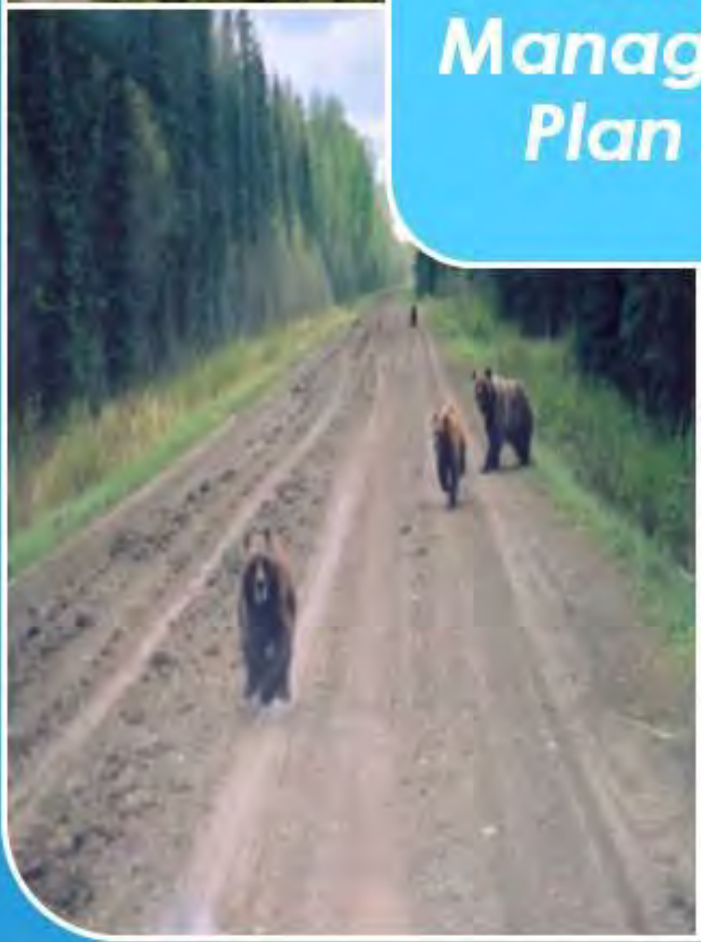
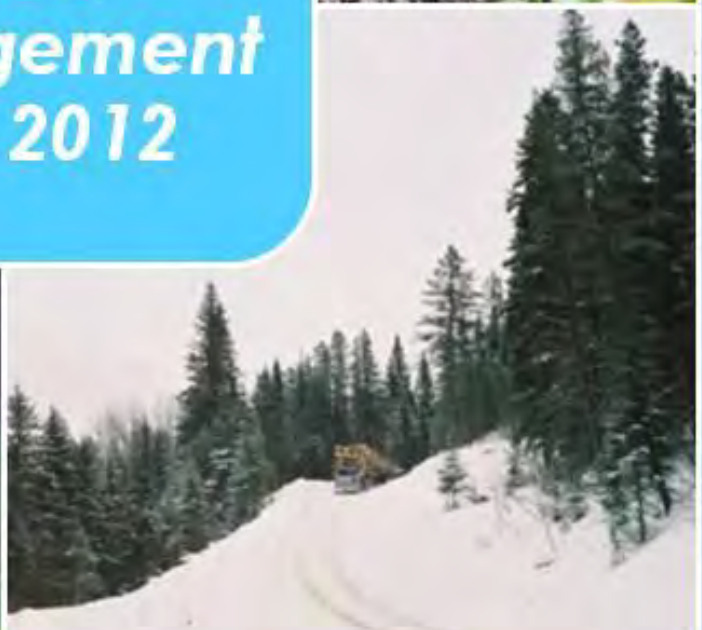
Sustainable Forest Management Plan 2012





Canfor's Alberta FMA 9900037
Certified under CSA Z809-08
August 2012

Sustainable Forest Management Plan 2012

Canadian Forest Products Ltd.

Alberta Forest Management Agreement 9900037

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Canfor would also like to thank the many individuals who provided information or contributed to specific components of this document.

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The majority of the literature cited in this document is available for viewing at Canfor's Grande Prairie office.

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Vision Statement

Canfor is committed to sustainable management (*Canfor Environment Policy, May 2011*) and (*Sustainable Forest Management Commitments, May 2012*) (Appendix 1) of the forest, while at the same time acknowledges and values the company's contribution to the economic and social viability of the communities in which it operates. Canfor has applied improvements made to its management systems and performance under its existing International Organization for Standardization (ISO) 14001 certification and through implementation of the 2005 Sustainable Forest Management Plan (SFMP) for the Grande Prairie Defined Forest Area (DFA) in the preparation of the 2012 SFMP. Canfor values the concept of third party verification to confirm that our forest practices and performance meet acceptable standards and therefore has chosen to prepare this SFMP in conformance with the Canadian Standards Association (CSA) CAN/ CSA Z809-08 Sustainable Forest Management system standard.

Executive Summary

This Sustainable Forest Management Plan (SFMP[1]) is the third iteration for the Canfor – Grande Prairie Forest Management Agreement (FMA) area (Alberta. 1999). The first SFMP was completed in 2001, and a second was completed in 2005.

The Forest Management Advisory Committee (FMAC) has supported Canfor Alberta in the development of the previous plans and the members of the Committee have continued to offer their input to this plan. Formal contributions to this SFMP by FMAC occurred between May 19th, 2010 and September 21st, 2011. Members of FMAC represented a broad cross-section of local interests including Aboriginal, recreation, public, education, tourism, trapping, local governments, outfitting, oil and gas, forestry, conservation and water and fish and wildlife.

The SFMP includes a set of values, objectives, indicators and targets (VOITs) that address environmental, economic and social aspects of forest management within the defined forest area (DFA). The plan conforms to the Canadian Standards Association (CSA) CAN/CSA Z809-08 Sustainable Forest Management Standard, which is one of the primary certification systems applied in Canada. A SFMP developed in conformance with the CAN/CSA Z809-08 SFM Standard applies performance objectives and targets over a DFA that reflect local and regional interests. Consistent with most certification systems, and as a minimum starting point, the CSA standard requires compliance with existing forest policies, laws and regulations. The Canfor Alberta SFMP has undergone substantive evaluation prompted by improvements to the CSA SFM Standard, initially in 2001 and again in 2005. Changes to this plan reflect the 2008 (CSA Z809-08) standard requirements and results of public input following changes to the standard.

Irrespective of changes that have occurred to the CSA SFM standard, the Canfor Alberta SFMP is a dynamic document that is reviewed and revised on an annual basis by Canfor with advice from FMAC to address changes in forest conditions and local community values. Canfor is committed to the achievement of the objectives of the SFMP. Each year the FMAC reviews an annual performance monitoring report prepared by Canfor to assess achievement of performance measures. This monitoring process provides Canfor Alberta and the public an opportunity to bring new information forward, and to provide input concerning new or changing public values for incorporation into future versions of the SFMP.

Development of the VOITs (Appendix 2) for the 2012 SFMP was founded on four guiding documents:

- The CAN/CSA Z809-08 Standard;
- Canfor Corporate Indicators (Appendix 3) prepared under the CAN/CSA Z809-08 Standard;
- The *Alberta Forest Management Planning Standard, Annex 4* VOITs (Appendix 4) ; and
- The Canfor Grande Prairie 2005 SFMP VOITs prepared under the CAN/CSA Z809-02 Standard.

[1] This SFMP was developed using the Kamloops – Thompson SFMP (January 2010) as a template for structure and generic content.

The Canfor Grande Prairie 2005 SFMP VOITs were included in recognition of the significant contributions made by FMAC to their development and FMAC members' continuing interest in them.

The resulting product was four sets of VOITs, which were subsequently compared to determine where they were aligned and where they were unique. This comparison led Canfor to make recommendations to FMAC regarding abandonment of VOITs from the 2005 SFMP that were either no longer applicable or redundant. Following FMAC's review and acceptance of the recommendations, the remaining VOITs were then refined and incorporated into this SFMP.

A facilitator, "Management Plus Communications Ltd." represented by Gail Wallin worked with FMAC during 6 sessions to develop the VOITs in this document.

The current SFMP and annual performance monitoring report are available for viewing and download on Canfor's website www.canfor.com/responsibility/environmental/plans

1.0 Introduction & Overview

During the past decade, there has been an increasing demand worldwide for certified wood products. This has led to the development of a number of certification systems to provide assurance to consumers that wood products have been produced using environmentally and socially responsible forest practices.

The Canadian Standards Association (CSA) "*Sustainable Forest Management; Requirements and Guidance*" is one of a number of certification systems currently being used in Canada. A Sustainable Forest Management Plan (SFMP) developed according to the CSA standard sets performance objectives and targets over a defined forest area (DFA) to reflect local and regional interests. This standard requires that SFMP development, maintenance and improvement include significant public involvement. Public Advisory Groups (PAGs) composed of a cross-section of local interests, including recreation, tourism, ranching, forestry, conservation, water, community and Aboriginal Groups, fulfill this role. The PAG for the Canfor - Alberta DFA is named the Forest Management Advisory Committee (FMAC).

Active forest tenure holders[2] in the DFA working in consultation with FMAC, developed and are maintaining and continuously improving the DFA SFMP based on the CSA Z809-08 standard. The plan was written to provide management direction on all forestland within the DFA.

Canfor – Alberta has been working responsibly with the public to develop credible SFMPs for over 16 years. Other company planning processes, including those relative to Forest Management Plans, General Development Plans and Annual Operating Plans also provide opportunities for public review and comment. This SFMP is an example of the commitment of Canfor and other forest companies to adapt their management practices to changes in societal values.

The SFMP serves as a "roadmap" to current and long-term management in the DFA with the inclusion of performance targets and management strategies that are reflective of the environmental, social and economic values of the DFA. Furthermore, the plan is consistent with applicable strategic plans such as Canfor's Forest Management Plan for FMA 9900037 and government land use plans.

An important pillar of the SFMP is a commitment to pursue continual improvement, which has led to the implementation of processes for reporting, reviewing and responding to performance results and changing conditions. These processes include participation by FMAC in the review of Annual Performance Monitoring Reports and the preparation of revisions to the plan that address, among other things, changes in local community values.

More information about the DFA certification process, Sustainable Forest Management Planning, public involvement, annual reporting and the Canfor FMA can be obtained at the Canfor office in Grande Prairie.

[2] Referred to as 'forest tenure holders' throughout this report. Refer to Sec 4.2.1 for a more complete description.

2.0 Guiding Principles

The SFMP has been prepared in conformance with several core principles, which guide forest management decisions on the DFA.

- Recognition that Aboriginal Groups people have constitutionally protected rights including specific Treaty rights to hunt, fish and trap for food on the DFA. Therefore, efforts to recognize, respect and accommodate Aboriginal Groups' unique rights and values in forest management decisions, plans and practices must be beyond those afforded other stakeholders.
- Maintenance of respect for other resource users on the DFA, including Crown licence holders and the general public and a commitment to communicate actively in order to maintain the viability of resources for all parties.
- Application of credible science and data in decision-making processes and the preparation of forestry plans.

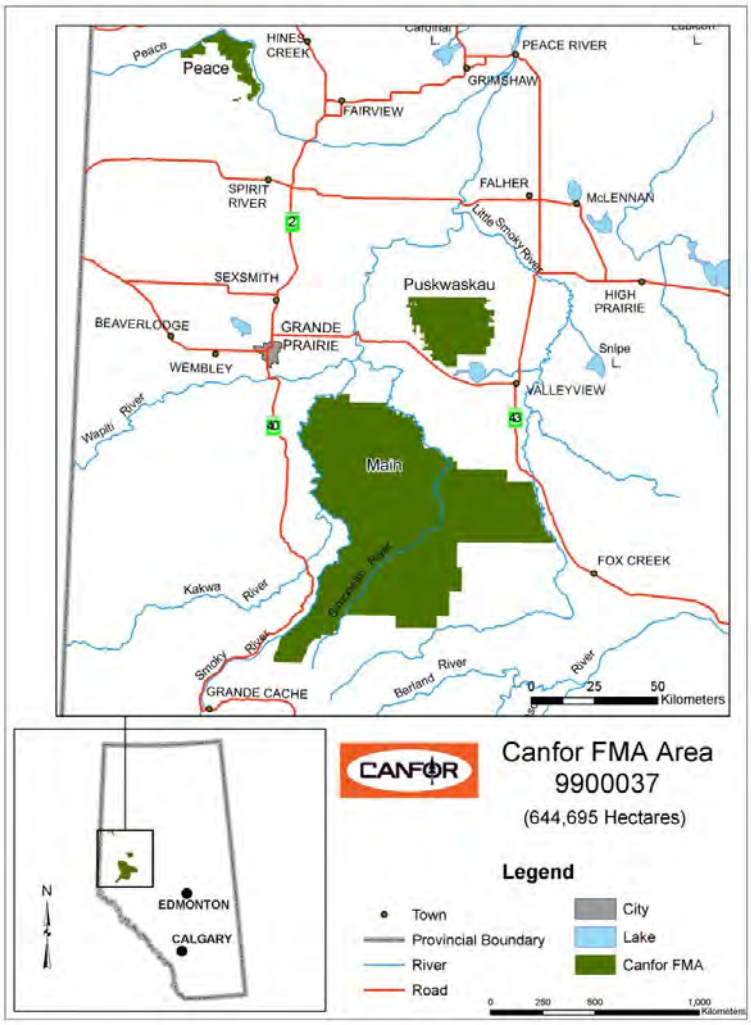
3.0 The Defined Forest Area

3.1 Area Description

3.1.1 Overview

Canfor - Alberta has chosen to adopt the Forest Management Agreement area (Alberta. 1999) as the defined forest area. The FMA area is located in west central Alberta (Figure 1). It is comprised of three separate parcels of forested land identified as Forest Management Unit G15, with a total area of 644,695 hectares. The parcels are identified as Peace, Puskwaskau and Main.

Figure 1: Canfor FMA 900037



3.1.2 Communities

Local Communities

There are no communities within the boundaries of the DFA, although there are several in the vicinity. The central community in proximity to the DFA is the City of Grande Prairie, with a population over fifty thousand. Several smaller communities are also located within fifty kilometres of the DFA including Clairmont and Sexsmith to the north, Beaverlodge and Wembley to the west, Grovedale to the south and Bezanson and DeBolt to the east. The communities of Spirit River, Valleyview and Grande Cache are also located in the vicinity of the DFA and have maintained traditional ties to the forest industry. The population of the region has risen dramatically over the past fifty years, driven in large part by the growth of the oil and gas industry. That trend is expected to continue into the future. The larger global trend toward urbanization is expected to continue as well, with Grande Prairie and its satellite communities growing the fastest.

Aboriginal Communities

Sturgeon Lake Cree Nation is located immediately west of the Town of Valleyview and south of the Puskwaskau block of the DFA. Many of the traplines in the main DFA and the Puskwaskau block are registered to members of this community. Horse Lake First Nation is located west of Beaverlodge. The community is located further from the DFA than Sturgeon Lake but Horse Lake members use parts of the DFA for traditional activities.

Aseniwuche Winewak Nation of Canada (AWN) was formalized in September 1994 with the amalgamation of the six Aboriginal settlements surrounding the town of Grande Cache. The members of AWN are non-status Indians descended from Cree, Beaver, Stony and Iroquois fur trappers and traders who inhabited the area after being moved out of the Jasper area when the National Park was established. AWN has formally claimed traditional area within west central Alberta, including portions of the southern DFA but a claims settlement has not yet been reached.

The Métis Nation of Alberta Region IV Regional Council represents the interests of Métis people in northwest Alberta. There are no Métis settlements in the vicinity of the FMA, but many people of Métis descent reside in the communities mentioned above.

3.1.3 Area Economy

The regional economy is thriving, driven by the exploration, development and management of natural resources. The region was settled by people of European descent primarily in the mid to late twentieth century, driven initially by agricultural expansion. The settlement required wood products, resulting in the establishment of a conifer based forest industry. Initially most wood products were sold locally to serve the needs of the agricultural community but gradually non-local markets were developed. By mid-century, the oil and gas industry also emerged as a significant economic driver in the area. Grande Prairie evolved as the transportation hub for the region and has become the main service centre for north-western Alberta and north-eastern British Columbia.

Canfor Corporation operates a modern sawmill and planer operation located in Grande Prairie. Timber for the operation is secured from the DFA and from forest tenure located north and west of the Peace River.

Weyerhaeuser operates an integrated pulpmill-sawmill complex immediately south of Grande Prairie, sourcing its wood from an FMA area generally west of the Canfor FMA area. Ainsworth Engineered Canada LP operates an Oriented Strand Board (OSB) mill located 17 kilometers south of Grande Prairie. Wood supply for the OSB plant is sourced from the Canfor and

Weyerhaeuser FMAs, along with purchases from private land. Tolko Industries Ltd. owns an OSB mill located in High Prairie with some of the fibre supply for the plant secured from the Canfor FMA area. However, the plant was closed indefinitely in 2008 due to poor market conditions.

The forest industry has traditionally been able to attract workers by offering comparatively high wages and benefits, but growth of the energy sector has created labor shortages in the region and competition in the labor market has grown. Historically, forestry and sawmill jobs often provided seasonal work for the substantial farm labour pool, but the evolution of both industries has changed this synergistic system.

The solid wood sector of the forest industry continues to experience a prolonged downturn. The 2008 collapse of the housing market in the United States, along with the financial crisis brought on partially by poor lending practices for mortgages, continues to negatively influence the demand for building products. Growth of lumber markets in China and other parts of Asia have partially offset this lack of demand, but global lumber production continues to oversupply the market.

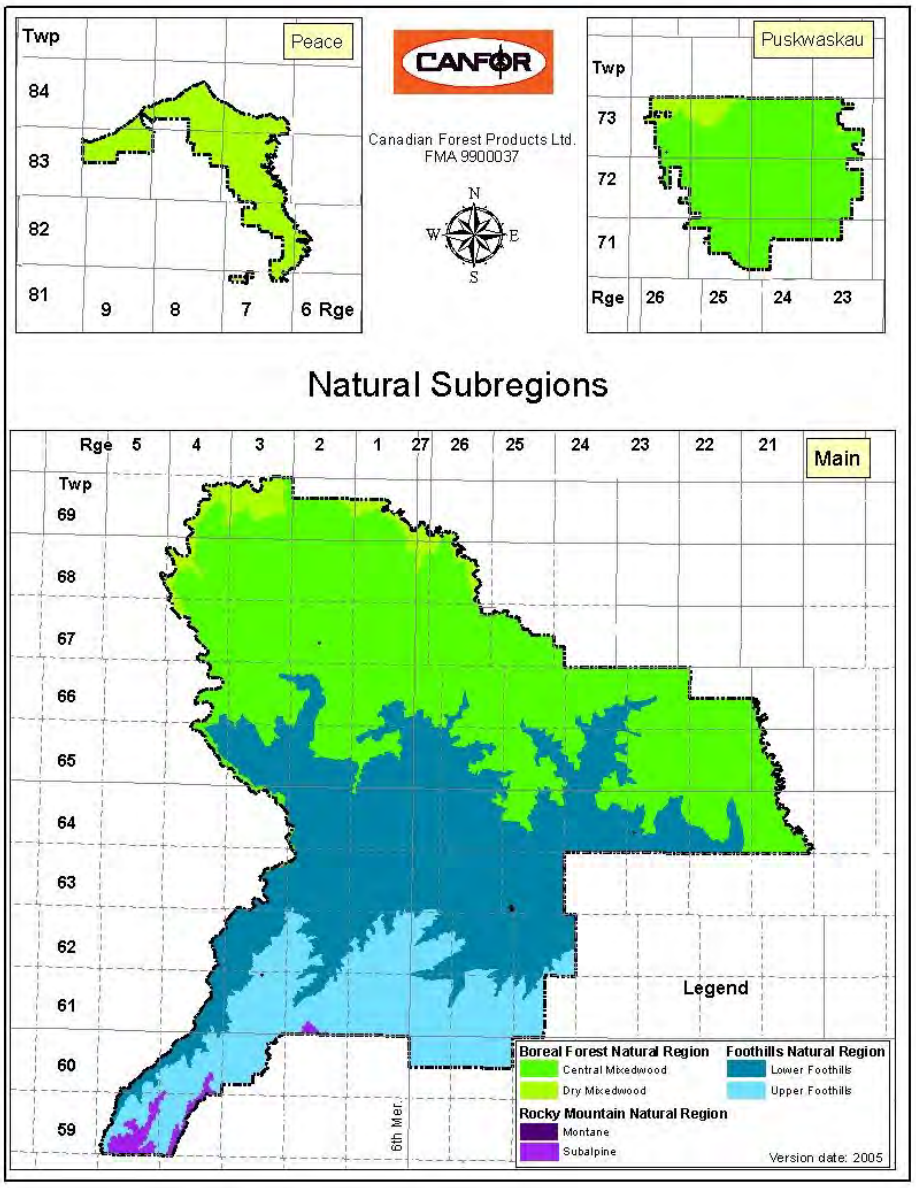
3.1.4 Environment

The FMA area is located in the Central Mixedwood, Dry Mixedwood, Lower and Upper Foothills and Subalpine Natural Subregions[3] (Figure 2) as described by Achuff (Achuff. 1996).
Coniferous trees dominate forest stands in the Upper Foothills and Subalpine. White spruce (*Picea glauca*) and lodgepole pine (*Pinus contorta*) are found at lower elevations and Engelmann spruce (*Picea engelmanni*i) and subalpine fir *(Abies lasiocarpa*) are located at higher elevations. In lower elevations of the Lower Foothills, Central Mixedwood and Dry Mixedwood, pure and mixed stands of trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) are interspersed with lodgepole pine, white spruce and balsam fir (*Abies balsamea*). Poorly drained depression areas and riparian zones throughout the region include, black spruce (*Picea mariana*), tamarack (*Larix larcina*), labrador tea (*Ledum groenlandicum*), willow (*Salix* spp.), peat and brown mosses (Sphagnum spp., *Tomenthypnum nitensm*, *Aulacomniun palustre*), and horsetails (*Equisetum* spp.).

These subregions are associated with foothills topography as well as undulating and rolling terrain. Stream elevations range from 400 m above sea level near the Puskwaskau River confluence with the Smoky River to over 1,700 metres above sea level in the southern headwaters. Landscape features are a result of both continental and cordilleran glaciers covering the area during the Pleistocene epoch with morainal, glacial-fluvial and glaciolacustrine deposits being predominant (Halstead, 1993). Colluvial and residual bedrock materials frequent higher elevations of the Subalpine Subregion, while bedrock outcrops of marine shale and non-marine sandstone are frequent in the Foothills Subregions. The Dry and Central Mixedwood Subregions are characterized by till as ground moraine and hummocky moraine landforms with aeolian dunes and sandy outwash plains occurring throughout (Achuff. 1996).

[3] A Natural subregion is a division of the Natural region based on differences in regional climate, landform, bedrock geology and soils. The Natural subregion is more refined than a Natural region through variations in elevation in addition to distinctive vegetation associations. Natural subregions contain “reference” vegetation types that are characterized by climate and environment (moisture and nutrients).

Figure 2: Natural Subregions within the FMA area



3.1.5 Species at Risk

Species at risk are determined at two levels: The Federal Species at Risk Act (SARA) and the Alberta Wildlife Act.

Federally, species protected under SARA are determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) comprised of an independent body of experts responsible for assessing and identifying species at risk. COSEWIC assesses and classifies a wildlife species as extinct; extirpated; endangered; threatened; special concern; data deficient or not at risk. COSEWIC provides its report to the Minister of the Environment and the Canadian Endangered Species Conservation Council. The SARA legislation covers federal lands such as national parks and Aboriginal Groups Reserves. Therefore, the impact on the DFA is not significant although issues at the federal level often influence provincial priorities.

Provincially, evaluation of the status of species at risk in Alberta relies upon the activities of the Endangered Species Conservation Committee (ESCC) and its scientific arm, the Scientific Subcommittee, both created under the auspices of the Wildlife Act. Using information contained in detailed status reports, the Scientific Subcommittee of the ESCC assesses what the risk of extinction or extirpation is for Alberta species that have been identified as potentially at risk through the General Status process. The Scientific Subcommittee evaluation is presented to the ESCC, which then decides what recommendations to make to the Minister of Sustainable Resource Development concerning the legal designation (e.g. 'endangered' or 'threatened'), as well as management and recovery of a species.

The Alberta Forest Management Planning Standard Manual (ESRD. 2006) prescribes a coarse filter approach for the management of all species collectively, combined with a fine filter approach for species of interest. Species of interest are often on the list of species at risk. Under the Provincial VOIT 1.2, the Planning Development Team (PDT) identifies the species that will require specific management strategies in the FMP. In this plan, the PDT has identified grizzly bear, trumpeter swan, woodland caribou, barred owl, bull trout and arctic grayling as fine filter species. The management of these species will be directed by fine filter strategies embedded in the SFMP. These strategies are outlined in the description of VOITs listed in Section 7 of this document.

3.1.6 DFA Use

The resources of the DFA are utilized by a number of other users listed below:

3.1.6.1 Deciduous Forest Companies

Tolko Industries Ltd. (Tolko) and Ainsworth Engineered Canada LP (Ainsworth) have been granted rights to harvest deciduous species in the FMA area. Table 1 provides a breakdown of the deciduous allocations by quadrants.

Table 1. Deciduous Timber Allocations (m^3/year) within the FMA area

FMU	Company	Disposition Number	Allocation (m3/yr)	5 Yr Quadrant (M3)
G15	Tolko	DTAG150001	114,712	573,560
G15	Tolko	DTAG150002	167,817	839,085
G15	Ainsworth	DTAG150003	170,000	850,000
Total			452,529	2,262,645

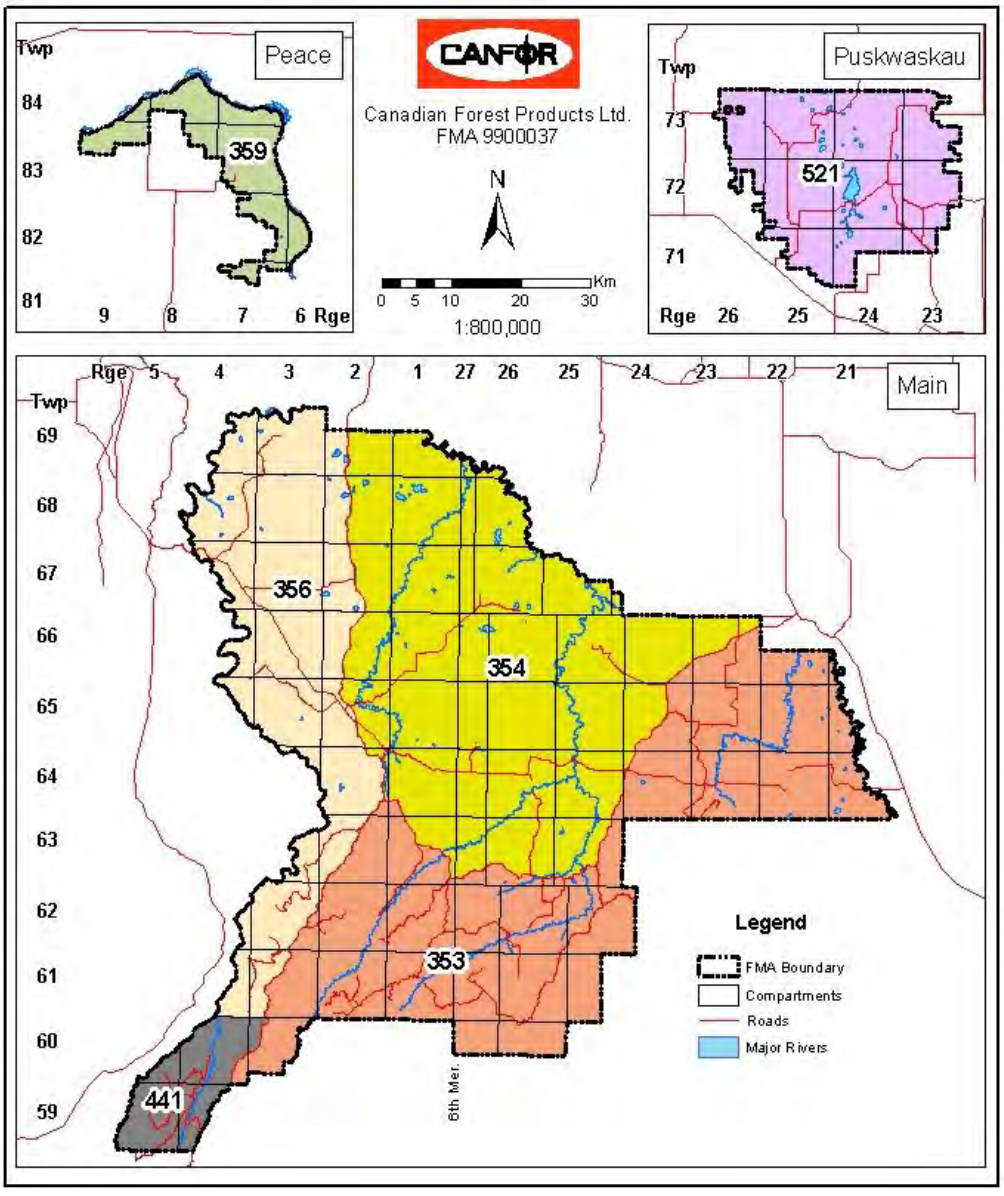
3.1.6.2 Oil and Gas Sector

Much of northern Alberta, including the DFA, is underlain with rich oil and gas deposits. Exploration and production of the hydrocarbons found in these deposits has a significant impact on the local, provincial, national and international economies. The oil and gas sector has been, and will continue to be, a major factor influencing the boreal forest landscape (Stelfox *et al*, 1999). Mineral development and geophysical deletions within the DFA are authorized under a variety of legal instruments including licenses of occupation, pipeline agreements, mineral surface leases and rights of entry.

3.1.6.3 Outfitters

Outfitters operate in all portions of the DFA. According to information provided by the Alberta Professional Outfitters Society (APOS), there are 26 professional outfitters who have expressed interest in operating on the FMA area. Outfitters operate within Wildlife Management Units established by Alberta, Environment and Sustainable Resource Development (Figure 3). APOS maintains an official directory of outfitters that are permitted to operate in Alberta www.apos.ab.ca

Figure 3: Wildlife Management Units



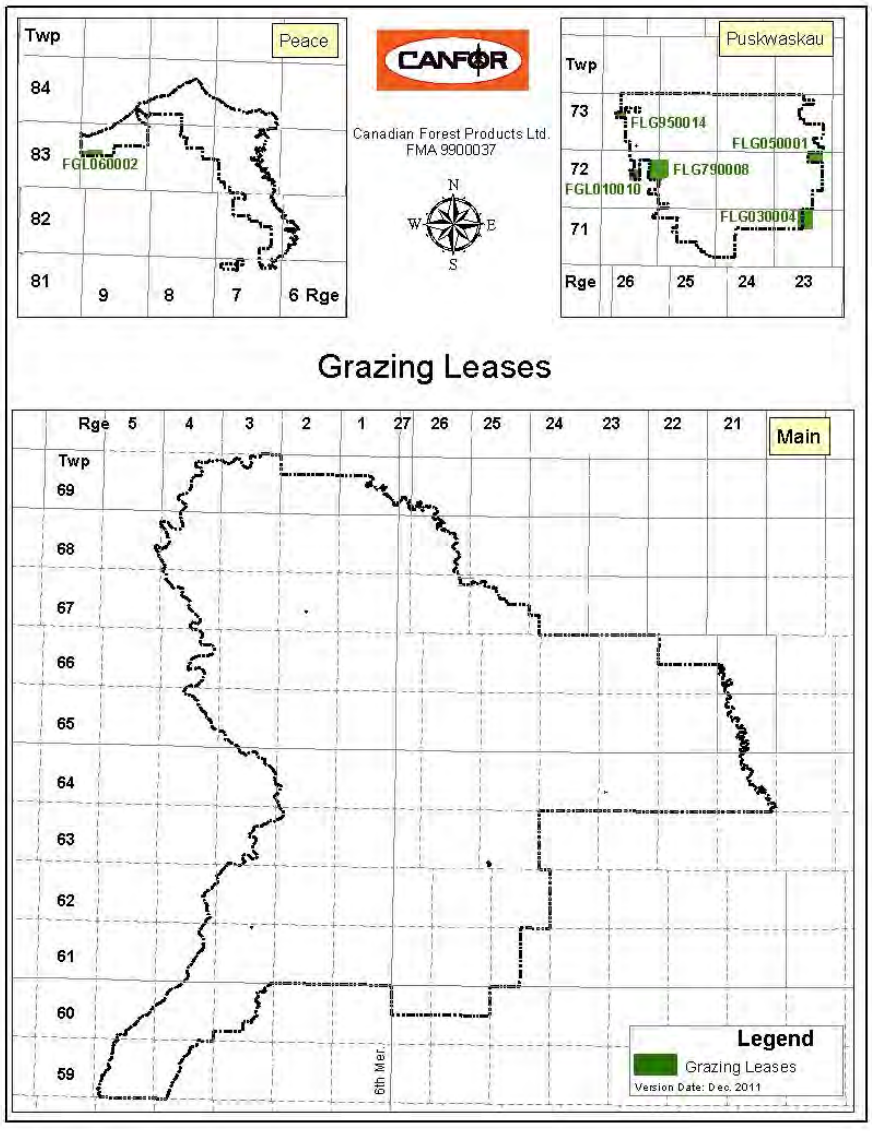
3.1.6.4 Grazing Dispositions

According to the *Public Lands Act, Dispositions and Fees Regulation* (Alberta Regulation 54/ 2000), a grazing disposition means a grazing lease, forest grazing lease, a grazing license, a grazing permit or a head tax grazing permit. There are 5 forest grazing licenses (FGL), covering approximately 1,470 ha, within the DFA (Figure 4)

In accordance with subparagraph 8(2) (d) of FMA Agreement 9900037:

…"after consultation with the Company, the Crown retains the right to authorize grazing dispositions within the FMA area provided, however, that the growth performance of the managed species is not impaired and the regeneration will not be damaged by domestic stock grazing to the point where the overall stocking is reduced below the reforestation standard as set out in the Timber Management Regulation, and provided the Company's rights to manage the area for timber production is not significantly impaired."

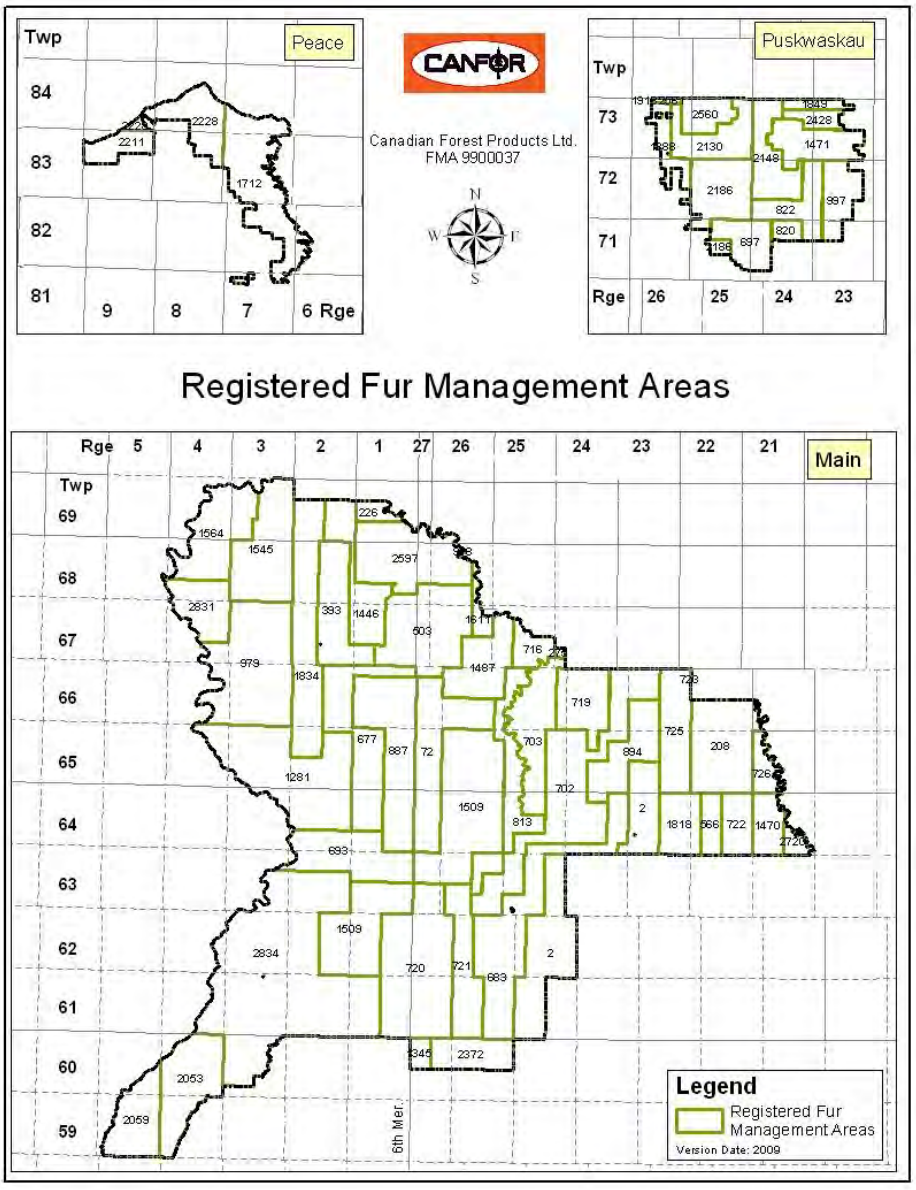
Figure 4: Grazing Dispositions within the FMA area



3.1.6.5 Registered Fur Management Areas

There are 59 registered fur management areas within the DFA (Figure 5). Canfor Alberta developed the *Trappers Consultation and Notification Program* (Canfor, 2012) to ensure all trappers potentially affected by activities proposed in the Annual Operating Plan (AOP) are notified prior to the commencement of operations.

Figure 5: Registered Fur Management Areas



3.1.6.6 General Public

The public uses the DFA for a number of recreational activities. These include camping, hunting, fishing, ATV recreational use, berry picking, firewood gathering and other pursuits. All access is open to the public, although some roads are gated for the protection of wildlife. These gates are meant to limit vehicle access but do not prevent the public from travelling beyond them by other means.

3.2 Mountain Pine Beetle

3.2.1 Overview

Mountain pine beetle (MPB), *Dendroctonus ponderosae* Hopkins (Coleoptera: Scolytidae) is severely impacting lodgepole pine stands on the DFA. MPB exist naturally in mature lodgepole pine forests, at various population levels, depending on pine availability and weather conditions. Beetles and other insects play an important role in the natural succession of these forests by attacking old and decadent stands, which are then replaced by young healthy forests. The beetle population levels in Alberta have been increasing steadily since 2006 following an in-flight of beetles from British Columbia to northwestern Alberta. All levels of government and the forest industry have participated in the development and implementation of control measures in response to the infestation.

3.2.2 Area Affected

MPB are present throughout the DFA, but in-flights of beetles in 2006 and again in 2009 were concentrated in the northern portions. Following the in-flights, spread patterns have generally been north to south and west to east.

3.2.3 Strategy & Response

The 2006 infestation attracted the immediate attention of the Alberta government, the forest industry and the general public. ESRD responded to the threat by developing a *Mountain Pine Beetle Action Plan for Alberta* (ESRD. 2007a). The plan includes a number of mitigation strategies, including a strategy to decrease the risk of MPB spread by reducing the volume of lodgepole pine on the landscape, particularly those stands that are most susceptible to mountain pine beetle infestation. In response to the ESRD action plan, Canfor Alberta commenced development of a Healthy Pine Strategy amendment (Canfor. 2010) to the approved 2003 Detailed Forest Management Plan (Canfor. 2003). The Alberta Government's Interpretive Bulletin: *Planning Mountain Pine Beetle Response Operations* ver. 2.6 (ESRD. 2006a) provided the direction for development of the amendment. The Healthy Pine Strategy amendment was submitted to ESRD for approval on April 30, 2009 and approval was received January 22, 2010. Approval of the plan included an uplift in the Coniferous Annual Allowable Cut (AAC) from 640,000 m^3/year to 715,000 m^3/year, effective May 1, 2009.

Management strategies applied on the DFA have been successful in reducing the spread of the infestation and limiting tree mortality in some areas. The strategies have also enabled utilization of many stands before they were heavily infested, thereby maintaining maximum timber values.

3.2.4 The Extent of Current & Future Infestations

To determine the extent of current and future infestations, the Timber Supply Analysis (TSA) data has been updated, susceptible stands have been identified, current MPB attack has been mapped and forecasts of future attack levels and intensities have been developed. This data, along with the MPB Strategy were all factored into the AAC determination for the DFA.

3.2.5 Factors Influencing the Severity of Attack

Fire and insects have historically played an important role in the natural disturbance and replacement of lodgepole pine forests in much of the province. Two key factors contributing to the recent expansion of the mountain pine beetle infestation are the predominance of older lodgepole pine on the land base and the relatively warm winters experienced in recent years in most of the province. Forest management policies (i.e., cutblock size/adjacency and fire control) have contributed to an accumulation of old pine forest above historical levels. Once lodgepole pine trees are mature (generally older than 80 years), they are more susceptible to attack by the pine beetle, particularly during times of prolonged favourable weather conditions. Experts concur that moderated climate conditions coupled with the increasing area of susceptible, mature lodgepole forests has led to the current unprecedented mountain pine beetle outbreak.

3.2.6 Outlook

Short of running out of suitable host trees, there is no indication the spread of the MPB infestation will slow significantly without sufficiently cold weather to kill the developing beetle brood. Temperatures need to reach -30°C in the early fall or late spring when the beetles are not fully in their "over-wintering state" or have sustained winter temperatures of less than -40°C to kill the brood. If the beetle is not stopped due to weather conditions, populations will only collapse when there is a shortage of acceptable, mature pine.

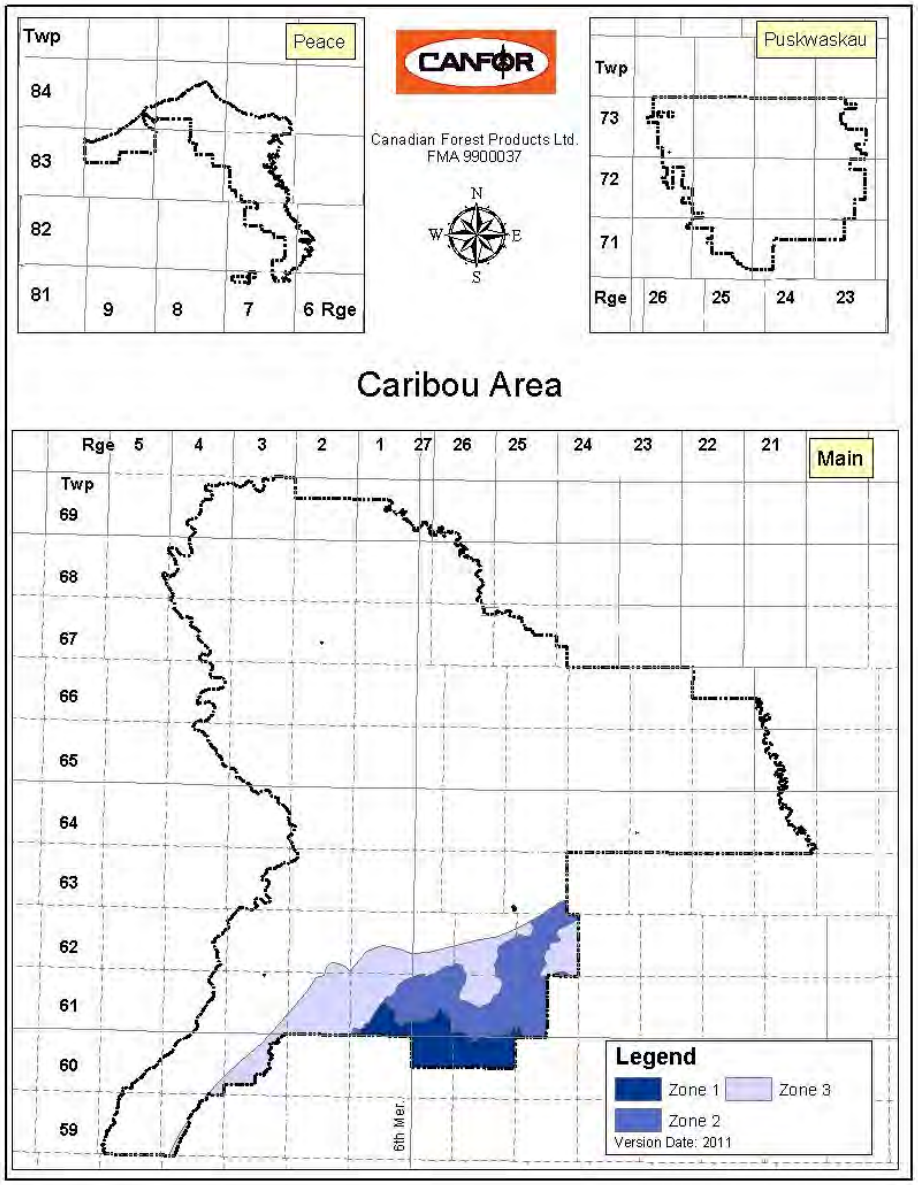
As the impacts to the SFMP from the MPB are better understood, further refinements to this plan may be required.

3.3 Woodland Caribou

Two woodland caribou (*Rangifer tarandus caribou*) herd ranges overlap portions of the DFA; the A La Peche and the Little Smoky. Their total range is 466,127 ha with 70,228 ha being located within the DFA (Figure 6). The ranges within the DFA represent 15% of their total ranges and 10.8% of the total DFA.

The Little Smoky herd is classified as part of the Boreal population of Woodland Caribou, which have been assessed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The proposed *Recovery Strategy for the Woodlands Caribou, Boreal Population* (Env. C. 2011) states that the long-term recovery goal for boreal caribou is to achieve self-sustaining local populations to the extent possible. Canfor has addressed the concern for caribou survival, in particular as it relates to the Little Smoky herd by engaging in a number of planning initiatives and through implementation of a suite of management strategies. These include a long term harvest deferral in the area identified as exhibiting the highest level of caribou habitat intactness within the Little Smoky Range.

Figure 6: Caribou Area



4.0 The Planning Process

4.1 The CSA Certification Process

The CSA Sustainable Forest Management (SFM) Standard, initially developed in 1996 and subsequently revised and improved in 2002 and again in 2008 is Canada's national certification standard. The standard is a voluntary tool that provides independent third party assurance that an organization is practicing sustainable forest management. Consistent with most certifications, the CSA standard expects compliance with existing forest policies, laws and regulations.[4]

Participants under the CSA certification system must address the following two components:

- Participants must develop and achieve performance measures for on-the-ground forest management, monitored through an annual public review with the input of the public and Aboriginal Groups (Sec 4.1.1 following).
- Participants who choose to be registered to the CSA standard must incorporate CSA-defined systems components into an internal environmental management system (EMS) (Sec 4.1.2 following).

For a tenure holder seeking certification to the CSA SFM standard, the DFA SFMP or a licensee-specific plan, complimentary to the DFA SFMP, is developed. The licensee-specific plans may contain additional information such as their defined forest area and internal means to monitor and measure the DFA SFMP components.

Applicants seeking registration to the CSA standard require an accredited and independent third-party auditor to verify that these components have been adequately addressed. Following registration, annual surveillance audits are conducted to confirm that the standard is being maintained. A detailed description of these two components and a summary of the CSA registration process are as follows.

4.1.1 Public/Aboriginal Involvement: Performance Requirements & Measures

The CSA standard includes performance requirements for assessing sustainable forest management practices that influence on-the-ground forestry operations. The performance requirements are founded upon six sustainable forest management criteria:

- conservation of biological diversity;
- conservation of forest ecosystem condition and productivity;
- conservation of soil and water resources;
- forest ecosystem contributions to global ecological cycles;
- provision of economic and social benefits; and
- accepting society's responsibility for sustainable forest management.

Each of these criteria has a number of "elements" that further define the criteria. The criteria and associated elements are all defined under the CSA standard and must be addressed during development of the SFMP. The criteria are endorsed by the Canadian Council of Forest Ministers and are aligned with international criteria. New to the CSA Standard (Z809-08 version) is the requirement to carry out specific discussion on selected forest management

[4] In the case of the SFMP for the DFA, this includes compliance with the strategic direction provided in the Alberta Forest Management Planning Standard.

topics during the public participation process. Also new are the requirements for the SFMP to contain core indicators for nearly all of the elements.

For each set of criteria and elements, forest managers, Aboriginal groups and the public identify local values and objectives. Core and local indicators and targets associated with each are assigned to the values and objectives to measure performance.

Values identify the key aspects of the elements. For example, one of the values associated with "species diversity" might be "sustainable populations of native flora and fauna."

Objectives describe the desired future condition, given an identified value. For example, the objective to meet the value of sustainable populations of native flora and fauna might be "to maintain a variety of habitats for naturally occurring species."

Indicators are measures to assess progress toward an objective. Indicators are intended to provide a practical, cost-effective, scientifically sound basis for monitoring and assessing implementation of the SFMP. There must be at least one indicator for each element and associated value. Core indicators have been included in the CSA standard for nearly all elements. Additionally, local indicators can be added to the SFMP.

Targets are specific short-term (one or two year) commitments to achieve identified indicators. Targets provide a clear specific statement of expected results, usually stated as some level of achievement of the associated indicator. For example, if the indicator is "minimize loss to the timber harvesting land base," one target might be "to have less than 'x' percent of harvested areas in roads and landings."

Values, objectives, indicators, and targets apply to socio-economic and ecological criteria and may address process as well as on-the-ground forest management activities. In the SFMP for the DFA, these performance measures were developed to be applied to the entire plan area.

As part of the process of developing values, objectives, indicators and targets, the FMAC also assisted in the development of forecasts of predicted results for indicators and targets.

Forecasts are the long-term projection of expected future indicator levels. These have been incorporated into the SFMP targets as predicted results or outcomes for each target. Additional forecasting of indicators has occurred where there is some reliance on the Timber Supply Analysis process.

4.1.2 Public Review of Annual Reports and Third Party Audits

Each year, Canfor compiles a report that summarizes results for each of the SFMP performance measures. This annual report is provided to the FMAC for review and comment. Annual monitoring of achievements against performance measures, and comparison of the actual results to forecasts, enables the SFMP to be continually improved. Continuous improvement is mandated by the CSA standard.

For a forest tenure holder registered to the CSA standard, the achievement of performance measures (indicators and targets) is assessed annually through surveillance audits carried out by a registered third party auditor. The audit confirms that the registrant has successfully implemented the SFMP and continues to meet the CSA Standard. Audit summaries are available to the public.

4.1.3 Internal Infrastructure: Systems Components

The CSA SFM standard mandates a number of process or systems-related requirements called "systems components." These systems components must be incorporated in a registrant's internal environmental management system (EMS). Systems components include:

- **Commitment:** A demonstrated commitment to developing and implementing the SFMP.
- **Public and Aboriginal Groups participation:** The CSA standard requires informed, inclusive and fair consultation with Aboriginal Groups and members of the public during the development and implementation of the SFMP.
- **CSA-aligned management system:** The management system is an integral part of implementation of the SFMP and is designed to meet CSA standards. The management system has four basic elements: Planning, Implementing, Checking and Monitoring, and Review and Improvement.

    1) Identify environmental risks.
    2) Identify standard operating procedures or develop performance measures to address significant risks.
    3) Develop emergency procedures in the event of an incident causing environmental impacts.
    4) Review all laws and regulations.
    5) Establish procedures for training. Providing updated information and training ensures that forestry staff and contractors stay current with evolving forest management information and are trained to address environmental issues during forestry activities.
    6) If an incident does occur, conduct an investigation or incident review and develop an action plan to take corrective action, based on the preparation undertaken in steps 1 to 5.

- **Continual improvement:** As part of Canfor's management system, the effectiveness of the SFMP is continually improved by monitoring and reviewing the system and its components. This includes a review of ongoing planning, public process and Aboriginal Groups liaison to ensure that the management system is being implemented as effectively as possible.

4.1.4 CSA Registration

Following completion of a sustainable forest management plan and the development of an environmental management system in accordance with the CSA standard, a licensee may apply for registration of its DFA. The determination of whether all the components of an SFM system applied to a DFA are in place and functional involves an on-the-ground audit of the DFA including field inspections of forest sites. The intent of the registration audit is to provide assurance that the objectives of sustainable forest management on the DFA are being achieved. The registration of a licensee's DFA follows a successful registration audit by an eligible independent third party auditor who has assessed and determined:

- an SFMP, that meets the CSA Standard, has been developed and implemented, including confirmation that quantified targets for meeting sustainable forest management criteria have been established through a public participation process;
- an SFM Environmental Management System has been developed and is being used to manage and direct achievement of the SFMP performance measures; and
- progress toward achieving the targets is being monitored, and monitoring results are being used for continual improvement of the SFMP and Environmental Management System.

A typical registration audit may include:

- interviews with public advisory group members;

- a review of monitoring and reporting responsibilities related to CSA performance measures;
- meetings with government officials to discuss licensee performance and government involvement in development of the SFMP;
- field reviews visiting harvest and road construction operations;
- interviews with staff and/or contractors to review their understanding of the environmental management system requirements; and
- meetings with management to assess the level of commitment to environmental performance and sustainability.

In addition to the registration audit, regular surveillance audits are conducted to examine performance against all aspects of the SFM System, including the requirement that regulatory standards and policy requirements are met or exceeded.

4.2 The DFA SFM Planning Process

The SFMP was developed by Canfor Alberta on advice and recommendations provided by the FMAC. The plan was developed to comply with all existing legislation and policy and consistent with the strategic direction of higher-level plans as identified in the Alberta Forest Management Planning Standard (ESRD. 2006). The plan will be continually updated and improved to incorporate new information, changing values, recommendations from monitoring activities and new circumstances.

4.2.1 Public Participation

FMAC assisted Canfor Alberta in developing the SFMP by identifying local values, objectives, indicators and targets and evaluating the effectiveness of the plan.

Members of FMAC represented a cross-section of local interests including environmental organizations, Aboriginals, resource-based local communities, public at large, etc. An open and inclusive process was used to formulate the public advisory group. ESRD provided technical support to the SFM planning process, including information on resources and policy issues. The group developed, and was guided by, the Terms of Reference and Procedures (TOR) The TOR is consistent with the CSA standard, and specifies that the process for developing the SFMP must be open and transparent. (A copy of the current TOR is located in Appendix 5). As part of the updating of the SFMP to meet the requirements of the revised 2008 CSA standard (Z809-08), considerable discussion occurred on specific topics related to the six Criteria.

FMAC reviews annual reports prepared by Canfor Alberta to assess achievement of performance measures. This monitoring process provides Canfor Alberta and others with an opportunity to bring forward new information and to provide input concerning new or changing public values that can be incorporated into future updates of the SFMP.

5.0 Strategy Guiding the SFMP

5.1 Land Use Framework

Alberta has initiated the Land Use Framework (LUF) process as an overarching land use planning exercise, but the Upper Peace Region planning process has not been initiated. When the Upper Peace Regional Plan has been completed, a review of this SFMP will be undertaken to ensure it is consistent with the land use plan.

5.2 Forest Management Plan

Canfor Alberta is required to submit a FMP as defined in the Forest Management Agreement (Alberta. 1999) with the Province. The Alberta Forest Management Planning Standard (AFMPS) is the guiding document for the completion of the FMP. ESRD created the AFMPS with the CSA 809 process as a guiding document. For this reason, there is significant synergy between FMPs and SFMPs. Canfor has decided that development of the plans simultaneously is the most effective process to ensure alignment. Both documents guide the strategic and operational decisions and plans made by Canfor Forest Practitioners. The 2012 FMP contains resource management philosophies and goals, forest management objectives and the overall implementation strategy, while the 2012 SFMP provides updated quantitative targets and the processes for monitoring performance. The FMAC plays an integral role in the development of both documents.

5.3 SFMP Strategy for the DFA

The DFA SFMP is aligned with the FMP strategic direction and Canfor's core indicators. The SFMP strategy recognizes the FMP Goals, Objectives and Strategies that support achievement of sustainable forest management on the DFA. The SFMP includes appropriate indicators to confirm forest management practices are aligned with the FMP Goals and Objectives, and that there is appropriate consideration of Aboriginal Groups, public and integrated resource management interests. The SFMP, guided by the FMP, utilizes indicators and targets that:

- reflect key goals, objectives and direction of the FMP;
- are guided by Canfor's core indicators;
- are guided by the Canadian Council of Forest Ministers' Criteria and Elements; and
- are within the ability of the forest industry to influence and manage.

A set of strategies has been developed to achieve the SFMP objectives and targets. These strategies document the relevance of the indicator to the SFMP and sustainability, and summarize actions required to meet the target. Applicable strategies are identified for each indicator in Section 7 of the SFMP.

5.4 Additional Guidance

Canfor is also guided by legislation, laws and policies established by federal, provincial and municipal governments.

6.0 Values & Objectives

FMAC has identified local values and objectives for each of the CSA defined elements. The values and objectives were developed in earlier SFMPs (2001 and 2005) and reviewed and updated for the 2011 plan. These updated values and objectives are summarized in this section.

Core Indicators (included in the CSA standard) as well as local indicators and their respective targets have been developed to meet these local values and objectives. SFMP indicators (core and local) and their targets are described in Section 7. A summary table showing all criteria and elements and associated local values, objectives, indicators and targets is provided in Appendix 2.

Criterion 1: Biological Diversity

Conserve biological diversity by maintaining integrity, function, and diversity of living organisms and the complexes of which they are part.

Element 1.1: Ecosystem Diversity

Conserve ecosystem diversity at the stand and landscape levels by maintaining the variety of communities and ecosystems that naturally occur in the DFA.

Description of Values	Description of Objectives	Indicators
Natural ecosystems on the landscape	All ecosystems are represented on the landscape at current levels	1.1.1, 1.1.2, 1.1.3, 1.1.4

Element 1.2: Species Diversity

Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained through time, including habitats for known occurrences of species at risk.

Description of Values	Description of Objectives	Indicators
Through time, all current habitats are represented	Habitat for focal species is maintained on the landscape	1.2.1a), b)
	Current species diversity is maintained on the landscape	1.2.2 a), b), c), d), 1.2.3

Element 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.

Description of Values	Description of Objectives	Indicators
Natural genetic diversity	Genetic diversity will be maintained on the landscape	1.3

Element 1.4 Protected Areas and Sites of Special Biological and Cultural Significance

Respect protected areas identified through government processes. Co-operate in broader landscape management related to protected areas and sites of special biological and cultural significance. Identify sites of special geological, biological, or cultural significance within the DFA, and implement management strategies appropriate to their long-term maintenance.

Description of Values	Description of Objectives	Indicators
Identified protected areas and sites that have special biological significance	Conservation of the natural states and processes to maintain protected areas and sites that have special biological significance	1.4.1
Identified protected areas and sites that have special biological and cultural significance Understand and respect Aboriginal special needs	The natural states and processes to maintain protected areas and sites that have special biological and cultural significance will be conserved Early and effective consultation with Aboriginal peoples will be provided	1.4.2, 6.2.1

Criterion 2: Forest Ecosystem Condition and Productivity

Conserve forest ecosystem condition and productivity by maintaining the health, vitality, and rates of biological production.

Element 2.1 Forest Ecosystem Resilience

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

Description of Values	Description of Objectives	Indicators
Healthy forest ecosystem	Meet reforestation targets on all harvested areas Forest ecosystem health will be maintained	2.1.1 a)
	Forest ecosystem health will be maintained	2.1.1 b), c), d)

Element 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 suited to the site.

Description of Values	Description of Objectives	Indicators
Sustained forest ecosystem productivity	Limit the conversion of productive forest to other uses	2.2.1
	Maintain productive harvest level	2.2.2

Criterion 3: Soil and Water

Conserve soil and water resources by maintaining their quality and quantity in forest ecosystems.

Element 3.1 Soil Quality and Quantity

Conserve soil resources by maintaining soil quality and quantity.

Description of Values	Description of Objectives	Indicators
Soil quality and quantity	Soil productivity will be maintained or enhanced	3.1.1 a)
	Soil erosion will be minimized	3.1.1 b)
	Maintain onsite coarse woody debris	3.1.2

Element 3.2 Water Quality and Quantity

Conserve water resources by maintaining water quality and quantity.

Description of Values	Description of Objectives	Indicators
Water quantity	Water quantity will be maintained	3.2.1 a)
Water quality	Water quality will be conserved	3.2.1 b)
	Impacts to water quality will be minimized	3.2.1 c)

Criterion 4: Role in Global Ecological Cycles

Maintain forest conditions and management activities that contribute to the health of global ecological cycles.

Element 4.1 Carbon Uptake and Storage

Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems.

Description of Values	Description of Objectives	Indicators
Carbon uptake and storage	Carbon uptake and storage (i.e. carbon balance) will be maintained	4.1.1

Element 4.2 Forest Land Conversion

Protect forestlands from deforestation or conversion to non-forests, where ecologically appropriate.

Description of Values	Description of Objectives	Indicators
Sustainable yield of timber	Limit the conversion of productive forests to other uses	2.2.1

Criterion 5: Economic and Social Benefits

Sustain flows of forest benefits for current and future generations by providing multiple goods and services.

Element 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.

Description of Values	Description of Objectives	Indicators
Sustainable yield of timber and non-timber benefits	Sustainable forest management that maintains timber and non-timber benefits	5.1.1 a), b)

Element 5.2 Communities and Sustainability

Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and by supporting local community economies.

Description of Values	Description of Objectives	Indicators
A range of benefits to local communities	Local communities and contractors will have the opportunity to share in benefits such as jobs, contracts and services	5.2.1 a) b), 5.2.2
Fair distribution of benefits across communities	A fair distribution of benefits and costs will be ensured across all communities in the local area	5.2.3, 5.2.4

Criterion 6: Society's responsibility

Society's responsibility for sustainable forest management requires that fair, equitable, and effective forest management decisions are made.

Element 6.1 Aboriginal and Treaty Rights

Recognize and respect Aboriginal title and rights and treaty rights. Understand and comply with current legal requirements related to Aboriginal title and rights and treaty rights.

Description of Values	Description of Objectives	Indicators
Understanding and respecting Aboriginal and treaty rights	Aboriginal and treaty rights will be respected	6.1.1, 6.1.2, 6.1.3

Element 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.

Description of Values	Description of Objectives	Indicators
Identify protected areas and sites that have special biological and cultural significance	The natural states and processes to maintain protected areas and sites that have special biological and cultural significance	6.2.1, 1.4.2
Understand and respect Aboriginal special needs	Early and effective consultation with Aboriginal peoples will be provided	

Element 6.3 Forest Community well-being and resilience

Encourage, co-operate with, or help to provide opportunities for economic diversity within the community.

Description of Values	Description of Objectives	Indicators
Inclusive public process	Affected and locally interested parties will be involved in the development of the decision-making process through an open, transparent and accountable process	6.3.1
Worker safety	Effective worker safety program	6.3.2
	Approved safety program	6.3.3

Element 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.

Description of Values	Description of Objectives	Indicators
Current scientific, local and traditional knowledge	Forest management decisions will be based on scientific, local and traditional knowledge	6.4.1, 6.4.2, 6.4.3

Element 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.

Description of Values	Description of Objectives	Indicators
Current scientific, local and traditional knowledge	Forest management decisions will be based on scientific, local and traditional knowledge	6.5.1, 6.5.2 a), b)

7.0 Indicators & Indicator Matrices

The indicators and targets in an SFMP provide the performance measures that are to be met through on-the-ground forest management activities. This section provides a detailed description of each of the indicators and targets in the SFMP. The DFA Indicator statements have been developed for each core indicator, and some core indicators incorporate more than one statement. These serve to put the target into context against the core indicator and make the target easily measurable. Many of the previous plan indicators were similar to the set of core indicators, thus the targets used to measure these core indicators have not changed significantly. Full conformance is required for many targets therefore no variance is appropriate. Where less than full conformance will pose an acceptable risk, an acceptable level of variance is indicated for the target.

Licensees monitor the achievement of targets annually. Monitoring procedures for each target in the SFMP are described below. Management strategies provide further direction to the performance measures (indicators and targets) and serve as a guide during annual monitoring activities.

7.1 Objectives, Indicators & Targets

The SFMP process has served to further refine the information and concerns of the local public. Incorporating these concerns and ideas into operations through the established performance measures and ongoing monitoring ensures long-term sustainability of the forest resource. Any indicators established in this SFMP that are conducive to long term projections are noted below.

Section 5 describes the plans, policies and management strategies that support the achievement of the targets in the SFMP.

7.2 Base Line for Indicators

The primary source of base line information for indicators is the initial monitoring report subsequent to adoption of the indicator. Where existing indicators and targets were used to satisfy a core indicator, the baseline will be identified as that from the previous SFMP. In some instances, particularly in the case of newly developed indicators, a baseline might be difficult to establish and thus be absent in the plan. In those situations, baseline information will become available through subsequent monitoring reports.

7.3 Current Status of Indicators

Current status of each indicator is as reported and updated in annual SFMP performance reporting. To obtain current information please refer to the most recent monitoring report located www.Canfor.com

7.4 Forecasting

Forecasts are the projection of expected future indicator levels. A variety of models have been used in the development of these projections. Where appropriate, these projections have been incorporated into the SFMP targets as predicted results or outcomes for each target. Forecasting of many of the SFMP indicators and targets has occurred during the development of the FMP. The SFMP has incorporated this information, often within the indicator and target itself. A strong example of this is Indicator 1.2.2 (c), Report on amount of Barred Owl habitat available for breeding pairs. The AFMPS requires that this percentage is shown for the present state, and through the future harvesting periods. The model outputs are valid only if all the other planning assumptions are reasonably accurate. The AFMPS requires some sensitivity analysis around these assumptions to ensure that minor inaccuracies in the assumptions. Where there is a risk of significant magnitude due to incorrect assumptions, extra monitoring, or a more conservative approach is required.

Often, the target for the indicator is in itself the predicted result or outcome. Indicator forecasts also provide predictions of future state relative to Elements, Values or Objectives.

7.5 Legal Requirements

Awareness of legal requirements is essential when considering suitable Objectives for an Element and determining appropriate Indicators and Targets. In the following list of Indicators, applicable Acts and Regulations are noted in the “Legal Requirements” section. Specific sections/ subsections of these Acts and Regulations have not been identified to avoid having to manage the ongoing changes to forest legislation. Canfor Alberta ensures that specific legislation related to Objectives, Indicators and Targets is known and complied with by staying current with legal requirements. Subscribing to commercial services, reliance on in-house staff or industry associations, and participating in joint legislative review committees are just some of the methods used by Canfor to remain current with legislation.

7.6 Indicators in the SFMP

1.1.1 Representation of Plant Communities at the Landscape Level

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.1 Ecosystem area by type (1.1.1.4 of the AFMPS)
Indicator Statement	**Percent of occurrence of identified uncommon (Forested/Woodland) plant communities protected within DFA**
Description of indicator	Natural plant communities are defined as recurring assemblages of plant species; the species occurring together because they respond similarly to a variety of site attributes. Maintenance of uncommon plant communities is a societal value, important in maintaining biodiversity.
Target	**100% of identified uncommon (Forested/Woodland) plant communities will be maintained**
Description of target	Uncommon forested/woodland plant communities, defined as either S1 or S2 in the Alberta Conservation Information Management System (ACIMS), will be maintained on the DFA through training, identification and development of site-specific strategies.

Basis for the Target

To ensure conservation of biodiversity, uncommon forested/woodland plant communities occurring on the DFA may require special management considerations. The ACIMS site provides information on the type and potential location of uncommon plant communities. The licensees will do training for staff and field layout contractors when operating in the areas listed on the ACIMS website www.tpr.alberta.ca/parks/heritageinfocentre/default.aspx for plant communities listed as S1 or S2. The training will involve identification and probability by ecotype. All identified sites will have strategies to minimize impact on the occurrences, such as avoidance or season of operation.

Strategy

Means of Achieving Objective & Target:

Three steps will be required; firstly, mapping of potential locations, secondly, training in identification, and lastly, development of protection strategies. The ACIMS plant community maps are compared annually to the SHS to identify potential overlap between planned blocks and potential areas of S1 and S2 forested/woodland communities. Training on identification of occurrences of S1 and S2 forested/woodland plant communities (Appendix 6) is provided to employees and contractors when working in areas of overlap. Finally, when S1 and S2 forested/woodland plant communities are identified during the operational planning stage strategies will be developed in consultation with the Government.

Forecast

Current Status:

This is a new target. The process for accessing ACIMS information and site identification will be developed over the next two years.

Predicted Results or Outcome:

Uncommon forested/woodland plant communities will be identified and strategies for maintaining their presence will be developed.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.4

Monitoring & Measurement

Annual:

Listing of Final Harvest Plans (FHP) completed and demonstration that FHP's were compared to ACIMS plant community classification and mapping for potential overlap. Where there is overlap between the FHP area and the ACIMS site, report training of employees and layout contractors in identification of potential S1 and S2 forested/woodland plant communities. List of any identified sites, and management strategies developed.

Reporting Process

The Annual Performance Monitoring Report (APMR) will list which FHP's had overlap with the ACIMS maps of potential S1 and S2 forested/woodland plant communities' areas. Where there is overlap, the report will list the training completed for layout staff and contractors. Finally, number of S1 and S2 forested/woodland plant communities identified during the planning and layout field season will require documentation that protection strategies were developed.

Variance

There is no allowable variance from the target

Response

Where overlaps between ACIMS and harvest areas are detected in the reporting process, and these areas did not have training and documentation of protection (if necessary), a root cause analysis will be conducted to identify the problem and the process may be modified.

1.1.2 Distribution of Forest Type

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.2 Forest area by type or species composition (no ESRD VOIT)
Indicator Statement	**Percent distribution of forest type (treed conifer, treed broad leaf, treed mixed) >20 years old across DFA**
Description of indicator	Tree species composition and stand structure are important variables that affect the biological diversity of a forest ecosystem - providing structure and habitat for other organisms.
Target	**Maintain the current baseline percent distribution of forest types (treed conifer, treed broad leaf, treed mixed) >20 years old into the future**
Description of target	Retain the broad forest cover types into the future.

Basis for the Target

Tree species composition, stand age, and stand structure are important variables to the biological diversity of a forest ecosystem - providing structure and habitat for other organisms. Ensuring a diversity of tree species within their natural range of variation, improves ecosystem resilience and productivity and positively influences forest health. Reporting on this indicator provides high-level overview information on area covered by broad forest type, forest succession and management practices that might alter species composition.

Ensuring a diversity of tree species is maintained improves ecosystem resilience, productivity and positively influences forest health. This guides forest managers in maintaining the natural forest composition in an area and lends itself to long-term forest health and productive forests that uptake carbon.

Treed conifer forests are those where conifers dominate the species mix (at least 80% of trees are conifer), treed broad leaf forests are those where mostly deciduous trees dominate the species mix (at least 80% of trees are broad leaf) and mixed forests are those that fall within the middle range where neither conifer or broad leaf trees dominate the species mix.

Strategy

Means of Achieving Objective & Target:

To maintain baseline ranges it is critical that regenerated forests are managed to the proper trajectory. Forest plans will incorporate reforestation strategies that retain the natural balance of broad forest types within the DFA. Silviculture plans will be implemented and results will be monitored. The broad forest types were derived from stratification used in the FMP.

Forecast

Current Status:

The percent distribution of forest types (Table 2) greater than 20 years of age across the DFA is 41.6% treed conifer, 12.8% treed broadleaf and 45.6% treed mix (2010 baseline derived from Alberta Vegetation Inventory).

Table 2. Distribution of Forest Types (Ha)

Forest Type	>20 Years (Ha)	Percent
Treed Conifer	226,171	41.6%
Treed Broad Leaf	69,826	12.8%
Treed Mixed	247,620	45.6%
Total	543,617	

Predicted Results or Outcome:

Healthy ecosystems with a diversity of native (treed conifer, treed broad leaf, treed mixed) species maintained at endemic and sustainable levels.

Legal Requirements

Not applicable

Monitoring & Measurement

Periodic:

Timber Supply Model will project the percentage of area by forest type and the output of the forest types from the Preferred Forest Management Scenario (PFMS) will be reported.

Reporting Process

The Forest Management Plan (FMP) modeling results will be reported in the APMR once FMP is completed.

Variance

The modeled area will be allowed to vary +/- 5% of the baseline percent for all three strata over the life of this SFMP.

Response

The PFMS will require that the target is met. Following the SHS will ensure compliance. A major natural disturbance may create a new baseline; therefore, a new TSA may be required.

1.1.3a) Old Interior Forest

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.3 Forest area by seral stage or age class (1.1.1.2b of the AFMPS)
Indicator Statement	**Area of old interior forest by natural region by cover class across the DFA**
Description of indicator	Old interior forests are defined by both an age and size criteria. The percentage of the land base that meets both criteria within the boreal and foothills natural regions are derived and used as targets.
Target	**Area of old interior forest will not be less than the current hectares by natural region of each cover class over the next 200 yrs**
Description of target	The amount of old interior forest is derived from the approved forest cover database (Alberta Vegetation Inventory (AVI)) data and a Geographical Information System (GIS) algorithm to extract the data. This initial amount is used as a target for the remainder of the 200-year planning horizon. The spatial harvest sequencing (SHS) and the timber supply model allows the spatial projection of the land base into the future, enabling the projection of the amount of old interior forest that will exist at any given point in time.

Basis for the Target

Old interior forest is a habitat requirement for some species. Harvesting, and other disturbances such as fire, have historically reduced the amount of old growth habitat, as well as fragmented larger old growth stands that would meet the habitat requirements of those species. New forest planning tools allow the forest manager to ensure stands of a specific description can be maintained along with some harvest level.

According to Alberta Forest Management Planning Standards, Annex 4 - Performance Standards (Appendix 4), old interior forest is a forest area greater than 100 ha in size located beyond edge effect buffer zone (1) along the edge (2). The interior forest objective will use a common age, definitions for all cover classes (yield groups) to prevent breaking up forest patches that have a common origin date.

Where:
(1) Forest edge: any of the following: a) a linear disruption in forest cover greater than 8m in width, or b) the line along which forest seral stage class changes.
(2) Edge effect buffer zone: 60m where adjacent area is non-forested or less than 40 yrs old; 30m where adjacent forest stand is >= 40 yrs and less than mature forest; 0m where adjacent forest stand is mature forest.

Strategy

Means of Achieving Objective & Target

The starting level of old interior forest will be derived in the land base summaries of the AVI data using old interior forest criteria. These levels will be listed by Natural Region and by cover class groups. Harvesting will be modeled forward and the amount of area meeting the definition of old interior forest will be reported in the FMP at key points in time (current, 10 and 50 years). Where a particular harvest level and spatial harvest sequence does not meet the targets, additional model runs will be completed, altering the spatial harvest sequence until the model scenario demonstrates the ability to achieve the targets.

Forecast

Current Status

Table 3 shows the amount of area of old interior forest by natural region and cover class at the current time.

Table 3. Old Interior Forest by Natural Region

Cover Class	Natural Region	Area (ha)
C	Boreal Forest	910
CD	Boreal Forest	212
DC	Boreal Forest	146
D	Boreal Forest	180
C	Foothills	12605
CD	Foothills	543
DC	Foothills	370
D	Foothills	4
Total		14970

Predicted Results or Outcome:

Predicted results will be displayed after approval of the Forest Management Plan Preferred Forest Management scenario is completed.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.2b

Monitoring & Measurement

Periodic:

The FMP and preferred forest management scenario (PFMS) will state the initial old interior forest and the levels achieved throughout the planning horizon for years 0, 10 and 50 years. At the end of year 5, the old interior amounts will be recalculated based on previous harvesting activities.

Reporting Process

At the end of year 5, the actual old interior forest will be compared to the target and reported in the APMR.

Variance

Area of old interior forest **will not be less than 90% the current hectares by natural region of each coverclass.**

Response

The PFMS will require that the target is met. Following the SHS will ensure compliance. A major natural disturbance may alter the success; therefore, a new TSA will be required.

1.1.3b) Patch Size

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	None (ESRD 1.1.1.2a)
Indicator Statement	**Range of patch sizes by subunit and entire DFA**
Description of indicator	Patch definitions include age, seral, and structural-based, as well as habitat-based systems. These systems all classify contiguous stands into patches based on similarity criteria. Patch dynamics are explored, showing how patch distributions change in a variety of classification-dependent ways as the landscape ages.
Target	**The Preferred Forest Management Scenario patch size distribution will be constrained through the modeling to meet the targets in the table below (based on literature review), over 200 year planning horizon**
Description of target	The distribution of patch sizes is reported by 0 - 100 ha, 100 - 500 ha and 500+ hectare classes. These classes were defined based on extensive literature review and the maximum 500-hectare aggregation rule.

Basis for the Target

Fragmentation of the forest landscape is an ecological concern related to some plants and animals. Maintenance of a natural range of patch sizes will allow these species to continue their presence on the land base. Patch size distribution targets were derived for the Boreal Forest and Foothills Natural regions based on theoretical fire-return intervals (ORM. 2000). Targets for the Boreal Forest Natural region were derived from measured patch size classes of four 20-year periods of unmanaged forests (Tanner, D. a. 1996); while targets for the Foothills Natural region were based on the distribution of patch sizes in historical pre-suppression air photos of the Foothills Model Forest in Hinton, Alberta (Andison, 1997). The targets for the reporting units (FMA area and the Peace, Puskwaskau and Main portions) are weighted based on the proportion of areas in the Boreal Forest and Foothills Natural regions Table 4

Table 4. Natural Disturbance Patch Size Class Percentage

Natural Disturbance Patch Size Class Percentage

Reporting Areas	Percent by Area					
	1–100 ha		100–500 ha		500+ ha	
	LL	UL	LL	UL	LL	UL
FMA Area	10	16	14	25	53	82
Peace	14	23	13	25	52	73
Puskwaskau	14	23	13	25	52	73
Main	9	15	14	25	53	83
Notes: LL= Lower Limit; UL= Upper Limit						

Strategy

Means of Achieving Objective & Target:

The evaluation of the patch size on the DFA will determine the present distribution. When developing the SHS, constrain patch size distribution when selecting preferred forest management scenario.

Forecast

Current Status:

The current patch size distribution is illustrated in Table 5 will be calculated when the preferred forest management scenario is completed in 2012.

Table 5. Current Patch Size Percent

Reporting Areas	Percent by Area		
	1–100 ha	100–500 ha	500+ ha
FMA Area	23.8	14.8	61.4
Peace	15.3	7.4	77.3
Puskwaskau	21.9	9.1	69.0
Main	24.4	15.7	59.9

Predicted Results or Outcome:

The target patch size distribution will be achieved by following the Alberta's Forest Management Planning Standard and Operational Ground Rules.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.2a

Monitoring & Measurement

Periodic:

The model will have an output of the planned the patch size distribution after the SHS is completed at key points in time (current, 10, 20 and 50 years) to demonstrate how the FMP is going to meet the targets.

Reporting Process

Upon completion of the PFMS, the target and planned patch size distributions will be calculated and the results published in the APMR.

Variance

The acceptable variance is to be within +/-10% of the FMP PFMS forecast based on reporting periods 0, 10 and 50 years.

Response

If the SHS can not be followed, a compartment assessment, or new Timber Supply Analysis will be required. Constrain future modelling to the same targets.

1.1.3c) Seral Stage

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.3 Forest area by seral stage or age class (ESRD 1.1.1.1)
Indicator Statement	**Percent of area of old, mature and young forest by natural region across the DFA**
Description of indicator	Seral stages are defined by the age of the stand at breast height for different yield groups. The breast height age ranges used to define seral stages are presented in Table 6. Seral stage distribution "is important for the conservation of biodiversity because it enables timber harvests to be planned so as to maintain a full range of successional habitats for wildlife and ecosystem types over the long-term" (CCFM 1997: p.2).
Target	**Over the 200 year planning horizon** **A. Gross land base: >13% old forest, > than 76% mature plus old forest, < than 11% young forest; and** **B. Net land base: >10% old forest, > than 73% mature plus old forest, < than 17% young forest.**
Description of target	The land base summaries from the AVI inventory will provide the amount of old, mature and young forest within the gross and net land bases. The models used to determine the AAC will be constrained to ensure that seral stage targets are achieved.

Basis for the Target

The target seral stage distribution is one that approximates the current distribution created by natural disturbance regimes within the two Natural regions, Foothills and Boreal Forest. The natural disturbance regime was forecasted using theory outlined "Fire-Return Interval for Canfor's FMA" (ORM 2000).

Setting targets and monitoring seral stage distribution over time will ensure a range of seral stages is present on the landscape throughout the planning horizon.

Table 6. Seral Stage Age by Yield Group

YG	Description	Young	Mature	O.Mature	Old
1	AW+(S) -B	1-20	21-70	71-110	110+
2	AW+(S) -CD	1-20	21-70	71-110	110+
3	AWSW/PBSW/BWSW	1-40	41-80	81-120	120+
4	BW/BWAW+(S)	1-20	21-70	71-110	110+
5	FB+OTH	1-40	41-100	101-120	120+
6	H+(S)/S	1-20	21-70	71-110	110+
7	PB+(S)	1-20	21-80	81-110	110+
8	PL/PLFB+(H)	1-40	41-80	81-120	120+
9	PLAW/AWPL	1-30	31-70	71-120	120+
10	PLSB+OTH	1-40	41-90	91-120	120+
11	PLSW/SWPL	1-40	41-90	91-120	120+
12	SBLT/LTSB(G)	1-50	51-130	131-150	150+
13	SBLT/LTSB(M,F,U)	1-50	51-140	141-160	160+
14	SBPL/SBSW/SBFB	1-40	41-100	101-130	130+
15	SW/SWFB+(H) - AB	1-40	41-90	91-120	120+
16	SW/SWFB+(H) - CD	1-40	41-90	91-120	120+
17	SWAW/SWAWPL	1-40	41-90	91-120	120+

Strategy

Means of Achieving Objective & Target:

Development of the preferred forest management scenario (PFMS) spatial harvest sequence (SHS) for the Forest Management Plan (FMP) scheduled for completion in 2012. The TSA process will outline current and future seral stage distribution of the model runs. The PFMS will choose a run where the seral stage distribution is maintained.

Forecast

Current Status:

Table 7. Percentage of Old, Mature and Young Forest

Seral Stage	Gross Landbase		Net Landbase	
	Ha	Percent	Ha	Percent
Old Forest	82,367	13.7%	79,009	10.3%
Mature plus Over Mature Forest	458,356	76.1%	347,283	73.1%
Young Forest	61,563	10.2%	48,820	16.6%
Total	602,286	100.0%	475,112	100.0%

Predicted Results or Outcome:

Once FMP PFMS receives approval, predicted results will be posted for key points in time (0, 10, 20, 50, 100 and 200 years). The predicted results will be the targets for this indicator.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.1

Monitoring & Measurement

Periodic:

The model will have an output of the planned the seral stage distribution after the SHS is completed at key points in time (current, 10, 20, 50, 100 and 200 years) and compared to the current seral stage distribution.

Reporting Process

Upon completion of the PFMS, the target and planned seral stage distributions will be calculated and the results published in the APMR.

Variance

Area of old and mature forest by cover class, shall be between 90% and 100% of target areas. Area of young forest by cover class, shall not exceed 110% of target area.

Response

If the SHS is not followed, a compartment assessment, or new TSA will be required. Constrain future modelling to the same targets.

1.1.4a) Structural Retention

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.4 Degree of within-stand structural retention (ESRD VOIT 1.1.2.1a)
Indicator Statement	**Percent of total annual harvested area retained in openings across the DFA**
Description of indicator	The retention of representative, un-harvested patches within harvest area boundaries
Target	**4% of total annual harvested area will be left un-harvested as structural retention of which 2% will be merchantable.**
Description of target	The target will ensure that structural retention (standing trees) will be left standing within the boundaries of harvested blocks.

Basis for the Target

Natural disturbances (i.e. fire, floods, avalanches, wind events, insects and disease infestations) rarely kill all trees within the disturbed area. Within all disturbance types, "skips" or "islands" result in residual patches of live trees remaining within larger disturbed areas. The retention of single live trees and patches of large live trees in harvest areas creates habitat in the harvested areas that is similar to that found within burned and other naturally disturbed areas.

Current information suggests that larger patches of residual structure generally provide more benefits than smaller patches (lower blowdown probability, interior forest characteristics, hiding and thermal cover) and patches generally provide more benefits than individual stems.

The islands left after disturbance will be roughly proportional to the total land base. One half of the islands will be from the non harvestable land base while the remaining half will have

minimums that will be made up of equal proportions of deciduous and coniferous volume. The un-harvested volume must include both small and large merchantable trees. Partially harvested areas are not considered retention patches.

Strategy

Means of Achieving Objective & Target:

Retention will be planned at the final harvest plan stage. The layout and design phase will include planned retention. The FHP includes a summary table of blocks and block areas. Columns will be added that will show the amount of area within the block boundaries that will not be harvested. Planned patches may be chosen for a variety of reasons, including watercourse buffers, steep slopes, raptor nests, seepage areas, cabins, etc. The non-harvested areas will be classified into non-merchantable and merchantable. The merchantable class will be further divided into deciduous dominated and coniferous dominated. At the bottom of the table, there will be a sum of the total block area and sums of the total area planned for retention for the three classes. When the un-merchantable retention is less than 2% or the coniferous and deciduous dominated merchantable patches are less than 1% respectively, planned retention patches will be added to the blocks. This will be done iteratively until the total retention meets the three minimums.

Operations: Harvesting of retention patches will not be allowed unless a similar patch (merchantability and broad cover group) is located elsewhere. Harvesting Supervisors, upon completion of harvesting, will assess the block for merchantable structure that was retained in the following manner:

a. Patches retained within the block boundary (both planned at the Final Harvest Plan (FHP) and added during operations) will be listed and the following attributes noted:
    i. Non-merchantable patches will be noted as such.
    ii. Merchantable patches will be assigned to either coniferous dominated or deciduous dominated categories.

Post Operations: Post harvest imagery will be acquired and digital Geographic Information System process will verify:

b. The location of the patches
c. The exact area of the patches
d. Confirm the coniferous leading, deciduous leading, coniferous/deciduous mixed wood or deciduous/mixed wood assignment
e. Timber volumes will be assigned to the merchantable patches (table 8) as follows:
    i. “C” Coniferous leading;
    ii. “D” Deciduous leading;
    iii. “CD” Coniferous/Deciduous mixed wood; or
    iv. “DC” Deciduous/Coniferous.
f. The sum of the volumes for both conifer and deciduous will be used for Annual Allowable Cut (AAC) timber drain in the volume reconciliation with the Province.

Table 8. Merchantable Timber Volumes

Broad Cover Group	Stand Age	Net merchantable volume (m3/ha)		
		Conifer	Deciduous	Total
C	100	171	23	194
CD	100	116	113	229
DC	100	62	163	225
D	80	6	190	196

Mountain pine beetle: Any blocks harvested for the purpose of Level 2 as defined in the Alberta Government's Interpretive Bulletin: *Planning Mountain Pine Beetle Response Operations* ver. 2.6 (ESRD. 2006a) will be completely excluded from this target however merchantable volume will be included as part of the AAC timber drain if any merchantable retention occurred.

www.srd.alberta.ca/LandsForests/ForestManagement/ForestManagementPlanning/documents/MPB_InterpretiveBulletin2007.pdf

Forecast

Current Status:

Retention was a target in the past 2005 SFMP but was calculated using a different process. Results from the past years are not comparable to the present system, so are not shown here.

Predicted Results or Outcome:

The forest will have healthy ecosystems with diversity and an abundance of native species and habitats. Harvested areas with habitat attributes will help to sustain biological and ecological processes. Merchantable retention volume will be reported as timber drain to ensure there is no over harvesting.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.2.1a

Monitoring & Measurement

Periodic:

The APMR will list current and historical retention achievement as a summary for all blocks in a given year. These numbers will be used to show trends and as described in the variance described below.

Annual:

The amount of structure retained on harvest areas measured annually. The timber volumes associated with the retention will be reported to the Province annually as part of the timber drain. These areas will be measured using GPS technology or interpreted digital imagery. Ocular estimates are not allowed.

Reporting Process

The harvested areas, the allocation to non-merchantable/conifer dominated/deciduous dominated and the volumes associated will be listed in the APMR.

Variance

50% of the annual targets (i.e. annual amounts could be 1% of non-merchantable, 0.5% coniferous dominated and 0.5% deciduous dominated) to take into account that not all blocks in an FHP will be harvested in a single year. The rolling 5-year average will have no allowable variance to the target.

This target and variance does not apply any blocks harvested to help control insect and disease populations. These situations will require consultation with the Province, i.e. mountain pine beetle.

Response

If the annual targets are not met, increase the following year's retention. The annual targets and reporting will indicate issues prior to the five-year target coming due. If the five-year target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.1.4b) Dispersed Retention

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current l levels
CSA Core Indicator	1.1.4 Degree of within-stand structural retention (no ESRD VOIT)
Indicator Statement	**Percent of blocks meeting dispersed retention levels as prescribed in the site plan/logging plan**
Description of indicator	Dispersed retention can be defined as retaining individual trees scattered throughout a cutblock. *www.borealforest.org/nwgloss3.htm*
Target	**100% of blocks prescribed to have dispersed retention will meet the levels as identified in site/logging plans**
Description of target	The target is to compare prescriptions with the post-harvest results.

Basis for the Target

This target provides recognition that tree retention and riparian areas are "focus areas" for successfully meeting biodiversity and ecosystem objectives. The retention of single live trees and patches of large live trees in harvest areas creates habitat in the harvested areas that is similar to that found within burned and other naturally disturbed areas.

Strategy

Means of Achieving Objective & Target:

During harvest, varying levels of structure retention may be retained within individual harvest areas depending on the availability of the types of structure (i.e. merchantable trees, understory, snags, etc.) and operational issues (i.e. safety concerns, size of harvest area, etc.).

Generally, the larger the harvest area, the more important the need is to retain a number of individual trees, snags and residual tree patches distributed across the harvest area. Residual tree patches should be located such that natural features, riparian areas, wildlife features, stand structure and composition, and proximity to standing forests are taken into account to maximize their utility for the biotic community.

The following forms of structure retention have historically been retained on harvested areas across the DFA:

- Incidental merchantable deciduous timber that was not required by the deciduous companies at the time – left in patches or single trees;
- No harvest zones designed to protect wildlife features, sensitive sites or immature timber;
- Understory protection;
- Riparian buffers; and
- Machine free zones.

Riparian buffers, machine free zones and no harvest zones are typically delineated from the harvest area with flagging. For incidental merchantable deciduous and understory, Canfor Forest Management Group (FMG) Alberta operations supervisors and equipment operators generally decide where and how structure is to be left on the harvest area.

Operationally, site/logging plans often include retention of dispersed trees such as snags, large live trees, deciduous trees, stub trees and understory trees. Dispersed retention provides stand level complexity and long term recruitment of coarse woody debris. Harvest value and ecological value can be optimized by selecting the variety of tree types (e.g., species, size, live and dead, etc.) that have high ecological value and low economic value, and through the number of trees retained.

Determine if the site/logging plan prescription for a cutblock requires dispersed retention during harvesting. On harvest map indicate 'yes' or 'no' if dispersed retention is planned. When it is prescribed, specify what type such as snags, species, quality, wildlife tree.

Forecast

Current Status:

New strategy will be fully implemented on any blocks planned after May 1st 2012.

Predicted Results or Outcome:

Healthy ecosystems with a diversity and abundance of native species and habitats. Harvested areas with habitat attributes that will help to sustain biological and ecological processes.

Legal Requirements

None

Monitoring & Measurement

Annual:

Annually measure the number of blocks with prescribed dispersed retention compared to the number of blocks with post-harvest dispersed retention. To determine if a block has adequate dispersed retention the block must have a minimum of 30% block area where dispersed retention occurred. Evaluations by photo interpretation will be used to assess post harvest dispersed retention.

Reporting Process

Dispersed retention achievement will be compared to the planned retention. Results will be reported in APMR.

Variance

90% of the blocks that had planned dispersed retention will meet the planned dispersed retention target.

Response

If the annual targets are not met, increase the following year's retention. The annual targets and reporting will indicate issues prior to the five-year target coming due. If the five-year target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.1.4c) Riparian Management

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	Retain ecological values and functions associated with riparian zones)
CSA Core Indicator	1.1.4 Degree of within-stand structural retention (ESRD VOIT 3.2.2.1)
Indicator Statement	**Number of non-compliances where forest operations are not consistent with riparian management requirements as identified in operational plans**
Description of indicator	Infractions would indicate systems failures around protecting riparian areas.
Target	**Zero non-compliances, specific to Operating Ground Rules (OGR), with riparian management requirements in forest operations**
Description of target	OGR infractions involving riparian areas reported to the Province, or found by the Province, will be reported.

Basis for the Target:

Riparian management areas provide opportunities for connectivity of forested cover along waterways, which are generally areas with high value for wildlife habitat and movement.

Strategy

Means of Achieving Objective & Target:

Block and road layout prior to harvest requires the identification of all riparian areas. Main road maintenance in riparian areas is also considered. Operating and road maintenance plans will include operational strategies for riparian areas.

Forecast

Current Status:

For 2011, there were two minor non-compliances reported in Canfor's Incident Tracking System. These were an improperly removed crossing and harvesting 5 meters outside of the original block boundary, which encroached inside a required 30m buffer.

Predicted Results or Outcome:

Healthy ecosystems with a diversity and abundance of native species and habitats. Harvested areas with habitat attributes that will help to sustain biological and ecological processes. Properly functioning riparian systems leading to the conservation of fish habitat and maintenance of water quality.

Legal Requirements

Timber Management Regulations & Canfor Operational Ground Rules,

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.6 and 3.2.2.1

Monitoring & Measurement

Annual:

Canfor's Incident Tracking System (ITS) will be used for entering and tracking all incidents and outcomes.

Reporting Process

The APMR will list any non-conformances and non-compliance incident that occurred during the previous years activities. This list will be a summary of incidents reported in the ITS system.

Variance

The allowable variance is two incidents per year.

Response

Remediation of any outstanding issues is the first priority. All incidents are investigated. Root cause analysis is conducted where the cause is not clear. Strategies and procedures will be modified where appropriate.

1.1.4d) Balancing Fibre and Ecological Factors in Burned Forests

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.4 Degree of within-stand structural retention (ESRD 1.1.1.5a)
Indicator Statement	**Area of un-salvaged burned forest**
Description of indicator	Forest fires are naturally occurring events. Traditionally, where burned areas of merchantable trees were large enough to justify operations, salvage logging recovered most of the timber. The indicator will track areas that have burned versus those that have been salvage logged in burned areas.
Target	**100% of Salvage Plans for burned areas will be in conformance with Environment and Sustainable Resources Development directive**
Description of target	Alberta Environment and Sustainable Resource Development, Forest Management Branch, Directive 2007-1 (ESRD. 2007b) (or its successors) directs the salvage plans and the retention required depending on burn size. All salvage plans will follow the directive.

Basis for the Target

Salvaging of fire killed timber to maintain forest growth must be balanced with allowing some burned areas to remain as habitat for plants and animals that require freshly burned forest for their survival. Following the Directive will ensure that this balance is attained.

Strategy

Means of Achieving Objective & Target:

Alberta Environment and Sustainable Resource Development, Forest Management Branch, Fire Salvage Planning and Operations Directive 2007-1 (ESRD. 2007b) directs salvage planning and operations. Meeting the intent of the Directive, Canfor Alberta will:

- Fires less than 1000 hectares: follow the normal Canfor

FMA 9900037 Operating Ground Rules (ESRD. 2011) retention strategies. Both green and burned patches may be selected for retention.

- Fires between 1000 and 10,000 hectares: Retain all unburned, wind-firm, islands in patches larger than two hectares up to a minimum of 10% and a maximum of 25%. Total retention will be between 10% and 25% of the merchantable-forested area, so burned timber areas will be retained where there are insufficient green tree patches.
- Fires larger than 10,000 hectares: A minimum of 25% of the merchantable area will be retained. The method of retention will be as per the Directive.

Forecast

Current Status:

All fire salvage operations since 2007 have been consistent with the Fire Salvage Planning and Operations Directive 2007-1 (ESRD. 2007b)

Predicted Results or Outcome:

All fire salvage plans will follow Fire Salvage Planning and Operations Directive 2007-1 (ESRD. 2007b) or its successors.

Legal Requirements

Alberta Environment and Sustainable Resource Development, Forest Management Branch, Fire Salvage Planning and Operations Directive 2007-1 (ESRD. 2007b)

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.5a

Monitoring & Measurement

Periodic:

The cumulative number of fires with salvage planned will be listed, with the percentage that have approved Salvage Plans tracked.

Annual:

Fire histories are obtained from the Province. All fires larger than 10 hectares in merchantable stands will be reported in the annual APMR report. The Province will not approve salvage plans if they do not meet the Directive; therefore, approval of the Salvage Plan denotes that the Directive was followed. All burned areas planned for salvage operations will have approved Salvage Plans.

Reporting Process

Annually in the APMR, fires with more than 10 hectares of merchantable timber and the approved Salvage Plans will be listed. Only fires older than one year will be included. Total area burned and area not harvested will be reported.

Variance
None. All salvage plans will conform to ESRD standards.

Response
If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.1.4e) Balancing Fibre and Ecological Factors in Blowdown Forest Areas

Criterion 1: Biological Diversity	**Element 1.1:** Ecosystem Diversity
Value	Natural ecosystems on the landscape
Objective	All ecosystems are represented on the landscape at current levels
CSA Core Indicator	1.1.4 Degree of within-stand structural retention (ESRD 1.1.1.5b)
Indicator Statement	**Area of un-salvaged blowdown**
Description of indicator	Blowdown of the trees in a forest is a natural event that may be stand replacing. Traditionally, where blowdown areas were large enough to justify operations, salvage logging recovered most of the timber. The indicator will track areas of blowdown greater than 10 hectares observed in the field and the percentage of those areas that are salvage logged.
Target	**In areas of blowdown that are salvage logged, greater than 25% of the area (ha) will be left un-salvaged**
Description of target	All areas of blowdown greater than 10 hectares will be tracked and reported annually in the Annual Performance Monitoring Report. The area of those blowdown patches will also be reported. At least 25% of the reported blowdown areas will be left un-salvaged. The target will be on a cumulative area of blowdown and salvage logging.

Basis for the Target
Salvaging of blowdown timber to maintain forest growth must be balanced with allowing some blowdown areas to remain as habitat for plants and animals that require some blowdown habitat for their survival as identified in annex 4 of the Alberta Forest Management Planning Standard.

Strategy

Means of Achieving Objective & Target:

Staff or government while doing other duties find blowdown areas. All areas larger than 10 hectares will be tracked and summarized in the APMR. Salvage plans will ensure that at least 25% of the cumulative area is not salvaged.

Forecast

Current Status:

Blowdown events are very stochastic. No major blowdown events have been reported on the FMA for a number of years. Historically, these areas were completely salvaged where economically accessible.

Predicted Results or Outcome:

Future blowdown events will be planned to leave at least 25% un-salvaged.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.5b

Monitoring & Measurement

Annual:

Areas of blowdown larger than 10 hectares will be reported annually in the APMR. The area and percent of salvage logged will also be reported.

Reporting Process

Annually in the APMR, the cumulative area blowdown and cumulative area salvage logged will be summarized. The difference will be shown as a percentage.

Variance

None. 25% of blowdown areas will be left un-salvaged.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.2.1a) Trumpeter Swans

Criterion 1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time, all current habitats are represented
Objective	Habitat for focal species is maintained on the landscape
CSA Core Indicator	1.2.1 Degree of habitat protection for selected focal species, including species at risk (ESRD 1.2.1.1)
Indicator Statement	**Trumpeter Swan habitat maintained**
Description of Indicator	Trumpeter swans (*Cygnus Buccinator*) are listed as Threatened under the *Alberta Wildlife Act*. http://www.srd.alberta.ca/fishwildlife/speciesatrisk/default.aspx Trumpeter swans are sensitive to human disturbance, and human activity in breeding areas may decrease survival of eggs or cygnets. Trumpeter swans that are disturbed may not nest or may abandon an existing nest. Therefore, the breeding population continues to be dependent on current management practices and habitat protection.
Target	**No future winter harvest within 200 meters and no summer harvesting within 800 meters of provincially identified Trumpeter Swan sites**
Description of Target	Two hundred meters of "no harvest" buffers are maintained and no summer harvesting within eight hundred meters around identified trumpeter swan areas to protect nesting sites, unless changes are recommended or approved by ESRD.

Basis for the Target

Trumpeter swans are sensitive to human disturbance, and human activity in breeding areas may decrease survival of eggs or cygnets. Trumpeter swans that are disturbed may not nest or may abandon an existing nest. Therefore, the breeding population continues to be dependent on current management practices and habitat protection. In order to minimize habitat disturbance, forest companies operating on the DFA have committed to "no timber harvesting within 200m from the high water mark and no summer harvesting within 800m of identified Trumpeter Swan lakes or water bodies" in the Canfor FMA Operating Ground Rules 7.7.4.2 (ESRD. 2011) to avoid disturbing trumpeter swans during the breeding season.

Strategy

Means of Achieving Objective & Target:

Canfor staff will check annually, in the spring, with ESRD Fish and Wildlife any new or excluded Trumpeter Swan sites in the DFA. At the preliminary design phase identify those trumpeter swan sites and plan a no harvest within 200m of site during winter harvest and 800m during summer harvest. At the strategic level account for trumpeter swan buffer areas within the land base netdown process in calculation of the annual allowable cut.

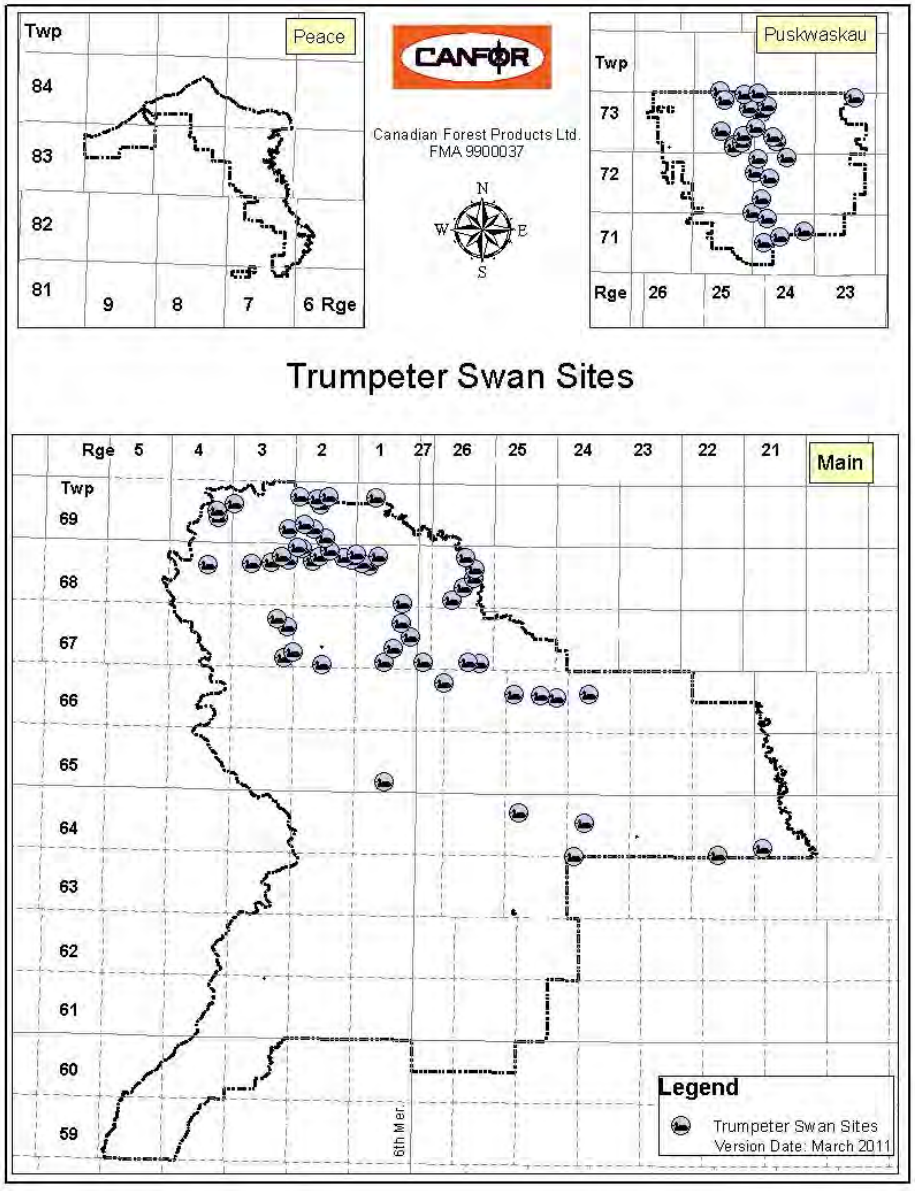
Forecast

Current Status:

Trumpeter Swans are currently designated as threatened under the Wildlife Act. There is a relativity healthy population of trumpeter swans on the DFA. There are 105 trumpeter swan breeding lakes requiring 200 meter and 800 meter buffers in the DFA.

www.srd.alberta.ca/FishWildlife/SpeciesAtRisk/GeneralStatusOfAlbertaWildSpecies/GeneralStatusOfAlbertaWildSpecies2010/SearchForWildSpeciesStatus.aspx

Figure 7: Trumpeter Swan Sites



Predicted Results or Outcome:

Through maintaining a 200m “no harvest” and 800m no summer harvest buffer around all spatially identified trumpeter swan breeding sites, disturbance will be minimized and nesting habitat will be sustained.

Legal Requirements

Canfor FMA Operating Ground Rules

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.2.1.1

Federal Species at Risk Act

Alberta Wildlife Act

Monitoring & Measurement

Annual:

Overlay previous seasons harvested blocks to trumpeter swan buffers in GIS. Any overlaps will be considered an infraction, unless approved in the FHP for some overriding reason.

Reporting Process

Infractions will be reported in the APMR.

Variance

None, unless approved by ESRD for some overriding reason.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.2.1b) Mineral Licks

Criterion 1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time, all current habitats are represented
Objective	Current species diversity is maintained on the landscape
CSA Core Indicator	1.2.1 Degree of habitat protection for selected focal species, including species at risk (ESRD VOIT 1.1.2.2)
Indicator Statement	**Percentage of significant wildlife mineral licks conserved**
Description of indicator	Canfor Alberta has been using the following definition for the term "Significant Mineral Lick": (Canfor. 2006) *An area used by ungulates to obtain dietary macro minerals including sodium, calcium and phosphorous as well as trace minerals such as manganese, copper and selenium that is (a) regionally rare on the landscape; or (b) used annually by more than one species; or (c) used by a large proportion of individuals within a species.* *Three types of mineral licks are generally recognized: (i) wet or mucky licks found in seepage areas; (ii) dry earth exposures such as clay or lacustrine deposits found above river cutbanks; and (iii) rock face licks. Although mineral licks are typically used by ungulates during the spring and early summer seasonal periods, some ungulates may also use mineral licks during the summer and fall months.* *Some include water source areas that do not freeze during winter providing year round benefits. In order to be significant, licks must be used by wildlife on a regular basis.*
Target	**100% of significant wildlife mineral licks will be conserved annually, consistent with Operating Ground Rules**

Description of target	Significant wildlife mineral licks are identified operationally during reconnaissance and harvest area layout. Licks are protected with a 100 metre "no harvest" buffer. They are not explicitly identified on maps as they are subject to broader public disclosure and associated risk to sensitive feature disturbance.

Basis for the Target

Conserving wildlife mineral licks this will assist in maintaining wildlife species diversity and habitat.

Strategy

Means of Achieving Objective & Target:

Canfor FMA Operating Ground Rules (ESRD. 2011) incorporate mineral licks as sensitive sites. One hundred meter "no harvest" buffers are generally the minimum protection standard and may be larger depending on specific circumstances.

Management activities include identification, verification and buffering of significant wildlife mineral licks. Field staff are trained in the identification of wildlife mineral licks. Information on identifying wildlife licks, as well as other wildlife areas, are provided to all field layout staff and contractors.

Forecast

Current Status:

To date 105 significant wildlife mineral licks have been conserved within the FMA area.

Predicted Results or Outcome:

The management strategy is to provide a degree of conservation by not harvesting in designated mineral licks.

Legal Requirements

Canfor FMA Operating Ground Rules state the required protection parameters.

Alberta Forest Management Planning Standard, Annex 4 – Performance Standard 1.1.2.2

Monitoring & Measurement

Annual:

The sites are spatially stored in Canfor Alberta's Geographic Information System (GIS) and new sites are included annually. These will be spatially overlain to confirm that buffers were correctly applied to known licks.

Reporting Process

Past seasons harvested blocks will be compared to the spatial wildlife mineral licks to insure no infractions had occurred and reported in the APMR.

Variance

No variance. All mineral licks will have buffers applied unless approved by ESRD for some overriding issue.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.2.2a) Caribou

Criterion 1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time, all current habitats are represented
Objective	Habitat for focal species is maintained on the landscape
CSA Core Indicator	1.2.2 Degree of suitable habitat in the long term for selected focal species, including species at risk (ESRD 1.2.1.1)
Indicator Statement	**Sufficient amount of functional woodland caribou habitat over time**
Description of indicator	Woodland caribou in Alberta have a legal designation of *Threatened*[5] under the provincial *Wildlife Act*, and nationally across Canada under the Federal *Species at Risk Act*. Functional woodland caribou habitat consists of a range of forested landscapes that supports the maintenance or enhancement of a self-sustaining population. Derived from *Methodological Framework for Caribou Action Planning*, June 2011 by T. Antoniuk, E. Dzus & J. Nishi. (T. Antoniuk, E. D. 2011)
Target (1)	**No timber harvesting will occur in the high intactness zone identified for the Little Smoky range for the period 2007-2022**
Target (2)	**Less than 20% of the forested land base in the caribou range will be less than 30 years old**
Target (3)	**Canfor Alberta open route density in the caribou range south of Deep Valley Creek will be zero**

Description of targets	**1)** The concept of "habitat intactness" was introduced in the *West-Central Alberta Caribou Landscape Plan* (WCCLPT-Plan) (May 6, 2009) and the *Recommendations for a West-Central Alberta Caribou Landscape Plan proposed by the Alberta Caribou Committee Governance Board* (ACC-Recommendations) (ACCGB. 2008). The plans identified high, medium and low intactness zones based on the relative level of anthropogenic disturbance that has occurred on the landscape. A commitment to forego timber harvesting in the high intactness zone for an extended period of time assists in the maintenance of existing caribou habitat values on a relatively large landscape. **2)** Minimization of early seral stage forests reduces the presence of habitat conditions favourable to primary prey species such as moose and deer. Management of population levels of these species directly influences the population of predator species (i.e. Wolves). The WCCPLT-Plan (WCACLPT. 2008) and Alberta Caribou Committee Recommendations both identify wolf predation as the limiting factor to caribou recovery so managing constraints on the amount of young forest on the landscape is essential to the long-term management of caribou predators. **3)** The ACC-Recommendations (ACC. 2008) document states that research has demonstrated that increased anthropogenic footprint, such as linear disturbances, and declining caribou populations are correlated. Much of the impact on caribou population caused by roads is related to the number of road users, and the length of time the road is accessible to potential users. The term "Open Route Density" refers to the kilometres of all-weather road that is accessible per square kilometre on any given landscape. Winter use roads deactivated promptly in the spring do not contribute to Open Route Density metrics.

Basis for the Targets

Population trend data demonstrate that almost all of the monitored woodland caribou populations in Alberta are declining, some at high rates, as a result of extremely high levels of predation. Habitat change, as a result of human land use activities. (e.g., timber harvesting, oil and gas exploration and development, human use of access routes) is a significant factor directly or indirectly affecting the size and distribution of woodland caribou populations and the current high levels of predation. In addition, natural processes (e.g. forest fires) have in some cases been demonstrated to negatively affect woodland caribou in Alberta. Typically, factors affecting woodland caribou are inter-related with resulting cumulative effects causing poor conditions for caribou conservation. Reference: "Recommendations for a West Central Alberta Caribou Landscape Plan Report to the Deputy Minister, Sustainable Resource Development Prepared by the Alberta Caribou Committee Governance Board July 10, 2008" (ACCGB. 2008).

The *Action Plan for a West-Central Alberta Caribou Recovery* (WCACLPT. 2008) outlines a range of actions that must be implemented in an integrated fashion in order to manage successful caribou recovery.

- Implementing the intactness zone concept;
- Managing the industrial footprint;
- Implementing population monitoring programs for caribou, wolves, and alternate prey;
- Reducing alternate prey populations in caribou ranges;
- Reducing wolf populations in caribou ranges; and
- Employing adaptive management principles for caribou recovery.

Forest tenure holder responsibilities and rights with respect to management of caribou and other wildlife are limited to manipulation of habitat conditions through the planning and implementation of timber harvesting and regeneration activities. Therefore, tenure holders have no ability to manage wildlife populations directly. However, Canfor Alberta may contribute to the effective implementation of the recommended actions by achieving the stated targets.

The goal of the Alberta Caribou Committee is to *maintain and recover woodland caribou in Alberta's forest ecosystems while providing opportunities for resource development* [Alberta Caribou Committee Terms of Reference (ACC. 2005)]. The Department of Sustainable Resource Development mission is to encourage balanced and responsible use of Alberta's natural resources. The Department is obligated to deliver its mandate of sustainable resource development by enabling access to resources and honouring existing dispositions and allocations. A key aspect of that mandate is to enable protection of the forest resource from natural disturbances such as fires, insect infestations and disease. Studies and predictive models indicate that pine stands in the caribou range area are highly susceptible to mountain pine beetle infestation and recent field observations have confirmed thriving populations of beetle across much of the range. It is Canfor Alberta's intent to follow the Government's direction and the company's 2003 approved Detailed Forest Management Plan (Canfor 2003) has been amended in support of the strategy. *"The provincial government intends to reduce the amount of timber susceptible to the MPB. It will identify the most susceptible stands and direct Forest Management Agreement (FMA) holders to amend their current management plans to reduce the amount of susceptible pine on their operating land base by 75 percent over the next 20 years".* MPB Action Plan December 2007 - Long-Term Actions (ESRD. 2007a).

Canfor's Healthy Pine Strategy (HPS) FMP Amendment (Canfor. 2010) was created in compliance with this direction and the amendment received approval on January 22, 2010 with an effective date of May 1, 2009. The existence of mountain pine beetle in the caribou zone, and the company's commitment to implement a Healthy Pine Strategy (Canfor. 2010) on the FMA may jeopardize the achievement of caribou management targets. However, the company remains committed to pursuit of management strategies that will balance the need for caribou recovery with the risk of a catastrophic loss of the pine resource.

Strategy

Means of Achieving Objective & Targets:

Target (1) No harvesting is sequenced in the primary intactness zone for the term of the current amended Forest Management Plan and none will be sequenced in the new plan, scheduled for completion in December 2012.

Target (2) The HPS will be fully implemented and completed by 2022. It is anticipated that upon completion of the strategy (i.e. completion of harvesting of high susceptible pine stands) no additional harvesting in the caribou zone will be sequenced until the seral stage target has been achieved. During those periods when the target is being exceeded Canfor Alberta will implement a mitigation plan that reduces the effectiveness of alternate prey habitat, minimizes disturbances to existing caribou populations and supports government actions to manage predator and alternate prey populations.

Target (3) All Canfor Alberta roads required to access harvest areas will be constructed to Class III or lower standards for winter use only and will be promptly deactivated each spring. Any Canfor Alberta owned bridges across Deep Valley Creek will be available for winter use only.

Forecast

Current Status:

Target (1) Canfor Alberta has not harvested in the high intactness zone at any time since the first Forest Management Agreement, in May 1964.

Target (2) Table 9 indicates the results of the current approved Healthy Pine Strategy Amendment to the Detailed Forest Management Plan (2003).

Table 9. Percentage of Forested Land base <30 years within Caribou Range

	Total Gross Area (ha)	Total Forested Area (ha)	Total Forested <30 years	Percent Forested <30 years
Current (2011)	71,310	68,021	8,415	12.4%
Projected (2022)			15,995	23.5%

Target (3) Currently, Canfor Alberta does not own or operate any Open Route access south of Deep Valley Creek within the caribou range area.

Predicted Results or Outcome:

Target (1)	No harvesting in high intactness zone until after 2022
Target (2)	Target will be exceeded during periods up until 2022 but will be achieved thereafter
Target (3)	No open route access will be constructed by the company in the caribou zone south of Deep Valley Creek

Legal Requirements

Forest Management Agreement, approved Forest Management Plan, Healthy Pine Strategy

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.2.1.1 Federal Species at Risk Act

Monitoring & Measurement

Annual:

Target (1)	Report on amount of harvesting within high intactness area
Target (2)	Report on percentage of forested land base less than 30 years old within the caribou range
Target (3)	Report on the km/km^2 of open route access constructed and owned by Canfor Alberta within the caribou range south of Deep Valley Creek

Reporting Process

Update AVI with harvested areas and other industrial activities (DID's) and summarize the area harvested within the high intactness area and the percentage of area <30 years of age within the caribou range. Record in the Genus Road Management System the amount of open route access (i.e. Class I and II roads accessible by 4x4 vehicles in summer) constructed and owned by Canfor Alberta in the caribou zone south of Deep Valley Creek. Report all results in the Annual Performance Monitoring Report.

Variance

Target (1)	None
Target (2)	Up to 25% of the land base will be less than 30 years old for a portion of the planning timeframe
Target (3)	None

Response:

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.2.2b) Bull Trout and Arctic Grayling Fish Risk

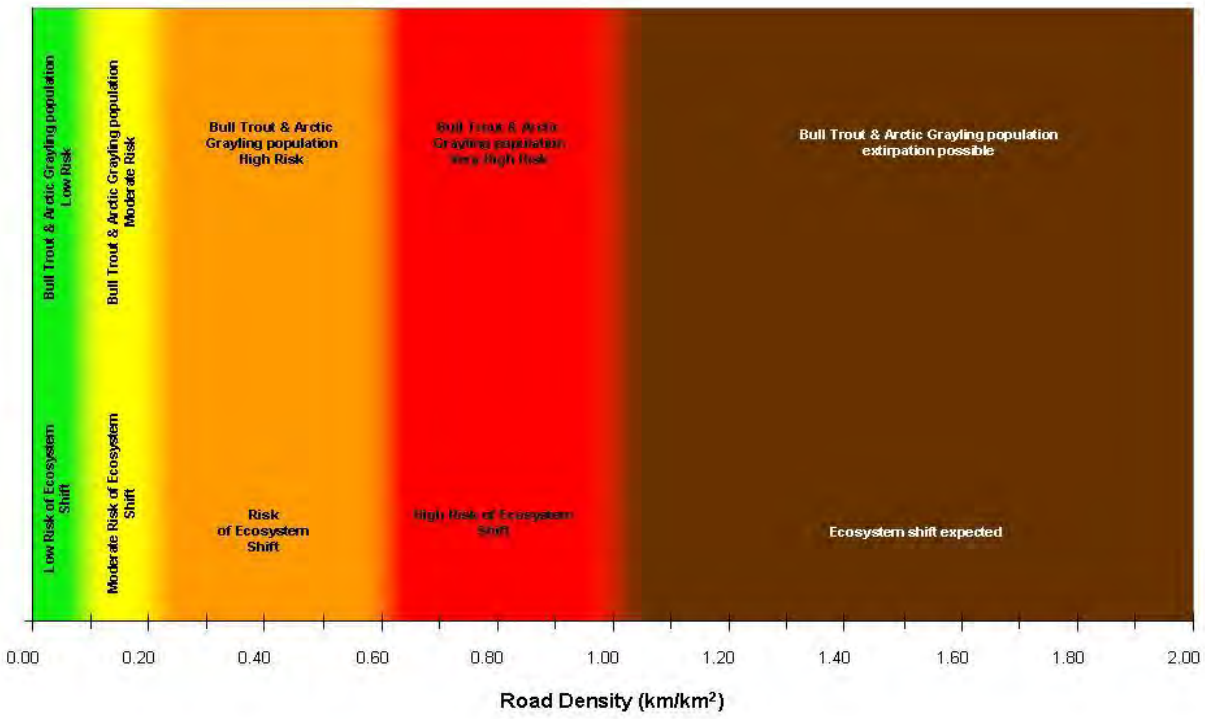
Criterion1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time, all current habitats are represented
Objective	Current species diversity is maintained on the landscape
CSA Core Indicator	1.2.1 Degree of habitat protection for selected focal species, including species at risk (ESRD VOIT 1.2.1.1)
Indicator Statement	**Fish risk ranking for bull trout and arctic grayling report**
Description of indicator	Fish risk is determined by calculating the road density (km/km^2) utlizing the conceptual approach to fish ranking developed by Alberta, Environment and Sustainable Resource Development (ESRD). Road density integrates many key variables that contribute to risk. Road density is useful for describing level of risk to fish populations and communities and is easily quantified.
Target	**Annually, report on fish risk ranking for bull trout and arctic grayling by watershed, utilizing ESRD's "*Conceptual Approach to Fish Risk*" ranking**
Description of target	Risk to fish populations and communities is a key consideration for developing and directing strategies to conserve and manage fish resources. Many factors contribute to risk, and the most important factors are alterations to fish habitats and exploitation. Development of forested landscapes requires the development of roads. Roads and road-stream crossings cumulatively increase habitat fragmentation, sedimentation of habitats, and access for exploitation. Road density within watersheds is an excellent metric to describe this cumulative risk to fish and fish habitats.

Basis for the Target

Bull trout are a *Species of Special Concern* in Alberta (ESCC. 2009). The Alberta Endangered Species Conservation Committee (ESCC) classifies arctic grayling as Sensitive in the current General Status of Alberta Wild Species report and Species of Special Concern. Both species have been recommended by ESRD Fisheries Management to use road density as method in calculating risk ranking. Road density is a simple metric to measure fish risk. Bull trout and arctic grayling habitat is not only impacted by Canfor Alberta's roads, but also roads of other industrial users. The accumulation of these roads overtime creates more risk to fish through an increased number of crossings and associated fragmentation of habitats, traffic, sedimentation, access to anglers, etc.

The target will be reassessed with ESRD in the first quarter of 2013 as more information becomes available.

Figure 8: Bull Trout and Arctic Grayling Population Risk



Strategy

Means of Achieving Objective & Target:

By monitoring the fish risk using road densities, forest managers and government will be able to determine the higher risk watersheds and collaboratively determine types of mitigation strategies that will reduce the risk to bull trout and arctic grayling fish populations. Mitigation strategies may include:

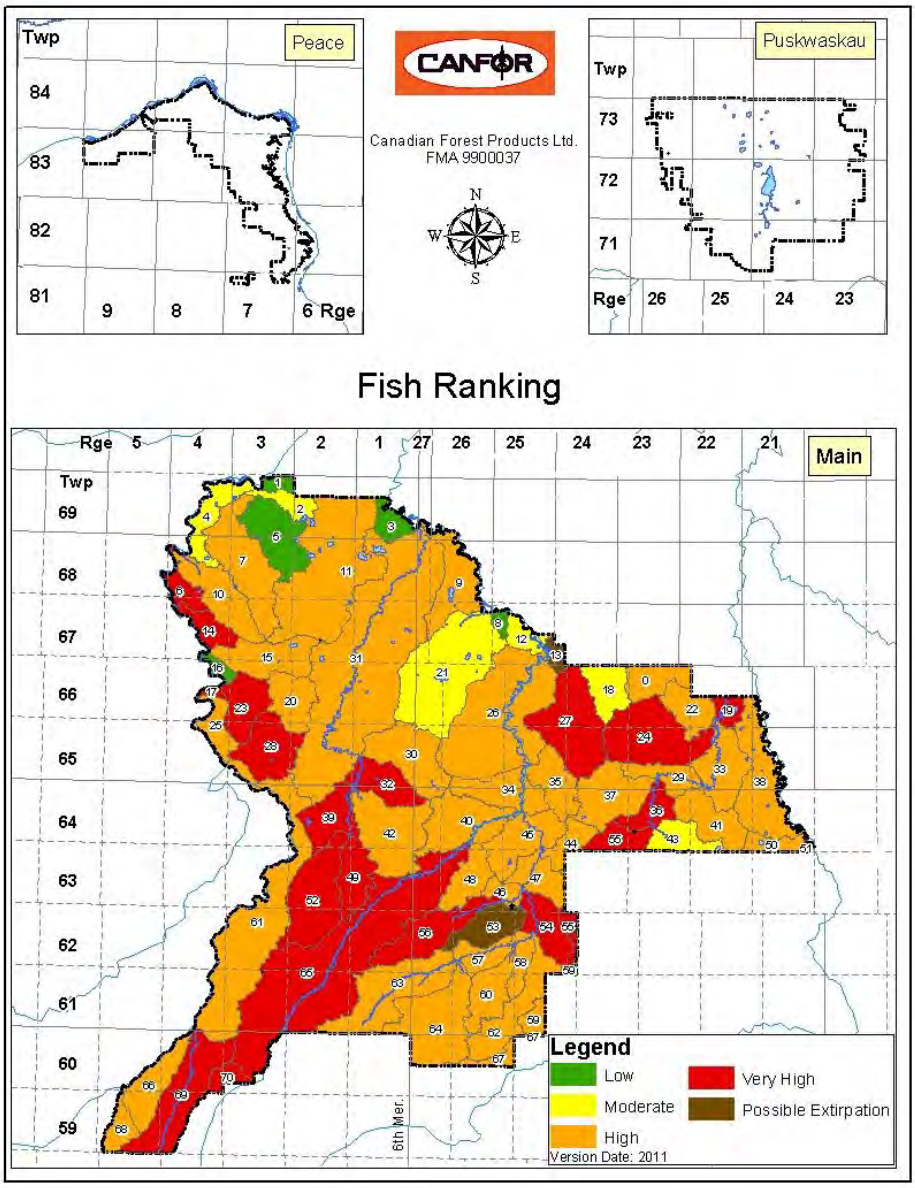
- Minimizing amount of permanent roads and number of crossings utilizing LiDAR and Wet Areas Mapping (WAM) at the strategic and operation planning stages
- Road-stream crossings
  - Crossing inventory and monitoring program;
  - Identification and remediation plan for crossings requiring causing fragmentation;
  - Correct sedimentation issues;
  - Prompt sedimentation control measures at time of construction;
  - Prompt sedimentation control measures at time of temporary roads;

- Best management practises for road construction, maintenance and management; and
- Consider risk to fish from road-densities in the context of risk related to watershed risk levels the same watersheds. For example, lower levels of water yield might be more significant to fish when existing risk is high.

Forecast

Current Status:

Figure 9: Fish Ranking



Predicted Results or Outcome:

Healthy bull trout and arctic grayling fish populations and results communicated to ESRD

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.2.1.1

Monitoring & Measurement

Periodic:

Target will be reassessed with ESRD in the first quarter of 2013 as more information becomes available.

Annual:

Report annually the fish risk for bull trout and arctic grayling by watershed through calculating road density (Km/Km^2) of permanent and non-reclaimed temporary forest industry roads within the Main portion of the DFA.

Reporting Process

Utilize Canfor Alberta's current road layer and update with other companies new License of Occupation's (LOC) and temporary roads used for extraction of timber. Remove all temporary roads that had received a block final clearance stored in the company's Cut Block Management System "*Cengea Solutions Inc.".*

Variance

Zero All watersheds will have fish risk ranking calculated and reported to ESRD annually within the Main portion of the DFA.

Response

If the targets are not met a root cause analysis will be completed to determine cause. Once cause is determined the process may be modified.

1.2.2c) Barred Owl

Criterion 1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time, all current habitats are represented
Objective	Current species diversity is maintained on the landscape
CSA Core Indicator	1.2.2 Degree of suitable habitat in the long term for selected focal species, including species at risk (ESRD VOIT 1.2.1.1)
Indicator Statement	**Amount of Barred Owl habitat available for breeding pairs**
Description of indicator	Preferred Barred Owl habitat is old mixedwood forest, a habitat type that could be impacted by forest operations over the long term. The amount of Barred Owl habitat at any given time in the planning horizon is an indicator of the effectiveness of the FMP in maintaining that habitat type.
Target	**Report on habitat available at key points in time (0, 20, 50, 100 and 200 yrs.) for Barred Owl breeding pairs will be completed and results incorporated into the Preferred Forest Management Scenario**
Description of target	The AVI-based barred owl habitat model was developed to estimate the spatial extent of potential barred owl breeding territories on the landscape (Russell, M. 2008). This model will be included in the spatial harvest sequence runs and will be consistent with the planning standard (0, 10, 20, 50, 100 and 200 yrs). The model outputs will report on the number of estimated barred owl territories for each sequence run and allow the company to assess the impact on this biodiversity indicator for each sequence. Specific thresholds for this target have not been established. However, this tool will identify changes to habitat and in consultation with ESRD allow for operational mitigation or additional sequence runs when significant declines are estimated.

Basis for the Target

Barred owls require old mixedwood forest throughout their range in Alberta. They are large owls that nest in cavities, typically very old hardwood trees or standing snags. This requirement for old mixedwood habitat and the large size of their home range make them a suitable indicator for other old-mixedwood associates. By maintaining enough suitable habitat for a barred owl pair to exist it is likely that many other species that require this habitat on a smaller scale will also benefit.

The coarse filter approach to ecosystem management, works on the assumption that if suitable habitat is available, the species associated with that habitat will be able to thrive. The management choices will ensure that habitat types available prior to operations will remain available through time.

Strategy

Means of Achieving Objective & Target:

ESRD's barred owls habitat model will be incorporated into Forest Management plan and spatial harvest sequence. The choice of PFMS will include consideration of the amount of barred owl habitat.

Forecast

Current Status:

This is a new process proposed by ESRD. Prior to selection of the PFMS, Canfor Alberta will provide the required data to ESRD during the model runs in order to determine the amount of Barred Owl habitat currently available.

Predicted Results or Outcome:

Through the FMP SHS, the amount of habitat that is available overtime will be predicted for barred owl breeding pairs thus will assist in selection of the PFMS. Although the target is not explicit, in cooperation with ESRD an adaptive management approach may be implemented, where necessary, to minimize the impact.

Sufficient habitat available for breeding pairs and habitat that helps supports a wide range of species. The model outputs will provide information that will enable adaptive management of barred owls and their habitat.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.2.1.1

Monitoring & Measurement

Periodic:

Consultation with ESRD prior to selection of PFMS

Reporting Process

Evidence of consultation with ESRD prior to selection of the PFMS will be reported.

Variance

Not applicable

Response

Once resulting PFMS is analysed by ESRD, Canfor will work with ESRD to develop a more quantitative measurable indicator and target. The current SFMP will be amended at that time.

Literature cited:

Russell, M.R. 2008. Habitat selection of barred owls across multiple spatial scales in a boreal agricultural landscape in north-central Alberta. MSc. Thesis, University of Alberta.

1.2.2d) Road Density

Criterion 1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time, all current habitats are represented
Objective	Current species diversity is maintained on the landscape by minimizing access
CSA Core Indicator	1.2.2 Degree of suitable habitat in the long term for selected focal species, including species at risk (ESRD VOIT 1.1.1.3)
Indicator Statement	**Density (linear km/km^2) of open roads (Licence of Occupation and Temporary non-reclaimed)**
Description of indicator	One way to gauge the wilderness quality of an area is to measure the amount of roads per unit area. Road density is an indication of the influence of human activity on an area and the state of its wildlife populations and natural processes. www.growingtogether.ca/pubs/bcfgs/page20.htm
Target	**Density of open roads (lineal km/km^2) not to exceed 110% of the current levels in individual DFA parcels (Main, Puskwaskau & Peace) and grizzly bear and caribou wildlife areas**
Description of target	Density of roads (LOC and Temporary non-reclaimed) is a measure of industrial footprint.

Basis for the Target

Roads provide access for urban and industrial development and to previously inaccessible forest areas. Their presence can alter local hydrology, fragment habitat, increase road kill, increase legal and illegal fishing and hunting, and create disturbance from motorized vehicles.

The basis for the target is to minimize the footprint as it relates to roads and to align with an allready identified target within the "*Berland Regional Access Development Plan" Foothills Landscape Management Forum, August 22, 2011* and ESRD *Action Plan for West Central Caribou 2008 (ESRD. 2008).*

Some wildlife species will avoid roads, resulting in isolated wild populations and a disruption in seasonal movements and genetic interchange. Amount of human use in an area, which is usually related to amount of access, can affect grizzly bear health and survival. Grizzly bear mortality has been correlated with road density; more roads usually equate to more human use. S\It has been suggested that high road densities could create mortality sinks for grizzly bears, and in the northern east slopes, grizzly bear survival rates decreased with increasing road densities (Stenhouse. 2005). In some jurisdictions, distance from roads is used to evaluate habitat suitability for grizzly bears (Gibeau. 2000). Roads on which there is little or no human use represent low disturbance and low risk of mortality to bears.

www.srd.alberta.ca/FishWildlife/WildlifeManagement/BearManagement/GrizzlyBears/GrizzlyBearRecoveryPlan.aspx

For caribou, the *ESRD Action Plan for West Central Caribou 2009* refers to the same density targets developed for grizzly bear as stated in section 7.2 *"Manage road and linear disturbances to meet the open road density target adopted for grizzly bear management".*

Strategy

Means of Achieving Objective & Target:

Access management and integrated land management with government and energy sector, including road deactivation and access restriction, can mitigate some of the negative impacts of roads.

Forecast

Current Status:

Table 10. 2011 Road Area Density (km/km^2)

Area	2006 Road (Km)	2011 Road (Km)	Area (Km^2)	2006 Density (Km / Km^2)	2011 Density (Km / Km^2)
Main	2,489	2,567	5,509	0.45	0.47
Peace	180	177	241	0.74	0.73
Puskwaskau	209	173	697	0.30	0.25
Caribou Area	298	365	713	0.42	0.51
Grizzly Bear Range	992	1,053	1,899	0.52	0.55

Predicted Results or Outcome:

Reporting and controlling the road density will maintain biodiversity within the reporting areas.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.1.3a

Monitoring & Measurement

Annual:

Annually report the road density (km/km^2) by reporting areas.

Reporting Process

Utilize Canfor Alberta's current road layer and update with new License of Occupation roads from provincial database and temporary roads used for extraction of timber. Remove all temporary roads that have received a block final clearance or that are known to have been deactivated permanently.

Variance

Zero

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, this will be communicated to ESRD and course of action will be determined.

1.2.3 Native Seedlings Used In Reforestation

Criterion 1: Biological Diversity	**Element 1.2 Species Diversity**
Value	Through time all current habitats are represented
Objective	Current species diversity is maintained on the landscape
CSA Core Indicator	1.2.3 Proportion of regeneration comprised of native species (no ESRD VOIT)
Indicator Statement	**Regeneration consistent with provincial regulations and standards for seed and vegetative material use**
Description of indicator	Provincial regulations require the use of native seed for all reforestation on crown lands. Non-native species are not permissible for deployment.
Target	**Annually, 100% conformance with the Alberta Forest Genetics Resources Management and Conservation Standards**
Description of target	Provincial regulations require the use of native seed for all reforestations on crown lands. Following the regulations will ensure this target is met.

Refer to target 1.3 *Genetic Diversity of the Seedlings Used In* Reforestation for the detailed write up.

The Alberta Forest Genetic Resources Management and Conservation Standards (FGRMS) set the standard for the use of seed and vegetative material that can be used in reforestation programs. The regulation applies to both forest collected (native species) and orchard seed. .

1.3 Genetic Diversity of the Seedlings Used In Reforestation

Criterion 1: Biological Diversity	**Element 1.3 Genetic Diversity**
Value	Natural genetic diversity
Objective	Genetic diversity will be maintained on the landscape
CSA Core Indicator	No core indicator in Z809-08 (ESRD VOIT none)
Indicator Statement	**Regeneration consistent with provincial regulations and standards for seed and vegetative material use**
Description of indicator	The Alberta Forest Genetic Resources Management and Conservation Standards (FGRMS) outline the rules for the use of seed and vegetative material that can be used in reforestation programs. The purpose of FGRMS is to ensure proper management of forest genetic material.
Target	**100% conformance with the Alberta Forest Genetic Resources Management and Conservation Standards for all seed collection and seedling deployment**
Description of target	The company must report the source of seedling and vegetative resources used in reforestation. The regulation applies to both forest collected and orchard seed. This data is audited to ensure compliance with the policy. Data checks are in place to ensure conformance prior to completing reforestation work. Non-conformances are reported to, and are audited by the Province.

Basis for the Target

Following FGRMs will ensure that seedlings and vegetative material collected and used in reforestation programs meet the genetic requirements of the Province. FGRMS ensures that there is genetic diversity in those seedlots. FGRMS applies to both forest collected and orchard seed.

Strategy

Means of Achieving Objective & Target

Reforestation staff is required by law to follow FGRMS. Data entry into the Alberta Reforestation Information System allows the Province to audit the company's results. Use of the company's database, (*Cengea Solutions Inc.* or its successor) provides the tools internally to make reforestation plans that meet the regulations. Information provided to the contractor will identify correct deployment of seedlings.

Forecast

Current Status:

In the past, Canfor Alberta has had some minor incidents with adherence to FGRMS and its predecessor, Standards for Tree Improvement in Alberta that were reported in past APMR's. Staff training and modifications to the reforestation planning tools has reduced the probability of re-occurrence.

Predicted Results or Outcome:

Proper implementation of the FGRMS will ensure that the company meets the target.

Legal Requirements

Timber Management Regulations, Alberta Forest Genetic Resources Management and Conservation Standards

Monitoring & Measurement

Annual:

All reforestation records are submitted to the Province annually. Any incidents reported by the company or the Province will be noted in the APMR. Incidents could involve planting seedlings in the wrong seed zone without approval and use of un-registered seed.

Reporting Process

The APMR report will list any contraventions to FGRMS that have been recorded.

Variance

None

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.4.1a) Consultation on Protected Park Areas

Criterion 1: Biological Diversity	**Element 1.4 Protected Areas and Sites of Special Biological and Cultural Significance**
Value	Identified protected areas and sites that have special biological significance
Objective	Conservation of the natural states and processes to maintain protected areas and sites that have special biological significance
CSA Core Indicator	1.4.1 Proportion of identified sites with implemented management strategies (ESRD VOIT 1.4.1.1)
Indicator Statement	**Percent of forest management activities where consultation has occurred for operations near protected park areas**
Description of indicator	The Province will be consulted when the company is operating within one kilometre of any legally protected park areas.
Target	**The Province will be consulted 100% of the time when activities will occur within one kilometre of legally protected park areas**
Description of target	 When harvesting operations are planned to occur near legally protected areas such as the Dunvegan West Wildland Park, the government department responsible for that area will be consulted.

Basis for the Target

Protected park areas contribute to ecological values in near proximity to the FMA area (i.e. protection of important wildlife habitat, watercourse protection, seral stages, and grasslands).

Strategy

Means of Achieving Objective & Target:

When the PFMS is chosen, the SHS will be projected on a map with, Dunvegan West Wildland Park, Silver Valley and Young's Point legally protected areas.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Consultation with protected area agencies will occur.

Legal Requirements

Canfor FMA Operating Ground Rules

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.4.1.1

Monitoring & Measurement

Periodic:

The SHS will be verified in comparison to the parks layers to check for potential need to consult. Any planned harvest areas will be flagged for further discussions when harvesting is planned.

Annual:

When harvesting is planned to occur, further notification and consultation will occur.

Reporting Process

Conformance to the target will be compiled and reported in the *Annual Performance Monitoring Report.*

Refer to associated databases and summarize and report on the results.

Variance

None. All planned harvest within one kilometre of a Protected Park Area will show consultation records.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.4.1b) Consultation on Areas of Special Biological Significance

Criterion 1: Biological Diversity	**Element 1.4 Protected Areas and Sites of Special Biological and Cultural Significance**
Value	Identified protected areas and sites that have special biological significance
Objective	Conservation of the natural states and processes to maintain protected areas and sites that have special biological significance
CSA Core Indicator	1.4.1 Proportion of identified sites with implemented management strategies (ESRD VOIT 1.4.1.1
Indicator Statement	**Percent of forest management activities consistent with management strategies for sites of biological significance**
Description of indicator	The targets for parks are in 1.4.1(a) and unique biological sites are found in 1.1.1 above. This target involves areas such as trumpeter swan buffers and mineral licks that are not covered by parks or Alberta Conservation Information Management System (ACIMS). These sites are of biological importance and require diligence.
Target	**100% of identified biologically significant sites will have implemented management strategies identified in consultation with the Province, annually**
Description of target	Final Harvest Plan and General Development Plan documents and maps will show wildlife referral map overlaps and discuss how the biologically significant areas have been integrated into the plan.

Basis for the Target

Areas of special biological significance contribute to ecological values within the FMA area. These areas must be managed to ensure those other values are maintained. These are areas such as trumpeter swan buffers and mineral licks, which are not covered by Parks or ACIMS. These sites are of biological importance and require special attention.

Strategy

Means of Achieving Objective & Target:

All protection initiatives for areas of special biological significance, as required by legislation, regulation, Canfor FMA Operating Ground Rules (ESRD. 2011) or company policy will be implemented and maintained.

Forecast

Current Status:

Current OGR and operations consider these sites when plans are developed. Review, approvals and monitoring from the Province ensure that we operate around these sites appropriately.

Predicted Results or Outcome:

The company will continue to operate appropriately within and around these sites.

Legal Requirements

Canfor FMA Operating Ground Rules

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.4.1.1

Monitoring & Measurement

Annual:

Operating Plans, approval documents, inspection documents and ITS will be reviewed annually to demonstrate that no non-conformances or non-compliances have occurred.

Reporting Process

Conformance to the target will be compiled and reported in the *Annual Performance Monitoring Report.*

Refer to associated databases and summarize and report on the results.

Variance

None. All identified special biologically important sites will have management strategies developed with the Province.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

1.4.2 Aboriginal Consultation

NOTE: Combined with 6.2.1

Criterion 1: Biological Diversity **Criterion 6.** Society's Responsibility	**Element 1.4:** Protected Areas and Sites of Special Biological and Cultural Significance **Element 6.2:** Respect for Aboriginal Forest Values, Knowledge, and Uses
Values	▪ Identified protected areas and sites that have special biological and cultural significance ▪ Understand and respect Aboriginal special needs
Objectives	▪ The natural states and processes to maintain protected areas and sites that have special biological and cultural significance will be conserved. ▪ Early and effective consultation with Aboriginal peoples will be provided
CSA Core Indicators	1.4.2 Protection of identified sacred and culturally important sites (no ESRD VOIT) 6.2.1 Evidence of understanding and use of Aboriginal knowledge through the engagement of willing Aboriginal communities, using a process that identifies and manages culturally important resources and values (ESRD VOIT 6.1.1.1)
Indicator Statement	**% of identified historic, sacred and culturally important sites, forest values, traditional knowledge and uses considered in forestry planning processes**
Description of indicator	In order to maintain historic, sacred and culturally important sites, forest values, traditional knowledge and uses these must be identified through communication or archaeological processes or existing knowledge and evaluated to determine a range of options available for their protection.
Target	**100% of historic, sacred and culturally important sites, forest values, traditional knowledge and uses known or identified through communication are considered in forestry planning processes**

Description of target	All historic, sacred and culturally important sites, forest values, traditional knowledge and uses that are identified by local Aboriginal people during the communication process or by archaeological process or through existing knowledge will be protected.

Basis for the Target

In order to ensure that Aboriginal values are addressed in forest operations and plans, forest planners need to initiate a communication process with the affected Aboriginal groups. The Alberta government developed *Alberta's Aboriginal Groups Consultation Policy on Land Management and Resource Development* in May 2005 (Alberta. 2005) to help standardize these procedures. From this policy, the *Alberta's Aboriginal Groups Guidelines on Land Management and Resource Development* (Alberta. 2007) was created. These guidelines form the basis to which Canfor Alberta communicates with Aboriginal groups to address Aboriginal sacred and culturally important sites, forest values, traditional knowledge and uses in forestry planning. In addition to the guidelines, ESRD has also developed a more detailed summary for Aboriginal communication as it relates to forestry and outlines Alberta's expectations in *Procedural Steps for Consultation with Aboriginal Groups.*

http://www.srd.alberta.ca/LandsForests/FirstNationsConsultation/FirstNationsConsultationForestry.aspx

Through effective communication with the Aboriginal groups during the planning process, Canfor Alberta will be able to address any identified issues, recommendations, and values that may be of concern.

Management of historic sites are addressed in the Alberta Historical Resources Act (R.S.A. 2000) and it is the government's responsibility to manage historical resources. Developers (such as Forest Companies) are required to conduct historical resource overview impact assessments and implement mitigation measures in order to ensure that recorded and unrecorded historical resources are properly identified, evaluated, and managed.

Strategy

Means of Achieving Objective & Target:

Alberta's *Procedural Steps for Consultation with Aboriginal Groups* describes the steps to follow during the consultation process including initial contact, follow-up, and requirements for records of communication. The records of communication are used to keep a detailed summary of the items discussed during the meetings as well as any actions that were created and how they were addressed. Canfor Alberta uses a database called Creating Opportunities for Public Involvement (COPI) to keep record of all attempts to consult, items discussed, actions, and follow-up. The details that are entered into COPI will be in accordance with Alberta's *Procedural Steps for Consultation with Aboriginal Groups.* The follow-up and completion of the action items identified during consultation will ensure that all identified Aboriginal sacred and culturally important sites, forest values, traditional knowledge, and uses are considered in forest planning.

When Canfor Alberta is notified of a sacred and culturally important site, forest value, traditional knowledge, and use by Aboriginal people Canfor Alberta will agree on "prescriptions" for the site. Prescriptions may vary from maintaining the availability of the site (e.g. berry picking areas), to no activity at all (e.g. grave sites) or to any other prescription that both parties deem necessary to protect the resource. A prescription may also involve keeping knowledge of the resource confidential.

Historic sites are identified, evaluated, and managed through the archaeological process. Canfor Alberta contracts certified archaeologists to conduct historical resource impact assessments on all harvest units and roads prior to commencement of forestry activities. The prescriptions from the assessments can range from performing extensive field surveys to approving the block ready for harvest. If the field surveys result in historical resources being located the archaeologist prescribes measures to protect the resource in accordance with the *Alberta Historical Resources Act.*

Current Status:

To date, no known historical, sacred or culturally important sites have been impacted by Canfor Alberta's operations. Canfor Alberta personnel have been using COPI to keep detailed records of consultation since 2007. It continues to be an effective tool for tracking any issues or concerns regarding Aboriginal forest values, traditional knowledge and uses that are brought forward in the communication process as well as all actions completed to address these concerns.

Canfor Alberta has been conducting historical resource overview assessments on all harvest areas and roads since March 2002.

Predicted Results or Outcome:

Through consideration of the historic, sacred and culturally important sites, forest values, traditional knowledge and uses identified by Aboriginal people, Canfor Alberta is ensuring that such sites are being maintained across the landscape.

Legal Requirements

Alberta's First Nation's Consultation Guidelines on Management and Resource Development (November 2007)

Alberta's Aboriginal Groups Consultation on Land Management and Resource Development (May, 2005)

Alberta Historical Resources Act

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 6.1.1.1

Monitoring & Measurement

Annual:

All records of consultation will be entered into COPI and will include dates of communication, methods of communication, detailed description of items discussed, any issues or recommendations that were made, and action items. All actions completed will also be recorded. These records will be summarized annually in the Annual Performance Monitoring Report to ensure that all identified Aboriginal sacred and culturally important sites, forest values, traditional knowledge, and uses and historic sites were considered in the planning process.

Reporting Process

Report the number of historic, sacred and culturally important sites, forest values, traditional knowledge and uses that have been identified and determine if they have been considered.

Variance

None. All identified sites will be considered.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

2.1.1a) Prompt Reforestation to Maintain Forest Resilience

Criterion 2: Ecosystem Condition and Productivity	**Element 2.1:** Forest Ecosystem Resilience
Value	Healthy forest ecosystem
Objective	Meet reforestation targets on all harvested areas
CSA Core Indicator	None (no direct ESRD VOIT)
Indicator Statement	**Prompt reforestation**
Description of indicator	Prompt reforestation helps to keep the forest healthy and resilient.
Target	**100% of all harvested blocks will be reforested within 2 years**
Description of target	The target is to have all harvested areas reforested within 2 years of harvest. This includes planting where required, site preparation where pine natural regeneration is the target, and natural regeneration for deciduous stands.

Basis for the Target

Early establishment of a viable crop of trees reduces the need for subsequent interventions (re-planting, brushing) and positively contributes to forest growth and carbon sequestration.

Strategy

Means of Achieving Objective & Target:

Reforestation strategies implemented will require site preparation and planting to be completed within the first year following harvest, but allowing the second year to ensure all blocks are completed. Plans developed in the planning database (*Cengea Solutions Inc.* or its successors) will schedule site preparation and planting within the first year after harvest.

Forecast

Current Status:

From 2005 to current date, 100% of harvested blocks were reforested within 2 years.

The company has had prompt reforestation programs for a number of years. Most areas are reforested within the first year following harvest, but some areas are left to a second year where changes to harvest plans have created challenges for the seedling orders.

Predicted Results or Outcome:

Prompt reforestation ensures that the productive capacity of forest land base to grow trees is maintained. Promptness also aids in providing young trees a head start against competing vegetation, helping to reduce the need for manual or chemical brushing treatments.

Legal Requirements

Timber Management Regulation

Canfor FMA Operating Ground Rules

Monitoring & Measurement

Annual:

The APMR will list the blocks harvested in the previous year and the second previous year to the report. A data base query of the reforestation completed by April 30th of the following year will be compared to the harvesting report.

Reporting Process

The APMR will list the number of blocks harvested in the previous year and the second previous year to the report. The number of those blocks reforested will be listed.

Variance

5% of any years blocks could be delayed due to seed, nursery or climatic issues. Planting of top piles and roads are not considered here as they may be completed later than two years to accommodate the burning of top piles.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

2.1.1b) Success of Reforestation Program to Promote Forest Resilience

Criterion 2: Ecosystem Condition and Productivity	**Element 2.1:** Forest Ecosystem Resilience
Value	Healthy forest ecosystem
Objective	Forest ecosystem health will be maintained
CSA Core Indicator	2.1.1 Reforestation success (ESRD VOIT 2.1.1.1)
Indicator Statement	**Prompt retreatment of failed areas**
Description of indicator	Prompt retreatment of areas not successfully reforested on the initial treatment, as defined in the Regeneration Standards of Alberta (RSA).
Target	**All harvested blocks that have not achieved the regeneration targets as per the Regeneration Standards of Alberta establishment survey standards will have remedial treatments completed within 12 months of the survey date**
Description of target	All blocks require an establishment survey completed by year 8 after harvest. Reforestation treatments to date have been quite successful, but there are some areas that are less successful due to weather, animal browse or other unplanned events. These blocks will receive a remedial treatment within 12 months of the survey to ensure regeneration success.

Basis for the Target:

Reforestation success is measured with Regeneration Surveys. This target will promote the prompt retreatment of blocks that have not achieved initial success due to uncontrollable or unforeseen factors.

Strategy

Means of Achieving Objective & Target:

When establishment surveys are completed, a list of blocks requiring remedial treatment is generated. Remedial treatments will be planned and completed within 12 months of the survey dates.

Forecast

Current Status:

This target is similar to a target from the 2005 SFMP, with some minor modifications due to changes in the Regeneration Standards of Alberta. The company has had prompt retreatment of blocks not achieving initial success historically, so maintenance of this practice will continue.

Table 11. Establishment Survey Results

		Number of Blocks			Area (Ha)			
Survey Year	Harvest Year	Total	SR	Requied Retreatment	Total	SR	Requied Retreatment	Percent SR
2009 to 2011	2003 to 2006	368	363	5	10,339	10,293	46.3	99.6%

Predicted Results or Outcome:

Prompt reforestation ensures that the productive capacity of forest land base to grow trees is maintained. Promptness also aids in providing young trees a head start against competing vegetation, helping to reduce the need for manual or chemical brushing treatments.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 2.1.1.1a and b

Timber Management Regulations

Regeneration Standards of Alberta

Monitoring & Measurement

Periodic:

Data from past years will be displayed in the APMR to show trends over time.

Annual:

Query of all blocks surveyed in the calendar year preceding the last full calendar year. The total number of blocks and those blocks that achieved the required thresholds will be listed. Blocks that did not achieve the standard will also be listed, along with the number of blocks that have had remediation treatments applied.

Reporting Process

The APMR will document the annual monitoring and measuring data. Success with this target will be achieved when all blocks requiring remedial treatments have the treatments completed within one year of the survey.

Variance

A six-month variance to the twelve-month retreatment period will apply for up to 50% of the blocks requiring remediation treatments. The six months allows for surveys done in the spring of one year to have treatments done in the following summer when seedlings may not be available the first summer.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

2.1.1c) Growth Rate of Regenerating Forests to Promote Forest Resilience

Criterion 2: Ecosystem Condition and Productivity	**Element 2.1:** Forest Ecosystem Resilience
Value	Healthy forest ecosystem
Objective	Forest ecosystem health will be maintained
CSA Core Indicator	2.1.1 Reforestation success (ESRD VOIT 5.2.3.1)
Indicator Statement	**Actual regenerated stand yield compared to the yield expectations of the Timber Supply Analysis**
Description of indicator	The Regeneration Standards of Alberta (RSA) is a process for comparing actual results of regenerating stands to the growth expectations in the Timber Supply Analysis.
Target	**The regenerated stand yield (Mean Annual Increment) for the total of all sampling populations will meet or exceed the regenerated stand yield assumptions of the Timber Supply Analysis in the Regeneration Standards of Alberta performance survey process**
Description of target	The Province requires that regenerated stand yield achieved by reforestation programs is measured and compared to the projections used in developing the TSA. Targeting yields that meet or exceed the expectations will ensure sustainable harvest levels and a healthy forest ecosystem.

Basis for the Target:

Healthy forests can be achieved when harvest levels do not exceed growth levels. RSA provides the tools to measure and report on the growth predictions of reforested stands in comparison to the yield expectations of the TSA.

Strategy

Means of Achieving Objective & Target:

Prompt and effective reforestation programs will create regenerating stands. Upon completion of initial reforestation treatments, there are additional programs to monitor regeneration success prior to conducting a RSA performance survey. The RSA process provides the tools to measure and compare yields.

Forecast

Current Status:

Table 12. Performance Survey Results

Survey Year	Harvest Year	Landbase Designation Code	Total (Ha)	MAI Target (M3/ha/yr)		MAI Survey Results (M3/ha/yr)	
				Conifer	Deciduous	Conifer	Deciduous
2009 to 2011	1996 to 1999	Deciduous	163	0.15	2.75	2.54	0.70
		Deciduous/Conifer	442	1.71	1.80	2.41	1.14
		Conifer/Deciduous	2,059	1.76	0.91	2.80	0.43
		Conifer	7,524	2.26	0.22	3.06	0.34

Predicted Results or Outcome:

Prompt reforestation helps to ensure that the productive capacity of the forest land base to grow trees is maintained.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 5.2.3.1

Timber Management Regulation, Regeneration Standards of Alberta

Monitoring & Measurement

Periodic:

The process for calculating RSA results is determined by the Province. The RSA results are accumulated for an out control quadrant. The quadrant summary will be included in each APMR.

Annual:

All RSA program results will be documented in the APMR. Some years may not have results, as the surveys may be completed every second year.

Reporting Process

The APMR will include the results of all programs completed in that year, as well as have a running total for the quadrant. The annual report will show past results for the total period of the SFMP. Results are also reported to ESRD and are entered into their ARIS database.

Variance

The yield results compared to the yield assumption can be lower in any two years of the quadrant, but cannot be lower in three or more years, or for the five-year period.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

2.1.1d) Noxious Weeds

Criterion 2: Ecosystem Condition and Productivity	**Element 2.1:** Forest Ecosystem Resilience
Value	Healthy forest ecosystem
Objective	Forest ecosystem health will be maintained
CSA Core Indicator	2.1.1 Reforestation success (ESRD VOIT 2.1.3.1)
Indicator Statement	**Noxious weed program implementation**
Description of indicator	Noxious weed are plants which have the potential for rapid spreading and major crop losses. Weeds in this category are to be controlled to prevent spreading.
Target	**100% of previously identified and scheduled for treatment noxious weeds will receive treatment along Canfor Alberta's LOC roads**
Description of target	Effectively controlling the noxious weeds along Canfor Alberta's LOC roads that where identified. Purpose of target is to monitor success of noxious weed treatment program.

Basis for the Target

The treatment of noxious weeds is legislated under the *Weed Control Act of Alberta*, which was implemented as a result of landowners recognizing the need to control weeds. The Weed Control Act ensures that the appropriate action and control practices are utilized for threatening weed infestations.

The following excerpt is from the Weed Control Act:
A person shall control a noxious weed that is on land the person owns or occupies.
A person shall destroy a prohibited noxious weed that is on land the person owns or occupies.

Strategy

Means of Achieving Objective & Target:

Identification of noxious weeds along Canfor Alberta's roads is the responsibility of Canfor Alberta's field staff and contractors. In May of each year when Canfor Alberta's summer staff arrive individuals are trained to recognize noxious weeds. Throughout the year Canfor Alberta, staff and the municipal weed inspectors collect locations and weed identification. Those noxious weed locations assembled prior to mid-June of a year are entered into our *Cengea Solutions Inc.* database. The information is extracted for mapping and tabulation in early July and treatment activities are scheduled for mid-July through the end of August where necessary.

Forecast

Current Status:

This new target will be reported in the next APMR. Canfor Alberta will have a report developed that can pull the total roadside weed control and weed control activities from our database and then show how many of these sites received action. An action could involve monitoring to see if the weed has returned or treatment where the weeds have expressed themselves.

Predicted Results or Outcome:

Reduction in noxious weeds and less chance of spread

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 2.1.3.1

Weed Control Act part 1, ESRD Directive 2000-6

Monitoring & Measurement

Annual:

Record annually the number of locations noxious weeds were identified in previous years and those treated.

Reporting Process

The Weed Control Activities are stored in Canfor Alberta's Roads Database and will be reported in the APMR.

Variance

90% of identified weeds must be treated. The reason for the variance is that access issues can limit treatment of some patches of weeds. 100% of the identified noxious weed locations that are reasonably accessible will be treated. Treatment of these inaccessible noxious weed locations will occur once reasonable accessibility is available providing treatment at that time will be effective.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

2.2.1 Maintenance of the Forested Land base

Criterion 2: Ecosystem Condition and Productivity	**Element 2.2:** Forest Ecosystem Productivity
Value	Sustained forest ecosystem productivity
Objective	Limit the conversion of productive forest to other uses
CSA Core Indicator	2.2.1 Additions and deletions to the forest area (ESRD VOIT 2.1.2.1)
Indicator Statement	**Percent of gross forested land base in the DFA converted to non-forest land use through forest management activities**
Description of indicator	Conversion to non-forest land use includes roads, gravel pits, camp clearings etc. Canfor Albertawill minimize the conversion of forested land to non-forested lands in their operations.
Target	**Forest management company activities not to exceed NET 3% reduction in gross forest land base in the DFA over the life of the Forest Management Agreement (May 26, 1964)**
Description of target	The DFA gross area is 644,695 hectares. Conversion to non-forest land use includes construction of roads, gravel pits, camp clearings etc. Restoration of past land uses can convert those areas back to forest. The difference between the two numbers should not exceed 3% of the gross DFA area.

Basis for the Target:

Maintenance of the forested land base is important for sustaining the forest ecosystem. Conversion to non-forest by other industries is not under the control of Canfor, so is not tracked in this indicator. However, Canfor does have indirect influence in the amount of forest converted to non-forest as indicated in strategies.

Strategies

Means of Achieving Objective & Target:

Several strategies can be employed to achieve this target.

1. Will work with other industrial users to coordinate plans. The Foothills Landscape Management Forum (FLMF) is a prime example of where both forest companies and energy sectors are members and have developed a Berland Smoky Regional Access Development Plan: Corridor Routing August 22, 2011 (FLMF. 2011);

2. Minimize the conversion to non-forest by planning forestry roads using existing corridors wherever possible. Forest company camps, log storage areas, and other disturbances will use existing clearings where possible;
3. Reforest temporary roads that were used for timber extraction;
4. Work with Oil and Gas industry to reforest past land use openings; and
5. Strategic planning of road corridors

Forecast

Current Status:

Canfor has not exceeded the three percent land base conversion to non-forest conditions. Currently 1,448 ha is under disposition with the government, which represents 0.22 percent of the total DFA area of 644,695 ha.

Predicted Results or Outcome:

Canfor will plan and operate to minimize land base conversion to non-forested conditions.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 2.1.2.1 and 4.2

Monitoring & Measurement

Annual

The APMR will report all Canfor Alberta dispositions on an ongoing basis for the term of the SFMP. (The dispositions tracked will be LOC's, MLL's etc.)

Reporting Process

Total area of dispositions added annually in the APMR. The cumulative total will be compared to the 19,310 hectare maximum. If the cumulative total approached the maximum, a plan to return past dispositions to forest cover will be required.

Variance

None

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

2.2.2 Balancing Approved Harvest Level over 5 Years

Criterion 2: Ecosystem Condition and Productivity	**Element 2.2:** Forest Ecosystem Productivity
Value	Sustained forest ecosystem productivity
Objective	Maintain productive harvest level
CSA Core Indicator	2.2.2 Proportion of the calculated long-term sustainable harvest level that is actually harvested (no ESRD VOIT)
Indicator Statement	**% of volume harvested compared to long term approved harvest level**
Description of indicator	Ensuring harvest levels do not exceed the long term allowable harvest will help ensure sustainability of the forest and ecosystem, thereby providing timber and non-timber benefits now and in the future.
Target	**Not to exceed 100% of the approved harvest level (Annual Allowable Cut) over 5 years (5 yr. quadrant balance)**
Description of target	The *Forest Management Agreement* (Alberta. 1999) allows for over or under harvesting in any one year, but must be reconciled on a fixed five-year period. The reconciliation is a comparison of the actual versus allowed harvest levels. The target ensures that the company does not over-harvest.

Basis for the Target

The Timber Supply Analysis (TSA) is developed as per the legal requirements of the Forest Management Agreement (Alberta. 1999). The TSA involves the calculation of the long-term harvest level (AAC). Monitoring of the actual harvest level compared to the AAC is a legal requirement that occurs monthly, and is audited by the Province annually. Any harvesting beyond the quadrant allowable harvest level is subtracted from the next period's allowable harvest.

Strategy

Means of Achieving Objective & Target:

All of the processes for meeting the target are legal requirements that have been in place for many years. Harvest volumes are tracked and reported to the Province. The General Development Plan (GDP) is prepared annually to summarize the harvested volumes and compares them to the AAC. In the fifth year of the quadrant, the company planners and management will control the harvest level to ensure that the quadrant allowable harvest is not exceeded.

Forecast

Current Status:

Conifer harvest on the DFA has been ongoing for over fifty years with allowable cuts closely monitored by the Province. Deciduous harvest began in the last decade, but has been sporadic due to poor markets.

Table 13. Current Quadrant Approved Level of Harvest

Timber Disposition	Quadrant 1 Period	Quadrant Harvest Level (m3)	Harvested as of April 30, 2012 (m3)	Remaining (m3)
FMA 9900037	May 1 2009 - April 30, 2013	3,575,000	1,999,154	1,575,846
DTA15001	May 1 2009 - April 30, 2013	458,848	69,186	389,662
DTA15002	May 1 2009 - April 30, 2014	839,085	51,288	747,974
DTA15003	May 1 2009 - April 30, 2013	1,662,369	1,293,101	369,268

Predicted Results or Outcome:

Ensuring a sustainable flow of timber provides social, economic and environmental benefits to industry, communities and individuals.

Legal Requirements

Forest Act, Timber Management Regulation, Forest Management Agreement

Monitoring & Measurement

Periodic:

The annual audited volumes will be summarized on a five-year quadrant basis and compared to the quadrant allowable harvest level.

Annual:

The harvest volume will be tracked monthly, and audited by the Province annually.

Reporting Process

Annual reporting is in the GDP and the APMR. The quadrant report is also completed in the GDP and will be reported in the SFMP. Evaluation of performance to this target will be done when audited quadrant volumes are available, every five years.

Variance

The actual quadrant harvest volume will not exceed 105% of the allowable harvest level.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

3.1.1a) Maintaining or Enhancing Soil Productivity by Minimizing Soil Disturbance

Criterion 3: Soil and Water	**Element 3.1** Soil Quality and Quantity
Value	Soil Quality and Quantity
Objective	Soil productivity will be maintained or enhanced
CSA Core Indicator	3.1.1 Level of soil disturbance (ESRD VOIT 3.1.1.1)
Indicator Statement	**% of harvested blocks meeting soil disturbance objectives identified in plans and Operating Ground Rules**
Description of indicator	Canfor Alberta commits to the 1994 Forest Soils Conservation Guidelines in the Canfor FMA Operating Ground Rules. The percentage of blocks meeting the Guidelines will be calculated and tracked.
Target	**100% of harvested blocks will not exceed 5% soil disturbance without government approval as outlined in Canfor Operating Ground Rules**
Description of target	The Operating Ground Rules 9.0.3 state that the area disturbed by roads cannot exceed 5% of the block area without specific approval. The block list in the Final Harvest Plan will identify blocks in which roads will exceed the 5% threshold. These blocks must have approval from the Province to achieve this target.

Basis for the Target:

To minimize soil disturbance through monitoring and reporting and to continually seek ways to minimize the amount in the future. Soil disturbance in harvesting operations is an unavoidable consequence. Maintenance of site productivity is a core prerequisite for achieving sustainability. Managing the area of detrimental soil disturbance will help retain the productive capacity of the land base.

Strategy

Means of Achieving Objective & Target:

The 1994 Forest Soils Conservation Guidelines states the targets negotiated as achievable in minimizing soil disturbance. While the long-term average percentage of road to block area is under 4%, certain types of blocks will exceed the target, such as long thin blocks, small blocks (< 10 ha) or blocks with complex slopes. Approval from the Province for blocks where the percentage is over 5% will demonstrate that the company will only surpass the threshold where necessary.

The Final Harvest Plan (FHP) lists the blocks to be harvested, and the percentage of area to be occupied by roads planned for each individual block. The approval letter from the Province will acknowledge the Company's diligence in this respect.

Forecast

Current Status:

Blocks with more than 5% road area compared to the block area have been getting approval since 1995.

Predicted Results or Outcome:

Productive forest soils with minimized losses from forest operations.

Legal Requirements

Canfor Operational Ground Rules, Timber Management Regulations, 1994 Forest Soils Conservation Guidelines (or its successors)

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 3.1.1.1a

Monitoring & Measurement

Annual:

The road area percentage is calculated and reported annually to the Province. Blocks with planned roads greater than 5% roads will be checked to ensure they were approved. The APMR will list the number and percentage of blocks that exceeded the 5% disturbance during harvesting and those that where were not approved.

Reporting Process

The APMR will summarize up to five years of operations. The summary will indicate total number of blocks planned per year, along with the number of blocks planned to have over 5% roads. The report will also indicate the number of blocks with more than 5% roads that were approved in the FHP approval letter**.** The average of the road areas percentage for all blocks in a year will also be listed to show the trend in road percentage.

Variance

Zero percent of post harvested blocks will not exceed 5% road area disturbance without approval**.**

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified

3.1.1b) Maintaining or Enhancing Soil Productivity by Minimizing Soil Erosion and Slumping

Criterion 3: Soil and Water	**Element 3.1:** Soil Quality and Quantity
Value	Soil Quality and Quantity
Objective	Soil erosion will be minimized
CSA Core Indicator	3.1.1 Level of soil disturbance (ESRD VOIT 3.1.1.2)
Indicator Statement	**% of soil erosion and slumping incidences with mitigation strategies implemented**
Description of indicator	Loss of soil is a major concern for long-term productivity. Soil erosion is the removal of soil by either water or wind. Slumping denotes a type of mass wasting resulting in the down-slope movement of rock fragments and/or soil.
Target	**100% of known erosion and slumping events caused by forest operations will have mitigation strategies implemented within one year of identification**

Description of target	Soil erosion and slumping are often indicative of poor management practices. All incidents of significant erosion or slumping will be listed in ITS. Action plans and mitigation strategies will be in place in ITS.

Basis for the Target:

Road construction, silviculture and harvesting activities have potential to cause soil erosion due to their propensity to alter drainage patterns and disrupt surface soil. Erosion and slumping can reduce the productivity of the forest soils. Operational practices that promote soil stability and minimize soil movement will be implemented.

Strategy

Means of Achieving Objective & Target:

Maintenance of site productivity is a core prerequisite for achieving sustainability. Managing the area of detrimental soil disturbance will help retain the productive capacity of the land base.

All significant in block slumps greater than 1000 m^2 and erosion events on roads where the erosion is greater than 20 cm deep by 3 meters, caused by forest industry activities, will be documented with root cause investigations.

Locating these events will occur when:

- Company staff during annual road and final harvest inspections;
- Company planners are preparing harvest plans for an area;
- Harvesting operations personnel are working in the area;
- Silviculture staff are in the area following harvest for planting or site inspections and surveys;
- Periodic inspections after abnormal rainfall; and
- Notification from the Province or the public.

Action plans that include remediation of the damage and recommendations for modified management practices will be completed for all events.

Forecast

Current Status:

All Canfor Alberta incidents of significant erosion and slumping are tracked in ITS. Action plans have contributed to improved practices during the term of the 2005 SFMP.

Table 14. Slumps Reported from 2005 - 2011

Road or Block Id	Legal Description	Date of Original Slump	Size (m^2)	2010 & 2011Inspection
Bolton Main (LOC 033475)	TWP 59 RGE 4 W6M	2005	100	Further movement is limited. Monitor
Bolton Main (LOC 033475)	TWP 59 RGE 4 W6M	2005	250	No further movement noted. Monitor
Canfor Mainline (LOC 1774)	TWP 67 RGE 4 W6M	2010	200	Slump occurred with a heavy, wet snow fall in May. Scheduled Geo Tech Engineer to inspect in spring 2011 & provide potential of further movement and recommended remediation plan.
S112422	TWP 64 RGE 26 W5M	2011	200	Discoved a slump in the east and west end of block S112422. The slump is a crack about 1 foot wide which shifted down about 100 - 200 meters. (not near water) Slump occured this year after excessive rain events in June and July. Recommend to monitor
G342657	TWP 64 RGE 2 W6M	2011	Unknown	Observed two areas that were washed out in block G342657. The size of the washout is significant and will require reforestation work and may require remediation work.
G343365	TWP 64 RGE 2 W6M	2011	Unknown	Observed a internal road wash out in Blk G343365. The size of the washout is significant and will require remediation and reforestation work..

Predicted Results or Outcome:

Productive forest soils with minimized losses from forest operations.

Legal Requirements

Canfor FMA Operating Ground Rules, Timber Management Regulation, Soil Guidelines

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 3.1.1.2

Monitoring & Measurement

Annual:

Incidents and action plans from ITS or other forest companies' database will be documented annually in the APMR. Any incidents without mitigation strategies will be noted.

Reporting Process

APMR will document all incidents in ITS and document the percentage with mitigation strategies in place.

Variance

None. All reportable incidents will have mitigation strategies implemented within one year of identification.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

3.1.2 Coarse Woody Debris

Criterion 3: Soil and Water	**Element 3.1:** Soil Quality and Quantity
Value	Soil Quality and Quantity
Objective	Maintain onsite coarse woody debris
CSA Core Indicator	3.1.2 Level of downed woody debris (ESRD VOIT 1.1.2.1 b)
Indicator Statement	**Percentage of harvested area by subunit with coarse woody debris equivalent to preharvest conditions**
Description of indicator	Coarse woody debris (CWD) includes both downed woody debris and standing trees that have been left to allow the woody debris to decompose, resulting in organic matter that eventually becomes part of the soil. *CSA Standards Z809-08 Pg 50*
Target	**100% of subunits (Peace, Puskwaskau and Main) will meet or exceed coarse woody debris conditions equivalent to the pre-harvest state**
Description of target	To ensure coarse woody debris is maintained in subunits and that are similar, or greater than the pre-harvest state.

Basis for the Target

Coarse woody debris (CWD) is composed of non-merchantable sound or rotting logs, stumps, or large branches that have fallen or been harvested and left in the woods. It also includes trees and branches that are dead but remain standing or leaning (Dunster and Dunster, 1996). The trees may have excessive rot or other defect factors that make them unsuitable for milling, they may be windfalls that are too old to utilize, or they may be snags that have to be felled for

operational or safety reasons. CWD provides centers of biological interaction and energy exchange, symbolizing in many ways the complexity of forest ecosystems. Long-term management of this resource is vital to maintain ecosystem integrity.

Strategy

Means of Achieving Objective & Target:

Harvesting operations will retain CWD throughout the block. Equipment operators will be encouraged to not skid CWD to roadside and remain dispersed on site.

Forecast

Current Status:

A new Forest cover database (Alberta Vegetation Inventory) was completed in 2011 for the next Forest Management Plan. Forest cover strata has been developed. Once forest cover strata have been accepted by ESRD the pre-state will be calculated using information collected from sample plot data.

Predicted Results or Outcome:

Sufficient coarse woody debris left on site post harvest.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.2.1b

Monitoring & Measurement

Annual:

Ocular to verify presence or absence of CWD as outlined in ”Canfor Coarse Woody Debris Best Management Practices Appendix 7”

Reporting Process

Report the percent of harvest areas/blocks with retained coarse woody debris.

Variance

None.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

3.2.1a) Watershed Risk Level Assessments

Criterion 3: Soil and Water	**Element 3.2:** Water Quality and Quantity
Value	Water quantity
Objective	Water quantity will be maintained
CSA Core Indicator	3.2.1 Proportion of watershed or water management areas with recent stand-replacing disturbance (ESRD VOIT 3.2.1.1)
Indicator Statement	**Watershed with high or medium risk level assessments with mitigation strategies implemented**
Description of indicator	Watershed assessment under forest planning is intended to investigate potential impacts of the planned harvest on watershed values of concern. These values include flooding hazard, low flows, groundwater recharge, stream bank stability, fish habitat, drinking water impacts, water quality and quantity in general. *Reference: ESRD John Diiwu 2011*
Target	**100% of watersheds with a high or medium risk level will have approved mitigation strategies implemented**
Description of target	The purpose of this watershed hazard assessment is to identify the impacts of the preferred forest management scenario on all watersheds within the DFA and to successfully implement approved mitigation strategies on watersheds identified as potentially medium (equivalent clear-cut area (ECA) 30%-50%) or high (>50% ECA) risk.

Basis for the Target

Watershed hazard assessment projects changes to the flow regime (frequency, timing and magnitude of peaks and low flows) from the planned harvesting.

Draft Watershed Analysis Procedures for the Detailed Forest Management Plans (ESRD. 2009) (Appendix 8)

Strategy

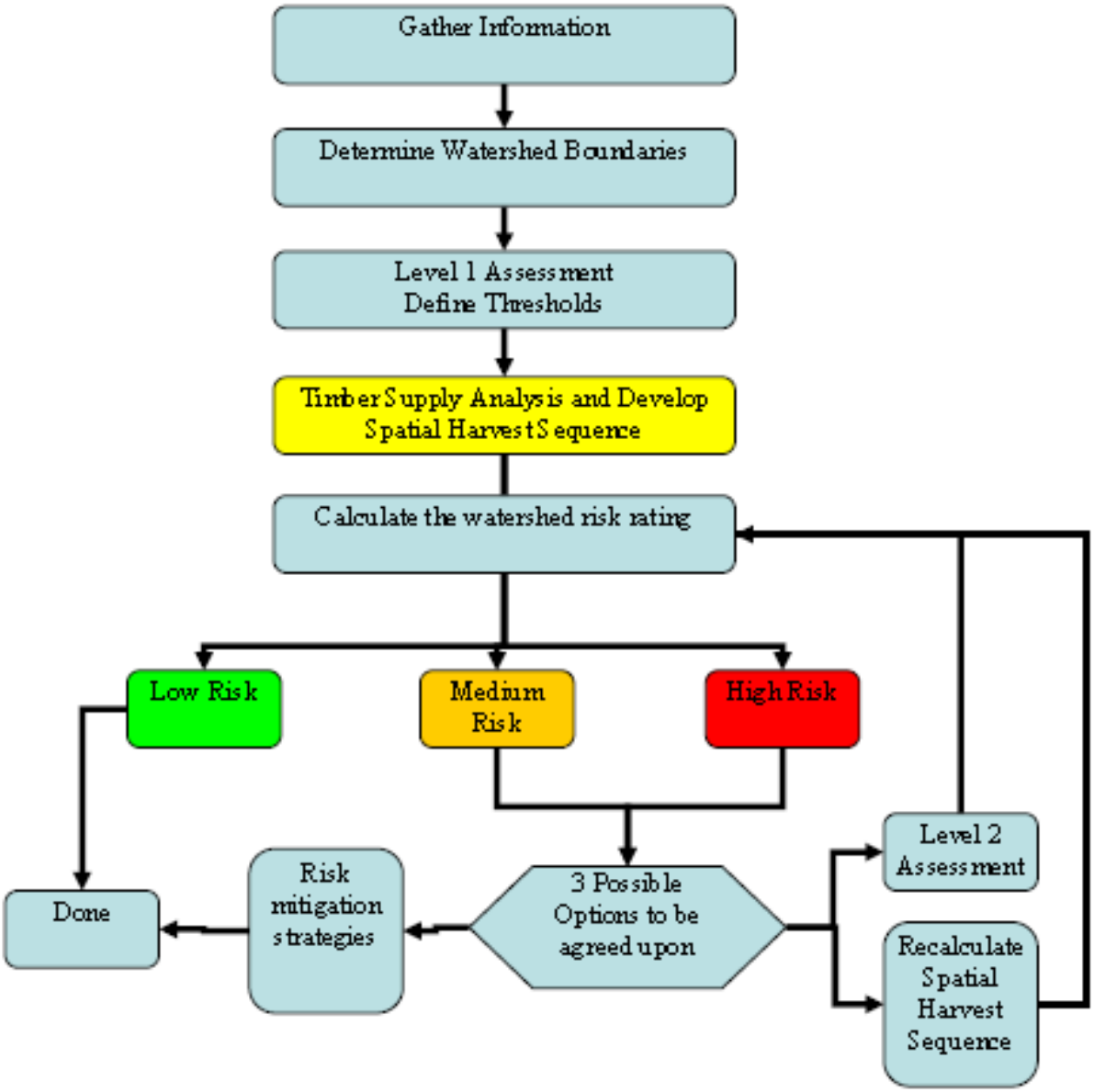
Means of Achieving Objective & Target:

The strategy used in ECA threshold and hazard levels calculations was developed by ESRD, and will be used for the 2012 forest management plan using the preferred forest management scenario spatial harvest sequence.

Those watersheds for which high or medium impacts are projected will have mitigation strategies implemented, in consultation with and recommended by ESRD, to protect watershed values. Some recommended mitigation measures include, but are not limited to:

- Timely removal of temporary roads;
- Extra retention of trees;
- Closure of roads to public (active roads have more erosion than inactive);
- Focusing harvest on areas that are not expected to contribute to spring freshets;
- Prompt reforestation;
- Timing of proposed operations (winter / summer); and
- Reduction of site disturbance associated with skidding and site prep, etc.

Figure 10: ECA Threshold and Hazard Levels



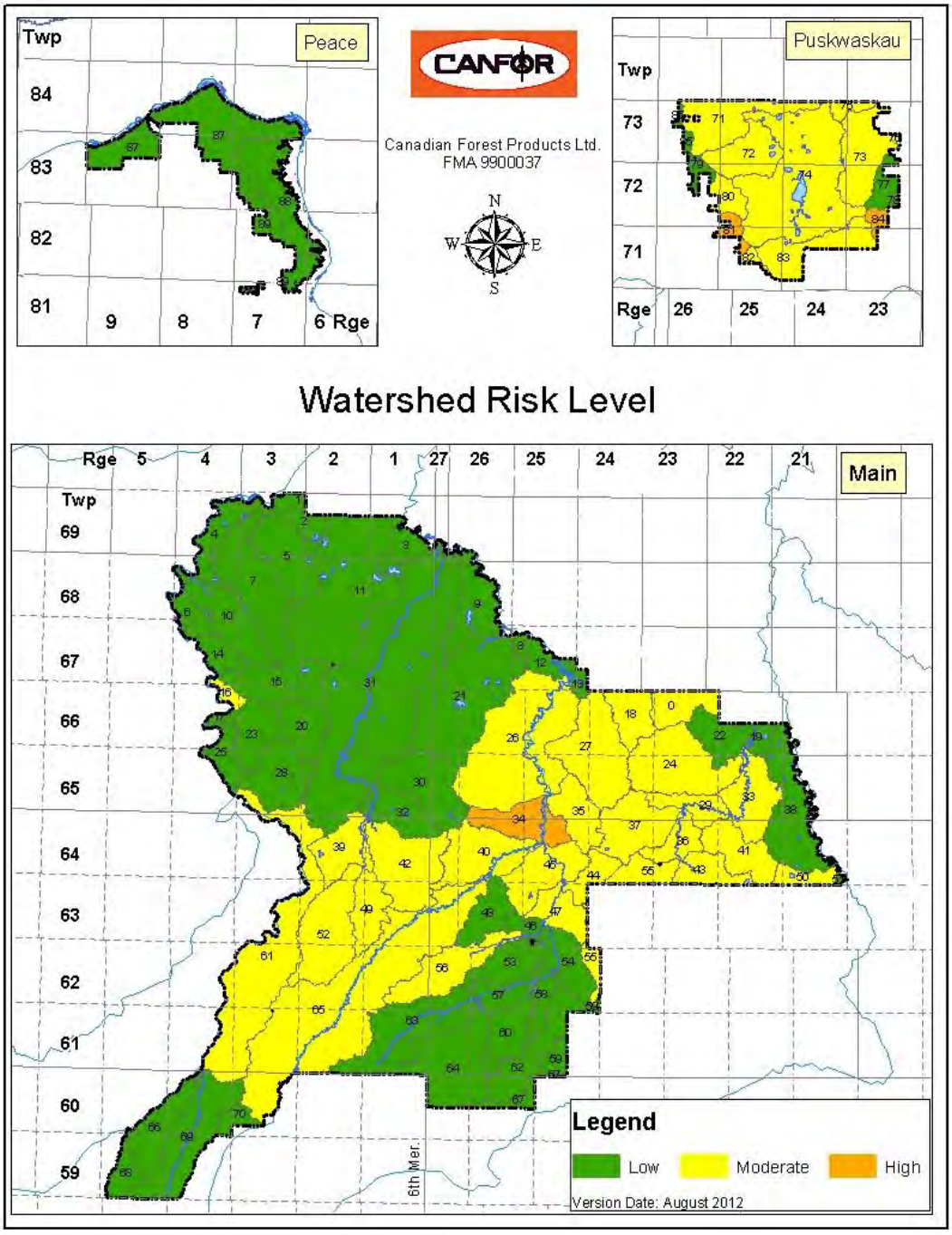
Report mitigation strategies on high and medium risk level watersheds for periods 1 and 2 (1 period = 5 yrs.) scheduled for completion in 2012.

Forecast

Current Status:

ESRD created new watersheds utilizing LiDAR. This is a new target and will be reported in the next APMR. The current status will be calculated with the FMP preferred forest management scenario.

Figure 11: Watershed Risk Level



Predicted Results or Outcome:

There will be a reduction to impacts on water quality and quantity by establishing mitigation strategies that reduce impacts on high and medium risk level watersheds.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 3.2.1.1

Water Act

Monitoring & Measurement

Annual:

Determine the watersheds with High and Medium rankings. Report on which of those watersheds has mitigation strategies implemented.

Reporting Process

In the APMR, report on watersheds with a high or medium risk level and the mitigation strategies implemented on watersheds where operational harvesting activities occurred.

Variance

None. All medium and high risk ranked watersheds with scheduled operations will have mitigation strategies completed, in consultation with ESRD.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

3.2.1b) Drainage Structures

Criterion 3: Soil and Water	**Element 3.2:** Water Quality and Quantity
Value	Water quality
Objective	Water quality will be conserved
CSA Core Indicator	3.2.1 Proportion of watershed or water management areas with recent stand-replacing disturbance (no ESRD VOIT)
Indicator Statement	**Drainage structures with identified water quality concerns that have mitigation strategies implemented**
Description of indicator	**Stream crossings by roads have a high potential to cause water quality issues. The structures must be monitored and repaired where necessary.**
Target	**100% of medium and high hazard drainage structures will have mitigation strategies implemented according to the road maintenance plan for permanent Canfor Alberta License of Occupation roads**
Description of target	Annual inspections are compiled and entered into the stream crossing database. Those structures with a high or medium risk for adverse impact will be considered for remedial action based on timing of budget development and availability of resources for the following field season.

Basis for the Target

Stream crossings by roads have the potential to cause water quality issues. Assessing and remediating those with issues is an ongoing task to ensure that impacts are minimized.

Strategy

Means of Achieving Objective & Target:

Canfor Alberta has elected to use the Foothills Stream Crossing Program. The Foothills Stream Crossing Program mandate is to:

- Monitor and improve the status of stream crossings
- Develop and oversee the implementation of new ideas for stream crossing management in Alberta
- Improve the environmental record of participating companies and organizations
- Collaborate and work together

After each field season, a remediation plan is developed and submitted to Department of Fisheries and Oceans and Sustainable Resource Development as a means of providing information on the maintenance and / or improvement of watersheds.

Initial inspections should be completed in the year after a new crossing has been installed. For all existing crossings, a schedule is being developed that identifies the structures for inspection, by watershed. Follow-up inspections are based on the age of a crossing and severity of defect found during the initial inspection. Where a crossing is removed, annual inspections are required until vegetation has established and the crossing site has stabilized.

The annual Road Maintenance Plan is a projection of remediation activities planned on those structures with the highest risk for adverse stream impacts. Remediation priorities will depend on sensitivity of watersheds and sufficient funding to complete some degree of repair to move the risk of that structure into a lower category.

Identifying priorities for remedial actions is determined using the information gathered during an inspection. Fish passage, safety and performance of the crossing structure and risk of erosion and sedimentation are all evaluated and summarized to risk rank the crossing as one of the following:

- High Risk – which describes fish migration issues, emergency repair of the crossing structure and high risk of sedimentation entering the stream
- Medium Risk – means the crossing may impede fish passage of some species or life stages at some point during the year, the crossing may present a blockage issue, a structural problem, or even a safety problem of missing signage and there is a medium risk of sedimentation entering the stream
- Low risk – means that fish passage resembles natural channel, no issues around safety or performance of the structure are identified and the potential of sediment to enter the stream is absent under normal high water flow conditions.

Forecast

Current Status:

Canfor Alberta has used the Stream Quality Crossing Index program (not described here) to monitor stream crossing quality. From the results, 161 of the 671 crossings (FMA) have been identified as requiring maintenance. Remedial work has been scheduled over the next ten years. Recently, Canfor Alberta has adopted the Foothills Stream Crossing Program and 21 crossings were assessed in 2010. Canfor Alberta plans to complete the assessments on the remaining crossings over the next five-year period. Part of the scheduling of crossings is to determine how many actual permanent stream crossings exist in Canfor's FMA area.

Predicted Results or Outcome:

Reduction in the number of high-risk drainage structures in sensitive watershed requiring mitigation strategies. Working with the Foothills Stream Crossing Program will achieve these results on a watershed level as well.

Over the next five-year period, Canfor Alberta should have all the initial inspection of stream crossings completed. Those crossings requiring work will be scheduled for repairs based on lead-time for budgeting purposes and the availability of skills and resources.

Legal Requirements

Federal Fisheries Act

Canfor FMA Operating Ground Rules

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 3.2.1.1

Monitoring & Measurement

Periodic:

Each crossing is to receive an initial inspection, based on procedures outlined by the Foothills Stream Crossing Partnership program, over the next five-year period based on location of watershed. If a crossing has no issues, it will not be inspected for another five years. Where crossings present issues, they will be tracked and acted upon through the remediation plan. The year following the remediation work will see another inspection and depending on the results (establishment of vegetation and stabilization of the stream crossing) the crossing will fall back into a regular inspection regime.

Annual:

Number of crossings that received required maintenance as per the number of crossings identified for repairs in the remediation plan

Reporting Process

The Foothills Stream Crossing Program is developing and implementing an online database to assist companies in managing, scheduling, and prioritizing the stream crossings for remediation. This will allow high and medium risk items to be planned into each budget year. The remediation plan forwarded to the government agencies will track those high-risk crossings to completion, with all data entered into the new online Foothills Stream Crossing Program database.

Variance

90% of identified medium and high-risk crossings will have mitigation strategies implemented within six months of being identified.

Response

If the targets are not met a root cause analysis will be completed to determine cause. Once cause is determined the process may be modified.

3.2.1c) Effective Water Crossings and Maintenance

Criterion 3: Soil and Water	**Element 3.2:** Water Quality and Quantity
Value	Water quality
Objective	Impacts to water quality will be minimized
CSA Core Indicator	3.2.1 Proportion of watershed or water management areas with recent stand-replacing disturbance (ESRD VOIT 1.1.2.3)
Indicator Statement	**Forestry water crossing construction and maintenance work in compliance with Code of Practice for Water Course Crossings or Operating Ground Rules within each subunit**
Description of indicator	Construction and maintenance activities on water crossings must follow the rules and regulations that apply.
Target	**100% of forestry water crossing construction and maintenance work in compliance with Code of Practice for Water Course Crossings or Operating Ground Rules**
Description of target	Active operations at water crossings (construction and maintenance) must be approved prior to the work being conducted. The operations must meet the conditions set out in the approval documents.

Basis for the Target:

Construction and maintenance of water crossings must be completed with care and attention to all rules and regulations to ensure negative consequences are minimized. The Code of Practice for Watercourse Crossings applies to any crossings with a culvert 1.5 meters and larger in diameter, or bridges with more than a single span. The OGR's apply to all smaller crossings not covered by the Code.

Strategy

Means of Achieving Objective & Target:

The General Development Plan includes a Road Maintenance, Construction and Abandonment Plan. Included in this plan is a listing of all work to be completed on roads and crossings. The table in the Plan will have two columns. The first will indicate if the Code or the Ground Rules applies to the activity. The second column will be a check mark to confirm that the planned work meets the applicable requirements and the timing planned to implement.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Introduction of sedimentation into watercourses is minimized.

Legal Requirements

Code of Practise for Water Course Crossings, Section 7 to 9 and Schedule 2, Water Act, Timber Management Regulations, Canfor FMA Operating Ground Rules.

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 1.1.2.3, 3.2.1.1, and 1.1.1.6

Monitoring & Measurement

Annual:

Annually, in April of each year, the Road Maintenance, Construction and Abandonment Plan will be checked to ensure that all crossings were planned using either the Code, or the Ground Rules, whichever apply.

Reporting Process

The APMR will summarize:

- the number of crossings constructed;
- the number of crossings for which maintenance was planned and of those the maintenance work that was completed;
- which criteria applied to the crossings; and
- whether the criteria were followed.

Variance

None. All construction and maintenance work will have the required approvals and will be carried out in compliance with Code of Practice for Water Course Crossings or OGRs.

Response

If the targets are not met a root cause analysis will be completed to determine cause. Once cause is determined the process may be modified.

4.1.1 Carbon Uptake and Storage

Criterion 4: Role in Global Ecological Cycles	**Element 4.1:** Carbon Uptake and Storage
Value	Carbon uptake and storage
Objective	Carbon uptake and storage (i.e. carbon balance) will be maintained
CSA Core Indicator	4.1.1 Net carbon uptake
Indicator Statement	**The Preferred Forest Management Scenario (PFMS) will be run through a Carbon Budget Model**
Description of indicator	Carbon Budget Models are available to evaluate the management scenarios.
Target	**A Carbon Budget Model will be run for the DFA within six months of the PFMS being developed**
Description of target	The outputs of a Carbon Budget Model will enable the company to review the sources, sinks and pools of carbon that form the carbon cycle on the DFA. This will allow the development of strategies to minimize the carbon footprint of the operations.

Basis for the Target

Forests are a large carbon pool in the carbon cycle. Carbon fluxes into and out of this pool are both natural and anthropogenic. Forest managers recognize their role in managing the anthropogenic impacts and influencing the natural ones. Strategies to manage direct impacts include prompt tree regeneration (Indicator 2.1.1a) and minimizing the conversion of forested land to non-forested (Indicator 2.2.1). Forest fuel management is a method of influencing natural negative carbon fluxes by reducing fire risk.

Science about the role of forests and forest products in the carbon cycle is evolving. Models for calculating a forest carbon budget are being developed, both provincially and regionally, that will be linked to forest inventory and timber supply models. Their use in forest planning can indicate whether a specific forest is expected to be a net carbon source or sink over the period normally used for wood-supply forecasts. The company is involved in Alberta Innovation Carbon Baseline Project, which will provide more information on management strategies impact carbon fluxes from the forest as well as forest operations. Ongoing monitoring of developments on forest carbon will ensure the company is at the forefront of developments.

The existing CFS-CBM-3- model developed by the Canadian Forest Service will be run concurrently with timber supply scenarios. The output of the model run with the specific DFA information will enable future management decisions that will influence carbon pools.

In addition to the model run, Canfor will be developing a strategy for all Canfor SFM plans. The strategy will include:

- Maintain some old growth on the land base for carbon storage.
  - The CSA and core indicator that this relates to is 4.1.1 Net carbon uptake. Canfor's core indicator statement is "Maintain the retention of existing (or replacement of) old forest retention area". We will be using the target for old seral from 1.1.3c Forest area by seral stage or age class. Canfor's core indicator statement is "Percent late seral stage distribution by ecological unit across the DFA". The actual targets will vary for each SFMP. For SFM reporting we would use the current condition for 1.1.3c and apply it to 4.1.1
- Prompt reforestation for carbon uptake.
  - CSA core indicator 2.1.1a reforestation success also applies to criterion 4 in the standard. Canfor's core indicator statement is "Average regen delay for stands established annually".
- Minimize permanent access structures to maintain forest productivity for carbon uptake.
  - CSA core indicator 2.2.1 Additions and deletions to the forest area also applies to criterion 4. Canfor's core indicator statement "Percent of gross forested land base in the DFA converted to non-forest use". The target for most plans relates to the total amount of road required to fully develop the DFA to extract timber and varies from 3% to 7%.
- Increase fiber utilization for carbon sequestration and replacement of fossil fuels.

Strategy

Means of Achieving Objective & Target:

The CFS-CBM-3 model will be calculated with the DFA data and the PFMS strategies.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Model runs will provide a greater understanding of the various carbon sources, sinks and pools and their interaction with management strategies. Future management strategies will use this information to make choices with better knowledge of the impacts.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 4.1

Monitoring & Measurement

Periodic:

Once, within six months after the Forest Management Plan Preferred Forest Management Strategy is finalized.

Reporting Process

The summary of results of the CFS-CBM-3 modelling process will be provided in the APMR. There will be no further analysis unless a new timber supply analysis is completed.

Variance

None. The model runs will be completed and reported.

Response

Run the model

4.2 Sustained Yield of Timber

Criterion 4: Role in Global Ecological Cycles	**Element 4.2:** Forest Land Conversion
Value	Sustainable yield of timber
Objective	Limit the conversion of productive forest to other uses
CSA Core Indicator	2.2.1 Additions and deletions to the forest area (ESRD VOIT 2.1.2.1)
Indicator Statement	**Percent of gross forested land base in the DFA converted to non-forest land use through forest management activities**
Description of indicator	Conversion to non-forest land use includes roads, gravel pits, camp clearings etc. The forest companies will minimize the conversion of forested land to non-forested lands in their operations.
Target	**Forest management company activities not to exceed NET 3% reduction in gross forest land base in the DFA over the life of the FMA agreement**
Description of target	The DFA gross area is 644,695 hectares. Conversion to non-forest land use includes construction of roads, gravel pits, camp clearings etc. Restoration of past land uses can convert those areas back to forest. The difference between the two numbers should not exceed 3% of the gross DFA area.

Refer to indicator 2.2.1 for the detailed write up.

5.1.1a) Timber and Non-Timber Benefits

Criterion 5: Economic and Social Benefits	**Element 5.1:** Timber and Non-Timber Benefits
Value	Sustainable yield of timber and non timber benefits
Objective	Sustainable forest management that maintains timber and non-timber benefits
CSA Core Indicator	5.1.1 Quantity and quality of timber and non-timber benefits, products, and services produced in the DFA (no ESRD VOIT)
Indicator Statement	**% of volume harvested compared to long term approved harvest level**
Description of indicator	Ensuring harvest levels do not exceed the long term allowable harvest will help ensure sustainability of the forest and ecosystem, thereby providing timber and non-timber benefits now and in the future.
Target	**Not to exceed 100% of the approved harvest level (Annual Allowable Cut) over 5 years (5 yr. quadrant balance)**
Description of target	The *Forest Management Agreement* (Alberta. 1999) allows for over or under harvesting in any one year, but must be reconciled on a fixed five-year period. The reconciliation is a comparison of the actual versus allowed harvest levels. The target ensures that the company does not over-harvest.

Refer to indicator 2.2.2 for the detailed write up.

5.1.1b) Maintenance of Recreational Areas

Criterion 5: Economic and Social Benefits	**Element 5.1:** Timber and Non-Timber Benefits
Value	Sustainable yield of timber and non timber benefits
Objective	Sustainable forest management that maintains timber and non-timber benefits
CSA Core Indicator	5.1.1 Quantity and quality of timber and non-timber benefits, products, and services produced in the DFA (ESRD VOIT 5.2.2)
Indicator Statement	**Maintenance of recreational areas for non-timber values**
Description of indicator	The company will maintain recreational areas on the DFA for public use.
Target	**Canfor Alberta will maintain a minimum of 3 recreational areas for use by the public within DFA.**
Description of target	Canfor Alberta will maintain recreational areas, such as campsites, on the DFA for public use.

Basis for the Target:

Recreational use of the DFA is a common non-timber value. The company will continue to maintain recreational areas for public use in at least three sites.

Strategy

Means of Achieving Objective & Target:

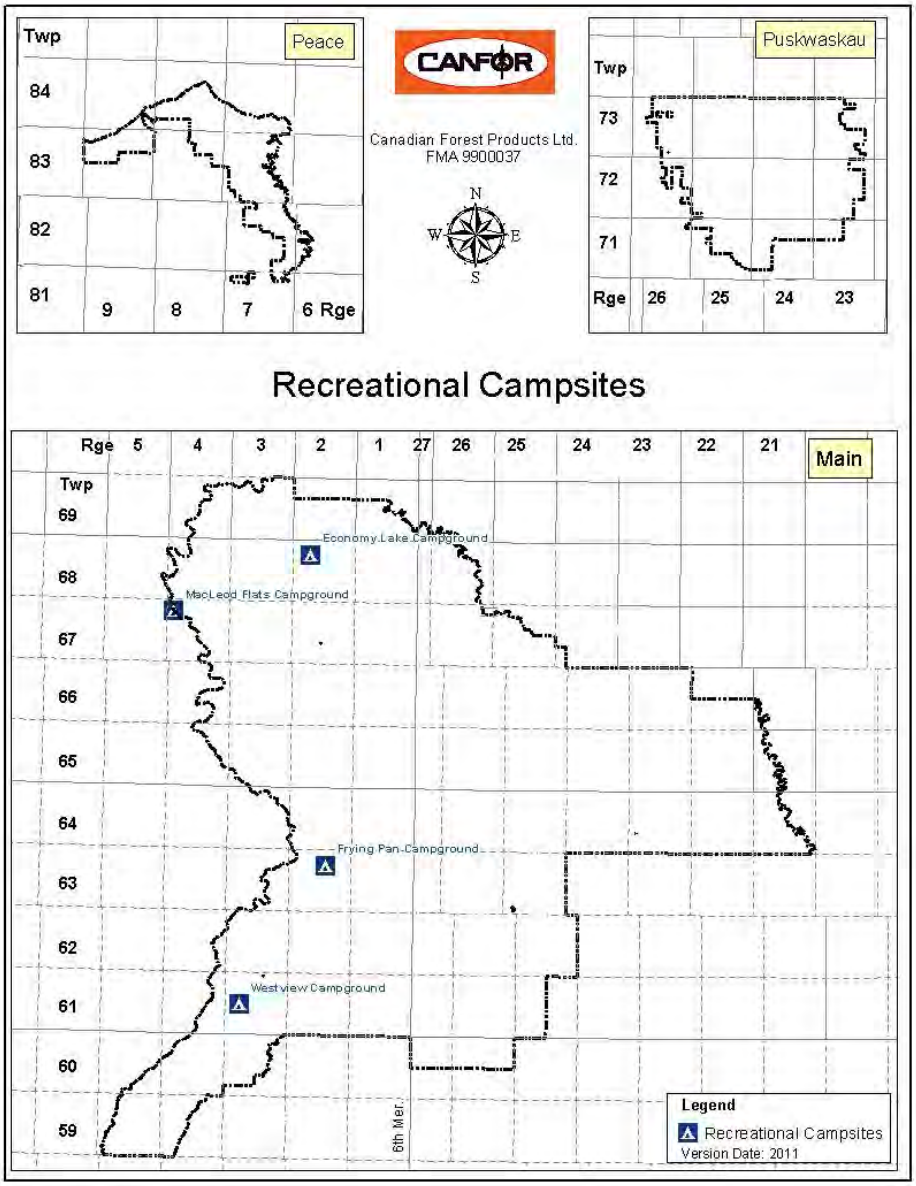
The company will fund, or seek funding to maintain recreational areas, such as MacLeod Flats, Economy Lake, Westview and Frying Pan Creek.

Forecast

Current Status:

Canfor Alberta currently maintains four recreational areas on the DFA.

Figure 12: Recreational Campsites



Predicted Results or Outcome:

The companies will continue to maintain recreational areas where feasible.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 5.2.2.1

Monitoring & Measurement

Annual:

Documentation showing contractual agreements for recreational areas maintenance will indicate which recreational areas supported.

Reporting Process

The APMR will report on the number of recreational areas maintained annually.

Variance

None

Response

Adjust activities

5.2.1a) Local Contract Services

Criterion 5: Economic and Social Benefits	**Element 5.2:** Communities and Sustainability
Value	A range of benefits to local communities
Objective	Local communities and contractors will have the opportunity to share in benefits such as jobs, contracts and services
CSA Core Indicator	5.2.1 Level of investment in initiatives that contribute to community sustainability (no ESRD VOIT)
Indicator Statement	**Investment in local communities**
Description of indicator	The indicator reflects a desire to enhance community well-being.
Target	**Over a rolling 5-year period, a minimum of 75% of Canfor Alberta forest operations dollars paid for contract services will be expended locally**
Description of target	A calculation will be conducted annually of the dollars paid for local contract services and total contract services.

Basis for the Target

This target demonstrates Canfor Alberta's involvement in the local community. There are many biological and ecological benefits provided by forests. They also contribute social and economic benefits. Forests represent not only a return on investment (measured, for example, in dollar value, person-days, donations, etc.) for the organization but also a source of income and non-financial benefits for DFA-related workers, contractors, and others; stability and opportunities for communities; and revenue for local, provincial, and federal governments.

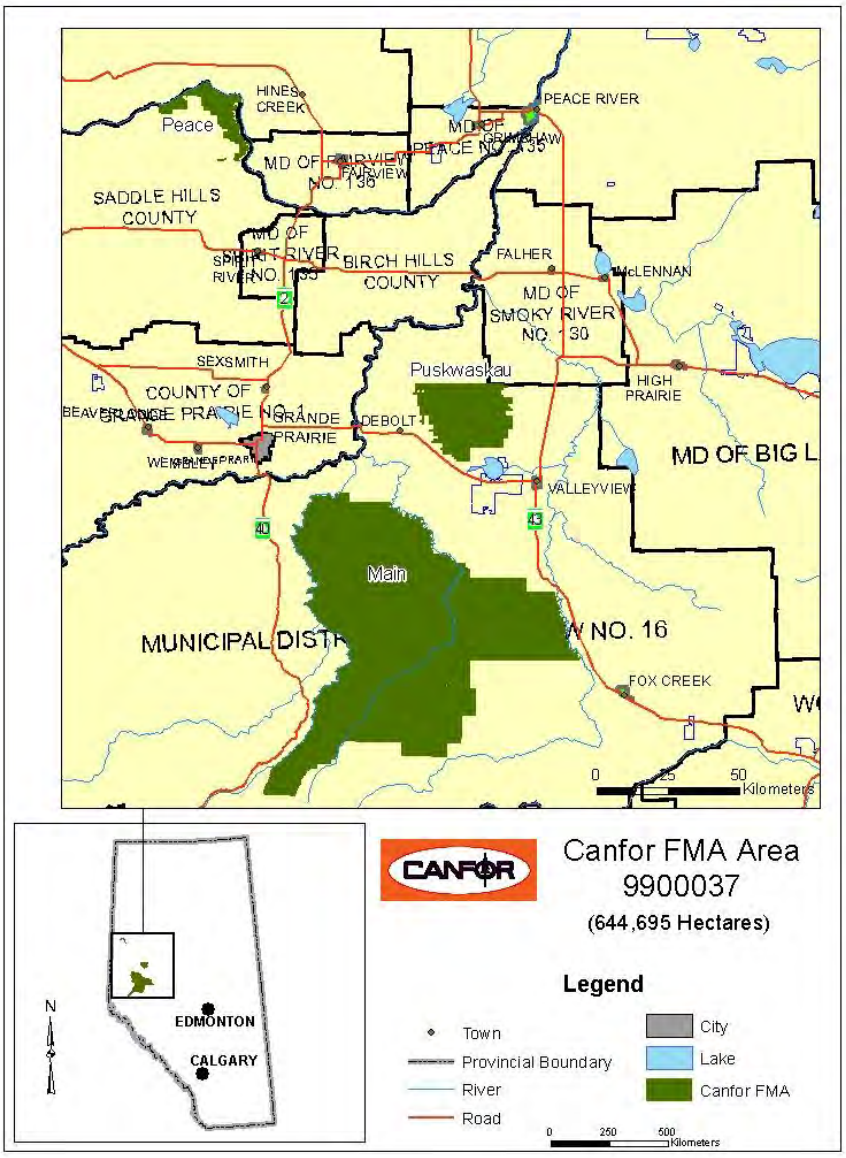
In the same way that larger forest organizations depend on a secure flow of resources to justify investment in a local area, small businesses depend on a sustained flow of opportunities to develop and invest in their local community. As the majority of forest workers are hired locally, communities benefit by forest planning and operations.

Strategy

Means of Achieving Objective & Target:

The total dollar value of contract services considered to be local will be calculated relative to the total dollar value of all contract services provided. This calculation will be used to derive the percentage of money spent on forest operations and management of the DFA from suppliers and contractors within local communities. Canfor Alberta track all spending pertaining to forest related activities (operations, management) within the DFA, separated by that occurring locally. For the purposes of this target, a local contractor or supplier is defined as one that resides within or in the vicinity of the DFA. Local communities have been defined by the Forest Management Advisory Committee (FMAC) as those adjacent to the FMA area i.e. Valleyview, DeBolt, Fox Creek, Spirit River, Fairview, Grande Cache, and Grande Prairie. Municipal District (MD) of Greenview No. 16, MD of Spirit River No. 20 and County of Grande Prairie No. 1 are also deemed local communities. 2005 SFMP. In 2011, the list was expanded, with discussions with FMAC, to include; MD of Peace River No 135, MD of Fairview No 136, Northern Lights County, Clearhills County, and Mackenzie County.

Figure 13: FMA Locations with MDs



Forecast

Current Status:

During the five year period from 2006-2010, 87% of the dollars paid by Canfor Alberta were for local contract services.

Predicted Results or Outcome:

Achievement of the target will support resilient and stable communities within and adjacent of the DFA. Localized spending may also provide better management through local knowledge.

Legal Requirements

None

Monitoring & Measurement

Annual:

Report percent of spending pertaining to forest related activities occurred locally.

Reporting Process

Use internal accounting systems to determine total amount of spending for contract services and that occurring locally during the reporting period. Report in APMR.

Variance

None.

Response

Adjust activities.

5.2.1b) Community Involvement

Criterion 5: Economic and Social Benefits	**Element 5.2:** Communities and Sustainability
Value	A range of benefits to local communities
Objective	Local communities and contractors will have the opportunity to share in benefits such as jobs, contracts and services
CSA Core Indicator	5.2.1 Level of investment in initiatives that contribute to community sustainability (no ESRD VOIT)
Indicator Statement	**Investment in local communities**
Description of indicator	The indicator describes efforts to enhance community well-being.
Target	**Canfor will provide financial/in-kind support to a minimum of 8 community events or services**
Description of target	Canfor Alberta is a supporter of the local community and this target will demonstrate the types of involvement.

Basis for the Target

Canfor's corporate policies and certification strategy clearly demonstrates the importance of public support to its business.

Strategy

Means of Achieving Objective & Target:

Canfor Alberta has maintained a strong community presence since 1964 and will continue to provide financial/in-kind support in the local community. Canfor Alberta upholds their involvement by maintaining an open and active public advisory group (FMAC), notification/referrals to stakeholders, and hosting field tours and open houses.

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Forecast

Current Status:

In 2011, Canfor provided financial support to such organizations as STARS, Grande Prairie Food Bank, Grande Prairie Regional Emergency Medical Services and United Way. In-kind support was also provided to various programs such as Arbour Day, Walk through the Forest, City Scrub and for Nitehawk Ski Patrol.

Predicted Results or Outcome:

A supportive and informed local public will allow Canfor the social licence to continue to operate on the public forestlands.

Legal Requirements

None

Monitoring & Measurement

Annual:

Report annually the number of community events or services Canfor has provided financial/in-kind support.

Reporting Process

To be reported in the APMR.

Variance

Zero

Response

Adjust activities.

5.2.2 Employees and Contractors with Environmental and Safety Training

Criterion 5: Economic and Social Benefits	**Element 5.2:** Communities and Sustainability
Value	A range of benefits to local communities
Objective	Local communities and contractors will have the opportunity to share in benefits such as jobs, contracts and services
CSA Core Indicator	5.2.2 Level of investment in training and skills development (no ESRD VOIT)
Indicator Statement	**Training in environmental and safety procedures in compliance with company training plans**
Description of indicator	A trained workforce is critical to safe and proper execution of plans.
Target	**100% of Canfor FMG Alberta employees and contractors have both environmental and safety training**
Description of target	Environmental and safety training of FMG employees and contractors will demonstrate Canfor's commitment to safety and the environment.

Basis for the Target

Sustainable forest management provides training and awareness opportunities for forest workers as organizations seek continual improvement in their practices. Investments in training and skill development generally pay dividends to forest organizations by way of a safer and more environmentally conscious work environment. Assessing whether forest contractors have received both safety and environmental training is a direct way of measuring this investment.

Strategy

Means of Achieving Objective & Target:

Canfor Alberta invests in skills development by ensuring forest contractors have adequate safety and environmental training and for woodland employees (staff) by ensuring training occurs in accordance with their plans. Forest planning and operations are conducted with a genuine focus on worker safety and environmental stewardship. Canfor Alberta uses a database (Eclipse Training) to schedule and record training for employees and has standard work procedures and pre-work forms to track contractor environmental training and safety certification.

Forecast

Current Status:

This is a new target and will be reported in the next APMR. Canfor is maintaining its commitment to training and education of its workforce.

Predicted Results or Outcome:

An educated workforce that performs their duties safely and environmentally responsibly

Legal Requirements

None

Monitoring & Measurement

Annual:

The percentage of company employees and contractors that receive both environmental and safety training will be tracked in company databases, as a percentage of all employees and contractor employees that work on the DFA.

Reporting Process

Report the total number of company employees and report the number of those that had received both environmental and safety training in accordance with training plan expectations. Employee training records are located in the Eclipse Training Database. Contractor training records can be found in the contract pre-work form and report from ITS any issues discovered from inspections or audits regarding contractor training.

Variance

None. All DFA-related contractors will have the required training. Administrative and clerical workers are out of scope.

Response

Safety program will be strictly enforced.

5.2.3 Direct and Indirect Employment

Criterion 5: Economic and Social Benefits	**Element 5.2:** Communities and Sustainability
Value	Fair distribution of benefits across communities
Objective	A fair distribution of benefits and costs will be ensured across all communities in the local area
CSA Core Indicator	5.2.3 Level of direct and indirect employment (no ESRD VOIT)
Indicator Statement	**Level of direct and indirect employment**
Description of indicator	A measure of the company's level of direct and indirect employment opportunities
Target	**Report annually on trend of Canfor Alberta's level of direct and indirect jobs created from the DFA**
Description of target	The level of direct and indirect employment will be calculated and reported annually.

Basis for the Target

Canfor Alberta contributes to direct and indirect employment within the local region and to sustainable harvesting by adhering to their apportioned harvest volume within FMA. Organizations that harvest at sustainable harvest levels in relation to the allocated supply levels continue to provide direct and indirect employment opportunities.

While employment levels have been declining in many manufacturing industries including the forest industry, there remains a strong relationship between direct and indirect employment and annual harvest levels.

Strategy

Means of Achieving Objective & Target:

Maintain harvest levels

Forecast

Current Status:

This is a new target. Current numbers will be reported in the next APMR.

Predicted Results or Outcome:

Forest organizations that harvest in relation to their allocation of the annual allowable cut provide employment and taxation revenue to local communities.

Legal Requirements

None

Monitoring & Measurement

Annual:

The coniferous annual allowable cut for the DFA is 715,000 m3. Using a multiplier of 4.4 jobs per 1000 m3, the level of direct and indirect employment was 3,146 jobs.

(Natural Resources Canada website www.canadaforests.nrcan.gc.ca/rpt/indicators the multiplier is approximately 4.4 direct and indirect jobs per 1000 m3 of harvest.)

Reporting Process

In the APMR, report the annual production volume and the calculated number of jobs, annually. Show the trend from previous years.

Variance

Not applicable

Response

Not applicable

5.2.4 Aboriginal Opportunities in the Forest Economy

Criterion 5: Economic and Social Benefits	**Element 5.2:** Communities and Sustainability
Value	Fair distribution of benefits across communities
Objective	A fair distribution of benefits and costs will be ensured across all communities in the local area
CSA Core Indicator	5.2.4 Level of Aboriginal participation in the forest economy (no ESRD VOIT)
Indicator Statement	**Opportunities for Aboriginal communities and contractors to participate in the forest economy**
Description of indicator	Canfor Alberta will offer opportunities for local Aboriginal communities and contractors to participate in the forest economy
Target	**Maintain evidence that opportunities have been provided**
Description of target	The number of opportunities will be tracked in Canfor's Creating Opportunities for Public Involvement (COPI) system and reported annually

Basis for the Target

It is evident that more and more people believe that development of natural resources in their local area should accrue benefits for local communities. These include benefits for local Aboriginal communities and may include economic opportunities such as employment, contracts, or a provision of services.

Strategy

Means of Achieving Objective & Target:

Employment opportunities provided by Canfor Alberta in woodlands operations is predominately through contractual arrangements with qualified service providers. Canfor Alberta will offer employment opportunities to local, Aboriginal contractors providing they:

- Have the appropriate level of skill and knowledge;
- Have the required equipment;
- Meet applicable legal requirements, including Occupational Health and Safety requirements;
- Have the ability to meet and maintain the Company's health, safety, and environmental performance requirements;

- Have the ability to meet and maintain the Company's quality and production requirements;
- Deliver services at competitive prices; and
- Provide the required overall service.

Forecast

Current Status:

In 2011, one local Aboriginal community was offered opportunity to sell Canfor Alberta logs and to submit a proposal to conduct timber harvesting and log hauling operations on the DFA.

Predicted Results or Outcome:

The results of this target are intended to provide fair and equal opportunities for local Aboriginal communities and contractors to benefit from the local forest industry as well as to develop a mutually beneficial working relationship between Canfor Alberta and local Aboriginal people.

Legal Requirements

None

Monitoring & Measurement

Annual:

Annually report evidence of opportunities offered.

Reporting Process

All opportunities offered to Aboriginal people for participation in the forest economy will be recorded in Canfor's Creating Opportunities for Public Involvement (COPI) tracking system. An annual report from COPI will summarize the number of opportunities offered and reported in the Annual Performance Monitoring Report.

Variance

Not applicable

Response

Will continue of offer opportunities as they arise.

6.1.1 Aboriginal Awareness Training for Canfor Alberta

Criterion 6. Society's Responsibility	**Element 6.1:** Aboriginal and Treaty Rights
Value	Understanding and respecting Aboriginal and treaty rights
Objective	Aboriginal and treaty rights will be respected
CSA Core Indicator	6.1.1 Evidence of a good understanding of the nature of Aboriginal title and rights (no ESRD VOIT)
Indicator Statement	**Canfor Alberta employees will receive Aboriginal awareness training**
Description of indicator	Canfor Alberta invests in cultural awareness and skill development by ensuring that employees receive Aboriginal awareness training.
Target	**100% of Canfor Alberta Forestry Supervisors, Coordinators, Superintendants, and the Operations Manager will receive credible and effective Aboriginal awareness training once every two years**
Description of target	It is important Canfor Alberta employees are provided credible, effective, and knowledgeable Aboriginal awareness training, this target will record the type and date of training.

Basis for the Target

As forest managers, Canfor Alberta employees need to consider and respect all of the major values of the forest and impacts to its stakeholders when creating plans and operating on the land base. Effective forest management requires employees to be sufficiently educated in values and stakeholder interests, particularly those of the local Aboriginals. To achieve a better understanding of the local Aboriginal values, titles, rights and how to communicate effectively with them, it is Canfor Alberta recognizes that employees require credible and effective Aboriginal awareness training.

Strategy

Means of Achieving Objective & Target:

There are 4 Aboriginal Groups that have interest in Canfor Alberta's Forest Management Area; Sturgeon Lake First Nation, Horse Lake First Nation, Aseniwuche Winewak First Nation of Canada and the Métis Nation Zone 6. Canfor Alberta will consult with these Aboriginal groups to determine whom they recommend to deliver credible and effective

training and a list of suggested key topics in order to ensure that Aboriginal values, titles, and rights are understood.

Training will be scheduled for all Canfor Alberta staff once every two years to ensure continuing education.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Forest operations that respect Aboriginal title and rights reflect the timber and non-timber interests of local Aboriginal groups.

It is expected that the relationship between Canfor Alberta employees and local Aboriginal people will be enhanced with the implementation and coordination of effective Aboriginal awareness training. Increased knowledge about the local Aboriginal culture, titles, and rights will give FMG employees a better understanding and respect for these values in the planning process and during operations.

Legal Requirements

Alberta's First Nation's Consultation Guidelines on Land Management and Resource Development (November 2007)

Alberta's Aboriginal Groups Consultation Policy on Land Management and Resource Development (May, 2005)

SRD Lands and Forestry First Nations Consultation Operating Procedures (May, 2011)

Monitoring & Measurement

Annual:

Report annually the percent of Canfor Alberta staff that have received credible and effective training over the two-year period.

Reporting Process

All training completed by Canfor Alberta employees is entered into Canfor's Eclipse Training database. A report will be produced from the Eclipse database and a summary of the percentage of the Canfor Alberta staff that has received credible and effective training over the two-year period will be reported in the Annual Performance Monitoring Report.

Variance

A minimum of 90% of Canfor Alberta staff receives a minimum of one credible and effective training session every two years.

Response

If the targets are not met a root cause analysis will be completed to determine cause. Once cause is determined the process may be modified.

6.1.2 Forest Management Plan Communicated to Aboriginal Groups

Criterion 6. Society's Responsibility	**Element 6.1:** Aboriginal and Treaty Rights
Value	Understanding and respecting Aboriginal and treaty rights
Objective	Aboriginal and treaty rights will be respected
CSA Core Indicator	6.1.2 Evidence of best efforts to obtain acceptance of management plans based on Aboriginal communities having a clear understanding of the plans (ESRD VOIT 6.1.1.1)
Indicator Statement	**Members of local Aboriginal communities will be provided ample opportunity to understand Canfor Alberta's forest management plan**
Description of indicator	To ensure that members of local Aboriginal communities and their representatives will be provided information, in a variety of forms, to enable clear understanding of the FMP
Target	**Opportunity to communicate key components of the forest management plan have been communicated to each affected local Aboriginal group**
Description of target	The FMP will be communicated to Aboriginal groups through direct consultation and participation in the FMAC.

Basis for the Target

Canfor Alberta recognizes the importance of having an effective communication plan in place to allow Aboriginals to have a clear understanding of higher-level plans. As outlined in Alberta's Aboriginal Groups Consultation Guidelines on Land Management and Resource Development (November 2007), Canfor Alberta will communicate with Aboriginal Groups to review planned forest operations regarding forest management activities that have the potential to adversely impact Aboriginal Groups Rights and Traditional uses of Alberta Crown Lands. The guidelines state that Forest Management Plans (FMP) must be communicated with Aboriginal Groups groups identified as having some interest in the Forest Management Area.

The Alberta Forest Management Planning Standard (ver. 4.1-April 2006), also details ESRD's requirements for the successful development of a Forest Management Plan. Within these standards, there is a requirement for meaningful communication with Aboriginal forest users. Meaningful Consultation is defined as "Consulting in good faith, with honest communication and an open exchange of relevant information before making decisions".

Through the implementation of these guidelines and standards, Canfor Alberta will be able to ensure the successful communication of key components of the forest management plan to aboriginal groups.

Strategy

Means of Achieving Objective & Target:

A description of Canfor Alberta's intent to ensure successful communication of the FMP to Aboriginal groups is outlined in Canfor's Terms of Reference 2012 Forest Management Plan for Canfor FMA 9900037 section 8.6 (Canfor. 2012b)

Canfor Alberta makes provision for Aboriginal input using processes that are in conformance with the Government of Alberta's Aboriginal Groups Consultation Guidelines on Land Management and Resource Development (ESRD, 2007).

Aboriginal involvement is ensured in two ways:

- Aboriginal groups, including Sturgeon Lake First Nation and Métis nation Zone 6, are members of the Forest Management Advisory Committee; and
- Via direct consultation with Sturgeon Lake First Nation, Horse Lake First Nation, and the Aseniwuche Winewak First Nation of Canada to ascertain their desired level of involvement."

Through participation in Canfor Alberta's Forest Management Advisory Committee (FMAC), members are directly involved in the development of the Values, Objectives, Indicators, and Targets (VOITs) that form the basis of the SFMP as well as the mandatory VOITs identified by ESRD in Annex 4 of the Alberta Forest Management Planning Standard (ESRD. 2006).

Canfor Alberta will also directly contact each of the aboriginal groups to determine how they would like to be involved in the development of the FMP and engage in consultation as per Alberta's Aboriginal Groups Consultation Guidelines and ESRD Lands and Forestry First Nations Consultation Operating Procedures.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Through the implementation of clear and effective communication of the FMP, Canfor Alberta can ensure an increased knowledge of the FMP by the Aboriginal communities. In turn, this will lead to a better understanding of both party's interest in the Forest Management Area and will assist in the approval of the FMP.

Legal Requirements

Alberta's Aboriginal Groups Consultation Guidelines on Land Management and Resource Development (November 14, 2007)

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 6.1.1.1

Alberta's Aboriginal Groups Consultation Policy on Land Management and Resource Development (May, 2005)

SRD Lands and Forestry First Nations Consultation Operating Procedures (May, 2011)

Monitoring & Measurement

Periodic:

This indicator will be monitored and measured after the development of any new FMP.

Reporting Process

During the development of an FMP each opportunity offered and materials/presentations given to each of the Aboriginal communities will be entered into Canfor's Creating Opportunities for Public Involvement (COPI) tracking system. A report from COPI describing these opportunities will be summarized and reported in the Annual Performance Monitoring Report. Records of attendance at FMAC meetings will also be maintained in addition to the COPI summary.

Variance

Not applicable

Response

Continue to offer training and opportunities to communicate.

6.1.3 Conformance with Plans to Address Aboriginal Values

Criterion 6. Society's Responsibility	**Element 6.1:** Aboriginal and Treaty Rights
Value	Understanding and respecting Aboriginal and treaty rights
Objective	Aboriginal and treaty rights will be respected
CSA Core Indicator	6.1.3 Level of management and/or protection of areas where culturally important practices and activities (hunting, fishing, gathering) occur (ESRD VOIT 6.1.1.1)
Indicator Statement	**% of forest operations in conformance with operational/site plans developed to address Aboriginal forest values, traditional knowledge and uses**
Description of indicator	It is essential that operational/site plans for forest management activities address any concerns regarding Aboriginal forest values, traditional knowledge and uses before the operations commence. This is achieved through the communication process. In addition to addressing identified concerns in the operational/site plans, it is equally important that the plans be implemented at the operational level.
Target	**100% of forest operations are conducted in conformance with operational/site plans that have been developed to address Aboriginal forest values, traditional knowledge and uses**
Description of target	Canfor Alberta is required to verify that operational/site plans are effectively implemented through a series of inspections, audits, and reporting/monitoring procedures. Conformance to applicable policies and reporting/monitoring procedures ensures that identified Aboriginal forest values, traditional knowledge, and uses are addressed as intended.

Basis for the Target

There are many land users and stakeholders on Canfor Alberta's Forest Management Area. It is often difficult for forest planners to create a balance between the different values that they are managing; some of these include Aboriginal forest values, traditional knowledge, and traditional uses. In order to ensure that Aboriginal values are addressed in forest operations and plans, forest planners need to initiate a communication process with the affected Aboriginal groups. Refer to Indicator 1.4.2 and 6.2.1 for details on communication procedures.

Operational plans developed should address any Aboriginal forest values, traditional knowledge, and uses that may have been identified. It is important that there are systems in place to ensure that the plans are being followed at the operational level. Canfor Alberta monitors conformance with operational plans through several processes. Therefore ensuring the protection of areas where culturally important practices and activities (hunting, fishing, and gathering) occur.

Strategy

Means of Achieving Objective & Target:

In order to ensure conformance with operational/site plans, Canfor Alberta operations supervisors are required to conduct regular site inspections. In addition to these inspections, operations are audited by internal and external parties on an annual basis. The purpose of these audits is to ensure that operational/site plans are being followed at an operational level and areas of non-conformance are identified. In instances, where it has been determined that an operational/site plan has not been followed, whether through the inspection or auditing process, a record will be entered in Canfor's Incident Tracking System (ITS). This database requires that an action plan be put in place to address the non-conformance and develop further preventative measures.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Canfor Alberta's operations will be in conformance with all operational/site plans that address Aboriginal forest values, traditional knowledge and uses.

Legal Requirements

Canfor FMA Operating Ground Rules

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 6.1.1.1

Alberta's Aboriginal Groups Consultation Guidelines on Land Management and Resource Development (November 14, 2007)

Monitoring & Measurement

Annual:

Annually report the percent of forest operations in conformance with operational/site plans that have been developed to address Aboriginal forest values, traditional knowledge, and uses.

Reporting Process

All non-conformances identified during the inspection, audit, and monitoring process will be entered into Canfor's Incident Tracking System (ITS) and reported in the Annual Performance Monitoring Report.

Variance

None. All operational/site plans that have been developed to address Aboriginal forest values, traditional knowledge and uses will be implemented.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.2.1 Aboriginal Consultation

NOTE: Combined with 1.4.2

Criterion 1: Biological Diversity **Criterion 6:** Society's Responsibility	**Element 1.4:** Protected Areas and Sites of Special Biological and Cultural Significance **Element 6.2:** Respect for Aboriginal Forest Values, Knowledge, and Uses
Values	▪ Identified protected areas and sites that have special biological and cultural significance ▪ Understand and respect Aboriginal special needs
Objectives	▪ The natural states and processes to maintain protected areas and sites that have special biological and cultural significance will be conserved ▪ Early and effective consultation with Aboriginal peoples will be provided
CSA Core Indicators	1.4.2 Protection of identified sacred and culturally important sites 6.2.1 Evidence of understanding and use of Aboriginal knowledge through the engagement of willing Aboriginal communities, using a process that identifies and manages culturally important resources and values (ESRD VOIT 6.1.1.1)
Indicator Statement	**% of identified historic, sacred and culturally important sites, forest values, traditional knowledge and uses considered in forestry planning processes**
Description of indicator	In order to maintain historic, sacred and culturally important sites, forest values, traditional knowledge and uses these must be identified through communication or archaeological processes or existing knowledge and evaluated to determine a range of options available for their protection.
Target	**100% of historic, sacred and culturally important sites, forest values, traditional knowledge and uses known or identified through communication are considered in forestry planning processes**

Description of target	All historic, sacred and culturally important sites, forest values, traditional knowledge and uses that are identified by local Aboriginal people during the communication process or by archaeological process or through existing knowledge will be protected.

Basis for the Target

In order to ensure that Aboriginal values are addressed in forest operations and plans, forest planners need to initiate a communication process with the affected Aboriginal groups. The Alberta government developed *Alberta's Aboriginal Groups Consultation Policy on Land Management and Resource Development* in May 2005 (Alberta. 2005) to help standardize these communication procedures. From this policy, *Alberta's Aboriginal Groups Guidelines on Land Management and Resource Development* (Alberta. 2007) was formed. These guidelines form the basis to which Canfor Alberta communicates with Aboriginal groups to address Aboriginal sacred and culturally important sites, forest values, traditional knowledge and uses in forestry planning. In addition to the guidelines, ESRD has also developed a more detailed summary for Aboriginal communication as it relates to forestry and outlines Alberta's expectations in *Procedural Steps for Consultation with Aboriginal Groups*

www.srd.alberta.ca/LandsForests/FirstNationsConsultationForestry.aspx

Through effective communication with the Aboriginal groups during the planning process, Canfor Alberta will be able to address any identified issues, recommendations, and values that may be of concern.

Historic sites are addressed in the *Alberta Historical Resources Act (RSA. 2000)* and it is the government's responsibility to manage historical resources. Developers (such as Forest Companies) are required to conduct historical resource overview impact assessments and implement mitigation measures in order to ensure that recorded and unrecorded historical resources are properly identified, evaluated, and managed.

Strategy

Means of Achieving Objective & Target:

Alberta's *Procedural Steps for Consultation with Aboriginal Groups* describes the steps to follow during the consultation process including initial contact, follow-up, and requirements for records of consultation. The records of communication are used to keep a detailed summary of the items discussed during the communications as well as any actions that were created and how they were addressed. Canfor Alberta uses a database called Creating Opportunities for Public Involvement (COPI) to keep record of all attempts to communicate, items discussed, actions, and follow-up. The details that are entered into COPI will be in accordance with Alberta's *Procedural Steps for Consultation with Aboriginal Groups.* The follow-up and completion of the action items identified during communication will ensure that all identified Aboriginal sacred and culturally important sites, forest values, traditional knowledge, and uses are considered in forest planning.

When Canfor Alberta is notified of a sacred and culturally important site, forest value, traditional knowledge, and use by Aboriginal people Canfor Alberta will agree on "prescriptions" for the site. Prescriptions may vary from maintaining the availability of the site (e.g. berry picking areas), to no activity at all (e.g. grave sites) or to any other prescription that both parties deem necessary to protect the resource. A prescription may also involve keeping knowledge of the resource confidential.

Historic sites are identified, evaluated, and managed through the archaeological process. Canfor Alberta contracts certified archaeologists to conduct historical resource overview impact assessments on all harvest units and roads prior to commencement of forestry activities. The prescriptions from the assessments can range from performing extensive field surveys to approving the block ready for harvest. If the field surveys result in historical resources being located the archaeologist prescribes measures to protect the resource in accordance with the *Alberta Historical Resources Act.*

Current Status:

To date, there have been no known historic, sacred or culturally important sites have been impacted by Canfor Alberta's operations. Canfor Alberta personnel have been using COPI to keep detailed records of consultation since 2007. It continues to be an effective tool for tracking any issues or concerns regarding Aboriginal forest values, traditional knowledge and uses that are brought forward in the consultation process as well as all actions completed to address these concerns.

Canfor Alberta has been conducting historical resource overview assessments on all harvest areas and roads since March 2002.

Predicted Results or Outcome:

Through consideration of the historic, sacred and culturally important sites, forest values, traditional knowledge and uses that are identified by Aboriginal people, Canfor Alberta is ensuring that such sites are being maintained across the landscape.

Legal Requirements

Alberta's First Nation's Consultation Guidelines on Management and Resource Development (November 2007)

Alberta's Aboriginal Groups Consultation on Land Management and Resource Development (May, 2005)

Alberta Historical Resources Act

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 6.1.1.1

Monitoring & Measurement

Annual:

Annually report number of historic, sacred and culturally important sites, forest values, traditional knowledge and uses protected.

Reporting Process

All records of consultation will be entered into COPI and will include dates of communication, methods of communication, detailed description of items discussed, any issues or recommendations that were made, and action items. All follow up items, and details of how the actions were completed will also be recorded. These records will be summarized annually in the Annual Performance Monitoring Report to ensure that all identified Aboriginal sacred and culturally important sites, forest values, traditional knowledge, and uses and historic sites were addressed in the planning process.

Variance

None. All sites will be considered.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.3.1 Purchase and Sales with other Forest Products Businesses

Criterion 6. Society's Responsibility	**Element 6.3:** Forest Community Well-Being and Resilience
Value	Inclusive public process
Objective	Affected and locally interested parties will be involved in the development of the decision-making process through an open, transparent and accountable process
CSA Core Indicator	6.3.1 Evidence that the organization has co-operated with other forest-dependent businesses, forest users, and the local community to strengthen and diversify the local economy (no ESRD VOIT)
Indicator Statement	**Relationships with other forest businesses and users**
Description of indicator	Canfor Alberta engages in purchases, sales, and trade arrangements with other forest products businesses.
Target	**Evidence of minimum of 4 relationships with forest products businesses annually within the vicinity of the DFA**
Description of target	Report annually which forest products businesses with which Canfor Alberta has a relationship

Basis for the Target

Support for local communities through business relationships (defined for this indicator as purchases, sales, and trading of primary forest products and forest by-products) provides employment diversification and increased local revenue.

An economically and socially diverse community is often more sustainable in the long term with its ability to weather market downturns of a particular sector. Support of efforts to increase diversity, the establishment of other enterprises and co-operation with other forest-dependent businesses and forest users is desirable.

Strategy

Means of Achieving Objective & Target:

Participating businesses seek and maintain active, mutually beneficial business relationships (purchases, sales, trade arrangements) with other forest products businesses within or in the immediate vicinity of the DFA. Canfor Alberta purchases

primary products such as saw logs and by-products such as hog fuel. Canfor Alberta sells oversized saw logs, saw logs, pulp logs, and chips.

Forecast

Current Status:

2011 relationships with: Foothills Forest Products, Weyerhaeuser Company Limited, Daishowa Marubeni International Ltd – Peace River Pulp Division, Zavisha Sawmills Ltd, Ainsworth Engineered Canada LP, and Tolko Industries Ltd.

Canfor Alberta had major contracts with Trans Alta Utilities (formerly Canadian Gas & Electric) to supply the Cogeneration Plant with waste wood from 2005-2011. Canfor Corporation has now purchased the facility and is responsible for providing employment and 100% of the waste fuel needed to generate electricity (clean energy) and steam (to eliminate the need for natural gas consumption for drying lumber). The Canfor Green Energy plant will also supply excess electricity to the provincial power grid.

Predicted Results or Outcome:

Business initiatives and relationships, built on sound principles are not only beneficial to the partners, but also to the economy and vitality of communities within and adjacent to the DFA.

Legal Requirements

None

Monitoring & Measurement

Annual:

Annually, report the total number of purchase/sale/trade relationships with other forest products businesses within, or in the vicinity, of the DFA.

Reporting Process

In the APMR, report on the number of purchase, sale or trade relationships with other forest dependant businesses within, or in the vicinity, of the DFA. Tracking is the number of relationships, not the number of transactions within each relationship.

Variance

None. Canfor Alberta will maintain a minimum of four relationships with other forest products businesses.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.3.2 Maintain a Certificate of Recognition

Criterion 6. Society's Responsibility	**Element 6.3:** Forest Community Well-Being and Resilience
Value	Worker safety
Objective	Effective worker safety program
CSA Core Indicator	6.3.2 Evidence of co-operation with DFA-related contractors and their unions to improve and enhance safety standards, procedures, and outcomes in all DFA-related workplaces and affected communities (no ESRD VOIT)
Indicator Statement	**Implementation and maintenance of a certified safety program**
Description of indicator	Canfor Forest Management Group, Alberta's safety program is certified through the Partnership In Injury Reduction program (PIR).
Target	**100% of Canfor FMG Alberta and eligible DFA-related contractors will obtain and maintain a Certificate of Recognition (COR) or equivalent**
Description of target	Certificate of Recognition (COR) indicates that an employer has implemented a health and safety program that meets the standards established by their Certifying Partner and Employment and Immigration Partnerships Program.

Basis for the Target

Canfor's first measure of success is the health and safety of its people. This philosophy is embraced and promoted from the mill floor to the executive offices. This commitment is reflected in the work practices and safety programs employed at the Canfor Alberta Region.

Canfor implements their safety program by assigning responsibilities to managers, supervisors and to employees as follows:

Management:

- Develop and maintain a comprehensive occupational health and safety program
- Conduct regular health and safety audits and implement appropriate action steps
- Facilitate active employee participation in health and safety initiatives and programs
- Provide the necessary education and training in safe work practices and procedures for supervisors, OH&S committee members, and all employees

Supervisors:

- Ensure that all employees under their direction receive proper training and instruction and that all work is performed safely
- Ensure that employees are made aware of all known or reasonably foreseeable health or safety hazards in the areas where they work
- Initiate actions and follow-up in order to maintain a healthy and safe working environment within their areas of responsibility

Employees:

- Take responsibility for avoiding risk to themselves and others and following all known safe work rules, procedures and instructions
- Eliminate all accidents by working together to identify any potential hazards in the workplace and to take the appropriate corrective action

Strategy

Means of Achieving Objective & Target:

The Partners in Injury Reduction (PIR) program encourages the development of effective workplace health, safety and disability management programs in Alberta. PIR has 13 certifying partners; a Certifying Partner is responsible for assessing the quality of health and safety management systems in Alberta. Companies entering the PIR program work towards attaining a Certificate of Recognition (COR). A COR indicates that an employer has implemented a health and safety program that meets the standards established by their Certifying Partner and Employment and Immigration Partnerships Program. Once a COR has been issued, it is valid for a three year period as long as all maintenance requirements are met. The employer is responsible for completing internal audits for each of the next two years. When the COR expires after three years, another external audit must be conducted to renew the COR.

www.wcb.ab.ca/pdfs/employers/pir_broch.pdf

www.safetycouncil.ab.ca/index.php/pircor/about-pircor.html

Canfor FMG Alberta has committed that the company and eligible DFA-related contractors will implement and maintain a PIR safety program and achieve a Certificate of Recognition (COR).

Forecast

Current Status:

Canfor FMG Alberta has implemented Partners in Injury Reduction (PIR) safety program and has a current Certificate of Recognition (COR). PIR commenced in 1989, the earliest record of Canfor Alberta achieving certification is 1992. It has been identified that Canfor FMG Alberta had safety programs and standards in place prior to its first official certification.

Contractors have been required to be COR or equivalent (i.e. BC Safe Companies) certified since 2009.

Predicted Results or Outcome:

To create the safest possible working environment for all forest workers and continuously improve safety record.

Legal Requirements

None

Monitoring & Measurement

Annual:

The indicator will be considered met for Canfor FMG Alberta if they are able to successfully maintain a COR during the reporting year. The indicator will be considered met for DFA-related contractors if they maintain a COR during the term of their contract with Canfor FMG Alberta within the reporting year. It does not include contracts that are non-forestry, field related.

Reporting Process

Report a yes/no in the APMR as to whether Canfor FMG Alberta and eligible DFA-related contractors have retained COR or equivalent.

Variance

90% of Canfor FMG Alberta and Contractors will have COR certification or equivalent.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.3.3 PIR Implemented, Reviewed, and Improved

Criterion 6. Society's Responsibility	**Element 6.3:** Forest Community Well-Being and Resilience
Value	Worker safety
Objective	Approved safety program
CSA Core Indicator	6.3.3 Evidence that a worker safety program has been implemented and is periodically reviewed and improved (no ESRD VOIT)
Indicator Statement	**Implementation and maintenance of certified safety program**
Description of indicator	Canfor Alberta's safety program is certified through Partnership In Injury Reduction (PIR).
Target	**100% of recommendations from Partners in Injury Reduction (PIR) audit will be addressed and action plans developed**
Description of target	A PIR audit reviews the basic elements of the Company's health and safety program using a Partnerships-approved audit instrument.

Basis for the Target

An audit is a comprehensive review of the health and safety program; therefore, it is critical Canfor Alberta addresses recommendations brought forward. The annual Occupational Health and Safety (OHS) program management review is an opportunity to continuously improve Canfor FMG safety program.

Strategy

Means of Achieving Objective & Target:

The previous indicator 3.3.2 talks about obtaining and maintaining a COR. A COR is valid for three years and an internal audit is conducted each year for 2 years and the 3rd year an external audit is required to renew the COR. The audits can be used as a tool to assess the effectiveness of the health and safety program against an established standard and ensure it is constantly being reviewed and improved. Recommendations are generated from the audits and the company addresses and creates action plans based on these recommendations.

Annually, there is a Forest Management Group OHS Program Management Review to evaluate trends toward or away from a continuously improving safety culture. Management Reviews look backward at progress to date, and look forward to anticipate the need for changes to the FMG OHS program. Management Reviews also evaluate the effectiveness of the program and compares actual results with the original objectives and targets to determine where further improvement is needed.

Forecast

Current Status:

This is a new target and will be reported in the next APMR. Canfor Alberta has maintained a COR since 1992.

January 17, 2011 was the first Forest Management Group OHS Program Management Review and it is scheduled in January annually going forward.

Predicted Results or Outcome:

Continue to improve and enhance Canfor Alberta's health and safety program.

Legal Requirements

None

Monitoring & Measurement

Annual:

Report the percentage of Woodlands audit recommendations addressed, and record the date of the management review of Canfor Alberta's safety program.

Reporting Process

The audit recommendations and action plans are recorded and results will be reported in the APMR. Canfor FMG Alberta and Mill are audited together; however, each party addresses their own recommendations.

Variance

None. Canfor will address all issues in the review of the safety program.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.4.1 Engaged and Active FMAC

Criterion 6. Society's Responsibility	**Element 6.4:** Fair and Effective Decision-Making
Value	Current scientific, local and traditional knowledge
Objective	Forest management decisions will be based on scientific, local and traditional knowledge
CSA Core Indicator	6.4.1 Level of participant satisfaction with the public participation process (ESRD VOIT 6.2.1.1)
Indicator Statement	**Public advisory group maintained and satisfaction survey implemented**
Description of indicator	Maintain Canfor Alberta's Forest Management Advisory Committee and implement the *Forest Management Advisory Committee Evaluation Form*.
Target	**80% annual satisfaction from surveys from all four sections will be reported**
Description of target	The four sections with a target of 80% satisfaction are: Meeting and FMAC Process, FMAC Meeting Facilitation, Meeting Logistics, and Yearly Assessment.

Basis for the Target

The SFM Forest Management Advisory Committee (FMAC) was established in 1995 to assist Canfor Alberta in developing the Forest Management Plan and an SFM Plan in 1999 by identifying local values, objectives, indicators and targets. The SFM Plan is an evolving document that will be reviewed for effectiveness and revised as needed with the assistance of FMAC to address changes in forest condition and local community values. Ensuring the continuing interest and participation of the FMAC is an integral part of a dynamic and responsive SFM Plan. The ability of people to share information, discuss and solve problems, and set and meet objectives is key to achieving and maintaining meaningful participation.

Strategy

Means of Achieving Objective & Target:

Canfor Alberta will provide all FMAC members a *Forest Management Advisory Committee Evaluation Form* to measure the effectiveness and awareness with the process. The survey will assist Canfor Alberta to improve on areas identified by FMAC. The survey content and process will be that described in the FMAC Terms of Reference. All survey questions will have a one to four scoring assessment with one being very poor and four being very satisfied.

Forecast

Current Status:

This is a new target and will be reported in the next APMR.

Predicted Results or Outcome:

Active, engaged, and satisfied FMAC.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 6.2.1.1

Monitoring & Measurement

Annual:

FMAC members will fill out the Forest Management Advisory Committee Evaluation Form after each meeting. Each of the four sections of the survey will be calculated and results will be compiled for each calendar year.

Reporting Process

Results of *Forest Management Advisory Committee Evaluation Form* will be compiled and reported in the APMR.

Variance

10% of target. Example: 80% target minus 10% variance equals minimum of 72%.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

Forest Management Advisory Committee Evaluation Form for Grande Prairie

FMAC Meeting Date: _____ Name (optional):_____

The purpose of this form is to provide an opportunity for Forest Management Advisory Committee (FMAC) members to evaluate the effectiveness of the public participation process with the goal of facilitating continual improvement.

Please evaluate the following:	Very poor (1)	Not Satisfied (2)	Acceptable (3)	Satisfied (4)	Very Satisfied (5)
A. Meeting and FMAC Process **Target 42 points**					
1. I have a good understanding of the purpose of the FMAC and my role as part of that group.					
2. Information provided in advance of meetings allows me to effectively contribute at meeting.					
3. The meeting agenda is reviewed prior to the meeting and followed					
4. The meeting minutes capture important aspects of the meeting including actions, progress updates, and any decisions.					
5. Communication with FMAC members between meetings is adequate.					
6. Canfor shares new information with FMAC members regarding impacts to the environment, sustainability, forestry, etc.					
7. The FMAC Terms of reference are followed.					
8. Were most FMAC members involved in meeting?					
9. Was your message received and acted on, if possible?					
10. Was there a positive atmosphere for the meeting?					
11. Was information presented clearly at the meeting?					
12. What is your overall satisfaction with the FMAC process?					
13. Ex-officio, licensee, or technical team members were organized and prepared for meeting.					
B. FMAC Meeting Facilitation: **Target 20 points**					
14. FMAC meeting facilitator was organized and prepared.					
15. FMAC meeting facilitator strived for consensus decision making.					
16. Facilitator actively listened to concerns and viewpoints expressed during the meeting.					
17. FMAC meeting facilitator addressed process issues.					
18. FMAC meeting facilitator remained neutral on content issues					
19. FMAC meeting facilitator kept the meeting focused and moving.					
C. Meeting Logistics: **Target 10 points**					
20. Was the meeting location convenient?					
21. Was the timing of the meeting convienient?					
22. Was the meal provided for the meeting good?					
D. Yearly Assessment (Pertains to Annual Reporting, FMAC Recruitment and FMAC Representation): **Target 20 points**					
23. Efforts have been made to incorporate concerns related to SFM values and objectives into the SFM Plan.					
24. Concerns related to SFM indicators and targets are being adequately listened to at FMAC meetings.					
25. Efforts have been made to incorporate my concerns related to SFM indicators and targets into the SFM Plan.					
26. The outputs generated through discussion with the FMAC (SFM Plan and annual monitoring reports) are clear and concise.					
27. Canfor has made an effort to recruit new FMAC members as needed.					
28. A broad cross-section of the community is represented at FMAC meetings.					

Suggestions for Improvement – Please list ways to improve on subsequent FMAC meetings including meals, topics or presentations for future meetings, date changes…
1.
2.
3.
General Comments – Please provide any comments or suggestions that you feel would improve the FMAC process, the SFM Plan or Annual Report or subsequent meetings:

Goal is to have 80% satisfaction or better on all 4 sections of evaluation form.

Consent to be contacted for feedback? **Y** or **N**

6.4.2 Educational Opportunities to Forest Management Advisory Committee

Criterion 6. Society's Responsibility	**Element 6.4:** Fair and Effective Decision-Making
Value	Current scientific, local and traditional knowledge
Objective	Forest management decisions will be based on scientific, local and traditional knowledge
CSA Core Indicator	6.4.2 Evidence of efforts to promote capacity development and meaningful participation in general (no ESRD VOIT)
Indicator Statement	**Number of educational opportunities for information/training/capacity building that are delivered to the public advisory group annually**
Description of indicator	Providing educational opportunities to the FMAC provides knowledge for better dialogue and ultimately better decisions.
Target	**Provide one educational opportunity per FMAC meeting, plus one field tour opportunity per year**
Description of target	Annually, Canfor Alberta will make available to the FMAC group a minimum of one educational opportunity and one field tour.

Basis for the Target

The ability of people to share information, discuss and solve problems, and set and meet objectives is key to achieving and maintaining meaningful participation. Many types of capacity development initiatives can be used to help promote meaningful participation.

This indicator and target recognizes the importance of providing informational or training opportunities for members of the FMAC that in turn contributes to a more knowledgeable and effective committee. Members of the public provide local knowledge that contributes to socially and environmentally responsible forest management. At times, public members may feel limited in their ability to contribute to discussions because they lack the technical forestry knowledge. Broadening this knowledge enables better dialogue and helps contribute to balanced decisions and an SFM Plan acceptable to the majority of public. A few of the many examples of educational opportunities would include guest presentations on a particular topic, literature on specific SFM targets, handouts, Forest Management Plans, and/or local associations updates/briefing (e.g. Canadian Boreal Forest Agreement, Mighty Peace Watershed Alliance).

Strategy

Means of Achieving Objective & Target:

Canfor Alberta will provide informational/educational/capacity building opportunities for FMAC members at each regularly held meeting. In addition, Canfor Alberta will offer one field tour annually.

Forecast

Current Status:

This is a new target and will be reported on in the next APMR.

Predicted Results or Outcome:

Public participation in forest planning and operations that is open, inclusive, responsive to public concerns, and grounded in science.

Legal Requirements

None.

Monitoring & Measurement

Annual:

Report in the APMR the number of educational opportunities and field tours presented to the FMAC.

Reporting Process

FMAC meeting minutes contain supporting documentation.

Variance

None. Opportunities will be provided.

Response

If the target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.4.3 Educational Opportunity to Aboriginals

Criterion 6. Society's Responsibility	**Element 6.4:** Fair and Effective Decision-Making
Value	Current scientific, local and traditional knowledge
Objective	Forest management decisions will be based on scientific, local and traditional knowledge
CSA Core Indicator	6.4.3 Evidence of efforts to promote capacity development and meaningful participation for Aboriginal communities (no ESRD VOIT)
Indicator Statement	**Number of opportunities for information/training/capacity development that are delivered to the Aboriginal communities annually**
Description of indicator	Providing educational opportunities to the Aboriginal communities provides knowledge for better dialogue and ultimately better decisions.
Target	**Greater than or equal to 1 Aboriginal information/training/capacity development opportunity per year**
Description of target	Canfor Alberta will provide a minimum of 1 information/training/capacity development opportunity for the Aboriginal communities, annually.

Basis for the Target

Open, respectful communication with local Aboriginal communities includes not only the company understanding the Aboriginal rights and interests but for the Aboriginals to understand the company's forest management plans and processes.

Strategy

Means of Achieving Objective & Target:

This indicator and target recognizes the importance of providing informational or training opportunities for the Aboriginal communities that in turn contributes to a more knowledgeable and effective relationship. A few of the many examples of educational opportunities would include guest presentations on a particular topic, literature on specific SFM targets, handouts, Forest Management Plans, field tours, local associations updates/briefing.

Canfor Alberta will offer a minimum of one information/training/capacity development opportunity per year to the Aboriginal communities.

Forecast

Current Status:

This is a new target and will be reported on in the next APMR.

Predicted Results or Outcome:

Forest operations that respect Aboriginal title and rights and reflect the timber and non-timber interests of local Aboriginals

Legal Requirements

None.

Monitoring & Measurement

Annual:

Report in the APMR the number of educational opportunities that were offered to the Aboriginal communities and the number of times those opportunities led to information/training/capacity development activities being completed.

Reporting Process

All opportunities and associated completed activities will be entered into the COPI database and reported in the APMR.

Variance

None. At least one development opportunity will be provided annually.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.5.1 Educational Opportunities

Criterion 6. Society's Responsibility	**Element 6.5:** Information for Decision-Making
Value	Current scientific, local and traditional knowledge
Objective	Forest management decisions will be based on scientific, local and traditional knowledge
CSA Core Indicator	6.5.1 Number of people reached through educational outreach (no ESRD VOIT)
Indicator Statement	**The number of educational opportunities provided to the community**
Description of indicator	Providing educational opportunities to the community provides knowledge for better decisions.
Target	**A minimum of 5 educational opportunities provided annually**
Description of target	Annually, Canfor Alberta will provide a minimum of 5 educational opportunities for the local community.

Basis for the Target

Canfor Alberta is committed to working with directly affected stakeholders and members of the public on forest management issues and has a well-established history of participation in community meetings, including local planning processes. The sharing of knowledge contributes to informed, balanced decisions and plans acceptable to the majority of public. Informed and engaged, members of the public can provide local knowledge and support that contributes to socially and environmentally responsible forest management.

Strategy

Means of Achieving Objective & Target:

Canfor Alberta participates in many educational outreach initiatives:

1. An active Forest Management Advisory Committee;
2. Research projects;
3. Vegetation management plan open houses;
4. Annual Operating Plan (AOP) and General Development Plan (GDP) open houses;
5. Field tours; and
6. The Grande Prairie and Area Environmental Sciences Education Society.

Forecast

Current Status:

Canfor Alberta provided 6 educational opportunities in 2011.

Predicted Results or Outcome:

An educated and informed public with a broad understanding of forestry that can provide local input and support on matters pertaining to forest planning and operations.

Legal Requirements

None.

Monitoring & Measurement

Annual:

Track and report the educational opportunities provided.

Reporting Process

List the type and number of opportunities Canfor Alberta offered annually in the APMR.

Variance

None. At least five opportunities will be provided annually.

Response

If the targets are not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

6.5.2a) Sustainable Forest Management Monitoring Report

Criterion 6. Society's Responsibility	**Element 6.5:** Information for Decision-Making
Value	Current scientific, local and traditional knowledge
Objective	Forest management decisions will be based on scientific, local and traditional knowledge
CSA Core Indicator	6.5.2 Availability of summary information on issues of concern to the public (no ESRD VOIT)
Indicator Statement	**CSA Z809-08 Sustainable Forest Management monitoring report made available to the public annually**
Description of indicator	Annually, Canfor Alberta prepares an Annual Performance Monitoring Report that is available to the public.
Target	**CSA Z809-08 Sustainable Forest Management monitoring report available to public annually via worldwide web and copies in print by request**
Description of target	Topical information will be provided to the local public as well as a worldwide audience.

Basis for the Target

This target recognizes the importance of keeping members of the public informed about forestry strategies being developed and planning occurring in the DFA. Annual reporting of the SFM Plan's performance measures to the advisory group and to the broader public provides an open and transparent means of demonstrating how forests are being managed. The target is a measure of performance to the indicators and targets in this SFM Plan and is an avenue to review their effectiveness.

Strategy

Means of Achieving Objective & Target:

Canfor Corporation maintains a website www.canfor.com that makes the SFM Annual Performance Monitoring Report (APMR) publicly availableCanfor Alberta will provide a printed copy of the APMR when requested.

Forecast

Current Status:

Canfor Alberta's APMR has been on Canfor's website annually since 2001.

Predicted Results or Outcome:

The Public is more informed and aware.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards 6.2.1.1

Monitoring & Measurement

Annual:

Report a yes/no answer as to whether the annual monitoring report was made publically available on an external website and if printed copies were available by request.

Reporting Process

Report in the APMR.

Variance

None. The SFMP and the APMR will be available digitally.

Response

Make the report available.

6.5.2b) Public Inquiries

Criterion 6. Society's Responsibility	**Element 6.5:** Information for Decision-Making
Value	Current scientific, local and traditional knowledge
Objective	Forest management decisions will be based on scientific, local and traditional knowledge
CSA Core Indicator	6.5.2 Availability of summary information on issues of concern to the public (no ESRD VOIT) None (No ESRD VOIT)
Indicator Statement	**Percentage of public inquiries that receive an initial contact**
Description of indicator	Responding to public inquires demonstrates Canfor Alberta commitment to be responsive to the public.
Target	**100% of all inquiries receive initial contact within 1 month of receipt**
Description of target	Timely response to any public inquiry is important.

Basis for the Target

Canfor's corporate policies and certification strategy clearly demonstrate a commitment to communicate with the public. The target assists in fulfillment of commitments made in the *Public Involvement Program* (Canfor, 2008) to record and action public inquiries. It is important to Canfor Alberta that members of the public have opportunities to provide input and comments which are followed up on.

Strategy

Means of Achieving Objective & Target:

Pubic inquiries are generally received via telephone, email, letters and occasionally via fax or in person. Whatever the method of the inquiry, it is important that Canfor Alberta deals with it adequately and in a timely manner.

In some cases, a public inquiry may require significant time to complete research, investigations and planning of actions to adequately deal with the inquiry. To ensure the public member knows the inquiry is being addressed, Canfor Alberta will, within one month, undertake initial contact by acknowledging an inquiry has been received and informing the inquirer that it is in the process of either addressing the inquiry or has developed plans to deal with the inquiry.

Forecast

Current Status:

This target is a continuation from the 2005 SFMP. During 2010, there were two public inquiries reported but only one response was provided within one month. Canfor Alberta has measures in place to improve those results going forward.

Predicted Results or Outcome:

Public involvement continues to be important to Canfor Alberta. All public inquiries will receive a response within one month.

Legal Requirements

None

Monitoring & Measurement

Annual:

As per Canfor's Forest Management System, all public inquiries are recorded in the Issue Tracking System (ITS). The system is utilized to record mandatory information including the date of inquiry, issue source, contact person and the Canfor Alberta employee responsible for dealing with the issue. Action plans and the progress in completing action plans are also tracked.

Reporting Process

The ITS database will be reviewed annually and the resultant data reported in the *Annual Performance Monitoring Report*.

Variance

90% of public inquiries will generate a response within one month.

Response

If the target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, the process may be modified.

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Appendix 1 Environment Policy and Sustainable Forest Management Commitments

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.

Don Kayne
President and Chief Executive Officer

Ronald L. Cliff
Chairman

May 2011

Canadian Forest Products

Sustainable Forest Management Commitments - May 2012

Sustainable Forest Management

We will manage forests to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social and cultural opportunities for the benefit of current and future generations. In the management of forests we will honour relevant international agreements and conventions to which Canada is a signatory.

Accountability

We will be accountable to the public for managing forests to achieve current and future values. One way we will demonstrate this is by certifying our forestry operations to internationally recognized, third-party verified sustainable forest management certification standards.

Adaptive Management

We will use adaptive management to continually improve sustainable forest management by identifying values, setting objectives and targets for the objectives, and monitoring results. We will modify management practices as necessary to achieve the desired results.

Science

We will utilize science to improve our knowledge of forests and sustainable forest management and will monitor and incorporate advances in sustainable forest management science and technology where applicable.

Multiple Value Management

We will manage forests for a multitude of values, including biodiversity, timber, water, soil, wildlife, fish/riparian, visual quality, recreation, resource features and cultural heritage resources.

Health and Safety

We will conduct our operations in a manner which will provide a safe environment for employees, contractors, and others who use roads and forest areas we manage.

Aboriginal Peoples

We recognize and will respect Aboriginal rights, title and treaty rights when planning and undertaking forest management activities.

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Telephone 604-661-5241 Fax 604-661-5235 info@canfor.ca www.canfor.com

Opportunities for Participation

We will provide opportunities for the public, communities, other stakeholders and Aboriginal Peoples with rights and interests in sustainable forest management to participate in the development and monitoring of our Sustainable Forest Management Plans.

Scale

We will define objectives over a variety of time intervals (temporal scales) and at spatial scales of stand, landscape and forest. This produces ecological diversity and allows for the management of a range of conditions, from early successional to old growth.

Timber Resource

We will advocate for a continuous supply of affordable timber from legal sources in order to carry out our business of harvesting, manufacturing and marketing forest products for the sustained economic benefit of our employees, the public, communities and shareholders, today and for future generations.

Forest Land Base

We will advocate for the maintenance of the forest land base as an asset for current and future generations.

Don Kayne

President and Chief Executive Officer

May 2012

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Telephone 604-661-5241 Fax 604-661-5235 info@canfor.ca www.canfor.com

Appendix 2 CSA VOITS

CCFM Criterion	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
1. 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	Natural ecosystems on the landscape	All ecosystems are represented on the landscape at current levels	1.1.1 Ecosystem area by type	Percent of occurrence of identified uncommon (Forested/Woodland) plant communities protected within DFA	100% of identified uncommon (Forested/Woodland) plant communities will be maintained
				1.1.2 Forest area by type or species composition	Percent distribution of forest type (treed conifer, treed broad leaf, treed mixed) >20 years old across DFA	Maintain the current baseline percent distribution of forest types (treed conifer, treed broad leaf, treed mixed) >20 years old into the future
				1.1.3 Forest area by seral stage or age class	a) Area of old interior forest by natural region by cover class across the DFA	Area of old interior forest will not be less than the current hectares by natural region of each cover class over the next 200 yrs
					b) Range of patch sizes by subunit and entire DFA	The Preferred Forest Management Scenario patch size distribution will be constrained through the modeling to meet the targets in the table below (based on literature review), over 200 year planning horizon
					c) Percent of area of old, mature and young forest by natural region across the DFA	Over the 200 year planning horizon A: Gross land base: >13% old forest, > than 76% mature plus old forest, < than 11% young forest; and B: Net land base: >10% old forest, > than 73% mature plus old forest, < than 17% young forest
				1.1.4 Degree of within-stand structural retention	a) Percent of total annual harvested area retained in openings across the DFA	4% of total annual harvested area will be left un-harvested as structural retention of which 2% will be merchantable
					b) Percent of blocks meeting dispersed retention levels as prescribed in the site plan/logging plan	100% of blocks prescribed to have dispersed retention will meet the as identified in site/logging plans
					c) Number of non-compliances where forest operations are not consistent with riparian management requirements as identified in operation plans	No non-compliances specific to Operating Ground Rules (OGR), with riparian management requirements in forest operations
					d) Area of un-salvaged burned forest	100% of Salvage Plans for burned areas will be in conformance with Environment Sustainable Resource Development directive
					e) Area of un-salvaged blowdown	In areas of blowdown that are salvage logged, greater than 25% of the area (ha) will be left un-salvaged
	CSA Element	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
	1.2 Species Diversity Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained through time, including habitats for known occurrences of species at risk	Through time all current habitats are represented	Habitat for focal species is maintained on the landscape	1.2.1 Degree of habitat protection for selected focal species, including species at risk	a) Trumpeter Swan habitat maintained	No future winter harvest within 200 meters and no summer harvesting within 800 meters of provincially identified Trumpeter Swan sites
					b) Percentage of significant wildlife mineral licks conserved	100% of significant wildlife mineral licks will be conserved annually, consistent with Operating Ground Rules
			Current species diversity is maintained on the landscape	1.2.2 Degree of suitable habitat in the long term for selected focal species, including species at risk	a) Sufficient amount of functional woodland caribou habitat over time	Target (1): No timber harvesting will occur in the high intactness zone identified for the Little Smoky range for the period 2007-2022 Target (2): Less than 20% of the forested land base in the caribou range will be less than 30 years old Target (3): Canfor FMG Alberta open route density in the caribou range south of Deep Valley Creek will be zero
					b) Fish risk ranking for bull trout and arctic grayling	Annually report on fish risk ranking for bull trout and arctic grayling by watershed for the Main area of the DFA, utilizing ASRD's "Conceptual Approach to Fish Risk" ranking
					c) Annual report on amount of Barred Owl habitat available for breeding pairs	Report on habitat available at key points in time (0, 20, 50, 100 and 200 years) for Barred Owl breeding pairs will be completed and results incorporated into the Preferred Forest Management Scenario
					d) Density (lineal km/km^2) of open (Licence of Occupation and Temporary non-reclaimed) roads	Density of open roads (lineal km/km^2) not to exceed 110% of the current levels in individual DFA parcels (Main, Pusloveskau & Peace) and grizzly bear and caribou wildlife areas
				1.2.3 Proportion of regeneration comprised of native species	Regeneration consistent with provincial regulations and standards for seed and vegetative material use	Annually, 100% conformance with the Alberta Forest Genetics Resources Management and Conservation Standards
CCFM Criterion	**CSA Element**	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
1. Biological Diversity Conserve biological diversity by maintaining integrity, function, and diversity of living organisms and the complexes of which they are part	**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	Natural genetic diversity	Genetic diversity will be maintained on the landscape	1.3 No core indicator in Z809-08 for Element 1.3 - waiting for practical indicators to be developed.	Regeneration will be consistent with provincial regulations and standards for seed and vegetative material use	100% conformance with the Alberta Forest Genetic Resources Management and Conservation Standards for all seed collection and seeding deployment
	CSA Element	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
	1.4 Protected Areas and Sites of Special Biological and Cultural Significance	Identified protected areas and sites that have special	Conservation of the natural states and processes to maintain	1.4.1 Proportion of identified sites with implemented management strategies	a) Percent of forest management activities where consultation has occurred for operations near protected park areas	The Province will be consulted 100% of the time when operations will occur within one kilometre of legally protected park areas

	Respect protected areas identified through government processes. Cooperate in broader landscape management related to protected areas and sites of special biological and cultural significance. Identify sites of special geological, biological, or cultural significance within the DFA and implement management strategies appropriate to their long-term maintenance	biological significance	protected areas and sites that have special biological significance		b) Percent of forest management activities consistent with management strategies for sites of biological significance	100% of identified biologically significant sites will have implemented management strategies identified in consultation with the Province, annually
		Identified protected areas and sites that have special biological and cultural significance Understand and respect Aboriginal special needs	The natural states and processes to maintain protected areas and sites that have special biological and cultural significance will be conserved Early and effective consultation with Aboriginal peoples will be provided	1.4.2 Protection of identified sacred and culturally important sites	% of identified historic sacred and culturally important sites, forest values, traditional knowledge and uses considered in forestry planning processes	100% of historic, sacred and culturally important sites, forest values, traditional knowledge and uses known or identified through consultation are considered in forestry planning processes
CCFM Criterion	**CSA Element**	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
2. Ecosystem Condition and Productivity Conserve forest ecosystem condition and productivity by maintaining the health, vitality, and rates of biological production	**2.1 Forest Ecosystem Resilience** Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions	Healthy forest ecosystem	Meet reforestation targets on all harvested areas	2.1.1 Reforestation success	a) Prompt reforestation	100% of all harvested sites will be reforested within 2 years
			Forest ecosystem health will be maintained	2.1.1 Reforestation success	b) Prompt retreatment of failed areas	All harvested blocks that have not achieved the regeneration targets as per the Regeneration Standards of Alberta establishment survey standards will have remedial treatments completed within 12 months of the survey date
					c) Actual regenerated stand yield compared to the yield expectations of the Timber Supply Analysis	The regenerated stand yield (Mean Annual Increment) for the total of all sampling populations will meet or exceed the regenerated stand yield assumptions of the Timber Supply Analysis in the Regeneration Standards of Alberta performance survey process
					d) Noxious weed program implementation	100% of previously identified and scheduled for treatment noxious weeds will receive treatment along Canfor Alberta's License of Occupation (LOC) roads
	CSA Element	**Value**	**Objective**	**Core Indicator**	**Indicator Statement**	**Target**
	2.2 Forest Ecosystem Productivity Conserve ecosystem productivity and productive capacity by maintaining ecosystem conditions that are capable of supporting naturally occurring species. Reforest promptly and use tree species ecologically suited to the site	Sustained forest ecosystem productivity	Limit the conversion of productive forest to other uses	2.2.1 Additions and deletions to the forest area	Percent of gross forested land base in the DFA converted to non-forest land use through forest management activities	"Forest Management company activities not to exceed NET 3% reduction in gross forest land base in the DFA over the life span of the FMA agreement (May 26, 1964)
			Maintain productive harvest level	2.2.2 Proportion of the calculated long-term sustainable harvest level that is actually harvested	% of volume harvested compared to long term harvest level	Not to exceed 100% of the approved harvest level (Annual Allowable Cut) over 5 years (5 yr quadrant balance)
CCFM Criterion	**CSA Element**	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
3. Soil and Water Conserve soil and water resources by maintaining their quantity and quality in forest ecosystems	**3.1 Soil Quality and Quantity** Conserve soil resources by maintaining soil quality and quantity	Soil Quality and Quantity	Soil productivity will be maintained or enhanced	3.1.1 Level of soil disturbance	a) % of harvested blocks meeting soil disturbance objectives identified in plans and Operating Ground Rules	100% of harvested blocks will not exceed 5% soil disturbance without government approval as outlined in Operating Ground Rules
			Soil erosion will be minimized		b) % of soil erosion and slumping incidences with mitigation strategies implemented	100% of known erosion and slumping events caused by forest operations will have a mitigation strategies implemented within one year of identification
			Maintain onsite coarse woody debris	3.1.2 Level of downed woody debris	Percentage of harvested area by subunit with coarse woody debris equivalent to preharvest conditions	100% of subunits (Peace, Puskwaskau and Main) will meet or exceed coarse woody debris conditions equivalent to the preharvest state
	CSA Element	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
	3.2 Water Quality and Quantity Conserve water resources by maintaining water quality and quantity	Water quantity	Water quantity will be maintained	3.2.1 Proportion of watershed or water management areas with recent stand-replacing disturbance	a) Watershed with high or medium risk level assessments with mitigation strategies implemented	100% of watersheds with a high or medium risk level will have approved mitigation strategies implemented
		Water quality	Water quality will be conserved	3.2.1 Proportion of watershed or water management areas with recent stand-replacing disturbance	b) Drainage structures with identified water quality concerns that have mitigation strategies implemented	100% of medium and high hazard drainage structures will have mitigation strategies implemented according to the road maintenance plan for permanent Canfor Alberta License of Occupation roads
			Impacts to water quality will be minimized		c) Forestry water crossing construction and maintenance work in compliance with Code of Practice for Water Course Crossings or Operating Ground Rules within each subunit	100% of forestry water crossing construction and maintenance work in compliance with Code of Practice for Water Course Crossings or Operating Ground Rules
CCFM Criterion	**CSA Element**	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
4. Role in Global Ecological Cycles Maintain forest conditions and management activities that contribute to the health of global ecological cycles	**4.1 Carbon Uptake and Storage** Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems	Carbon uptake and storage	Carbon uptake and storage (i.e. carbon balance) will be maintained	4.1.1 Net carbon uptake	The Preferred Forest Management Scenario (PFMS) will be run through a Carbon Budget Model	A Carbon Budget Model will be run for the DFA within six months of the PFMS being developed
	CSA Element	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
	4.2 Forest Land Conversion Protect forest lands from deforestation or conversion to non-forests, where ecologically appropriate	Sustainable yield of timber	Limit the conversion of productive forest to other uses	2.2.1 Additions and deletions to the forest area	Percent of gross forested land base in the DFA converted to non-forest land use through forest management activities	"Forest Management company activities not to exceed NET 3% reduction in gross forest land base in the DFA over the life span of the tenure (May 26, 1964)

CCFM Criterion	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
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 timber and non-timber benefits	Sustainable yield of timber and non timber benefits	Sustainable forest management that maintains timber and non-timber benefits	5.1.1 Quantity and quality of timber and non-timber benefits, products, and services produced in the DFA	a) % of volume harvested compared to long term harvest level	Not to exceed 100% of the approved harvest level (Annual Allowable Cut) over 5 years (5 yr. quadrant balance)
					b) Maintenance of recreational areas for non-timber values	Canfor Alberta will maintain a minimum of 3 recreational areas for use by the public within DFA
	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
	5.2 Communities and Sustainability Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and by supporting local community economies	A range of benefits to local communities	Local communities and contractors will have the opportunity to share in benefits such as jobs, contracts and services	5.2.1 Level of investment in initiatives that contribute to community sustainability	a) Investment in local communities	Over a rolling 5-year period, a minimum of 75% of Canfor Alberta forest operations dollars paid for contract services will be expended locally
					b) Investment in local communities	Canfor will provide financial/in-kind support to a minimum of 8 community events or services
				5.2.2 Level of investment in training and skills development	Training in environmental and safety procedures in compliance with company training plans	100% of Canfor FMG Alberta employees and contractors have both environmental and safety training
		Fair distribution of benefits across communities	A fair distribution of benefits and costs will be ensured across all communities in the local area	5.2.3 Level of direct and indirect employment	Level of direct and indirect employment	Report annually on trend of Canfor Alberta's level of direct and indirect regional/provincial employment created from the DFA
				5.2.4 Level of Aboriginal participation in the forest economy	Opportunities for Aboriginal communities and contractors to participate in the forest economy	Maintain evidence that opportunities have been provided
CCFM Criterion	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
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 title and rights, and treaty rights Understand and comply with current legal requirements related to Aboriginal title and rights, and treaty rights	Understanding and respecting Aboriginal and treaty rights	Aboriginal and treaty rights will be respected	6.1.1 Evidence of a good understanding of the nature of Aboriginal title and rights	Canfor FMG Alberta employees will receive Aboriginal awareness training	100% of Canfor FMG Alberta Forestry Supervisors, Coordinators, Superintendants, and the Operations Manager will receive credible and effective Aboriginal awareness training once every two years
				6.1.2 Evidence of best efforts to obtain acceptance of management plans based on Aboriginal communities having a clear understanding of the plans	Members of local Aboriginal communities will be provided ample opportunity to understand Canfor Alberta's forest management plan	Opportunity to communicate Key components of the forest management plan have been communicated to each affected local Aboriginal group
				6.1.3 Level of management and/or protection of areas where culturally important practices and activities (hunting, fishing, gathering) occur	% of forest operations in conformance with operational/site plans developed to address Aboriginal forest values, traditional knowledge and uses	100% of forest operations are conducted in conformance with operational/site plans that have been developed to address Aboriginal forest values, traditional knowledge and uses
	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
	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	Identified protected areas and sites that have special biological and cultural significance Understand and respect Aboriginal special needs	The natural states and processes to maintain protected areas and sites that have special biological and cultural significance will be conserved Early and effective consultation with Aboriginal peoples will be provided	1.4.2 Protection of identified sacred and culturally important sites 6.2.1 Evidence of understanding and use of Aboriginal knowledge through the engagement of willing Aboriginal communities, using a process that identifies and manages culturally important resources and values	% of identified historic, sacred and culturally important sites, forest values, traditional knowledge and uses considered in forestry planning processes	100% of historic, sacred and culturally important sites, forest values, traditional knowledge and uses known or identified through consultation are considered in forestry planning processes
	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
	6.3 Forest Community Well-Being and Resilience Encourage, co-operate with, or help to provide opportunities for economic diversity within the community	Inclusive public process	Affected and locally interested parties will be involved in the development of the decision-making process through an open, transparent and accountable process	6.3.1 Evidence that the organization has co-operated with other forest-dependent businesses, forest users, and the local community to strengthen and diversify the local economy	Relationships with other forest businesses and users	Evidence of minimum of 4 relationships annually within the vicinity of the DFA
		Worker safety	Effective worker safety program	6.3.2 Evidence of co-operation with DFA-related workers and their unions to improve and enhance safety standards, procedures, and outcomes in all DFA-related workplaces and affected communities	Implementation and maintenance of a certified safety program	100% of Canfor FMG Alberta and eligible DFA-related contractors will obtain and maintain a Certificate of Recognition (COR) or equivalent
			Approved safety program	6.3.3 Evidence that a worker safety program has been implemented and is periodically reviewed and improved	Implementation and maintenance of certified safety program	100% of recommendations from Partners in Injury Reduction (PIR) audit will be addressed and action plans developed
	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
	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	Current scientific, local and traditional knowledge	Forest management decisions will be based on scientific, local and traditional knowledge	6.4.1 Level of participant satisfaction with the public participation process	Public advisory group maintained and satisfaction survey implemented	80% annual satisfaction from surveys from all four sections reported
				6.4.2 Evidence of efforts to promote capacity development and meaningful participation in general	Number of educational opportunities for information/training/capacity building that are delivered to the public advisory group annually	Provide one educational opportunity per FMAC meeting, plus one field tour opportunity per year

	it's progress			6.4.3 Evidence of efforts to promote capacity development and meaningful participation for Aboriginal communities	Number of opportunities for information/training/capacity development that are delivered to the Aboriginal communities annually	Greater than or equal to 1 Aboriginal information/training/capacity development opportunity per year
	CSA Element	Value	Objective	CSA Core Indicator	Indicator Statement	Target
	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	Current scientific, local and traditional knowledge	Forest management decisions will be based on scientific, local and traditional knowledge	6.5.1 Number of people reached through educational outreach	The number of educational opportunities provided to the community	A minimum of 5 educational opportunities provided annually
				6.5.2 Availability of summary information on issues of concern to the public	a) CSA Z809-08 Sustainable Forest Management monitoring report made available to the public annually	CSA Z809-08 Sustainable Forest Management monitoring report available to public annually via worldwide web and copies in print by request
					b) Percentage of public inquiries that receive an initial contact	100% of all inquiries recieve initial contact within 1 month of receipt

Appendix 3 Canfor Core

Core Indicator (Z809-08)	Proposed Indicator Statement (Z809-08)
1.1.1 Ecosystem area by type	Percent representation of ecosystem groups across the DFA
1.1.2 Forest area by type or species composition	Percent distribution of forest type (treed conifer, treed broad leaf, treed mixed) >20 years old across DFA
1.1.3 Forest area by seral stage or age class	Percent late seral distribution by ecological unit across the DFA
1.1.4 Degree of within-stand structural retention	Percent of stand structure retained across the DFA in harvested areas
	Percent of blocks meeting dispersed retention levels as prescribed in the site plan/logging plan
	Number of non-conformances where forest operations are not consistent with riparian management requirements as identified in operation plans
1.2.1 Degree of habitat protection for selected focal species, including species at risk	Percent of forest management activities consistent with management strategies for Species of Management Concern
1.2.2 Degree of suitable habitat in the long term for selected focal species, including species at risk	
1.2.3 Proportion of Regeneration comprised of native species	Regeneration will be consistent with provincial regulations and standards for seed and vegetative material use
No core indicator in Z809-08 for Element 1.3 - waiting for practical indicators to be developed. *Proportion of genetically modified trees in*	
1.4.1 Proportion of identified sites with implemented management strategies	Percent of forest management activities consistent with management strategies for protected areas and sites of biological significance
1.4.2 Protection of identified sacred and culturally important sites	% of identified Aboriginal forest values, knowledge and uses considered in forestry planning processes
2.1.1 Reforestation success	Average Regeneration delay for stands established annually
2.2.1 Additions and deletions to the forest area	Percent of gross forested landbase in the DFA converted to
2.2.2 Proportion of the calculated long-term sustainable harvest level that is actually harvested	% of volume harvested compared to allocated harvest level
3.1.1 Level of soil disturbance	% of harvested blocks meeting soil disturbance objectives identified in plans
3.1.2 Level of downed woody debris	Percent of cutblocks reviewed where post harvest CWD levels are within the targets contained in Plans
3.2.1 Proportion of watershed or water management areas with recent stand-replacing disturbance	Sensitive watersheds that are above Peak Flow targets will have further assessment
	% of high hazard drainage structures in sensitive watersheds with identified water quality concerns that have mitigation strategies implemented

Core Indicator (Z809-08)	Proposed Indicator Statement (Z809-08)
4.1.1 Net carbon uptake	Maintain the retention of existing (or replacement of) old forest retention area
2.1.1 Reforestation success	Average Regeneration delay for stands established annually
2.2.1 Additions and deletions to the forest area	Percent of gross forested landbase in the DFA converted to non-forest land use through forest management activities
5.1.1 Quantity and quality of timber and non-timber benefits, products, and services produced in the DFA	% of volume harvested compared to allocated harvest level
	Conformance with strategies for non-timber benefits identified in plans
5.2.1 Level of investment in initiatives that contribute to community sustainability	Investment in local communities
5.2.2 Level of investment in training and skills development	Training in environmental and safety procedures in compliance with company training plans
5.2.3 Level of direct and indirect employment	Level of direct and indirect employment
5.2.4 Level of Aboriginal participation in the forest economy	# of opportunities for First Nations to participate in the forest economy
6.1.1 Evidence of a good understanding of the nature of Aboriginal title and rights	Employees will receive First Nations awareness training
6.1.2 Evidence of best efforts to obtain acceptance of management plans based on Aboriginal communities having a clear understanding of the plans	Evidence of best efforts to obtain acceptance of management plans based on Aboriginal communities having a clear understanding of the plans
6.1.3 Level of management and/or protection of areas where culturally important practices and activities (hunting, fishing, gathering) occur	% of forest operations in conformance with operational/site plans developed to address Aboriginal forest values, knowledge and uses
6.2.1 Evidence of understanding and use of Aboriginal knowledge through the engagement of willing Aboriginal communities, using a process that identifies and manages culturally important resources and values	% of identified Aboriginal forest values, knowledge and uses considered in forestry planning processes

Core Indicator (Z809-08)	Proposed Indicator Statement (Z809-08)
6.3.1 Evidence that the organization has co-operated with other forest-dependent businesses, forest users, and the local community to strengthen and diversify the local economy	Primary and by-products that are bought, sold, or traded with other forest dependent businesses in the local area
6.3.2 Evidence of co-operation with DFA-related workers and their unions to improve and enhance safety standards, procedures, and outcomes in all DFA-related workplaces and affected communities	Implementation and maintenance of certified safety program
6.3.3 Evidence that a worker safety program has been implemented and is periodiucally reviewed and improved.	Implementation and maintenance of certified safety program
6.4.1 Level of participant satisfaction with the public participation process	PAG established and maintained and satisfaction survey implemented according to Terms of Reference
6.4.2 Evidence of efforts to promote capacity development and meaningful participation in	Number of educational opportunities for information/trainning that are delivered to the PAG
6.4.3 Evidence of efforts to promote capacity development and meaningful participation for Aboriginal communities	Evidence of best efforts to obtain acceptance of management plans based on Aboriginal communities having a clear understanding of the plans
6.5.1 Number of people reached through educational outreach	The number of people to whom educational opportunities are provided
6.5.2 Availability of summary information on issues of concern to the public	SFM monitoring report made available to the public

Appendix 4 Forest Management Planning Standard, Annex 4

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
1. Biological Diversity	1.1 Ecosystem Diversity Conserve ecosystem diversity at the landscape level by maintaining the variety of communities and ecosystems that occur naturally in the DFA	1.1.1 Landscape scale biodiversity	1.1.1.1 Maintain biodiversity by retaining the full range of cover types and seral stages[3]	Area of old, mature, and young forest in each DFA subunit[4] by cover class[5]	Over the 200-year planning horizon: a) Gross landbase: greater than X% old forest, greater than Y% mature plus old forest, less than Z% young forest; and b) Net landbase: greater than X% old forest, greater than Y% mature plus old forest, less than Z% young forest **Note:** Old forest retention shall include the full natural range of ages	Targets and seral stage definitions shall be based on sound science, ecological considerations, wildlife zones, and disturbance regimes. Target shall ensure representation of natural range of ecosystem attributes (e.g., productivity class)	Planning Standard	Spatial Harvest Sequence	Regular updates to inventory	**FMP:** Tables of indicators (values and targets) at 0, 10, 50, 100, and 200 years. Maps of indicators at 0, 10 yrs, 50 years. **Performance:** Stewardship Report	Area (ha) of old and mature forests in each DFA subunit by cover class shall be between 90% and 100% of target areas. Area of young forest in each DFA subunit by cover class shall not exceed 110% of target area	Adjust strategies in subsequent FMP
			1.1.1.2 Maintain biodiversity by avoiding landscape fragmentation	a) Range of patch[6] sizes by subunit and entire DFA	a) A distribution of harvest area sizes that will result in a patch size pattern over the 200 year planning horizon approximating patterns created by natural disturbances	Targets shall be based on sound science, ecological considerations, wildlife zones, and disturbance regimes. Target shall ensure representation of natural range of ecosystem attributes (e.g. cover class and productivity class)	Planning Standard	Spatial and temporal harvest planning. Patch size distribution targets are set for forest patches less than 20 years old	Regular updates to forest inventory	**FMP:** Tables of area of forest in each patch size class by subunit at 0, 10, and 50 yrs (or end of first rotation). Maps of patch size classes at 0, 10, and 50 yrs, (or end of first rotation). **Performance:** Stewardship Report	a) At the end of the 10-year FMP term the target distribution is achieved; or demonstrated progress to achieving target in one rotation where the pattern has deviated significantly from the target	Adjust strategies in subsequent FMP
				b) Area of old interior forest[7] of each cover class by subunit and entire DFA	b) Area of old interior forest will not be less than X% of each cover class over the next 200 years	Targets shall be based on sound science, ecological considerations, wildlife zones, and disturbance regimes. Target shall ensure representation of natural range of ecosystem attributes (e.g. productivity class)	Planning Standard	Spatial and temporal harvest planning	Regular updates to forest inventory	**FMP:** Maps and Tables of indicator at 0, 10, and 50 yrs **Performance:** Stewardship Report	b) Target is achieved for at least 80% of the planning period with variance not exceeding 20% below target	Adjust strategies in subsequent FMP
			1.1.1.3 Maintain biodiversity by minimizing access	Open all-weather forestry road density by subunit	Less than X km/km^2	Targets shall be based on sound science, ecological considerations, harvest planning, wildlife zones, and social values	Planning Standard	Develop a strategy that coordinates access with other resource users, spatial/temporal sequencing of harvest, road closures and decommissioning. (SHS and long-term corridor access plan)	Regular updates to forest inventory	**FMP:** Table of road density by subunit at 0 and 10 years. Map of existing and proposed open and closed all weather roads. Report forestry roads and total (all users) roads. **Performance:** Stewardship Report	A variance not exceeding +/-20% must be achieved	Adjust strategies in subsequent FMP

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
				Open seasonal / temporary forestry road length by DFA	Less than X km by subunit	Targets shall be based on sound science, ecological considerations, harvest planning, wildlife zones, and social values.	Planning Standard	Road construction, maintenance and reclamation activities	Road plan OGR 11.2	AOP and Stewardship Report	A variance not exceeding +/- 20% must be achieved	Adjust strategies in subsequent AOPs
			1.1.1.4 Maintain plant communities uncommon in DFA or province	Area or occurrence of each uncommon plant community within DFA	X% of identified community will be maintained (separate target for each identified community	GIS analysis, AVI, ecosite phases, Alberta Natural Heritage Information Centre (ANHIC) plant community classification and tracking list. Predict and identify occurrence of uncommon plant community	Planning Standard	Coordinating with other resource users, spatial planning of harvest and road construction, OGR	Regular updates to inventory	**FMP:** Table with descriptive list and targets. Map(s) displaying known locations of uncommon plant communities. **Performance:** Stewardship Report	At the end of the 10-year FMP term the target is achieved	Adjust strategies in subsequent AOPs
			1.1.1.5 Maintain unique habitats provided by wildfire and blowdown events	Area of unsalvaged burned forest	Live trees: Retain all unburned trees in green islands and retained patches recognizing timber condition, access, non timber needs Burned trees - Compartment Scale: Retain greater than 10% of merchantable black trees in patches greater than 100 ha Burned trees - Harvest Area Scale: Retain greater than 10% of merchantable black trees in patches 10 -100 ha; and Retain greater than 5% of merchantable black trees in small patches, single trees according to loggers choice	Targets based on "Fire Salvage Strategy: Forest Management Planning and Operations 2002" Ensure consistency with FireSmart objectives	Fire Salvage Strategy: Forest Management Planning and Operations 2002 (Forest Operations Branch, Alberta)	Salvage planning	Organization reports, air photo interpretation, ground surveys, post harvest assessments	**FMP:** Table and map of natural disturbances within the last 10 years -salvaged and unsalvaged. Report area (ha). **Performance:** Stewardship Report	At the end of the 10-year FMP term the target is achieved or exceeded	Adjust strategies in subsequent AOPs
				Area of unsalvaged blowdown	In areas of significant blowdown greater than X% will be left unsalvaged	Targets are to be based on sound science, ecological considerations and disturbance regimes	Planning Standard	Salvage planning	Inventory updates	Stewardship Report	At the end of the 10-year FMP term the target is achieved or exceeded	Adjust strategies in subsequent AOPs

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
			1.1.1.6 Retain ecological values and functions associated with riparian zones	Compliance with OGR	Consistent with OGR	OGR	Federal Fisheries Act, Water Act	Planning, TSA, OGR	Organization reports, air photo interpretation, ground surveys, post harvest assessments or other existing compliance monitoring systems	**Performance:** Stewardship Report	No variance	Immediate remedial action and / or administrative penalty
		1.1.2 Local/stand scale biodiversity	1.1.2.1 Retain stand level structure	a) % area / volume / stems residual structure (both living and dead), within a harvest area, representative of the status (live / dead), sizes, and species of the overstorey trees by subunit and entire DFA	a) A combination of single stems, clumps, and islands comprising X% of the harvested area / volume / stems within a subunit Note: A wide range in variability in harvest area-level retention within a subunit is desired as long as the target level is achieved	Wildlife zones, roadside vegetation screens, recreational values, aesthetics, local knowledge, ANHIC, Biodiversity / Species Observation Database (BSOD)	Occupational Health and Safety Act, Forest and Prairie Protection Act	Implement residual structure retention strategies and OGRs	Organization reports, air photo interpretation, ground surveys, post harvest assessments	**Performance:** Stewardship Report	At the end of the 10-year FMP term the target is achieved or exceeded	Adjust strategies in subsequent FMP
				b) Percentage of harvested area by subunit with downed woody debris[8] equivalent to preharvest conditions	b) X% of harvest areas having downed woody debris retained on site	Assess preharvest downed woody debris condition by subunit or stand level average	Planning Standard	Organization developed standards	Organization developed during FMP planning	**Performance:** Report % of harvest areas with retained downed woody debris	FMP determined	Adjust strategies in subsequent FMPs
			1.1.2.2 Maintain integrity of sensitive sites	Sensitive sites (e.g. mineral licks, major game trails) by subunit and entire DFA	Strategies to maintain consistent with provincial guidelines / OGR	Local knowledge, ANHIC, Biodiversity / Species Observation Database (BSOD)	Planning Standard	Organization developed standards for sensitive site protection, OGRs 7.7.4	Organization reports, air photo interpretation, ground surveys	**Performance:** Stewardship Report	None	Adjust strategies in subsequent AOPs
			1.1.2.3 Maintain aquatic biodiversity by minimizing impacts of water crossings	Forestry water crossings in compliance with Code of Practice for Water Course Crossings within each subunit	Designs meet standards of the Code of Practice for Water Course Crossings	Code of Practice for Water Course Crossings: Sections 7 - 9 and Schedule 2	Code of Practice for Water Course Crossings	Road construction, maintenance and reclamation activities	Road plan OGR 11.2	**Performance:** Stewardship Report: AOP, number of crossings by type within each subunit by compliance status	None	Act immediately to eliminate problems and adjust strategies in subsequent AOPs

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
	1.2 Species Diversity Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained throughout time.	1.2.1 Viable populations of identified plant and animal species	1.2.1.1 Maintain habitat for identified high value species (i.e., economically valuable, socially valuable, species at risk, species of management concern)	Area (ha) of suitable habitat within the DFA or subunit **OR** Specific population parameter(s) (e.g. trends, distribution, absolute size, recruitment) for the DFA or subunit	Maintain above X hectares **OR** Maintained or increased	Based on sound science, ecological considerations, wildlife zones, Committee on the Status of Endangered Wildlife in Canada (COSEWIC) list, provincially listed species, BSOD, ANHIC, Recovery plans, Fish and Wildlife Division priorities, public consultation, habitat suitability analysis, literature review, observation data, local and traditional knowledge	Recovery plans for species at risk, Federal Species at Risk Act	Harvesting plans, road construction, OGR, planning and implementation, adherence to provincial wildlife guidelines	Habitat assessment mapping, population monitoring	**FMP:** For species with a suitable habitat target provide tables of area (ha) of suitable habitat at 0, 10, 50, 100, and 200 years. Maps of suitable habitat at 0, 10, and 50 years. **OR** For species with population parameter targets provide table with current parameter. **Performance:** Stewardship Report	At the end of the 10-year FMP term the target is achieved or exceeded	Adjust strategies in subsequent FMP
	1.3 Genetic Diversity Conserve genetic diversity by maintaining the variation of genes within species.	1.3.1 Genetic integrity of natural tree populations	1.3.1.1 Retain "wild forest populations[9] for each tree species in each seed zone through establishment of in-situ reserves by the organization or in cooperation with Alberta	Number and area (ha) of in situ genetic conservation areas	Number (X) of genetic conservation areas for each seed zone conforming with Section 3 of the Green Area section of Standards for Tree Improvement in Alberta	Target is a portion of the required number of genetic conservation areas determined in consultation with other FMAs in the same seed zone and Alberta	Standards regulated through Timber Management Regulation 144.2	Conservation areas are designated by a notation (PNT, CNT)	AVI updates, ground or air checks to confirm status. FMP planning and Stewardship Reporting	**FMP:** Table showing number of genetic conservation areas required in each seed zone and number provided in DFA. Map showing locations of genetic conservation areas. **Performance:** Stewardship Report	At the end of the 10-year FMP term the target is achieved or exceeded	Adjust strategies in subsequent FMP
			1.3.1.2 Retain wild forest genetic resources through ex-situ conservation	Number of provenances and genetic lines in ex-situ gene banks and trials	Active conservation program for all Controlled Parentage Program plan species and other species in cooperation with Alberta	Proportion of projects and species	Standards regulated through Timber Management Regulation 144.2	Standards for Tree Improvement in Alberta and government / industry genetic cooperatives	Conservation activities identified in FMP as per Standards for Tree Improvement in Alberta	**FMP:** Table showing number of genetic conservation areas required in each seed zone and number provided in DFA. Map showing locations of genetic conservation areas.	Confirmed program plan	Organization / Alberta / cooperatives

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
	1.4 Protected Areas - Respect protected areas identified through government processes	1.4.1 Areas with minimal human disturbances within managed landscapes	1.4.1.1 Integrate transboundary values and objectives into forest management	Stakeholder consultation	Ongoing consultation with relevant protected areas agencies	Link to consultation objective in Planning Standard or other existing consultation processes	Planning Standard	Management planning	Documentation of consultation processes	Performance: Stewardship Report	None	Adjust strategies in subsequent FMP
2.) Ecosystem Productivity	2.1 Ecosystem resilience	2.1.1 Reforested harvest areas	2.1.1.1 Meet reforestation targets on all harvested areas	Annual % of SR regeneration surveys	Set target based on timber supply analysis	ARIS or equivalent reports	Timber Management Regulation	Silviculture program	Regeneration surveys	ARIS, AOP, Stewardship Report	None	Alberta adjusts AAC
				Cumulative % of reforested areas that meet reforestation target	As above	ARIS or equivalent reports and Stewardship Report	Planning Standard	Silviculture program	Regeneration surveys	AOP and Stewardship Report	None	Alberta adjusts AAC
		2.1.2 Maintenance of forest landbase	2.1.2.1 Limit conversion of productive forest landbase to other uses	Amount of change in forest landbase	A program to maintain the forest landbase	Forest inventory and land use data	Planning Standard	Maintain current forest cover inventory and land use updates	Inventory and land use systems	Stewardship Report	Report actual	Adjust net landbase projections in next TSA
			2.1.2.2 Recognize lands affected by insects, disease or natural calamities	Amount of area affected	Area (ha) affected by significant outbreaks, infestations, natural calamities	Forest health surveys, inventory updates	Planning Standard, Alberta Forest Health Strategy and Shared Roles and Responsibilities between SRD and the Forest Industry	Maintain up-to-date information	Annual surveys	AOP and Stewardship Report	Report actuals	Event specific
		2.1.3 Control invasive species	2.1.3.1 Control non-native plant species (weeds)	Noxious weed program	Noxious weed program in place and implemented	Field inventories	Directive 2000-06	Co-operative programs	Field inventories	Inspections summarized in Stewardship Report	Report actuals	Improve weed program
3. Soil and water	3.1 Soil quantity and quality	3.1.1 Soil productivity	3.1.1.1 Minimize impact of roading and bared areas in forest operations	Compliance with OGRs	Less than 5%	Direction from Alberta	OGRs and Soils Guidelines	Effective planning and supervision of operations	Field inspection reports and audits	Inspection reporting	None	Immediate remedial action to correct
			3.1.1.2 Minimize incidence of soil erosion and slumping	Incidence of soil erosion and slumping	Complete compliance	Direction from Alberta	OGRs and Soils Guidelines	Effective planning and supervision of operations and adherence to relevant OGRs	Field inspection reports and audits	Inspection reporting	None	Immediate remedial action to correct
	3.2 Water quantity and quality	3.2.1 Water quantity	3.2.1.1 Limit impact of timber harvesting on water yield	Forecast impact of timber harvesting on water yield.	Zero Water Act penalties, Complete compliance with FMP	Water Strategy and local needs	Water Act, Planning Standard	Adherence to forecast harvest sequence and relevant OGRs	Report on area (ha) harvested compared with planned harvest area	Stewardship Report	Report actuals	Adjust harvest pattern if problems arise
		3.2.2 Effective riparian habitats	3.2.2.1 Minimize impact of operations in riparian areas	Riparian buffers maintained as outlined in OGRs	Complete compliance	Direction from Alberta	OGRs	Effective planning and supervision of operations	AOPs, Stewardship Reports	AOP	None	Immediate correction and / or administrative penalty

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
4. Global Ecological Cycles	4.1 Carbon uptake and storage	To be determined	To be determined	Results of carbon budget modeling	To be determined							
	4.2 Forest land conversion	See 2.1.2 above										
5. Multiple Benefits to Society	5.1 Timber and non-timber benefits	5.1.1 Sustainable timber supplies	5.1.1.1 Establish appropriate AACs	Process described in Annex 1 is followed and standards are met	Complete compliance	Consultation in planning process	Forests Act and Timber Management Regulation	Effective implementation of planning process	Multiple means: TPRS, ARIS, AOPs, Stewardship Reports, filed inspection reports	Progressive and continuous	Issue specific	Adjust AAC using most current and relevant information

ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[2]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
	5.2 Communities and Sustainability	5.2.1 Risk to communities and landscape values from wildfire is low.	5.2.1.1 To reduce wildfire threat potential by reducing fire behaviour, fire occurrence, threats to values at risk and enhancing fire suppression capability	1) Percentage reduction in Fire Behaviour Potential area (ha) within the FireSmart Community Zone 2) Percentage reduction in Fire Behaviour Potential area (ha) across the DFA now and over the planning horizon	1) Reduce the area (ha) in the extreme and high Fire Behaviour Potential rating categories by X% within the FireSmart Community Zone 2) Reduce the area (ha) in the extreme and high Fire Behaviour Potential rating categories by X% across the DFA	Planning process, wildfire threat assessment	Planning Standard	Spatial harvest sequence, thinning, partial harvest techniques, prescribed burns	AOPs, Compartment Assessments	FMP: Maps and Tables of indicator at 0, 10, 20, and 50 yrs **Performance:** Stewardship Report	Issue specific	Adjust harvest sequence
		5.2.2 Provide opportunities to derive benefits and participate in use and management	5.2.2.1 Integrate other uses and timber management activities	Extent of various uses	To be determined in the planning process	Consultation and co-operation	Legislation and policy	Effective implementation of plans	AOPs, Compartment Assessments	Stewardship Report	Issue specific	Adjust activities
		5.2.3 Forest Productivity	5.2.3.1 Maintain Long Run Sustained Yield Average	Regenerated stand yield compared to natural stand yield	No net decrease from the natural stand productivity	FMP Timber Supply Analysis	Planning Standard	Effective implementation of plans	Stewardship Report	Timber Supply Analysis, Stewardship Report	Report actual	Adjust AAC using most current and relevant information
6. Accepting society's responsibility for sustainable development	6.1 Aboriginal and treaty rights and aboriginal forest values	6.1.1 Compliance with government regulations and policies	6.1.1.1 Implement Public Involvement Program	Meet Alberta's current expectations for aboriginal consultation	Consult at the community level with designated representatives of affected aboriginal communities	Alberta to provide direction	Planning Standard	Effective implementation of Public Involvement Program		Reports as required in Public Involvement Plan	To be determined	Adjust activities
	6.2 Public participation and information for decision-making	6.2.1 Meaningful public involvement is achieved	6.2.1.1 Implement public involvement program	Meet expectations of Section 5 of CSA Z809-02	To be determined in the planning process	Consultation	Planning Standard	Effective implementation of public involvement program		Reports as required in Public Involvement Plan	To be determined	Adjust activities

Footnotes:

[1] "X" variable in target description to be determined by the FMP planning process.

[2] Items noted under the "Means to Identify Targets" and "Means of Achieving Objectives and Targets" are intended as suggestions and not meant to limit potential approaches. The list is not comprehensive or mandatory.

[3] Seral Stage: Seral stages definitions should include the following categories: Initiation, Establishment, Aggradation (stem exclusion), Mature, and Old (Song 2002, Ecological Basis for Stand Management in Alberta). Old forest is defined as stands 40 years older than MAI culmination age.

[4] Subunit: any acceptable stratification of the DFA. Delineation of planning "subunits" for the DFA will be made during FMP planning. However, delineation should reflect ecological considerations. Planning subunits may correspond to planning compartments.

[5] Cover-classes: definition will be developed through FMP planning. In general, cover-class is a coarser grouping than the cover type (AVI stand label) but provides finer resolution than the cover groups (C, CD, DC, D) and will reflect leading species and mixedwood types.

[6] Patch: a stand of forest in the same seral stage, and not split by a linear feature greater than 8m wide. Linear features in this definition include roads, pipelines, powerlines, and rivers, but does not include seismic lines.

[7] Interior forest: a forested area greater than 100 hectares in size located beyond edge effect buffer zone [7.2] along the forest edge [7.1]. For interior forest objective use a common age definitions for all cover classes to prevent breaking up forest patches that have a common origin date.

[7.1] Forest edge: any of the following: a) a linear disruption in forest cover greater than 8m in width, or, b) the line along which forest seral stage class changes.

[7.2] Edge effect buffer zone: 60 m where adjacent area is non-forested or less than 40 years old; 30 m where adjacent forest stand is >= 40 years and less than mature forest; 0 m where adjacent stand is mature forest.

[8] Downed woody debris: wood lying at an angle of less than 45 degrees from the ground and having a diameter greater than 7.5 cm.

[9] Wild: genetic materials of native species originating from natural regeneration (Standards for Forest Tree Improvement in Alberta).

Appendix 5 Terms of Reference

CANADIAN FOREST PRODUCTS LTD. GRANDE PRAIRIE
FOREST MANAGEMENT ADVISORY COMMITTEE
For CSA Certification
TERMS OF REFERENCE

Approved: May 19, 2010

BACKGROUND

In July of 1999 Canfor formally announced its commitment to seek sustainable forest management certification of the company's forestry operations under the Canadian Standards Association Sustainable Forest Management (SFM) standard.

As a preparatory step to sustainable forest management certification, Canfor developed an environmental management system (EMS) for the company's woodlands operations. In December 1999, this environmental management system was certified to the ISO 14001 standard developed by the International Organization for Standardization. The Company's EMS provides a platform on which to build the sustainable forest management elements required to meet the CSA SFM standard.

The management of Canfor has set out a number of commitments that define the mission, vision, policies and guiding principles for the company. These include the Canfor Mission, Environment Policy and Forestry Principles. These commitments have been used to enable and guide the development of this Sustainable Forest Management Plan (SFMP), and also commit us to the continual improvement of our performance in implementing the plan under the principle of adaptive management.

Canfor's Environment Policy includes a commitment to "create opportunities for interested parties to have input to our forest planning activities". The CSA SFM standard requires that sustainable forest management planning be carried out in consultation with those directly affected by or interested in forest management on the defined forest area (DFA). Canfor's Environment Policy commitment has been interpreted and extended to include the involvement of the public in the setting of local values, objectives, indicators and targets for the purpose of developing a plan to achieve and maintain sustainable forest management on the DFA. The Environment Policy and Canfor's Forestry Principles also include the opportunity for participation by Aboriginal peoples with respect to their rights and interests in SFM on the DFA.

In Grande Prairie, the FMA area encompasses a small area north and west of Spirit River, an area north and east of DeBolt and an area south of Grande Prairie and east of the Smoky River. The main neighboring communities include DeBolt, Valleyview and Grande Prairie. For certification with CSA, this FMA will serve as the Defined Forest Area (DFA). The attached map (Figure 14) shows the area covered.

In 1995, the Forest Management Advisory Committee (FMAC) was initiated to provide public input into preparing a long-term Detailed Forest Management Plan (DFMP). Initially this Committee met monthly to identify key issues and concerns to be addressed.
In December 1999, Canfor and the Forest Management Advisory Committee (FMAC) agreed to work on the development and revision on the Sustainable Forest Management Plan (SFMP) for the Grande Prairie FMA area. The terms of reference were revised and adopted to reflect this additional role.
In 2000, Canfor and FMAC developed the values, goals, indicators, and objectives for the SFMP, which was submitted for certification.
The Detailed Forest Management Plan (Canfor. 2003) (10-yr legal plan with the Alberta Government) that incorporated the 2000 SFMP was approved in November 2003.
From 2003-2005 the FMAC worked with Canfor in development of values, objectives, indicators, and targets for a new SFMP based on the new CSA-Z809-02 standard for re-certification in 2005. In the fall of 2006, Canfor submitted to the Alberta Government the 2005 SFMP to be incorporated as part of the approved Forest Management Plan (FMP).
During 2007 and 2008 FMAC provided input for the Healthy Pine Strategy FMP Amendment (Canfor. 2010).
The FMAC continues to work with Canfor to insure current certification and Alberta government mandated plans.
The terms of reference have been revised and updated regularly to reflect changes.

A. Defined Goals
The Forest Management Advisory Committee (FMAC) aims to help ensure that sustainable forest management decisions are made as a result of informed, inclusive, and fair consultation with local people who are directly affected by or have an interest in sustainable forest management. The FMAC consists of members who represent a broad range of interested parties, including DFA workers as related to this Forest Management Agreement area (FMA).
The FMAC will work with Canfor Grande Prairie to:
1) Identify and select values, objectives, indicators and targets, based on the CSA SFM elements and any other elements of relevance to the DFA;
2) Develop one or more possible strategies;
3) Assess and select one or more strategies;
4) Review the SFM plan;
5) Design monitoring programs, evaluate results and recommend improvements; and
6) Discuss and resolve any issues relevant to SFM in the DFA.

Canfor and the FMAC shall ensure that the values, objectives, indicators and targets are consistent with relevant government legislation, regulations and policies. Additionally, they recognize Aboriginal and treaty rights, and agree that aboriginal participation in the public process will not prejudice those rights.
In addition, the FMAC will continue to:
1) Provide input regarding Forest Ecosystem Management Objectives; and
2) In partnership with Canfor, will review, refine and implement the Public Involvement Program.

B. Operating Rules
1) Ground rules/ conduct

The FMAC and its members agree to work by the following ground rules:
a) All members will be given the opportunity to voice their perspectives;
b) All members will listen to the range of perspectives;

c) Meetings will be well-structured and facilitated to enable efficient progress; and
d) Refreshments and food will be provided for the meetings.

2) Meeting agenda and dates
a) Meeting agendas:
i) Will address, where possible, both the needs of the Forest Management Plan and CSA Certification;
ii) Input on upcoming meeting agendas will be obtained during each FMAC meeting; and
iii) Canfor will finalize the meeting agenda.
b) Semi-annual meetings, unless additional meetings are required.
c) Meeting dates:
5.
i) Will be confirmed jointly between Canfor and the FMAC.
d) Meeting notices:
i) At least two weeks advance notice of meeting dates will be given; and
ii) Generally, the next meeting date will be confirmed at each FMAC meeting.
e) Meeting Location:
i) Meetings will be held at a time and place most suitable to the members of the group, and may vary time or place to satisfy members requirements; and
ii) Suggested meeting location(s) are: Debolt and Grande Prairie
f) Material, if available, will be provided for review in advance of meetings.
g) Name:
The name is: Canfor's Forest Management Advisory Committee (FMAC).

C. Timelines
Canfor has maintained CSA certification since June 2000, and is audited by an independent third party annually.

D. Communication and Information
1) Internal to FMAC:
a) Canfor will ensure meeting minutes are distributed following each meeting;
b) Canfor will provide the FMAC with information as it applies to the function and business of the FMAC. Confidential business information such as financial or human resource information may be deemed to be sensitive and proprietary and may not be released; and
c) Canfor will provide access to information about the DFA and the SFM requirements.

2) External:
a) The Annual Performance Monitoring Report, which summarizes the progress that Canfor Grande Prairie Division (should this now be Alberta Operations??) has achieved in SFM requirements, is distributed to the Advisory Committee and made available for the public;
b) Canfor will provide information to a broader public about the progress being made in the implementation of the CSA Standard;
c) Canfor will make allowances for different linguistic, cultural, geographical or informational needs of interested parties as necessary;
d) Only authorized members of the advisory committee are to speak on behalf of the FMAC as agreed to by the group and Canfor;
e) When communicating with the media, interest groups or the public at large, specific comments will not be attributed to any individual FMAC member without his/her prior consent; and

f) If an FMAC member wishes to respond to the media, they are to speak on behalf of the interest group they represent only and:
i) Will be respectful of other members and other interest groups; and
ii) Will not characterize the suggestions or positions of other members or interest groups in their discussions with the public or media.

g) Canfor will provide the Registrar, upon request, with the contact information of the Advisory Committee. As part of the audit process they require input from SFM plan public advisory group members regarding implementation of SFM within Canfor's DFA. The Registrar is required to keep this information confidential. If a member chooses not to have his/her information released they must notify Canfor in writing.
3) Internal to Canfor:
a) Applicable recommendations from the FMAC will be reported at Woodlands meetings; and

b) Applicable implementation reports and updates will report quarterly to the Regional Forest Management System (FMS) meetings.

E. Meeting Expenses and Logistics
1) Meeting Expenses
a) On request, members are eligible for $50 per ½ day meetings for expenses (full day meetings to be covered at $100);
b) Additional travel costs to meetings will be reimbursed at $0. 52/km;
c) If required, accommodation for members who must travel in excess of 1 hour for meetings will be covered; and
d) Expense forms for the above need to be submitted to Canfor for reimbursement.

F. Roles and Responsibilities
1) FMAC Structure:
a) Structure will be inclusive with a range of representatives from any of the following;

Alberta Conservation Association
Alberta Fish and Game Association
Alberta Professional Outfitters Association
Alberta Trappers Association
Canadian Association of Petroleum Producers (CAPP)
Canadian Natural Resources Ltd.
City of Grande Prairie
DFA-related Worker
Ducks Unlimited
Grande Prairie #1, County of
Grande Prairie Forest Educator
Grande Prairie Regional College
M.D. of Greenview No. 16
Métis Nation Zone 6
Public member at large
Peace Wapiti School Division No. 76
South Peace Environmental Association
Sturgeon Lake Cree Nation
Travel Alberta North, Tourist Destination Region
Valleyview, Town of

And others as identified by FMAC
b) New or additional members will be considered on an annual basis.
c) In addition to the above members, advisors from the following will assist the group:

Canfor;
Alberta Environment and Sustainable Resource Development;
Tolko Industries; and
AinsworthEngineered;
And others as identified by the FMAC.

2) FMAC Member's Role:
a) To provide input as related to the Defined Goals (Section A) as related to the Forest Management Plan (FMP) and CSA planning processes;

b) The voting members are responsible for consensus reaching and decision making for the FMAC;
c) To act as a liaison between FMAC and the organization they are representing;
d) To attend meetings regularly;
e) Members will be appointed by each of the member organizations;
f) Members can be replaced if more than 2 consecutive meetings are missed without a valid reason;
g) To replace a member, the member organization will be asked, by either the current member or by the Canfor representative, to reappoint a new member;
h) Canfor will confirm appointment;
i) Existing members, who no longer represent their original organization, may choose to remain on as members-at-large as this will provide ongoing continuity; and
j) Use of Alternates:
i. an organization may appoint an alternate to act as an interim replacement for the member; and
ii. alternates are also guided by the Terms of Reference.
k) Conflict of Interest:
If an FMAC member (or alternate) has a perceived or real conflict of interest regarding their input related to the Goals for the FMAC (Section A), this must be declared. The FMAC and Canfor will then decide at the meeting what actions are then needed. Potential actions could lead to:
I. Restricted involvement in the FMAC including asking the member:
i. To serve as an observer for the relevant specific issue(s) and recommendation(s);
ii. To take a leave from the FMAC;
II. Other actions as created by FMAC and Canfor.

3) Observers Role:
a) Public members are welcome to observe the FMAC meetings, but will not receive print materials;
b) Observers may participate in discussions or make presentations only with agreement by the group, chair or facilitator;
c) Forestry students are encouraged to attend as observers; and
d) Will not take part in reaching consensus or decision-making of the FMAC.

4) Canfor's Role:

a) To review and consider the recommendations from the FMAC;
b) To make decisions regarding sustainable forest management and certification;
c) To report to FMAC on how input was considered and that responses are provided;
d) To demonstrate that there is ongoing public communication about the DFA, including the public communication process;
e) To provide the necessary human, physical, financial, and technological resources to the FMAC as necessary and reasonable; and
f) Will not take part in reaching consensus or decision-making of the FMAC except in areas of conflict of interests as stated in 2(k)

5) Advisor's Role:
a) To actively provide background or technical information, participate in discussions and provide support to the FMAC group;
b) To clarify technical information for the FMAC group; and
c) Will not take part in reaching consensus or decision-making of the FMAC.
6) Facilitator's Role:
a) To ensure that meetings address agenda topics;
b) To ensure that all members have an equitable opportunity to participate in the meeting;

c) To provide support in summarizing and clarifying issues, recommendations, etc.; and
d) Will not take part in reaching consensus or decision-making of the FMAC.

G. Decision Making and Methodology
1) The group agrees to work by consensus defined as:
a) Every effort shall be made to achieve consensus;
b) Consensus is defined as no member having substantial disagreement on an issue;
c) Consensus may consist of agreement on a summary of the different perspectives on an issue;
d) Decisions on specific issues will be considered interim consensus, unless agreed otherwise, until there is consensus on the full set of recommendations;
e) All decisions and recommendations will require involvement of at least 4 members; and
f) A member who is absent from a meeting where a decision was made, may request to have the decision reviewed at a future meeting. The chair or facilitator would identity when this would occur.

H. Dispute Resolution Mechanism
1) Process Issues:
a) The facilitator will resolve process issues.

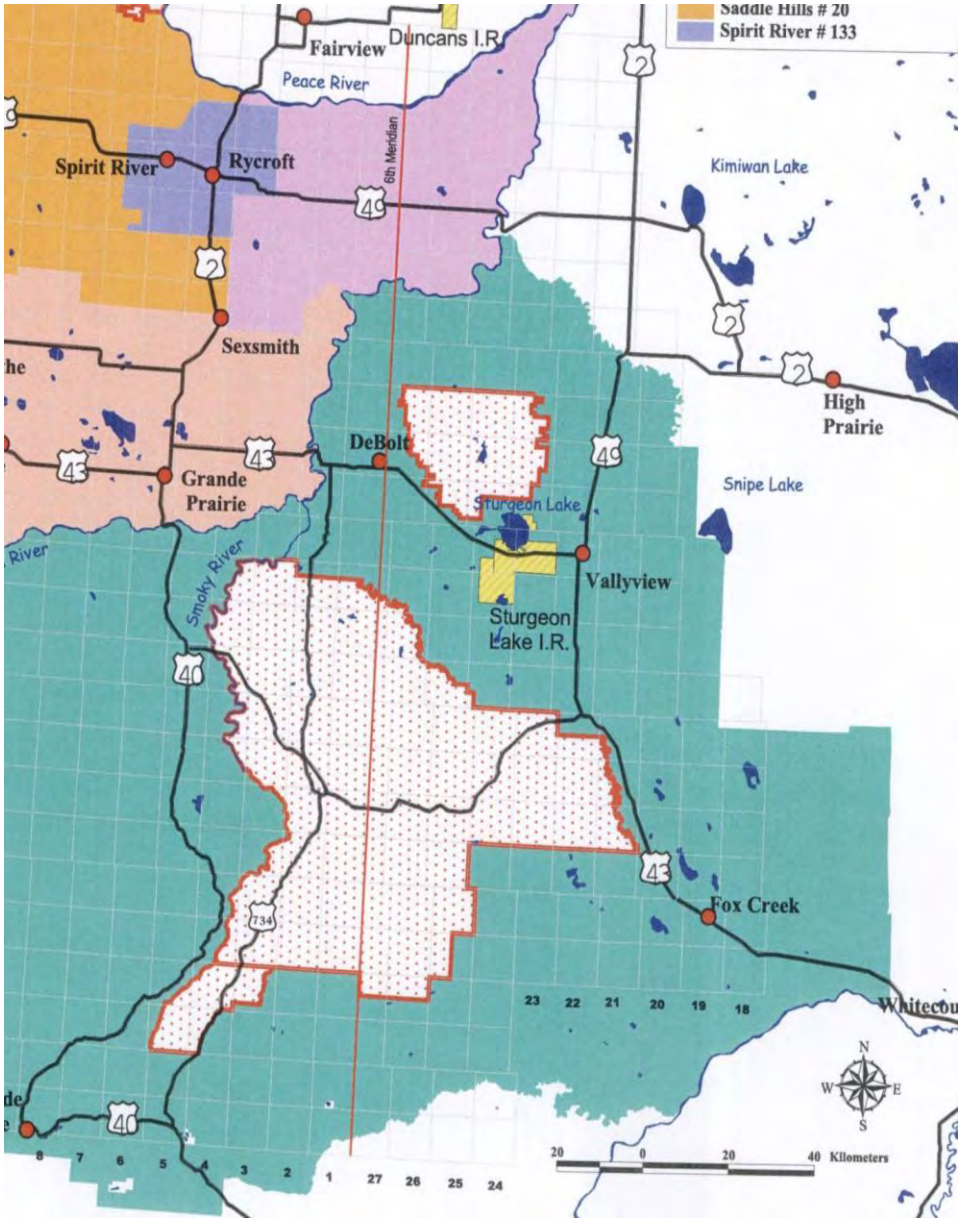
2) Technical Issues:
a) The members will work to identify the underlying issues and work towards a solution in a positive friendly environment;
b) The members will seek compromise, alternatives and clarification of information needed;
c) The members will commit to arriving at the best solution possible; and
d) If no consensus solution can be reached, then the outstanding issues will be summarized and forwarded to Canfor for their consideration. Canfor will be informed of the level of support and dissention with the issue.

I. Review of and Revisions to Terms of Reference

The Terms of Reference will be reviewed every 2 years at a minimum or earlier based on consensus of the group.

Figure 14 : Map of Defined Forest Area

FMA 9900037 of the FMAC and Canfor.



Appendix 6 Plant Communities

Communities are ranked on a global, national and sub-national scale of 1 to 5 in a manner similar to the system used by Nature Serve for ranking species. A rank of G1 (Global 1) indicates that a community is of high conservation concern at the global scale due to rarity, endemism and / or threats, and a rank of G5 (Global 5) indicates a community that is demonstrably widespread and abundant. Similarly, a rank of N1 (National 1) or S1 (Sub-National 1) indicates that the community is of high conservation concern at the national or state / provincial level, respectively.

The two major criteria in determining a community's rank are the total number of occurrences and the total area (hectares) of the community, range-wide. Measures of geographic range, trends in status (expanding or shrinking range), trends in condition (declining condition of remaining hectares), threats and fragility are additional ranking factors that may be considered when assigning a rank. The criteria used to assign a rank to a particular community are documented using a standardised format. The purpose and process for developing conservation ranks is discussed in greater detail at the following website http://www.natureserve.org/explorer/ranking.htm#assessment.

Alberta Conservation Information Management System (ACIMS),
Alberta Tourism, Parks and Recreation,
2nd Floor 9820 106 Street, Edmonton,
AB T5K 2J6
(780)427-6621

Estimating Ranks
While community ranking attempts to integrate all available information, it is usually necessary to do a preliminary ranking as, most often, information is incomplete. Although these methods are standardized, applying conservation ranks to communities is nonetheless a subjective process. The amount of information available for each of the ranking factors varies for each community. Ranks are assigned based on the best available information and are refined over time. This ranking procedure provides a reasonable estimate of the community rarity, although some degree of error is inherent.
.(Ref:Alberta Conservation Information Management System Ecological Community Tracking List; Government of Alberta 2011)

Table XX

Provincial Community Conservation Ranks

RANKS*	DEFINITION
S1	Five or fewer occurrences or very few remaining hectares
S2	Six to 20 occurrences or few remaining hectares
S3	21 to 80 occurrences. May be rare and local throughout its range or found locally, even abundantly, in a restricted range (e.g. a single western province or a physiographic region in the East).
S4	Apparently secure globally (State / Province wide), though it may be quite rare in parts of its range, especially at the periphery.

S5	Demonstrably secure globally (State / Province wide), though it may be quite rare in parts of its range, especially at the periphery.
SNR	Element is not yet ranked
SU	Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	Not Applicable —A conservation status rank is not applicable because the element is not a suitable target for conservation activities.
S#S#	Range Rank* —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
MODIFIERS	
Q	Can be added to any **global** rank to denote questionable taxonomy (e.g. G2Q = 6 to 20 known occurrences, but questions exist concerning the classification of this type). Cannot be used with provincial ranks.
?	Can be added to any rank to denote an inexact numeric rank (e.g. S1? = Believed to be 5 or less occurrences, but some doubt exists concerning status).
* Ranks can be combined to indicate a range (e.g. S2S3 = May be between 6 to 80 occurrences throughout Alberta, but the exact status is uncertain). Combined ranks indicate a larger margin of error than ranks assigned a "?" qualifier	

CODE	SCIENTIFIC NAME	COMMON NAME	RANK	CLASS	GROUP	Natural Region				
						BOREAL FOREST		FOOTHILLS		ROCKY MTNS
						DRY MIXEDWOOD	Central Mixedwood	Lower Foothills	Upper Foothills	SubAlpine
CEAB000003	Larix occidentalis / Rubus parviflorus	western larch / thimbleberry	S1	Forest/ Woodland	Larix occidentalis					Potential
CEAB000016	Betula papyrifera / Betula occidentalis / Arctostaphylos uva-ursi	white birch / water birch / common bearberry	S1	Forest/ Woodland	Betula papyrifera					Unlikley
CEAB000017	Picea engelmannii - Abies bifolia / Dryas octopetala	Engelmann spruce - subalpine fir / white mountain avens	S2S3	Forest/ Woodland	Picea engelmannii					Confirmed
CEAB000018	Picea engelmannii – Abies bifolia / Salix vestita / Cassiope tetragona	Engelmann spruce - subalpine fir / rock willow / white mountain-heather	S2	Forest/ Woodland	Picea engelmannii					Confirmed
CEAB000019	Picea engelmannii / Leymus innovatus	Engelmann spruce / hairy wild rye	S2	Forest/ Woodland	Picea engelmannii					Confirmed
CEAB000020	Picea glauca / Rosa acicularis / Abietinella abietina	white spruce / prickly rose / fern moss	S1	Forest/ Woodland	Picea glauca					Unlikley
CEAB000021	Picea glauca / Shepherdia canadensis / Abietinella abietina	white spruce / Canada buffaloberry / fern moss	S2	Forest/ Woodland	Picea glauca					Potential
CEAB000022	Populus tremuloides / Menziesia ferruginea	aspen / false azalea	S1	Forest/ Woodland	Populus tremuloides					Confirmed
CEAB000023	Populus tremuloides / Leymus innovatus – Aster conspicuus avalanche community	aspen / hairy wild rye - showy aster avalanche community	S2	Forest/ Woodland	Populus tremuloides					Confirmed
CEAB000038	Larix laricina / Carex prairea	tamarack / prairie sedge	S1	Forest/ Woodland	Larix laricina	Confirmed	Potential			
CEAB000040	Picea glauca / Alnus incana ssp. tenuifolia – Betula neoalaskana / Equisetum pratense / Hylocomium splendens	white spruce / river alder - Alaska birch / meadow horsetail / stair-step moss	S3	Forest/ Woodland	Picea glauca	Potential	Confirmed			
CEAB000041	Picea glauca / Cetraria islandica	white spruce / lichen	S1?	Forest/ Woodland	Picea glauca	Unlikley	Confirmed			
CEAB000042	Populus balsamifera /Alnus incana ssp. tenuifolia - Cornus stolonifera / Equisetum pratense	balsam poplar / river alder - red-osier dogwood / meadow horsetail	S3	Forest/ Woodland	Populus balsamifera	Potential	Confirmed			
CEAB000043	Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris	balsam poplar / high-bush cranberry / ostrich fern	S1S2	Forest/ Woodland	Populus balsamifera	Potential	Confirmed			
CEAB000044	Populus tremuloides / Rubus parviflorus / Aralia nudicaulis	aspen / thimbleberry / wild sarsaparilla	S2S3	Forest/ Woodland	Populus tremuloides	Unlikley	Confirmed	Confirmed	Unlikley	
CEAB000045	Populus tremuloides / Salix bebbiana -Corylus cornuta / Calamagrostis canadensis – Matteuccia struthiopteris	aspen / beaked willow - beaked hazelnut / bluejoint - ostrich fern	S1	Forest/ Woodland	Populus tremuloides	Potential	Confirmed			
CEAB000050	Abies bifolia – Pinus albicaulis – Picea engelmannii / Empetrum nigrum	subalpine fir - whitebark pine - Engelmann spruce / crowberry	S2	Forest/ Woodland	Pinus albicaulis					Confirmed
CEAB000051	Abies bifolia – Pinus albicaulis / Xerophyllum tenax	subalpine fir - whitebark pine / beargrass	S1S2	Forest/ Woodland	Pinus albicaulis					Confirmed

CODE	SCIENTIFIC NAME	COMMON NAME	RANK	CLASS	GROUP	Natural Region				
						BOREAL FOREST		FOOTHILLS		ROCKY MTNS
						DRY MIXEDWOOD	Central Mixedwood	Lower Foothills	Upper Foothills	SubAlpine
CEAB000052	Abies bifolia – Pinus flexilis – Populus tremuloides / Thalictrum venulosum	subalpine fir - limber pine - aspen / veiny meadow rue	S2?	Forest/ Woodland	Pinus flexilis					Confirmed
CEAB000063	Larix lyallii / Luzula hitchcockii	subalpine larch / smooth wood rush	S2?	Forest/ Woodland	Larix lyallii					Confirmed
CEAB000066	Picea engelmannii – Abies bifolia / Salix planifolia / Hylocomium splendens	Engelmann spruce - subalpine fir / flat-leaved willow / stair-step moss	S1?	Forest/ Woodland	Picea engelmannii					Confirmed
CEAB000067	Picea engelmannii / Salix drummondiana	Engelmann spruce / Drummond's willow	S1?	Forest/ Woodland	Picea engelmannii					Confirmed
CEAB000068	Picea engelmannii / Salix vestita	Engelmann spruce / rock willow	S2?	Forest/ Woodland	Picea engelmannii					Confirmed
CEAB000069	Picea glauca / Betula pumila - Salix bebbiana / Carex eburnea	white spruce / dwarf birch - beaked willow / bristle-leaved sedge	S1?	Forest/ Woodland	Picea glauca					Unlikley
CEAB000070	Picea glauca / Abietinella abietina	white spruce / fern moss	S2S3	Forest/ Woodland	Picea glauca					Confirmed
CEAB000071	Pinus albicaulis - Abies bifolia / Luzula hitchcockii - Vaccinium myrtillus	whitebark pine - subalpine fir / smooth wood rush - low bilberry	S1S2	Forest/ Woodland	Pinus albicaulis					Confirmed
CEAB000073	Pinus albicaulis – Pinus contorta / Juniperus communis – Leymus innovatus – Linnaea borealis	whitebark pine - lodgepole pine / ground juniper - hairy wild rye	S2S3	Forest/ Woodland	Pinus albicaulis					Confirmed
CEAB000074	Pinus albicaulis / Juniperus communis – Arctostaphylos uva-ursi	whitebark pine / ground juniper - common bearberry	S2S3	Forest/ Woodland	Pinus albicaulis					Confirmed
CEAB000075	Pinus flexilis - Pseudotsuga menziesii / Juniperus spp. / *Arctostaphylos uva-ursi*	limber pine - Douglas-fir / juniper species / common bearberry	S2	Forest/ Woodland	Pinus flexilis					Unlikley
CEAB000076	Pinus flexilis / Arctostaphylos uva ursi - Juniperus horizontalis	limber pine / common bearberry - creeping juniper	S2S3	Forest/ Woodland	Pinus flexilis					Unlikley
CEAB000077	Populus balsamifera - P. tremuloides / Alopecurus alpinus - Calamagrostis canadensis	balsam poplar - aspen / alpine foxtail - bluejoint	S1S2	Forest/ Woodland	Populus balsamifera					Unlikley
CEAB000078	Populus tremuloides / Rubus parviflorus	aspen / thimbleberry	S2	Forest/ Woodland	Populus tremuloides					Unlikley
CEAB000082	Pseudotsuga menziesii - Pinus flexilis / Juniperus communis / Festuca campestris	Douglas-fir - limber pine / ground juniper / mountain rough fescue	S2S3	Forest/ Woodland	Pseudotsuga menziesii					Potential
CEAB000114	Populus balsamifera / Rhamnus alnifolia / Equisetum arvense	balsam poplar / alder-leaved buckthorn	S1	Forest/ Woodland	Populus balsamifera	Unlikley	Confirmed			
CEAB000130	Pinus contorta / Ledum groenlandicum / Vaccinium scoparium / Pleurozium schreberi	lodgepole pine / common Labrador tea / grouseberry / Schreber's moss	S1?	Forest/ Woodland	Pinus contorta					Confirmed

CODE	SCIENTIFIC NAME	COMMON NAME	RANK	CLASS	GROUP	Natural Region				
						BOREAL FOREST		FOOTHILLS		ROCKY MTNS
						DRY MIXEDWOOD	Central Mixedwood	Lower Foothills	Upper Foothills	SubAlpine
CEAB000170	Populus tremuloides / Rosa acicularis / Apocynum androsaemifolium	aspen / prickly rose / spreading dogbane	S1S2	Forest/ Woodland	Populus tremuloides	Potential	Potential			
CEAB000175	Betula neoalaskana / Ledum groenlandicum	Alaska birch / common Labrador tea	S1S2	Forest/ Woodland	Betula neoalaskana	Confirmed	Potential			
CEAB000184	Populus angustifolia / Symphoricarpos occidentalis	narrow-leaf cottonwood / buckbrush	S2S3	Forest/ Woodland	Populus angustifolia					Unlikley
CEAB000188	Larix laricina - Picea mariana / Cornus stolonifera - Rubus idaeus	tamarack - black spruce / red-osier dogwood - wild red raspberry	S1S2	Forest/ Woodland	Picea mariana	Potential	Potential			
CEAB000189	Picea mariana / Cornus stolonifera / feathermoss	black spruce / red-osier dogwood / feathermoss	S1S2	Forest/ Woodland	Picea mariana	Potential	Potential			
CEAB000204	Picea mariana / Cladina stellaris	black spruce / star-tipped reindeer lichen	S1	Forest/ Woodland	Picea mariana	Unlikley	Unlikley			
CEAB000209	Populus tremuloides / Vaccinium myrtilloides woodland	aspen / common blueberry woodland	S2?	Forest/ Woodland	Populus tremuloides	Confirmed	Potential			
CEAB000214	Betula neoalaskana – Picea glauca / Salix discolor / Equisetum arvense swamp forest community	Alaska birch - white spruce / pussy willow / common horsetail swamp forest community	S1S2	Forest/ Woodland	Betula neoalaskana	Potential	Unlikley			
CEAB000222	Picea glauca / Equisetum scirpoides forest	white spruce / dwarf scouring-rush forest	SU	Forest/ Woodland	Picea glauca	Potential	Potential			
CEAB000224	Betula papyrifera / Lycopodium obscurum - Lycopodium annotinum woodland	white birch / ground-pine - stiff club-moss woodland	S2?	Forest/ Woodland	Betula papyrifera			Confirmed	Potential	
CEGL000164	Pinus contorta / Spiraea betulifolia forest	lodgepole pine / white meadowsweet forest	S2S3 G3G4	Forest/ Woodland	Pinus contorta					Confirmed
CEGL000317	Abies bifolia - Picea engelmannii / Luzula hitchcockii woodland	subalpine fir - Engelmann spruce / smooth wood-rush woodland	S1S2 G5	Forest/ Woodland	Picea engelmannii					Confirmed
CEGL000322	Abies bifolia - Picea engelmannii / Oplopanax horridus	subalpine fir - Engelmann spruce / devil's-club	SNR G3	Forest/ Woodland	Picea engelmannii					Potential
CEGL000542	Populus balsamifera ssp. trichocarpa - (Populus tremuloides) / Heracleum lanatum forest	black cottonwood - (aspen) / cow parsnip forest	S2 G2	Forest/ Woodland	Populus balsamifera ssp. trichocarpa					Confirmed
CEGL000802	Pinus flexilis / Arctostaphylos uva-ursi woodland	limber pine / common bearberry woodland	S2 G4	Forest/ Woodland	Pinus flexilis					Unlikley
CEGL000815	Pinus flexilis scree woodland	Limber pine scree woodland	S1S2 G3Q	Forest/ Woodland	Pinus flexilis					Unlikley
CEGL002664	Populus angustifolia / Cornus stolonifera	narrow-leaf cottonwood / red-osier dogwood	S2S3 G4	Forest/ Woodland	Populus angustifolia					Unlikley

CODE	SCIENTIFIC NAME	COMMON NAME	RANK	CLASS	GROUP	Natural Region				
						BOREAL FOREST		FOOTHILLS		ROCKY MTNS
						DRY MIXEDWOOD	Central Mixedwood	Lower Foothills	Upper Foothills	SubAlpine
CEGL005823	Abies bifolia - Picea engelmannii / Valeriana sitchensis woodland	subalpine fir - Engelmann spruce / mountain valerian woodland	S2? G2?	Forest/ Woodland	Picea engelmannii					Confirmed
CEGL005840	Pinus albicaulis – Picea engelmannii / Dryas octopetala woodland	whitebark pine - Engelmann spruce / white mountain avens woodland	S1 G2G3	Forest/ Woodland	Pinus albicaulis					Confirmed
CEGL005845	Populus balsamifera ssp. trichocarpa / Calamagrostis canadensis forest	black cottonwood - conifer / bluejoint forest	S1S2 G2?	Forest/ Woodland	Populus balsamifera ssp. trichocarpa					Unlikley
CEGL005853	Pseudotsuga menziesii / Angelica spp. forest	Douglas-fir / angelica spp. forest	S1S2 G2?	Forest/ Woodland	Pseudotsuga menziesii					Confirmed
CEGL005884	Larix lyallii / Vaccinium membranaceum / Luzula hitchcockii woodland	subalpine larch / tall bilberry / smooth wood-rush woodland	S2 G2G3	Forest/ Woodland	Larix lyallii					Confirmed
CEGL005905	Populus balsamifera ssp. trichocarpa - Picea engelmannii / Cornus stolonifera forest	black cottonwood - Engelmann spruce / red-osier dogwood forest	S1S2 G2G3	Forest/ Woodland	Populus balsamifera ssp. trichocarpa					Unlikley
CEGL005907	Populus balsamifera ssp. trichocarpa - Picea engelmannii / Equisetum arvense forest	black cottonwood - Engelmann spruce / common horsetail forest	S1S2 G2?	Forest/ Woodland	Populus balsamifera ssp. trichocarpa					Unlikley
CEGL005908	Populus tremuloides - Abies bifolia - Picea engelmannii / Streptopus amplexifolius forest	aspen - subalpine fir - Engelmann spruce / clasping-leaved twisted-stalk forest	S1S2 G2G3	Forest/ Woodland	Populus tremuloides					Confirmed
CEGL005914	Abies bifolia - Picea engelmannii / Vaccinium scoparium / Xerophyllum tenax forest	subalpine fir - Engelmann spruce / grouseberry / bear-grass forest	S1 G4G5	Forest/ Woodland	Picea engelmannii					Confirmed
CEGL005920	Abies bifolia - Picea engelmannii / Streptopus amplexifolius - Luzula hitchcockii woodland	subalpine fir - Engelmann spruce / clasping-leaved twisted-stalk - smooth wood rush woodland	S2S3 G2G3	Forest/ Woodland	Picea engelmannii					Confirmed
CEGL005929	Pinus contorta / Cornus stolonifera woodland	lodgepole pine / red-osier dogwood woodland	S2? G2G3	Forest/ Woodland	Pinus contorta					Confirmed

Appendix 7 Coarse Woody Debris Training

PAGE 1

Coarse Wood Debris (CWD) Best Management Practices

Audience: Permitting, Harvesting, Silviculture Supervisors

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Overview

- These best management practices (BMP)outline strategies to achieve the target for our coarse woody debris (CWD) indicators in our Sustainable Forest Management Plans (SFMP) under:
  - Criterion 3 Soil and Water
- The intent is to use a qualitative approach rather than a quantitative approach because:
  - CWD levels are highly variable in natural stands making it difficult to have a meaningful target at the block level.
  - Meaningful quantitative targets would require extensive pre and post harvest surveys.
  - It is difficult to implement because it is hard for equipment operators to estimate the quantity during harvest operations.

Overview (con't)

- A qualitative approach relies on the harvesting and or the silviculture supervisor to determine if adequate levels and quality of CWD are left on the block after harvest.
- The supervisor would be using the same examples that were provided to the contractor at the pre-work. (see slides 09 –14)
- Equipment operators are in the best position to influence the quantity and quality of CWD.
  - Instruct them to do the "best that they can" showing the examples.

Permitting Supervisors Roles and Responsibilities

- Ensure that the CWD strategies are documented in site plans. Site plans should contain at least the following statement or a similar one:
  - *"Canfor Best Management Practices for Coarse Woody Debris (CWD) retention should be followed. It is expected that these will exceed the minimum legal requirements of "retaining a minimum of 4 logs per hectare, each being a minimum of 2 m in length and 7.5 cm in diameter at one end within the block NAR".*
- Other more specific strategies such as retaining piles, Stubs, retaining deciduous, etc. can be documented in the site plan.

Harvesting Supervisors Roles and Responsibilities

- Communicate BMP's to harvesting contractors at pre-works.
- Document performance on FMG pre work, inspection and hazard assessment form.
  - http://fmg.canfor.ca/FMG_Main/fmg_harvesting_and_roads_prework_and_inspection_form.doc
- Document non-conformance in ITS if contractor did not follow BMPs'.
- Document non-compliance in ITS if contractor is below legal minimums for CWD.

Silviculture Supervisors Roles and Responsibilities

- Communicate BMP's to Site preparation contractors at pre-works.
- Document performance on FMG silviculture pre work and inspection form.
  - http://fmg.canfor.ca/FMG_Main/prework_fms_silviculture_2011_04_26.xls
- Document non-conformance in ITS if contractor did not follow BMPs'.
- Document non-compliance in ITS if contractor is below legal minimums.

SFMP Reporting

- Auditors will be looking for a commitment to Canfor's CWD BMPs in site plans so this needs to be documented in these plans.
- It is important that non-conformance or non-compliance is reported in ITS.
- This is the information that we rely on to report our performance for our CWD indicator in our annual SFM monitoring reports.

Canfor Best management Practices

- The following slides outline Canfor's BMPs' for CWD.
- There is a two page handout to be provided to contractors and employees at pre-works which show the material in the slides.
- Crews are instructed to "do the best you can", ensuring not to increase the time spent to a degree that would be considered unreasonable during normal operations.
- Under no circumstances should the BMPs' compromise safety!!!

Coarse Woody Debris Best Management Practices

Maintain clumps of CWD and other structural elements

Clumps could be built around:
- existing deadfall
- a group of snags (stubbed, with tops left in clump)
- existing clump of immature trees
- alder patch (or other tall shrubs)
- existing deciduous or cull trees
- a ridge crest or area where the skidder doesn't go

Remember they must be **visible**!

And not pose a safety hazard!!

Coarse Woody Debris Best Management Practices

Keep the larger, longer logs intact and on the block

- don't skid unwanted logs
- identify unmerchantable stems at the stump and leave on site
- place unwanted snags
  - in direction of skid
  - to one side of skid route
  - in or adjacent to clump
- applies particularly to snags with branches and bark

Coarse Woody Debris Best Management Practices

Think Jackstraw!!
Imitate natural distribution

- try not to disturb natural accumulations of downed logs
- if a tree or snag is felled and left, put it down across other logs (off the ground if possible).
- avoid bunching groups of logs if they are not going to be skidded to the landing

Coarse Woody Debris Best Management Practices

Maintain immature, deciduous and large cull trees for habitat and for future CWD

For immature trees, look for
- pole size or larger preferred
- large, healthy crowns
- in clumps where possible

Large green trees could be
- aspen or cottonwood
- declining or cull trees of little commercial value
- **Do not leave standing trees if they pose a safety hazard!!!**

Coarse Woody Debris Best Management Practices

Stub snags around the outside of a clump

•the stubs act as “rub trees” to prevent damage to the clump

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Coarse Woody Debris Best Management Practices

Place unwanted snags (or stub tops) in or around the clump

- in direction of skid
- at the side to avoid damage to live trees

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Summary

- Canfor BMPs' are intended to inform equipment operators what practices they can conduct on the ground to improve the quality of CWD within our harvesting operations.
- It is the supervisor's responsibility to ensure that contractors are aware of and implement Canfor's BMPs and document any non-conformances or non-compliances.
- Here is a link to the handout for contractors.
- \\canfor.ca\woods\FMG\WORKING\Certification\CSA_Z809_08\SFM_08_indicator_info\crit_3\elem_3_1\ind_3_1_2\Canfor_CWD_BMP_2012_03_26.docx

Appendix 8 Draft Watershed Analysis Procedures for Detailed Forest Management Plans

Watershed Analysis Procedures for the Detailed Forest Management Plans

DRAFT

1) Operations (eg winter versus summer operations)
   Winter harvesting will generally cause less erosion and hence less delivery to watercourses.
2) Location of harvesting operations (eg avoidance of steep slopes, fish-bearing streams, sensitive soils, etc)
3) Selection of appropriate cut block size, structure retention, elevation (see H60) and aspect.
4) Minimize ground disturbance.
5) Careful consideration given to sensitive and erodible soils.(already mentioned in items #1 and 2)

Road location and Road Planning

1) Employ best road construction, maintenance and management practices to reduce general road-related risks to fish in these categories (angler access, harmful alteration of habitat and water quality, impairment of fish passage).
2) Careful road location to avoid fish-bearing waters, particularly sites identified as highly sensitive.
3) Minimize road network density.

1.0 Overview

1.1 Purpose

The purpose of this watershed assessment procedure is to identify which watersheds will have values at risk as a result of a Detailed Forest Management Plan (DFMP). This procedure focuses on changes to the flow regime (frequency, timing and magnitude of peaks and low flows) and assumes that environmentally responsible operational practices (adherence to the Operating Ground Rules) is the mechanism to deal with site specific issues (eg fish passage) and water quality (primarily sedimentation). However, the Risk Mitigation section does discuss operational and tactical considerations in watersheds identified with high risk activities.

1.2 Watershed values

The watershed values to be protected will identified through public / stakeholder consultation and by local professionals, such as biologist, Alberta Environment Hydrologists and Drinking Water Specialists.

2.0 Approach

The streambed is sensitive to effective discharge and for purposed of this document is assumed to be the effective discharge, which has a return period of 2 to 5 years (or a 20 to 50 % probability of being exceeded each year). Forest harvesting removes the trees and requires roads which can result in more water and affect the effective discharge.
Increasing the magnitude of effective discharge can:

1) increase the likelihood of damaging fish habitat and fish eggs, and
2) increase in-stream sediment movements which can impact water quality and other downstream watershed values.
3) Once compromised by increases in peak flow the geomorphology of streams can take many decades to recover.

Most regions Alberta have limited meteorological and hydrometric data needed for detailed modelling of changes to peak flows at a scale of interest to forestry. This results in high uncertainty in model outputs. Apart from limitation due to insufficient data modelling can also be labour-intensive and expensive. As an alternative the potential change in effective discharge can be informed by scientific results and modelling projects in geo-climatic regions with sufficient data.

2.1 Level 1 Assessment

To minimize the number of watersheds that have to be assessed in detail, a two step process is encouraged. First, a Level 1 assessment will set initial thresholds and identify watersheds at low risk. Second, watersheds that have been identified to have a high risk during the Level 1 assessment could be refined with a Level 2 assessment.

As an example, Figure 1 shows data for published watershed experiments in rain dominated environments. For each DFMP, specific data for the region will be complied.

In this example, measurable impacts to the peak flows have been reported for a harvest area above 30 % of the watershed. From these data, we can assume that harvest plans that have 30 % or less of the watershed harvested will not likely cause an increase in the effective discharge and pose a low hazard to watershed values.

Some guidelines have used 50 % change to effective discharge as a point when significant damage to the stream is likely to occur (green line). Note that 50 % is used in some other assessment procedures, but it is a highly aggressive target and will have to be address during the information gathering stage. In Figure 1, the red line shows the upper limit of measured impacts from the selected studies. Where the red and green lines intersect (at approximately 40 % area harvested) these data show that it is possible to increase the effective discharge by 50 %. Forest activates that harvest 30 – 40 % of the watershed will be considered a medium hazard to watershed values. Above 40 % the forest harvesting will initially be considered to be a high hazard.

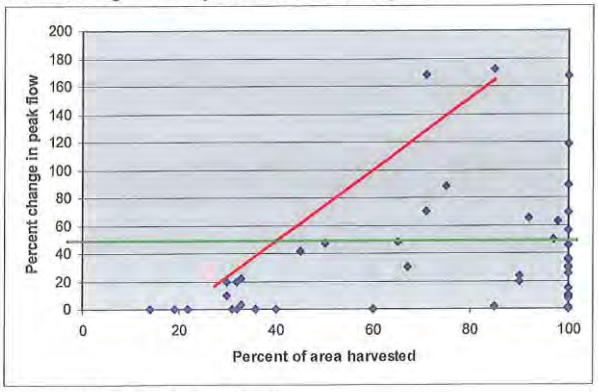

Figure 1. Data from watershed experiments.

2.2 Peak flow indicator

This method is based on an area based indicator and target (% of watershed area) because it can be incorporated into timber supply planning to help ensure that harvest sequences address risk to watershed values.

The Equivalent Clearcut Area (ECA) has been used extensively as an indicator of the level of forestry disturbance in a watershed (the hazard). As the name suggests the ECA uses relationships to equate recovering forest disturbances to a recently clear cut stand.

The ECA is usually expressed as a percent of the watershed area (or forested area), and thus can be represented on the x-axis of Figure 1. ECA was chosen because:

1) It accounts for stand level recovery of hydrological processes
2) It is easily calculated, implement, and transparent,
3) it has been used in other jurisdictions and within Alberta, and
4) it is informed by scientific experimental results and modelling results.

2.3 Level 2 Assessment

The above discussion was referred to as the initial (or Level 1) assessment, which will identify the risk to watershed values based on the most extreme measured values.

The results of the Level 1 assessment can be can be refined by a Level 2 assessment. Figure 1 shows that most experimental results plot below the upper red line. This response depends on the forestry practices used, climatic conditions, and watershed characteristics (topography, soil, amount of wetlands, etc). The amount of change to the peak flows that a watershed can sustain (green line) will depend on the values, and the sensitivity of the stream bed and banks to floods. More unstable stream geomorphology will be more sensitive to change. The Level 2 assessment will take into account these factors to refine the risk assessment. Modelling tools or site visits may be appropriate.

Figure 1, is derived from scientific experiments, however in certain regions it may be appropriate to use hydrological modelling results. Similar figures can also be used to account for:

1) Timing of the peak flows
2) Low flows (generally not negatively affected by forestry),
3) Water yield (however, existing simple models can be used to predict water yield)
4) Infrequent floods (25, 50, 100 yr return period) which may risk down stream infrastructure Note that the effective discharge (defined here as the 2 to 5 year return periods) are not "design floods" and this discussion above will not directly account for the potential increased risk to downstream infrastructure (roads, crossings, houses, etc) as a result of harvesting.

2.3.1 Road density assessment

During the Level 2 assessment procedure fish communities may be identified as values at risk. Roads have been shown to have a significant impact on fish populations and may be an additional indicator.

Forest harvesting alters landscapes by tree removal and road development. These activities have been shown to have a negative correlation with fish populations in Alberta. Information from the analyses of relationships between fish status indicators obtained via Fisheries Management Branch assessments and Index of Biotic Integrity (IBI) studies for aquatic systems has generated dose-response curves. A dose-response curve identifies the change in fish population health with a change in an indicator such as road density (Figure 2). These curves will be used to determine road density thresholds for fish populations and community integrity to forest-harvest activities. To provide

context and consistency of interpretation, dose-response relationships are referenced to defined fish sustainability risk categories (low risk, potential risk, at risk, high risk) following an international standard (Figure 2). The suite of fish indicators for Alberta includes:

- FSI-Alberta Fish Sustainability Index;
- FCI-Fish Community Index; and,
- % of fish species at-risk (% SAR).

These indicators represent a hierarchy of sensitivity of fish populations to forest harvest activities, wherein the most sensitive indicator will respond earliest to land use. Continued or increasing land use pressure will trigger changes in more robust indicators, until all three show a high-risk condition. The most sensitive is the FSI, which will report declines in populations of highly-valued sport fish (e.g. trout) soonest. Next, with continued or increasing land use, the FCI will indicate changes to the overall fish community. Finally, individual populations of fish species may decline to defined risk-based status categories as per SAR protocols and legislation.

In most cases, Alberta FSI-Alberta Fish Sustainability Index values for high-value sport fishes present in the watershed will be used as the primary indicator, as the most sensitive metric of land use pressure. In cases where the FSI indicates a high risk condition exists, FCI and %SAR metrics may also be used to determine the degree of risk based to fish community changes and considerations under species-at-risk legislation.

Figure 2. Example of fish-based risk categories used by ASRD, Fisheries Management Branch, showing the relative (%) ranges that correspond to fish indicator metrics. Categories are based on international (IUCN) setpoints.

Figure 3 shows a dose-response curve example, which uses the FSI watershed average density of adult bull trout in relation to road density. A similar relationship between bull trout occurrence and road density in the Kakwa River watershed was reported by Ripley et al. (2005). Note that the FSI-based relationship present in Figure 3 does not include temporary and winter roads, but just roads included in the Road Network of Alberta (ASRD, RIMB 2007). Densities of all linear features, including temporary roads, trails, seismic lines and pipelines is likely much higher. Data presented in Ripley et al. (2005)

include modelled results to pristine conditions, providing a means to assess relationships between human activities and fish at levels lower than current observational studies.

The relationship in Figure 3 is based on business-as-usual road management, not necessarily incorporating best road management practices designed to mitigate the effects of roads on fish. This provides the opportunity to use best management practices to mitigate the road network-related risks to fish.

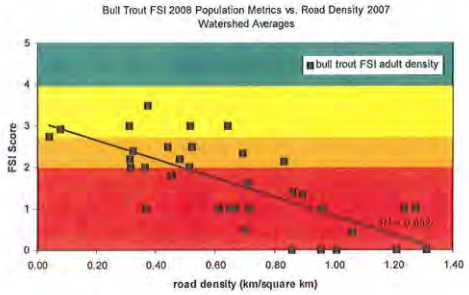

Figure 3. Bull trout Fish Sustainability Index 2008- watershed average adult density scores vs. watershed average road density for all FSI watershed units with bull trout (n=35). Color ranges represent ASRD, Fisheries Management risk categories (low = green; yellow=potential risk; orange=at risk; red=high risk).

2.3.2 Setting Road Density Thresholds

The setting of road density threshold will be done in consultation with local area Fisheries Management Branch staff following a two-stage process. In the first stage, road density will be determined for the watershed, and in some cases within a 10km radius of sensitive areas. The fish-based risk level represented by the road-density will then be determined based on the most appropriate FSI and FCI curves available (depending on fish species present and surveys conducted). In the second stage, road management plans for watersheds and areas identified at high risk will be developed with the goal of reducing the net road-threat effect to reduce risk an acceptable level. In this stage of the process, the causal factors of risk posed by roads will be examined in detail and best management practices will be incorporated to reduce the risk factors. In general, the primary risks to fish from roads are:

1. Increased access to fish populations leading to excessive harvest via legal and illegal angling;
2. Fragmentation of streams and reduced accessibility to habitats caused by poor road-stream crossings; and,
3. Degradation of water quality caused by increased sediment intrusion.

3.0 Steps during DFMP process

There are four steps in the assessment that should be carried out in chronological order. The flow chart in Figure 4 illustrates the assessment process which comprises of the following steps. The steps are further discussed in subsequent sections.

1) Gather Information
   a. Identification of Watershed Values
   b. Identification of non-forestry hazards
   c. Identification of hydrological and climatic setting
2) Determine watersheds boundaries, ECA (and other Indicators) and Thresholds
3) Calculate watersheds value risk
   a. Calculation of Hazards (Equivalent Clearcut Area)
   b. Refinement of High Risk Predictions
4) Identify mitigation strategies, or change harvest sequence.

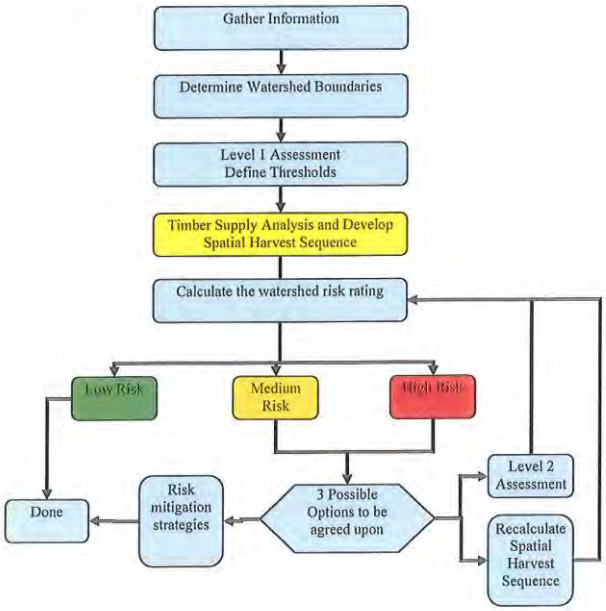

Figure 4. Diagram of the Watershed Assessment Procedure.

4.0 Information Gathering

Landscape Assessment will be the mechanism used to identify watershed issues and concerns. These issues may be known upfront or may be identified during the assessment and may be ecological, non-forestry related or hydro-climatic.

The FMP Plan Development Team (PDT) will consult with Forest Hydrology Specialists and Fisheries Biologists to determine the watershed values, non-forestry hazards and opportunities and watershed characteristics specific to the Defined Forest Area.

The Forest Hydrology Specialists will help to determine the scale of assessment that is required (i.e.: 1st, 2nd, and 3rd or higher order streams), the specific model or data to be used during the assessment and tactical mitigation measures that could be implemented to reduce impacts to watershed values.

4.1 Identification of Watershed Values

As defined in the Alberta Forest Planning Standard watershed values to be protected may include but not limited to:

- Drinking water
- Fisheries
- Wildlife habitat
- Infrastructure
- Recreation
- Social, cultural values, aesthetics, etc

Threshold values will be set to evaluate management activities in the watershed. Public input will be crucial at this stage.

4.2 Identification of non-forestry hazards and opportunities

Hazards may impact on watershed values. Non-forestry hazard identification will have to be within regional management priorities as identified in the land use framework. For example

- Resource management issues (eg fish habitat/migration)
- Community needs eg recreation
- Water quality impairment in streams
- Landscape management issues
- Project specific opportunities eg MPB threat reduction

At this stage reference may be made to any previous resource management plans as well as monitoring and research results.

4.3 Identification of watershed characteristics

Watershed characteristics are those physical and geo-climatic features of a watershed that distinguish it from any other watershed. The purpose of this identification is to document the current or reference condition of the watershed, and identify the most vulnerable

hydro-climatic processes and physical characteristics of the watershed. This includes data collection and analysis to determine:

- Magnitude and timing of peak flows
- Magnitude and timing of low flows
- Groundwater discharge/recharge areas (eg changes in infiltration rates)
- Evapotranspiration
- Water quality
- Stream channel characteristics (eg channel habitat type)
- Physical characteristics of the watershed. (eg elevation, steep slopes, surficial geology, erosion and sediment hazard)
- Location and types of potential impacts.

5.0 Determining Watersheds and Thresholds

5.1 Watershed size and location

The watershed classification system to be used is based on the Strahler stream ordering system and administrative units. The watershed sizes will be determined based on the values identified as sensitive to changes in the flow regime. Some general guidelines are that watersheds should be:

1. 2nd, 3rd or 4th order streams
2. Minimum of 500 ha if sensitive values are present, otherwise a minimum of 1,000 ha
3. Maximum of 10,000 ha.

5.2 Setting ECA Thresholds

To minimize the number of watersheds that have to be assessed in detail (Level 2), a two step process is suggested. First, a Level 1 assessment will set initial thresholds and identify activities of low risk. Second, Level 2 assessment of watersheds identified with values at high risk will refine the results of the Level 1 assessment. This step will require more data and the input of the specialists to determine the sensitivity of the values to proposed ECA and other hazards. For instance:

1) the stream geomorphology may be stable and can withstand higher levels of disturbances and the hazard thresholds could be modified to accommodate, or
2) the expected impact of the disturbance on the flow regime may be less than the initial value and warrant a higher hazard threshold.

The Level 2 assessment will take into account these factors to refine the risk assessment. Modelling tools or site visits might be appropriate.

6.0 Calculation of Watershed value risk

6.1 Calculation of Hazard: Equivalent Clearcut Area (ECA)

This Equivalent Clearcut Area (ECA) method accounts for the recovery of the hydrological processes by reducing the contribution of recovering stands to the total area disturbed (see equations [1] and [2]). This process equates all the forest disturbances to a new clearcut (ha). For example, a 100 ha 20 yr-old stand may be assumed to be

equivalent to an 80 ha new clearcut (0 yrs-old). The equivalent areas are summed up and expressed as a percentage of the watershed area, see equation [3].

Forest hydrology research results are of forestry activities before stands have recovered. By equating all the disturbances to new clearcuts the ECA indicator can be compared to experimental and model results to determine possible hydrological effects (eg changes to flow regime)

6.2 Calculation of the Stand ECA

Stand recovery can be accounted for in several ways, two common methods are Basal Area and Stand Height approaches. The relevant relationships are presented in equations [1] to [2] as follows:

1) Stand Basal Area

$$ECA_s = \frac{BA_A}{BA_{max}} A_s \qquad [1]$$

Where:

ECA_s is the ECA of the stand,
BA_A is the basal area of the stand at the age of interest,
BA_{max} is the maximum basal area that the site can sustain, and
A_s is the area of the stand (ha)

2) Stand Height

$$ECA_s = \frac{Ht_A}{Ht_{max}} A_s \qquad [2]$$

Where:

Ht_A is the height of the stand at the age of interest,
Ht_{max} is the height of the stand when it is assumed to be fully recovered (9 m or 5 m has been used in plans).
A_s is the area of the stand (ha)

6.3 Calculation of the Watershed ECA

Rainfall or rain-on-snow dominated flow regimes

For flow regimes that are dominated by rain events, watershed ECA is expressed as a percentage.

$$ECA_W = \frac{\sum_{s}^{S} ECA_i}{A_W} \qquad [3]$$

Where:

ECA_W is the Equivalent Clearcut Area of a watershed, and
A_W is area of the watershed. Note here the entire area of the watershed is used.

Snowmelt dominated flow regimes

In snowmelt dominated areas the snowmelt may provide the majority of the water to the spring freshet. In these areas, it is often assumed that only the upper portion of the watersheds can contribute to the peak flows. The area above the H60 is often used to identify this area. H60 is the elevation above which 60% of the watershed area lies. In this case:

$$ECA_W = \frac{\sum_{s}^{S} ECA_i}{A_{H60}} \qquad [3]$$

Where:

ECA_W is the Equivalent Clearcut Area of a watershed, and
A_{H60} is area of the watershed above H60

6.4 Determination of Watershed value Risk

The sensitivity of the watershed to disturbance is based on the values to be protected and non-forestry hazards identified. Three levels of sensitivity are suggested: low, medium and high. Along with the hazrad levels determined based on the calculated ECA, a decision matrix can be drawn as shown:

Table 1. Risk assessment matrices.

		Hazard (ECA thresholds from Figure 1)		
		Low	Medium	High
Sensitivity (based on watershed values and stream sensitivity)	Low	1	1	2
	Medium	1	2	3
	High	2	3	3

1: Low Risk
2: Medium Risk
3: High Risk
See Figure 4 for flow chart of how to deal with Risk levels:

7.0 Strategies to mitigate high risks

High risk mitigation measures may be applied at the operational or tactical level.

7.1 Forest Management Plan mitigation measures

These may include but not limited to:

Review of Spatial Harvest Sequence.

There are two ways to approach the risk mitigation:

1) Focus harvesting in one watershed over a short period of time. This will pose a significant risk for a short time, as a result of the vegetation removal. However, this method has the advantage of reducing the amount of active forest roads. Once the regenerating stands have recovered the hydrological risk there will likely be a long period of lower risk. This approach may be appropriate to deal with potential forest health issues such as Mountain Pine Beetle, or in areas with few added pressures on the water values (eg invasive species, human water use, etc)
2) Plan for multiple smaller entrances in to a watershed. This will reduce the risk from timber removal, but may increase the risk of forest health and the amount of active forest road.

Road location and Road Planning

1) Minimization of road network and stream crossing density.
2) Minimise roads in sensitive areas and erodible soils.
3) Adequate cross drain structure and erosion / sediment transport controls.
4) Reclamation of roads immediately upon completion of related harvest activities.
5) Use of bridges to cross fish-bearing streams (or minimally culvert crossing structures designed to ensure effective fish passage for all fish species and life stages present and minimal to no sediment deposition.
6) Access management (e.g. gated roads) to not increase angler access to fish-bearing waters.

Harvesting considerations

1) Location of harvesting operations (eg avoidance of steep slopes, fish-bearing streams, etc)
2) Additional retention, especially along riparian areas.

Monitoring

1) Commit to a monitoring program to test if assumptions are valid and the identified risks are being adequately managed (includes monitoring of stream crossings, water quality and fish).

Restoration

Restoration of features that will improve watershed values may include

1) stream banks,
2) riparian vegetation, or
3) stream crossings posing sedimentation or stream crossing problems.

7.2 Annual Operating Plan mitigation measures

These may include but not limited to

Timing of harvesting

Glossary

Aboriginal
Aboriginal peoples of Canada' [which] includes Indian, Inuit, and Métis peoples of Canada (Constitution Act, 1982, Subsection 35 (2)

Annual Allowable Cut
The volume of wood (m^3) that can be harvested in one year from any area of forest under a sustained yield management regime. It is a calculation based on the potential fertility of the site, the state and potential of the stands currently growing in the forest, and assumptions about how existing or anticipated future stands will continue to grow, the risks of loss, and constraints on operability.

Adaptive management
A learning approach to management that recognizes substantial uncertainties in managing forests and incorporates into decisions experience gained from the results of previous actions.

Alberta Vegetation Inventory
A system for describing the quantity and quality of vegetation present. It involves the stratification and mapping of the vegetation to create digital data according to the AVI Standards Manual and associated volume tables.

Anthropogenic
Made or induced by humans

Annual Operating Plan
A plan prepared and submitted annually by timber operators describing how, where and when to develop roads and harvest timber. It describes the integration of operations with other resource users, the mitigation of the impacts of logging, the reclamation of disturbed sites and the reforestation of harvested sites.

At Risk
Any species known to be 'At Risk' after formal detailed status assessment and designation as 'Endangered' or 'Threatened'

Coarse woody debris
Sound or rotting logs, stumps, or large branches that have fallen or been cut and left in the woods. It also includes trees and branches that are dead but remain standing or leaning.

Compartment Assessment
Compartment assessment is necessary when major issues or information that has been identified since the forest management plan approval make the spatial harvest sequence inappropriate. (E.g. forest fire, insect and disease, species of special concern, a major change in land use direction or an unacceptable variance of >20% of the spatial harvest sequence).

Compliance
The conduct or results of activities in accordance with legal requirements

Conformance
Meeting non-legal requirements such as policies, work instructions, or standards (including CSA-Z809-08)

Criterion
A distinguishable characteristic of sustainable forest management; a value that must be considered in setting objectives and in assessing performance

Defined Forest Area
A specified area of forest, land, and water delineated for the purpose of registration of a Sustainable Forest Management system. The DFA may or may not consist of one or more contiguous blocks or parcels (CSA. 2008).

Deciduous Timber Allocation
A deciduous timber allocation (DTA) allocates rights to harvest deciduous trees such as aspen and balsam poplar. A DTA allocates a specified volume of deciduous timber or a specific area of deciduous timber that the quota holder may harvest

Dispersed Retention
System retains individual trees within the cutblock for the purpose of maintaining or protecting environmental values and structural diversity

Edge effect
Edge metrics are not spatially explicit and yet still represent a form of landscape configuration. Researchers have shown that edges are important to many ecological phenomena. Edges between forests of dramatically different structure or composition often have different microclimatic environments than interior habitats. These microclimatic differences, such as changes in wind and light intensity alter disturbance rates and vegetation composition and structure, and thus alter habitats and the dynamics of species that are dependent on these habitats. Some species prefer edge habitats; others are indifferent while still others are adversely affected by edges.

Endangered
A species facing imminent extirpation or extinction

Environmental Management System
An Environmental Management System (EMS) is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency.

Endangered Species Conservation Committee
Alberta's Endangered Species Conservation Committee advises the Minister of Sustainable Resource Development on matters relating to the identification, conservation and recovery of wild species at risk in Alberta. These principles are important in a provincial and federal context.

Endemic
Native; indigenous; not introduced and often with geographic range.

Equivalent Clearcut Area
Refers to an area that has been harvested, cleared or burned. The ECA index, expressed as a percentage, describes an area of regenerated growth in terms of its hydrological equivalence to a clearcut. As the area regenerates and growth develops, the hydrological impact is reduced. ECA is a primary factor considered in an evaluation of the potential effect of past and proposed forest harvesting on water yield. ECA is expressed as a percent of watershed area.

Forest Ecosystem

A forest ecosystem is a terrestrial unit of living organisms (plants, animals and microorganisms), all interacting among themselves and with the environment (soil, climate, water and light) in which they live. The environmental "common denominator" of that forest ecological community is a tree, who most faithfully obeys the ecological cycles of energy, water, carbon and nutrients.

Final Harvest Plan
A map and associated report describing the laid out harvest plan as required by the Operating Ground Rules (ESRD. 2011)

Forest Management Agreement
A legal agreement signed between the Company and the Province of Alberta. It defines the rights, responsibilities, and constraints that apply to a specified area of forest for the purpose of removing timber for commercial purposes. The forested area to which the agreement applies is called the “FMA area.” Canfor’s FMA area is identified as Forest Management Unit G15.

Forest Management Unit
An area of forest managed as a unit for fibre production.

General Development Plan
A five year plan submitted annually to the Province

Historical Resource
Any work of nature or of man that is primarily of value for its paleontological, archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest including, but not limited to, a paleontological, archaeological, prehistoric, historic or natural site, structure or object.

Historic Site
Any site which includes or is comprised of an historical resource of an immovable nature or which cannot be disassociated from its context without destroying some or all of its value as an historical resource and includes a prehistoric, historic or natural site or structure.

Indicator
A variable that measures or describes the state or condition of a value (CSA, 2008)

Land Use Framework
Provincial process for higher level land use plans

License of Occupation
A Provincial disposition given to companies to build and maintain roads

Light Detection and Ranging
An optical remote sensing technology that can measure the distance to, or other properties of a target by illuminating the target with light, often using pulses from a laser. LIDAR technology has application in geomatics, archaeology, geography, geology, geomorphology, seismology, forestry, remote sensing and atmospheric physics, as well as in airborne laser swath mapping (ALSM), laser altimetry and LIDAR contour mapping.

Machine Free Zone
The area protected from machinery that would cause soil damage.

Netdown (procedure)
The process of identifying the net land base, which is the number of hectares of forestland that actually contribute to the allowable annual cut. Areas and/ or volumes are sequentially deleted or reduced from the gross land base for a number of considerations, including private ownership, non-forest or non-productive, environmentally sensitive, unmerchantable, and inaccessible.

Noxious weed
A plant under the Weed Regulation (AR 171/2001) of the Weed Control Act.

Objective
A broad statement describing a desired future state or condition for a value. (CSA. 2008)

Operating Ground Rules:
Standards for operational planning and field practices that must be measurable and auditable and based on forest management plan objectives.

Patch
A specific area wherein relatively homogeneous environmental conditions occur. Boundaries are defined by measurable changes in one or several environmental variables.

Plan Development Team
A team of industry and government staff assigned the responsibility of completing a Forest Management Plan

Preferred Forest Management Scenario
The timber supply scenario and associated cover constraints and schedules that best meet the FMP objectives.

Reforestation
The action of renewing forest cover (as by natural seeding or by the artificial planting or seeds or young trees (seedlings)).

Seral stage
The series of plant community conditions that develop during ecological succession from bare ground (or major disturbances) to the potential plant community capable of existing on a site where stand replacement begin and the secondary successional process starts again.

Slump
A form of mass wasting event that occurs when loosely consolidated materials or rock layers move a short distance.

Spatial Harvest Sequence
A stand level map depicting forest stands scheduled for timber harvesting that are feasible to be operated by the organization by the organization. SHSs are generally prepared for 20 years.

Sustainable Forest Management System
The structure, responsibilities, practices, procedures, processes, and timeframes set by a registration applicant for implementing, maintaining, and improving sustainable forest management.

Sustained yield of timber
A forest management regime that involves more or less continuous harvesting, balanced by growth, over managed forest units

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 (CSA. 2008)

Threatened
Any species likely to become endangered if limiting factors are not reversed.

Value
A DFA characteristic, component or quality considered by an interested party to be important in relation to a CSA SFM Element or other locally identified element. (CSA, 2008)

Water Quality Concern Rating
A ranking system developed by P Beaudry & Associates Ltd. based on the concept that the impact of stream crossings on water quality can be reduced through effective erosion and sediment control practices, and that this can be evaluated and scored using a field-based assessment.

Acronyms

AAC: Annual Allowable Cut
ACIMS: Alberta Conservation Information Management System
ESRD: Alberta, Environment and Sustainable Resource Development
AFMPS: Alberta Forest Management Planning Standard
AOP: Annual Operating Plan
APOS: Alberta Professional Outfitters Society
ASL: Above Sea Level
AVI: Alberta Vegetation Inventory
AWN: Aseniwuche Winewak Nation of Canada
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
CSA: Canadian Standards Association
CWD: Coarse woody debris
DFA: Defined Forest Area
DTA: Deciduous Timber Allocation
EMS: Environmental Management System
ESCC: Endangered Species Conservation Committee
FGRMS: Forest Genetics Resources Management System
FHP: Final Harvest Plan
FLMF: Foothills Landscape Management Forum
FMA: Forest Management Agreement
FMAC: Forest Management Advisory Committee
FMU: Forest Management Unit
GDP: General Development Plan
ISO: International Standards Organization
LOC: License of Occupation
LUF: Land Use Framework
MFZ: Machine free zone
MPB: Mountain Pine Beetle
OSB: Oriented Strand Board
PAG: Public Advisory Group
PDT: Plan Development Team
PFMS: Preferred Forest Management Strategies
SARA: Species at Risk Act
SFM: Sustainable Forest Management
SFMS: Sustainable Forest Management System
SFMP: Sustainable Forest Management Plan
SHS: Spatial Harvest Sequence
TOR: Terms of Reference
TSA: Timber Supply Analysis
VOIT: Value, Objective, Indicator and Target