weighted by Licensee based on Allowable Annual Cut (AAC).

Establishment of Targets and Future Practices

The target was based on the past performance of Licensees and reflects a commitment to supporting North Central Interior businesses. A 90% target represents a significant financial investment in the regional economy. However, a 10% variance was established because regional contractors may not be able to supply the technical expertise required for certain operations. Or, there may be insufficient local resources to meet the current demand, forcing Licensees to seek contract services elsewhere.

BCTS is excluded from this indicator because it is a Provincially based business and can not always fully control where contract dollars are spent due to government policies.

Forecasting and Predicted Trends

This indicator is not easy to quantifiably forecast over a defined time frame. The use of a “what if scenario” can be beneficial in identifying what the accepted target means to SFM. The percent of operational forestry contract value in the DFA serviced from north central interior suppliers is an important aspect of SFM because it directly relates to sustaining the local economy. As the target for this indicator is listed as 90%, one other scenario should be analyzed:

- a) What if <50% of the operational forestry contract value within the DFA was serviced by north central British Columbia?

If less than 50% of the operational forestry contract value within the DFA was serviced by north central BC, two important values could potentially be at risk. The first, and most important of these, would be a possible reduction in the overall economy of the north central interior. Utilizing services from outside of north central BC could reduce the overall economy and in turn affect 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 of north central BC simply reduces the overall economy of the region.

The second potential risk to contracting less than 50% of operational forestry activities outside of the north central interior is the lack of local knowledge and expertise that could be delivered. Businesses that are located in north central BC 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 BC 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 north central BC, the Fort St. James Licensees are committed to achieving the stated target for this indicator.

Monitoring and Reporting Procedures

This indicator has a Licensee specific target and will be monitored and reported from Licensees' accounting systems. Licensees will conduct a financial query of expenditures by postal code for suppliers and contractors within north central BC compared to the total dollars spent. The average will be weighted by the Licensee's volume of timber cut. 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

Licensees are responsible for the monitoring, tracking and reporting of this indicator. Specifically, accounting departments are responsible for querying the information needed to determine the percentage. In the future, Licensees may want to focus their spending on businesses in the Fort St. James DFA, or the Prince George TSA rather than just north central BC. In this way the communities closest to the DFA receive the most benefit from local forests.

Indicator 49 - Employment Opportunities Advertised Locally

| Indicator Statement | Target and Variance |
|---|---|
| Percentage of advertised employment opportunities published in the local paper. | <u>Target:</u> 100% (Excluding BCTS) <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|--|
| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.2: Communities and Sustainability Value: Sustainable communities. Objective: Creating opportunities for local employment.</p> |
|--|

Description of Indicator

Forest Licensees and the variety of contractors they employ constitute a major source of employment in the Fort St. James DFA. Many local people rely on the jobs created by forest Licensees for their careers and livelihoods. To take advantage of local employment opportunities, residents of the DFA and other members of the local public must be aware of them. This indicator is intended to measure the success of Licensees to publish advertised employment opportunities in the local paper. For the purposes of this indicator, the local paper is the Caledonia Courier or the PG Citizen.

Current Practices and Status of Indicator

Licensees currently publish all advertised employment opportunities in the local paper. BCTS is excluded from this indicator because it is required to advertise positions in accordance with public service regulations.

Establishment of Targets and Future Practices

The Licensees have established a target of 100% of advertised employment opportunities to be published locally to reflect their commitment to contributing to the local economy. They will continue to publish advertised employment in the local paper and encourage local residents to apply for positions with their organizations. Future practices will also include monitoring, tracking and reporting out this information to the public annually.

Forecasting and Predicted Trends

This indicator is not easy to quantifiably forecast over a defined time frame. The use of a “what if scenario” can be beneficial in identifying what the accepted target means to SFM. As the target for this indicator is 100% of advertised employment opportunities to be published in the local paper, one other scenario should be analyzed:

- a) What if only 50% of advertised employment opportunities were published in the local paper?

Publishing only 50% of advertised employment opportunities in the local paper could potentially affect social values of SFM. If local residents of the DFA do not have opportunities to participate in the primary local industry (forestry), unemployment and poverty in the DFA may increase. Sustainable forest management relies on support and participation from the public. If the local public is not benefiting from forestry employment opportunities, they may have less perceived reason to support the goals of SFM. Publishing advertised employment opportunities in the local paper would provide more residents of the DFA an opportunity to participate in the forestry economy, and thereby potentially increase overall interest in sustainable forest management.

To sustain the social and economic values of SFM, the Licensees are committed to publishing 100% of advertised employment opportunities in the local paper.

Monitoring and Reporting Procedures

This indicator has a Licensee specific target and will be managed on an individual basis. Each Licensee will develop a system to track all advertised employment opportunities that they publish in the local paper.

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

Licensees are responsible for the monitoring, tracking and reporting of this indicator. Specifically, Licensees are responsible for ensuring advertised positions are published in the local paper, and that a record of these publications is made to determine the indicator percent. Opportunities for improvement include support of training and education programs for local residents in forestry skills. Licensees may also participate in career days at local high schools to promote forestry as a career for local young people.

Indicator 50 - Bidding Opportunities for Local Forestry-Based Businesses

| Indicator Statement | Target and Variance |
|--|------------------------------|
| Percentage of bidding opportunities that are provided to qualified local forestry-based resource businesses. | Target: 100% Variance: 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.3: Fair Distribution of Benefits and Costs Value: Community benefits. Objective: Maintain a positive operating climate for local forestry based resource businesses.</p> |
|---|

Description of Indicator

Forests provide substantial socio-economic benefits in addition to their many ecological benefits. In order to have sustainable socio-economic conditions for communities associated with the DFA, local forestry-based resource businesses should be able to benefit from the work that is required by forest Licensees. Furthermore, for local forestry-based resource businesses to contribute to and invest in the local economy they must have opportunities to bid on contracts tendered by Licensees.

This indicator is intended to measure the percent of bidding opportunities that are provided to qualified local forestry-based resource businesses. Bidding opportunities include woodlands related tendered projects, other than logging, hauling, and road building. These could include cruising, block layout, road layout, and silviculture activities such as tree planting, surveys, and stand tending. Local forestry-based businesses should be able to have the opportunity to bid on these contracts and bring the economic benefits of the forest industry to the local community.

For the purpose of this indicator, local forestry based resource business are defined as those that are located within the Fort St. James DFA.

Current Practices and Status of Indicator

Licensees currently provide opportunities for qualified local forestry-based resource businesses to bid on woodlands related projects. These opportunities are usually expressed as advertisements in local papers. The exact percentage of these bidding opportunities that are provided to local businesses has not been formally tracked.

Establishment of Targets and Future Practices

The target is based on the past performance of Licensees and reflects their commitment to supporting qualified local forestry-based resource businesses. BCTS is exempt from this indicator due to their status as a government managed, Provincial wide organization and their established protocols for project tendering.

Forecasting and Predicted Trends

It is expected that 100% of bidding opportunities will be provided to qualified local forestry-based resource businesses, but the exact success in achieving this target is not easy to quantifiably forecast. The use of a “what if scenario” can be beneficial in identifying what the accepted target means to SFM. As the target for this indicator is 100%, one other scenario should be analyzed:

- a) What if only 50% of the bidding opportunities were provided to qualified local forestry-based resource businesses?

If only 50% of the bidding opportunities were provided to qualified local forestry-based resource businesses, two important SFM values could be at risk. The first, and most important of these, would be a potential reduction in the local economy. Local forestry contractors provide employment for DFA residents and spend money on local suppliers and businesses. Without employment opportunities from local forest Licensees, their contribution to the local economy is weakened and may impact the sustainability of the local economy.

The second potential risk is deteriorating social support of SFM. If local qualified forestry-based resource businesses believe that local Licensees are not providing them with bidding opportunities, they may have less incentive to support the forest industry. Overall public involvement in forest planning and management may decline and the residents of the DFA may see fewer reasons to support SFM if they are not sharing in local economic benefits.

Due to the identified potential impacts this indicator could have on the economy and stability of local communities, the Fort St. James Licensees are committed to achieving the stated target for this indicator.

Monitoring and Reporting Procedures

This indicator has a Licensee specific target and will be managed on an individual basis. Licensees will record all bidding opportunities for appropriate woodlands related tendered projects and track the number of these opportunities that were made available to qualified local businesses. These records may be kept in databases such as GENUS, or in other information management systems. 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

Licensees are responsible for the monitoring, tracking and reporting of this indicator. Specifically, Licensees are responsible for tracking bidding opportunities and the percent that are provided to local qualified forestry-based resource businesses. In the future, Licensees may want to focus their spending on businesses in the Fort St. James DFA. In this way the communities in to the DFA receive the most benefit from local forests.

Indicator 51 - Promoting Local Shopping

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|---|--|
| Annually, licensees will encourage employees to shop local. | <p><u>Target:</u> 1 promotion per licensee per year (applies to signatories with Woodlands operations located within 20 km of the town of Fort St. James)</p> <p><u>Variance:</u> 0%</p> |

This indicator addresses the following CSA-SFM parameters:

| |
|--|
| <p>CCFM Criterion 5: Multiple Benefits to Society CSA SFM Element 5.3: Fair Distribution of Benefits and Costs Value: Community benefits. Objective: Promote programs and advertising that encourage employees to shop local.</p> |
|--|

Description of Indicator

Businesses in the DFA depend on the local forest economy, as it is the largest employer in the region. Money generated by the forest economy supports local businesses and the broader local communities. By promoting programs that encourage employees to shop local, Licensees with Woodlands operations in the Fort St. James DFA are promoting the economic sustainability of the DFA's communities. Sustainable forest management is committed to the fair distribution of benefits from the forest industry, and this indicator is intended to promote that distribution.

Current Practices and Status of Indicator

Licensees with Woodlands operations in the Fort St. James currently promote shopping locally to employees through various types of promotions. Those Licensees/BCTS that do not have Woodlands operations within 20 km of the town of Fort St. James cannot encourage employees to shop locally as they may not live and work within the town of Fort St. James.

Establishment of Targets and Future Practices

The target reflects the commitment of the Licensees with Woodlands operations within Fort St. James to promoting local shopping. In the future, these Licensees will collectively promote local shopping to all employees at least three times per year. This promotion may take the form of a circulation attached to each employee's pay stub and will highlight the importance of their support to local businesses, and will urge them to consider shopping in local stores.

Forecasting and Predicted Trends

It is expected that the target of 1 promotion per licensee per year will be achieved, but the exact success is not easy to quantifiably forecast. The use of a "what if scenario" can be beneficial in identifying what the accepted target means to SFM. As the target for this indicator is 1 promotion per licensee per year, one other scenario should be analyzed:

- a) What if no employees were encouraged to shop locally?

If the concept of shopping locally was not promoted to all employees of Licensees with Woodlands operations in the Fort St. James DFA, the fair distribution of the economic benefits of the forest economy may not occur. Employees may not consider the importance of shopping locally and make their purchases in businesses and communities that have no interest or connection to the Fort St. James DFA. The vigor, sustainability, and quality of life of the DFA's communities depend on a healthy business sector. This business sector relies on the support of local residents, most of whom earn their income from the forest industry. As community stability and sustainability are important aspects of SFM, the promotion of local shopping should be a priority for all Licensees.

Monitoring and Reporting Procedures

This indicator has a Licensee specific target and will be managed on an individual basis. Licensees will record the number promotions sent to each employee annually. These records will be kept in accounting databases or other applicable tracking systems. 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

Licensees with Woodlands operations within the Fort St. James DFA are responsible for the monitoring, tracking and reporting of this indicator. Specifically, Licensees are responsible for ensuring that each employee receives a promotional circulation annually. Licensees are also responsible for the recording of this indicator and querying it upon request. Opportunities for improvement may include the expansion of this promotion or financial incentives for employees to shop locally.

Indicator 52 – Aboriginal Treaty Rights

| Indicator Statement | Target and Variance |
|---|--|
| Encouragement of aboriginal participation in the SFM process by offering assurance to aboriginal people the process will not compromise aboriginal and treaty rights. | <p><u>Target:</u> Develop a PAG terms of reference that specifically states that participation in the SFM process will not prejudice aboriginal treaty rights</p> <p><u>Variance:</u> None</p> |

This indicator addresses the following CSA-SFM parameters:

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|---|
| <p>CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development CSA SFM Element 6.1: Aboriginal and Treaty Rights Value: First nation Aboriginal and treaty rights. Objective: Recognition and respect for Aboriginal and treaty rights.</p> |
|---|

Description of Indicator

First Nation communities are an integral component of the Fort St. James DFA and their support for SFM is very important for the Licensees and BCTS. It is the intent of the Licensees and BCTS to respect all duly established Aboriginal and treaty rights. This indicator was designed to ensure the Public Advisory Group (PAG) Terms of Reference specifically states that participation in the SFM process will not prejudice treaty rights.

Current Practices and Status of Indicator

The Fort St. James Public Advisory Group Terms of Reference approved December 4, 2005, specifically states in Section 3.6 of the document that *"the Licensees will recognize First Nations and treaty rights and agree that First Nations participation in the public participation process will not prejudice those rights."* The Terms of Reference was reviewed and amended in February 2005 and will continue to be reviewed annually to ensure the target is achieved.

Establishment of Targets and Future Practices

The target to develop a PAG Terms of Reference that specifically states that participation in the SFM process will not prejudice aboriginal treaty rights was established to encourage First Nations' participation in SFM. The PAG is an open and transparent process and First Nation's participation will ensure their concerns are heard and the processes for SFM are developed in consideration of their involvement. Licensees/BCTS plan to initiate a project that is designed to solicit input from First Nations for SFM planning. Future practice will involve adherence to the PAG Terms of Reference to ensure Aboriginal treaty rights will not be compromised as a result of participation in the PAG process.

Forecasting and Predicted Trends

The exact success in achieving this target is not easy to quantifiably forecast. The use of a "what if scenario" can be beneficial in identifying what the accepted target means to SFM. As the target for this indicator is the development of a PAG Terms of Reference that respects Aboriginal treaty rights and participation without prejudice to those rights, one other scenario should be analyzed:

- a) What if a PAG Terms of Reference was not developed that specifically stated that participation in the SFM process would not prejudice aboriginal treaty rights?

If the PAG Terms of Reference does not meet the indicator target, the amount of aboriginal participation in SFM may decrease. First Nations' communities in the DFA may be skeptical of the overall intent of SFM and may see it as threatening to their perceived or established treaty rights. Without sufficient First Nations' participation and support of SFM, the plan can never truly claim to consider all residents and stakeholders of the DFA. While the Licensees and BCTS cannot force participation in the SFM planning process, they can create an atmosphere of respect that encourages this participation. A PAG Terms of Reference that specifically states that participation in the SFM process will not prejudice aboriginal treaty rights will help create that environment.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level. The PAG Terms of Reference will be reviewed and revised (if necessary) at an annually scheduled PAG meeting to ensure the document continues to specifically state that participation in the SFM process will not prejudice aboriginal treaty rights. The success of this review/revision will be reported in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities

The Licensees/BCTS are responsible for the monitoring, tracking and reporting of this indicator. Opportunities for improvement may involve adjusting this indicator to incorporate feedback received from solicitation of First Nations' comments into forest planning practices.

Indicator 55 - Local Aboriginal Participation in Forest Management

| <u>Indicator Statement</u> | <u>Target and Variance</u> |
|---|--|
| Solicit participation in forest management from local aboriginal communities for areas of overlapping interest. | <u>Target:</u> Bi-annually 100% of local aboriginal communities <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <u>CCFM Criterion:</u> Accepting society's responsibility for sustainable development. <u>CSA SFM Element:</u> Aboriginal and Treaty Rights <u>Value:</u> First nation Aboriginal and treaty rights. <u>Objective:</u> Recognition and respect for Aboriginal and treaty rights. |
|---|

Description of Indicator

First Nations' participation in forest management is an important aspect of SFM as it promotes management of non-timber forest resources within Crown forests. A forest industry that respects First Nations input will build the support of First Nations, creating a more economically stable and inclusive forest economy.

For areas where there is overlapping interest between local aboriginal communities and the forest industry, the solicitation of First Nations' participation in forest management is of particular importance. Activities in these areas should be planned in a manner that can reflect input from local aboriginal communities. To achieve this, the Licensees and BCTS are committed to bi-annual solicitations to legally established First Nations Bands to participate in forest management. While the Licensees and BCTS cannot force any community to participate, they can continually provide the opportunities to do so.

Current Practices and Status of Indicator

All Licensees and BCTS currently solicit participation from local aboriginal communities where forest management activities are planned for areas of overlapping interest. These areas may be First Nations communities' claims of historic use, or known sites currently relied on for cultural, spiritual, or subsistence use. First Nations solicitation usually takes the form of a letter addressed to the chief and band council and occurs at the time of Forest Development Plan (FDP)/ Forest Stewardship Plan (FSP) preparation.

Table 12. Local First Nation Communities and General Locations

| <u>First Nation Community</u> | <u>Geographic Location</u> |
|--------------------------------------|-----------------------------------|
| McLeod Lake First Nation | McLeod Lake |
| Nak'azdli First Nation | Fort St. James |
| Takla First Nation | Takla Lake |
| Tsay Keh Dene Band | Omineca |
| Tl'azt'en First Nation | Tachie |
| Yekooche First Nation | Stuart Lake |
| Gitksan | Hazelton |

| | |
|-------------------------|---------------|
| Nat'oot'en First Nation | Babine Lake |
| Lheidli T'enneh | Prince George |

Establishment of Targets and Future Practices

The indicator's target of 100% is based on a review of Licensees' and BCTS past performance in soliciting aboriginal community participation in forest management. Aboriginal input is an important aspect of the SFM process, so it is paramount that all aboriginal communities with areas of overlapping interests with the forest industry have an opportunity to participate in the management of those areas.

Bi-annually, Licensees and BCTS will solicit the participation in forest management from local aboriginal communities for areas of overlapping interest. This will be done in the form of a letter addressed to the chief and band council. Future Practices will include monitoring, tracking and reporting out this information to the public on an annual basis.

Forecasting and Predicted Trends

It is the intent of all Licensees and BCTS to meet the identified 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. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator has a stated target of 100%, one other potential scenario should be developed:

- a) What if only 50% of local aboriginal communities are solicited for participation in forest management for areas of overlapping interest?

If only 50% of local Aboriginal communities were solicited for participation in forest management for areas of overlapping interest, adequate attention would potentially not be given to valuable Aboriginal input. Aboriginal input into the SFM process is required to adequately consider cultural heritage values within the DFA and to ensure that forest management respects treaty rights. If adequate participation by First Nations was not solicited, significant loss of First Nation's cultural features could occur. Aboriginal support of SFM would likely 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 opportunities are not given to Aboriginal people to become involved in the planning process within the DFA.

As such, Licensees/BCTS will strive to ensure that 100% of local Aboriginal communities are solicited for participation in forest management for areas of overlapping interest.

Monitoring and Reporting Procedures

A review of the number of areas of overlapping interest versus the number solicitations to local aboriginal communities will be analyzed on an annual basis. Licensees and BCTS track communication information in various ways, but all have procedures to ensure First Nations solicitation is managed appropriately. The indicator percent will be recorded and reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking, and reporting this indicator. Specifically, Planning Foresters are responsible for identifying areas of overlapping interest during FDP/FSP preparation and contacting the applicable aboriginal community. They are also responsible for ensuring the solicitations are recorded properly to monitor this indicator Opportunities to improve the performance of this indicator may be linked to indicators #53 and #56 that are both in the realm of First Nations involvement.

Indicator 56 - Archaeological Assessment Referrals to Aboriginals

| Indicator Statement | Target and Variance |
|--|--|
| Percentage of archaeological assessments completed, on cutblocks and roads harvested during the reporting period, that have been referred to relevant aboriginal communities for review and comment prior to harvesting. | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development CSA SFM Element 6.1: Aboriginal and Treaty Rights Value: First nation Aboriginal and treaty rights. Objective: Recognition and respect for Aboriginal and treaty rights.</p> |
|---|

Description of Indicator

As discussed in indicator #40, the Fort St. James DFA is rich in archaeological resources from its long history of First Nations and European inhabitation. FDPs/FSPs use 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, Licensees and BCTS conduct site level archaeological assessments to identify, assess and record any archaeological resources that may be present.

Prior to their incorporation into operational plans, the results of the archaeological assessments for planned cutblocks and roads should be referred to affected aboriginal communities for review and comment prior to harvesting. Aboriginal communities have expressed a desire to be made aware of evidence of historic use by their ancestors. These communities have cultural interests in managing archeological resources and Licensees and BCTS should solicit their input when these resources are detected.

The indicator is designed to ensure that archaeological assessments for all harvested cutblocks and roads have been referred to the relevant aboriginal community for review and comment prior to harvesting. Tracking such information will allow Licensees and BCTS to evaluate how successful communication strategies are with First Nations' communities and improve procedures if required.

Current Practices and Status of Indicator

Licensees and BCTS currently conduct archaeological assessments on all harvesting areas where the Archaeological Predictive Model predicts a high potential for the presence of archaeological resources. These resources are usually of First Nation origin, but also include non-First Nation archaeological resources. All archaeological assessments are referred to the aboriginal communities that have claimed the inspected areas as areas of traditional use. The communities are invited to provide comments and this input is considered when determining management practices for archaeological resources.

Establishment of Targets and Future Practices

The target for this indicator was established at 100% because the participation of aboriginal communities in forest management is an important aspect of SFM. Licensees and BCTS will continue to take measures to ensure archeological assessments for all harvested cutblocks and roads have been referred to the relevant aboriginal communities for review and comment prior to harvesting. Future practice will include monitoring, tracking and reporting out this information to the public on an annual basis.

Forecasting and Predicted Trends

It is anticipated that 100% of archaeological assessments for all harvested cutblocks and roads will be referred to the relevant aboriginal communities for review and comment prior to harvesting. The exact level of success, however, is difficult to forecast, as it is administrative in nature. First Nations' referrals primarily influence social values within the DFA. Therefore, the use of a "what if scenario" is beneficial in

identifying what the accepted target means to SFM. As this indicator currently has a target set at 100%, one other scenario should be identified:

- a) What if only 50 % of archaeological assessments for harvested cutblocks and roads have been referred to the relevant aboriginal communities for review and comment prior to harvesting?

Failure to refer all archaeological assessments to the relevant aboriginal communities for review and comment may impact Aboriginal participation in SFM. Contributions to planning processes by First Nations would likely be reduced if they perceived their input was not valued. The potential infringement of unresolved treaty rights could occur if archaeological values are not properly managed. Aboriginal communities consider their input as being crucial to forest management and wish to be notified of sites of potential historic use by their people.

Licensees and BCTS will continue to ensure that 100% of archaeological assessments for all harvested cutblocks and roads are referred to the relevant aboriginal communities for review and comment prior to harvesting.

Monitoring and Reporting Procedures

This indicator has a Licensee/BCTS specific target and will be managed on an individual basis. The information that is required to monitor this indicator includes a summary of the number of archaeological assessments completed for harvested cutblocks and roads versus the number that were sent to aboriginal communities for comment. Licensees and BCTS track communication information in various ways, but all have procedures to ensure First Nations' referrals are managed appropriately. The indicator percent will be recorded and reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for ensuring all archaeological assessments for harvested cutblocks and roads were referred to the relevant aboriginal communities for review and comment. They are also responsible for ensuring that any corresponding communication is tracked in the appropriate database so the indicator percent can be determined annually.

Licensees and BCTS, in cooperation with First Nations, the public and local archaeologists, will continue to expand their awareness of archaeological resources, and explore the effectiveness of strategies utilized to manage them.

Indicator 59 - First Nations Forest Values and Indicators

| <i>Indicator Statement</i> | <i>Target and Variance</i> |
|--|--|
| Develop management strategies with the purpose of obtaining a list of important forest values and corresponding indicators from the first nations whose traditional territories in which the Licensees operate | <u>Target:</u> Within a year of adopting the SFMP <u>Variance:</u> six months |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion: Accepting society's responsibility for sustainable development.</p> <p>CSA SFM Element: Respect for Aboriginal Forest Values, Knowledge, and Uses</p> <p>Value: Interests of Aboriginal people.</p> <p>Objective: Manage for cultural values, and incorporate aboriginal knowledge in forest management.</p> |
|---|

Description of Indicator

The forests of the Fort St. James DFA are valued from many resource use perspectives. These values may be economic, social, cultural, or spiritual, and should be considered in sustainable forest management planning. While the forest industry naturally focuses on the economic worth of the DFA's forests, First Nations may have a different set of forest values that the forest industry should be aware of.

Being aware of these values will enable the Licensees and BCTS to plan forest operations that consider them and contribute to the overall goals of SFM.

The intent of the indicator is to develop a list of important forest values and corresponding indicators from First Nations whose traditional territories the Licensees/ BCTS operate in. This list will be developed in consultation with First Nations and will be used by forest planners to consider these values when preparing operational plans.

Current Practices and Status of Indicator

There is currently no list of important forest values and corresponding indicators from First Nations whose traditional territories the Licensees and BCTS may operate within. These values are currently addressed on an individual basis as concerns are brought forward during the Forest Development Plan/Forest Stewardship Plan development stage.

Establishment of Targets and Future Practices

The target of one year from the date of SFMP approval to develop a forest values/indicators list was established as it was deemed a sufficient amount of time to successfully complete the project. A six-month variance was established to account for additional time to consult with First Nations if required and to create a comprehensive document that will meet the objectives of the indicator. A Forest Investment Account (FIA) project is planned for 2005 to solicit input from First Nations. This information will be used in the completion of the forest values/indicators list.

Forecasting and Predicted Trends

It is anticipated that the forest values/indicators list will be completed within one year of adopting the SFMP. However, the exact level of success is difficult to forecast, as it is dependent on consultation processes. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator currently has a target set at one year, one other scenario should be identified:

- a) What if it took 5 years from the SFMP approval date to complete a list of important forest values and corresponding indicators from the First Nations whose traditional territories fall within areas in which the Licensees and BCTS operate?

If it took 5 years to complete the forest values/ indicators list, First Nations' communities involved in the process may perceive that the forest industry has put a low priority on managing for their concerns. Their participation in SFM and other planning process may decline if they believe their input wasn't dealt with in a timely and efficient manner. This increased time period may also result in some First Nations values being poorly managed in the interim.

The protection of non-timber forest values and First Nations participation is important for SFM. Therefore, the Licensees and BCTS are committed to completing the list of forest values and corresponding indicators from the First Nations whose traditional territories they operate in.

Monitoring and Reporting Procedures

The Licensees and BCTS will monitor the list's progress once the SFMP is approved. This progress, and its success in being completed on time will be reported in the annual SFMP report for the operational year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

The Licensees and BCTS are responsible for initiating the list's development and organizing consultation with First Nations. Opportunities for improvement may be found in developing techniques to protect and enhance First Nations' forest values during forest planning and operations.

Indicator 61 - Review of PAG Terms of Reference

| Indicator Statement | Target and Variance |
|---|--|
| A relevant and functioning PAG (Public Advisory Group). | <u>Target:</u> Annual review of PAG ToR <u>Variance:</u> None |

This indicator addresses the following CSA-SFM parameters:

- | |
|---|
| <p>1) CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development. CSA SFM Element 6.3: Public Participation Value: Public participation in the SFM process. Objective: A well-designed and functioning public participation process.</p> |
|---|

Description of Indicator

This indicator monitors review 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 ensures these requirements are met in a credible and transparent fashion (see Appendix 6 for the PAG Terms of Reference). The Terms of Reference document will be reviewed at least once annually unless consensus from the group suggests otherwise.

Because British Columbia's forests are primarily publicly owned, it is vital that a SFM initiative involves the public extensively in the forest management planning process. The Fort St. James PAG represents a diverse range of interests specific to the DFA of this plan. Therefore, the PAG is necessary to ensure that sustainable forest management is achieved. Each member of the PAG must be able to have effective and fair interaction or communication with one another, as well as with the Licensees, to ensure all identified values receive adequate consideration. The Terms of Reference document is intended to provide the necessary framework and proper protocol to ensure the existence of a relevant and functioning PAG.

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 December 4, 2004. This document will be reviewed and revised as required at least once annually to ensure it is up to date with the present day context of SFM and the process within the Fort St. James DFA. Licensees and BCTS will ensure that PAG members are given adequate notice as to when the Terms of Reference document will be reviewed. This review will be part of a scheduled PAG meeting so that all participants are aware of review timelines. The Licensees/BCTS 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.

Establishment of Targets and Future Practices

The target for this indicator was identified from a review of other public participation processes and from consultation with the Fort St. James PAG. Having one or more reviews of the PAG Terms of Reference annually will allow the document to remain timely and achieve its purpose within the PAG. Future practice will include monitoring, tracking and reporting out this information annually to the public.

Forecasting and Predicted Trends

The target of an annual review of the PAG Terms of Reference is expected to be achieved. However, the exact level of success in meeting this target is not easy to quantifiably forecast over a defined time frame. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator currently has a target set at one review 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 local values of the Fort St. James DFA, as values change 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 skepticism of the overall process. General understanding of SFM and resulting initiatives may be reduced and future goals identified by the Licensees/BCTS would be more difficult to achieve.

It is clear that a balance of values can be achieved with an annual review of the PAG terms of reference. As such, the Licensees and BCTS are committed to reviewing the PAG Terms of Reference once a year to ensure a consensus-based public involvement process.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed on a DFA level. 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.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for all aspects of this indicator. Licensees/BCTS will ensure the Terms of Reference is reviewed and that this data is included in the annual SFMP report.

Indicator 62 - Satisfaction with the PAG Process

| Indicator Statement | Target and Variance |
|---|--|
| Sufficient and satisfied PAG membership | <p><u>Target:</u> Membership minimum size of 8 as an indicator of level of satisfaction</p> <p><u>Variance:</u> -2</p> |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development CSA SFM Element 6.3: Public Participation Value: Public participation in the SFM process. Objective: A well-designed and functioning public participation process.</p> |
|---|

Description of Indicator

The PAG is one of the key elements of public involvement in the SFM process. The Fort St. James PAG provides guidance, input and evaluation during development of the SFMP. It is also instrumental in maintaining links to current local values and forest resource uses within the DFA. Therefore, it is important that the PAG participants remain satisfied with the group and continue their involvement. This indicator will use membership numbers to determine the level of satisfaction of the PAG with the public participation process. Specifically, a PAG membership of 8 or more will indicate satisfaction of the PAG is sufficient.

Current Practices and Status of Indicator

Table 13. Summary of Public Advisory Group Participation

| PAG Meeting Date | # Of Participants |
|-------------------------|--------------------------|
| December 4, 2004 | 10 |
| January 8, 2005 | 12 |

| | |
|---------------------------|-------------|
| January 29, 2005 | 12 |
| February 19, 2005 | 12 |
| March 5, 2005 | 9 |
| March 19, 2005 | 9 |
| Average Attendance | 10.7 |

Establishment of Targets and Future Practices

A PAG membership minimum of 8 was deemed to be a sufficient indicator of satisfaction with the PAG. The attendance at future PAG meetings will be taken and recorded in the meeting minutes. There will also be correspondence with past and current PAG members to determine if interest in membership is maintained or reasons why it was not. If meeting attendance and correspondence determines the membership is less than 8 PAG members, then steps will be taken by the Licensees and BCTS to encourage greater PAG participation. Licensees/BCTS will continue to encourage a wide range of representation on the PAG from non-forestry interests and will strive to satisfy the PAG membership with the SFM planning process.

Forecasting and Predicted Trends

This indicator is not easy to forecast, as it is dependent on the variations of human opinion. However, the PAG membership levels may influence the success of the SFMP. Therefore, the use of a “what if scenario” is beneficial in identifying what the accepted target means to SFM. As this indicator currently has a target set at a minimum PAG membership level of 8, one other scenario should be identified:

- a) What if there was significantly less than 8 people in the PAG?

If there were significantly less than 8 people in the PAG then the entire SFMP process may become questionable. Meaningful, broad public participation in SFM is essential if the plan is to succeed or have any validity. Low PAG participation might suggest there is widespread dissatisfaction with the public participation process. If there was a limited PAG membership, the plan might not address the wider societal values of SFM and, correspondingly, its indicators, targets, and objectives may not reflect the greater community. If low PAG participation was not corrected, it may result in lower social acceptance of the SFMP and less belief in its validity.

Due to the importance of having a sufficient and satisfied PAG, the Licensees and BCTS are committed to achieving the identified target. It is expected that in the future most, if not all, of the PAG participants will be satisfied with the process and that membership will be in excess of 8 participants.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level. Attendance will be kept for each PAG meeting. The attendance will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

It is the responsibility of the Licensees and BCTS to maintain PAG satisfaction and to encourage continued participation in SFM. If PAG membership is waning, Licensees/BCTS should take steps to determine the causes of dissatisfaction before participation reaches minimum levels. This may involve the creation of PAG surveys to gauge the group's satisfaction, and to determine specific areas of improvement.

Indicator 63 - PAG SFM Information Gap Inquiries

| Indicator Statement | Target and Variance |
|---|--|
| Percent of PAG SFM information gap inquiries responded to within 3 months | <u>Target:</u> 100% <u>Variance:</u> 0% |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development |
|---|

CSA SFM Element 6.4: Information for Decision Making**Value:** Adequate information to make informed decisions.**Objective:** Provide relevant information to interested parties.**Description of Indicator**

As mentioned in indicator #61 and #62 the PAG is one of the key elements of public involvement in the SFM process. In order for the PAG to make decisions with regards to the content of the SFMP, such as indicators, targets, and levels of responsibility, they must have the necessary information to support those decisions. This information must be sufficient in amount and quality and delivered in a timely manner for the PAG to make sound decisions for the SFMP process.

This indicator is intended to measure and report the percentage of PAG SFM information gap inquiries responded to within 3 months. If the SFMP is to succeed, the people who are involved in its creation and implementation must have a level of certainty that the information they need is delivered in a timely manner.

Current Practices and Status of Indicator

Once an information gap is identified by the PAG, the Licensees/BCTS are to supply the relevant information to the PAG within 3 months. As information gaps were identified during the reporting period, Licensees/BCTS responded to the PAG within 3 months.

Establishment of Targets and Future Practices

Three months to respond to PAG SFM information gap inquiries was determined to be sufficient time to collect and deliver the information, but not so long that the information could not be adequately received and incorporated into decision making. Future SFM information gaps will be determined at scheduled PAG meetings. At that time, Licensees/BCTS will be assigned tasks to locate and provide outstanding information to the group within 3 months.

Forecasting and Predicted Trends

This indicator is not easy to forecast, as it may be dependent on human oversight. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator currently has a target set at 100% of PAG SFM information gap inquiries responded to within 3 months, one other scenario should be identified:

- a) What if only 50% of PAG SFM information gap inquiries were responded to within 3 months?

If only 50% of PAG SFM information gap inquiries were responded to within 3 months, social values of SFM could potentially be reduced. Public participation requirements would not be fulfilled if the PAG was not satisfied with the process because members would have no incentive to continue participating. Without local public comment, this plan would potentially not be adequately localized to the Fort St. James DFA. 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 reduced PAG satisfaction as a result of only responding to 50% of information gap inquiries within 3 months could be a reduced public acceptance of the plan and potential skepticism of the overall intent. General understanding of SFM and resulting initiatives would also likely be reduced and future goals identified by the Licensees/BCTS would be more difficult to achieve.

Due to the impact this indicator could have on important social values of SFM, the Licensees/BCTS are committed to responding to 100% of PAG SFM information gap inquiries within 3 months. It is anticipated that Licensees/BCTS will continue to maintain a good working relationship with the PAG and continue to promote a consensus based decision making process.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level. Any information gap inquiries will be formally presented at PAG meetings, or circulated to the members in the absence of a scheduled meeting. The inquiries will be recorded in the meeting minutes and a deadline established for

a response. The percentage of inquiries that were responded to within 3 months will be determined for the operating year of April 1st to March 31st and reported in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities

Licensees/BCTS are responsible for recording SFM information gap inquiries and ensuring the success in responding to these inquiries.

Licensees/ BCTS will look for ways to provide the best information possible to future PAG inquiries. This dissemination of information could utilize guest speakers, academics, recent scientific literature, and other sources of current knowledge. The Licensees and BCTS may also consider organizing field tours to help increase the PAG's general knowledge of forestry operations.

Indicator 64 - Fort St James SFM Website

| Indicator Statement | Target and Variance |
|--|--|
| A Fort St. James SFM website with the goal of providing SFM information to the community of Fort St. James and to the PAG members. | Target: Functioning website by July 2006 Variance: +/- 6 months |

This indicator addresses the following CSA-SFM parameters:

- | |
|--|
| <p>1) CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development. CSA SFM Element 6.4: Information for Decision Making Value: Adequate information to make informed decisions. Objective: Provide relevant information to interested parties.</p> |
|--|

Description of Indicator

Circulating information with regards SFM to the people of Fort St. James and the PAG will help build understanding and support for the SFM process. While traditional means of communication can be used, a SFM website can be accessed by many people that are now accustomed to using the Internet for information. The ability to update websites quickly and efficiently will mean that the public will be able to stay abreast of the most recent developments in the Fort St. James SFMP. They will also be able to use this website to submit questions and comments related to the SFMP and its implementation in the DFA.

In light of these advantages, the Licensees and BCTS are committed to having a functioning Fort St. James SFM website in place by July 2006.

Current Practices and Status of Indicator

Some Licensees and BCTS have individual corporate websites that provide information on the organizations' products, structure, and policies. However, there is not currently a website devoted solely to the Fort St. James SFMP.

Establishment of Targets and Future Practices

The target date of July 2006 was chosen to provide enough time to complete a functioning, well-designed and informative SFM website. However, to account for unexpected technical difficulties and delays in collecting information, a 6-month variance has been established. Future practice will include utilization of this website to coordinate public aspects of the SFMP, such as PAG meeting schedules, links to SFM information, and continual updates to the plan or management practices within the DFA.

Forecasting and Predicted Trends

This indicator is not easy to forecast, as it may be dependent on non-foreseeable technical difficulties. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator currently has a target completion date of July 2006, one other scenario should be identified:

- a) What if it took 5 years complete a Fort St. James SFM website?

A huge opportunity could potentially be missed if it took 5 years to complete a Fort St. James SFM website. Despite the fact that many of the DFA's residents rely on the forest industry for their livelihoods, they may have very limited knowledge of SFM and its goals. A SFM website created in a timely fashion will allow many of these people to satisfy their SFM information needs in a useful and efficient manner. However, if it took 5 years to provide this information over the Internet, the SFMP process may have lost this chance to receive a wider range of interest and comments during its crucial early stages.

Due to the importance of providing current, accurate information to the public and to the PAG, the Licensees and BCTS are committed to having a functioning Fort St. James website by July 2006. It is expected that the target date will be achieved and residents of Fort St James will be able to access this website to further their understanding of SFM and the CSA initiative within the Fort St. James DFA.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level. The Licensees and BCTS will initiate the website's development and monitor its progress. This progress and the success in completing it by July 2006 will be reported in the annual SFMP report.

Responsibility and Continuous Improvement Opportunities

The Licensees and BCTS are responsible for establishing parameters for the website, the information it will present, and who will construct it. They will also determine a process for updating its content so that it stays relevant to the current status of the SFMP.

Opportunities for improvement may be found in combining the website objectives with meeting public consultation objectives discussed in many of the indicators within this SFMP. The Internet may be a valuable tool for the Licensees and BCTS to receive information as well as a means of providing it to the public.

Indicator 65 - Hardwood Stands

| Indicator Statement | Target and Variance |
|---|--|
| The percent of hardwoods (mixed wood and deciduous leading stand) within the DFA. | Target: To be determined once forecasting is complete. Variance: To be determined once forecasting is complete. |

This indicator addresses the following CSA-SFM parameters:

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|--|
| <p>CCFM Criterion 1: Conservation of Biological Diversity - Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element 1.2: Species Diversity</p> <p>Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution).</p> <p>Objective: Ensure habitat for species where ecologically appropriate.</p> |
|--|

Description of Indicator

Hardwood stands are forest stands that are dominated by deciduous species, but may include a coniferous component. The major hardwood species in the Fort St. James DFA are trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), black cottonwood (*Populus trichocarpa*), and paper birch (*Betula papyifera*). These stands are very important habitats for a variety of wildlife species and often represent unique plant communities. This indicator is intended to ensure that a certain percentage of the DFA land base is occupied by hardwood stands to maintain species diversity and to support sustainable populations of the flora and fauna that rely on them for habitat.

Historically, hardwood stands were not seen as valuable for industrial forestry uses. Many hardwood stands were cleared for agricultural production and the forest industry concentrated management efforts

on the coniferous component of the DFA. However, in recent years the importance of deciduous stands is coming to light from both an ecological and potentially economic viewpoint. Ecologically, hardwood stands play an important role in creating a mosaic forest landscape. Deciduous stands are also of high value for many wildlife species for habitat purposes. From an economic viewpoint, some markets have developed for deciduous species. Aspen is used in the production of orientated strand board (OSB) and birch is increasingly seen as a valuable furniture wood.

Current Practices and Status of Indicator

Historically, deciduous species were removed from harvested stands and discarded as "waste wood". Regeneration of harvested blocks did not generally include hardwood species, with most silviculture practices targeting hardwoods for removal from conifer plantations. Current practice has not changed considerably, but hardwood species are more often left standing in cutblocks, where possible, or cut out of harvest areas and retained in wildlife tree patches. If harvested, hardwoods in cutblocks are not usually regenerated and areas in the Fort St. James DFA are not currently managed as hardwood stands. Due to the low value historically placed on hardwood stands, the Licensees and BCTS have not previously monitored the overall percent of hardwoods in the DFA.

Establishment of Targets and Future Practices

Licensees and BCTS acknowledge the importance of maintaining hardwoods in the DFA from both an ecological and economic aspect and have established this indicator to ensure a percentage of the DFA remains in deciduous cover over the long-term. Due to the lack of historical interest in harvesting hardwoods, more research needs to be completed in order to determine a suitable target for this indicator. Licensees and BCTS will complete a GIS analysis of the hardwood component of the DFA based on a Vegetative Resource Inventory (VRI) and targets will be identified based on this analysis.

Forecasting and Predicted Trends

The success in maintaining the target percent of hardwoods in the DFA is not easy to quantifiably forecast over a defined time frame, as it may depend on a variety of factors such as forest health, fire, etc. 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 XX%.

- a) What if there was considerably less than the target percent of the DFA land base as hardwoods (including mixed wood and deciduous leading stands)?

If considerably less than the target percent of the DFA was conserved as hardwood stands, overall species diversity may be reduced as many wildlife and plant communities depend on these stands for habitat. Deciduous trees support a wide range of insects, birds, and other animals that depend on their unique characteristics to survive. Hardwoods are also a valuable component of the DFA's aesthetics, and contribute to the social values of the DFA. By not meeting the target retention of hardwood stands, these social values may be compromised. Hardwood stands may play an important economic role in the future within the DFA. Failure to properly manage for the sustainability of these stands may also impact the DFA economically, as the forest industry may eventually seek alternatives to mature pine that have been lost to mountain pine beetle.

Monitoring and Reporting Procedures

Targets will be set at the landscape level for the Licensee/BCTS DFA.

The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If the target percent is not being met, corrective measures will be taken to reverse the trend. Opportunities for

improvement may include modifying silviculture practices to maintain more deciduous trees in conifer plantations, or actively planting hardwoods in ecologically appropriate areas.

Indicator 66 - Douglas Fir Stands

| Indicator Statement | Target and Variance |
|--|---|
| Percent of Douglas fir (mixed stands and Douglas fir leading stands) within the DFA. | <p><u>Target:</u> To be determined once forecasting is complete.</p> <p><u>Variance:</u> To be determined once forecasting is complete.</p> |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion: Sustainable populations of all flora and fauna native to the DFA (natural abundance and distribution of species within their natural range).</p> <p>CSA SFM Element: Species Diversity</p> <p>Value: Sustainable populations of flora and fauna native to the DFA (natural abundance and distribution).</p> <p>Objective: Ensure habitat for species where ecologically appropriate.</p> |
|---|

Description of Indicator

Douglas fir (*Pseudotsuga menziesii*) grows throughout much of southern British Columbia. There are two distinct forms of the species- the coastal and the interior. The Fort St. James DFA is the northern extent of the interior Douglas fir's range, where it is found in small stands, or in mixed forests with spruce, pine, or birch. Douglas fir has played an important economic role in BC's forest industry, but due to its low numbers in the Fort St. James DFA it has not been as economically important. In recent years Douglas fir has gained more recognition for its value as an important component of the forest ecosystem. Its large size, longevity, fire resistance, and unique form provides habitat for a variety of species. Winter ungulate range, especially for mule deer, is particularly dependent on Douglas fir for its maintenance. This indicator is intended to ensure the target percent of Douglas fir stands, both mixed and leading, will be maintained in the DFA to support species diversity and to ensure habitat is present for dependant species.

Current Practices and Status of Indicator

Since 1999 the Licensees and BCTS have managed stands containing a Douglas fir component according to the BC Ministry of Forests "Douglas fir Management Guidelines for the Prince George Forest Region". This document provides guidelines for the maintenance and regeneration of Douglas fir across the PG Forest Region, which includes the Fort St. James DFA. These guidelines are generally included in operational plans such as Site Plans, which prescribe what forest activities are required to meet Douglas fir management objectives.

Establishment of Targets and Future Practices

The Licensees and BCTS acknowledge the importance of maintaining Douglas fir in the DFA and have established this indicator to ensure a percentage of the land base contains a Douglas fir component. Due to its lower importance as a commercial species in the Fort St. James DFA, more research has to be done to determine a target percent for this indicator. Past management activities have focused on Douglas fir at the stand level, and have not considered the broader presence of Douglas fir at the landscape/ DFA level. As such, there is not a reliable value for the target percent of Douglas fir (mixed stands and fir leading stands) that should be maintained for the DFA. Licensees and BCTS will complete a GIS analysis of the Douglas fir component of the DFA based on a Vegetative Resource Inventory (VRI). Targets will be based on this analysis.

Forecasting and Predicted Trends

The success in maintaining the target percent of Douglas fir in the DFA is not easy to quantifiably forecast over a defined time frame, as it may depend on a variety of factors such as forest health, fire, etc. However, it is important to identify what the accepted target means 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 **XX%**:

- a) What if there was considerably less than the target percent of the DFA area that contained a Douglas fir component (either in mixed stands or as Douglas fir leading stands)?

If considerably less than the target percent of the DFA area that contained a Douglas fir component was sustained, ecological, economic and social values of SFM could potentially be affected. Maintaining the target percent of Douglas fir is required to maintain species diversity and to sustain native flora and fauna populations in the DFA. Douglas fir stands (mixed and Douglas fir leading) support a wide range of insects, birds, and other animals that depend on their unique characteristics to survive. Although they are fewer in number than other coniferous species in the DFA, their presence is crucial for maintaining ungulate winter range habitat, and for creating denning/nesting sites for birds and mammals. If less than the target percent is achieved, these ecological values may decrease across the DFA. The future may also see the economic value of Douglas fir increase, as the forest industry seeks alternatives to mature pine that have been lost to mountain pine beetle. If less than the target percent of Douglas fir is maintained, these economic values may not be fully realized. Negative impacts to both ecological and economic values within the DFA could potentially have related negative social values as the public’s value from the forest resource decreases.

Monitoring and Reporting Procedures

The percent of Douglas fir across the Area Under the Plan (AUTP) will be monitored to ensure that the amount existing meets the indicator target and variance by licensee DFA. Annually, harvested cutblocks will be compared to a GIS query of Douglas fir leading polygons using the most up-to-date forest inventory. Results of the query will be assessed to ensure consistency with the targets.

The indicator status will be included in the annual SFMP report for the operational year April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for monitoring, tracking and reporting this indicator. If the target percent is not being met, corrective measures will be taken to reverse the trend. Opportunities for improvement may include modifying silviculture practices to incorporate more Douglas fir in plantations in ecologically appropriate areas.

Indicator 68 - Landscape Level Strategy for Protection of Known Subsistence Uses, Recreational/Commercial & Cultural Trails/Sites and Spiritual Sites

| Indicator Statement | Target and Variance |
|---|--|
| Develop a landscape level strategy for protection of subsistence uses, recreational/commercial /cultural trails/sites, and spiritual sites. | <u>Target:</u> Within 1 year of SFMP approval <u>Variance:</u> 6 months |

This indicator addresses the following CSA-SFM parameters:

| |
|---|
| <p>CCFM Criterion: Multiple benefits to society. CSA SFM Element: Timber and Non-Timber Benefits Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits. Objective: Conserve known subsistence uses (berries, hunting, fishing, medicinal plants).</p> <p>CCFM Criterion: Multiple benefits to society. CSA SFM Element: Timber and Non-Timber Benefits Value: Acceptable and feasible mix of a healthy forest industry and non-timber benefits. Objective: Respect recreational/ cultural trails/ sites, spiritual sites.</p> |
|---|

Description of Indicator

As discussed in the previous indicator (# 46), many areas in the Fort St. James DFA may be valued for subsistence uses and for their recreational, cultural, or spiritual values by both First Nations communities and non-First Nations people. Sustainable forest management must consider non-forestry use of the DFA land base, and subsistence sites and known recreational/ commercial and cultural trails/ sites and spiritual uses should all be considered in forestry planning to meet this aspect of SFM.

Managing these non-timber resource values at the site level can protect these resources in the short-term, but their long-term sustainability will depend on management at the landscape level. With regards to subsistence use, all ecosystems change, and areas that are valuable for subsistence use may decrease in importance as their ecology changes. Developing a landscape level strategy for protection of known subsistence uses will attempt to ensure that subsistence uses are available in the DFA over the long term. In terms of recreational/commercial & cultural trails/sites, and spiritual sites, a landscape level strategy to respect these non-timber resources will help coordinate planning by all Licensees and BCTS to ensure there is consistency in management. It will also enable Licensees/BCTS to develop landscape level plans that consider the overall effect forestry activities may have on recreational/ commercial and cultural trails/ sites and spiritual uses.

This indicator is intended to measure the success of the Licensees and BCTS to develop a landscape level strategy within one year of the SFMP approval. By developing such a strategy, it is anticipated that the long-term sustainability of these resources can be maintained.

Current Practices and Status of Indicator

Currently a landscape level strategy for protection of subsistence uses and recreational/ commercial and cultural trails/ sites and spiritual uses in the Fort St. James DFA does not exist. Licensees and BCTS have traditionally managed these values at the Site Plan level, but there has been little coordination of information on how to protect and respect them on a broader geographic area.

Establishment of Targets and Future Practices

The Licensees and BCTS recognize the importance of the indicator values for many of the residents of the DFA and have set a target of developing a landscape level strategy within one year of the SFMP approval. One year should be sufficient time to collect the appropriate information and develop a strategy without delaying its completion. However, there may be difficulties in coalescing the information, or developing a proper strategy. For this reason a 6-month variance has been established. Future practice will include the use of this landscape level strategy during planning processes to ensure these non-timber resource sites are managed for appropriately.

Forecasting and Predicted Trends

It is the intent of all Licensees and BCTS to meet the indicator target deadline, 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 and landscape level data collection. Therefore, the use of a "what if scenario" is beneficial in identifying what the accepted target means to SFM. As this indicator has a stated target of developing a proposal within one year, one other potential scenario should be developed:

- a) What if it took 5 years to develop a proposal for a landscape level strategy for protection of subsistence uses, recreational/commercial & cultural trails/sites, and spiritual sites?

Five years would be an excessive amount of time to develop the strategy. In its absence, forestry activities may reduce the long-term potential for subsistence uses to exist in their natural spatial distribution, and may potentially damage trails and sites that have not been identified at the landscape level. Even if values such as trails are identified at the site level, their extent is not fully realized until they are identified at the landscape level where they often cover a large amount of area. Opportunities may be lost to implement management of these resources arising from the landscape level strategy designed to enhance these uses. The users of these resources may see the lack of a proposal as the result of the forest industry placing a low value on non-timber resources. SFM relies on public participation in forest

planning, and the public may withdraw support if they perceived a forest industry that placed a low priority on their input.

For these reasons the Licensees and BCTS are committed to completing a landscape level strategy to respect subsistence uses and recreational/ commercial and cultural trails/sites and spiritual uses within one year of the plan approval.

Monitoring and Reporting Procedures

This indicator has a DFA specific target and will be managed at the DFA level. Once the SFMP is approved, the Licensees and BCTS will track and monitor the progress of the strategy's development. This progress and the success in meeting the target date will be reported in the annual SFMP report for the operating year of April 1st to March 31st.

Responsibility and Continuous Improvement Opportunities

Licensees and BCTS are responsible for initiating the strategy's development once the SFMP is approved. Opportunities for improvement may be linked to using local knowledge in the development of the strategy, and encouraging both First Nation's and non-First Nation's inhabitants to become involved in its creation.

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Appendix 1

Fort St. James Sustainable Forest Management - Area Under The Plan Map

Appendix 2

Fort St. James Sustainable Forest Management - Licensee/BCTS Operating Areas Map

Appendix 3

Fort St. James Sustainable Forest Management - Natural Disturbance Units Map

Appendix 4

**Fort St. James Sustainable Forest Management - Biogeoclimatic Ecosystem Classification
Map**

Appendix 5

Fort St. James Public Advisory Group List of Participants

| Name of PAG Member | Home Phone | Work Phone | Interest |
|--------------------|------------|------------|-------------------------|
| Henner Grimm | 996-8668 | | Wildlife |
| Randy Sulyma | 996-8840 | 996-8499 | Wildlife & ecology |
| Barb Rooke | 996-2299 | 996-2299 | Forest worker, wildlife |
| Ron Timothy | 996-8405 | | Trapping |
| Joe Vogl | 996-8458 | | Trapping, mill owner |
| Bob Frederick | 996-0119 | 996-0190 | Trapping |
| Orville Koette | 996-7255 | | Regional district |
| Joanne Vinnedge | | 996-5200 | Wildlife biologist |
| Paul Swartz | 996-7700 | | Chamber of commerce |
| Sue Granger | 996-0028 | 996-0038 | Research |
| Beulah Broen | 996-7759 | 996-7757 | Logging |
| Larry Erickson | | | Guiding |
| Bryan Muloin | | 996-2253 | Prospecting |

Appendix 6

Fort St. James Public Advisory Group Terms of Reference

**FORT ST. JAMES SUSTAINABLE FOREST
MANAGEMENT PLAN**

Public Advisory Group (PAG)

APPROVED TERMS OF REFERENCE

December 4, 2004

AMENDED

February 19, 2005

Facilitated by:
Industrial Forestry Service Ltd. Ltd.
(250) 374-7277

1 Background

1.1 Purpose of Sustainable Forest Management

The objective of sustainable forest management (SFM) is to concurrently balance the sustainability of forestry-related ecological, social and economic values for a defined area over a defined timeframe. SFM is about being economically sustainable on public land, respecting the social needs of the public, and sustaining viable ecosystems.

The SFM Plan will be developed for participating licensees in the Fort St. James Forest District and will incorporate the principles of SFM. The goals of the Fort St. James SFM Plan are:

1. To provide members of the Licensee Team the opportunity to obtain Canadian Standards Association (CSA) certification, and
2. Offer an opportunity for public and other stakeholders to participate in an open public forum.

1.2 Participating Licensee Team

The Licensee Team for the Fort St. James SFM Plan consists of representatives from Apollo Forest Products Ltd., Canadian Forest Products Ltd. (Canfor – Houston, Fort St. James, Prince George, and Vanderhoof), Lakeland Mills Ltd., L & M Lumber Ltd, Winton Global, BC Timber Sales (BCTS) – Stuart Nechako Business Area, Ta Da Chun Timber Ltd., Stuart Lake Lumber Co. Ltd., Tanizul Timber Ltd. and Carrier Lumber. These licensees and BCTS have forest tenures subject to change over time in size, location and ownership. Participating Licensees may change over time.

1.3 Defined Forest Area (DFA)

The PAG provides input for values, objectives, indicators and targets specific to the DFA for the SFM plan.

The DFA for the SFM Plan is within the Fort St. James Forest District. The operating area of participating licensees and BCTS will set the geographic extent of the DFA.

1.4 Public Advisory Group

The PAG for the Fort St. James SFM Plan is comprised of a range of individuals representing the interests listed in section 3.1.1. The role of the PAG is to provide local representatives an effective forum to provide input into and receive feedback from the process of developing and monitoring the SFM plan.

2 Defined Goals

The goal of the PAG is to demonstrate commitment to SFM principles for the Defined Forest Area in the Fort St. James Forest District. The development and implementation of the SFM Plan will be the responsibility of the Licensee Team, guided by the PAG.

3 Roles and Responsibilities

3.1 Public Advisory Group

3.1.1 Membership Structure

The Public Advisory Group reflects a range of interests in the DFA, including DFA-related workers. The PAG consists of members representing the following interests:

1. Research and education
 2. Community stability
 3. Healthy, viable environment
-

4. BC Wildlife Federation
5. Recreation
6. Trapping
7. Hunting
8. Fishing
9. Sawmill owner
10. Wildlife
11. Viewing (scenic values)
12. Meaningful levels of sustainability for all forest resources
13. Prospecting
14. Ecology
15. Woodlots
16. Town council
17. Protection of water quality
18. Protection of endangered or at risk species
19. Regional district
20. Forest worker
21. Chamber of commerce
22. General Public
23. Local motel owner

and such other interests that may be decided upon by PAG when a new member joins the group.

3.1.2 Selection of PAG Members

The Licensee Team will recruit potential members from various interests and First Nations through invitations to individuals. As well, they will hold a public open house and advertise in local newspapers to generate interest in the PAG.

Based on the above:

- a) Members of the public and the Licensee Team will review the potential membership at the initial PAG meeting. Once the PAG is established, members of the PAG and the Licensee Team can recommend changes in PAG structure and potential members.
- b) The PAG and the Licensee Team will jointly confirm appointments and replacement of PAG members.
- c) Local residents who feel that their values are not represented by the PAG can submit a written request to the Licensee Team to add a member for that purpose, outlining the perceived need for an additional member. The Licensee Team, and the PAG, will consider each request for membership on its merits and provide a timely response in writing.
- d) To provide continuity, it is hoped that PAG members will serve for a minimum of two years. They may be replaced if their term is complete or if they are not meeting the Terms of Reference.

3.1.3 Role of PAG Members

The PAG will work according to requirements and guidance as outlined in CSA standard Z809-02 for SFM. PAG members will:

- a) Attend meetings regularly
 - b) Have the opportunity to assign an alternate member to attend meetings if they cannot attend scheduled meetings. It is the responsibility of the members to keep alternate representatives informed of the group's progress and deliberations.
 - c) Strive to reach consensus or general agreement on recommendations to the Licensee Team.
 - d) Approve a Terms of Reference.
-

Work with Licensees' to:

- e) Review the six criteria and associated 17 elements identified in the SFM Framework.
- f) Identify any other elements of relevance to the DFA.
- g) Identify at least one value for each element.
- h) Identify one or more objectives for each value.
- i) Identify and justify one or more quantifiable indicator(s) for each objective.
- j) Identify one target for each indicator, which includes acceptable levels of variance.
- k) Develop alternative strategies to be assessed.
- l) Assess alternative strategies and select the preferred one.
- m) Review the SFM plan.
- n) Design monitoring programs, evaluate results, and recommend improvements.
- o) Discuss and resolve any issues relevant to SFM on the DFA.

It is recognized that PAG members may miss some meetings due to the nature of their work or other activities. If a member is unable to attend a particular PAG meeting, he/she is encouraged to arrange for their alternate to attend and must inform the facilitator.

3.1.4 Conflict of Interest

The PAG recognizes that a conflict of interest could occur if there is a potential for a member to personally and directly benefit from specific recommendations from the PAG. Therefore, if a member 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 Goals, that member, other PAG members or a member of the Licensee Team must state the potential conflict and abstain from decisions related to the conflicting issue.

3.2 Role of Licensee Team

The role of the Licensee Team is to:

- a. Provide information to the PAG as related to SFM planning and DFA.
- b. Review and consider the recommendations of the PAG with the goal of incorporating recommendations in to the SFMP.
- c. Make decisions regarding SFM and certification.
- d. Demonstrate that all input is considered and responses are provided where PAG recommendations are not incorporated.
- e. Provide the necessary human, physical, financial, information and technological resources, as reasonable.
- f. Not take part in reaching consensus or decision-making by the PAG.

3.3 Role of Advisors

Advisors will be invited, as required, to provide technical information and advice to the PAG. These advisors could be from government agencies, professional organizations, educational institutions, consulting firms or other sources.

The role of advisors is to:

- a. Provide and/or clarify technical or legal information and participate in discussions as requested.
- b. Not take part in reaching consensus or decision-making by the PAG.

3.4 Role of Observers

The public is welcome to observe PAG meetings but:

- a. May not participate in discussions unless agreed to by the PAG, facilitator and Licensee Team.
 - b. May not take part in reaching consensus or decision-making by the PAG.
-

3.5 *Role of the Facilitator*

The role of the PAG facilitator is to:

- a. Ensure that PAG meetings address the agreed-upon agenda topics.
- b. Manage and implement the Terms of Reference, including the appropriate participation of all members of the PAG and Licensee Team, in addition to advisors and observers.
- c. Ensure the circulation of draft and final meeting summaries and agendas.
- d. Start and end all meetings at the times stated in the agenda.
- e. Enable equitable opportunity by all PAG members to participate in the meetings.
- f. Work to clarify interests and issues and help the PAG build recommendations.
- g. Act as a contact for PAG members.
- h. Provide scribe services at meetings.
- i. Not take part in reaching consensus or decision-making by the PAG.

3.6 *First Nations*

The Licensees will recognize First Nations and treaty rights and agree that First Nations participation in the public participation process will not prejudice those rights. First Nations are welcome to participate in the PAG process.

4 **Timelines**

The following summarizes key dates for development of the Fort St. James Sustainable Forest Management Plan.

- | | | |
|----|--|---------|
| 1. | Invitations sent to potential participants and newspaper ads printed September/October 2004 | |
| 2. | Public Open House 23, 2004 | October |
| 3. | Initial Public Advisory Group meeting November 6, 2004 | |
| 4. | Complete input by PAG Summer 2005 | |
| 5. | Review of SFMP by PAG 2005 | Fall |

Following the completion of the SFMP, it is estimated that the PAG meeting schedule would include up to two meetings per year beginning in 2006 and potentially include:

1. Review of the SFMP annual report, and
2. Complete revised input on the SFMP.

5 **PAG Operating Rules**

5.1 *Ground Rules*

All participants in this process agree to work under the following ground rules:

- a) To be on time for PAG meetings.
- b) To be respectful of other participants.
- c) To avoid interrupting a speaker or making personal attacks.
- d) To speak to the topic.
- e) To try to understand each other's point of view.

Participants will direct questions and comments to the facilitator, who will recognize the speaking order as participants raise their hand to speak. Everyone will be able to speak to a topic once before participants are offered a second opportunity.

5.2 Meetings

The meeting location and schedule may change if agreed to by the PAG and Licensee Team and input on upcoming meeting agendas will be obtained during each PAG meeting. The facilitator, working with the Licensee Team will finalize and ensure the distribution of meeting agendas, meeting summaries and pre-meeting material to PAG members, advisors and observers. The agenda will include proposed objectives for the meeting.

Meeting dates will be confirmed jointly between the Licensee Team and the PAG during the first meeting on November 6, 2004. Proposed dates for the rest of the meetings are:

December 4, 2004,
January 8 and 29, 2005,
February 19, 2005 and
March 12, 2005.

6 Communication

6.1 Internal to the PAG

- a. The facilitator will ensure the meeting agenda and minutes from the previous meeting are distributed to PAG members within one week of the meeting.
- b. The facilitator will provide the opportunity for PAG members to discuss issues between meetings through the use of a PAG E-mail list or other means of communication.

6.2 External to the PAG

- a. The Licensee Team will provide an annual report to the PAG each fall and make it available to interested parties.
- b. Only a Person appointed by the PAG may communicate the official position of the PAG to the media and external parties about the PAG process.
- c. The appointed spokesperson can speak to the media based on consensus of the PAG
- d. The PAG may draft and approve a media release on its activities and/or may invite the media to attend meetings as observers.

6.3 Internal to the Licensee Team

- a. Input from the PAG will be reported at meetings of the Licensee Team.

7 Meeting Expenses

- a. Mileage to and from PAG meetings for those members traveling more than 32 kilometers each way to the meeting site will be reimbursed at \$0.45 per kilometer. PAG members traveling from outside the Fort St. James Forest District must obtain approval for travel expenses from the facilitator before the meeting.
- b. Overnight accommodation for those traveling to PAG meetings will be reimbursed if pre-approved by the facilitator. As a general principle, accommodation should be economical.
- c. Expense forms with copies of receipts for the above must be submitted to the facilitator within two weeks of the PAG meeting.

8 Decision Making and Methodology

The PAG agrees to work by consensus, defined as “no member having substantial disagreement on an issue and is willing to proceed to the next step”, or, by general agreement.

- a. Every effort shall be made to achieve consensus, but if this is not possible, decisions will be carried by general agreement. General agreement is defined as 80% of the PAG members present provided there is a quorum. Members in a 20% or less minority position on a given decision may request one opportunity to restate their case for consideration by the majority and to have a decision reconsidered by the membership. Such a request will not cause a decision to be delayed to a subsequent meeting. Where agreement is reached by general agreement, the minority view(s) will be recorded along with the decision. A PAG member abstaining from voting on an issue is deemed not to be in substantial disagreement and to indicate a willingness to proceed to the next step.
- b. A meeting quorum of the PAG consists of a majority (greater than 50%) of public members, unless revised for that meeting by a majority of members present at the meeting.
- c. If greater than 50% of PAG member are not present at a meeting, and the members who do attend vary the quorum and make decisions, any such decisions must be ratified by the PAG using section (a) above, prior to, or at, the next meeting.
- d. PAG members will respect decisions made by the PAG.

9 Dispute Resolution Mechanism

9.1 Process Issues

The facilitator will resolve process issues.

9.2 Technical Issues

- a. The PAG 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 needed.
- c. The members will commit to arriving at the best solution possible.
- d. If no consensus or general agreement solution can be reached, then the outstanding issues will be summarized by the PAG and forwarded to the Licensee Team for its consideration.

10 Review and Revisions

The Terms of Reference will be reviewed annually after adoption, or earlier, based on consensus or general agreement of the PAG and the Licensee Team. The facilitator will coordinate comments and draft text revisions.

Approved:

Public Advisory Group

Date: December 4, 2004

Licensee Team

Date: December 4, 2004

Amended:

Public Advisory Group

Date: February 19, 2005

Licensee teamwork

Date: February 19, 2005

Appendix 7

Fort St. James SFMP Matrix

Appendix 8

Licensee/BCTS Current Status Data for the SFMP Indicators

NOTE: At time of printing, not all Licensee/BCTS data was received. Therefore, the data in the following tables is not yet complete

| | |
|---|--|
| Indicator 1: Relative abundance of ecosystems (Number / types of habitats). | TARGET: To Be Determined (Develop within 1 year of PEM completion) VARIANCE: None |
|---|--|

Data Required:

Targets to be assigned after PEM completion

| | |
|--|---|
| Indicator 2: Maintain "old forest" within each NDU / merged BEC. | TARGET: Maintain average percent of total old forest VARIANCE: as per "Landscape Biodiversity Objectives for the PG TSA" |
|--|---|

| Unit Label | Natural Disturbance Unit | Merged Biogeoclimatic Units | Current Status as of June 21 st , 2004 (%) | Target (%) | Target Non-pine Leading (%) | Variance (%) |
|------------|---------------------------|--------------------------------------|---|------------|-----------------------------|--------------|
| E1 | Moist Interior | ESSF mv1, ESSF mv3, ESSF mvp1 | 49.2% | >41% | 33% | 0% |
| E2 | Moist Interior | SBS dk | 55.8% | >17% | 13% | 0% |
| E3 | Moist Interior | SBS mc2 | 60.5% | >17% | 10% | 0% |
| E4 | Moist Interior | SBS mk1, SBS wk3 | 39.4% | >12% | 4% | 0% |
| E5 | Moist Interior | SBS dw3 | 51.8% | >12% | 6% | 0% |
| E6 | Northern Boreal Mountains | ESSF wvp, ESSF mcp, ESSF mc, ESSF wv | 89.9% | >37% | - | 0% |
| E7 | Northern Boreal Mountains | SWB mks, SWB mk | 80.5% | >37% | - | 0% |
| E8 | Northern Boreal Mountains | SBS mc2 | 80.6% | >26% | - | 0% |
| E9 | Omenica Mtn. | ESSF mv | 94.9% | >58% | - | 0% |
| E10 | Omenica Mtn. | ESSF mc | 84.2% | >41% | - | 0% |
| E11 | Omenica Mtn. | ESSF mv3 | 70.2% | >41% | - | 0% |
| E12 | Omenica Valley | SBS dk, SBS dw3 | n/a - results part of A13 | >16% | - | 0% |
| E13 | Omenica Valley | ICH mc1 | 91.1% | >23% | - | 0% |
| E14 | Omenica Valley | BWBS dk1 | 67.5% | >16% | - | 0% |
| E15 | Omenica Valley | SBS mc2 | 75.6% | >16% | - | 0% |
| E16 | Omenica Valley | SBS mk1 | 49.5% | >16% | - | 0% |
| E17 | Omenica Valley | SBS wk3 | 41.6% | >16% | - | 0% |

| | |
|--|--|
| Indicator 3: Maintain "old interior" within each NDU / merged BEC. | TARGET: ≥ targets as per "Landscape Biodiversity Objectives for the PG TSA" VARIANCE: as per "Landscape Biodiversity Objectives for the PG TSA" |
|--|--|

| Unit Label | Natural Disturbance Unit | Merged Biogeoclimatic Units | Minimum Percent of the Old Forest Required in Previous Table that Must be Old Interior Forest (%) | Current Status as of June 21 st , 2004 (%) | Variance (%) |
|------------|---------------------------|--|---|---|--------------|
| E1 | Moist Interior | ESSF mv1 ESSF mv3 ESSF mvp1 | 40% | 46.6% | 0% |
| E2 | Moist Interior | SBS dk | 10% | 65.3% | 0% |
| E3 | Moist Interior | SBS mc2 | 10% | 137.7% | 0% |
| E4 | Moist Interior | SBS mk1 SBS wk3 | 25% | 77.4% | 0% |
| E5 | Moist Interior | SBS dw3 | 25% | 129.1% | 0% |
| E6 | Northern Boreal Mountains | ESSF wvp ESSF mcp ESSF mc ESSF wv | 40% | 90.2% | 0% |
| E7 | Northern Boreal Mountains | SWB mks SWB mk | 40% | 68.5% | 0% |
| E8 | Northern Boreal Mountains | SBS mc2 | 25% | 104.7% | 0% |
| E9 | Omenica Mtn. | ESSF mv | 40% | 58.9% | 0% |
| E10 | Omenica Mtn. | ESSF mc | 40% | 79.8% | 0% |
| E11 | Omenica Mtn. | ESSF mv3 | 40% | 73.1% | 0% |
| E12 | Omenica Valley | SBS dk SBS dw3 | 25% | results part of A13 | 0% |
| E13 | Omenica Valley | ICH mc1 | 40% | 172.9% | 0% |
| E14 | Omenica Valley | BWBS dk1 | 25% | 171.6% | 0% |
| E15 | Omenica Valley | SBS mc2 | 25% | 228% | 0% |
| E16 | Omenica Valley | SBS mk1 | 25% | 95.7% | 0% |
| E17 | Omenica Valley | SBS wk3 | 25% | 74.3% | 0% |

| | |
|--|--|
| Indicator 4: Maintain a variety of young patch sizes in an attempt to approximate natural disturbance. | TARGET: as per "Landscape Biodiversity Objectives for the PG TSA" VARIANCE: as per "Landscape Biodiversity Objectives for the PG TSA" |
|--|--|

| Natural Disturbance Unit | Patch Size Category | Current Status June 21, 2004 | Target (%) | Trend | Future Condition (2010) |
|---------------------------|---------------------|------------------------------|------------|-------------|-------------------------|
| Moist Interior Plateau | ≤ 50 ha | 13.6% | 5% | Away | 17.2% |
| | 50-100 | 14.9% | 5% | Away | 18.1% |
| | 100-1000 | 27.1% | 20% | Away | 27.1% |
| | >1000 | 44.4% | 70% | Away | 37.6% |
| Moist Interior Mountain | ≤ 50 ha | 20.2% | 40% | Toward | 40.7% |
| | 50-100 | 28.5% | 30% | Away | 24.0% |
| | 100-1000 | 2.4% | 10% | Away | 27.2% |
| | >1000 | 48.9% | 20% | Toward | 8.0% |
| Omenica Valley | ≤ 50 ha | 13.9% | 5% | Toward | 13.7% |
| | 50-100 | 20.4% | 5% | Toward | 16.8% |
| | 100-1000 | 39.0% | 30% | Toward | 35.1% |
| | >1000 | 26.7% | 60% | Toward | 34.4% |
| Omenica Mountain | ≤ 50 ha | 19.9% | 10% | Toward | 15.4% |
| | 50-100 | 26.4% | 10% | Toward | 23.7% |
| | 100-1000 | 40.0% | 30% | Toward | 33.7% |
| | >1000 | 13.6% | 40% | Toward | 27.2% |
| Northern Boreal Mountains | ≤ 50 ha | 69.6% | 5% | No change | 69.6% |
| | 50-100 | 27.2% | % | No change | 27.2% |
| | 100-1000 | 3.2% | 30% | No change | 3.2% |
| | >1000 | 0.0% | 60% | No change | 0.0% |

| | |
|---|---|
| Indicator 5: Percent of openings (>100ha) harvested annually that meet the large opening design criteria. | TARGET >80% of openings (-10% variance) |
|---|---|

| Total Number of Openings Harvested (>100ha) | Number of Openings That Meet Large Opening Design Criteria | Comments | % in DFA |
|---|--|--|----------|
| 2 | 2 | Some Licensees/BCTS unable to measure this indicator for the current reporting period. | 100% |

Percent of openings = (openings that meet large design criteria / total number of large openings (>100ha) harvested) X 100

| | |
|--|--|
| Indicator 7: Plant Species Diversity index. | TARGET: 100% Annually VARIANCE: 0 |
|--|--|

Data Required:

Source for data and implementation still to be determined

| | |
|--|-------------------------------------|
| Indicator 8: Percentage of cutblocks harvested that are consistent with legally established ungulate winter range objectives. | TARGET: 100% VARIANCE: 0 |
|--|-------------------------------------|

| Total Number of blocks harvested between April 1 st and March 31 st that are located within Legally established Ungulate Winter Ranges | Number of cutblocks with Site Plans completed in accordance with Ungulate Winter Range Requirements | Comments | % in DFA |
|--|---|---|----------|
| 1 | 1 | Only blocks that fell within UWR were recorded for this indicator | 100% |

% = (Total # of blocks harvested with site plans completed in accordance with UWR requirements / Total number of blocks harvested in UWR) X 100

| | |
|---|-------------------------------------|
| Indicator 9: The percentage of cutblocks harvested consistent with approved provincial Species at Risk Notice/ Orders requirements as identified in operational plans. | TARGET: 100% VARIANCE: 0 |
|---|-------------------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st that coincide with FRPA Sect. 7 Notices | Number of cutblocks with Site Plans completed in accordance with FRPA Sect. 7.0 Notices | Comments | % in DFA |
|--|---|---|----------|
| N/A | N/A | The section 7.0 notices were not released until after this assessment period. | N/A |

% = (Total # of blocks harvested with site plans in accordance with FRPA section 7 notices/Total # of those blocks that coincide with Section 7 notices) X 100

| | |
|--|--|
| Indicator 10: Develop management strategies for legally identified wildlife species, CDC ranked blue and red listed species, not already managed under UWR, regionally important species, species at risk, and IWMS, that occur within the DFA and that are likely to be affected by industrial activity. | TARGET: Within 1 year of plan endorsement VARIANCE: 0 |
|--|--|

Data Required:

Planned project for mapping and verification of habitats

| | |
|--|--------------------------------------|
| Indicator 12: Percentage of cutblocks harvested that are consistent with management strategies for identified wildlife and CDC ranked blue and red listed species. | TARGET: 100% Annually VARIANCE: 0 |
|--|--------------------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st that coincide with species identified above | Number of cutblocks with Site Plans completed in accordance with the Management Strategies | Comments | % in DFA |
|--|--|--|----------|
| N/A | N/A | Management strategies are based off of Indicator #11, that have not been developed for blocks harvested during this assessment period. | N/A |

% = (Number of Site Plans with appropriate management strategies / Total number of Site Plans with identified wildlife and blue and red listed species) X 100

| | |
|---|--|
| Indicator 14: Percent of wildlife trees and / or wildlife tree patches associated with areas harvested annually by licensee as measured across the DFA. | TARGET: >7% by licensee annually VARIANCE: none |
|---|--|

| Total Area Harvested Between April 1 st and March 31 st | Of This Harvest Total, How Much Area Left as Wildlife Trees or Wildlife Tree Patches | Comments | % in DFA |
|---|--|----------|----------|
| 4182.84 | 451.77 | | 10.8% |

% = (Total area left as wildlife trees or wildlife tree patches / Total area harvested) X 100

| | |
|---|---------------------------------------|
| Indicator 15: Percentage of thinning and spacing prescriptions implemented annually that specify a post-treatment conifer density greater than the original planting density. | TARGET: 100% Annually VARIANCE: 0% |
|---|---------------------------------------|

| Total Number of Thinning and Spacing Prescriptions Implemented Between April 1 st and March 31 st | Number of Those Prescriptions With Post Treatment Conifer Density Greater Than the Original Planting Density | Comments | % in DFA |
|---|--|----------|----------|
| 4 | 3 | | 75% |

% = (Number of prescriptions with post treatment conifer density greater than original planting density / Total number of thinning and spacing prescriptions) X 100

| | |
|---|---------------------------|
| Indicator 16: Percent of harvest activities that are within protected areas or parks. | TARGET: 0% VARIANCE: 0 |
|---|---------------------------|

| Total number of cutblocks harvested Between April 1 st and March 31 st | Number of Those cutblocks that are within Protected Areas or Parks | Comments | % in DFA |
|--|--|---|----------|
| 66 | 0 | Forest Activities include harvesting and off block road construction. | 0% |

% = (Number of forest activities within Protected Areas or Parks / Total number of forest activities) X 100

| | |
|--|-----------------------------|
| Indicator 17: Percentage of cutblocks harvested that are consistent with established guidelines for wildlife habitat features. | TARGET: 100% VARIANCE: 0 |
|--|-----------------------------|

| Total Number of blocks harvested Between April 1 st and March 31 st that have Site Plans containing Identified Wildlife Habitat Features | Number of Those Site Plans That Are Consistent With Guidelines for Wildlife Habitat Features | Comments | % in DFA |
|--|--|----------|----------|
| 0 | 0 | | 100% |

% = (Number of site plans that are consistent with guidelines for wildlife habitat features / Total number of site plans in wildlife habitat feature areas) X 100

| | |
|--|---|
| Indicator 18: Develop a DFA map for sites of biological significance; including Ungulate Winter Ranges, known habitats of red and blue listed species and plant communities, and sites of unusual or rare forest conditions. | TARGET: Within 1 year of commencement of the plan VARIANCE: 6 months |
|--|---|

Data Required:

Licensees and BCTS to develop map based off of government spatial data

| | |
|---|--|
| Indicator 19: Develop a management strategy for each biological significance site classification type within the DFA that is likely to be affected by industrial forestry activities. | TARGET: Within 6 months of completion of the biological significance map VARIANCE: 6 months |
|---|--|

Data Required:

Licensees and BCTS to develop the management strategies based off of government supporting information

| | |
|---|-----------------------------|
| Indicator 20: Percentage of cutblocks harvested that adhere to the management strategies for the mapped sites of biological significance. | TARGET: 100% VARIANCE: 0 |
|---|-----------------------------|

| Total Number cutblocks harvested Between April 1 st and March 31 st that have Site plans containing Areas of Biological Significance | Number of Those Site Plans That Are Consistent With Management Strategies For These Areas | Comments | % in DFA |
|--|---|--|----------|
| N/A | N/A | Map and management strategies not created yet. | N/A |

% = (Number of site plans that are consistent with management strategies / Total number of site plans in areas of biological significance) X 100

| | |
|--|-----------------------------|
| Indicator 21: Percentage of cutblocks harvested having mappable non-forest types (>0.5ha.) that are artificially converted to forested types through afforestation treatments. | TARGET: 0% VARIANCE: 20% |
|--|-----------------------------|

| Total Number of cutblocks harvested between April 1 st and March 31 st that contain non-forested areas > 0.5 ha | Number of These cutblocks where the Non-Forested Areas are Aforested | Comments | % in DFA |
|---|--|----------|----------|
| 8 | 1 | | 12.5% |

% = (Number of cutblocks with non-forest areas that are > 0.5 ha that are not planted / Total number blocks with non-forest areas that are > 0.5 ha.) X 100

| | |
|---|--------------------------------|
| Indicator 23: Percent of audited cutblocks harvested where post harvest CWD levels are within the acceptable natural range of variability (as stated in m3/ha). | TARGET: 100% VARIANCE: -10% |
|---|--------------------------------|

| Total Number of cutblocks audited for post harvest CWD Between April 1 st and March 31 st | Number of Those audited cutblocks that are Within the Natural Range of Variability for CWD | Comments | % in DFA |
|---|--|--|----------|
| N/A | N/A | Implementation strategy for CWD auditing was not in place during the period. | N/A |

% = (Number of audited cutblocks within the natural range of variability for CWD / Total number of audited cutblocks) X 100

| | |
|---|---------------------------|
| Indicator 24: Percent of cutblocks harvested where the soil disturbance limits identified in the Site Plan are exceeded. (Typically 5% on sensitive soils and 10% on other soils) | TARGET: 0% VARIANCE: 0 |
|---|---------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st | Total Number of cutblocks harvested Between April 1 st and March 31 st where the soil disturbance limits identified in the Site Plan are exceeded. | Comments | % in DFA |
|--|--|----------|----------|
| 66 | 0 | | 0% |

% = (Total number of cutblocks harvested where the soil disturbance limits are exceeded / Total number cutblocks harvested) X 100

| | |
|--|---|
| Indicator 25: Permanent access structures. | TARGET: <5% of the gross cutblock area harvested annually within the DFA (based on a 5-year rolling average) VARIANCE: 0 |
|--|---|

| Total Area Harvested (Gross Cutblock Area) Between April 1 st and March 31 st | Total Area of Permanent Access Structures (Gross Cutblock Area) | Comments | % in DFA |
|---|---|----------|----------|
| 4302.53 | 151.13 | | 3.5% |

% = (Area of permanent access structures / Total gross cutblock area) X 100

| | |
|---|------------------------------|
| Indicator 26: Percent of road related soil erosion events that introduce sediment into a stream identified in annual road inspections that are addressed. | TARGET: 100% VARIANCE: 0% |
|---|------------------------------|

| Total Number of Road Related Soil Erosion Events Introducing Sediment Into a Stream Identified Between April 1 st and March 31 st | Number of These Erosion Events That Are Addressed | Comments | % in DFA |
|---|---|----------|----------|
| 3 | 3 | | 100% |

% = (Number of erosion events that are addressed / Total road related soil erosion events identified) X 100

| | |
|---|---------------------------------------|
| Indicator 27: Percentage of fish stream crossings planned and installed to a reasonable design and sediment control standard. | TARGET: 100% Annually VARIANCE: 0% |
|---|---------------------------------------|

| Total Number of Fish Stream Crossings Installed Between April 1 st and March 31 st | Number of These Crossings That Are Installed to a Reasonable Design and Sediment Control Standard | Comments | % in DFA |
|--|---|----------|----------|
| 19 | 19 | | 100% |

% = (Number of crossings installed to a reasonable design and sediment control standard / Total number of fish stream crossings installed) X 100

| | |
|--|---|
| Indicator 28: Percentage of stream crossing inspections and resulting mitigation measures completed according to schedule. | TARGET: 100% Annually VARIANCE: -10% |
|--|---|

| Total Number of Stream Crossing Inspections and Mitigation Measures Completed Between April 1 st and March 31 st | Number of These Inspections and Mitigation Measures Completed According to Schedule | Comments | % in DFA |
|--|---|----------|----------|
| 3 | 3 | | 100% |

% = (Number of inspections and mitigation measures completed according to schedule / Total number inspections and mitigation measures completed) X 100

| | |
|---|--|
| Indicator 29: Creation of a DFA risk ranking system for assessing stream crossings. | TARGET: April 1, 2006 VARIANCE: +3 months |
|---|--|

Data Required:

Licensees and BCTS to complete by April 1, 2006

| | |
|---|---|
| Indicator 30: Conformity to the DFA risk ranking system developed for assessing stream crossings. | TARGET: by April 1, 2007 VARIANCE: 0 |
|---|---|

| Total Number of Stream Crossings Assessed Between April 1 st and March 31 st | Number of These Crossings Assessed According to the Risk Ranking System | Comments | % in DFA |
|--|---|-------------------|----------|
| N/A | N/A | Under development | N/A |

% = (Number of stream crossings assessed according to the risk ranking system / Total number of stream crossings assessed) X 100

| | |
|---|--------------------------------------|
| Indicator 31: Percentage of permanent crossing structures installed on fish streams that will allow for adequate fish passage (<i>dependant on the presence/absence of fish</i>). | TARGET: 100% Annually VARIANCE: 0 |
|---|--------------------------------------|

| Total Number of Permanent Crossing Structures Installed on Fish Streams Between April 1 st and March 31 st | Number of These Structures That Will Allow for Adequate Fish Passage | Comments | % in DFA |
|--|--|----------|----------|
| 11 | 11 | | 100% |

% = (Number of structures that will allow for adequate fish passage / Total number of permanent crossing structures installed on fish streams) X 100

| | |
|---|-----------------------------|
| Indicator 32: Percent of cutblocks harvested that are consistent with riparian management commitments identified in site plans. | TARGET: 100% VARIANCE: 0 |
|---|-----------------------------|

| Total Number of cutblocks harvested between April 1 st and March 31 st with Site Plans containing Riparian Management Area Commitments | Number of These Blocks Harvested in Compliance With Identified Commitments made in site plans | Comments | % in DFA |
|--|---|----------|----------|
| 46 | 46 | | 100% |

% = (Number of blocks harvested in compliance with identified commitments / Total number of harvested blocks with riparian management commitments) X 100

| | |
|--|--|
| Indicator 33: Establish long term benchmarks for water quality and quantity. | TARGET: Within 1 year of plan approval, develop and implement a system to monitor long term water quality and quantity VARIANCE: 6 months |
|--|--|

Data Required:
Planned future project.

| | |
|--|------------------------------|
| Indicator 34: Percentage of blocks > 1.0ha harvested 3 years prior to the reporting period, that have been reforested. | TARGET: 90% VARIANCE: 20% |
|--|------------------------------|

| Total number of cutblocks (>1.0ha) harvested 3 years prior to the reporting period | Total number of these cutblocks that are planted within 3 years of the completion of harvesting | Comments | % in DFA |
|--|---|----------|----------|
| 78 | 78 | | 100% |

% = (Total area regenerated with conifers in the 3 year time frame allotted / Total area harvested for the previous 3 years) X 100

| | |
|---|--|
| Indicator 35: The percent of watersheds achieving baseline targets for the peak flow index. | TARGET: Annually, 85% of the watersheds will be below the baseline target VARIANCE: +/- 15% |
|---|--|

Data Required:
Planned future project.

| | |
|--|------------------------------|
| Indicator 36: Percent of watershed reviews completed where the baseline target is exceeded, and new harvesting is planned. | TARGET: 100% VARIANCE: 0% |
|--|------------------------------|

Data Required:
Planned future project.

| | |
|---|------------------------------|
| Indicator 37: Percent of standards units declared annually that meet free growing requirements on or before the late free growing date. | TARGET: 100% VARIANCE: 0% |
|---|------------------------------|

| Total Number of standards units that are Due to Meet Free Growing During April 1 st and March 31 st of Reporting Year | Number of these standards units that achieved Free Growing By or Before the Obligation Due Date. | Comments | % in DFA |
|---|--|----------|----------|
| 29 | 29 | | 100% |

% = (Number of blocks achieving free to grow in allotted time / Number of blocks due in reporting year) X 100

| | |
|--|--------------------------------|
| Indicator 39: Percent of cutblocks harvested, in known scenic areas, which have visual assessments completed and implemented according to the recommendations. | TARGET: 100% VARIANCE: None |
|--|--------------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st that are within Known Scenic Areas | Number of Those cutblocks With Visual Assessments Completed and Implemented According to Recommendations | Comments | % in DFA |
|---|--|---|----------|
| 19 | 13 | Small scale salvage blocks did not have visual assessments completed. | 68% |

% = (Number of visual assessments completed & implemented according to recommendations / Total cutblocks harvested in known scenic areas) X 100

| | |
|--|------------------------------|
| Indicator 40: Percent of blocks and roads harvested that are consistent with recommendations contained in site level archaeological assessments. | TARGET: 100% VARIANCE: 0% |
|--|------------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st that have archaeological assessments Completed | Number of Those cutblocks That Follow Recommendations Contained In The Archaeological Assessment | Comments | % in DFA |
|---|--|----------|----------|
| 25 | 25 | | 100% |

% = (Number of blocks that follow recommendations contained in the AIA / Total number of blocks with AIAs completed) X 100

| | |
|--|--|
| Indicator 41: The percent of individuals who have expressed an identified interest in forest planning are communicated with. | TARGET: Annually, 100% VARIANCE: -10% |
|--|--|

| Total Number of Individuals Expressing an Interest in Forest Planning | Number of These Individuals Who Are Communicated With | Comments | % in DFA |
|---|---|----------|----------|
| 26 | 26 | | 100% |

% = (Number of individuals communicated with / Total number of individuals expressing an interest in forest planning) X 100

| | |
|--|---|
| Indicator 43: General notification to request expression of interest (newspaper ad). | TARGET: Annual notification VARIANCE: None |
|--|---|

| Number of Licensees submitting annual notification to request expression of interest | Comments |
|--|----------|
| 2 | |

| | |
|--|------------------------------|
| Indicator 44: Annual personal notification to every "known" non-timber licensed tenure holder. | TARGET: 100% VARIANCE: 0% |
|--|------------------------------|

| Number of known non-timber licensed tenure holders. | Number annual personal notifications sent. | Comments | % in DFA |
|---|--|----------|----------|
| 78 | 78 | | 100% |

| | |
|---|---|
| Indicator 45: Develop management strategy for marten and moose. | TARGET: Within 1 year of plan endorsement VARIANCE: 6 months |
|---|---|

Data Required:

Planned project for mapping and verification of habitats.

| | |
|---|-------------------------------|
| Indicator 46: Percent of cutblocks harvested that have incorporated information of known subsistence uses, recreational/cultural trails/sites, or spiritual sites that have been brought forward. | TARGET: 100% VARIANCE: 20% |
|---|-------------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st that contain known subsistence uses, recreational, cultural trails & sites, or spiritual sites. | Number of Those cutblocks harvested that Have Incorporated this information into the Site Plan. | Comments | % in DFA |
|--|---|----------|----------|
| 4 | 4 | | 100% |

% = (Number of site plans that have incorporated subsistence use information / Total number of site plans with known subsistence uses) X 100

| | |
|---|---|
| Indicator 48: Percentage of operational forestry contract value in dollars within the DFA serviced by north central British Columbia. | TARGET: 90% (achieved annually) VARIANCE: -10% |
|---|---|

| Percent Money Spent in NCI | Comments |
|----------------------------|------------------------------------|
| 97.8% | BCTS is exempt from this indicator |

% = (Total of each licensee percent money spent in the DFA / Number of Licensees) X 100

| | |
|---|-----------------------------|
| Indicator 49: Percentage of advertised employment opportunities published in the local paper. | TARGET: 100% VARIANCE: 0 |
|---|-----------------------------|

| Total Number of Advertised Employment Opportunities Between April 1 st and March 31 st | Number of Those Employment Opportunities published in the local paper | Comments | % in DFA |
|--|---|---|----------|
| 2 | 2 | Some Licensees currently do not have a system to track this data. BCTS is exempt from this indicator | 100% |

% = (Number of employment opportunities advertised locally / Total number of employment opportunities advertised) X 100

| | |
|--|-----------------------------|
| Indicator 50: Percentage of bidding opportunities that are provided to qualified local forestry-based resource businesses. | TARGET: 100% VARIANCE: 0 |
|--|-----------------------------|

| Total Number of Bidding Opportunities Between April 1 st and March 31 st | Number of Those Bidding Opportunities Provided to Qualified Local Forestry-Based Resource Businesses | Comments | % in DFA |
|--|--|---------------------------------|----------|
| 59 | 58 | For Contract opportunities only | 98% |

% = (Number of bidding opportunities provided to qualified local forestry-based resource businesses / Total number of bidding opportunities) X 100

| | |
|---|---|
| Indicator 51: Annually, licensees will encourage employees to shop local. | TARGET: 3 promotions per year (applies to signatories with Woodlands operations located within 20 km of the town of Fort St. James). VARIANCE: 0 |
|---|---|

| Number of annual employee promotions to encourage shopping local | Method Used to Query/Collect Data | % in DFA |
|--|--|----------|
| 1 | Other Licensees have not implemented programs for this indicator in this assessment period. BCTS, Canfor Houston, Carrier, and Canfor PG are exempt from this indicator. | 33% |

| | |
|---|---|
| Indicator 52: Encouragement of aboriginal participation in the SFM process by offering assurance to aboriginal people the process will not compromise aboriginal and treaty rights. | TARGET: Develop a PAG terms of reference that specifically states that participation in the SFM process will not prejudice aboriginal treaty rights VARIANCE: None |
|---|---|

| Indicator Status | Comments |
|------------------|---|
| Done | Based on PAG meeting minutes. ToR endorsed by PAG on December 4, 2004. Refer to Section 3.6 of the ToR. |

| | |
|---|---------------------------|
| Indicator 55: Number of communication opportunities (SFM or Forest Management related) provided to First Nations Bands whose traditional territories overlap with the area of the plan. | TARGET: 8 VARIANCE: -2 |
|---|---------------------------|

| Total Number of Communication Opportunities to First Nations Between April 1 st and March 31 st | Comments |
|---|----------|
| 13 | |

| | |
|--|------------------------------|
| Indicator 56: Percentage of archaeological assessments completed on harvested cutblocks and roads that have been referred to relevant aboriginal communities for review and comment. | TARGET: 100% VARIANCE: 0% |
|--|------------------------------|

| Total Number of cutblocks harvested Between April 1 st and March 31 st that have had Archaeological assessments Completed | Number of These Archaeological assessments Referred to Aboriginal Communities for Comment | Comments | % in DFA |
|---|---|----------|----------|
| 24 | 24 | | 100% |

% = (Number of archaeological assessments referred to aboriginal communities / Total number of archaeological assessments completed) X 100

| | |
|---|--|
| Indicator 61: A relevant and functioning PAG. | TARGET: Annual review of PAG ToR VARIANCE: None |
|---|--|

| Number of Times the ToR Was Reviewed Between April 1 st and March 31 st | Comments |
|---|---|
| 3 | Based on PAG meeting minutes. ToR reviewed on November 6, 2004 / December 4, 2004 / and February 19, 2005 |

| | |
|--|--|
| Indicator 62: Sufficient and satisfied PAG membership. | TARGET: Membership minimum size of 8 as an indicator of level of satisfaction VARIANCE: -2 people |
|--|--|

| Average PAG member attendance between April 1 st and March 31 st | Comments |
|--|--|
| 10.7 | As of March 31, 2005 – based off of meeting minutes and attendance records |

| | |
|--|-----------------------------|
| Indicator 63: Percent of PAG SFM information gap inquiries responded to within 3 months. | TARGET: 100% VARIANCE: 0 |
|--|-----------------------------|

| Total Number of PAG SFM Information Gap Inquiries Made Between April 1 st and March 31 st | Number of Those Inquiries Responded to Within 3 Months | Comments | % in DFA |
|---|--|---|----------|
| 9 | 9 | Action plan from the April 30 meeting minutes | 100% |

| | |
|--|--|
| Indicator 64: A Fort St. James SFM website with the goal of providing SFM information to the community of Fort St. James and to the PAG members. | TARGET: Functioning website by July 2006 VARIANCE: +/- 6 months |
|--|--|

Data Required:

Utilize the CNRC website for displaying information about the SFM. Licensees to put a hit recorder on the web page to measure activity.

| | |
|--|--|
| Indicator 65: Percent of hardwoods (mixed wood and deciduous leading stands) within the DFA. | TARGET: To be determined at a later date VARIANCE: To be determined at a later date |
|--|--|

Data Required:

Licensees and BCTS to complete GIS analysis based on VRI and then develop indicators and targets based on these numbers

| | |
|--|--|
| Indicator 66: Percent of Douglas fir (mixed stands and Douglas fir leading stands) within the DFA. | TARGET: To be determined at a later date VARIANCE: To be determined at a later date |
|--|--|

Data Required:

Licensees and BCTS to complete GIS analysis based on VRI and then develop indicators and targets based on these numbers

| | |
|---|--|
| Indicator 68: Develop a landscape level strategy for protection of subsistence uses, recreational/commercial/cultural trails/sites, and spiritual uses. | TARGET: Within 1 year of SFMP approval VARIANCE: 6 months |
|---|--|

Data Required:

Licensees and BCTS to develop this landscape level strategy – in kind costs

Appendix 9

The Licensee Landscape Objective Working Group Memorandum of Understanding

Appendix 10

**The Prince George Timber Supply Area Landscape Biodiversity Objectives Reporting
Protocol July 2005**

Prince George Timber Supply Area
Landscape Biodiversity Objectives
Reporting Protocol
July 2005

The following reporting protocol has been discussed and agreed to by the members of the Landscape Objectives Working Group, made-up of

Forest Licensees and BC Timber Sales, as represented by:

- Canadian Forest Products Ltd. (PG and Vanderhoof Operations)
- BC Timber Sales (Vanderhoof, PG and Fort St. James)
- Carrier Lumber Ltd.
- Lakeland Mills Ltd.
- Winton Global
- Fraser Lake Sawmills
- L&M Lumber Ltd.

AND

BC Government, as represented by:

- Integrate Land Management Bureau, Northern Interior Region staff,
- Ministry of Forests and Range, Northern Interior Region's Ecologist, and Stewardship staff at the Prince George, Fort St. James and Vanderhoof forest Districts
- Ministry of Environment staff

The proposed reporting formats are indicated below. It is anticipated that these may be modified and made more explicit as the reporting protocol is implemented. The following products will be produced and provided for Summer 2005:

- map products at about 1:250,000 scale (paper copies, plot files)
- ArcInfo coverages (e.g. consolidated disturbance layer, Crown Forested Land Base, old and interior old forest layer)
- database (.mdb format and resultant similar to what is provided in Timber Supply Review database and Natural Range of Variability analysis for the Landscape Objectives Working Group database)
- tables (paper and .xls files)

The content of the above products are anticipated to contain information similar to the products produced during the LOWG development process. That is, maps would include operating areas, old growth management areas (where appropriate), areas where interior forest conditions are being met, young seral patches and recruitment areas (where appropriate). Tables would include the detailed numbers for how each of the objectives is met by each licensee and how each of the licensees roll-up to meet the objectives for the merged BEC units. The standards/methodology/assumptions used to generate each of the products will be provided.

A listing of all data sources for depletion information should be included (all replaceable forest licensees, non-replaceable forest licensees, salvage non-replaceable forest licensees contributing to the depletion data); this maybe the same as the signatories to the PG TSA Licensees / BC Timber Sales Memorandum of Understanding.

The products will be provided to Ministry of Sustainable Resource Management who will share with other government agencies, as required. The information is considered to be public; however, the Forest Licensees will be provided opportunities to lead in sharing the information with other tenure holders, groups (Public Advisory Groups, Land and Resource Management Plan Tables, etc.) and other stakeholders.

1. Old Forest and Interior Old Forest:

In order to demonstrate old forest and interior old forest objectives are being achieved, the Forest Licensees and BC Timber Sales will provide to the BC Government the following information, at the times indicated in Table 1.

Table 1: Reporting for old forest and interior old forest objectives.

| Reporting out Date | reporting out items | | |
|--------------------|---|---|--|
| | MAPS | TABLES | |
| Summer 2005 | Map of old and interior old for 2005 (all units) | Table of old and interior old for 2005 (all units) | Table of forecast of range of anticipated drawdown for 2010 (all units) |
| Summer 2006 | Map of old and interior old for 2006 (priority units) | Table of old and interior old for 2006 (priority units) | Table of forecast of range of anticipated drawdown for 2011 (priority units) |
| Summer 2007 | Map of old and interior old for 2007 (all units) | Table of old and interior old for 2007 all units) | Table of forecast of range of anticipated drawdown for 2012 (priority units) |
| Summer 2008 | Map of old and interior old for 2008 (priority units) | Table of old and interior old for 2008 (priority units) | Table of forecast of range of anticipated drawdown for 2013 (priority units) |
| Summer 2009 | Map of old and interior old for 2009 (all units) | Table of old and interior old for 2007 all units) | Table of forecast of range of anticipated drawdown for 2014 (priority units) |

2. Young Forest Patch Size Distribution:

In order to demonstrate that the young forest patch size distribution objectives are being achieved the Forest Licensees will provide to the BC Government the following information at the times indicated in Table 2.

Table 2: Reporting for young forest patch size distribution objectives.

Patch Size:

| Reporting out Date | reporting out items | |
|--------------------|---|---|
| Spring 2005 | Map of young patch size 2005 (all units) | Table of young patch size for 2005 (all units) |
| Spring 2010 | Map of young patch size for 2010 (all units) | Table of young patch size for 2010 (all units) |

A strategy will be developed by the Licensees Landscape Objective Working Group, to assist operational planners, working with the Forest Licensees and BCTS, to assess how new harvest block proposal will fit with existing young patch size distribution.

Adopted by Landscape Objectives Working Group:

This Reporting Protocol will be reviewed annually or as requested by either the Licensees / BC Timber Sales OR the BC Government.

Appendix 11

Fort St. James SFM Large Design Criteria

SFM

Large opening design criteria

For the purpose of this design criterion, an “*opening*” consists of the combined area of immediately adjacent:

- planned cut blocks(harvest boundary is identified);
- harvested cut blocks (< 20 years from harvest date);
- internal & external reserve patches; and
- non-harvested areas within the opening.

This large opening design criteria pertains to openings larger than 100 ha. Openings less than 100 ha. will be designed based on legal requirements for WTP retention.

| Indicator | Target | Variance |
|---|-----------------|----------|
| Percent of openings (> 100 ha.) harvested annually that meet the large opening design criteria. | 80% of openings | -10% |

There are currently 3 measures for this indicator, shape index, reserve size & location, and connectivity.

Shape Index

This is a measure of the perimeter of an opening (edge) compared to the area harvested. There are 2 ways to increase edge. The first one is to increase the perimeter to area ratio by creating small openings. The second one is to increase the complexity of the perimeter.

$$SI = P / (3.545 * (SQRT(A * 10000)))$$

SI = shape index

P = perimeter of the opening in meters

A = harvested area of the opening + adjacent harvested blocks < 20 years old + adjacent planned cut blocks

SI targets

| Opening size (ha) | SI target |
|-------------------|-----------|
| 100-500 | > 1.5 |
| 501 + | > 2.5 |

Reserve Size and Location*Opening size targets*

| Opening size (ha) | Reserve Size | Reserve Location |
|--------------------------|---|--|
| 100-1000 | > 50% of the reserve area to be > 2.0 ha. | > 50% of reserve area to be internal reserves. |
| >1000 | > 30% of the reserve area to be 2.0-10.0 ha. >50% of the reserve area to be > 10.0 ha. | > 80% of the reserves to be internal reserves. |

Internal reserves include islands and bridges between harvest areas. External reserves are reserves contiguous to the outer edges of the opening.

Connectivity (bridges)*Connectivity Targets*

| Opening size (ha) | Percent of internal reserve area as connective bridges between harvest areas |
|--------------------------|---|
| 100-500 | >30% |
| 500-1000 | >50% |
| >1000 | >80% |

Reserve connectivity within openings can provide for travel routes and hiding cover for a variety of wildlife. Connective bridge characteristics include:

- Minimum of 50 meters wide, on average.
- Located along known wildlife travel routes.
- Designed to encompass important habitats.
- Windfirm boundaries where possible.
- Design connective bridges adjacent to riparian habitat where possible.
- Operational breaks (roads, skid trails, etc) in connective bridges is acceptable provided that the break does not exceed 50 meters.

Appendix 12

FRPA Section 7 Order for the Fort St. James Forest District

Appendix 13

FRPA Section 7 Notice for the Fort St. James Forest District