

Vanderhoof Defined Forest Area Sustainable Forest Management Plan

Version 3.0 – November 2010



Vanderhoof Sustainable Forest Management Plan

Vanderhoof Licensee Team
Vanderhoof DFA



VERSION 3.0 – November 2010

**SUSTAINABLE FOREST MANAGEMENT PLAN
VANDERHOOF DFA**

**Canadian Forest Products Ltd. (Vanderhoof)
BC Timber Sales, Stuart-Nechako Business Area**

We are pleased to present this Sustainable Forest Management Plan on behalf of the Vanderhoof DFA Licensee Team.

Original signed by Peter Baird

Canadian Forest Products Ltd.

Original signed by Rick Sommer

**BC Timber Sales,
Stuart-Nechako Business Area**

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Preamble

Version 3.0 of the Vanderhoof Sustainable Forest Management Plan (SFMP) is the latest update to the Vanderhoof SFMP. It incorporates a revised Defined Forest Area (DFA), two signatories (instead of the initial four), a revised format (CSA element based vs the original Slocan framework) and updated and revised indicators. Appendix 1 includes a tracking summary of the various versions of this SFMP, as it continues to evolve. The Licensee Team (LT) is comprised of:

- Canadian Forest Products Ltd. (Vanderhoof Division)
- BC Timber Sales (BCTS), Stuart-Nechako Business Area

The following describes the commitments of Sustainable Forest Management (SFM) for the Vanderhoof Defined Forest Area (DFA), developed by the Vanderhoof SFMP Licensee Team, endorsed and adhered to by the signatories of this plan. These commitments are available and communicated publicly.

The Vanderhoof Licensee Team believes in conducting business in a manner that protects the environment and ensures sustainable forest development. We are committed to a process that continually improves our activities involving environmental performance and stewardship. To achieve this objective, we must and 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.
- **Integrate** an adaptive management system that incorporates improved knowledge, monitoring of results and advances in SFM science and technology so that future plans and practices will continue to move towards sustainability of social, ecological and economic values.
- **Commit** to evolving processes that will ensure work site health and safety standards provide conditions and safeguards for the health and safety of employees and the public.
- **Conduct** timely audits of environmental management systems and SFM parameters, and implement corrective measures as required.

The success of Sustainable Forest Management within the Vanderhoof DFA is dependent on the performance of each licensee and their commitment to the strategies within this SFMP and other forest management planning processes.

1.0 Introduction

Sustainability of the forest resource for future use and value is the primary objective of a Sustainable Forest Management Plan (SFMP or SFM plan). The Vanderhoof SFMP will provide signatory licensees operating within the Defined Forest Area (DFA) an SFM planning platform that adheres to the CSA Z809-02 standard.

This SFMP begins with a background of SFM and a section defining the purpose of this SFMP for the Vanderhoof Licensee Team. Following these introductory sections, the plan continues with a description of the Vanderhoof DFA, including a description of the area, discussions about natural disturbance types and the mountain pine beetle epidemic, and the various resource users present in the DFA. The next section discusses the development of the SFMP, including responsibility and supporting information used in development. An in-depth section describing the indicators, based on the Canadian Council of Forest Ministers (CCFM) SFM criteria and elements, occurs after the plan development section. Each indicator is described in its current state and its forecasted future state along with methods of monitoring and analysis. The SFMP is concluded with a section on adaptive management and its importance to the success of this plan and SFM as a whole. Extensive appendices, tables and figures are also included in the plan to help describe and define proposed management strategies, monitoring plans and reporting procedures.

The Vanderhoof Licensee Team SFMP is a working document and will be continually updated and revised, as future forestry practices and socio-economic values associated with the local forest resource change over time.

1.1 Background

Throughout the world, forest management has been moving steadily toward a multi-value approach to sustainable development. International agreements and legally binding documents (e.g. United Nations Conference on Environment and Development, Agenda 21, The International Convention on Forests) demonstrate that socio-economic and environmental forestry related issues remain high on the international agenda (Jeakins et. al 2004). These agreements also imply that instruments to address forest values in a balanced and comprehensive manner are needed (Rousseau 1998 in Jeakins et. al 2004). The concept of Sustainable Forest Management (SFM) calls for a much wider set of ecological, economic and social values that must be integrated into operational decision making (Jeakins et. al 2004). It also requires accountability measures and detailed action plans that will account for future as well as present forest resource needs.

In addition, the SFM concept has attracted the attention of consumers, who are increasingly demanding that the products they purchase be derived from forests that are managed on a sustainable basis. Forest certification has emerged as a dominant factor in the forest industry in order to provide assurances to the public that forest management meets certain standards that are considered critical in order to sustain forest resources. Independent third party certification of an organizations forest management practices is emerging as a requirement for continued access to key world markets. The Vanderhoof SFM plan forms an important forest sustainability planning system that will assist in addressing CSA certification requirements.

The Vanderhoof SFM plan uses the CCFM criteria and elements as a vehicle to achieve sustainable forest management, contribute to national initiatives around sustainable management of forest resources, focus funding and staff time, and assist with the development of certification plans. The overall objective of the plan process has been to demonstrate to government, forest managers, area residents, stakeholders, First Nations and consumers of forest resources that it is possible to implement SFM at the management unit level. Development of a collaborative SFMP will lead to efficiencies for both government and industry, as well as increase the public's confidence in forest management.

1.2 Purpose

The SFMP has been developed to provide a planning framework that will localize SFM indicators and translate concepts and ideologies into working initiatives. The SFMP provides the "on the ground"

implementation of locally developed Indicators, thereby addressing a range of ecological, economic and social issues for the DFA.

As well, the SFMP provides a structure that allows the forest manager to link strategic level goals and objectives to tactical level approaches that will apply to forest management's changing values and conditions. Strategic level planning involves a large land base and a long-term time frame. Tactical level planning is derived from the strategic level and focuses on a smaller planning area and shorter time frames. The last phase of this hierarchical model is the operational level, involving individual sites and short-term horizons. If the hierarchical model is executed properly, the approach encourages resource managers to organize information for discrete management levels, supporting each level of management to be more efficient and integrated. Levels are defined temporally and spatially where the scope of the higher level fully encompasses the scope of the lower level (Connelly 1996). The Vanderhoof SFMP provides the forest manager with a process to implement management strategies, measure their response and initiate necessary changes to practices through adaptive management. This will continually improve on decisions, practices and on the ground results for a wide range of values, and implement an overall philosophy of good forest management.

The SFMP provides direction and links to government policy and signatory member's business processes. Some of the expected outcomes include:

- continual improvement in assessing sustainable forest management through a set of indicators and targets endorsed by the public
- development of local initiatives and management strategies,
- involvement of First Nations in ways that reflect their preferences and interests,
- marketplace recognition,
- a source of credible forest management information to improve economic efficiencies,
- acceptance of innovative, cost-effective practices by government decision makers, and easy implementation of practices by forest managers due to science based approaches and information,
- efficient involvement of stakeholders in ways that reflect their interests and capacity and
- supporting the results-based regime associated with the Forest and Range Practices Act.

2.0 The Defined Forest Area

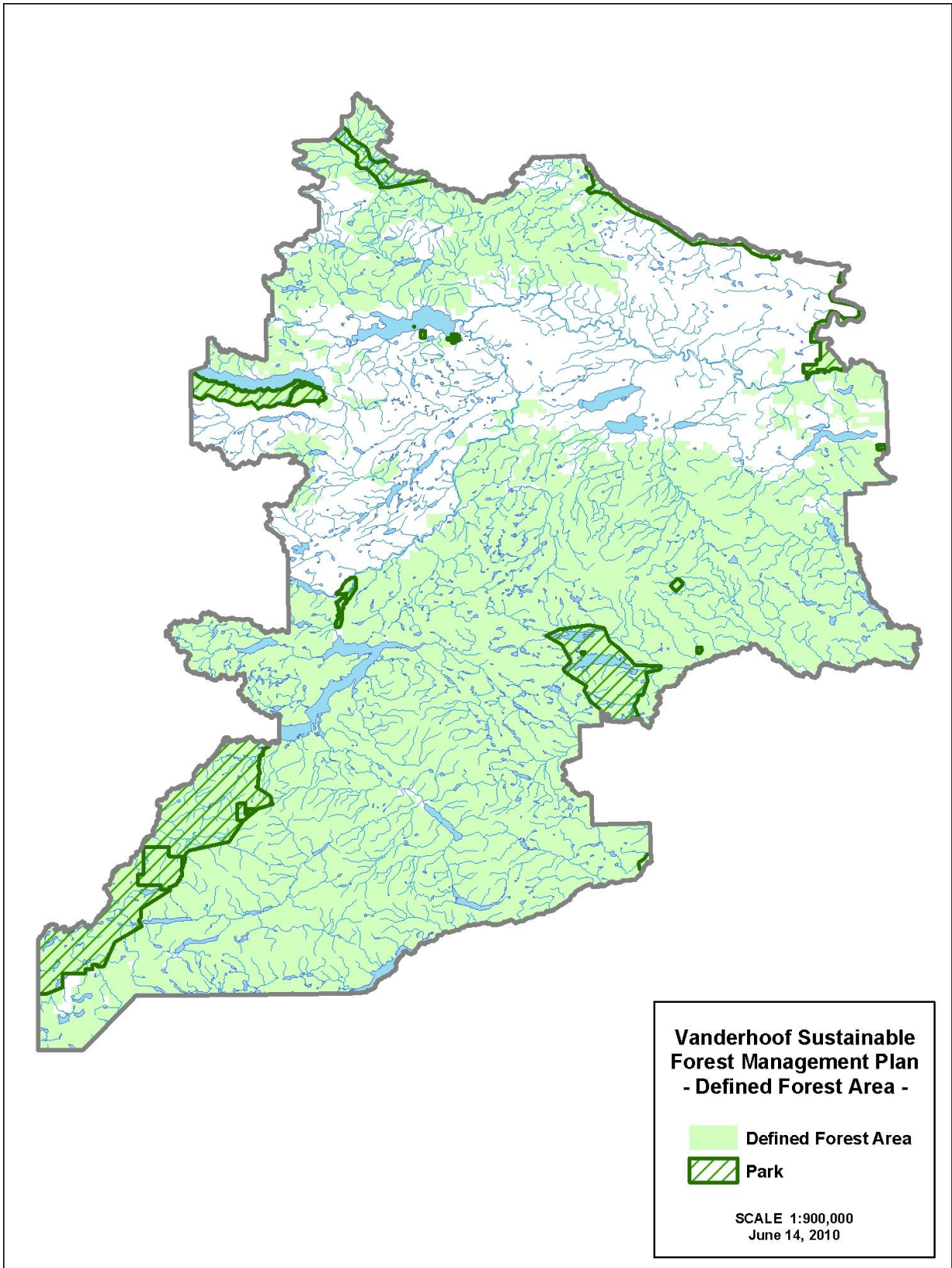
Forest management plans are generally written for a specified area based on various factors determined by the nature of the plan. A Defined Forest Area (DFA) is defined in this plan as a specified area of forest, including land; water and range, to which the SFMP is applied (refer to PAG Glossary in Appendix II). This plan defines the DFA as the Crown Forest Land Base that comprises the operating areas of Canadian Forest Products Ltd (Vanderhoof Division) and BC Timber Sales (Stuart Nechako Business Area) including parks within the Vanderhoof Forest District as defined by the map provided (Figure 1), excluding woodlots and private land.

Features of the DFA including management responsibility, an area summary (natural disturbance types and mountain pine beetle) and the various related interest groups are detailed in the following subsections.

2.1 Non-signatories and Non-replaceable Forest Licences

This SFMP was initially designed as a collaborative effort among the majority of licence holders and BCTS within the Vanderhoof Forest District. The primary licence type within the DFA is volume-based forest tenure. Under these tenure types, operations can and do occur across the Vanderhoof Forest District. To provide continuity for planning processes and public participation, initially the entire district was included as the DFA for this plan. In 2009, the Sinclair Group announced their intention to leave the CSA process and seek alternative certification programs. As such, the DFA was refined to include only those areas within the Vanderhoof Forest District that Canfor and BCTS are operating within. L&M Lumber Ltd., Lakeland Lumber Ltd, Fraser Lake Sawmills (West Fraser) and holders of Non-replaceable Forest Licences (NRFLs) administered by the Ministry of Forests will not be signatories to this SFMP at this time. However, these forest operations may be managed under other sustainable forestry initiatives. Efforts will

Figure 1. Defined Forest Area (DFA)



be made by the Licensee Team to continue working with the non signatory Licensees in order to obtain data required to achieve any landscape level DFA targets (if so warranted). Licensee Team members are committed to working with non-signatory licence holders in conjunction with this plan in order to ensure SFM is achieved across the DFA. It is expected that harvest levels will evolve, operating areas will undergo revision and new licensees may operate within the Vanderhoof Forest District. The Licensee Team will continue to monitor the landscape condition within the DFA in consideration of indicator relevance, effectiveness and continual improvement of SFM.

2.2 Biophysical Description

The Vanderhoof DFA is located on the North Central Interior Plateau at the geographical center of British Columbia. The overall landscape is relatively flat with several low and rolling areas of topography due to a number of river valleys. Several lower mountain ranges are also present throughout the DFA, such as the Fawnie and Nechako ranges, Jerryboy and Tatuk Hills, and Greer and Sinkut Mountains (LRMP 1997). In the north-west portion of the DFA, the topography is more structured, including the mountain ranges Ormand, Shass and Peta that continue on into the Lakes and Fort St. James Forest Districts.

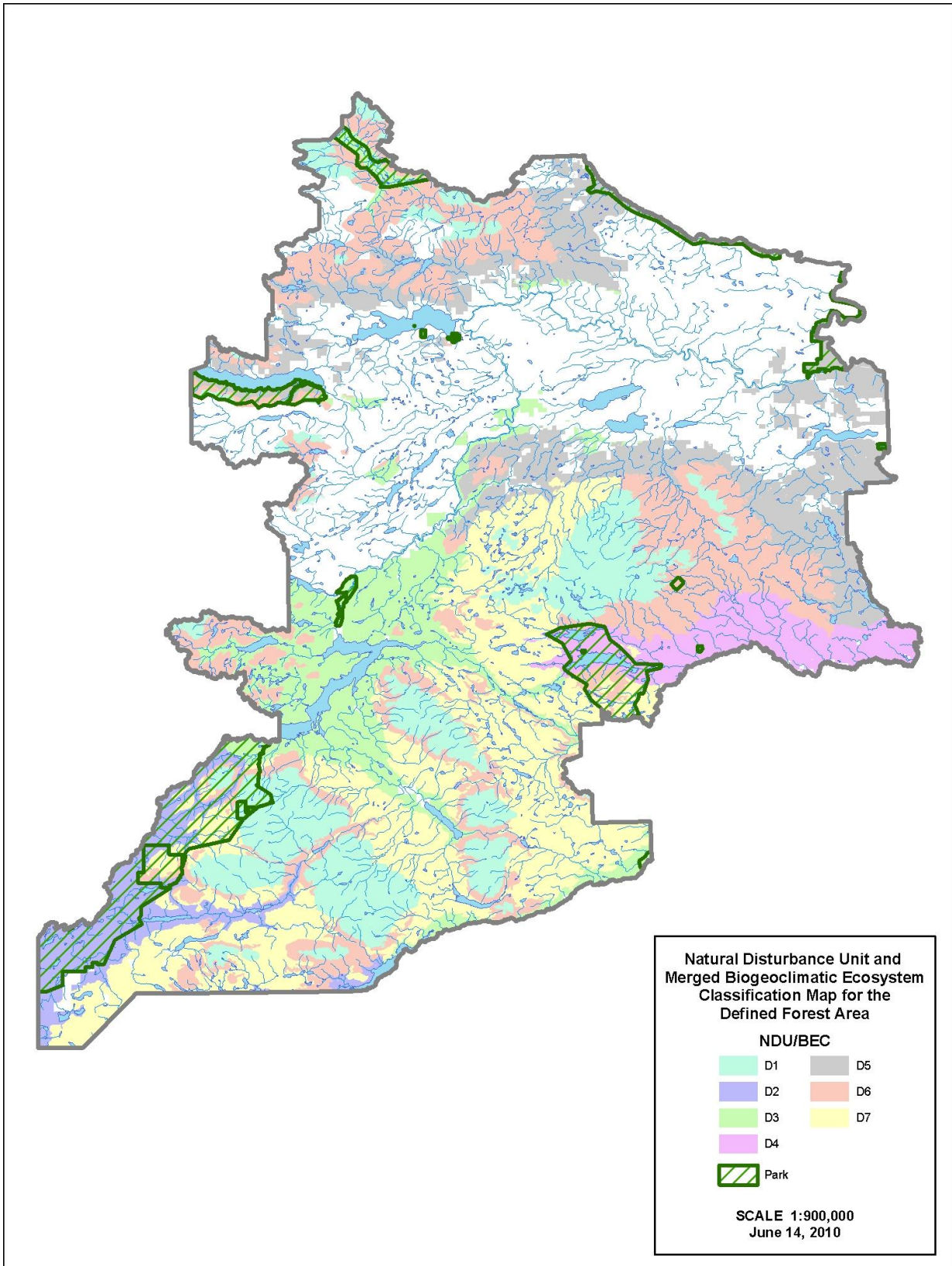
Forest cover within the DFA consists mainly of lodgepole pine stands, with a lesser component of spruce stands and scattered patches of aspen, fir, tamarack and birch (LRMP 1997). Lodgepole pine is the predominant tree species (82%) and represents the majority of the commercial harvest. Douglas-fir leading stands are sparsely scattered across the DFA, and primarily occur in the eastern portion. These stands are unique due to the fact that the Vanderhoof and Fort St. James Forest Districts are the northern most extent of Douglas-fir's natural range (LRMP 1997). Higher elevations within the DFA also have occasional small groves of Engelmann spruce and sub-alpine fir.

The DFA is approx. 983,787 hectares in total land area and of this total approx. 627,157 hectares (461,509 ha Canfor and 165,648 ha BCTS) are within the Timber Harvesting Land Base (THLB). There are seven parks within the DFA. These include: the Sutherland River, Stuart River, Francois Lake, Finger-Tatuk, Kluskoil Lake and Entiako Class "A" Parks and the Nechako Canyon Protected Area. Parks, Protected Areas and Ecological Reserves form approx. 9.3 % of the DFA forested land base and are excluded from the THLB, and subsequently from timber harvest activities. The DFA contains two Natural Disturbance Units (NDUs) and eight biogeoclimatic ecosystem classification (BEC) subzones (refer to Figure 2), which are landscape level classifications based on natural disturbance type and ecosystem respectively. A diverse range of vegetation, wildlife and habitat exists throughout the DFA and these classifications will help to streamline management activities based on the natural landscape and environmental condition.

2.3 Natural Disturbance

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. Therefore, coping with the ecological changes associated with forest management activities should be easier if the pattern and structure created resembles those of natural disturbance. Natural disturbance is defined in this SFMP as the historic process of fire, insects, wind, landslides, and other natural events in an area that were not caused by humans (refer to VSFMP PAG Glossary, Appendix II). Nine Natural Disturbance Units (NDUs) have been identified in British Columbia based on a combination of differences in disturbance process, stand development, and temporal and spatial landscape pattern (DeLong 2002). Of these nine units, only the Moist Interior NDU is present within the Vanderhoof DFA. However, this NDU is subdivided into the Moist Interior Plateau and the Moist Interior Mountain sub-units based on significant differences in elevation (DeLong 2002). Fire and mountain pine beetle are the key stand replacement disturbance events operating within the Moist Interior Plateau NDU (DeLong 2002). However, DeLong (2002) also notes that there is no documented evidence that mountain pine beetle played a major role as a stand replacement agent prior to fire control. Fire suppression activities, from a natural disturbance perspective, actually interrupted natural cycles. Due to the absence of a natural disturbance event, a large supply of viable host for the mountain pine beetle was made available throughout most of the DFA and it can now be argued that Mountain Pine Beetle is the dominant disturbance pattern on the landscape.

Figure 2. Natural Disturbance Units and Biogeoclimatic Ecosystem Classification in the DFA



2.3.1 Mountain Pine Beetle

Bark beetles such as the mountain pine beetle (*Dendroctonus ponderosae*) are a natural part of forest ecosystems across British Columbia, provided a host is present. One of the tree species susceptible to mountain pine beetle infestation is lodgepole pine. As mentioned, the Vanderhoof DFA was historically maintained by large-scale fire events that produced widespread, homogeneous forest stands of lodgepole pine. Fire suppression activities resulted in large tracts of pure pine hosts across the DFA for mountain pine beetles to infest. In the past, cold winter weather occurring during late October and November kept mountain pine beetle populations relatively stable, even with an abundance of host. However, over the last decade, warmer average temperatures have allowed pine beetle populations to reach epidemic levels and cause catastrophic mortality to the pine forests dominating the DFA.

The unprecedented impact of the Mountain Pine Beetle not only threatens timber supply, but also negatively impacts forest aesthetics and recreational opportunities within the DFA. One of the primary industrial concerns with the mountain pine beetle epidemic involves the utilization of infested timber. If beetle wood is not harvested soon after infestation, it will progressively deteriorate and eventually become unsuitable for use in lumber manufacturing. Non-sawlog markets must arise to capture the value (economically & socially) of this declining fibre and enable reforestation efforts to speed up the recovery cycle. SFM goals involve a sustaining the forest resource and ensuring a diversity of resource use maintains or possible stimulates the local economy. Through the SFMP, management strategies will be developed and implemented in attempt to reduce the impacts of the pine beetle epidemic and promptly return damaged stands to productive forest. The Vanderhoof SFMP will focus on management regimes that will allow for beetle management within the realm of sustainability and overall health of the forest resource.

2.4 Interest Groups

Communities tributary to and highly dependent on the DFA include Vanderhoof, Fraser Lake and Fort Fraser. The Vanderhoof Forest District supports a population of nearly 10,000 people (including nearby rural residents and communities). This base is made up of the municipality of Vanderhoof (4,064 people), the village of Fraser Lake (1354 people), the community of Fort Fraser (950 people), and the First Nations communities of Nadleh Whut'en (208 people), Saik'uz (367 people), and Stelat'en (204 people). This population base leads to a variety of interest groups and resource values derived from the forests within the DFA. Interest groups include (but are not limited to): trappers, guide outfitters, range tenure holders, commercial tourism operators, mushroom pickers, snowmobile/ATV clubs, hunters and anglers and members of the general public recreating on crown land. Planning tools such as this SFMP will help to ensure a healthy, sustainable future for the forest resources of the DFA.

2.4.1 Industry

Forestry is the leading natural resource based industry supported by the DFA. The survey results undertaken by Pierce Lefebvre Consulting indicated that in 2007: There were approx. 499 full-time & 618 part-time jobs attributable to harvesting within the Vanderhoof Forest District, there were approx. 2591 jobs in the district related to primary processing within the PG region, 19 % of the timber harvesting employees, associated with the Prince George region timber harvest, reside in the Vanderhoof Forest District and 75.9 % of the timber harvested from the Vanderhoof Forest District is hauled to milling facilities within the district (Pierce Lefebvre Consulting, 2008). Therefore, communities tributary to the DFA are very dependent upon the forest industry. Forestry employment exists in the form of silviculture activities, harvesting operations, road construction and maintenance, hauling, planning and management activities, and mill-related employment, including a major portion of primary and value-added manufacturing. The DFA contains three active sawmills and several value-added operations, such as Vanderhoof Specialty Woods, Rocky Mountain Log Homes and Premium Pellet. Considerable indirect forest industry employment is also generated through logging contractors, trucking firms, equipment supply, machinery repair, fuel distributors and a variety of other support services.

The Vanderhoof Forest District historically had an annual harvest level of 1.965 million cubic meters, or approximately 20% of the Prince George TSA AAC (Vanderhoof IFPA 2000). Currently, the district has an annual harvest level of 5.490 million cubic meters per year (BC MOF 2004b) based on recent uplifts due to action around mountain pine beetle infested timber. Most of the new Licences issued in the district were

short-term non-replaceable tenures, designed to mitigate the impacts of the Mountain Pine Beetle infestation. The majority of the short-term licences that were issued, have since expired, or are inactive. It is likely that accelerated harvest levels will continue over the next five years and then decline, as beetle related mid-term timber supply impacts are incurred. Table 1 indicated a detailed breakdown of the actual harvest volume in the Vanderhoof Forest District for the period April 1, 2008 to March 31, 2009.

Table 1. Vanderhoof Forest District – Actual Harvest Detail (Apr 1/08 – March 31/09)

Licensee / Forest Licence	Actual Scaled Volume Harvested (m3)
Canfor A40873	648,347
Canfor A18165	1098
Canfor A18157	696,764
L&M A17842	45,867
L&M A55578	211,939
BC Timber Sales	425,422
West Fraser A18162	306,603
West Fraser A70864	4,963
Stellako NRFL A72920	172,672
Saik'uz NRFL A72189	68,237
Nadleh NRFL A75068	171,815
Other (FLTC, OLTC)	49,103
Woodlots	95,486
Private Land	32,646
Vanderhoof District Total	2,930,962

Agriculture is the second largest resource industry associated with the DFA, with 470 farms and ranches spanning across the Vanderhoof Forest District (Vanderhoof IFPA 2000). Agriculture and farming account for 11% of the local jobs, as the Nechako Valley is the third largest agriculture region and the second largest forage-producing region in the province of British Columbia. The agriculture industry is interconnected with the forest industry within the DFA as grazing values for livestock exist throughout the forested regions. The DFA contains nearly 225,000 hectares of Crown range and as such, the land base must be co-managed by both industries.

Mineral exploration is also present within the DFA, including industrial mining of coal, gold, silver, molybdenum, and several other minerals. Exploration, site development and active mining practices are ongoing activities within the DFA depending on markets and economic viability in extraction of the particular resource.

2.4.2 First Nations

A long history of habitation by First Nations exists within the DFA and the current land base contains an abundance of archaeological and cultural sites relating to past and present use by Aboriginal people. The First Nations villages of Stellat'en, Nadleh Whut'en and Saik'uz are tributary to the DFA. The asserted traditional territories of 12 First Nations overlap the DFA boundary (see Table 2). Fishing, hunting and berry gathering are undertaken on traditional territories. It is important for First Nations to have the opportunity to provide input into forest management planning processes, such as this SFMP, to ensure cultural heritage resources are identified and appropriate practices implemented to mitigate potential impacts resulting from planned forestry activities. Conservation of historical and cultural features within the DFA is important, as is the involvement of First Nations people in management decisions, in order to promote a sustainable forest management.

Table 2. Local First Nation's with Asserted Traditional Territory in the DFA

First Nation	General Location of Asserted Traditional Territory
Cheslatta Carrier	Fraser Lake south area
Lheidli T'enneh	East Vanderhoof area
Nazko	Bobtail/Southeast Vanderhoof area
Nadleh Whut'en	Northwest Vanderhoof area
Nak'azdli	North Vanderhoof area
Saik'uz	Stoney Creek, central/eastern Vanderhoof area
Stellat'en	Stellako, Fraser Lake/Northwest Vanderhoof area
Tl'azt'en	North Vanderhoof area
Ulkatcho	South Vanderhoof area
Lhoochs'uz Dene	South Vanderhoof area
Yekooche	North Vanderhoof area
Skin Tyee	Central/Southwest Vanderhoof area

2.4.3 Recreation/Tourism

Recreation opportunities are provided by various interest groups within the DFA. Local residents and commercial tourism operators (guide outfitters, commercial lodges and resorts) make use of the extensive backcountry and wilderness values present within the DFA. Recreation and wilderness opportunities abundant within BC generate substantial tourism revenues. It was expected that by 2003, visits to British Columbia forest lands would be over 70 million, thousands of which would be in the Vanderhoof DFA (Vanderhoof IFPA 2000).

Forest Service recreation sites, campgrounds and access to rugged hiking opportunities along rivers, lakes and streams are some of the recreation opportunities available to the public due to the extensive forest road system in the DFA. Major river systems within the DFA include the Nechako, Stuart, Sutherland, Blackwater, Chilako and Entiako. Each of the river systems supports spawning runs of salmon, steelhead and other fish species, and both the Blackwater and the Entiako rivers are world-class sport fishing rivers (Vanderhoof IFPA 2000).

Various wildlife species are present within the DFA, which also helps to enhance the recreation and tourism potential for the area. Moose are abundant in the low-lying wetlands and open forests, deer thrive throughout the entire DFA, elk often winter next to areas of the Nechako River, and Woodland caribou have been identified in the southwest portion of the DFA near Tweedsmuir Provincial Park. Wolves, grizzly bears, black bears, cougars, bobcats and lynx are also present throughout the DFA. Coyotes and various fox species are abundant, along with smaller mammals such as rabbits, squirrels, beavers, otters, marten and fisher. Many varieties of songbirds, upland game birds, waterfowl and larger birds such as owls, eagles and falcons are also present and plentiful throughout the DFA.

Commercial tourism through lodges, resorts and guided wilderness adventure experiences such as hunting, fishing and hiking is another forest dependent sector growing within the DFA. These commercial tourism operators, along with other members of the public, forest licensees, and other interest groups must achieve sustainable and integrated management of the forest resource in order to satisfy all their values. Proper management and forest planning with consideration of all parties will assist in the conservation and enhancement of recreational values for current and future forest use.

3.0 Developing the SFMP

The primary purpose of this SFMP is to outline local level indicators and targets that will support the Licensee Team in SFM certification, in accordance with the CSA Z809-02 standard for sustainable forest

management. One of the primary requirements of the CSA standard is the inclusion of public opinion in the development and implementation of the SFM plan. This section describes the various groups responsible for the plan, including the public and the public participation process, along with a description of the documents and information used to develop the Vanderhoof SFMP.

3.1 Responsibility

The organizational structure for the development and implementation of the Vanderhoof SFMP consists of the Vanderhoof SFMP Licensee Team, the Vanderhoof SFM Public Advisory Group (PAG), and local First Nations. The Licensee Team consists of local representatives acting on behalf of the signatories to the SFMP. Consultation with members of the public through the PAG, and with First Nations, will help to create an SFMP that encourages acceptable and effective strategies to achieving SFM. Public input and involvement is represented by those members volunteering to participate in the PAG. First Nation participation on the PAG provides a unique perspective on First Nation cultural values within the DFA.

3.1.1 Signatories

Currently two parties are signatory to the SFMP and committed to its implementation and maintenance within the Vanderhoof DFA. The signatories to the plan include:

- Canadian Forest Products Ltd.
- BC Timber Sales, Stuart-Nechako Business Area

While this SFMP document will serve to guide the implementation of SFM, other existing management systems (i.e. ISO 14001 EMS), Standard Operating Procedures and internal policies will support SFM achievement. These items will need to be monitored and revised to ensure conformance with the standard. Details on the signatories to this SFMP are included below.

3.1.1.1 Canadian Forest Products Ltd.

Canfor Corporation is a leading Canadian integrated forest products company with head offices based in Vancouver, BC. With the recent integration of Canadian Forest Products and Slocan Forest Products, Canfor now has woodlands operations throughout most of BC, including Vanderhoof, and also operations in Alberta, Quebec and Washington. Canfor Corporation is listed on the Toronto stock exchange with the main operating company as Canadian Forest Products Ltd., from which the name Canfor is derived. Products produced and sold in global markets include lumber, bleached kraft pulp, semi-bleached and unbleached kraft paper, oriented strand board, plywood, veneer and remanufactured lumber products.

Canfor operates two facilities that have operating areas within the Vanderhoof DFA. These include the Plateau and Isle Pierre sawmills. Both mills are located just off of highway 16 with the Plateau Division being approximately 20 km west of Vanderhoof and the Isle Pierre Division approximately 50 km east of Vanderhoof. Canfor's operations in the Vanderhoof DFA consume approximately 2.5 million cubic meters of coniferous timber annually. The primary sources of this timber are from renewable Forest Licenses (59%) and purchases (41%).

The Woodlands operations of both Plateau and Isle Pierre are certified by ISO 14001 for environmental management. The following is the Canfor (Vanderhoof) Environmental Policy.

Environment Policy



We are 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 into our sustainable forest management planning activities.
- Promote environmental awareness throughout our operations.
- Conduct regular audits of our forest and environmental management systems.
- Communicate our sustainable forest management and environmental performance to our Board of Directors, shareholders, employees, customers and other interested parties.

Handwritten signature of Jim Shepard in black ink.

Jim Shepard
President and Chief Executive Officer

Handwritten signature of Ronald L. Cliff in black ink.

Ronald L. Cliff
Chairman

October 2009



TOOLBOX CANFOR/Canfor_Policies/Environment

3.1.1.2 BC Timber Sales

The transformation of the former Small Business Forest Enterprise Program into BC Timber Sales was part of the widespread policy and organizational change instituted under the Forest Revitalization Act. 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. BCTS is mandated to competitively sell approximately 20% of the provincial harvest through public auction. Twelve BCTS business areas were established across the province. 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.

BC Timber Sales (BCTS) is committed to managing and administering forest management activities on our operations through effective measures that ensure *sustainable forest management (SFM)*.

It is the policy of BC Timber Sales to:

- ◆ Conduct our forest management activities to comply with relevant legislation, regulations, policies and other requirements to which we subscribe;
- ◆ Provide public participation opportunities;
- ◆ Confer with, and provide opportunities for participation by, Aboriginal Peoples;
- ◆ Respect and recognize Aboriginal title and rights, and treaty rights;
- ◆ Maintain an organizational culture where all staff proactively participate in providing conditions and safeguards for the health and safety of staff, clients and the public;
- ◆ Honour all international agreements and conventions to which Canada is a signatory;
- ◆ Improve knowledge of the forest and SFM, monitor advances in science and technology, and incorporate these advances where applicable;
- ◆ Promote awareness of SFM to our clients and the public;
- ◆ Strive for excellence in forest management by continually improving the performance of resource management activities and practices.



Mike Falkner
Executive Director
Field Operations Division
BC Timber Sales

July 1, 2010

3.1.2 Public Advisory Group

Public participation is an integral part of SFMP development and is also a specific requirement of the CSA SFM Z809-02 Standard. Because the Defined Forest Area within this SFMP encompasses public forests, public participation is essential to address the concerns and values identified by local residents. One of the public participation methods proposed in the CSA SFM standard is the formation of a Public Advisory Group (PAG), which allows for input from a broad range of interested parties.

The PAG for the Vanderhoof SFMP began with the development of a Stakeholder Analysis project. This project compiled Licensee public referral lists with the end goal of identifying all local stakeholders. Stakeholders were then contacted by mail and invited to an SFM Open House. The Open House was designed to inform and educate the public and area licensees on the concepts and overall benefits of SFM for Vanderhoof. The Open House was also advertised in local newspapers and on local radio stations. A presentation on SFM was later delivered to the former Community Natural Resources Committee (CNRC) for the purpose of soliciting members to participate in the SFM initiative and sit on the PAG.

The Vanderhoof SFMP PAG contributes to SFMP development by speaking on behalf of the public regarding identification and recognition of local interests and DFA specific indicators. The structure of the PAG is defined and outlined in the Terms of Reference for the Vanderhoof DFA (Appendix III). The Terms of Reference also outlines the organizational structure used for the development of the SFMP. The PAG is fundamental in providing input, evaluation and feedback into the various processes of SFMP development.

The involvement of the PAG in the SFMP process began with the initial stage of interest identification and evolved to the development of DFA specific indicators and targets through a consensus based development matrix. Forecasting and scenario designs were also reviewed and conducted as per PAG preferences. Now that the SFMP is implemented in the DFA, the PAG meets several times annually with the Licensee Team to continually monitor, review and continually improve the plan.

3.1.3 First Nations Participation

Incorporating Aboriginal values into the SFMP requires active participation from those First Nations with asserted traditional territory within the DFA. In order to determine those values which have cultural and spiritual importance to First Nations (and design local indicators); it is important to seek participation from representatives of local First Nation communities on the Public Advisory Group.

Participation response levels received from the local First Nations has been relatively low, with varying degrees of input. Both the Saik'uz and Ulkatcho First Nations were represented on the PAG during the initial development of the SFMP. The Licensee Team accepted an invitation by the Ulkatcho First Nation to provide a presentation to community leaders and Elders regarding SFM within the DFA. This presentation took place in the Ulkatcho community and provided an opportunity for the attending First Nations people to review and provide input into this SFMP.

All First Nations that have known traditional territory in the DFA have been (and continue to be) invited to participate in the Vanderhoof SFM planning process through the PAG. Each First Nations' group was contacted by mail and by telephone to inform them of meeting dates and to encourage participation. Subsequent telephone invitations were also made to each group prior to initial PAG meetings. In order to maintain and even increase the level of First Nations' participation on the PAG, the Licensee Team will continue to keep local First Nations informed of SFM activities and annual reports, particularly as it applies to the specific interests of local First Nations. The Licensee Team and the PAG recognize and agree that Aboriginal participation in the public participation process will not prejudice Aboriginal and Treaty rights.

3.2 Supporting Information

SFM initiatives will utilize and incorporate many of the existing strategies and policies previously implemented in the DFA. The following table outlines the potential linkages existing legislation and policy have to SFM.

Table 3. SFMP Linkages to Existing Legislation, Policies or Strategies

Document	Linkage to SFMP
Forest and Range Practices Act (FRPA)	FRPA provides forest managers with a "results-based" structure upon which to develop and deliver forest management. The SFMP is also "results-based" in nature, providing the participants a context to develop, implement and report on achievement of objectives. The plan must meet or exceed the requirements set forth in FRPA.
Land and Resource Management Plan (LRMP)	The Vanderhoof LRMP (1997) was a community-based process used to develop land use strategies where decisions were made through consensus from members of the public, forest licensees and government resource agencies. Certain objectives developed in the LRMP were also integrated into the measures of SFM plan.
Timber Supply Review (TSR)	The main objectives of a TSR are: <ul style="list-style-type: none"> to identify economic, environmental and social information that reflects current forest management practices including their effects on the short and long-term timber supply;

	<ul style="list-style-type: none"> • to identify where improved information is required for future timber supply forecasts; and • to provide the Chief Forester with information to make any necessary adjustments to the AAC for the next five years.
Vanderhoof Innovative Forest Practices Agreement (IFPA)	IFPA's are an initiative of the Ministry of Forests and are awarded to licensees in order to conduct projects that will test new and innovative forestry practices. IFPA proponents must prepare a Forestry Plan that outlines any proposed forest management projects and strategies. IFPA projects have produced various datasets for the Vanderhoof Forest District that will assist in indicator development, baseline target establishment and the monitoring phases of this plan.
Canadian Standards Association (CSA)	This SFMP is the document that supports the SFM requirements of the CSA Z809-02 Standard necessary for eligibility for certification under CSA. Some of the requirements for SFM in a DFA include public participation, performance measures, a management framework, action and response plans, and a commitment to continual improvement.
SAFE Company Certification Program	"SAFE" stands for Safety Accord Forestry Enterprise, and this is the most ambitious, comprehensive safety initiative ever undertaken by the BC Forest Safety Council in British Columbia. Every forestry operation will be required to establish and implement all required safety programs and procedures, and demonstrate proof of such, through annual audits. Both Canfor and BC Timber Sales have achieved SAFE Company certification.
Forest Stewardship Plan (FSP)	The FSP is a landscape level plan that is submitted to government for approval and forms the framework for subsequent site level planning. The FSP is the operational plan that contains the various management strategies used to conserve the core values identified in <i>FRPA</i> . It includes stocking standards for post-harvest reforestation obligations. Each Licensee Team member will be responsible to ensure that SFM principles are upheld through their approved FSPs and other site level plans.
Site Plan (SP)	<p>The SP is a legislatively required site level plan that identifies the location of cutblocks and roads, and how the intended results or strategies described in the Forest Stewardship Plan will be implemented at the site level. In the context of this SFMP, the SP is one of the tools that will outline specific management strategies to support SFMP indicators and achieve targets. The SP prescribes strategies for a particular development area, based on its site specific characteristics. Site level activities are inspected once complete and compared to the SP to ensure adequate management toward SFM.</p> <p>Site specific stocking standards are contained in the SP and in order to ensure these standards are achieved, reforested sites must be monitored to ensure the desired crop trees are growing naturally and uninhibited. Mechanical brushing treatments are applied to some plantations where competition from vegetation will inhibit tree growth. Silviculture surveys are conducted on harvest openings to determine regeneration performance, brushing requirements and to assess free growing status. Once a free growing status is achieved the requirement of basic silviculture is complete and subsequent management activities undertaken on the plantation are done so at the discretion of the MOFR.</p>

The SFMP development process involves analysis of DFA specific data, in order to develop landscape and stand level strategies consistent with sustainability forest management. Information regarding the analysis of existing and required DFA inventories is indicated below and an overview of current DFA management practices is presented. The last two components of this section include a discussion of the Multi Criteria Analysis (MCA), which was used to prioritize and develop scenario designs, and a description of the forecasting methods used to predict future conditions for the SFM indicators within this plan.

3.2.3 Inventory Analysis

The inventory analysis for the DFA involved researching and collating available forest resource data and/or creating supporting datasets. Through licensees, government, academic, or other funding sources, a number of land based inventories have been completed within the Vanderhoof Forest District. Larger land based inventories pertaining to the Prince George TSA have also been completed. Recorded inventories

applicable to the development of this SFMP include: cover interests such as forest health, forest inventory, roads and landings, biodiversity, wildlife, watershed management, and archaeological inventories.

An additional part of inventory analysis includes indicator mapping. SFM assumes that the entire land base (whether managed or unmanaged) contributes to meeting ecological, economic and social goals of sustainability. Indicator mapping is a tool that assesses the current status of resources to be sustained within the DFA and indicates how these resources spatially contribute to the defined sustainability targets within this plan. The DFA is delineated into the Timber Harvesting Land Base (THLB) and the Non-timber Harvesting Land Base (NHLB) in order to assess the contributions of both areas into meeting SFMP targets.

3.2.6 Scenario Analysis and Forecasting

The Base Case for forecasting purposes is a scenario that identifies the current status of forest management and how a continuation of today's management will affect the indicators of SFM identified within this plan. Assumptions for the Base Case include an AAC of 5.5 million cubic meters, biodiversity based on the Provincial order delineated by BEC unit and landscape unit, ungulate winter range, visual quality, riparian reserves and assumptions involving mountain pine beetle infested timber from the SHIP analysis.

Scenarios were identified by the PAG as being important to the development of the SFMP as part of a range of situations that could be managed for, through strategies developed within the plan. These scenarios included one in which maximum harvest levels were implemented, where no constraints around biodiversity, visual attributes or integrated resource management were considered. To counter maximum harvest, a no harvest scenario was also identified where the entire land base within the DFA would be preserved for values other than timber harvest. Other scenario options that were deemed valuable in the quest to identify an overall SFM scenario included a recreation based scenario and a biodiversity based scenario. In the recreation scenario, all Base Case assumptions remained static except for visual quality attributes and the size of riparian reserves. In order to maximize recreation values, the visual quality classes were increased by one class and riparian reserve sizes were increased until the total was equal to 12% of the land base. In the biodiversity scenario, again all Base Case assumptions remained static except for reserve area size. As the scenario is meant to highlight biodiversity, no harvest activity would occur in riparian zones or in ungulate winter range areas, and reserve areas would be increased with riparian areas consisting of 12% of the land base and wildlife tree patches consisting of 15% of the land base.

Forecasting is an explicit statement of the expected future condition, through time, of an indicator. Projections are used to compare indicators and sustainability targets over time with use of current and best management practices in order to assess the level of risk for each indicator. Each scenario identified in the scenario analysis was forecasted to predict future conditions of the DFA and the influence of each management scenario to the indicators of SFM identified in this plan. As this plan was developed, forecasting was able to identify the future state of indicators that contained a quantitative character. All other indicators in this SFMP were forecasted with alternate methods, including a logical "what if scenario" analysis of each indicator and how the values of SFM would be affected if the target for each indicator were not achieved.

Based on the results of the scenario analysis and forecasting, the Licensee Team determined that a balance of PAG interests and values could not be adequately captured within any of the identified scenarios. Licensee Team members then used the results of a Multi-Criteria Analysis, discussions from PAG meetings, and the results of scenario analysis questionnaires, to formulate a SFM scenario. The SFM scenario designed for this plan was created to achieve a balance of PAG values and Licensee Team business needs within the framework of SFM.

The SFM scenario provides an achievable balance of values and incorporates indicators that were identified by the PAG and included in the development matrix. In comparison to the Base Case, the SFM scenario increased Wildlife Tree Patch retention to 10% of the land base as opposed to 8%. The Base Case utilized the Provincial order for biodiversity objectives, whereas the SFM scenario uses the Landscape Objective Working Group (LOWG) biodiversity objectives, which incorporate Natural Disturbance Unit (NDU)

science rather than broad landscape units and Biogeoclimatic Ecosystem Classification (BEC). The SFM scenario developed for the Vanderhoof DFA also incorporates the latest Allowable Annual Cut (AAC) determination (related to Mountain Pine Beetle uplift) made by the Chief Forester. The SFM scenario starts in year zero with a cut level of 6.5 million cubic meters per year. The timber harvesting land base (THLB) in the SFM scenario is slightly less than in the Base Case due to an increase in retention across the DFA. A long-term sustainable harvest level of 2.57 million cubic meters per year was also identified in the SFM scenario. This scenario will achieve sustainability of a balance of values across the DFA and will assist the Licensee Team in trending toward the targets identified for the indicators of sustainability in the DFA.

Implementation of the SFM scenario will be accomplished through this SFMP and the monitoring and reporting of results will be presented in future annual reports. Forecasting and modeling of forest resources provides a picture of forest condition that will undoubtedly change throughout time. Future forecasting of the indicators in this plan and the SFM scenario will be required in order to ensure the balance of SFM values and sustainability of the forest resource continues across the DFA.

4.0 SFM Criteria and Monitoring

In consideration of the *CCFM Criterion* and related *CSA SFM Elements*, the PAG needs to identify one or more *values* of sustainability for each *CSA SFM Element*. For each value at least one *objective* is defined that described the future condition of that value and each value requires one or more *indicator(s)* identified for it. Once an indicator is identified, it in turn needs 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*", an 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 "*>10 % by licensee*".

Table 4. CCFM Criteria and CSA Critical Elements

Criteria	Critical Element
CCFM Criterion 1 Conservation of Biological Diversity	1.1 Ecosystem Diversity 1.2 Species Diversity 1.3 Genetic Diversity 1.4 Protected Areas and Sites of Biological Significance
CCFM Criterion 2 Ecosystem Condition and Productivity	2.1 Forest Ecosystem Resilience 2.2 Forest Ecosystem Productivity
CCFM Criterion 3 Soil and Water	3.1 Soil Quality and Quantity 3.2 Water Quality and Quantity
CCFM Criterion 4 Role in the Global Ecological Cycles	4.1 Carbon Uptake and Storage 4.2 Forest Land Conversion
CCFM Criterion 5 Economic and Social Benefits	5.1 Timber and Non-timber Benefits 5.2 Communities and Sustainability 5.3 Fair Distribution of Benefits and Costs
CCFM Criterion 6 Society's Responsibility	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

One of the PAG's major roles is 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 Licensee Team and the PAG established a set of indicators and targets (section 5.0 below), which have been updated through continual improvement (current to SFMP version 3.0). Appendix IV contains a working copy of the development matrix (SFM element, local indicators, targets & variances) that will serve as the basis of the transition to the new CSA Z809-08 standard.

4.1 Monitoring

Indicator monitoring involves the collection of appropriate data to verify target achievement or forecasted outcomes and provides a baseline for continual improvement. The overall intent of the monitoring process is to determine whether or not management strategies are meeting the required expectations put forth by identified indicators. A monitoring plan is identified for each unique indicator in this SFMP. By means of established Licensee Team EMS frameworks, standard operating procedures and tracking systems, SFM indicators are monitored and evaluated against their corresponding target. Indicators not monitored through a digital datasets will be tracked and summarized through paper files in a clear and concise manner, in order to satisfy audit requirements. During the monitoring process, indicators are also reviewed to ensure they are responsive, adaptive, defensible and publicly acceptable to represent sustainable forest management within the DFA.

4.2 Analysis/Evaluation and Adjustment

Analysis and evaluation of indicators involves a collation, review and if necessary analysis of licensee team data collected during the monitoring phase. In forestry operations, the element of control lies with

management practices that occur on the ground. If adjustments to practices are required (to effect change in the field), there needs to be a clear relationship between the particular practice being employed and the related effects of this practice on the corresponding indicator. Only by clearly understanding the linkage between practice and indicator performance can effective adaptive management strategies be implemented.

In response to analysis of forecasted information, there is always the possibility that incorrect assumptions are made with respect to the degree to which forecasted values can be achieved. It is important for data analyzers and interpreters to use objectivity to determine achievement of targets or progress towards SFM. One of the errors that may be introduced with regards to analysis and evaluation is the human element. When evaluating progress toward SFM within the DFA it is important to consider who is analyzing the data, who is interpreting the results and who is providing the review of management strategies. Continual cooperation and collaboration between the PAG and the Licensee Team is essential when adaptive management strategies are proposed to alter the progress of SFM indicators.

The main objective of monitoring, analyzing and evaluating indicator performance is to determine whether or not management objectives are being met. In the situation where targets and goals of SFM are not being achieved, a decision to alter management strategies is necessary. One of the difficulties faced by foresters is to assess impacts related to achieving management strategies versus leaving current practices in place. Forests are dynamic systems and sometimes will not respond to practices as predicted in the planning phases. Another challenge is to identify which part of the management practice needs to be altered in order to achieve the goal of SFM. A change in management can affect many facets of a forest ecosystem therefore decisions must be informed, scientifically based and carefully planned.

4.3 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 analyzing data must be objective when determining if changes are required to either, the indicator, the target, or the strategies used to achieve targets. Cooperation between the PAG and the Licensee Team is important for continuous improvement of sustainable forest management performance.

4.4 Annual Reporting and Communication Strategies

Communication of the results of indicator performance to the PAG and the general public is an essential element of this SFMP. Each year an annual report, that summarizes the Licensee Team performance relative to the indicators and targets for the DFA, is produced and made publicly available. Along with performance successes, the annual report identifies any targets not achieved and provided remedial actions for subsequent achievement of targets. Continual improvement is discussed relative to Licensee Team performance and current indicator and target relevance given present and future landscape condition or other changes within the DFA. Revisions or updates to the SFMP will also be publicly communicated. Results of individual Licensee Team third party CSA certification audits (a requirement of the CSA SFM Z809-02 standard) are posted on public websites for review. The SFMP document, along with associated updates and annual reports will be publicly available at the BCTS government website http://www.for.gov.bc.ca/bcts/areas/TSN_certification.htm , Canfor's Public website www.canfor.com and the PG TSA SFMP PAG website www.sfmptsa.com

Throughout the life of the SFMP, Licensee Team members will continue to engage the PAG to discuss annual report results, identify new or redundant indicators and/or targets and to incorporate new science into the existing planning regime. Communicating the progress of sustainable forest management through the annual report will help to ensure that continual improvement occurs in accordance with a publicly accepted planning process.

5.0 Indicators

The following section identifies the local indicators and associated targets pertaining to SFMP version 3.0 (as adopted by the Licensee Team and PAG).

Indicator 1 - Distinct Habitat Types

Statement of Indicator	Target	Variance
The percent area of distinct habitat types in the DFA.	To be determined Report every 5 yrs.	N/A

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 1 – Conservation of Biological Diversity</p> <ul style="list-style-type: none"> • CSA SFM Element 1.1 – Ecosystem Diversity • CSA SFM Element 1.2 – Species Diversity • CSA SFM Element 1.3 – Genetic Diversity • CSA SFM Element 1.4 – Protected Areas and Sites of Special Biological Significance
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Indicator Description

This indicator relates primarily to ecosystem representation. The intent of sustaining biological richness is to maintain productive, well-distributed populations of species and diverse gene pools in the DFA over time. Maintaining a representation of a full range of ecosystem types is a widely accepted strategy to conserve biodiversity in protected area networks (e.g. Margules and Pressey 2000) and is suggested for landscapes managed for forestry (e.g. Lindenmayer and Franklin 2002). Managing for ecosystem types rather than for individual species is often called the “coarse-filter approach” (Noss 1987). This approach is based on the assumption that a representative array of ecosystems will encompass the vast majority of species present on the landscape (Hunter, Jacobsen, and Webb 1988).

Maintaining ecosystem representation in the Non-Harvestable Land Base (NHLB) is a coarse filter approach that is intended to manage for the array of species that we have no knowledge of, provide a buffer for species that are managed for within the harvested land base, and preserve unmanaged benchmarks for monitoring the ecological effects of human activities (Wells, Haag, and Braumandl 2003). Knowledge of the state of representation of individual ecosystems allows managers to set habitat priorities within the Timber Harvesting Land Base.

While maintenance of ecosystems in the NHLB involves an inventory analysis of pre-defined areas, maintenance of ecosystems in the Timber Harvesting Land Base (THLB) can primarily be accomplished through retention of areas of mature forest across the land base. Assurance of ecosystem representation in the NHLB and a distribution of unmanaged reserves, at a variety of scales (small and large), throughout the THLB will help to ensure that a variety of distinct habitat types are maintained within the DFA. There is no control over the abundance of ecosystems, but ecosystem representation can be increased in the NHLB by: establishing reserves in high-risk ecosystems; and prioritizing high-risk ecosystems when allocating stand and landscape level retention.

Current Practice and Indicator Status

Previous Ecosystem Representation Analysis (ERA) projects have been completed for the Vanderhoof Forest District - Vanderhoof ERA Report (Forest Ecosystem Solutions 2004 and 2006). The most recent ERA project completed for the Prince George Timber Supply Area (TSA) and TFL30 updated this work so that the analysis was consistent across the entire TSA, and matched the ecosystem groups to those within the Quesnel and Mackenzie TSA’s (FES 2009). As with the previous two projects, new site series aggregations were established that recognized the uniqueness of individual sites while providing logical ecosystem units for coarse filter management. Ralph Wells (Centre for Applied Conservation Research) created groups of site series for this analysis using statistical methods and expert review was provided by

Craig DeLong (MoFR Regional Ecologist). The DFA is located within the west region of the study area, which is represented by 60 ecosystem groupings. Since both the DFA itself and the ecosystem groupings have changed substantially in the last several years, no meaningful comparisons to the original 2004 ERA baseline target data can be made. Recommendations within the recent Prince George TSA ERA analysis (FES 2009) indicated that coarse filter management is designed to address poorly understood systems, so ecologically meaningful thresholds for ecosystem representation are inherently difficult to determine. Rather than establishing thresholds for all ecosystem groups, forest planners could manage for ecosystem representation in a process of continual improvement, where highest-risk ecosystems are managed first, based on a prioritization system.

Target Establishment

Appropriate targets will be determined for the revised DFA once new baseline data has been calculated. Initially a new dataset must be produced for Ecosystem Representation Analysis within the DFA. The Non-Forested, Non-Harvestable and Timber Harvesting Land Bases must be defined spatially in detail. Ecosystem Representation Analysis examines the proportion of each ecosystem unit that is reserved from harvest for one reason or another.

Monitoring and Reporting

Monitoring and reporting protocols will be determined when appropriate baseline data has been determined and/or this indicator is fully developed or revised.

Forecasting and Probable Trends

This indicator was not originally forecasted by modeling as it was assumed to remain constant over the long term. Therefore, the use of a “what if scenario” will likely be used to identify future trends when this indicator is fully developed.

Continual Improvement

Continual improvement efforts will examine the relevance of this indicator, given the severe level of pine mortality within the DFA (NHLB & THLB) and the caution that meaningful ecological thresholds are difficult to determine. Comparable data capture to assess trending may be difficult to obtain. Ecosystem classification units are somewhat arbitrary surrogates for ecological diversity, which varies across the landscape. Refinement of ecosystem mapping through field verification will be likely and changes to the NHLB (especially economic operability) should be anticipated as beetle-killed stands deteriorate. Rather than meeting thresholds, this ERA is more suited to prioritizing retention areas at the stand and landscape level. This indicator will likely be moved to the continual improvement matrix, until it can be fully developed.

Indicator 2 - Late Seral Forest

Statement of Indicator	Target	Variance
The minimum proportion of late seral forest (%) by NDU.	Annually sustain proportions of late seral forest (%) by NDU in accordance with Table 5.	0 %

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity <ul style="list-style-type: none"> • CSA SFM Element 1.1 – Ecosystem Diversity • CSA SFM Element 1.3 – Genetic Diversity CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity <ul style="list-style-type: none"> • CSA SFM Element 2.2 – Ecosystem Productivity

Indicator Description

This indicator can be considered a “state of the forest” measure because it portrays the percentage of the landscape that is represented by older age classes (late seral). Late seral forest is generally defined across the DFA as greater than 120 years of age for both coniferous and deciduous stands in the Moist Interior NDU. Emphasis is generally placed on late seral forest when it comes to retention, but it is important to note that forests occurring in different seral and structural stages over space and time are recognized as a vital part of the landscape with regards to biodiversity values. Forest management, through the harvest of stands, affects the distribution of seral stages across the landscape. Forest stands are often regenerated and then planned for harvest again in a time span (rotation) that is usually less than the age that they would have matured and grown old naturally. Therefore, over an entire rotation, forest management can reduce the availability of late seral forest stands beyond the limits of natural variability. DeLong (2002) has estimated the natural range of variation regarding late seral forest for different NDUs within the Vanderhoof Forest District. As such, landscape biodiversity can be conserved within these defined natural ranges of variation by maintaining a representation of late seral forest across the DFA.

Current Practice and Indicator Status

The Landscape Objective Working Group (LOWG), which has representation from ILMB, MOFR, timber licensees and BCTS participated in the development of landscape biodiversity objectives and old forest retention requirements for the Prince George Timber Supply Area, which includes the Vanderhoof Forest District (DVA). The subsequent *Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area* was signed off October 20, 2004 by the Regional Director of the Northern Interior Region of the Ministry of Sustainable Resource Management. These objectives utilize NDU research conducted by DeLong (2002) to establish old forest retention objectives for each NDU that occurs within the DVA. The current status of late seral forest within the DVA exceeds the minimum levels required as determined through the LOWG (refer to Table 5). Minimum levels of old seral have been used as the basis for the targets identified in this indicator and thus harvesting activities can continue throughout the DFA as long as levels of old seral are monitored to ensure the targets are achieved or exceeded.

Table 5. Late Seral Forest in the Vanderhoof Forest District and Associated Targets

Natural Disturbance Unit	Merged Biogeoclimatic Units	Current Status as of March 31, 2010* (ha)	Target (%)
D1 Moist Interior Mountain	ESSF mv1, ESSF.mvp1, ESSF.xv1	42 %	>29 %
D2 Moist Interior Plateau	SPBS mc	51 %	>17 %
D3 Moist Interior Plateau	SBS dk	33 %	>17 %
D4 Moist Interior Plateau	SBS.dw2	30 %	>12 %
D5 Moist Interior Plateau	SBS.dw3	33 %	>17 %
D6 Moist Interior Plateau	SBS.mc2, MS.xv	38 %	>12 %
D7 Moist Interior Plateau	SBS.mc3	35 %	>12 %

*The current status is from the LOWG Analysis Project

The current status is derived a LOWG analysis utilizing a Vanderhoof depletion layer (harvest openings, wild fires etc.) and the Crown Forested Landbase (based on the Vegetation Resource Inventory) current to March 31, 2010. The mountain pine beetle epidemic is a significant DFA specific factor affecting late seral pine stands. Mortality resulting from the mountain pine beetle epidemic and increased harvest levels associated with salvage efforts within the DFA will create future deficiency gaps in late seral forest.

Target Establishment

As previously mentioned, targets for this indicator were adopted from the *Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area* (2004).

Monitoring and Reporting

Monitoring of this indicator occurs through the LOWG Licensee Implementation Team. This group meets annually to consolidate data, conduct analysis and review the resultant to determine if any NDU/mBEC units for the Prince George TSA are approaching old seral targets. Documentation of this collaborative initiative by LOWG members is outlined in an informal Memorandum of Understanding (MOU) signed by those licensees and BCTS conducting harvest activities on the landbase. Although the LOWG group currently conducts analysis on an annual basis, future analysis may be completed as required depending on risk to old seral targets. This analysis is conducted over the entire TSA, with separate outputs for the three applicable districts (Prince George, Vanderhoof and Fort St James). The results of the late seral LOWG analysis and any actions that may be required to remain above the identified targets will be reported to the PAG on an annual basis.

Forecasting and Probable Trends

The difficulty in meeting the old growth target due to the assumptions regarding natural disturbance were experienced roughly at the midpoint of the planning horizon (between years 100 and 150, NDU 1) and at the end of the planning horizon (NDU 3, 4, 5 and 7). Some may argue that not meeting the late seral targets because of natural disturbance assumptions indicates that the long-term management direction is not sustainable. However, current assumptions regarding natural disturbance are arbitrary and may change once more information becomes available on natural stand dynamics. As an example, this analysis assumed that all late seral stands in the NHLB become young stands after natural disturbance. This is not a likely a correct assumption. Also, the age of 280 was used as an over-all natural disturbance age. This may or may not be a correct assumption. Further, using optimization or research algorithm based timber supply models would avoid this problem by looking at the whole planning horizon simultaneously and scheduling harvest so that no violations of late seral or other targets would happen. These kinds of models can see upcoming natural disturbances, before they happen. The downfall with this approach is that one is not supposed to be able to predict when and where natural disturbance happens.

Continual Improvement

Substantial mortality of old seral has occurred within the DFA due to the mountain pine beetle infestation. Therefore, surrogate old growth areas termed a “Natural Forest Area” are utilized to support old growth targets. These Natural Forest Areas represent areas in transition and could be in one or more of the following stages: old forest; dying forest; dead forest; or young natural forest. Continual improvement efforts will focus on the relevance of this indicator and the use of natural forest areas, given the severe level of old growth mortality within the DFA.

Indicator 3 - Young Forest Patch Size

Statement of Indicator	Target	Variance
The percent area of young forest by patch size class by NDU.	Trend toward young forest patch size targets by NDU, in accordance with Table 6. Measured periodically every five (5) years.	≥ 50% of Patch Size Categories trend towards targets.

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity <ul style="list-style-type: none"> • CSA SFM Element 1.1 – Ecosystem Diversity CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity <ul style="list-style-type: none"> • CSA SFM Element 2.2 – Ecosystem Productivity
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Indicator Description

A young forest is defined as forested areas between 0 and 20 years old. A patch (for the purpose of this indicator) is defined as a young forest unit categorized according to its discrete area size. The analysis methodology for calculating young forest patch size is described within the implementation policy of the *Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area* (2004). Patches may be created through single disturbance events or through a series of events (i.e. a combination of natural disturbance and harvesting events within a similar timeframe). In the absence of natural disturbance, timber harvesting is employed as a disturbance mechanism and thus influences the distribution and size ranges of young forest patches in the same fashion as historical natural disturbance events.

Past social constraints associated with harvest size limits (i.e. 60 ha maximum cutblock rule) have lead to fragmentation of the landscape beyond the natural ranges of variability (i.e. many small openings vs the historic large scale natural disturbance patterns common to the moist interior plateau). Thus the objective of this indicator is to reverse this trend and management young forest patch size to mimic historic natural disturbance patterns.

Patch Size Categories:	
•	< 51 hectares
•	51-100 hectares
•	101-1000 hectares
•	> 1000 hectares

Current Practice and Indicator Status

The DFA is composed of the Most Interior NDU, which is further classified into Mountain and Plateau. Through research conducted by Craig DeLong (2002) on NDU attributes, patch size categories have been defined (see young forest patch size distribution objectives in the *Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area* (2004). As identified in Table 6, certain patch size categories have either been achieved, are nearing target values, or have slightly exceeded targets identified by the LOWG. Table 6 demonstrates an overall trend towards the natural range of variability, when we compare the initial status in 2004 to that of 2009. Forecasting activities will help to identify the future condition of forest stands, overall patch size influence and the future status of this measure based on the identified assumptions.

Table 6. Young Forest Patch Size Classes by NDU in the Vanderhoof Forest District

Natural Disturbance Unit	Patch Size Category	Initial Status March 31/10*	Current Status March 31/10*	Target (%)
D1 Moist Interior Mountain	>1000 ha	26.9 %	51.9 %	40%
	101-1000 ha	23.5 %	15.5 %	30%
	51-100 ha	35.1%	20.2 %	10%
	≤ 50 ha	14.5 %	12.4 %	20%
D2 Moist Interior Plateau	>1000 ha	46.2 %	72.4 %	70%
	101-1000 ha	22.7 %	13.6 %	20%
	51-100 ha	18.0 %	6.0 %	5%
	≤ 50 ha	13.1 %	8.1 %	5%

*The current status is from the LOWG Analysis Project (Apr 1/09 to March 31/10)

Target Establishment

Targets come directly from the *Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area* (2004). Certain factors will limit how effectively the LT will be at trending toward patch size targets. These include compensating for historic harvesting patterns that have substantially fragmented portions of the DFA and incorporating Mountain Pine Beetle mortality (the now dominant natural disturbance) into patch size analysis methodologies. At this time, the four patch size categories indicated above will be applied to each NDU, yielding a total of eight (8) targets that will be applied to this indicator (see Table 6).

Monitoring and Reporting

Monitoring of this indicator occurs through the LOWG Licensee Implementation Team. As disturbance occurs on the landscape, the young forest patch size categories are altered. At the end of each fiscal, licensees operating within the Vanderhoof Forest District will submit spatial files depicting those areas harvested. In addition to any natural disturbances such as fire or wind events, these harvest openings will be incorporated into existing consolidated young forest patch size datasets. Periodic analysis (every five years) will determine consistency with the desired objective of trending towards the young forest patch size targets.

Forecasting and Probable Trends

Young Forest patch sizes were predicted using a spatially explicit timber supply model. The model was used to report on the patch size distributions achieved using a harvest schedule from the SFM Scenario. There was no attempt use a spatial model to create specific patch distributions.

While the patch targets were not generally met, the overall trends are reasonable. As mentioned earlier, the patch results are summarized based on the predicted timber supply over 250 years with no attempt to create a harvest schedule that would meet the patch targets. It is believed that operationally, the targets are achievable and trending can be monitored. Generally, the larger patches are more difficult to achieve, particularly during those times when harvest is limited due to the availability of timber. No harvest or little harvest within a NDU/mBEC unit for consecutive years creates less early seral forest, which makes it more difficult to have 70% of the patches in that NDU over 1,000 ha in size.

Continual Improvement

Beetle related mortality has altered the young forest patch size distribution within the DFA. It will become increasingly more difficult to simply use fire and harvest (salvage) activities as predictors of young forest patch size. The licensee team will need to examine the relevance of this indicator as time since death of the dominant timber type progresses. A decision matrix would appear necessary to predict when a dead pine stand becomes a young forest and what form the new natural disturbance pattern will take.

Indicator 4 - Stand Level Retention

Statement of Indicator	Target	Variance
The average stand level percent retention for all LT harvested blocks by NDU.	Achieve and sustain >10% retention at the stand level by NDU	0%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity <ul style="list-style-type: none">• CSA SFM Element 1.2 – Species Diversity• CSA SFM Element 1.3 – Genetic Diversity
CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity <ul style="list-style-type: none">• CSA SFM Element 2.2 – Ecosystem Productivity

Indicator Description

Stand level retention consists primarily of wildlife tree retention areas (WTRAs), which are defined as forested areas of timber within or immediately adjacent to a harvested cutblock. Residual patches of timber are generally retained for their value in providing a source of habitat for wildlife, to sustain local genetic diversity, or to protect archaeological, riparian, or habitat features, such as mineral licks and raptor nesting sites. Maintenance of habitat through WTRAs contributes to conservation of species diversity by

conserving a variety of important features such as shrubs, CWD, and live or dead standing timber for cavity sites. Elements retained in WTRAs may also help to conserve critical habitat components that support residual populations, help with the re-introduction of populations expatriated by disturbance, and enhance overall ecosystem function (Bunnell et al. 1999).

WTRAs in managed stands also contribute to a landscape level pattern that attempts to emulate wildfire. During a fire disturbance, large areas may be burned and undamaged or lightly burned patches may exist in areas within the burn boundary. Residual patches left by wildfire vary substantially in size, shape and composition. Therefore variability in these characteristics within designed WTRAs is also essential.

Current Practice and Indicator Status

The stand level retention percentage was derived from licensee team cut blocks (retention over the gross block area) where harvesting activities were undertaken between April 1st, 2008 and March 31st, 2009.

The average stand level percent retention by NDU (Moist Interior), for all licensee team harvested blocks during the stated time frame, is 12.4%.

Target Establishment

A baseline target of at least 10% stand level retention by NDU was established for this indicator based on licensee team performance beyond the default requirements of the Forest Planning and Practice Regulation of FRPA. It is important to note that each individual cutblock may contain more or less than the 10% retention, but the overall average will achieve >10% by NDU. This provides flexibility in assigning stand level retention where most appropriate.

Monitoring and Reporting

Potential sources for calculating and monitoring this indicator include Site Plans, EMS pre-work forms, EMS harvest inspection forms, and various licensee information tracking systems such as Genus. Stand level retention area and gross cut block area will be recorded for licensee team blocks harvested within the specified timeframe and then averaged by NDU. Results will be reported to the PAG and general public as part of the SFMP annual report.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast over a defined time frame, however it is important to identify what the accepted target means to SFM. Retention at the stand level contributes to biodiversity of ecosystems through vertical structure on the land base, wildlife habitat for a variety of species, emulation of natural disturbance patterns, and promotion of genetic diversity based on retention trees acting as a natural seed source. Currently, forecasting of this indicator will be completed with the use of a “what if scenario” to help identify anticipated future trends for stand level retention. When forecasting an attribute in this manner, it is useful to identify 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 overall perceived value from stand level retention is assumed to increase with an increase in area retained. This continues up to a saturation point where overall value then begins to level off and positive returns are no longer realized. While it is currently not possible to identify this point of equilibrium on the basis of existing information, assumptions surrounding the above mentioned “what if scenarios” can be made. If no stand level retention was prescribed in managed stands, it is anticipated that biodiversity values would decrease, wildlife productivity may decline, natural species diversity would decrease and natural patterns across the landscape would not be represented. If three times the stand level retention was prescribed in managed stands economic values from the timber resource would not be fully achieved and reforestation or other silviculture activities would potentially become more costly and less efficient due to

smaller patches of harvested timber. Higher levels of retention would also affect natural disturbance patterns across the DFA with a higher percentage of smaller patches and increased fragmentation of the landscape.

In the long-term, failing to achieve the identified target for this indicator could reduce the ecological values of forest stands, and could also negatively impact economic and social values across the DFA. The above “what if scenario” analysis implies that a balance of values can be achieved through maintenance of an identified level of stand retention that lies somewhere in between the two scenarios. Although this level has not yet been identified through scientific findings, the Licensee Team is committed to achieving the identified target and will strive to continually improve practices, as new information becomes available.

Continual Improvement

A potential opportunity for continual improvement would rely on developing a stand level quality matrix to assess the quality of stand level retention. Given the impact of beetle mortality in the DFA and the extensive salvage efforts being undertaken, stand level retention becomes increasingly more important (both qualitatively and quantitatively). Where quality is lacking, increased quantity may offer little benefit.

Indicator 5 - Seed Use

Statement of Indicator	Target	Variance
The percentage of seed for coniferous species collected and seedlings planted in accordance with the Forest and Range Practices Act.	Annually, ensure 100 % of seed for coniferous species collected and seedlings planted are in accordance with the Forest and Range Practices Act	-5%

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 1 – Conservation of Biological Diversity</p> <ul style="list-style-type: none"> • CSA SFM Element 1.3 – Genetic Diversity
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Indicator Description

This indicator is one of three included in this SFM plan in order to conserve genetic diversity of plant species across the DFA. Genetic diversity is an important aspect of overall biological diversity; however it is difficult to manage due to the complexities of natural systems and plant reproductive patterns. Genetic diversity involves the variability of genes among populations. Well-distributed populations tend to retain genetic variability because the chance of interbreeding and the production of monocultures are decreased. Therefore, sustaining well-distributed populations of plant species is an effective way of ensuring genetic diversity exists.

While natural regeneration of harvest areas would ensure retention of genetic diversity in managed areas, artificial regeneration of harvested areas can still conserve genetic diversity. Use of genetically diverse tree stock for planting will help to mimic natural processes and help to ensure the maintenance of genetic variability in managed forests. Genetic diversity in managed areas can also be increased where management practices encourage a natural influx of plant species where possible.

Assurance of genetically diverse seedlings for reforestation in the DFA is delivered through the Ministry of Forests and Range seedlot registration program. When seed is collected from natural sources, the seedlot program requires that a minimum of 10 trees are used as a seed source in order to increase genetic variability among seed. Seed is also collected from seed orchards where standards for genetic diversity are enforced. In order to ensure productivity of artificially regenerated forest stands, the trees most genetically suited to a particular location and climate will have the best survival rates. As such, transfer guidelines have been developed to minimize the risks associated with moving seed or vegetative material from location to location.

Current Practice and Indicator Status

Under the Forest and Range Practices Act, licensees must abide by seed and stock transfer guidelines and the Chief Forester may make standards for regulating the use, registration, storage, selection or transfer of seed to be used in the establishment of free growing stands. For the period of April 1, 2008 to March 31, 2009 the Licensee Team achieved 99.3 % conformance with the Chief Foresters Standards for Seed Use across the DFA.

Target Establishment

The current target of 100% (with a 5% variance) was determined from a review of past performance and an understanding of the scope of salvage and reforestation efforts that will be undertaken within the DFA.

Monitoring and Reporting

Reforestation activities are currently tracked by the Licensee Team using information tracking systems such as Genus. Seedlots and request keys of all planted stock are recorded in this system as part of the reforestation planning activities and then confirmed after planting.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast over a defined time frame because it is operational in nature and dependent on conformance. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends. As this target identifies a value of 100%, one other scenario should be identified:

- a) What if considerably less than 100% of the seeds for coniferous species collected and the seedlings planted in the DFA were in accordance with the Forest and Range Practices Act?

If considerably less than 100% of the seeds for coniferous species collected and the seedlings planted in the DFA were in accordance with the Forest and Range Practices Act, impacts to all three of the values of SFM could be expected. Reforesting harvested areas with artificial stock from seedlots outside the seed transfer guidelines does not ensure maintenance of genetic variability and may result in loss of productivity (not suited to the elevation) or mortality (decreased volume yields). Decreases in genetic variability in managed stands may lead to decreased biodiversity and increased forest health problems. With potentially decreased ecological and economic values, a decrease in social values would also occur as quality of life would invariably also decrease.

This “what if scenario” analysis implies that a balance of values can be achieved through sustaining 100% of the seeds for coniferous species collected and the seedlings planted in the DFA in accordance with the Forest and Range Practices Act.

Continual Improvement

As part of the continual improvement process, the Licensee Team will continue to explore methods of maintaining genetic diversity of planted trees within their operating areas. As future research evolves, this information will be analyzed and adapted where necessary into current forest management practices.

Indicator 6 - Management Strategies for Species at Risk

Statement of Indicator	Target	Variance
Species at Risk “Management Strategies” being implemented as prescribed.	Annually, ensure 100% of species at risk management strategies are being implemented as prescribed.	-5%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity <ul style="list-style-type: none">• CSA SFM Element 1.4 Protected Areas and Sites of Biological Significance• CSA SFM Element 1.1 – Ecosystem Diversity• CSA SFM Element 1.2 – Species Diversity
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Indicator Description

Landscape level coarse filter guidelines alone will not be sufficient to ensure the conservation of species that have been given special status in BC, such as those listed as Species at Risk. Fine filter management guidelines are required to ensure that Species at Risk are maintained within the DFA. This indicator will ensure that specific, fine filter management strategies are implemented in order to conserve and manage specific habitat needs for the identified Species at Risk described below.

Species at Risk are currently derived from three sources:

- 1) **Red Listed Species:** Defined by COSEWIC 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.
- 2) **Blue listed species:** Defined by COSEWIC as taxa considered being vulnerable in British Columbia. Vulnerable taxa are of special concern because of 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:** Defined by the British Columbia provincial government as those species at risk that require special management attention within the province. These species are listed as Identified Wildlife Management Species (IWMS) and are protected under the Forest Practices Code of British Columbia.

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

Current Practice and Indicator Status

LT members use databases such as BC Species and Ecosystems Explorer (<http://a100.gov.bc.ca/pub/eswp/>) to identify: (1) The Red and Blue-listed plants and animals and ecological communities found within the DFA, (2) Pertinent information regarding status, legal designation, distribution, life histories, conservation needs and recovery plans, (3) The relevant publications to aid in identification of the applicable red and blue listed species and ecological communities. Alpha Wildlife Research & Management Ltd. and Timberline Natural Resource Group Ltd. completed a report titled, *Management Guidelines for Species and Plant Communities at Risk: PG TSA – 2007*. LT members are utilizing this report and other developed planning processes to implement Species At Risk (SAR) strategies in their planning processes. Standard Operating Procedures (SOP's) are developed for field staff and contractors to identify and assess SAR within the DFA. This may include the development of local field guides to aid in the identification of a particular species/habitat or an ecological community. Regular periodic SAR training is provided to LT staff and contractors. Through the use of the Predictive Ecosystem Mapping (PEM) inventory undertaken in the Vanderhoof Forest District, overview maps and development queries can be used to identify potential red and blue-listed ecological communities. Once the presence of a red or blue listed species or ecological community is confirmed, applicable management strategies are assigned (through discussions with planning staff, biologists, ecologists etc.). Site specific management strategies are then prescribed within site level plans (i.e. the Site Plan). Post harvest EMS inspections confirm conformance to the prescribed management strategy.

A review of LT performance for the period April 1/08 to March 31/09 indicated that 100% of the SAR strategies were implemented where SAR were identified.

Target Establishment

The target for this indicator was established based on a review of past LT performance.

Monitoring and Reporting

LT members will review site level plans (or databases) to identify those development areas where SAR were identified and management strategies prescribed. Post-harvest EMS inspections and incident tracking systems will be reviewed to determine conformance to prescribed management strategies. The LT results will be summarized, collated and reported annually.

Forecasting and Probable Trends

This indicator is conformance dependent and therefore best forecasted using a “what if scenario”. The following “what if scenario” analysis will help to identify why the stated target was chosen for this indicator and how it contributes to SFM in the DFA. Since a target of 100% was established, only one other potential scenario will be analyzed.

- a) What if only 50% of management strategies for all Species at Risk were implemented as prescribed?

This scenario considers only implementing 50% of the management strategies for Species at Risk encountered within the DFA. It can be assumed that 50% of the red or blue-listed plant, animal or ecological community would likewise be negatively impacted. Biological diversity, key to the SFM framework, would be reduced on the DFA landscape. Disturbance sensitive species may be impacted irreparably, resulting in further population decline. Blue-listed species at risk may become red-listed species and BC efforts to manage species at risk may be challenged federally to prevent further population decline.

Continual Improvement

Continual improvement will focus on training efforts to increase staff and contractor awareness of potential Species at Risk within the DFA, how they can be identified and the management strategies available. More research is necessary to better understand the interactions between salvage harvesting and the Red and Blue-listed plants and animals and ecological communities found within the DFA.

Indicator 7 - Regeneration Delay

Statement of Indicator	Target	Variance
The percent of harvested standard units meeting the regeneration delay date.	Annually, 100% of harvested standard units meet the regeneration delay date.	(- 5 %)

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity
• CSA SFM Element 2.2 – Ecosystem Productivity
CCFM Criterion 4 – Forest Ecosystem Contributions to Global Ecological Cycles
• CSA SFM Element 4.1 – Carbon Uptake and Storage

Indicator Description

The Forest Stewardship Plan (FSP) is a landscape level plan providing the forest management planning framework within LT operating area. All relevant stocking standards that relate to site level planning (i.e. Site Plans) are prescribed within this document (including regeneration delay). Regeneration delay is defined in this SFMP as the time allowed between the start of harvesting and the date by which a minimum number of acceptable, well-spaced trees per hectare are established in the harvested area. The maximum

permissible time allowed is detailed within the FSP stocking standards approved by government. Ensuring that all standard units (ecologically based site specific units) pertaining to harvested blocks meet the prescribed regeneration delay date is an indication of maintaining productive forest capacity and resiliency. As beetle-killed trees within the DFA are salvaged and promptly reforested (demonstrated through achievement of Regen Delay targets) the carbon emissions associated with dead and decaying trees are reduced and the process of carbon absorption by live trees is initiated.

Current Practice and Indicator Status

Either planting quality assessments or post-planting regeneration surveys are completed to ensure adequate stocking of harvested blocks. The current status of this indicator for the time period of April 1, 2008 to March 31, 2009 is that 99.8% of Licensee Team harvested blocks in the DFA required to meet regeneration delay within the specified timeframe met the regeneration delay date prescribed in their respective FSP.

Target Establishment

The target for this indicator is established at 100% in order to ensure that all harvested areas are promptly regenerated and the productive forest capacity within the DFA is maintained. Achievement of regeneration delay is a legal obligation and thus performance targets should be set at 100%. However, due to extensive salvage harvesting associated with the mountain pine beetle epidemic some openings will be amalgamated to the original harvest start date, which may result in not achieving the initial regeneration delay targets. This should be a relatively short-term anomaly as minor salvage and Bark Beetle Regulation (BBR) harvesting is no longer a common practice over the landscape.

Monitoring and Reporting

Standard Unit identification numbers are used to assign legal stocking standards described in approved FSP's (including regeneration delay) to particular Biogeoclimatic site series (or groups site series with similar characteristics). These are recorded and monitored in the government database RESULTS and licensee team GENUS databases. If a planting or post-planting survey indicates that the stand has not regenerated successfully, corrective actions are prescribed to ensure regeneration delay deadlines are met. Despite all efforts, some areas will not meet regeneration delay targets and the Site Plan must be amended to extend the critical dates so that continued treatments can be applied to try and regenerate the area.

Once regeneration delay has been achieved, the licensee must submit a report to the Ministry of Forests and Range that will update the status of the cutblock in the government database RESULTS.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast through modeling over a defined time frame, as it is operational in nature. The use of a "what if scenario" is beneficial in helping to identify anticipated future trends for an indicator such as this. As the stated target for this indicator is 100%, one other potential scenario will be analyzed:

- a) What if only 50% of harvested blocks met the prescribed regeneration delay date?

If only 50% of harvested blocks met the prescribed regeneration delay date the future sustainability of the timber resource within the DFA would be in jeopardy. Regeneration delay is an important milestone because it is fundamental in determining and maximizing long-term timber supply. Another important aspect of meeting regeneration delay is that by prompt reforestation, impacts on other forest values can be reduced. Not achieving regeneration delay could lead to an increase in invasive plants, reduction of wildlife habitat, and excessive silviculture establishment costs. In the long-term, failing to achieve the identified target for this indicator could reduce the ecological values of forest stands, and could also negatively impact the sustainability of economic and social values across the DFA. Within the DFA, trends will likely show that regeneration delay continues to be achieved on 100% of harvested blocks.

Continual Improvement

The Licensee Team will continually improve by trying to lessen the regeneration delay in lieu of operational constraints and the current mountain pine beetle infestation.

Indicator 8 - Free Growing Obligation

Statement of Indicator	Target	Variance
The percent of harvested standard units meeting free growing requirements on, or before, the free growing date.	Annually, 100% of harvested standard units are declared free growing on, or before, the free growing date	(- 5 %)

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity <ul style="list-style-type: none">• CSA SFM Element 2.2 – Ecosystem Productivity CCFM Criterion 4 – Forest Ecosystem Contributions to Global Ecological Cycles <ul style="list-style-type: none">• CSA SFM Element 4.1 – Carbon Uptake and Storage
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Indicator Description

A free growing stand is defined in this SFM plan as 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 (refer to glossary in Appendix II). A free growing assessment is conducted on standard units (within a harvested cutblock) depicted and defined (as to biogeoclimatic ecosystem classification, specific crop tree standards and term to achieve) within a Site Plan. The time bound obligation is triggered by the initial date of harvest commencement. Under FRPA, there is only one free growing date, while older FPC standard units have both early and late free growing dates.

Continued ecosystem productivity is ensured through the principle of achieving a free growing status. The process of carbon sequestration will begin again, locking up additional green house gases as cellulose in the growing plantation. As second growth plantations mature, they could make a significant local contribution to reducing global climate change, especially given the extent of lodgepole pine mortality within the DFA.

Current Practice and Indicator Status

The licensee team track and monitor free growing obligations for each standard unit pertaining to a harvested opening. These standards and the results of related free growing surveys are maintained in databases, such as GENUS. Harvest openings are surveyed prior to the free growing date (or late FG in the case of FPC openings) to ensure free growing standards are achieved. If a survey indicates that a particular standard unit has not achieved a free growing standard, corrective actions are prescribed immediately. When free growing standards are achieved, the licensee team submits a free growing declaration to the MOFR and if accepted the standard unit reverts to the Crown's responsibility. The current status of this indicator was derived from a review of current Licensee Team member's records for the time period of April 1, 2008 to March 31, 2009. During this time frame, 94.8 % of harvested blocks in the DFA met the free growing date prescribed in the respective Site Plan.

Target Establishment

The target for this indicator is established at 100% in order to ensure that all standard units pertaining to the licensee team achieve a free growing status within the prescribed time period. A performance target of 100% is consistent with legal obligations and serves to demonstrate sustainable forest management.

Monitoring and Reporting

Free growing obligations for standards units are recorded, maintained and monitored in licensee team databases such as GENUS, or other corporate reporting systems. When free growing standards are achieved, the licensee team submit a free growing declaration to the MOFR and if accepted, the standard unit status is updated within a government database (RESULTS). The declaration is generally supported by free growing survey information. Free growing declarations must be made on or before the prescribed date (initiated by initial harvest commencement) to be considered to have met the free growing obligation. The number of standard units achieving free growing within the fiscal (April 1st to March 31st) is measured against the number of standard units due to achieve free growing within the same fiscal period.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast through modeling over a defined time frame. A “what if scenario” is helpful in identifying the importance of meeting the prescribed target and the anticipated future trend. As the stated target for this indicator is 100%, one other potential scenario will be analyzed:

- a) What if only 50% of standard units meet the prescribed free growing date (on or before)?

If only 50% of standard units meet the prescribed free growing date the future sustainability of the timber resource within the DFA would be in jeopardy. Future harvest levels would be reduced given the loss of productivity and excessive establishment period (fundamental in determining long-term timber supply). A worst case scenario might mean a 50% decline in future harvest opportunities. Achievement of free growing ensures that the nutrients and productivity of the site have not been significantly altered from harvest and that a preferred forest cover has been established. A free growing stand also represents an area that is actively storing carbon and as it matures will contribute to the removal of carbon dioxide from the atmosphere. The higher the percentage of standards units meeting their free growing date, the greater (and sooner) the contribution made to reduce atmospheric carbon dioxide.

In the long-term, failing to achieve the identified target for this indicator could reduce the ecological values of forest stands, and could also negatively impact economic and social values across the DFA.

Continual Improvement

It is the responsibility of individual licensee team members to monitor, track and report their performance relative to this indicator. The Licensee Team has identified several points for continual improvement. Currently, failure to achieve free growing obligations generally relates to data base tracking, survey methodology and administrative reporting delays. These issues will be reviewed and if necessary, a resulting action plan to minimize future negative impacts to this indicator will be developed and implemented.

Indicator 9 - Damaging Agents

Statement of Indicator	Target	Variance
Management strategies are implemented to reduce the impact of damaging events or agents (i.e. target harvest toward beetle salvage).	Implement (annually) 100% of applicable management strategies developed to reduce the impact of Mountain Pine Beetle.	0%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity
• CSA SFM Element 2.2 – Ecosystem Productivity
CCFM Criterion 4 – Forest Ecosystem Contributions to Global Ecological Cycles
• CSA SFM Element 4.1 – Carbon Uptake and Storage
Criterion 5 – Multiple Benefits to Society
• CSA SFM Element 5.1 – Timber and Non-timber Benefits

Indicator Description

Damaging agents can be considered as biotic (i.e. insects, diseases, animals etc.), or abiotic factors (i.e. fire, wind, ice etc.) that reduce the commercial value of stands of timber. These damaging agents can also threaten the aesthetic value of the DFA forests, creating safety concerns for recreational activities and increasing fire hazards. Watersheds and wildlife may also be impacted, since widespread tree mortality will disrupt ground water hydrology and valuable wildlife habitats. Damaging agents also play a significant role in the development of young stands and may limit these stands from achieving their potential production. Standardized silviculture surveys incorporate forest health assessments to ensure second growth plantation success is achieved.

Damaging agent strategies within the DFA will focus on reducing the impact of Mountain Pine Beetle (MPB), since catastrophic lodgepole pine mortality, far outweighs the impact associated with other current and historic damaging agents. Concentrating LT harvest efforts on beetle-killed trees within the DFA serves to reduce the carbon emissions associated with dead and decaying timber and provides for the establishment of live trees, important to carbon absorption. It is not expected that all outlined strategies will be utilized, as LT members have specific business practices that guide their forest management activities and some strategies may have already been implemented and may not be relevant at this time. However, if sustainable forest management is to be achieved and practiced in the DFA, it will do so on a post-beetle landscape.

The following serves as a checklist of potential management strategies that may be implemented within the Vanderhoof DFA, to mitigate the impact Mountain Pine Beetle.

- Develop and implement a detailed landscape inventory process that allows evaluation of beetle infestation incidence, attack intensity and status of the standing inventory.
- Develop an operational Non-Pine Retention Matrix to provide guidance in assigning salvage priorities to stand types with components of non-pine species. This would pertain to overstory and understory non-pine structure.
- Investigate opportunities to enhance existing timber inventories within the DFA, to accurately determine the extent of non-pine and mixed wood stand types and the presence of viable non-pine understory structure.
- Implement harvest strategies to optimize the value recovery of dead timber in consideration of the product base and the factors limiting quality and quantity of value recovery.
- Consider coordinated landscape level silviculture plans, designed to create species and age-class mosaics at the landscape level in order to reduce the risk of future beetle epidemics.
- Diversify species composition at the block level. Increase the component of non-pine species being regenerated and assist in prioritizing non-salvage stands for re-habilitation.
- Work cooperatively to track silviculture obligations on the landbase.
- Ensure long-term seed availability.
- Ensure forest road infrastructure is sufficient to address increased and accelerated salvage harvesting.
- Enhance woodland safety programs to conduct safe operations in a landscape dominated with dead timber.
- Enhance fire preparedness and participate in the development of a DFA Fire Safety Harvest Plan.
- Establish harvested buffers in rural interface areas and around utility infrastructure.

Current Practice and Indicator Status

The LT continue to direct 100% of their annual harvest to the salvage of beetle-killed timber. Inventories depicting the extent of beetle mortality have been undertaken with support from color ortho-photography and satellite imagery. None-pine retention strategies have been developed by LT members (overstory and understory). Species diversity is being enhanced at the planting and free-growing stages. LT members have consolidated silviculture obligations (beetle patches) and continue to track obligations through databases (GENUS). Seed collection programs have been increased to ensure adequate availability in the future. Road upgrades and right-of-way widening have been undertaken to ensure safety is maintained. Safety programs are in place to ensure safe work conditions within the DFA forests. LT members continue to work co-operatively with the public to remove beetle-killed pine within rural interface areas.

A review of past LT performance indicates that during the period April 1/08 to March 31/09; the LT implemented 100 % of applicable strategies to reduce the impact of Mountain Pine Beetle within the DFA.

Target Establishment

Since the mature pine forests of the DFA have been severely impacted by mountain pine beetle, it was only appropriate that a target of 100% was chosen to reflect LT implementation of applicable management strategies to reduce post-beetle impacts.

Monitoring and Reporting

The government Harvest Billing System will be utilized to verify that annual LT harvest levels are directed towards the salvage of beetle-killed timber. Other pertinent management strategies undertaken by members of the LT will be documented, tracked and collated to clearly demonstrate that the LT is attempting to reduce the impact of the Mountain Pine Beetle within the DFA.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast by modeling over a defined time frame, as it is dependent on the implementation of operational activities. Therefore, a “what if scenario” is helpful in identifying the importance of meeting the prescribed target and the anticipated future trends. As the stated target for this indicator is 100%, one other potential scenario will be analyzed:

- a) What if only 50% of management strategies to reduce the impact of Mountain Pine Beetle were implemented as scheduled?

If the LT were to only implement 50% of management strategies to reduce the impact of Mountain Pine Beetle, definite social and economic losses within the DFA would occur. Not focusing annual harvest levels on beetle-killed timber would increase non-recoverable losses, decrease mid-term timber supply and increase the duration of reduced harvest levels within the DFA. Economic loss would be incurred by the forest industry and local economy, community stability within those tributary communities to the DFA would be negatively impacted. If large tracts of beetle-killed pine remain on the landscape, wildlife habitat, recreational opportunities, public safety, fire management and hydrological recovery would all be negatively impacted.

Continual Improvement

Given the landscape condition of the DFA, continual improvement efforts will focus on developing and implementing DFA management strategies to reduce the impact of damaging agents on second growth forests.

Indicator 10 - Site Index

Statement of Indicator	Target	Variance
Site index for LT managed stands within the DFA is sustained at the subzone level.	Sustain site index for LT managed stands within the DFA at the subzone level as outlined in Table 7 (measured periodically every 5 yrs).	See Table 7 in the SFMP

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity</p> <ul style="list-style-type: none"> • CSA SFM Element 2.2 – Forest Ecosystem Productivity <p>CCFM Criterion 4 – Role in Global Ecological Cycles</p> <ul style="list-style-type: none"> • CSA SFM Element 4.1 – Carbon Uptake and Storage

Indicator Description

Site index is defined in this SFMP as the height of a tree at 50 years of age (age is measured at 1.3m above the ground) (refer to glossary in Appendix II). In managed forest stands (young second growth plantations), site index may be predicted for the site using biogeoclimatic ecosystem classification (BEC) site index tables, derived from BEC averaged site index data, or by direct height and age measurements of selected stems and plotting such relative to Site Index Curves (Growth Intercept method). Site index is used in timber supply planning to predict productivity and future stand volume. Site index is also used in silviculture to help make sound management decisions, in forest inventory to describe site quality and update inventory databases, and in wildlife habitat modeling to estimate the amount and size of tree attributes. Site index is very sensitive to changes in ecological site conditions including soil nutrients, soil moisture, and other variables.

Site index serves as a means to evaluate if the productive capacity of the forest is being maintained. Even though trees are just one part of the forest ecosystem, the continued productivity of the trees at a sustained level contributes to the maintenance of productivity of other parts of the forest ecosystem. For example, the continued productivity of trees on the land base is important to the process of carbon uptake and storage and the forests ability to act as a carbon sink to help reduce green house gases.

Current Practice and Indicator Status

Site index is a measure of potential productivity of a site and can be impacted, depending upon site disturbance. Generally, if soil productivity is reduced (through compaction or loss of organic layers/nutrients), site productivity is also reduced (site index). The current status of lodgepole pine and spruce site indices in the Vanderhoof DFA are shown in Table 7. Since lodgepole pine and spruce are the main tree species within natural and managed forests in the DFA, these were the species of choice to measure site index and estimate site productivity.

Current practices involve minimizing soil disturbance levels, undertaking appropriate silviculture treatments, and reforestation with ecologically suitable species. Appropriate harvest method and season of activity are planned to ensure soil productivity is maintained. Sensitive soils are generally harvested in the winter, or with low ground pressure equipment in the summer.

Table 7. Site Index in the Vanderhoof Forest District by Broad BEC Zone

Broad BEC Zones	Species	Current Status as of March 31, 2004* (m)	Target (m)	Variance (%)	Achieved By
Dry SBS (SBS dk, dw2 & dw3)	Interior spruce	22.5	>21.4	-5%	Reported every 5 yrs.
	Lodgepole pine	21.1	>20.0	-5%	
Moist SBS (SBS mc2 and mc3)	Interior spruce	21.0	>19.9	-5%	
	Lodgepole pine	19.9	>18.9	-5%	
ESSF (mv1)	Interior spruce	20.1	>19.1	-5%	
	Lodgepole pine	17.7	>16.8	-5%	

*The current status measurement comes from Farnden, 2004.

Target Establishment

Baseline targets were determined for each broad BEC subzone group by reviewing the results of a site index adjustment project for the Vanderhoof IFPA (see Farnden 2003 and 2004). The purpose of the project was to compare inventory estimates of site with those actually measured in randomly selected ground samples throughout the Vanderhoof Forest District. Field sampling was limited to managed stands with leading lodgepole pine and spruce that were free from overtopping vegetation, free from repression, and free of enhanced spacing or fertilization treatments. A total of 220 field samples were used to define the current status and subsequent targets.

Monitoring and Reporting

The source of the data to support monitoring this measure has been the 220 field samples established by Farnden (2004). The Licensee Team collects site index data for all Free Growing stands, by means of systematic Free Growing surveys (refer to Indicator 8). This data is entered and archived in a database (GENUS) and can be reported and summarized by species, BEC zone and for a particular unit of time (i.e. every 5 yrs). The periodically calculated site index values can then be compared with those in Table 7.

Forecasting and Probable Trends

Site index is not an easy attribute to quantifiably forecast over a defined time frame. However, it is important to identify what the accepted targets mean to SFM. Maintenance of site index contributes to biodiversity of ecosystems through conservation of the productive capacity of the land base. An abundance of scientific literature exists regarding site index in British Columbia, including Farnden's "Site index adjustments for the Vanderhoof IFPA" (2004), which was used in the development of this indicator. However, to help provide assurance for positive future trends for this indicator, a simple "what if scenario" can be used to identify what would occur on the land base should the targets not be met. When forecasting a variable in this manner, it is useful to identify two potential scenarios:

- a) What if site indices were maintained at levels considerably higher than the stated targets?
- b) What if site indices were maintained at levels considerably lower than the stated targets?

The first scenario suggests that site indices would be maintained at levels much higher than the stated targets. The most important point to make regarding this scenario is that it is realistically not achievable. While it is relatively easy to decrease the productivity of a site through poor management practices, increasing a site's overall productivity is quite difficult to do in a short time frame and could potentially be very costly. The major influences to a site's overall productivity are generally climate, soil moisture and soil nutrients. Site productivity increases with warmer climates, increased soil moisture and increased soil nutrients. Natural ecosystems function at levels that are within a defined natural range of variability. Increasing the productivity of a site might imply moving that site out of its natural range. Long-term climate change has already been documented, but management practices generally have no ability to manipulate climate. Moisture and nutrients can be increased to try and increase the productivity of a site through irrigation and fertilization techniques. The influences of added moisture and nutrients may

potentially increase the productivity of a site, but these practices would need to occur at a regular interval over a long time frame, which would constitute a serious investment to the forest manager.

In contrast, the second scenario suggests maintaining site indices at levels considerably lower than the stated targets. While this scenario can be achieved through poor practices, it is not a desired outcome and would have significant negative impact on the ecological, economic and social values of the DFA. Degradation of the soil (compaction etc.) during forestry activities could reduce the productivity of a site in a very short time frame by drastically altering the soil morphology. Reduced site productivity would lead to poor tree growth, increased forest health impacts, decreased carbon uptake, decreased harvest levels, diminished recreational opportunities and a general value reduction of the public forest resource.

Within the Vanderhoof DFA, it is anticipated that future trends will show that site indices have been maintained at or slightly above target levels, thereby keeping site productivity within natural ranges.

Continual Improvement

The baseline data collected by Farnden (2004) will be reviewed every 5 years (in relation to current 5 yr site index averages) to ensure targets are appropriate across the DFA.

Indicator 11 - Soil Conservation

Statement of Indicator	Target	Variance
The percentage of blocks meeting soil conservation targets after harvesting and silviculture activities.	Annually, 100% of blocks will meet soil conservation targets after harvesting and silviculture activities.	-5%

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity</p> <ul style="list-style-type: none"> • CSA SFM Element 2.1 – Ecosystem Resilience <p>CCFM Criterion 3 – Conservation of Soil and Water Resources</p> <ul style="list-style-type: none"> • CSA SFM Element 3.1 – Soil Quality and Quantity
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Indicator Description

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 corduroyed trails, compacted areas, and areas of dispersed disturbance (see glossary in Appendix II). Some level of soil disturbance is expected through timber harvesting, or subsequent silviculture activities. The soil attributes of all proposed harvest areas are assessed to determine the potential for adverse impact to the site and to ensure protection of the soil resource. Within the applicable site plan, soil disturbance targets are then assigned to each standard unit comprising the proposed cut block. There are various soil disturbance hazards that must be considered when determining soil disturbance limits. Some of these include soil erosion, soil displacement, and soil compaction (BC MOF 2001b). Appropriate management practices are then implemented (on a site level basis) to ensure soil disturbance limits remain within acceptable limits. Minimizing the negative impact caused by various forest management activities conserves the soil resource and its ecosystem function.

Current Practices and Indicator Status

Various management strategies are employed to reduce soil disturbance during forestry activities and to promote soil conservation. Forest operations are timed seasonally depending on individual site conditions to help minimize soil disturbance. Site information detailing soil hazards is collected during site level planning and where warranted, management strategies to conserve soil resources are written into the Site Plan. Prior to the commencement of harvesting activities, EMS pre-works are completed, which include a review of applicable soil disturbance targets in the site plan. Ongoing inspections occur throughout

harvesting activities and final EMS inspections assess (and report) conformance to the targets within the Site Plan. Soil conservation training is also periodically undertaken to increase soil conservation awareness among harvesting and silviculture contractors. A review of LT incident tracking systems (ITS) and related EMS inspection forms for the period April 1, 2009 to March 31, 2010 indicated that 100 % of operations conformed to the targets identified within the Site Plan.

Target Establishment

The target for this indicator was set at 100% in order to sustain soil productivity, as legally required under *FRPA*.

Monitoring and Reporting

Data sources for monitoring this indicator include each Licensee Team’s applicable Site Plans, EMS inspection forms and ITS reports for the applicable timeframe. Final harvest and site prep inspections will indicate if the soil disturbance targets stated in the Site Plan were met through an ocular survey. 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. Where non-conformances are identified, they will be entered into ITS.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast over a defined time frame. However, it is important to identify what the accepted target means to SFM. Scientific research on the effects of soil disturbance is extensive in British Columbia, but failure to achieve soil disturbance targets in managed stands over the long-term is not clearly understood. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As the target for this measure is set at 100%, the analysis of one other potential scenario is useful:

- a) What if only 50% of harvested blocks met prescribed soil disturbance targets?

If only 50% of harvested blocks met the soil conservation targets identified in the Site Plan there would be serious impacts to the soil resource across the DFA. Soil disturbance in the Vanderhoof DFA includes soil compaction, soil displacement, surface soil erosion, and mass wasting. Exceeding the prescribed soil conservation targets for harvested areas would ultimately affect ecological, economic and social aspects of SFM. High levels of soil disturbance can alter natural ecosystem function, which in turn can affect and even alter the vegetation supported by a particular site. This not only results in future economic timber losses, but also potentially diminishes wildlife habitat and public recreational values within the DFA.

Continual Improvement

The severity of pine mortality (beetle-killed Lodgepole Pine) within the DFA has led to increased soil moisture and higher water tables serve to increase the potential for soil disturbance. The LT will have to monitor hydrological recovery and where warranted adjust management practices (type of equipment, season of harvest) to accommodate this anomaly.

Indicator 12 - Coarse Woody Debris

Statement of Indicator	Target	Variance
The amount of coarse woody debris retained on prescribed areas.	Annually sustain CWD levels \geq 4 logs per hectare after harvesting.	0 logs per hectare

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity

- CSA SFM Element 1.1 – Ecosystem Diversity
- CSA SFM Element 1.2 – Species Diversity

CCFM Criterion 3 - Conservation of Soil and Water Resources

- CSA SFM Element 3.1 – Soil Quality and Quantity

Indicator Description

Coarse woody debris (CWD) is defined in this SFMP as sound or rotting logs and branches greater than 7.5cm in diameter at one end, either resting on the forest floor, or at an angle to the ground of 45 degrees or less (refer to glossary in Appendix II). CWD provides valuable habitat for plants, animals and insects, and serves as a nutrient source for soil development. The CWD generated through wildlife tree retention areas, riparian zones, leave trees, unsalvaged burns, or unsalvaged mountain pine beetle sites serve to compliment CWD levels (including mid & long-term) within the DFA. The objectives outlined within “A Short-term Strategy for Coarse Woody Debris Management in British Columbia’s Forests – March 2000” include maintaining small, dispersed CWD piles where appropriate, providing a range of decay and diameter class CWD, and providing a supply of both coniferous and deciduous CWD. Standing dead trees or artificially created stubbed trees serve as long-term CWD and provide valuable wildlife habitat inputs.

Current Practice and Indicator Status

Both LT and Forest and Range Evaluation Program (FREP) CWD surveys indicate that the volume of CWD left after harvesting is acceptable. FREP monitoring indicated that there is a deficit of large diameter longer piece sizes (i.e. the density of logs 10 metres or longer, is less than what is found in unharvested areas). Given the extent of beetle-killed timber in the DFA and current salvage efforts, this trend will likely prevail at least in the short-term as decay and breakage increases in pine stands with the increased time since death. Ocular estimates of CWD retention levels for the period April 1/08 to March 31/09 indicate that a minimum of four (4) logs per hectare are retained on LT harvested areas.

Target Establishment

Targets for CWD in the Vanderhoof DFA were based on the standard indicated within *Section 68 (1) of the Forest Planning and Practices Regulation of FRPA*. This target represents minimum CWD retention levels until localized meaningful targets for the DFA are developed. The LT is reluctant to base targets on the natural range of variability, given that these ranges are too wide to assess a meaningful post-harvest outcome.

Monitoring and Reporting

Post-harvest CWD levels are prescribed within site level plans (consistent with practices requirements contained with approved FSP’s). LT CWD retention levels are currently assessed via ocular estimates during post-harvest EMS inspections. This data is collated, summarized and reported annually for LT harvest areas within the DFA.

Forecasting and Probable Trends

CWD forecasting was carried out by linking stand level growth and yield curves to snag and downed log curves (logs being snags that fall down over time). Limitations in the snag and log model resulted in forecasting assumptions that assumed harvesting operations do not retain snags at the time of harvest. This is contrary to current operational practice and led to the underestimation of coarse woody debris over time.

A predicted CWD area containing more than 4 logs per hectare (without any operational CWD input) generally follows the harvest forecast. The amount of CWD increases from the beginning of the planning horizon due to existing dead and/or dying pine stands (dead trees become snags and eventually fall down to form logs). CWD reaches its peak at year 20, after which the amount of CWD is predicted to decrease and reach its lowest level at around 75 years. After this, the naturally regenerated pine stands that were killed by the mountain pine beetle start again recruiting snags and logs and there is a sharp increase in the amount

of CWD between year 100 and year 125. In the long term, the area of the THLB that is predicted to have 4 or more logs per hectare stabilizes at around 200,000+ hectares or approximately 25% of the THLB.

The forecast above indicates that even in the absence of operational snag and CWD retention/recruitment a significant amount of CWD is naturally occurring. Thus a CWD target to retain 4 or more logs/ha, is deemed sustainable within the THLB associated with the DFA, particularly in the short-term where beetle mortality is prevalent.

Continual improvement

Continual improvement efforts will focus on assessing whether the current target is appropriate for the DFA. As discussed above, targets based on the natural range of variability would appear too broad to provide meaningful post-harvest assessment. Methodologies comparing CWD retention levels in wildlife tree retention areas (natural existing) to harvested salvage areas appear flawed since the associated timber types are generally quite different. It may be that a subset of LT harvest areas are annually assessed in detail to determine whether appropriate quality and quantity of CWD is being retained within the DFA.

Indicator 13 - Riparian Reserves

Statement of Indicator	Target	Variance
The percent of forest management operations consistent with Riparian Reserve Zone strategies identified in the Site Plan (including the Vanderhoof Draft Lakeshore Management Plan).	Annually, 100% conformance with riparian reserve zone strategies identified in the Site Plan.	-5%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity <ul style="list-style-type: none"> • CSA SFM Element 1.2 – Species Diversity
CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity <ul style="list-style-type: none"> • CSA SFM Element 2.2 – Ecosystem Productivity
CCFM Criterion 3 – Conservation of Soil and Water Resources <ul style="list-style-type: none"> • CSA SFM Element 3.2 – Water Quality and Quantity

Indicator Description

Riparian areas occur next to the banks of streams, lakes and wetlands and include both the area covered by continuous high moisture content and the adjacent upland vegetation. Riparian Management Areas (RMAs) consist of a Riparian Management Zone (RMZ) and where required by legislation, a Riparian Reserve Zone (RRZ) (refer to SFMP glossary in Appendix II under Riparian Management Area, Figure 1). The width of these zones is determined by the specific attributes of the associated streams, wetlands, lakes, and adjacent terrestrial ecosystems. RMAs provide critical habitats, home ranges and travel corridors for fish and wildlife and serve to conserve water quality and quantity.

Riparian Reserve and Management Zone attributes (size according to riparian feature) and their applicable objectives are established in a Forest Stewardship Plan (FSP) under the *FRPA*. Harvest area Site Plans specify the type of riparian features present, the size of the RMA (which includes the RRZ where applicable) and the management practices pertaining to the RMZ. The RRZ, if required, is located immediately adjacent the riparian feature and is generally maintained as a no-harvest zone. Depending on the FSP, harvesting is permitted within the RRZ under prescribed circumstances. This indicator will ensure that post-harvest RRZ attributes are consistent with that prescribed in the Site Plan or road construction design.

Current Practices and Indicator Status

Currently, all streams, wetlands, and lakes within and directly adjacent to harvested areas are classified during site level plan planning. Site level riparian management objectives are described within the Site Plan or road design for the proposed harvest area. RRZ widths and management practices must be consistent with the associated approved *FSP*. Current practice when establishing reserve boundaries in the field is to utilize natural topographic breaks and timber type boundaries, which generally result in a variable width reserve. Boundaries located along naturally occurring features are usually more windfirm than fixed width RRZs and easier to implement. Baseline data for this measure was established from a review of LT performance from April 1, 2008 to March 31, 2009. A review of Licensee Team ITS reports and EMS inspections indicates that 100% of all RRZs were implemented in conformance with the Site Plan.

Target Establishment

The target value for this indicator was established to be consistent with legal requirements under *FRPA* and past performance in the DFA.

Monitoring and Reporting

EMS pre-works are conducted prior to harvesting or road construction to review all applicable RMA objectives, including RRZ direction. EMS harvest inspections are undertaken to ensure RRZ standards contained in the Site Plans are implemented in the field. Where non-conformance issues are identified, an incident report is documented in ITS.

Forecasting and Probable Indicator Trends

This indicator 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 SFM. In order to forecast this measure, a “what if scenario” analysis can be used to help identify the importance of the stated target to overall SFM within the DFA. The following “what if scenario” consists of one scenario as the current target is set at 100%:

- a) What if only 50% of blocks with Riparian Reserve Zones were implemented in conformance with the Site Plan?

If only 50% of blocks with Riparian Reserve Zones were implemented in conformance with the Site Plan, ecological values such as water quality, biodiversity and wildlife habitat could be compromised. RRZ's act as a buffer for riparian features and serve to conserve the aquatic habitat of water dwelling species. This includes maintaining shade requirements, water temperature and screening from predators. Water quality values are protected by promoting stream bank stability. RRZ's are biologically diverse and greater enhance wildlife habitat across the DFA. If only 50% of RRZs were implemented across the DFA, a significant portion of riparian habitat would be lost and water quality and wildlife diversity could potentially decrease. These impacts would influence certain economic and social values in the DFA. Potential increases to timber supply would be recognized (access to timber that would otherwise be retained). Reductions to recreational (fishing, camping, aesthetics) and quality of life values (good quality water) may impact the communities associated with the DFA. RRZs are also a legislative requirement that must be achieved unless site specific circumstances with an approved FSP indicate otherwise. The Licensee Team is committed to achieving the stated target for this measure and long term trends are anticipated to show that 100% of RRZs are implemented as prescribed within associated Site Plans.

Continual Improvement

Continual improvement will involve ongoing review of LT performance and the supportive EMS of pre-works, inspections, and awareness training.

Indicator 14 - Riparian Management Zones

Statement of Indicator	Target	Variance
The percent of forest management operations consistent with Riparian Management Zone strategies identified in the Site Plan.	Annually, 100% conformance with Riparian Management Zone strategies identified in the Site Plan.	-5%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 3 – Conservation of Soil and Water Resources <ul style="list-style-type: none"> • CSA SFM Element 3.2 – Water Quality and Quantity CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none"> • CSA SFM Element 5.1 – Timber and Non-timber Benefits

Indicator Description

As described in indicator 13, Riparian Management Areas (RMAs) consist of a Riparian Management Zone (RMZ) and where required by legislation, a Riparian Reserve Zone (RRZ). The RMZ provides critical wildlife cover, fish food organisms, stream nutrients, large organic debris, and stream bank stability. RMZ objectives are established in an FSP, and a Site Plan describes how these objectives will be achieved on a site specific basis. This indicator is designed to ensure that RMZ strategies within a Site Plan are implemented at the harvest, silviculture or road construction phase. Post-harvest consistency is measured through EMS inspections and conformance is tracked accordingly.

Current Practice and Indicator Status

Riparian features are classified during the planning phase and these classifications are confirmed during the layout phase. The RMZ objective applicable to a riparian feature identified during site level assessment is contained within an approved FSP and represents a legal obligation. Appropriate management strategies and/or retention levels (to achieve FSP objectives) are established at the site level and documented in a Site Plan. A review of past performance during the period April 1, 2008 to March 31, 2010 indicates that 100% of the LT forest operations are consistent with the RMZ strategies within the applicable Site Plan.

Target Establishment

The target for this indicator has been established at 100% based on past LT performance.

Monitoring and Reporting

Riparian features are classified through riparian assessments conducted in either the planning or layout phases. Site specific strategies to achieve legal RMZ objectives in the FSP are documented in the associated Site Plan. Post-harvest EMS inspections assess and document conformance with the RMZ strategies contained within the Site Plan. Instances of non-conformance are recorded in an incident tracking system (ITS). EMS inspections and ITS reports for a specific timeframe are thus utilized to determine the annual percent of forest operations consistent with RMZ strategies described within site plans.

Forecasting and Probable Indicator Trends

This indicator 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 SFM. Management practices within the RMZ can influence ecological, economic and social values within the DFA. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for indicators such as these. As this indicator target is currently set at 100%, one other scenario is identified:

- a) What if only 50 % consistency occurred between actual forest management operations and the associated RMZ strategies identified in the applicable Site Plan?

In an ecological sense, aquatic habitat, biological richness, water quality and species diversity could potentially all be negatively influenced by implementing only 50% of strategies to protect RMZ values. Social values could also decrease in response to the negative influence on ecological and economic values. If riparian habitat within the RMZ is decreased, wildlife populations could also potentially decrease, thereby reducing recreational hunting values. The Licensee Team anticipates the future trend of this indicator will remain at the target of 100%, given the existing processes and protocols in place.

Continual Improvement

Continual improvement will involve ongoing review of LT performance and the supportive EMS of pre-works, inspections, and awareness training.

Indicator 15 - Stream Crossing Density in the DFA

Statement of Indicator	Target	Variance
Stream crossings density in the DFA.	Sustain ≤ 0.28 stream crossings per kilometer of road within the DFA. Report every 5 years.	+10%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 3 – Conservation of Soil and Water Resources <ul style="list-style-type: none"> • CSA SFM Element 3.2 – Water Quality and Quantity
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Indicator Description

As the number of stream crossings are increased, so increases the risk of a reduction in water quality. Emphasis should be placed on limiting the number of stream crossings within the DFA and on improving the state of existing crossings in order to lessen the effects on water quality over time. This indicator was designed to monitor the number of stream crossings in the DFA. The conservation of water quality is a vital part of the SFM framework and conservation of aquatic habitats is fundamental to sustaining biological richness.

Current Practice and Indicator Status

The Provincial TRIM II Stream Coverage served as the base source data for this indicator. These drainages were intersected with the TRIM watershed groups to assign watershed groups and codes to all streams within the DFA. This source data was updated to remove Non-Classified Drainages (NCDs) and Non-Visible Channels (NVCs) as determined through physical stream classification. This classification data was supplied by BCTS and Canfor. All stream data sets were confirmed to be RP Bio classified. Older classifications of uncertain origin were discounted and not applied to the analysis. The Vanderhoof District Road and Landings Inventory (2007) was updated from 2006 to March 31, 2008 using 2006 SPOT imagery, 2007 Landsat imagery and licensee supplied construction events. Road classes of non-status trails and skid trails were discounted. The initial updated coverage was sent out to the contributing licensees (Canfor, L&M, Fraser Lake Sawmills and BCTS) for review and quality control. Deactivation events, where undertaken, were also supplied in order to discount in the final analysis. All roads (in block and operational) and streams with a designation of S6 or greater were used in the analysis (see Table 8 and Figure 3).

Table 8. Stream Crossing Density within the DFA

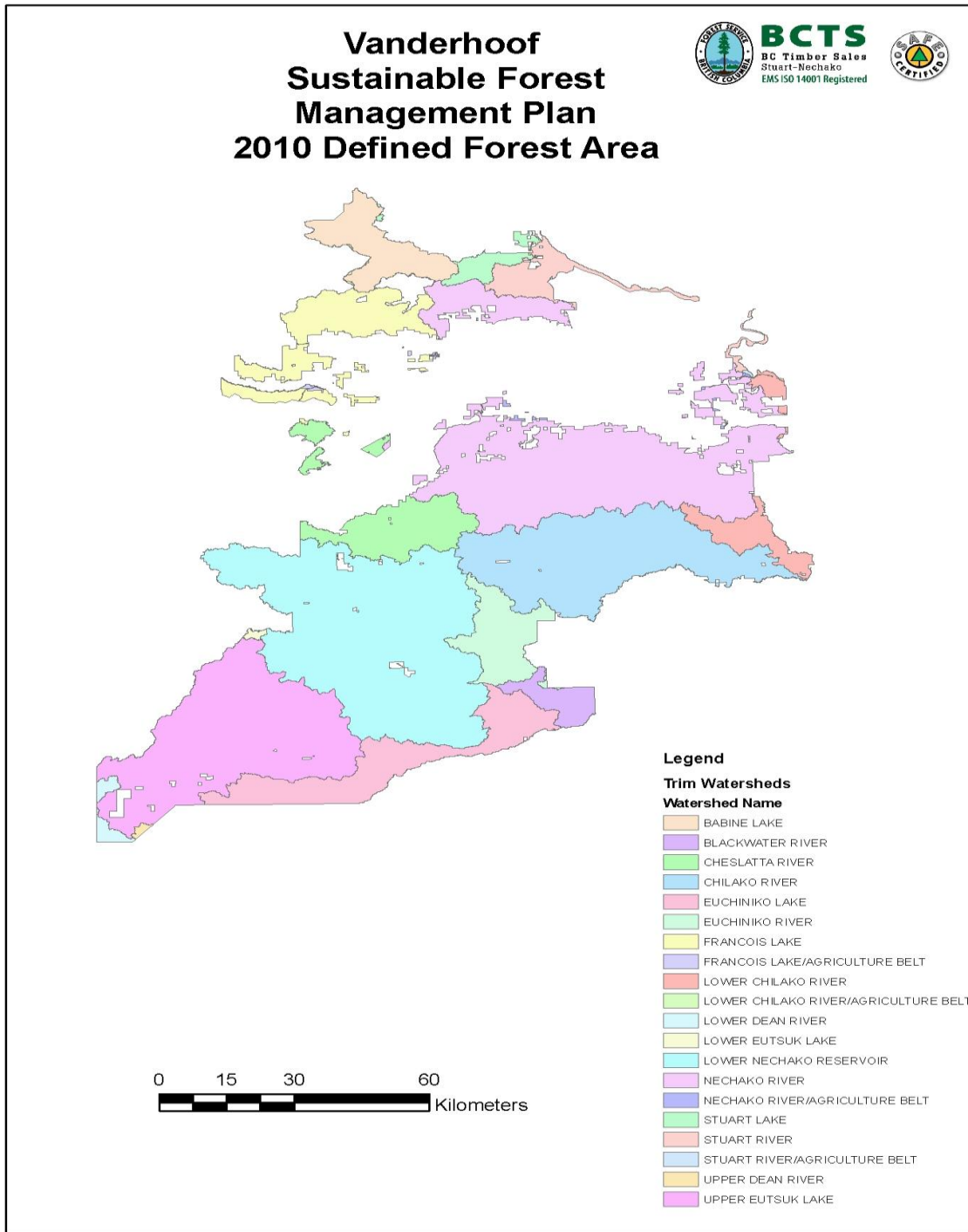
Watershed Group	Area Within DFA (ha)	Rd Length (km)	2007 No. of Rd Crossings	2007 Crossings / km of Rd	2007 Deactivated Crossings
Babine Lake	34,216	264	302	1.14	0
Blackwater River	14,454	157.5	48	0.30	0
Cheslatta River	45,690	452	52	0.12	3
Chilako River	119,656	1,413.8	413	0.29	3
Euchiniko Lake	61,197	508.5	104	0.20	4
Euchiniko River	33,247	454.6	55	0.12	0
Francois Lake	53,417	526.8	170	0.32	1
Lower Chilako River	23,990	497.1	72	0.14	0
Lower Dean River	5,205	24.8	18	0.73	0
Lower Nechako Reservoir	213,803	2,069.1	392	0.19	38
Nechako River	197,461	2785.5	697	0.25	10
Stuart Lake	10,110	245.7	166	0.68	0
Stuart River	21,623	312.5	157	0.50	1
Upper Dean River	888	9.4	9	0.96	0
Upper Eutsuk Lake	145,632	784.2	252	0.32	2
Lower Eutsuk Lake	0	0	0	0.00	0
Total	980,589	10,506	2,907	0.28	62

Table 8 summarizes the stream crossings within the THLB of the DFA by watershed. Within each watershed, the area of the watershed is recorded along with the total length of road, the total number of stream crossings and a calculated crossing density by watershed (deactivated crossings are discounted).

Target Establishment

The target was established through the analysis outlined above (snapshot of past performance) and pertains to the Timber Harvesting Landbase associated with the DFA. The total, average stream crossing density within the DFA is 0.28 stream crossings/km of road. Current practice of minimizing stream crossings will continue in the DFA, therefore this baseline data has been used as the indicator target value.

Figure 3. Watershed Groups within the DFA



Monitoring and Reporting

The average number of stream crossings per kilometer of road in the DFA will continue to be monitored through the updating of the stream crossing inventory database. The road layer will be updated as road construction and deactivation events continue throughout the DFA. The stream layer, will be updated as additional stream classification is undertaken (drainages not meeting the definition of a stream will be discounted). Where stream crossings are rehabilitated through deactivation events, they will be discounted in the analysis process. The analysis will be re-run every five years and reported to the PAG.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast over a defined time frame because it is dependent on various, forest management related activities. The total number of stream crossings in the DFA will be dependent on the level of harvesting, the length of road built, the location of new roads and the number of crossings that are deactivated each year. However, it is important to identify what the accepted target means to SFM. The use of a “what if scenario” is beneficial in identifying anticipated future trends. As the target for this indicator is a value less than or equal to 0.28, one other scenario should be analyzed:

- a) What if stream crossings density was significantly greater than 0.28 stream crossings/km of road?

If the stream crossing density was significantly greater than 0.28, access levels for both the public and the forest industry would increase throughout the forest and the values of other interest groups could potentially be compromised (i.e. trapper, guides, commercial recreation). Another important potential impact could be an increase in the levels of sedimentation into streams and other water bodies, thereby negatively impacting water quality and potential habitat for water dwelling species, such as sport fish. This could eventually lead to a decrease in tourism due to a reduced fishery and other negative impacts to social values, including a reduction in water quality in and around the community of Vanderhoof.

The target for this indicator was set to try and reach a balance between access benefits and potential water quality impacts across the DFA. Therefore, the Licensee Team is committed to achieve the target of ≤ 0.28 stream crossings per kilometer of road within the DFA. Future trends will likely show that the number of road crossings within the DFA will remain constant, or decrease as harvest levels decline and deactivation activities potentially increase. However current salvage efforts associated with the mountain pine beetle infestation may put this target at risk of achievement in the short-term.

Continual Improvement

Baseline targets will be refined to specifically reflect the current status in the DFA. The Licensee Team will develop an effective and efficient methodology to update the road and stream layers pertinent to this indicator. Additional stream classifications and deactivation events will be added to the dataset, to better reflect the landscape condition.

Indicator 16 & 17 - Stream Crossings and Stream Crossing Mitigation Measures

Statement of Indicator 16	Target	Variance
The percentage of stream crossings planned and installed to design/standard.	Annually, 100% of planned stream crossings will be installed as per design or prescribed standard.	- 10%
Statement of Indicator 17	Target	Variance
The percentage of stream crossing inspections and resultant mitigation measures completed according to schedule.	Annually, 100% of mitigation measures resulting from stream crossing inspections will be completed according to schedule.	+ 10%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 3 – Conservation of Soil and Water Resources <ul style="list-style-type: none">• CSA SFM Element 3.2 – Water Quality and Quantity
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Indicator Description

Forestry roads can have a large impact on water quality, where they intersect with streams, including potentially increasing sedimentation into water channels. Certain studies indicate that sediment yields from logging roads can show a 2 to 50 fold increase over historical sediment levels (Reid 1993) and these deposits can affect fish, fish habitat or other important aspects related to water usage (Slaney, Halsey and Smith 1977). When proper stream crossings are installed, the additional sedimentation can be minimized. From a forest management perspective, it is important to ensure that a process is in place to monitor the quality of stream crossings, to identify problems and to mitigate any issues as soon as possible.

Indicator 16 is designed to ensure stream crossings (S6 or greater) within the DFA are installed according to design or prescription standards. Indicator 17 tracks the implementation of mitigation measures to address identified stream crossing deficiencies. Both indicators are implemented and monitored to ensure issues such as sedimentation are identified and related mitigation measures are promptly initiated. Both indicators rely on inspections during installation, upon completion of the installation and during the life of the crossing (maintenance inspections which are completed at a predetermined frequencies, based on the overall risk of the road and the associated structure).

Current Practice and Indicator Status

Stream crossing structures are identified during site level operational planning. Bridge designs, Standard Operating Procedures, EMS pre-works, Environmental Monitoring, EMS inspections and Installation Certification are all potential sources of documentation to ensure proper crossing installation (depending on stream classification and structure requirements). Fish stream crossing installations are planned around fish timing windows. During the installation process, appropriate erosion control devices are also installed.

Existing stream crossing structures are routinely inspected according to maintenance schedules. Inspections are risk ranked to ensure that stream crossings with higher fish values and higher risks of sediment delivery are inspected more frequently than lower risk crossings. All inspection results and mitigation actions are tracked through LT databases such as GENUS. Non-conformance issues are tracked in an Incident Tracking System (ITS).

The current status of the percentage of LT stream crossings installed to design standards is 96% for the period April 1, 2008 to March 31, 2009. The percentage of LT stream crossing inspections requiring mitigation measures completed according to schedule is 91% for the period April 1, 2008 to March 31, 2009.

Target Establishment

Each indicator was assigned a target of 100% based on past performance and achievement of 100% as the desired outcome.

Monitoring and Reporting

Data sources that may be utilized to calculate and monitor this indicator over time include EMS installation inspections, Bridge Certifications and maintenance inspections. The percentage of stream crossings installed to design standards, along with proposed stream mitigation measures completed according to schedule will be tracked and reported annually.

Forecasting and Probable Indicator Trends

These indicators are not easy to quantifiably forecast over a defined time frame, as they are operational in nature. A “what if scenario” analysis will identify the importance of the targets for these indicators to SFM within the DFA. The following “what if scenario” will identify two potential scenarios that will help to substantiate proposed targets:

- a) What if only 50% of stream crossings were installed according to design or prescribed standards?
- b) What if only 50% of mitigation measures as a result of stream crossing inspections were completed according to schedule?

If only 50% of stream crossings were installed according to design or prescribed standard, both water quality and safety could be compromised. Water crossings are designed to mitigate negative impacts (i.e. sedimentation) to the stream, or otherwise water quality could be compromised. Stream crossing structures are designed to provide industrial traffic safe passage over the water feature, otherwise public and forestry worker safety may be compromised.

If only 50% of the prescribed mitigation measures were completed according to schedule, both water quality and safety could be compromised (as above). Mitigation measures are generally prescribed for stream crossings when, through an inspection, the crossing is deemed not to be functioning as per design or prescribed standard. If the issue is not remedied, increased sedimentation or unsafe conditions may result. It is anticipated that some stream crossings within the DFA will require restoration work over their life span in order to reduce the risk of sediment delivery and to uphold safety standards. Long term trends are anticipated to show that stream crossings are routinely inspected and that mitigation work is completed as required and on schedule.

Continual Improvement

Continual improvement will focus on improving and standardizing data tracking. EMS pre-works, installation inspections and maintenance inspections should be reviewed to ensure appropriate data is being captured. Additional improvement could entail the development of a stream crossing quality index rating to enhance data capture.

Indicator 18 - Residual Fibre

Statement of Indicator	Target	Variance
The percentage of blocks where a portion of the residual wood is utilized or left on-block to contribute to other values.	≥ 5% of blocks where a portion of the residual wood is utilized or left on-block to contribute to other values	-5%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 4 – Forest Ecosystem Contributions to Global Ecological Cycles <ul style="list-style-type: none"> • CSA SFM Element 4.1 – Carbon Uptake and Storage CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none"> • CSA SFM Element 5.2 – Communities and Sustainability
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Indicator Description

This indicator is designed to promote the utilization of post-harvest wood fiber that is currently disposed of through pile burning (hazard abatement). The amount, distribution and quality of residual wood fiber left in an area post harvest varies depending on the pre-harvest stand characteristics, the harvest method used and the current wood utilization standards. Coarse woody Debris is retained on all harvest areas and thus is not considered in this indicator. Currently within some harvest areas, Wildlife Debris Piles are left on-site for small mammal habitat, or other forest products (i.e. chips, posts, pellet biomass) are obtained from sawlog waste piles. The potential utilization of this wood fiber is an emerging industry within the DFA with low margins, sporadic markets and a dependency on the highway corridors. The Licensee Team support efforts to maximize alternate uses of fiber, otherwise disposed of through hazard abatement.

Current Practices and Indicator Status

Within the DFA, ground based harvesting and roadside processing is the general practice. Roadside processing results in the accumulation of large debris piles containing waste tree limbs, tops and non-merchantable pieces. Current legislation requires the burning of such debris for fire hazard abatement. Tenures holders also undertake pile burning to minimize losses to the productive forest (reductions in the net area to reforest). The current status of this indicator was derived from LT performance in the period of April 1, 2009 to March 31, 2009. During this time frame, 1% of LT harvested blocks in the DFA had a portion of the residual waste wood utilized, or left on-site to contribute to other values.

Target Establishment

A target of $\geq 5\%$ was established to reflect past performance and the emerging nature of waste wood utilization. Given the extent of salvage within the DFA, it is expected that increased utilization of non-sawlog fibre will increase.

Monitoring and Reporting

The establishment of Wildlife Debris Piles (small mammal habitat) within harvest areas is directed through Site Plans. Post-harvest inspections ensure creation and placement of these wildlife piles. An annual query of the harvested blocks containing constructed Wildlife Debris Piles will allow monitoring of this indicator. Utilization of logging debris will be captured through annual logging agreements and related tenure issuance.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame because it is operational in nature. Utilization of residual wood waste or leaving it on-site to contribute to other values will generally affect ecological values, including wildlife habitat and ecosystem productivity (nutrient cycling). Economic and social values may also be influenced as the development of alternate wood utilization sources will create jobs in both field and related processing facility. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends. As the target for this indicator is a value greater than or equal to five percent, one other scenario should be analyzed:

- a) What if no harvested blocks had a portion of the residual wood utilized or left on-site to contribute to other values?

If no harvested blocks had a portion of the residual wood utilized or left on-block to contribute to other values, overall ecological values within the DFA would decrease. Wildlife debris piles would not be available to create desirable habitat for marten and other small fur-bearers, or contribute to nutrient cycling, which over the long-term may reduce overall site productivity. If waste wood is not utilized, potential job creation in roadside processing, trucking and at the processing facility would be lost. With a potential downfall in harvest levels due to beetle mortality, any non-traditional forest industry job creation is very important to the local economy and social well being of those communities tributary to the DFA. The expected trend for residual wood waste utilization is an increase, as alternate fibre facilities emerge within or adjacent to the DFA.

Continual Improvement

Timber supply constraints are expected due to the mountain pine beetle epidemic and utilization of non-traditional logging debris may serve to offset these constraints. As residual waste wood fiber becomes economically viable to process, transport and manufacture into alternate forest products the opportunities for continual improvement will emerge.

Indicator 19 - Forest Land Conversion

Statement of Indicator	Target	Variance
The percentage of area within the THLB in permanent access.	Sustain < 4.2% of area within the THLB in permanent access, as measured every 5 years.	+1 %

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 4 – Forest Ecosystem Contributions to Global Ecological Cycles <ul style="list-style-type: none"> • CSA SFM Element 4.2 – Forest Land Conversion
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Indicator Description

Permanent access structures (PAS) include roads, bridges, landings, gravel pits, or other similar structures that provide access for timber harvesting (refer to glossary in Appendix II). PAS are significant because road construction removes land area from the productive forested landbase. Unless significant rehabilitation work is undertaken, PAS will not produce a viable and productive forest stand. Permanent Access Structures may also have a negative influence on water quality, wildlife population and recreational values if not properly planned. In addition to providing forestry access, PAS are used by other tenure holders, industrial users and the general public. PAS also provide access for fire protection activities on Crown land. This indicator monitors the amount of permanent access within the THLB on a periodic basis (every five years). Minimizing the amount of productive forest land converted to roads and other non-productive structures helps to protect the forest ecosystem.

Current Practice and Indicator Status

An inventory of roads and landings within the Vanderhoof Forest District was initially in 2003/2004 (Timberline 2004d). This inventory defined roads, landings and trails as per TRIM II definitions below:

- Roads are defined as any bladed structure constructed to access, develop and manage forest resources or access non-timber resources (i.e. recreation sites). Minimum length 50m;
- Landings are defined as any bladed structure developed for the deposition and processing of timber.

The initial inventory in 2003/2004 determined that the percent of area within the THLB in permanent access within the Vanderhoof Forest District is **4.17%**.

A subsequent inventory was completed in 2007, which updated the original 2003 roads and landing coverage utilizing 2006 data and an associated ortho photography support layer. Applying the calculated non-productive area for roads, trails and landings to the THLB resulted in a current status **3.67%** (estimates of future roads, trails and landings were calculated to be 2.68%).

Target Establishment

The current target of ≤ 4.2% was determined from baseline data collected through the IFPA roads and landings inventory project 2003/2004.

Monitoring and Reporting

Data sources used to calculate and monitor this indicator include updating the roads and landings inventory created for the Vanderhoof Forest District. All new road construction (since the last periodic inventory) will be added to the existing inventory and supported by ortho photography or satellite imagery confirmation. The THLB pertaining to the most recent Timber Supply Review (TSR) will be utilized for the framework of this analysis.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame because it is operational in nature. 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 less than 4.2%, one other scenario should be identified:

- a) What if considerably more than 4.2% of the area within the THLB was in permanent access?

If considerably more than 4.2% of the area within the THLB was in permanent access, impacts to all three of the values of SFM could be expected. Since PAS remove productive forest area from the THLB, this increase would reduce the future available timber supply, thereby decreasing the economic return from the forest resource. While the public may have greater access within the DFA, wildlife populations may potentially decrease from a subsequent increase in hunting activity. Water quality may also decrease as a significant increase in permanent access would likely result in more stream crossings, thereby increasing potential sedimentation sources. The potential decrease in water quality, adverse impacts to wildlife from increased hunting/fishing pressure and decreased wilderness recreational opportunities would negatively impact social values in the DFA.

This “what if scenario” analysis implies that a balance of ecological, economic and social values can be achieved by maintaining a certain road density within the DFA. Although this road density level is unknown, the LT is committed to achieving the target established through an analysis of the best information available. Salvage efforts related to the mountain pine beetle epidemic continue to influence this indicator. The smaller salvage patches associated with past practices resulted in a higher proportion of permanent access structures. It is anticipated that large salvage blocks will be planned in the future and less road will be required to complete harvesting activities.

Continual Improvement

Continual improvement will focus on refining the road and landing inventory described above to the DFA in order to obtain DFA specific baseline data.

Indicator 20 - Annual Harvest

Statement of Indicator	Target	Variance
Annually, total volume (m ³ /ha) of timber harvested in the DFA (Actual).	Sustain a DFA harvest level of two (2) million cubic meters per year.	+/- 0.5 million m ³ /year

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none">• CSA SFM Element 5.1 – Timber and Non-timber Benefits• CSA SFM Element 5.2 – Communities and Sustainability

Indicator Description

To be considered sustainable, harvesting a renewable resource cannot deteriorate the resource on an ecological, economic or social basis. During Allowable Annual Cut (AAC) determination, various considerations are examined including the long term sustainable harvest of the timber resource, community stability, wildlife use, recreation use, and the productivity of the DFA. The AAC is usually determined every five years by the Chief Forester of British Columbia, using a number of forecasts to assess the many resource values that need to be managed. By adhering to the AAC determination, the rate of harvest is consistent with what is considered by the crown to be sustainable ecologically, economically and socially.

In the summer of 2004, the Chief Forester completed an expedited Timber Supply Review (TSR) and re-determined the AAC for the Prince George TSA (including the Vanderhoof Forest District). This review was initiated in order to address the severe mountain pine beetle infestation within the TSA. The Chief Forester examined conservation values, management practices, infestation levels, shelf-life assumptions and the various options and implications of increasing volumes of timber harvested.

Current Practice and Indicator Status

The current status of the total potential harvest within the DFA for the period April 1, 2008 to March 31, 2010 is shown in Table 11.

Table 9. Total Volume Harvested in the Vanderhoof Forest District

Licensee and Forest Licence	* Actual Harvest (M3)
Canfor A40873	648,347
Canfor A18165	1098
Canfor A18157	696,764
BCTS	425,422
DFA Licensee Team Subtotal	1,771,631
L&M A55578	211,939
Stellako NRFL A72920	172,672
Saik'uz NRFL A72189	68,237.14
Nadleh NRFL A75068	171,815
Other (FLTC, OLTC)	49,103
** DFA Total Potential Harvest	2,445,397
L&M A17842	45,867
Lakeland A18163	0
West Fraser A16830	0
West Fraser A18162	306,603
West Fraser A70864	4,963
Provincial Forest Subtotal	2,802,830
Woodlots	95,486
Private Land	32,646
Vanderhoof Forest District Total	2,930,962

* Source = MOFR Harvest Billing System – Scaling Report

** The Total Potential Harvest in the DFA assumes that L&M A55578 (small pine licence), three First Nation Non-Replaceable Forest Licences (NRFLs) and all small tenures are harvested within the DFA.

Target Establishment

The target for this indicator was established based on past performance and the expectation that harvest levels will remain relatively stable, as efforts continue to salvage dead timber within the DFA.

Monitoring and Reporting

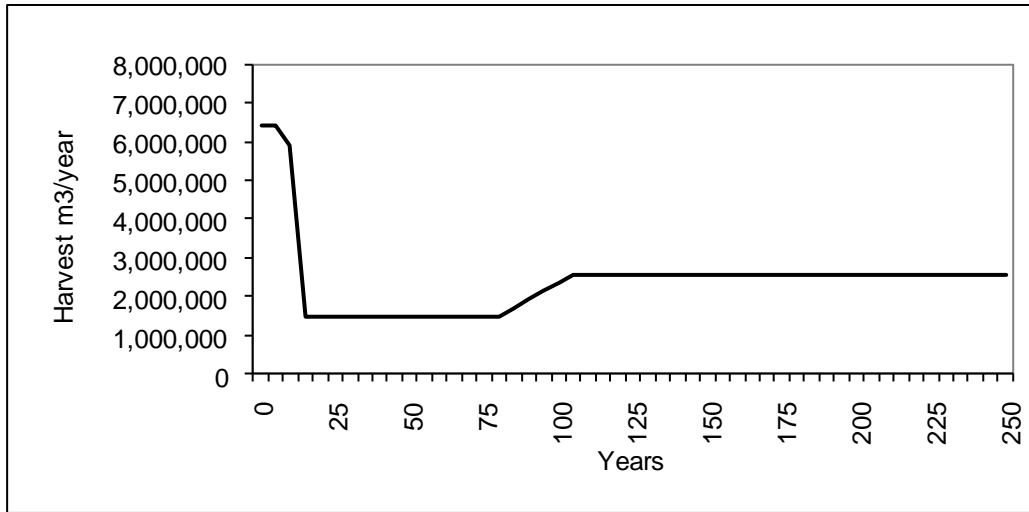
The volume of timber actually harvested within the DFA will be determined annually by means of MOFR Harvest Billing System Scaling Report summaries for the period of April 1st to March 31st.

Forecasting and Probable Indicator Trends

The total volume harvested annually within the DFA will be directly related to the forecasted volume over time described in Figure 4, by Forest Ecosystem Solutions, as part of the development of the SFM Scenario. This chart indicates that the 2004 AAC uplift in the Vanderhoof Forest District to 6.5 million

m³/year, can be maintained for the first 5 years, after which the harvest forecast decreases down to 6 million m³/year for the next 5-year period.

Figure 4. Forecasted Total Volume Harvested in the Vanderhoof Forest District



Ten years following year zero the harvest level must be stepped down to 1.45 million m³ in the medium term in order for forestry to remain a sustainable resource. This harvest level must be maintained until year 80, after which it can be gradually increased to the long-term harvest level of 2.57 million m³/year. This level is reached at year 105.

Continual Improvement

Continual improvement will focus on developing an accurate and efficient methodology to determine the actual total harvest within the DFA. Spatial queries of non-signatory licensee harvesting within the DFA may have to be utilized to identify applicable cutting permits and enable refinement of HBS scaling reports.

Indicator 21 - Range Resources

Statement of Indicator	Target	Variance
The percent of forest management operations consistent with the conservation of range resources identified in Site Plans.	Annually, sustain 100% consistency between forest management operations and the measures to conserve range resources, identified in Site Plans.	-5%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 2 – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity <ul style="list-style-type: none"> • CSA SFM Element 2.2 – Ecosystem Productivity CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none"> • CSA SFM Element 5.1 – Timber and Non-timber Benefits

Indicator Description

Range resources can include grazing or hay cutting tenures within the timber harvesting landbase. Thus range and forest managers must work cooperatively in order to sustain both timber and range values. FSP’s (FRPA Operational Plan) contain the legal measures a forest manager will utilize, when planning forest development activities, to mitigate the removal of natural ranger barriers. These measures are then implemented through site level planning under the Site Plan or related contractual agreements in the case of

proposed fencing projects. Maintenance of natural range barriers is an important aspect of range management and the overall economic viability of the range tenure. Diverse utilization of the forest resource, within the DFA, is more important than ever, given the severity of the beetle infestation.

Current Practice and Indicator Status

Range resources and related tenures are managed by the Ministry Of Forest and Range (MOFR) under *FRPA*. Range Use Plans, which contain specific range management detail, are developed and approved by government for all range tenures. FSP's contain the measures a forest manager will utilize to mitigate the removal of existing natural ranger barriers. Once the measures are approved within the FSP, they become a legal obligation under the *FRPA*. Where mitigative measures are required (usually through range tenure holder and forest manager site specific identification) they are implemented through site level plans which contain applicable operational detail. Post-harvest consistency with the applicable mitigative measures is assessed and reported through EMS inspections. Instances of non-conformance are entered and tracked in incident tracking databases.

A review of LT performance for the period April 1, 2008 to March 31, 2009 indicates that 100% of the measures to conserve range resources identified in the FSP were consistently implemented at the site level.

Target Establishment

The target for this indicator was established at 100% based on past LT performance within the DFA.

Monitoring and Reporting

Development activities (harvested blocks & related access) undertaken within the specified timeframe are reviewed to identify those within existing range tenures and those where specific measures were identified to conserve range values. EMS inspections and incident tracking system reports are then reviewed to ensure post-harvest consistency with the specified measures. This information is collated for the LT and reported annually.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is operational in nature. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for indicators measures such as this. As this indicator currently has a target set at 100%, one other scenario will be identified:

- a) What if only 50 % consistency occurred between forest management operations and measures identified in the Site Plan to conserve resources?

If only 50% of the forest management operations conserved range resources, it can be assumed that natural range barriers would be removed, which would result in a significant increase in the cost of managing cattle within the range tenure area. This cost may be economically prohibitive to the range tenure holder and negate continued use of the area for range purposes. Not only would this negatively impact economic and social values in the DFA, but integrated and full use of the forest resource would be diminished. Forestry and range tenures are compatible uses on the forest landbase and represent a desirable outcome of integrated resource management within the DFA. The LT expects trends will indicate 100 % consistency between forest management operations and measures identified in the Site Plan to conserve resources.

Continual Improvement

Licensee Team continual improvement will likely focus on building relationships with applicable range tenure holders and better understanding range tenure management (including existing natural range barriers and potential mitigative measures if these are compromised through continued salvage operations).

Indicator 22 - Visual Quality Values

Statement of Indicator	Target	Variance
The percent of forest management operations consistent with the conservation of Visual Quality Objectives	Annually, sustain 100% consistency between forest management operations and the strategies identified in the Site Plan to conserve Visual Quality Objectives.	-5%

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 5 – Multiple Benefits to Society</p> <ul style="list-style-type: none"> CSA SFM Element 5.1 – Timber and Non-timber Benefits

Indicator Description

A Visual Quality Objective (VQO) is an objective established by the district manager for a specific legally designated scenic area polygon. Under *FRPA* legislation a Visual Quality Objective (VQO) means:

- an existing VQO pertaining to scenic area, grandparented into *FRPA* (section 181 of *FRPA*),
- a visual quality class, for an existing scenic area, brought into effect under the *Government Actions Regulation (section 17)*, or
- a VQO established for a scenic area under the *Government Actions Regulation*.

The first two legal means were used to bring VQO’s associated with the 2001 Vanderhoof Scenic Area Plan (applicable to the DFA) into effect under *FRPA*. An update to the Vanderhoof Scenic Area Plan was given effect in 2008 under the third bullet above. Thus depending on a proponent’s FSP approval date, either the 2001, or 2008 scenic area plan and its associated VQO’s can be in effect (scenic area polygons and applicable VQO’s at the time of approval remain in effect until FSP expiry or extension (5 yrs)).

VQO’s reflect the desired post-harvest condition of the visually altered forest landscape. The categories of visually altered forest landscapes (resulting from the size, shape and location of cutblock & roads) established in the *Forest Planning and Practices Regulation under FRPA* are as follows:

- (a) *Preservation*: consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) very small in scale, and (ii) not easily distinguishable from the pre-harvest landscape;
- (b) *Retention*: consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) difficult to see, (ii) small in scale, and (iii) natural in appearance;
- (c) *Partial Retention*: consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) easy to see, (ii) small to medium in scale, and (iii) natural and not rectilinear or geometric in shape;
- (d) *Modification*: consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, (i) is very easy to see, and (ii) is (A) large in scale and natural in its appearance, or (B) small to medium in scale but with some angular characteristics;
- (e) *Maximum Modification*: consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, (i) is very easy to see, and (ii) is (A) very large in scale, (B) rectilinear and geometric in shape, or (C) both.

This indicator is designed to ensure that where harvest operations are undertaken within designated scenic areas, the cutblock designs and/or strategies identified within Site Plans, to achieve the desired VQO, are implemented on the ground.

Current Practice and Indicator Status

The results and strategies the LT will undertake to achieve government objectives for visual quality are contained within the applicable approved Forest Stewardship Plan. Where harvest operations are conducted within a designated scenic area, a Visual Impact Assessment (VIA) is undertaken to ensure the altered

forest landscape is consistent with the established VQO (defined category of visually altered forest landscape). These VIA's can be utilized to confirm and/or establish various options related to block design, such as boundary location, access roads, wildlife tree retention area locations, applicable silviculture system etc. The eventual block design and related applicable strategies are identified within the associated site plan. A review of LT performance for the period April 1, 2008 to March 31, 2009 indicates 100% of the strategies prescribed in applicable Site Plans were implemented to achieve desired Visual Quality Objectives.

Target Establishment

The target for this indicator is established at 100% to reflect past LT performance and recognize the importance of visual quality to various stakeholders within the DFA.

Monitoring and Reporting

The results and strategies to achieve visual quality are contained within an applicable approved Forest Stewardship Plan. A Visual Impact Assessment is undertaken to ensure block design is consistent with the desired VQO. The resulting block design & applicable strategies are described within the associated site plan. Post-harvest inspections are utilized to ensure consistency with the desired outcome and incidents of non-conformance are recorded and tracked in an incident tracking system database. This information will be collated and reported annually by the Licensee Team.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as they are operational in nature. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for indicators such as these. As this indicator currently has a target set at 100%, one other scenario will be identified:

- a) What if only 50 % of the forest management operations were consistent with site plan strategies planned to conserve Visual Quality Objectives?

If only 50% of forest management operations were consistent with applicable strategies to conserve VQO's, it is likely that social and economic values would be impacted. Although the overall DFA timber supply may increase as a result of additional harvesting in scenic areas (achieving lower VQO categories), it would likely be at the expense of other economic and social values. Visual quality is important to various commercial recreation and outdoor tourism businesses that provide recreational opportunities such as guiding, hunting, fishing, hiking and other backcountry wilderness experiences. By not conserving desired visual values, these businesses could be negatively impacted from a financial perspective. Social values attributed to outdoor recreation and backcountry activities could also decrease within the DFA.

Continual Improvement

A severe level of lodgepole pine mortality exists within the majority of the scenic areas in the DFA. A balance must be obtained between the visual impact associated with salvage/rehabilitation efforts, safety concerns and impacts to existing businesses dependent on commercial recreational. The LT envision continual improvement will focus on enhancing cooperative and proactive planning in regards to conserving visual quality and renewal of the timber resource.

Indicator 23 - Access Management Plan

Statement of Indicator	Target	Variance
The percent of LT conformance with the Vanderhoof Access Management Plan for Forest Recreation.	Annually, achieve 100% LT conformance with the Access Management Plan for Forest Recreation.	-10%

CCFM Criterion 5 – Multiple Benefits to Society

- CSA SFM Element 5.1 – Timber and Non-timber Benefits

Indicator Description

The *Vanderhoof Access Management Plan for Forest Recreation* (facilitated through the Vanderhoof LRMP – 1997) was given endorsement by the Regional Executive Director of the Integrated Land Management Bureau on March 14, 2008.

The goal of the revised *Vanderhoof Access Management Plan for Forest Recreation* (AMP) is to:

- align the existing patterns of recreational use with the current situation regarding roads and access;
- manage for the continued integrity of the recreational experiences and opportunities provided;
- ensure there is no impact to timber flow and supply.

The AMP does not prevent or preclude anyone from accessing Crown land; the right for industrial development and public recreational activity is still maintained. The AMP is a map that provides strategic options for “how to access an area” based on the access management designation and does not deal with implementation. The AMP is a policy plan that does not have any legislative authority to regulate compliance. Implementation is reliant on professional reliance and voluntary compliance from all parties including government agencies, industry, commercial recreation, the community-at-large and the general public.

Following endorsement of the AMP, meetings were held between the MOFR, Licensees and BCTS over the 2008/09-year to formulate an implementation strategy. Given the current landscape condition (extensive stands of beetle-killed timber), deteriorating timber resource, need for expedited sawlog salvage, emerging non-sawlog industry and fire management concerns, it became apparent that opinions on consistency vary and that implementing the plan as written would be problematic. The outcome of this process was the establishment of Access Management Plan Implementation Principles. The implementation strategies contained within present an operationally feasible approach at access management. The strategies are essentially focused around communication with stakeholders as operations impact specific AMP polygons. Attention has focused on the non-motorized and functionally non-roaded polygons, as well as on access control points.

Current Practice and Indicator Status

A review of LT performance, relative to the Access Management Plan Implementation Principles, over the period April 1/08 to March 31/09 indicated that 100% of LT operations within access management polygons were in conformance with the AMP.

Target Establishment

The target for this indicator was based on a review of past LT performance.

Monitoring and Reporting

Licensee Team conformance with the AMP is based on Access Management Plan Implementation Principles and is currently monitored by each LT member. Planning staff provide operational strategies within non-motorized and non-roaded polygons and track implementation consistency. Operational field staff remove and replace applicable access control points and forward implementation detail to planning staff. Conformance detail is collated, summarized and reported annually by the LT.

Forecasting and Probable Indicator Trends

This indicator cannot be quantifiably modeled and forecasted, as it is a matter of conformance with the existing AMP. However, a “what if scenario” can be utilized to illustrate the value of the chosen target in relation to SFM. As this indicator identifies a target of 100%, only one “what if scenario” will be analyzed:

- a) What if the Licensee Team achieves only 50% conformance with the Vanderhoof Access Management Plan for Forest Recreation?

Achieving only 50% conformance with the AMP could negatively impact social, economic and environmental values within the DFA. This scenario assumes industrial roads are constructed and maintained within non-motorized AMP areas and are available to the public to utilize for roaded recreational opportunities. It assumes that members of the public do not agree to voluntarily conform to the AMP. In this scenario, without a balanced choice of quality recreation experiences within the DFA, conflicts will arise between diverse recreational user groups. Established businesses reliant on providing wilderness recreational opportunities (fly-in/walk-in hunting, fishing and hiking) may be forced to close and re-locate if the experience they provide is compromised by public road access. This would negatively impact local social and economic values. Public road access into sensitive wildlife habitats, or excessive road densities (accessible to the public) will also negatively impact wildlife, without changes to the hunting regulations.

Continual Improvement

Continual improvement efforts will focus on determining expected LT implementation responsibilities (from government, stakeholders and the general public). Determining who and how conformance with the AMP is measured. Determining how public adherence to the plan will be monitored, and with whom the responsibility resides. Determining the operational feasibility of achieving the objectives, as written in the AMP and suggesting changes to government where warranted. It is clear there are differing opinions on AMP objectives and implementation responsibilities.

Indicator 24 - Effectiveness Monitoring for Access Points

Statement of Indicator	Target	Variance
Effectiveness Monitoring Plans are developed and implemented for selected AMP polygons to continually improve implementation strategies.	Establish a timeline once initial MOFR monitoring results are known and a PAG task team is formed to identify the selected AMP polygons.	

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none"> • CSA SFM Element 5.1 – Timber and Non-timber Benefits
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Indicator Description

The Licensee Team and Ministry of Forests and Range (MoFR) staff have collectively reviewed the new *Vanderhoof Access Management Plan for Forest Recreation- March 14/08 (AMP)* and developed interim implementation strategies (Access Management Plan Implementation Principles). Discussions have and continue to focus on obtaining AMP objective clarity, assignment of responsibility and the development of an effectiveness monitoring plan. MoFR stewardship staff have agreed to monitor the implementation of the AMP, thus enabling initial baseline conformance data to be gathered. This baseline data is essentially documented input from stakeholders, the general public and forest industry regarding implementation (or lack thereof) of the Vanderhoof Access Management Plan for Forest Recreation. Once sufficient baseline data has been obtained to determine whether implementation strategies are effective (anticipate March 31/10), some conclusion can be drawn on which AMP values are at risk and which AMP areas should be chosen for the development of effectiveness monitoring plans. It is anticipated that a task team consisting of several members of the PAG, LT planning staff and MoFR representatives will comprise this group. The task team findings and recommendations will be presented to the PAG and this indicator updated accordingly. Ideally this indicator should be removed from the SFMP and placed on the continual

improvement matrix until such time it can be developed in detail and an appropriate target assigned. However when discussed, some PAG members were adamant this indicator remain in the SFMP.

Current Practice and Indicator Status

Current practice and indicator status will be provided when there is sufficient indicator detail and supportive information to do so.

Target Establishment

An appropriate target will be established when there is sufficient indicator detail and supportive information to do so.

Monitoring and Reporting

Monitoring and Reporting procedures will be outlined when there is sufficient indicator detail and supportive information to do so.

Forecasting and Probable Indicator Trends

Forecasting and probable indicator trends will be described when this indicator and associated target is fully developed.

Continual Improvement

Continual improvement guidance will be provided once this indicator and associated target is fully developed.

Indicator 25 - Accidental Industrial Fires

Statement of Indicator	Target	Variance
The number of hectares of accidental fires caused within the DFA by forest industry operations.	Annually, sustain <100 cumulative hectares of accidental fires caused by forest industry operations in the DFA.	+10 hectares

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 5 – Multiple Benefits to Society</p> <ul style="list-style-type: none"> • CSA SFM Element 5.1 – Timber and Non-timber Benefits <p>CCFM Criterion 4 – Forest Ecosystem Contributions to Global Ecological Cycles</p> <ul style="list-style-type: none"> • CSA SFM Element 4.1 – Carbon Uptake and Storage
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Indicator Description

This indicator is critical to the sustainability of the forest resource within the DFA by reducing the losses attributable to accidentally caused industrial forest fires. The LT do not have control over fires ignited by natural causes, but they do have the opportunity to reduce industrial related fires caused by slash pile burning, machinery sparks lack of training and suppression equipment, cigarette smoking or other human induced errors. In most situations, industrial fires are brought under control quickly due to staff fire suppression training (S-100), availability of firefighting equipment and documented emergency response plans.

Current Practice and Indicator Status

An assessment of the LT performance for the period April 1, 2008 to March 31, 2009 indicated that 9.0 hectares of timber or plantation were lost due to industrial caused fires. The main causes of accidental

forest industry related fires in the DFA are slash pile burning (hazard abatement) and industrial machinery related fire starts.

Target Establishment

The target was established from a review of LT performance and the desire to minimize industrial caused forest fires. The LT is however, apprehensive in setting this target due to the excessive amount of standing dead lodgepole pine, left in the wake of the Mountain Pine Beetle epidemic. Thus the overall risk of accidental fire starts and rapid spread is greatly increased.

Monitoring and Reporting

The LT has discussed the tracking of this indicator with the Ministry of Forests and Range, Forest Protection Branch in Vanderhoof. Forest protection staff; currently maintain a database that tracks all fires within the DFA in significant detail. This third party verified dataset offers the most consistent and comprehensive method of reporting industrial caused fires within the DFA. Therefore, the LT will contact Forest Protection annually to confirm the number, size and source of ignition of any fires within the DFA. Any industrial caused fires will be confirmed through LT incident tracking system databases.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is operational in nature. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has the target set at less than 100 hectares, one other scenario should be identified:

- a) What if there were significantly more than 100 hectares of accidental fires caused within the DFA by forest industry operations?

If there were more than 100 hectares of accidental fires caused by forest industry operations throughout the DFA, ecological values may benefit due to the significant role fire has played in ecosystem development within the DFA. However economic and social values would be negatively impacted. Loss of human life and property damage could be expected. Timber supply, resource values and visual quality may all be compromised, thereby negatively affecting the overall economic benefits derived from forests in the DFA. Community stability and public quality of life values could be jeopardized within the communities dependent on the forest resource within the DFA. Negative influences from an increase in accidentally caused forest industry related fires would far outweigh any potentially positive ecological gains. Given the level of mortality caused by the mountain pine beetle infestation, the long-term trends of this indicator remain unknown.

Continual Improvement

Continual improvement relative to this indicator will focus on preventative training initiatives, EMS pre-works, Emergency Response Plans, inspections and landscape level planning designed to create buffers, or fire breaks within rural interface areas.

Indicator 26 - Money spent in the DFA

Statement of Indicator	Target	Variance
The percent of money spent on DFA forest management activities, provided from the north central interior suppliers (stumpage not included).	Annually, ≥ 80% of the expenditures on forest operations and management in the DFA are attributable to north central interior suppliers.	-5%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society

- CSA SFM Element 5.2 – Communities and Sustainability
- CSA SFM Element 5.3 – Fair Distribution of Benefits and Costs

Indicator Description

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) (refer to glossary in Appendix II). The total dollar value of goods and services considered to be local will be calculated relative to the total dollar value of all goods and services purchased for forest management activities within the DFA. 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 business opportunities (work and supplies) required to manage the forest resources of the DFA. As large local milling facilities depend on a secure flow of resources from the DFA, small businesses depends on a sustained flow of opportunities to develop and invest in the local community.

Current Practice and Indicator Status

A query of the financial data stored within the LT’s individual accounting system provides the basis for this indicator reporting. Individual LT percentages are collated by volume harvested within the same timeframe and a DFA average is determined. A review of LT performance for the period April 1, 2008 to March 31, 2009, indicated that 96 % of the annual dollars spent on forest management within the DFA was attributable to purchases from north central interior suppliers.

Target Establishment

Targets are established based on a review of past LT performance and expected future performance within the DFA.

Monitoring and Reporting

The annual data collection attributable to this indicator is collected in and reported from Licensee Team accounting systems. Office locations and their applicable postal codes are utilized to clarify the source of the goods and services purchased.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast through the modeling process over a defined time frame. The use of a “what if scenario” can be beneficial in identifying anticipated future trends for an indicator such as this. As the target for this indicator is a value greater than or equal to 80%, one other scenario should be analyzed:

- a) What if of the money spent on forest management activities within the DFA, none was attributable to north central interior suppliers?

If the money spent on forest management in the DFA was from suppliers outside the north central interior, two important values would be at risk. First, there would be a negative impact to the overall economy of the north central interior (economic & social impacts). Second, there is a risk that without local business opportunities, certain specialized services or supplies would not be available locally and accessing these services from other locations may prove to be time or cost prohibitive. Substantial expense can be incurred waiting for machine repairs or supplies. Cost effective services should be expected from locally established business and local knowledge may yield more cost effective and efficient solutions. Given the expected downturn in the forest industry, due to beetle impacts, supporting local business is an important step in addressing community stability.

Continual Improvement

Given the expected downturn in the forest industry, due to beetle impacts, supporting local business is an important step in addressing the stability of those communities tributary to the DFA. Continual improvement efforts could examine opportunities to enhance the level of goods and services purchased within DFA communities, rather than the north central interior.

Indicator 27 - Forest Roads

Statement of Indicator	Target	Variance
The number of kilometers of forest road maintained annually for public use.	Maintain \geq 300 km of forest road annually for public use.	-30km

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society

- CSA SFM Element 5.1 – Timber and Non-timber Benefits

Indicator Description

Roads are a necessary component of forest management as they provide access to the forest resource and its recreational potential. The presence and density of road systems can affect hydrological functions, serve as a source for erosion and mass wasting, and adversely impact wildlife populations. Roads need to be carefully planned and access needs to be closely monitored in order to achieve economic efficiency and mitigate detrimental effects to the forest ecosystem. A sustainable balance must be sought between the financial costs of maintaining public access, the social costs or benefits derived from increased access and the ecological cost or impacts to other resource values such as wildlife. This indicator is a measure of the amount of road in the DFA maintained annually that in-turn provides the public access to utilize the forest resource. Enabling public use of these forest roads enhances recreational opportunities, quality of life values and the economic value derived from non-timber resource in the DFA.

Current Practice and Indicator Status

Road maintenance programs are currently tracked through each LT's internal database systems (i.e. Genus). The number of roads currently being maintained in the DFA can be identified through these systems. Generally this indicator reflects maintenance of the mainline Forest Service Roads, regularly utilized by the general public and other non-timber tenure holders. The current status of this indicator for the period April 1, 2008 to March 31, 2009 is that 335 km of forest roads are maintained for use by the general public.

Target Establishment

The target for this indicator is established from a review of past LT performance within the DFA.

Monitoring and Reporting

The LT inspects roads under their maintenance responsibility on an annual basis or according to a risk-based assessment schedule to ensure forest roads are maintained in safe condition. Required maintenance or mitigation works are documented scheduled for completion and tracked through database activity entries. The data used in the reporting of this indicator is collected from the LT's annual road maintenance tracking.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame because it is operational in nature. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an

indicator such as this. When forecasting a variable in this manner, it is useful to identify two potential scenarios:

- a) What if no forest roads were maintained for public use?
- b) What if three times the target amount of forest roads was maintained for public use?

If no forest roads were maintained for public use, it is anticipated that recreation opportunities would potentially decrease, certain quality of life values may decline, and economic and social values from non-timber resources may decrease due to limited public access to the forests within the DFA. If three times the target amount of forest roads were maintained for public use ecological, economic and social values may all potentially be negatively influenced. While the public may have greater access, wildlife populations may be decreased from a potential increase in hunting activity. The forest industry within the DFA would be negatively impacted from an economic perspective, due to excessive road maintenance costs. Social values may potentially be adversely impacted due to decreased wildlife populations resulting from increased recreation, hunting and fishing opportunities. This “what if scenario” analysis implies that a balance of values can be achieved by maintaining a level of public road access somewhere in between the two scenarios.

Continual Improvement

The Licensee Team will evaluate the effectiveness of this measure in assessing the use of maintaining forest roads for the public to determine whether the public continues to receive a portion of the economic benefits from the forest resource.

Indicator 28 - Smoke Management

Statement of Indicator	Target	Variance
The percent of prescribed burns that follow the smoke management guidelines.	Annually, 100% of LT prescribed burns follow the smoke management guidelines.	-10%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none"> • CSA SFM Element 5.1 Timber and Non Timber Benefits
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Indicator Description

The Vanderhoof PAG identified smoke management as a public concern and a potential area of improvement for LT performance. Forest Industry related smoke can be attributed to the necessity to burn machine piled logging debris, either to reduce the fire hazard or to remove habitat for forest pests. Smoke is the most visible product of this controlled burning and large amounts of smoke may affect air quality and result in an increased occurrence of respiratory ailments in communities adjacent to the smoke source. The Ministry of Forests & Range (MOFR) is mandated through the Wildfire Act and Wildfire Regulation to regulate the fire activities (open burning) of the forest industry within 1 kilometre of forest lands. The Ministry of Environment has the mandate to regulate smoke emissions from open burning under the *Environmental Management Act* and the *Open Burning Smoke Control Regulation* (OBSCR). MOE uses Environment Canada or other venting indices and weather information to regulate where and when burning is permitted, and periodically issues open burn bans. The MOFR and MOE collectively issue an approved Burn Plan for Smoke Management within the Vanderhoof Forest District. This plan is considered a ‘burn plan’ as it pertains to the OBSCR sec. 8 (1) of Schedule A. It is also a portion of a burn plan as it pertains to section 23 of the Wildfire Regulation for the purposes of achieving smoke management objectives. This means that the venting requirements in this plan supersede the venting requirements of the OBSCR. Combined with the description or map of the smoke sensitivity areas, this Plan provides the venting conditions and other modified requirements which must be met to allow open burning to be done in

compliance with the OBSCR. Thus the LT is responsible for obtaining current weather and venting information, making appropriate burning decisions, and managing their fire activities.

Current Practice and Indicator Status

The LT operate within the parameters identified in the Vanderhoof Forest District Burn Plan for Smoke Management. Smoke sensitivity areas (High, Moderate and Low) were developed within the district and venting conditions assigned accordingly. Two day venting index forecasting is obtained from Environment Canada’s website on a daily basis. Venting indices indicate the atmosphere’s ability to disperse pollutants and these are reported as good, fair or poor. A venting index of good indicates that conditions are sufficient for burning and this is when scheduled Licensee Team burning activities are initiated. A review of LT performance for the period April 1st, 2008 to March 31st, 2009 indicated that 100% of prescribed burns were conducted in accordance with the Vanderhoof Forest District Burn Plan for Smoke Management.

Target Establishment

The target for this indicator was established based on a review of past LT performance within the DFA.

Monitoring and Reporting

Data reporting applicable to this indicator is based on the specific business process LT members utilize to track burning events and adherence to the Vanderhoof Forest District Burn Plan for Smoke Management. In some instances contractual agreements are utilized to ensure adherence to the district burn plan and fire hazard abatement report forms are collected as supportive documentation. LT data is collated and reported annually.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame, as it is operational in nature. The percent of prescribed burns that follow the smoke management guidelines relates primarily to the social values of SFM, such as quality of life. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for a measure such as this. As this indicator states a target of 100%, one other scenario should be analyzed:

- a) What if only 50% of prescribed burns followed smoke management guidelines?

If only 50% of prescribed burns followed smoke management guidelines, it is likely that air pollution within and surrounding the DFA would increase during burning operations. Increased smoke in the DFA could potentially affect air quality and result in an increased occurrence of respiratory ailments in communities adjacent to the smoke source. The overall quality of life for residents and visitors to the Vanderhoof area would be diminished. Economic losses could be incurred if tourism and recreation values were affected by inadequate smoke.

It is anticipated that prescribed burns in the DFA will continue to follow smoke management guidelines in the future in order to mitigate the potential negative effects identified in this "what if scenario" analysis.

Continual Improvement

Continual Improvement will focus on developing a standardized methodology of tracking and reporting LT burning activities.

Indicator 29 - Support Opportunities in the DFA

Statement of Indicator	Target	Variance
Annually, the number of support opportunities provided in the DFA.	Annually, sustain ≥ 50 support opportunities in the DFA.	- 25

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society
• CSA SFM Element 5.2 – Communities and Sustainability

Indicator Description

This indicator details the economic and social benefits the LT provide to community’s tributary the DFA. In addition to wages, taxes and stumpage fees, the LT contribute to the social well-being of communities local to the DFA. These support opportunities vary from providing facility use, staff participation in local initiatives, equipment donations, scholarships, funding raising events, and support of community events. This indicator is an important component of a community's economic and social stability, but it is difficult to quantify, as support opportunities often go unrecorded. Support opportunities help to increase awareness of sustainable forest management and the scope of the forest industry’s contribution to a community.

Current Practice and Indicator Status

Each Licensee Team member will determine the current status of support opportunities provided within the DFA and report out on a collaborated total. A review of LT performance for the period April 1, 2009 to March 31, 2009 indicated that 23 support opportunities were provided by the LT for those communities tributary to the DFA (see table 10)

Table 10. The Number of LT Support Opportunities in the DFA (April 1/08 to March 31/09)

Support Opportunity	Number of Opportunities
Cash Donations	8
Product Donations	2
Resource and Worker Donations	4
Employee Donations	1
Community Events	8
TOTAL	23

Target Establishment

The target was established based on a review of past and expected LT future performance within the DFA (see PAG minutes Nov 4/10).

Monitoring and Reporting

Support opportunities will be tracked and reported by each Licensee Team member annually, and reported collectively for the DFA.

Forecasting and Probable Trends

This indicator is not easy to quantifiably forecast through the modeling process over a defined time frame. The use of a “what if scenario” can be beneficial in identifying anticipated future trends for an indicator such as this. As the target for this indicator is stated as ≥ 100 , one other scenario should be analyzed:

- a) What if the annual number of support opportunities provided in the DFA was considerably less than 100?

If the annual number of support opportunities provided to community’s tributary to the DFA was considerably less than 10, it may be indicative of an economically unhealthy Forest Industry. Generally when the forest industry encounters a prolonged downturn in market conditions, financial constraints are implemented to restrict all but necessary expenditures. Given the importance of the forest economy to local

communities, social values and quality of life may decrease over time. Local communities may not be receiving an adequate portion of the social and economic benefits derived from DFA forests. Local community organizations provide a variety of public benefits and often rely on support opportunities from the forest industry to fund community events. If less than 10 support opportunities were provided annually, many of these community events may not be possible, thereby potentially decreasing the public's quality of life and negatively impacting community stability.

Continual Improvement

Continual improvement efforts will focus on identifying the scope of support opportunities and standardizing the methodology to track and report such opportunities.

Indicator 30 - Local Business Relationships

Statement of Indicator	Target	Variance
The number of annual LT business relationships or opportunities with businesses within those community's tributary to the DFA.	Sustain \geq 100 business relationships or opportunities annually within community's tributary to the DFA.	-25

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 5 – Multiple Benefits to Society</p> <ul style="list-style-type: none"> • CSA SFM Element 5.2 – Communities and Sustainability

Indicator Description

In managing the forest resources of the DFA, the LT provide a variety of business relationships and opportunities to local tributary communities. These local businesses then provide social, economic and cultural benefits important to community stability. The majority of the LT's suppliers, contractors and employees are retained from local community's tributary to the DFA and the northern interior of British Columbia. This indicator monitors the number of business relationships and opportunities that the LT's woodlands operations are able to provide and maintain with local businesses in communities tributary to the DFA. A business relationship, in the context of this indicator, is defined as a financial arrangement between a local business, or a person from a local community and a member of the LT. It can also be a financial arrangement between a local business and a third party undertaking a project financially sponsored by a member of the LT. A business opportunity, within the context of this indicator, is defined as an opportunity provided by the LT to a business to enter into a business relationship.

Current Practice and Indicator Status

Based on a review of LT performance for the period April 1, 2008 to March 31, 2009, 86 business relationships or business opportunities were established or provided to businesses within community's tributary to the DFA (see Table 11). Although the details of these relationships are maintained in confidence, they range in monetary value and variety of project type. Some of the current business relationships include timber harvesting contracts, road construction and maintenance contracts, archaeological and riparian assessment contracts, a variety of silviculture contracts, and short-term daily or weekly hires.

Table 11. The Number of LT Business Relationships or Opportunities Made Available to Local Businesses in Communities Tributary to the DFA (April 1/08 to March 31/09)

Type of Business or Opportunity	Number of Business Relationships	Number of Business Opportunities	Total for the Indicator
Forestry Management	16	10	26

Silviculture	4	12	16
Harvesting/ Road Construction	18	26	44
Total	38	48	86

Target Establishment

The target was established based on a review of past and expected LT future performance relative to this indicator.

Monitoring and Reporting

The data relative to this indicator is derived from LT contract and accounting databases. This data will identify those business relationships with businesses in community's tributary to the DFA. The resulting data will be collated annually and reported.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is related to operational practices. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at greater than or equal to 100, one other scenario should be identified:

- a) What if no business relationships or opportunities were made available or taken up?

If there were no business relationships or opportunities made available to businesses tributary to the DFA, two important values would be at risk. First, there would be a direct negative economic impact to local communities through the loss of economic benefits derived from sustainable management of the DFA. Second, without local business opportunities, there would be no incentive for the establishment of new forestry-based businesses and existing local businesses may choose to re-locate. In either case community stability would be negatively impacted. Utilizing local expertise and resources, when establishing business opportunities, should mutually benefit local communities and the forest industry.

Continual Improvement

Continual improvement efforts will focus of evaluating the LT performance trends relative to the target of this indicator. Due to beetle related timber losses, there will be a reduction in harvest levels and timber quality within the DFA, which may not support the current target.

Indicator 31 - First Nations Business Relationships and Opportunities

Statement of Indicator	Target	Variance
The number of annual LT business relationships or opportunities made available to local First Nations.	Sustain \geq 20 local First Nation business relationships or opportunities annually.	-10

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none"> • CSA SFM Element 5.2 – Communities and Sustainability
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Indicator Description

Providing business relationships or opportunities to local First Nations, provides social, cultural and economic benefits. The majority of the LT's suppliers, contractors and employees are retained from local community's tributary to the DFA and the interior of northern British Columbia. First Nation communities

are not well represented within this distribution, but they are often geographically and economically the most connected to local forest operations. This indicator is designed to monitor the number of business relationships and opportunities that the LT's woodlands operations are able to provide and maintain with members of local First Nation communities. A business relationship, in the context of this indicator, is defined as a financial arrangement between a member of a local First Nation community and a member of the Licensee Team. It can also be a financial arrangement between a local First Nation member and a third party undertaking a project financially sponsored by a member of the LT. A business opportunity is defined as an opportunity provided by the LT to a local First Nation member to enter into a business relationship.

Current Practice and Indicator Status

Based on a review of LT performance for the period April 1, 2008 to March 31, 2009, seven (7) business relationships or business opportunities were established or provided to local First Nation members (see Table 12). Although the details of these relationships are maintained in confidence, they range in monetary value and variety of project type. These business relationships could include timber harvesting contracts, silviculture planting and tending contracts and participation in archaeological contracts.

Table 12. The Number of LT Business Relationships or Opportunities Made Available to Local First Nation's (April 1/08) to March 31/09)

Business Type	Number of Business Relationships	Number of Business Opportunities	Total
Forest Management	1	0	
Silviculture	1	1	
Harvesting	4	0	
Total	6	1	7

Target Establishment

The target was established based on a review of past and expected LT future performance relative to this indicator. The Licensee Team expects to enhance the number and diversity of business relationships or opportunities that are formed with First Nations.

Monitoring and Reporting

The data relative to this indicator is derived from LT contract and accounting databases or planning records documenting First Nation initiatives. The resulting data will be collated annually and reported.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast through the modeling process over a defined time frame. The use of a "what if scenario" can be beneficial in identifying anticipated future trends for an indicator such as this. As the target for this indicator is a value greater than or equal to 20, one other scenario will be analyzed:

- a) What if no business relationships or opportunities were made available by the LT to local First Nations?

If there were no business relationships or opportunities made available to local First Nations, two important values would be at risk. First, there would be a direct negative economic impact to the local First Nation community through the loss of economic benefits derived from sustainable management of the DFA. Lack of business opportunities would be detrimental to the local First Nation's ability to build the capacity necessary to share in a portion of the economic benefits derived from the DFA. Second, there would be a loss of unique First Nation knowledge and experience that would otherwise not be realized. This would be detrimental to local historic and cultural heritage values within the DFA. Utilizing this knowledge and

experience through potential business opportunities could potentially mutually benefit First Nation communities and the forest industry.

Continual Improvement

Continual improvement efforts will focus of evaluating the LT performance trends relative to the target of this indicator. Due to beetle related timber losses, there will be a reduction in harvest levels and timber quality within the DFA, which may not support the current target.

Indicator 32 - Diversity of Forest Products

Statement of Indicator	Target	Variance
The number of different forest products produced by milling facilities tributary to the DFA.	Annually, sustain the production of ≥ 15 different forest products produced by milling facilities tributary to the DFA.	-2

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 5 – Multiple Benefits to Society</p> <ul style="list-style-type: none"> • CSA SFM Element 5.1 – Timber and Non-timber Benefits • CSA SFM Element 5.2 – Communities and Sustainability

Indicator Description

This indicator describes the forest products produced by the milling facilities directly associated with the DFA. These forest products range from dimensional lumber to a variety of value added products. This indicator illustrates how forest management activities within the DFA can produce a range of wood products at the local level. Value added wood products are an important part of a local economy. They utilize lumber waste material to produce secondary products. LT members also provide dimensional lumber products to value-added manufacturers in exchange for round wood for sawlog production. Primary and secondary milling facilities create local employment, contribute directly and indirectly to the tax base and purchase local goods and services. By ensuring a large portion of the volume of timber harvested in the DFA is processed by local facilities, the local economy will remain stable and a variety of products from local area mills will continue to be available, .

Current Practice and Indicator Status

The milling facilities directly associated with the DFA currently produces a variety of forest products with different grades and sizes of dimensional lumber. They also produce specialty wood products such as Japanese select lumber, Machine Stress Rated lumber, bed frame stock, and a variety of special order lumber products. Value added manufacturers associated with DFA purchase dimensional lumber and certain by-products from local sawmills to produce products such as log homes, house logs, finger-jointed lumber, wood pellets and building timbers. A complete list of local DFA wood products is shown in table 13 below.

Table 13. The Current Number of Forest Products Produced in Milling Facilities Tributary to the DFA (April 1/08 to March 31/09)

Manufacturer	Products	Tally
Canfor Vanderhoof	2X4, 2X6 all dimensions, MSR, J-Grade, Square Edge	4
L&M Lumber	2x3, 2x4, 2x6, 1x3, 1x4 studs, Japanese Premium, bed frames	7
Specialty Mills (VSWP, Premium Pellet, Legacy Log Homes, Rocky Mt. Log Homes, etc.)	finger joints, wood pellets, house logs, log homes, custom cut timbers.	4
		15

Target Establishment

The target is established from a review of wood products produced from mills tributary to the DFA and the potential for a reduction in the number of wood products produced due to decreased wood quality attributable to beetle-killed timber.

Monitoring and Reporting

Licensee Team members will annually query local mills tributary to the DFA (including value-added mills) to determine the specific wood products produced at each mill. This information will be collated and reported.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is dependent on other variables such as markets, harvesting levels and the availability of raw material. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at greater than or equal to 15, one other scenario should be identified:

- a) What if significantly less than 15 different forest products were produced within the DFA?

If significantly less than 15 different forest products were produced within the DFA the full value of the forest resource within the DFA would not be recognized and public benefits would be lessened. Employment would likely decrease due to reduced milling capacity, which in turn would affect the quality of life in communities tributary to the DFA. In light of the mountain pine beetle infestation, this indicator is increasingly important. In the short-term, harvesting levels will increase in an effort to salvage timber before its quality decreases to the point where only low-value products can be produced. At such time non-traditional utilization is expected to produce a variety of wood products from this dead timber. Innovative harvesting, processing and hauling methods, combined with non-traditional milling facilities would likely result if the declining timber resource within the DFA is to be fully utilized.

Continual Improvement

Continual improvement efforts will examine the effectiveness of this indicator and its ability to promote and contribute to a diversified local economy.

Indicator 33 - First Nations Involvement in the Planning Process

Statement of Indicator	Target	Variance
The number of opportunities provided to Aboriginal people to be involved in the planning process and/or provide Cultural Heritage Resource input.	Annually, sustain ≥ 50 opportunities for Aboriginal people to be involved in the planning process and/or provide CHR input.	-5

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development <ul style="list-style-type: none">• CSA SFM Element 6.1 – Aboriginal and Treaty Rights• CSA SFM Element 6.2 – Respect for Aboriginal Forest Values, Knowledge and Uses

Indicator Description

This indicator reports the opportunities provided to Aboriginal people to be involved in the forest management planning processes and/or provide Cultural Heritage Resource input relative to proposed LT

development activities. This indicator will contribute to respecting the social, cultural and spiritual needs of those First Nation's whose traditional territory overlap the DFA. Within the SFM PAG process, a First Nations' communications strategy has been developed and implemented to provide additional opportunities for First Nations to be involved in the SFM planning process.

Current Practice and Indicator Status

All First Nation communities have had the opportunity for participation and input in the SFM planning process. Forest Stewardship Plans depicting the results and strategies to be utilized to guide forest management operations are provided to First Nation's for review and input. In addition, the LT provide site level information sharing opportunities to those First Nations whose traditional territory may potentially be impacted by proposed development activities. Table 14 lists the current status of opportunities that were made available for First Nations to become involved in the planning process throughout the DFA.

Table 14. The Number of Opportunities for First Nations to be involved in the Planning Process and/or provide Cultural Heritage Resource input on proposed development activities.

Opportunity Type	Number of Opportunities
Open House	0
Letters	50
Newspaper Ads	3
Pest Management Prescriptions	0
Individual Meetings	5
Other (E-mail etc.)	4
TOTAL	62

** (based on April 1/08 – March 31/09 reporting period)

Target Establishment

First Nation communities are generally reluctant to participate in initiatives such as the SFM Public Advisory Group, due to the sensitivity surrounding treaty negotiations. However, the LT attempt to engage First Nations through a variety of information sharing opportunities designed to solicit Aboriginal input and avoid unduly impacting aboriginal interests. This target has been increased (April 2009 – March 31/10) to better reflect past performance of the LT.

Monitoring and Reporting

As indicated above, the LT utilize a variety of methods to share proposed development planning with potentially affected First Nations. Despite the means utilized, the objective is to build a relationship of mutually beneficial information sharing (i.e. sharing of proposed development & potentially impacted First Nation interests). Opportunities for First Nation involvement in the planning process and/or to provide input on proposed development activities is documented and tracked by LT planning staff. This information will be collated, summarized and reported out annually to ensure the target is achieved.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of ≥ 50 , one other potential scenario should be developed:

- a) What if considerably less than 50 opportunities were given to Aboriginal people to become involved in the planning process and/or provide Cultural Heritage Resource (CHR) input on proposed development activities?

If there were considerably less than 50 opportunities given to Aboriginal people to become involved in the planning process and/or provide CHR input on development activities, then CHR values may be unduly impacted. First Nation input is necessary to supplement LT processes such as Archaeological Overview Assessments to ensure CHR values within the DFA are identified and conserved. If no opportunities were provided, significant loss of First Nation CHR features would occur and negative impacts to unique non-timber forest resources would likely occur. Traditional and historic knowledge associated with many of the village elders would be lost to DFA planning processes. The LT expects that the number of opportunities provided to Aboriginal people to become involved in the planning process and/or provide CHR input on proposed development activities will be sustained at a level of 50 opportunities or greater.

Continual Improvement

The Licensee Team will work cooperatively with First Nations to solicit their involvement and input into the planning process and/or provide CHR input on proposed development activities. Continual Improvement will also focus on assessing the effectiveness of these input opportunities.

Indicator 34 - Conservation of Cultural Heritage Resource Features

Statement of Indicator	Target	Variance
The percent of forest management operations consistent with the conservation of identified unique or significant CHR features.	Annually, 100% conformance between forest management operations and the strategies identified in the Site Plan to conserve unique or significant CHR features.	-5%

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 5 – Multiple Benefits to Society</p> <ul style="list-style-type: none"> • CSA SFM Element 5.1 – Timber and Non-timber Benefits <p>CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development</p> <ul style="list-style-type: none"> • CSA SFM Element 6.2 – Respect for Aboriginal Forest Values, Knowledge and Uses.
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Indicator Description

The conservation of unique or significant CHR features is especially important to those First Nations whose traditional territories overlap the DFA. A Cultural Heritage Resource feature is a unique or significant place or feature of social, cultural or spiritual importance, such as an archaeological site, cultural heritage site or trail, historic site or a protected area (refer to glossary in Appendix II). Cultural features often incorporate First Nation heritage and spiritual sites, but they can also involve features protected and valued by non-aboriginal people. Maintenance of unique or significant CHR features is an important aspect to SFM because it respects the social and cultural values of the people who traditionally inhabited the DFA and serves to maintain the traditional aspects of their lifestyles. This indicator is designed to ensure that the strategies contained within Site Plans, pertaining to development areas with identified unique or significant CHR features, are implemented on the ground.

Current Practice and Indicator Status

The LT utilize an accepted Archaeological Predictive Model (the Vanderhoof Archaeological Overview Assessment Model) to assess the likelihood that a given area (harvest area or road corridor) has the potential to contain archaeological resources. Also First Nation input and field staff observations serve to identify potential CHR values that can be further assessed by an archaeologist. Where development activities are proposed within zones of high archaeological potential, the LT utilize an Archaeologist to conduct site level Archaeological Impact Assessments (AIAs) to identify, assess and record any archaeological resources that may be present. Mitigative measures to conserve identified features are recommended by the archaeologist and subsequently incorporated into Site Plans. Cultural Heritage

Resource or historic features (non-archaeological protected sites) are also recorded and mitigative recommendations proposed as warranted (i.e. historic trapper cabins, trails, post-1846 CMTs etc). A review of past performance for the period April 1/08 to March 31/09 indicates that where unique or significant CHR features were identified, 100% of the conservation strategies within the applicable Site Plans were implemented during the development phase.

Target Establishment

The target for this indicator was based on a review of past LT performance.

Monitoring and Reporting

Site Plans identify unique or significant CHR features within the development area and prescribe conservation strategies for these features. EMS inspections assess post-harvest consistency with applicable site level plans (in this case whether CHR strategies were implemented as prescribed). Incident tracking systems record any identified non-conformances. These data sources will be queried and collated to determine the annual percentage of LT forest management operations consistent with the conservation of identified unique or significant CHR features.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame, as it is operational in nature. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for indicators such as this. As this indicator currently has a target of 100%, one other scenario has been identified:

- a) What if only 50 % consistency occurred between forest management operations and the strategies identified in the Site Plan to conserve unique or significant CHR features?

Implementing only 50% of strategies to protect CHR features would lead to significant cultural loss to both First Nations and the general public within the DFA. First Nation communities may seek compensation if there is undue infringement of their aboriginal interests. Members of the general public may lose faith in forest management and planning processes if cultural heritage values in the DFA were compromised.

Continual Improvement

Continual improvement will focus on increasing the accuracy of the AOA model, assessing the effectiveness of LT strategies to conserve CHR values and ensuring operational controls are in place to implement prescribed strategies.

Indicator 35 - Public Advisory Group Meetings

Statement of Indicator	Target	Variance
The number of Public Advisory Group meetings per year.	Annually, sustain ≥ 2 PAG meetings per year.	0

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development</p> <ul style="list-style-type: none"> • CSA SFM Element 6.3 – Public Participation • CSA SFM Element 6.4 – Information for Decision Making
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Indicator Description

PAG members represent a diverse spectrum of forest resource interests within the DFA. The PAG initially served to provide valuable input on the SFM values, indicators and targets developed for this SFMP. The PAG continues to provide guidance, input and evaluation of LT performance relative to implementing the

SFMP and achieving the desired targets. PAG members act as a subset of the general public, to identify local forest management issues and values applicable to the DFA, thus assisting in the prioritization of continual improvement efforts. This indicator provides a means of assessing the active status of the PAG by tallying the annual meeting opportunities provided by the LT and demonstrating achievement of public participation requirements.

Current Practice and Indicator Status

During the period April 1/08 to March 31/09 the PAG met 2 times to review LT performance relative to the indicators and targets within the SFMP. The frequency of PAG meetings is consistent with the current maintenance phase of the SFMP; however it is expected that additional meetings will be required to transition to the new CSA standard (CAS Z809-08).

Target Establishment

This target was based on past performance and the assumption that a minimum of two (2) PAG meetings a year will provide the PAG opportunity to review LT performance relative to the SFMP and provide input regarding continual improvement of the SFMP. Requirements to convene the PAG will be dependent on the scope of tasks requiring the guidance, input and/or evaluation by PAG members.

Monitoring and Reporting

PAG meetings will be scheduled a minimum of two times throughout the year. During these meetings, minutes will be recorded indicating the date of the meeting, members in attendance and the items discussed during the meeting. Meeting minutes will be tracked, filed and collated annually to ensure that Licensee Team members are meeting target requirements.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is dependent on the scheduling of PAG meetings based on LT performance review, evaluation and SFMP continual input related tasks. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at greater than or equal to two, one other scenario should be identified:

- a) What if there were no future PAG meetings?

If there were no future PAG meetings, social, economic and environmental values associated with SFM would likely be reduced. Without regular PAG meetings, public participation requirements would not be fulfilled and the diversity of interests (and/or their changes) within the DFA would not be captured. Sustainability of the forest resource would be more difficult to achieve as locally important values might be overlooked without sufficient public input. There would likely be reduced public acceptance of the SFMP and potential skepticism of the CSA standard.

Continual Improvement

The Licensee Team will look for ways to maximize the effectiveness of future PAG meetings. One possible improvement may be to explore creating small working groups to work on specific projects and issues.

Indicator 36 - PAG Satisfaction

Statement of Indicator	Management Objective
Measure the level of satisfaction of the PAG members with the SFM process annually.	Annually, sustain a satisfaction index level ≥ 4 (-0.5 variance).

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development

- CSA SFM Element 6.3 – Public Participation
- CSA SFM Element 6.4 – Information for Decision Making

Indicator Description

The PAG is one of the key elements of public involvement in the SFM process. The PAG provides guidance, input and evaluation of LT performance relative to the SFMP and is instrumental in providing continual improvement input through links to local values and forest resource users within the DFA. Therefore, it is important that the LT have a positive and meaningful working relationship with the PAG. This indicator involves collating PAG satisfaction surveys (distributed during PAG meetings) to determine the level of PAG satisfaction with LT implementation of the SFMP. This information provides the LT with an analysis tool to gauge how well the public participation process is working.

Current Practice and Indicator Status

During PAG meetings, PAG members complete satisfaction surveys. These surveys consist of four general sections including comment on the PAG meeting, the facilitation of the meeting, a rating of meeting logistics, and finally a section for suggestions and general comments. A numerical satisfaction index of 1 to 5 is utilized to evaluate PAG satisfaction (see target establishment). The results of these individual surveys are collated for the meetings and summarized annually for reporting purposes. A summary of the PAG meeting satisfaction survey results is generally distributed at the next PAG meeting. During the period April 1/08 to March 31/09 an average PAG satisfaction index rating of 4.1 was achieved.

Target Establishment

The satisfaction index is a numerical rating system composed of the following values:

- 1 = very poor
- 2 = poor
- 3 = average
- 4 = good
- 5 = very good

The target for this indicator is a satisfaction level of ≥ 4 . This value was determined by the PAG and the LT as being an accurate value to represent overall PAG satisfaction. Any component of the questionnaire that receives a value less than 4 indicates the LT should re-visit the item and attempt to implement strategies to address the perceived deficiency.

Monitoring and Reporting

PAG satisfaction surveys will be distributed during PAG meetings. The LT will collate the results of these individual questionnaires in order to summarize average meeting results. If the target satisfaction index level of ≥ 4 is not achieved, LT members will meet to discuss strategies to improve satisfaction level. Meeting surveys results will be provided to the PAG at the next meeting as part of the meeting minutes and summarized annually for reporting purposes.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it subjective in nature and depends on the individual PAG member’s perception of satisfaction. Therefore, the use of a “what if

scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at greater than or equal to four, one other scenario will be identified:

a) What if the PAG satisfaction index was less than four?

If the PAG satisfaction index was less than four, the public participation process important to SFM would likely be negatively impacted. PAG members not satisfied with the process would likely have no incentive to continue active participation on the PAG. Without diverse DFA specific input, some important resource interests would not be captured, or continual improvement of the SFMP advanced. The input and guidance provided by the PAG may become bias to certain interests and lose focus on overall SFM. General SFM awareness and associated public initiatives would be reduced and perhaps negatively received.

Continual Improvement

The Licensee Team will likely focus continual improvement efforts on assessing and improving the effectiveness of the PAG satisfaction survey to assess the level of PAG satisfaction with the SFM process.

Indicator 37 - PAG Terms of Reference

Statement of Indicator	Target	Variance
Maintain and review the SFMP PAG TOR, every two years to ensure a credible and transparent process.	The PAG TOR will be reviewed every two (2) years to ensure a credible and transparent process.	0%

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development</p> <ul style="list-style-type: none"> • CSA SFM Element 6.3 – Public Participation

Indicator Description

This indicator is designed to ensure the PAG has a guiding document to outline the roles and responsibilities of its members, thus enhancing the effectiveness and functionality of the group. Members of the PAG must be able to have effective and respectful interaction/communication with one another and the LT, 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 effective input from all PAG members. A PAG Terms of Reference (TOR) document has been developed in consultation with the PAG, and that TOR has been endorsed for PAG meeting facilitation. SFM requires public participation and the PAG TOR ensures this requirement is achieved in a credible and transparent fashion. The PAG TOR will be reviewed every two (2) years or as otherwise desired by PAG consensus.

Current Practice and Indicator Status

The PAG TOR document was developed by the PAG and LT and accepted as part of the SFMP process on January 15, 2004. To ensure PAG functionality, continual improvement and to account for new and changing interests within the DFA, it was decided that the PAG TOR would be reviewed every two (2) years, or as suggested by PAG consensus. In this regard, the LT will ensure that PAG members are given adequate notice as to when the TOR document will be reviewed. This review will be documented in the PAG meetings minutes. The LT will update and maintain the TOR document so that any revisions resulting from the review will be incorporated into a new document and distributed to PAG members. The PAG Terms of Reference was last reviewed and approved by the Public Advisory Group and the Licensee Team on December 10, 2009.

Target Establishment

The target for this indicator was established by the LT and PAG. It was determined that a TOR document updated every two (2) years would provide the PAG with an effective guiding framework, while still allowing timely updates as changes within the DFA require.

Monitoring and Reporting

The review of the PAG TOR every two (2) years will be a part of a scheduled PAG meeting and as such will be documented in the meeting minutes. The revised TOR will be date stamped according to its approval date and subsequently distributed to PAG members. The LT will maintain a record of the current TOR and report such annually.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame, as it is dependent on changes within the dynamics of the PAG or unforeseen changes within the DFA. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at every two (2) years, it is important to identify two potential scenarios:

- a) What if the PAG Terms of Reference document was never reviewed?
- b) What if the PAG Terms of Reference document was reviewed five times per year?

If the PAG TOR were never reviewed, the functionality of the PAG may be negatively impacted. This could result in PAG dissatisfaction and reduce the incentive for members to actively participate on the PAG. Without a current TOR to serve as a guiding framework, interest input may become bias to certain resource users and potentially negatively impact those not adequately represented, or compromise SFM values.

If the PAG TOR were reviewed five times per year, it would not be an efficient use of the PAG’s time and commitment to SFM. It is very likely that some active members would not choose to continue to participate on the PAG and similar consequences indicated above would result. Spending an excessive amount of time reviewing the PAG TOR would ultimately detract from other important aspects and contributions that PAG members make within the course of the year.

Continual Improvement

Continual improvement will focus on assessing the adequacy of this indicator, to assess the functionality and effectiveness of the public participation process.

Indicator 38 - Public Review of SFM Plan

Statement of Indicator	Target	Variance
The number of times the SFM plan and associated annual reports will be communicated to the public for review and comment annually.	Annually, the SFMP and associated annual reports will be communicated to the public ≥ 3 times.	0

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development <ul style="list-style-type: none">• CSA SFM Element 6.3 – Public Participation• CSA SFM Element 6.4 – Information for Decision Making
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Indicator Description

This indicator is one of a group that helps to increase the overall understanding and awareness of SFM. The SFMP and resulting annual reports will be communicated to the public at least three times throughout the year, either through a public open house or by a posting the documents on the Internet.

Current Practice and Indicator Status

The SFMP is currently posted throughout the year on certification websites maintained by the LT for public access and awareness. For the period April 1/08 to March 31/09, the current SFMP was available for the public to view at Canfor's website (www.canfor.com), the BCTS certification website (www.for.gov.bc.ca/bcts/areas/TSN_certification.htm) and the Sustainable Forest Management website for the Prince George Timber Supply Area (www.sfmptgsa.com).

Target Establishment

The target for this indicator is based on past LT performance and effective use of publicly accessible websites to raise SFM awareness and provide public access to the SFMP and its related annual reports.

Monitoring and Reporting

The websites on which the SFMP and its related annual reports are posted are maintained by members of the LT, thus monitoring and reporting are straightforward. The number and sources by which the SFMP is made available to the public will be collated annually. Should open houses or other public forums be utilized, they will be documented and tracked individually by LT members.

Forecasting and Probable Indicator Trends

Forecasting for this indicator is not easy to quantifiably forecast over a defined time frame, as it is totally dependent on the number of opportunities and sources chosen to publicly communicate the SFMP. Therefore, the use of a "what if scenario" is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of ≥ 4 , one other potential scenario should be developed:

- a) What if the SFMP and associated annual reports were not communicated to the public?

If the SFMP and associated annual reports were not communicated to the public, SFM awareness would be negatively impacted and public educational opportunities in SFM would be reduced. Valuable forest resource input within the DFA would be reduced and the opportunity to recruit new PAG members would be lessened. Annual SFM reports provide significant detail on DFA specific forest resources and forest management practices and should this not be communicated, additional value-added economic opportunities may not be recognized and thus the forest resource not fully utilized. Reduced communication on the status of forest management within the DFA can only have a negative impact on public acceptance of SFM efforts within the DFA.

Continual Improvement

Continual Improvement efforts will focus on evaluating the effectiveness of the various websites to communicate the SFMP and related annual reports to the public. A website user tracking system can be explored to collect data on the public use of the applicable websites.

Indicator 39 - SFM Extension Activities

Statement of Indicator	Target	Variance
The number of opportunities provided for SFM extension activities annually.	Annually, sustain ≥ 4 SFM extension opportunities.	-1

CCFM SFM Criteria and CSA SFM Elements:

<p>CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development</p> <ul style="list-style-type: none"> • CSA SFM Element 6.3 – Public Participation • CSA SFM Element 6.4 – Information for Decision Making
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Indicator Description

This indicator is designed to ensure that the collective understanding of SFM by the forest industry and the public is increased. This indicator describes the number and type of extension opportunity provided to communities tributary to the DFA and opportunities provided to industry employees for SFM awareness training.

Current Practice and Indicator Status

The LT have and continue to provide a variety of SFM extension opportunities within those communities tributary to the DFA and the forest industry staff employed within the DFA. During the period April 1/08 to March 31/09, seven extension opportunities were provided by the LT (see Table 15 below).

Table 15. SFM Extension Opportunities within the Defined Forest Area

Activity Description	Audience
Project Forest Management at Echo Lake Bible Camp	Student / educational
BCTS – TSN Certification (SFM awareness, soil disturbance training etc.)	Forest Industry Staff
Canfor external website and certification initiatives posting	Public and Forest Industry
MOFR office – SFM BCTS EMS Field Manuals, Booklets & Staff Guides	Forest Industry Staff
BCTS SFM Booth at Forest Expo	Public and Forest Industry
PAG FIA project presentations	Public
Riverside Park Wildlife Detective Event	Student / Public

Target Establishment

The target was established through review of LT past performance and an assumption of future trends (reduce harvest levels associated with beetle mortality) within the DFA.

Monitoring and Reporting

Extension activities offered by members of the LT will be documented (with supportive documentation), annually collated, summarized and reported by type of opportunity provided. Where joint opportunities are provided, the hosting proponent will track and record the event. Periodically conducting an “SFM Public Opinion Survey” (minimum of every 5 years) as described under Indicator 43, will assist in assessing the effectiveness of the extension opportunities provided by the LT to increase public SFM awareness. Likewise, trends based on the level of LT staff and contractors SFM awareness (identified in annual CSA audits) should verify an increased level of SFM awareness.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is dependent on individual offering and choice of extension opportunity. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of ≥ 4, one other potential scenario should be developed:

- a) What if there were no opportunities provided for SFM extension activities?

If no opportunities were provided for SFM extension activities, the overall understanding of SFM and CSA certification would decrease. SFM is based on evolving science and it is important for forest industry staff

and the general public to stay informed on forest management practices within the DFA. LT SFM extension initiatives provide an opportunity for both the public and forest industry to gain an insight into the forest resource values important to the other party. The public has an opportunity to better understand the management of their forests and the importance of a sustained resource to the forest industry. Any diminished educational opportunity has a negative impact whether assessed from a public or forest industry employee.

Continual Improvement

Continual improvement efforts will focus on methods to assess the effectiveness and scope of the opportunity provided to enhance SFM awareness within the DFA.

Indicator 40 - Public and Resource Users Involvement in Planning Processes

Statement of Indicator	Target	Variance
The number and variety of effective opportunities given to the residents and stakeholders to be proactively involved in planning processes and provide input on proposed development.	Annually, sustain \geq 100 opportunities for residents and stakeholders to be proactively involved in planning processes and provide input on proposed development.	- 10

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development <ul style="list-style-type: none"> • CSA SFM Element 6.3 – Public Participation • CSA SFM Element 6.4 – Information for Decision Making

Indicator Description

This indicator was designed to assess the LT’s performance relative to providing stakeholders, effective opportunities to be proactively involved in the planning process and provide input on proposed development activities. This ensures that when forestry activities are planned, information is exchanged in an effective and timely manner, so as to resolve potential land use conflicts before they occur. This process will help to identify public/stakeholder interests and non-timber values that require consideration within the LT’s planning framework. Resulting stakeholder input could include the identification of interest areas, detail as to the nature of the interest on the land base and site level detail regarding potential impacts resulting from proposed development activities.

Current Practice and Indicator Status

The LT solicits public and stakeholder input on a landscape basis through a review and comment process associated with Forest Stewardship Plan approval. Public and stakeholder input is sought on the results and strategies that guide forest management operations. Once an FSP is approved, an information sharing process is utilized to share proposed site level planning and seek public and stakeholder input on such. These review and comment/ information-sharing opportunities are provided through a variety of methods. A review of current LT performance is documented in Table 16 below.

Table 16. Effective Opportunities Provided to Non-Timber Resource Users to be Pro-actively Involved in the Planning Process (April 1, 2008 to march 31, 2009)

Description of Opportunity	Opportunities
Open Houses	0
Individual Meetings	9
Letters	43
Newspaper Advertisements	3
Other	28
Total	83

Target Establishment

The current target is based on a review of past LT performance and the assumption that harvest levels may decline due to the impact of the Mountain Pine Beetle epidemic.

Monitoring and Reporting

The number and type of LT opportunities provided for residents and stakeholders to be pro-actively involved in planning processes and provide input regarding proposed development will be tracked by LT planning staff. Each LT member will be required to review and summarize this information annually for collating and reporting purposes.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame, as it is dependent on human interaction. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator has a stated target of ≥ 50 , one other potential scenario should be developed:

- a) What if less than 10 effective opportunities were given to residents and stakeholders to be pro-actively involved in the planning process, and provide input on proposed development activities?

If there were less than 10 effective opportunities provided to residents and stakeholders to be proactively involved in the planning process and provide input on proposed development activities, SFM within the DFA would be negatively impacted. Public input into forest management planning is a key ingredient to SFM and respecting non-timber values within the DFA. Reduced public and stakeholder input would likely result in lower public acceptance of the management of the forest resources within the DFA. Without informed local level input, other non-timber values such as cultural heritage and recreation would likely be negatively impacted. Negative impacts to other forest values would in turn decrease the economic value derived from the forest resource within the DFA.

Continual Improvement

Continual Improvement will likely focus on evaluating the effectiveness of the pro-active planning opportunities provided by the LT (i.e. strategic/landscape level vs the operational level).

Indicator 41 - Research and Development Projects

Statement of Indicator	Target	Variance
The number of research and development projects and/or partnerships completed within the DFA.	Annually, sustain ≥ 3 research and development opportunities within the DFA.	-1

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 1 – Conservation of Biological Diversity <ul style="list-style-type: none">• CSA SFM Element 1.1 – Ecosystem Diversity CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none">• CSA SFM Element 5.1 – Timber and Non-timber Benefits
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Indicator Description

SFM system requirements are based on adaptive management and continual improvement, which can both be guided by the results of research and development projects, or partnerships undertaken within the DFA. Research and development initiatives can also provide direct economic benefits to the community’s tributary to the DFA through local job creation and the purchase of goods and services. Research projects

and other DFA partnerships also serve to enhance ecological, economic and social benefits through technological advancement (i.e. increased utilization of beetle-killed fibre). The proximity of the DFA to the University of Northern British Columbia combined with the unprecedented Mountain Pine Beetle impact on the DFA pine forests provides enhanced research opportunities.

Current Practice and Indicator Status

The current status of research and development projects, or partnerships undertaken within the DFA during the period April 1st, 2008 to March 31st, 2009 are summarized below in Table 17.

Table 17. The Number of Research and Development Projects and/or Partnerships in the DFA

Research and Development Projects	Total Number
Biodiversity Projects	6
Silviculture Projects	0
Forest Product Research and Development	2
Total Number	8

Target Establishment

The target was established through a review of past LT performance and reasonable expectations for annual fluctuations due to market conditions and the future availability of research funding.

Monitoring and Reporting

Licensee Team members will track and report individual projects and/or partnerships undertaken within the DFA and these will be summarized by type and reported annually.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it is related to individual choice and circumstance. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target set at greater than or equal to three, one other scenario will be identified:

- a) What if no research and development projects and/or partnerships were completed within the DFA?

If there were no research and development projects and/or partnerships undertaken within the DFA, the core values of SFM would be at risk. Without the research necessary to support forest management evolution within the DFA, ecological, economic and social values would be negatively impacted. Biological richness within the vast beetle-killed forests of the DFA may be reduced. Lack of technological advancement may jeopardize local mill viability. Community stability may be compromised through long-term timber supply impacts.

Continual Improvement

Continual improvement will focus on building working relationships with the local University, research organizations (i.e. FERIC) and members of the local research community.

Indicator 42 - Percent Timely Responses

Statement of Indicator	Target	Variance
The percent of LT timely responses to documented Forest Management Planning concerns.	Annually, achieve a 100% timely response rate to documented public concerns regarding LT Forest Management Planning and related practices.	-10%

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development

- CSA SFM Element 6.3 – Public Participation
- CSA SFM Element 6.4 – Information for Decision Making

Indicator Description

Members of the LT solicit feedback on strategic plans (i.e. FSP results & strategies) and site specific operational activities (i.e. proposed cutblocks & roads) through related information sharing processes. Public involvement is an important aspect of SFM, so it is necessary to provide meaningful and effective opportunities to incorporate public input into forest management planning. Equally important is LT feedback relative to public, or stakeholder concerns expressed regarding forest management planning. Timely response to documented concerns often serves to clarify proposed activities, or allows input to be incorporated into subsequent site planning.

Current Practice and Indicator Status

The LT strives to provide a timely response to all written stakeholder, or general public concerns expressed relative to their forest management planning efforts within the DFA. A review of questions raised with regard to strategic, or site level planning and the timely responses put forth by LT members was analyzed for the reporting period (April 1/08 to March 31/09) and a 100% timely response rate was determined (i.e. within 30 days).

Target Establishment

The target was established based on past LT performance relative to this indicator and the desire to emphasize that stakeholder or public concerns are dealt with in a timely and thorough manner.

Monitoring and Reporting

Written concerns expressed regarding LT forest management planning are tracked by LT members (generally planning staff). LT responses to received concerns from stakeholders or the general public are likewise documented and can be monitored and tracked to ensure an LT response is provided in a timely manner. LT member timely response rates are collated and summarized annually for the DFA.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame, as it is dependent on an individual’s choice of implementation. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this and since the stated target is 100%, only one other potential scenario will be presented:

- a) What if there was a 50% LT timely response rate to all written and documented concerns?

If the LT only responded to 50% of all written concerns in a timely manner, it would emphasize that public input is not being given adequate consideration within the DFA. Public input into forest management is a key value in sustainable forest management. Not only would LT/resource user conflicts increase within the DFA, but it is likely that other forest values (i.e. recreation, cultural heritage, wildlife etc.) would be compromised. If other forest values are not fully realized, or negatively impacted, economic and social benefits derived from the DFA forest would decrease.

Continual Improvement

Continual improvement will involve incorporating this indicator into indicator # 40 (proactive planning). This will ensure that the LT is proactively soliciting stakeholder and general public input and responding to concerns received in a timely manner.

Indicator 43 - SFM Public Opinion Survey

Statement of Indicator	Target	Variance
Periodically conduct and report out on a DFA wide SFM Public Opinion Survey	Conduct and report on the survey a minimum of every 5 years.	0

CCFM SFM Criteria and CSA SFM Elements:

CCFM Criterion 5 – Multiple Benefits to Society <ul style="list-style-type: none">• CSA SFM Element 5.1 – Timber and Non-timber Benefits CCFM Criterion 6 – Accepting Society’s Responsibility for Sustainable Development <ul style="list-style-type: none">• CSA SFM Element 6.3 – Public Participation• CSA SFM Element 6.4 – Information for Decision Making

Indicator Description

Periodically conducting an “SFM Public Opinion Survey” (minimum of every 5 years) not only serves to assist the LT and PAG in assigning priorities, but it provides an opportunity to identify public opinion trends & comparisons relative to forest management within the DFA (significant value given the current landscape condition). The LT envisions periodically undertaking this survey (UBC – SFM Public Opinion Survey) as a means of assisting the PAG to focus and prioritize continual improvement within the DFA and this SFM plan. The formal nature of this survey, its analysis and rollout will provide the LT and PAG a broader cross section of public opinion relative to Sustainable Forest Management.

Current Practice and Indicator Status

The LT last conducted this survey in conjunction with UBC in January 2009 and will report out the outcome to the PAG in conjunction with the 2009 – 2010 annual report. The outcome of this survey will be utilized to provide guidance to the LT and PAG, as to where continual improvement efforts should be focused in coming years (i.e. Annual Prioritization for CI Matrix initiatives).

Target Establishment

The target of conducting an “SFM Public Opinion Survey” at least every five (5) years was deemed an appropriate timeline to identify trends, within a changed DFA landscape condition. This changed condition could be biological (i.e. beetle mortality), economic (i.e. market or product changes) or social (i.e. mill closures, community stability).

Monitoring and Reporting

The “SFM Public Opinion Survey” will be completed, analyzed and reported out to the PAG. This process and the resulting prioritization of continual improvement initiatives will be captured in the associated PAG minutes and thus serve to validate achievement of the indicator target.

Forecasting and Probable Indicator Trends

This indicator is not easy to quantifiably forecast over a defined time frame as it subjective in nature and depends on individual choice of implementation. Therefore, the use of a “what if scenario” is beneficial in identifying anticipated future trends for an indicator such as this. As this indicator currently has a target of completing a public opinion survey within a five year period, one other scenario will be identified:

a) What if the LT did not complete an SFM Public Opinion Survey?

If the LT did not complete a public opinion survey, the PAG would serve as the only source of public opinion relative to continual improvement of this SFM plan. PAG membership would have to reflect all the diverse interests within the DFA to gain an equivalent perspective on Sustainable Forest Management. Given that PAG membership tends to decrease during the SFMP maintenance phase, this may not be possible and a balanced perspective not achieved. Without the survey results from a broad cross section of the general public, continual improvement efforts may focus on indicator revision, or development inconsequential to the general public using the forest resource within the DFA. The LT believe the output from these periodic public opinion surveys will serve as a valuable tool to guide the PAG in continual improvement of the SFMP.

Continual Improvement

Continual improvement efforts will focus on reviewing the survey (with UBC and the PAG) to ensure that its composition is sufficient to address local forest management issues within the DFA and meet the intended use as a continual improvement guidance tool. Potential enhancements may include assessing whether addition structure is required to acquire, or assess a unique First Nation perspective of SFM.

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Appendices

Appendix I: Sustainable Forest Management Plan Revision Tracking

Vanderhoof Sustainable Forest Management Plan – Revisions

- 1) DRAFT 1.0 October 2004 – Distributed to Vanderhoof Public Advisory Group members for review on October 28, 2004.
- 2) DRAFT 2.0 December 2004 – Distributed to Canfor in December 2004 for internal audit to take place late December 2004, early January 2005
- 3) DRAFT 3.0 January 2005 – Distributed to Vanderhoof Public Advisory Group members on January 29, 2005.
- 1) DRAFT 3.0 February 2005 - Revisions made after PAG distribution and Canfor CSA pre-audit review.
- 2) SFMP version 1.0 July 29, 2005 - Revisions made after PWC review and PAG endorsement of proposed changes.
- 3) SFMP version 2.0 July 2006 – Revisions consolidated over previous Annual Period.
- 4) SFMP version 3.0 September 2010 – Complete revision of SFMP framework (Slocan framework to CSA (value, objective, indicator, target). Complete update of all revisions to the SFM plan since version 2.0 (including indicator modification, deletion, implementation, current practice, status, continual improvement and target revisions).

Appendix II: Vanderhoof SFMP Public Advisory Group Glossary

From CSA definitions, Ministry of Forests "Glossary of Forestry Terms" website, and miscellaneous sources

Aboriginal: "Aboriginal peoples of Canada, which includes Indian, Inuit and Métis peoples of Canada" (Constitution Act 1982).

Access Management Plan: An operational plan that shows how road construction, modification and deactivation will be carried out to protect, or mitigate impacts on, known resources or sensitive areas, while maximizing the efficacy of forest resource development.

Access Structures: A structure, including a road, bridge, landing, gravel pit, or other similar structure that provides access for forest management activities such as harvesting.

Adaptive Management: A learning approach to management that recognizes substantial uncertainties in managing forests and incorporates into decisions the experience gained from the results of previous actions. Adaptive management rigorously combines management, research, monitoring, and means of changing practices so that credible information is gained and management activities are modified by experience.

Age Class: Any interval into which the age range of trees, forests, stands, or forest types is divided for classification. Forest inventories commonly group trees into 20-year age classes.

Annual Allowable Cut (AAC): The allowable rate of timber harvest from a specified area of land. The Chief Forester sets specific AACs for Timber Supply Areas and Tree Farm Licences in accordance with Section 8 of the *Forest Act*.

Best Management Practice (BMP): A forestry practice or combination of practices determined to be the most practicable means of protecting and conserving forest resources and forest land productivity, now and into the future. BMP are often developed for Forest Roads, Stream Crossings, Riparian Management Zones, handling fuels, lubricants and trash, and others.

Biogeoclimatic Ecosystem Classification (BEC): A hierarchical system of ecosystems that integrates regional, local and chronological factors and combines climatic, vegetation and site factors. The following BEC zones are within the Vanderhoof Forest District:

- ESSF – Engelmann Spruce-Sub Alpine Fir
- SBPS – Sub-Boreal Pine Spruce
- SBS – Sub-Boreal Spruce

Subzones further refine the zones and are based on precipitation and temperature. Examples include: mc – moist, cold; mv – moist, very cold; dk – dry, cool; dw – dry, warm; xv – very dry, very cold. Each subzone can be further refined by variants. A variant reflects further difference in regional climate. Also see Site Series.

Biological Richness (species richness): Species presence, distribution, and abundance in a given area.

Biomass: The total dry weight or volume of all or part of a tree.

Carbon Cycle: The storage and cyclic movement of organic and inorganic forms of carbon between the biosphere, lithosphere, hydrosphere, and atmosphere.

Carbon Sink: Forests and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting CO₂ emissions.

Coarse-filter Ecosystem Group: Is the outcome of grouping site series that have relative similarities of their indicator plant communities. This term is also referred to habitat types in the SFM Plan.

Coarse Woody Debris (CWD): Downed woody material of a minimum diameter or greater, either resting on the forest floor or at an angle to the ground of 45 degrees or less. Coarse woody debris consists of sound and rotting logs and branches, and may include stumps when specified. For the purposes of coarse woody debris, a log is considered as being a minimum of 2 m in length and 7.5 cm in diameter at one end. CWD provides habitat for plants, animals and insects, and a source of nutrients for soil development.

Conserve: Keep from harm or damage.

Cultural Feature: Unique or significant places and features of social, cultural or spiritual importance, such as an archaeological site, recreational site or trail, cultural heritage site or trail, historic site, or protected area.

DBH (diameter at breast height): The stem diameter of a tree measured at breast height, 1.3 meters above the ground.

Ecosystem: A dynamic complex of plants, animals and micro-organisms and their non-living environment interacting as a functioning unit.

Edge Habitat: Habitat conditions, such as degree of humidity and exposure to light or wind, created at or near the boundary dividing ecosystems, for example, between open areas and adjacent forest.

Environmentally Sensitive Area (ESA): An area requiring special management attention to protect important scenic values, fish and wildlife resources, historical and cultural values, or other natural systems or processes. ESAs for forestry include potentially fragile, unstable soils that may deteriorate unacceptably after forest harvesting, and areas of high value to non-timber resources such as fisheries, wildlife, water, and recreation.

Extension Services: Assistance provided to people to help them learn more about a particular subject from people with specific technical expertise.

Forest and Range Practices Act (FRPA): The *Forest and Range Practices Act* brings in the application of a results-based system for the management of forest and range resources. It will fully replace the *Forest Practices Code of British Columbia Act* by December 2005.

Free-growing Stand: 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.

Free-growing Assessment: the determination for whether young trees have attained free-growing status.

Global Ecological Cycles: The complex of self-regulating processes responsible for recycling the Earth's limited supplies of water, carbon, nitrogen, and other life-sustaining elements.

Inoperable: Lands that are unsuited for timber production now and in the foreseeable future because of a range of factors including: elevation; topography; inaccessible location; low value of timber; small size of timber stands; and steep or unstable soils that cannot be harvested without serious and irreversible damage to the soil or water resources. Inoperable lands may also be designated as parks, wilderness areas, or other uses incompatible with timber production.

Interior Forest: Forest that is far enough away from a natural or harvested edge that the edge does not influence its environmental conditions, such as light intensity, temperature, wind, relative humidity, and snow accumulation and melt.

Live Tree: Any living tree of a merchantable size. General merchantability standards are 12.5 cm at dbh for pine and 17.5 dbh for spruce and fir.

Long Run Sustained Yield (LRSY): For any Timber Supply Area, the LRSY is equal to the culmination of mean annual increment weighted by area for all productive and utilizable forest land types in that TSA including all stands classified as Not Satisfactorily Restocked (NSR), Disturbed—Stocking Doubtful and potentially usable non-commercial cover.

Managed Forest Land: Forest land that is managed under a forest management plan, utilizing the science of forestry.

Merchantable Timber: a tree or stand that has attained sufficient size, quality and/or volume to make it suitable for harvesting.

Natural Disturbance: The historic process of fire, insects, wind, landslides, and other natural events in an area not caused by humans.

Natural Disturbance Unit (NDU): Large geographic areas that have similar topography, climate, disturbance dynamics (e.g., fire cycle, patch size), stand development and successional patterns.

NHLB: Non-Harvestable Land Base. The portion of the total area of the Defined Forest Area considered **not** to contribute to, and **not** to be available for, long-term timber supply. The non-harvestable land base includes parks, protected areas, inoperable areas, and other areas and tends to change slightly over time.

Nitrogen Cycle: The movement of nitrogen in its many forms between the hydrosphere, lithosphere, atmosphere and biosphere.

North Central Interior: The land base that includes communities from 100 Mile House to Fort St. John (south to north) and Terrace to Valemount (west to east).

Opportunity THLB: Currently inoperable forests in the Timber Harvesting Land Base that may become operable in the future due to current factors that may be mitigated, such as developed access or a minimum tree diameter to improve the economic feasibility of harvesting.

Over Time: The change from now moving forward in time and includes short-term (≤ 20 years), mid-term (>20 years and less than one rotation ≥ 100 years), and long-term ($>$ one rotation).

Patch: A particular unit with identifiable boundaries and different vegetation from its surroundings.

Permanent Access: A structure, including a road, bridge, landing, gravel pit or other similar structure that provides access for timber harvesting and is shown on a forest development plan, access management plan, logging plan, road permit or silviculture prescription / site plan as remaining operational after timber harvesting activities on the area are complete.

Plant Association: A community of plants, generally comprised of, at least the three most abundant species found growing on a site, with at least one representative from the tree layer and one or more representatives from the shrub, herb, or bryophyte layers.

Predictive Ecosystem Mapping (PEM): A computer-GIS, and knowledge-based method that divides landscapes into ecologically oriented map units for management purposes. PEM is a new and evolving inventory approach designed to use available spatial data and knowledge of ecological-landscape relationships to automate the computer generation of ecosystem maps.

Productive Capability: The current and future ability of forest ecosystems to produce biomass.

Productivity: The natural ability of a forest ecosystem to capture energy, support life forms, and produce goods and services.

Public: The people as a whole within a defined area (i.e. community, forest district). At its broadest sense public means everyone anyone in the world and to narrowest sense public might be considered as the people living on your street.

Regeneration delay: the time allowed in a prescription between the start of harvesting in the area and the earliest date by which the prescription requires a minimum number of acceptable well-spaced trees per hectare to be growing in that area. There is a maximum permissible time allowed and comes from standards developed and/or approved by government.

Resident: A member of the public who has resided within a defined area (i.e. community, forest district, defined forest area) for more than 6 months.

Riparian: An area of land adjacent to a stream, river, lake or wetland that contains vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas.

Riparian Habitat: Vegetation growing close to a watercourse, lake, swamp, or spring that is generally critical for wildlife cover, fish food organisms, stream nutrients and large organic debris, and for streambank stability.

Riparian Management Area (RMA): Defined in the Forest Practices Code of British Columbia Act Operational Planning Regulation as an area, of width determined in accordance with Part 10 or the regulation, that is adjacent to a stream, wetland or lake with a riparian class of L2, L3 or L4; and, consists of a riparian management zone and, depending on the riparian class of the stream, wetland or lake, a riparian reserve zone. See Figure 1.

Riparian Management Zone (RMZ): Defined in the Forest Practices Code of British Columbia Act Operational Planning Regulation as that portion of the riparian management area that is outside of any riparian reserve zone or if there is no riparian zone, that area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 10 or the regulation. See Figure 1.

Riparian Reserve Zone (RRZ): Defined in the Forest Practices Code of British Columbia Act Operational Planning Regulation as that portion, if any, of the riparian management area or lakeshore management area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 10 of the regulation. See Figure 1.

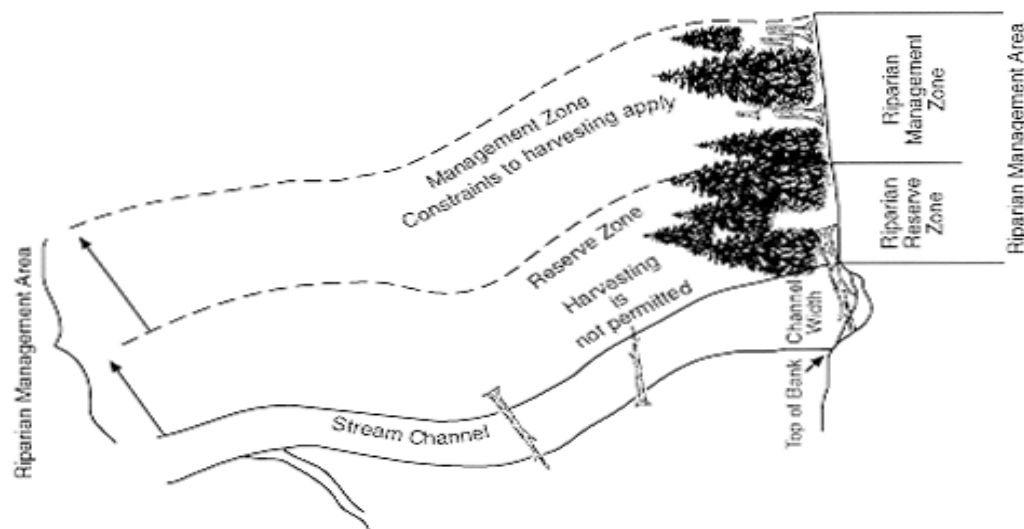


Figure 1. Riparian management area showing a management zone and a reserve zone. Source: Riparian Management Area Guidebook 1995.

Road Deactivation: measures taken to stabilize roads and logging trails during periods of inactivity, including the control of drainage, the removal of sidecast where necessary, and the re-establishment of vegetation for permanent deactivation. Road deactivation ranges from temporary to permanent.

Road Permit: An agreement entered into under Part 8 of the Forest Act to allow for the construction or modification of a forest road to facilitate access to timber planned for harvest.

Stakeholder: A person with an interest or concern with resource management within a defined area (i.e. community, forest district, defined forest area).

Seral Stage: Any stage of development of an ecosystem, from a disturbed, non-vegetated state (early seral) to a mature plant community (late seral).

Site Index: The height of a tree at 50 years of age (age is measured at 1.3m above the ground) In managed forest stands site index may be predicted using either (1) the biogeoclimatic ecosystem classification for the site or (2) the Site Index Curve which uses the height and age of sample trees over 30 years old.

Site Plan: A site level plan that supports the strategic (and legal) results and strategies contained within a proponents Forest Stewardship Plan (FSP). The site plan identifies the appropriate standards for specific cutblocks, including:

- Stand-level biodiversity, permanent access, soil disturbance limits, stocking requirements, regeneration date, and free-growing date at the standards unit level.

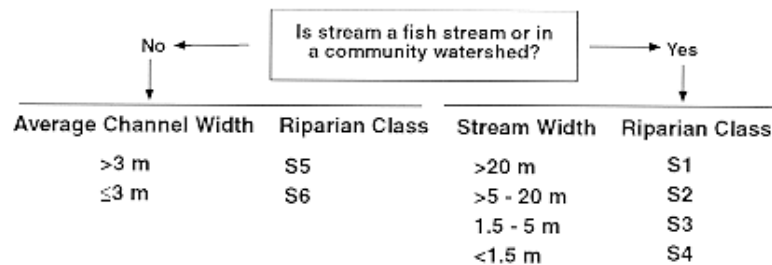
Site Series: A landscape position consisting of a unique combination of soil edaphic features, primarily soil nutrient and moisture regimes within a biogeoclimatic subzone or variant. Soil nutrient and moisture regimes define a site series, which can produce various plant associations (see definition of "plant association"). In the BEC system, site series is identified as a number (e.g., 01, 02, 03,).

Soil Disturbance: Disturbance caused by a forest practice on an area. This includes areas occupied by excavated or bladed trails of a temporary nature, areas occupied by corduroyed trails, compacted areas, and areas of dispersed disturbance.

Soil Moisture Regime: The amount of moisture in the soil. Generally shown on a scale going from **xeric** (being deficient in moisture - dry) to **mesic** (characterized by moderate or a well-balanced supply of moisture) to **hydric** (characterized by excessive moisture).

Stocking Standard: The required range of healthy, well-spaced, acceptable trees growing on an area to achieve a free-growing stand.

Stream Class: A stream is a watercourse, having an alluvial sediment bed, formed when water flows on a perennial or intermittent basis between continual definable streambanks. There are six riparian stream classes designated S1 to S6 that are based on presence of fish, occurrence in a community watershed and average channel width. S1 to S4 streams are fish streams or streams in a community watershed. S5 and S6 streams are not fish streams and are not within a community watershed.



Stumpage: The fee that individuals and firms are required to pay the government for harvesting Crown timber in British Columbia. Stumpage is determined through a complex appraisal of each stand or area of trees that will be harvested for a given timber mark. A stumpage rate (\$ per m³) is determined and applied to the volume of timber that is cut, and the individual or firm is invoiced by the Ministry of Forests.

Sustainable Forest Management (SFM): The balanced, concurrent sustainability of forestry-related ecological, social, and economic values for a defined area over a defined time frame.

SFMP: Sustainable forest management plan.

Snag: A standing dead tree, or part of a dead tree, found in various stages of decay—from recently dead to very decomposed.

Timber Harvesting Land Base (THLB): The portion of the total area of the Defined Forest Area considered to contribute to, and to be available for, long-term timber supply. The harvesting land base is defined by reducing the total land base according to specified management assumptions and tends to change slightly over time.

Visual Landscape Inventory: the identification, classification, and recording of the location and quality of visual resources and values.

Unmerchantable: of a tree or stand that has not attained sufficient size, quality and/or volume to make it suitable for harvesting.

Unsalvaged Losses: the volume of timber destroyed by natural causes such as fire, insect, disease or blowdown and not harvested, including the timber actually killed plus any residual volume rendered non-merchantable.

Utilization Standards: the dimensions (stump height, top diameter, base diameter, and length) and quality of trees that must be cut and removed from Crown land during harvesting operations. For detailed standards see the Provincial Logging Residue and Waste Measurement Procedures Manual.

Waste: the volume of timber left on the harvested area that should have been removed in accordance with the minimum utilization standards in the cutting authority. It forms part of the allowable annual cut for cut-control purposes. For detailed standards see the Provincial Logging Residue and Waste Measurement Procedures Manual.

Water Cycle (also known as the hydrologic cycle): The journey water takes as it circulates from the land to the sky and back again.

**VANDERHOOF SUSTAINABLE FOREST
MANAGEMENT PLAN**

Public Advisory Group

**TERMS OF REFERENCE
As of December 10, 2009**

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 was developed for the Vanderhoof Forest District and incorporated these principles of sustainable forest management. One of the goals of the Vanderhoof SFM Plan is to provide members of the Licensee Team the opportunity to obtain Canadian Standards Association (CSA) certification where appropriate.

1.2 Licensee Team

The Licensee Team for the Vanderhoof SFM Plan consists of representatives from Canadian Forest Products Ltd. (Canfor) and BC Timber Sales (Stuart-Nechako Business Area)

1.3 Defined Forest Area

The Defined Forest Area (DFA) for the Sustainable Forest Management Plan is the Vanderhoof Forest District, excluding private land and woodlots. The DFA boundaries are shown in the map provided in Figure 1 in the SFMP text.

1.4 Public Advisory Group

The Public Advisory Group (PAG) for the Vanderhoof Sustainable Forest Management Plan is comprised of a range of individuals representing the interests listed in section 3.1.1. As outlined in these terms of reference, the PAG will specifically work under the Defined Goals (section 2) as an open, transparent and accountable process.

2. Defined Goals

The goal of the Vanderhoof Sustainable Forest Management Plan is to demonstrate commitment to sustainable forest management principles for the Vanderhoof Forest District. The development and implementation of the SFM Plan will be the responsibility of the Licensee Team, which will work with a Public Advisory Group.

The Public Advisory Group will have the opportunity to work with the Licensee Team to:

- a. Review the nine criteria identified in the SFM Framework and identify interests for each.
- b. Identify an indicator for each criterion.
- c. Identify measures and targets for each indicator.
- d. Develop alternative strategies to be assessed.
- e. Assess alternative strategies and select the preferred one.
- f. Review the SFM plan.
- g. Design monitoring programs, evaluate results, and recommend improvements.
- h. Discuss and resolve any issues relevant to SFM on the DFA.

The Licensee Team and the PAG shall ensure that the indicators, measures and targets are consistent with relevant government legislation, regulations and policies.

The Licensee Team and the PAG recognize and agree that Aboriginal participation in the public participation process will not prejudice Aboriginal and Treaty rights.

The Licensee Team will attempt to resolve all strategic level issues (including those recognized and agreed to by the PAG) relative to the SFM; and identify appropriate processes and contacts for specific operational issues.

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. In addition to Aboriginals, the PAG consists of members representing the following interests:

- a. Agriculture (includes farming and ranching)
- b. Berry and mushroom picking
- c. Commercial recreation and tourism (includes guide outfitters)
- d. Environment and conservation
- e. Forest contractors
- f. History and archaeology
- g. Mill workers
- h. Mining, oil and gas
- i. Non-commercial recreation and tourism (includes resident hunting and fishing)
- j. Residents of the Defined Forest Area (Vanderhoof Forest District)
- k. Retirees
- l. Rural communities
- m. Small community business
- n. Trapping
- o. Woodlots

3.1.2 Selection of PAG Members

The Licensee Team initially recruited potential members from the above interests through mailed invitations to individuals on the comprehensive stakeholder database compiled for the Community Natural Resources Committee. As well, they held a public open house and advertised in local newspapers to generate interest in the PAG.

Based on the above:

- a. The potential membership was reviewed at the initial PAG meetings by members of the public and the Licensee Team. Once the PAG was established, members of the PAG and the Licensee Team could recommend changes in PAG structure and potential members.
- b. The Licensee Team, in consultation with the PAG, confirms appointments, replacement, and removal of PAG members.
- c. The PAG will aim to be comprised of individuals representing an equitable distribution of the interests identified in 3.1.1.
- d. The long term objective will be to target the size of the PAG, excluding Aboriginals, to 15 members
- e. Existing PAG members will be grandparented into the ongoing PAG and new members will only be recruited where interests identified in 3.1.1 are not represented in the PAG.
- f. The list of interests and/or members may be revised based on input from the PAG and with the agreement of the Licensee Team.
- g. 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 role of PAG members is to:

- a. Provide input related to the Defined Goals (defined in Section 2).
- b. Attend meetings regularly having reviewed meeting materials prior to meeting.
- c. Assume responsibility towards reaching consensus on recommendations to the Licensee Team.
- d. Inform her/his alternate and the facilitator if unable to attend a PAG meeting and ensure that the alternate is informed, up-to-date and prepared prior to the alternate participating in a PAG meeting. This includes providing the alternate with a past meeting summary in a timely, effective fashion.
- e. Provide input related to the Defined Goals (defined in Section 2)

Based on consultation with the PAG, members may be replaced and/or removed if more than two consecutive meetings are missed without a valid reason (i.e. Absent with regrets) *and without notifying his/her alternate* and a Licensee Team representative if they cannot attend a meeting. 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 provide input for discussion about an agenda item to the PAG, or *his/her alternate*, before the meeting.

3.1.4 Role of Alternate PAG Members

An alternate may be appointed for each PAG member.

The role of the PAG alternate is to:

- a) Attend PAG meetings on behalf of the member. When doing so, the alternate agrees to work according to the Terms of Reference; and
- b) When attending on behalf of the member, come informed, up-to-date, and prepared for discussions based on briefings by the member.

The alternate and member may both attend the same PAG meeting but only the member will participate. When both the member and alternate are in attendance, the alternate may participate in discussions, with agreement by the group or the Licensee Team, but may not take part in reaching consensus or decision-making by the PAG.

3.1.5 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. The PAG and the Licensee Team will then decide on what actions are needed.

Potential actions could include asking the member to:

- a. Serve as an observer for the relevant specific issue(s) and recommendation(s);
- b. Take a leave from the PAG (length of term to be defined); or
- c. Carry on with normal participation.

3.2 Role of Licensee Team

The role of the Licensee Team is to:

- a. Provide information to the PAG as related to the Defined Goals.
- b. Ensure the circulation of draft and final meeting summaries, dates and agendas.
- c. Maintain a current listing of continuous improvement items as agreed to in PAG meetings.
- d. Review and consider the recommendations of the PAG.
- e. Make decisions regarding sustainable forest management and certification.
- f. Demonstrate that all input is considered and responses are provided.
- g. Provide the necessary human, physical, financial, information and technological resources, as reasonable.
- h. Technological resources and expertise will be provided by the Licensee Team, and where required by guest speakers as determined by the Licensee Team with input from the PAG.
- i. Notify inactive PAG members regarding their pending replacement or removal.
- j. Not take part in reaching consensus or decision-making by the PAG.

3.3 Advisors

Advisors will be invited by the Licensee Team, as required, to provide technical information and advice to the PAG. These advisors could be from government agencies, professional organizations, academia, consulting firms or other sources.

3.3.1 Role of Advisors

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 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 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. Regularly review and prioritize with the PAG and Licensee Team outstanding "parking lot" items.
- 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. Ensure past consensus based decisions are respected and supported.
- g. Not take part in reaching consensus or decision-making by the PAG.

4. Timelines

Following the completion of the SFMP, it is estimated that the PAG meeting schedule would include 2–3 meetings per year such as

1. Review annual report and CSA audit results Fall
2. Provide input on SFMP and development chart January to April

5. 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 others' 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 Meeting Agenda and Dates

The meeting location and schedule may change if agreed to by the PAG and Licensee Team.

5.2.1 Meeting Agenda and Location

- a. Input on upcoming meeting agendas will be obtained during each PAG meeting.
- b. The Licensee Team will finalize and ensure the distribution of meeting agendas, meeting summaries and pre-meeting material to PAG members. The agenda will include proposed objectives for the meeting.
- c. The suggested meeting location is the Village Inn in Vanderhoof.

5.2.2 Meeting Schedule

- a. Meeting dates will be confirmed jointly between the Licensee Team and the PAG.
- b. Timing of meetings will be evenings, with dinner provided
- c. The preferred day is Thursday

6. Communication

6.1 Internal to the PAG

- a. The Licensee Team will ensure the meeting summary is distributed to PAG members within two weeks of that meeting..
- b. The Licensee Team will ensure draft meeting agendas are circulated to PAG members at least one week prior to the meeting.
- c. The Licensee Team will strive to provide background and technical information to the PAG as related to the PAG's defined role, including information related to the DFA and SFM requirements.
- d. The Licensee Team will respond to all recommendations from the PAG, and will identify how they have been addressed or their rationale for why they were not addressed.

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. When speaking to the media and external parties about the SFM Plan and PAG process, members of the PAG and the Licensee Team will avoid being disrespectful to others.
- c. 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.
- b. The Licensee Team will provide feedback on how the PAG recommendations were considered, or the rationale for why they were not.
- c. The Licensee Team will appoint a lead representative for each PAG meeting.

7. Meeting Expenses

- a. Mileage to and from PAG meetings for those members traveling more than 50 kilometers each way to the meeting site will be reimbursed at \$0.41 per kilometer. PAG members traveling from outside the Vanderhoof Forest District must obtain approval for travel expenses from the Licensee Team before the meeting.
- b. Overnight accommodation for those traveling to PAG meetings will be reimbursed if pre-approved by the Licensee Team. 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."

- a. Every effort shall be made to achieve consensus, but if this is impossible then the person(s) with the outstanding issue shall offer solutions or options for resolution.
- b. Consensus may consist of agreement on a summary of the different perspectives and those perspectives will be forwarded to the Licensee Team for a decision.
- c. Decisions on specific issues will be considered interim consensus, unless agreed otherwise, until there is consensus on the full set of recommendations.

9. Dispute Resolution Mechanism

9.1 Process Issues

Process issues will be resolved by the facilitator.

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 solution can be reached, then the outstanding issues will be summarized by the PAG and forwarded to the Licensee Team for a decision and rational.

10. Review and Revisions

The Terms of Reference will be reviewed every second year or earlier based on consensus of the PAG and the Licensee Team to review.

Approved:

Public Advisory Group

Date: December 10, 2009

Licensee Team

Date: December 10, 2009

Appendix V: CSA Z809 Standard – Transitional Development Matrix

CSA Z809-08 Standard - Transitional Development Matrix (CCFM Criterion, SFM Elements, Objectives, Indicator, Target)

CCFM Criterion	SFM Element and Objective	#	Indicator Name and Statement	Target	Variance	
CCFM Criterion 1 Conservation of Biological Diversity Conserve biological diversity by maintaining integrity, function, and diversity of living organisms and the complexes of which they are part.	1.1 Ecosystem Diversity Conserve ecosystem diversity at the stand and landscape level by maintaining the variety of communities and ecosystems that naturally occur in the DFA.	1	Distinct Habitat Types: The percent area of distinct habitat types in DFA.	To be determined. Report every 5 years.	N/A	
		2	Late Seral Forest: The minimum proportion of late seral forest (%) by NDU.	Sustain proportions of late seral forest (%) by NDU in accordance with PG TSA Biodiversity Order	See Table 5 in SFMP	
		3	Patch Size: The percent area of young forest patch size class by NDU.	Trend toward young forest patch size targets by NDU, in accordance with Table 6. Measured periodically every five (5) years.	≥ 50% of Patch Size Categories trend towards targets.	
	Additional DFA specific Indicators applicable to SFM Element 1.1 include: # 6, 12					
	1.2 Species Diversity Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained through time, including the habitats for known occurrences of species at risk.	4	Stand Level Retention: The average stand level percent retention for all LT harvested blocks by NDU.	Sustain > 10% retention at the stand level by NDU	0%	
		Additional DFA specific Indicators applicable to SFM Element 1.2 include: # 1, 6, 12, 13				
	1.3 Genetic Diversity Conserve genetic diversity by maintaining the variation of genes within species and ensuring that reforestation programs are free of genetically modified organisms.	5	Seed Use: Percentage of seed for coniferous species collected and seedlings planted in accordance with FRPA.	100 % of seed collected & seedlings planted in accordance with FRPA	-5%	
		Additional DFA specific Indicators applicable to SFM Element 1.3 include: # 1, 2, 4				
	1.4 Protected Areas and Sites of Biological Significance Respect protected areas identified through government processes. Co-operate on broader landscape management related to protected areas and sites of special and biological significance. Identify sites of geological, biological, or cultural significance within the DFA and implement management strategies appropriate to their long-term maintenance.	6	Species at Risk: Species at Risk "Management Strategies" are being implemented as prescribed.	100% of Species at Risk Management Strategies are being implemented as prescribed.	-5%	
		Additional DFA specific Indicators applicable to SFM Element 1.4 include: # 1, 34				
CCFM Criterion 2 Ecosystem Condition and Productivity Conserve Forest	2.1 Forest Ecosystem Resilience Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions.	7	Regeneration Delay: Percent of harvested standard units meeting the regeneration delay date.	100% of harvested standard units meet the regeneration delay date.	-5%	
		8	Free Growing: Percent of harvested standard units meeting the free growing assessment date.	100% of harvested standard units meeting the free-growing date.	-5%	

CCFM Criterion	SFM Element and Objective	#	Indicator Name and Statement	Target	Variance
Ecosystem condition and productivity by maintaining the health, vitality, and rates of biological production	2.2 Forest Ecosystem Productivity Conserve forest ecosystem productivity and productive capacity by maintaining ecosystem conditions that are capable of supporting naturally occurring species. Reforest promptly and use tree species ecologically suitable to the site.	Additional DFA specific Indicators applicable to SFM Element 2.1 include: # 9, 11			
		10	Site Index: Site Index for managed stands within the DFA is sustained at the subzone level.	Sustain site index for managed stands within the DFA at the subzone level as outlined in Table 7 in the SFMP. Report every 5 yrs	See Table 7 in SFMP
		9	Damaging Agents: Management Strategies are implemented to reduce the impact of damaging events or agents (i.e. target harvest toward beetle salvage).	Implement 100% of applicable management strategies developed to reduce the impact Mountain Pine Beetle.	0%
Additional DFA specific Indicators applicable to SFM Element 2.2 include: # 2, 3, 4, 7, 8, 10, 13, 21					
CCFM Criterion 3 Soil and Water Conserve soil and water resources by maintaining their quality and quantity in forest ecosystems	3.1 Soil Quality and Quantity Conserve soil resources by maintaining soil quality and quantity.	11	Soil Conservation: Percentage of blocks meeting soil conservation targets after harvesting and silviculture activities.	100% of blocks meet soil conservation targets after harvesting & silviculture activities.	-5%
		12	Coarse Woody Debris: The amount of Coarse Woody Debris retained on prescribed areas.	Sustain CWD levels ≥ 4 logs per ha after harvesting.	0
	3.2 Water Quality and Quantity Conserve water resources by maintaining water quality and quantity	13	Riparian Reserves: The percent of forest management operations consistent with Riparian Reserve Zone strategies identified in the Site Plan (including the Vanderhoof Draft Lakeshore Management Plan).	100% conformance with RRZ strategies identified in the Site Plan.	-5%
		14	Riparian Management Zones: The percent of forest management operations consistent with Riparian Management Zone strategies identified in the Site Plan.	100% conformance with RMZ strategies identified in Site Plan.	-5%
		15	Stream Crossing Density: Stream crossing density in the DFA.	Sustain ≤ 0.28 stream crossings / km of road within the DFA. Report every 5 years.	+10%
		16	Stream Crossings: Percentage of stream crossings planned and installed to design / standard.	100 % of planned stream crossings will be installed as per design, or prescribed standard.	-10%
		17	Stream Crossing Mitigation Measures: Percentage of stream crossing inspections and resulting mitigation measures completed according to schedule.	100 % of mitigation measures resulting from stream crossing inspections will be completed according to schedule.	+10%
CCFM Criterion 4 Role in the Global Ecological Cycles	4.1 Carbon Uptake and Storage Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems	18	Residual Fibre: The percentage of blocks where a portion of the residual wood is utilized or left on block to contribute to other values.	$\geq 5\%$ of harvested blocks have a portion of the residual wood utilized or left on-block to contribute to other values.	-5%

CCFM Criterion	SFM Element and Objective	#	Indicator Name and Statement	Target	Variance	
Maintain forest conditions and management activities that contribute to the health of global ecological cycles.		25	Accidental Industrial Fires: The number of hectares of accidental fires caused within the DFA by forest industry operations.	<100 cumulative hectares of accidental fires are caused by forest industry operations in the DFA.	+10 ha	
	Additional DFA specific Indicators applicable to SFM Element 4.1 include: # 7, 8, 9, 10, 11					
	4.2 Forest Land Conversion Protect forest lands from deforestation or conversion to non-forests, where ecologically appropriate	19	Forest Land Conversion: The percentage of area within the THLB of the DFA in permanent access.	Sustain < 4.2 % of area within the THLB of the DFA in permanent access. Reported every 5 years.	+1%	
CCFM Criterion 5 Economic and Social Benefits Sustain flows of forest benefits for current and future generations by providing multiple goods and services.	5.1 Timber and Non-timber Benefits Manage the forest sustainably to produce an acceptable and feasible mix of both timber and non-timber benefits. Evaluate timber and non – timber forest products and forest based services	20	Annual Harvest: Annually, total volume (m3/ha) of timber harvested in the DFA (Actual).	Sustain a harvest level of two (2) million m3/yr.	+/- 0.5 million m3/yr	
		21	Range Values: The percent of forest management operations consistent with the conservation of range resources identified in Site Plans.	Sustain 100% consistency between forest management operations and measures to conserve range resources identified in Site Plans.	-5%	
		22	Visual Quality Values: The percent of forest management operations consistent with the conservation of Visual Quality Objectives.	Sustain 100% consistency between forest mgmt operations and strategies identified in the Site Plan to conserve VQO's.	-5%	
		23	Access Management: The percent of LT conformance with the Vanderhoof Access Management Plan for Forest Recreation.	100 % LT conformance with the Access Management Plan for Forest Recreation.	-10%	
		24	Monitoring Access Management: Effectiveness Monitoring Plans are developed and implemented for selected AMP polygons to continually improve implementation strategies.	Establish a timeline once initial MOFR monitoring results are known and a PAG task team is formed to identify the selected AMP polygons.	N/A	
		27	Forest Roads: The number of Kilometers of forest road maintained annually for public use.	Maintain \geq 300km of forest road annually for public use	- 30km	
		28	Smoke Management: The percent of prescribed burns that follow the smoke management guidelines.	100% of prescribed burns follow the smoke management guidelines.	-10%	
		Additional DFA specific Indicators applicable to SFM Element 5.1 include: # 7, 8, 9, 14, 25, 33				
		5.2 Communities and Sustainability Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and by supporting local	26	Money Spent in DFA: The percent of money spent on DFA forest management activities, provided from the northern central interior suppliers (stumpage not included).	\geq 80% of the expenditures on forest operations & management in the DFA are attributable to North Central Interior suppliers.	-5%

CCFM Criterion	SFM Element and Objective	#	Indicator Name and Statement	Target	Variance	
	community economies.	30	Local Business Relationships: The number of annual business relationships or opportunities with businesses within those communities tributary to the DFA.	≥ 100 business relationships or opportunities within community's tributary to the DFA.	-25	
		31	First Nations Business Relationships: The number of LT business relationships or opportunities made available to local First Nations.	≥ 20 local First Nation business relationships or opportunities annually.	-10	
		32	Diversity of Forest Products: The number of different forest products produced by milling facilities tributary to the DFA.	≥ 15 different forest products are produced by milling facilities tributary to the DFA	-2	
Additional DFA specific Indicators applicable to SFM Element 5.2 include: # 18, 20, 27,						
CCFM Criterion 6 Society's Responsibility Society's responsibility for sustainable forest management requires that fair, equitable and effective forest management decisions are made.	6.1 Aboriginal and Treaty Rights Recognize and respect Aboriginal and treaty rights.	33	First Nations Involvement in Planning Processes: The number of opportunities provided to Aboriginal people to be involved in the planning process and/or to provide Cultural Heritage Resource input.	≥ 50 opportunities for Aboriginal people to be involved in the planning process and/or provide CHR input.	-5	
	Additional DFA specific Indicators applicable to SFM Element 6.1 include: # 34, 44.					
	6.2 Respect for Aboriginal Forest Values, Knowledge, and Uses Respect traditional Aboriginal forest values, knowledge, and uses as identified through the Aboriginal input process.	34	Cultural Resource Values: The percent of forest management operations consistent with the conservation of identified unique or significant Cultural Heritage Resource features.	100% conformance between forest management operations & strategies identified in SP's to conserve unique or significant CHR features.	-5%	
	Additional DFA specific Indicators applicable to SFM Element 6.2 include: # 33, 44.					
	6.3 Forest community well-being and resilience Encourage, co-operate with, or help to provide opportunities for economic diversity within the community.	40	Public and Resource Users Involvement in Planning Processes: The number and variety of effective opportunities given to the residents and stakeholders to be proactively involved in planning processes and provide input on proposed development.	≥ 100 opportunities for residents & stakeholders to be proactively involved in the planning process and provide input on proposed development.	-10	
		29	Support Opportunities: Annually, the number of support opportunities provided in the DFA.	≥ 50 support opportunities in the DFA.	-25	

CCFM Criterion	SFM Element and Objective	#	Indicator Name and Statement	Target	Variance
		41	Research and Projects: The number of research and development projects and/or partnerships completed within the DFA	≥ 3 research and development opportunities within the DFA.	-1
	6.4 Fair and effective decision-making Demonstrate that the SFM public participation process is designed and functioning to the satisfaction of the participants and that there is general public awareness of the process and its progress.	35	PAG Meetings: Number of Public Advisory Group meeting per year.	≥ 2 PAG meetings per year.	0
		36	PAG Satisfaction: Measure the level of satisfaction of the PAG members with the SFM process annually.	Sustain a satisfaction index level of ≥ 4.	-0.5
		37	PAG Terms of Reference: Maintain and review annually the SFM plan PAG TOR, to ensure a credible and transparent process.	Maintain & review the SFM PAG TOR every two (2) yrs.	0
Additional DFA specific Indicators applicable to SFM Element 6.4 include: # 43					
	6.5 Information for decision-making Provide relevant information and educational opportunities to interested parties to support their involvement in the public participation process, and increase knowledge of ecosystem processes and human interactions with forest ecosystems.	38	SFM Plan Available for Review: The number of times the SFM plan and associated annual reports will be communicated to the public for review and comment annually.	The SFMP & associated annual report will be communicated to the public ≥ 3 times / year.	0
		39	SFM Extension: The number of opportunities provided for SFM extension activities annually.	Sustain ≥ 4 SFM extension opportunities.	-1
		42	Timely Response to Inquiries: The percent of timely responses to documented Forest Management Planning concerns.	100% of timely response rate to documented public concerns regarding Forest Management Planning and related practices.	-10%
		43	SFM Public Opinion Survey: Periodically conduct and report out on a DFA wide SFM Public Opinion Survey.	Conduct and report on the survey a minimum of every 5 years.	0
Additional DFA specific Indicators applicable to SFM Element 6.5 include: # 35, 36, and 40.					

