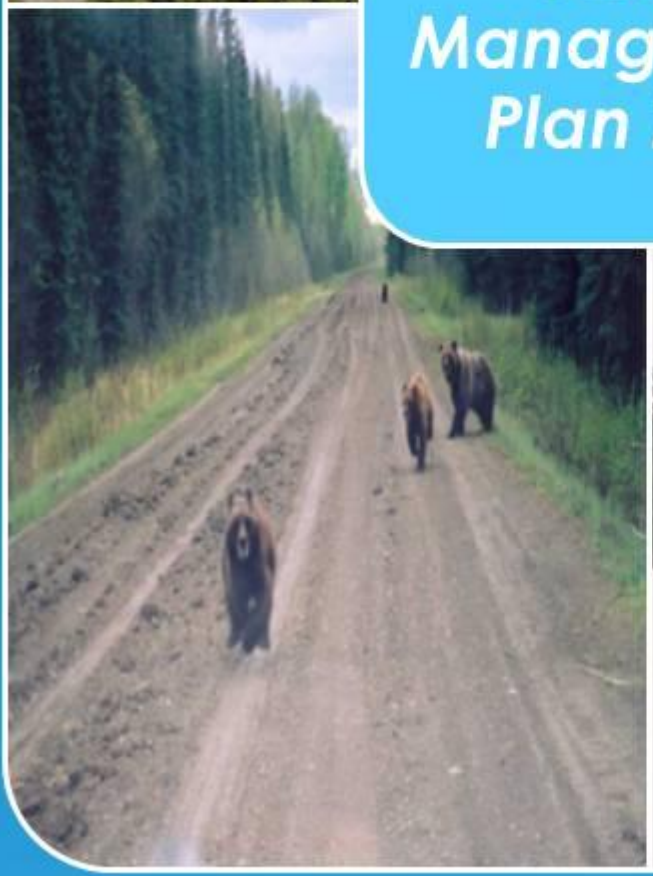
Sustainable Forest Management Plan 2012



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Sustainable Forest Management Plan 2012

Revised: April 2014

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 14001 certification and through implementation of the 2005 Sustainable Forest Management Plan for the Grande Prairie Defined Forest Area in the preparation of the 2012 Sustainable Forest Management Plan. 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 Sustainable Forest Management Plan in conformance with the Canadian Standards Association CAN/ CSA Z809-08 Sustainable Forest Management system standard.

Executive Summary

This Sustainable Forest Management Plan is the third iteration for the Canfor – Grande Prairie Forest Management Agreement area (Alberta. 1999). The first Sustainable Forest Management Plan was completed in 2000, and a second was completed in 2005.

The Forest Management Advisory Committee 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 Sustainable Forest Management Plan by Forest Management Advisory Committee occurred between May 19th, 2010 and September 21st, 2011. Members of Forest Management Advisory Committee 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 Sustainable Forest Management Plan includes a set of values, objectives, indicators and targets that address environmental, economic and social aspects of forest management within the Defined Forest Area. The plan conforms to the Canadian Standards Association CAN/CSA Z809-08 Sustainable Forest Management Standard, which is one of the primary certification systems applied in Canada. A Sustainable Forest Management Plan developed in conformance with the CAN/CSA Z809-08 SFM Standard applies performance objectives and targets over a Defined Forest Area that reflect local and regional interests. Consistent with most certification systems, and as a minimum starting point, the Canadian Standards Association standard requires compliance with existing forest policies, laws and regulations. The Canfor Alberta Sustainable Forest Management Plan has undergone substantive evaluation prompted by improvements to the Canadian Standards Association SFM Standard, initially in 2000 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 Canadian Standards Association SFM standard, the Canfor Alberta Sustainable Forest Management Plan is a dynamic document that is reviewed and revised on an annual basis by Canfor with advice from Forest Management Advisory Committee to address changes in forest conditions and local community values. Canfor is committed to the achievement of the objectives of the Sustainable Forest Management Plan. Each year the Forest Management Advisory Committee 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 Sustainable Forest Management Plan.

Development of the values, objectives, indicators and targets (Appendix 2) for the 2012 Sustainable Forest Management Plan 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* values, objectives, indicators and targets (Appendix 4) ; and

- The Canfor Grande Prairie 2005 Sustainable Forest Management Plan values, objectives, indicators and targets prepared under the CAN/CSA Z809-02 Standard.

The Canfor Grande Prairie 2005 Sustainable Forest Management Plan values, objectives, indicators and targets were included in recognition of the significant contributions made by Forest Management Advisory Committee to their development and Forest Management Advisory Committee members' continuing interest in them.

The resulting product was four sets of values, objectives, indicators and targets, which were subsequently compared to determine where they were aligned and where they were unique. This comparison led Canfor to make recommendations to Forest Management Advisory Committee regarding abandonment of values, objectives, indicators and targets from the 2005 Sustainable Forest Management Plan that were either no longer applicable or redundant. Following Forest Management Advisory Committee's review and acceptance of the recommendations, the remaining values, objectives, indicators and targets were then refined and incorporated into this Sustainable Forest Management Plan.

A facilitator, "Management Plus Communications Ltd." represented by Gail Wallin worked with Forest Management Advisory Committee during 6 sessions to develop the values, objectives, indicators and targets in this document.

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

Active forest tenure holders[1] in the Defined Forest Area working in consultation with Forest Management Advisory Committee, developed and are maintaining and continuously improving the Defined Forest Area Sustainable Forest Management Plan based on the CSA Z809-08 standard. The plan was written to provide management direction on all forestland within the Defined Forest Area.

Canfor – Alberta has been working responsibly with the public to develop credible Sustainable Forest Management Plans 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 Sustainable Forest Management Plan is an example of the commitment of Canfor and other forest companies to adapt their management practices to changes in societal values.

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

An important pillar of the Sustainable Forest Management Plan 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 Forest Management Advisory Committee 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 Defined Forest Area certification process, Sustainable Forest Management Planning, public involvement, annual reporting and the Canfor Forest Management Agreement area can be obtained at the Canfor office in Grande Prairie.

[1] 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 Sustainable Forest Management Plan has been prepared in conformance with several core principles, which guide forest management decisions on the Defined Forest Area.

- Recognition that Aboriginal Groups people have constitutionally protected rights including specific Treaty rights to hunt, fish and trap for food on the Defined Forest Area. 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 Defined Forest Area, 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.

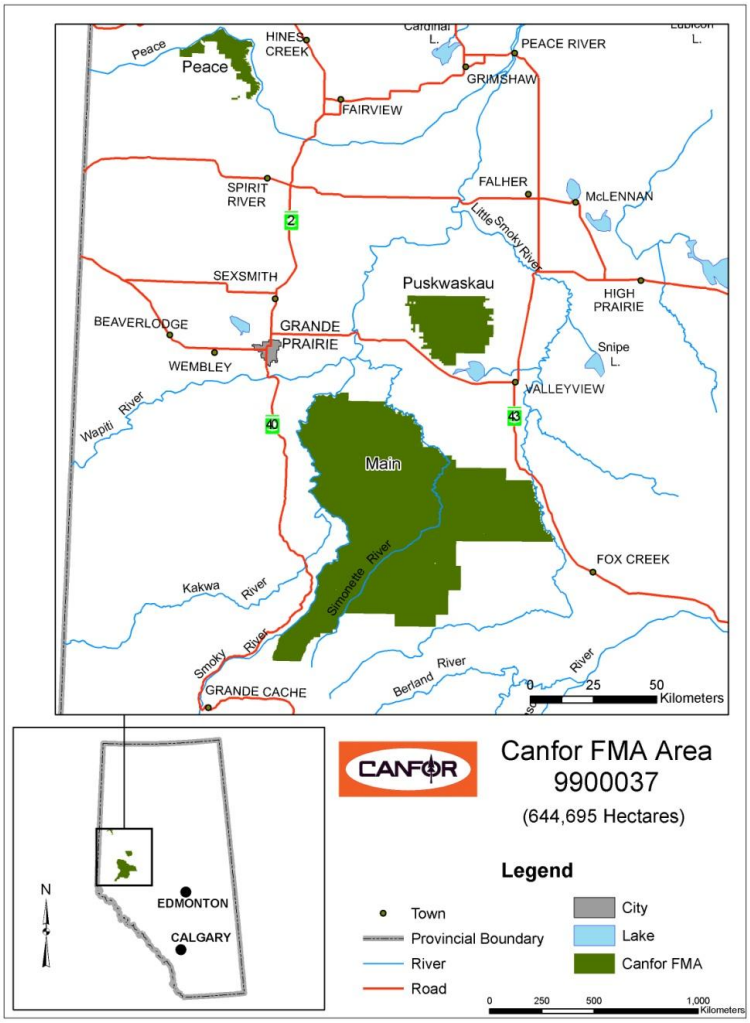
3.0 The Defined Forest Area

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 Forest Management Agreement 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 Forest Management Agreement area 900037



3.1.2 Communities

Local Communities

There are no communities within the boundaries of the Defined Forest Area, although there are several in the vicinity. The central community in proximity to the Defined Forest Area is the City of Grande Prairie, with a population over fifty thousand. Several smaller communities are also located within fifty kilometres of the Defined Forest Area 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 Defined Forest Area 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 parcel of the Defined Forest Area. Many of the traplines in the main and the Puskwaskau parcels of the Defined Forest Area are registered to members of this community. Horse Lake First Nation is located west of Beaverlodge. The community is located further from the Defined Forest Area than Sturgeon Lake but Horse Lake members use parts of the Defined Forest Area for traditional activities.

Aseniwuche Winewak Nation of Canada was formalized in September 1994 with the amalgamation of the six Aboriginal settlements surrounding the town of Grande Cache. The members of Aseniwuche Winewak Nation of Canada 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. Aseniwuche Winewak Nation of Canada has formally claimed traditional area within west central Alberta, including portions of the southern Defined Forest Area 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 Forest Management Agreement area, 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 Defined Forest Area 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 a Forest Management Agreement area generally west of the Canfor's Forest Management Agreement area. Ainsworth Engineered Canada LP operates an

Oriented Strand Board mill located 17 kilometers south of Grande Prairie. Wood supply for the Oriented Strand Board plant is sourced from the Canfor and Weyerhaeuser Forest Management Agreement areas, along with purchases from private land. Tolko Industries Ltd. owns an Oriented Strand Board mill located in High Prairie with some of the fibre supply for the plant secured from the Canfor Forest Management Agreement 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

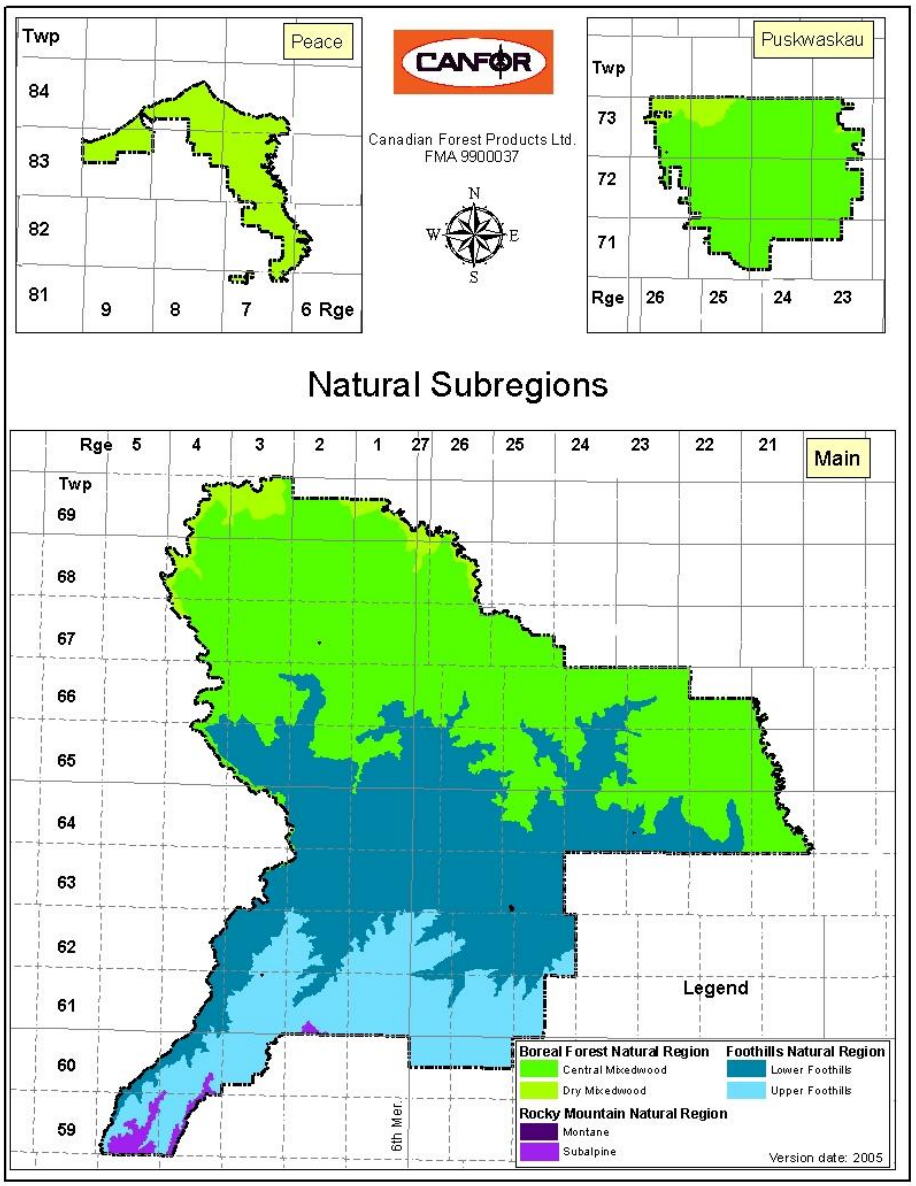
The Forest Management Agreement area is located in the Central Mixedwood, Dry Mixedwood, Lower and Upper Foothills and Subalpine Natural Subregions[2] (Figure 2) as described by Achuff (Achuff. 1996).

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 engelmannii*) 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).

[2] 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



3.1.5 Species at Risk

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

Federally, species protected under Species at Risk Act are determined by the Committee on the Status of Endangered Wildlife in Canada comprised of an independent body of experts responsible for assessing and identifying species at risk. Committee on the Status of Endangered Wildlife in Canada assesses and classifies a wildlife species as extinct; extirpated; endangered; threatened; special concern; data deficient or not at risk. Committee on the Status of Endangered Wildlife in Canada provides its report to the Minister of the Environment and the Canadian Endangered Species Conservation Council. The Species at Risk Act legislation covers federal lands such as national parks and Aboriginal Groups Reserves. Therefore, the impact on the Defined Forest Area 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 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 Endangered Species Conservation Committee 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 Endangered Species Conservation Committee, 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 value, objective, indicator and target 1.2, the Planning Development Team identifies the species that will require specific management strategies in the Forest Management Plan. In this plan, the Plan Development Team 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 Sustainable Forest Management Plan. These strategies are outlined in the description of values, objectives, indicators and targets listed in Section 7 of this document.

3.1.6 Defined Forest Area Use

The resources of the Defined Forest Area 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 Deciduous Timber Allocations that issues rights to harvest deciduous species in the Forest Management Agreement area. Table 1 provides a breakdown of the deciduous allocations by quadrants.

Table 1. Deciduous Timber Allocations (m^3/year) within the Forest Management Agreement 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

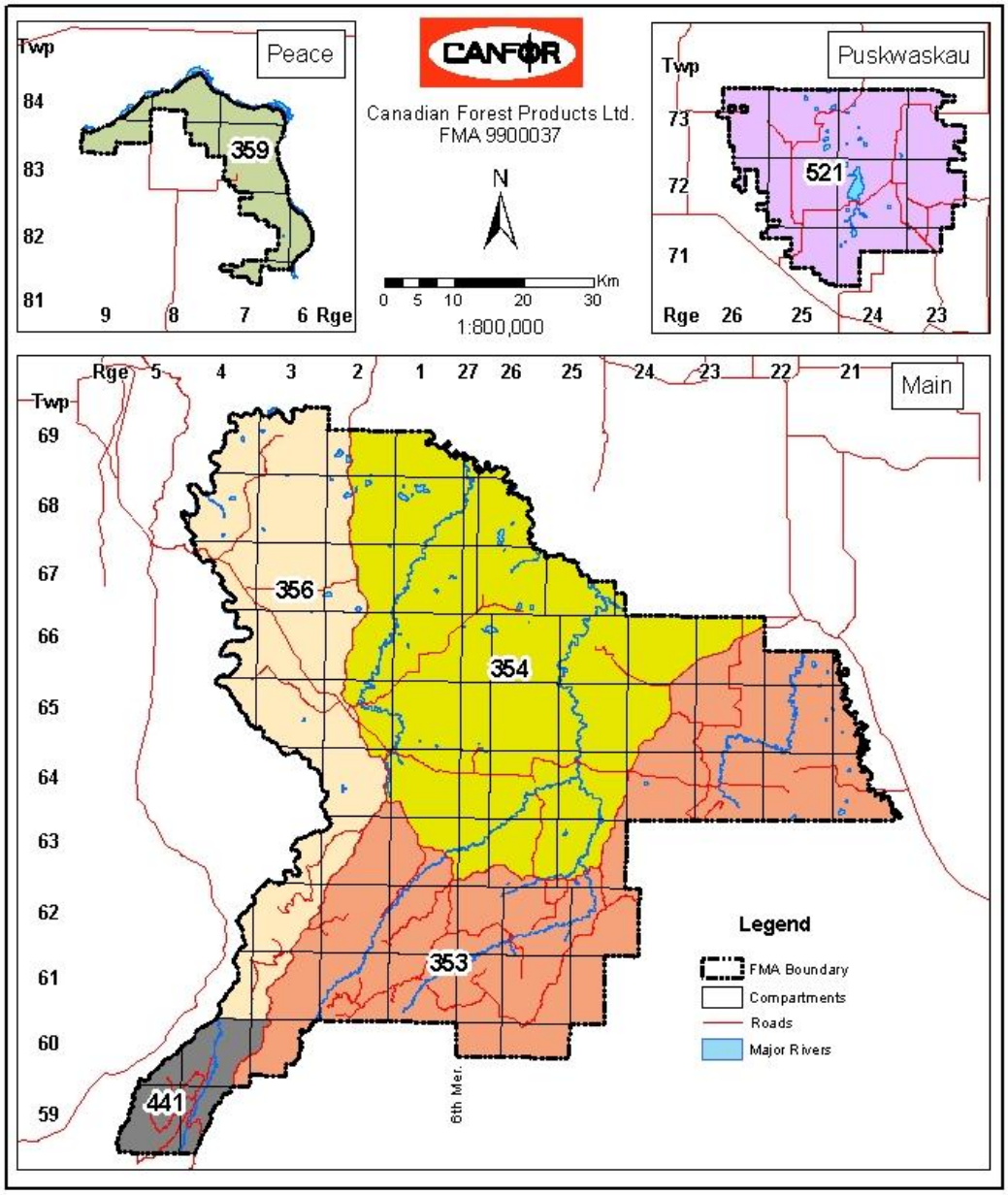
3.1.6.2 Oil and Gas Sector

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

Figure 3: Wildlife Management Units



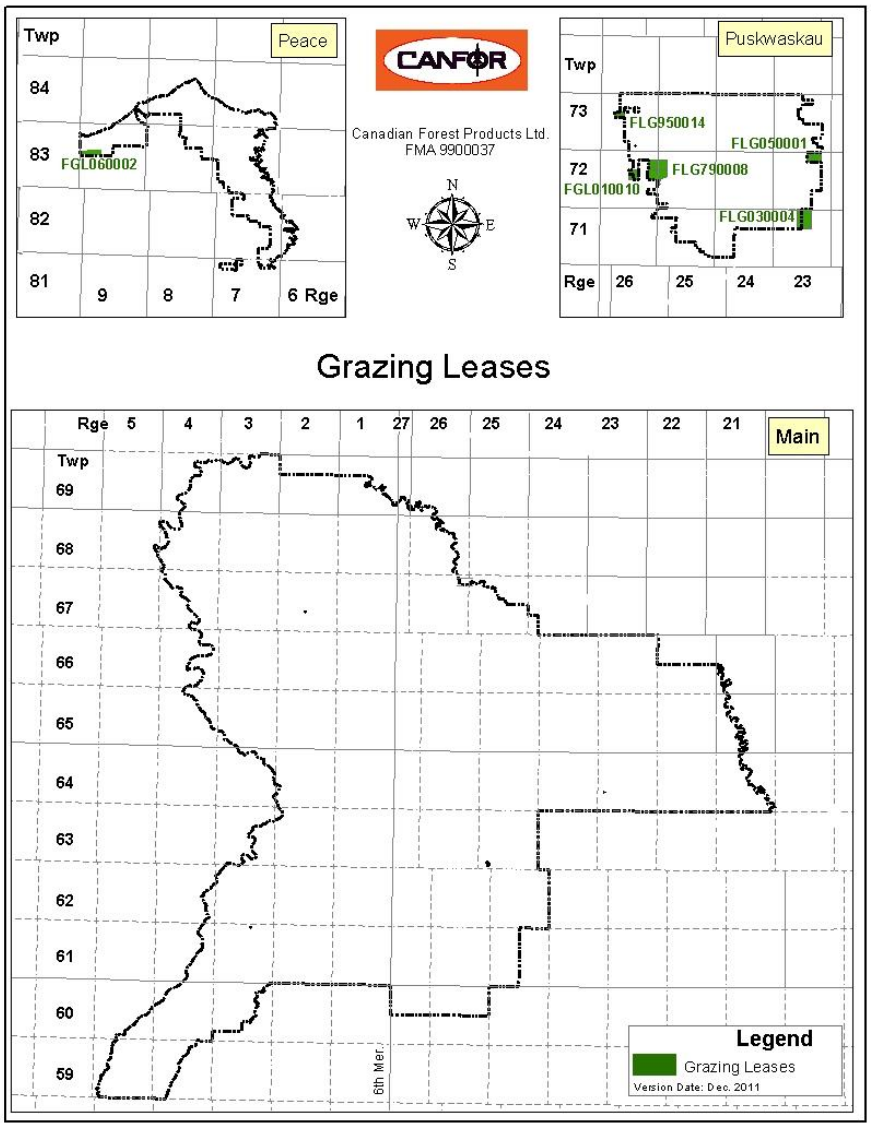
3.1.6.4 Grazing Dispositions

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, covering approximately 1,470 ha, within the Defined Forest Area (Figure 4)

In accordance with subparagraph 8(2) (d) of Forest Management Agreement area Agreement 9900037:

…"after consultation with the Company, the Crown retains the right to authorize grazing dispositions within the Forest Management Agreement 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."

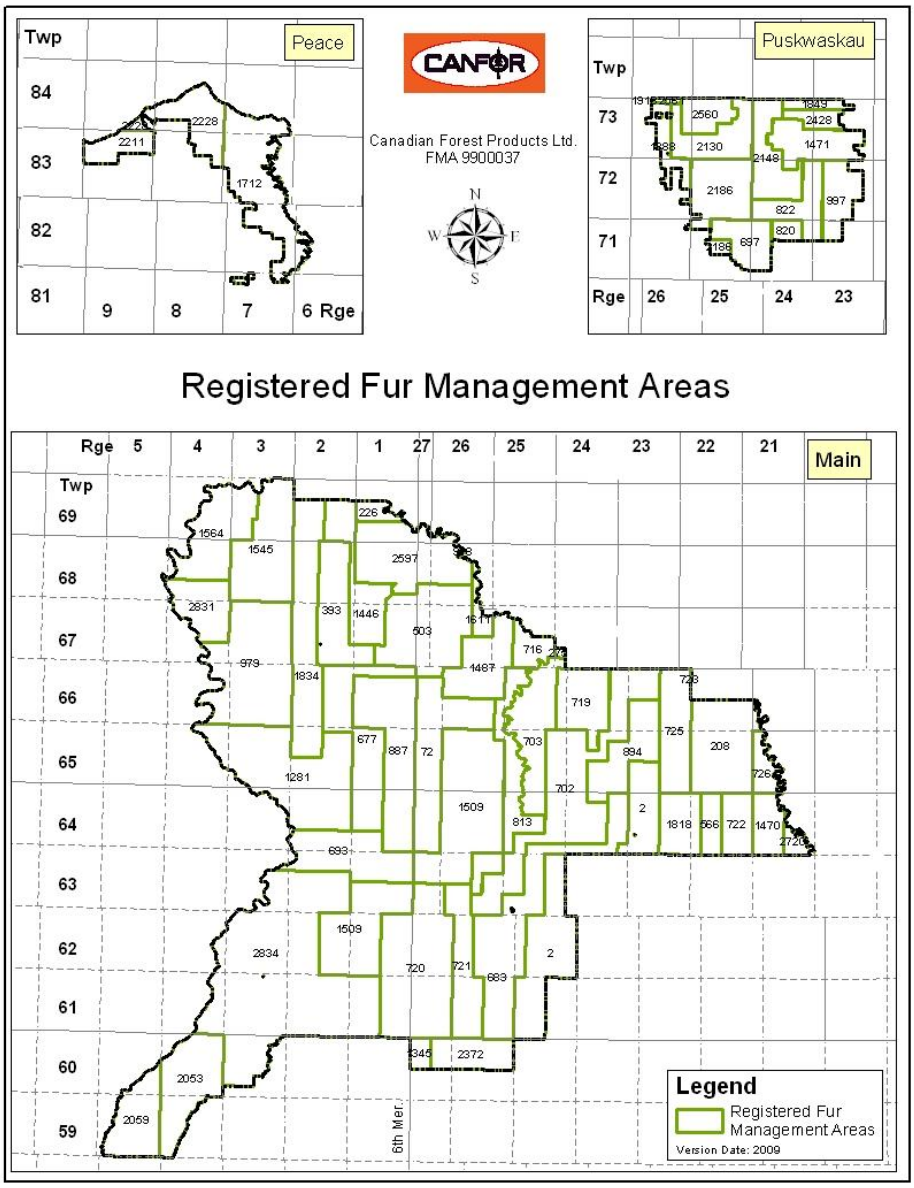
Figure 4: Grazing Dispositions within the Forest Management Agreement area



3.1.6.5 Registered Fur Management Areas

There are 59 registered fur management areas within the Defined Forest Area (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 are notified prior to the commencement of operations.

Figure 5: Registered Fur Management Areas



3.1.6.6 General Public

The public uses the Defined Forest Area 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, *Dendroctonus ponderosae* Hopkins (Coleoptera: Scolytidae) is severely impacting lodgepole pine stands on the Defined Forest Area. Mountain pine beetle 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

Mountain pine beetle are present throughout the Defined Forest Area, 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. Environment and Sustainable Resource Development 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 mountain pine beetle 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 Environment and Sustainable Resource Development 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 Environment and Sustainable Resource Development for approval on April 30, 2009 and approval was received January 22, 2010. Approval of the plan included uplift in the Coniferous Annual Allowable Cut from 640,000 m^3/year to 715,000 m^3/year, effective May 1, 2009.

Management strategies applied on the Defined Forest Area 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 data has been updated, susceptible stands have been identified, current mountain pine beetle attack has been mapped and forecasts of future attack levels and intensities have been developed. This data, along with the mountain pine beetle strategy were all factored into the annual allowable cut determination for the Defined Forest Area.

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 mountain pine beetle 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.

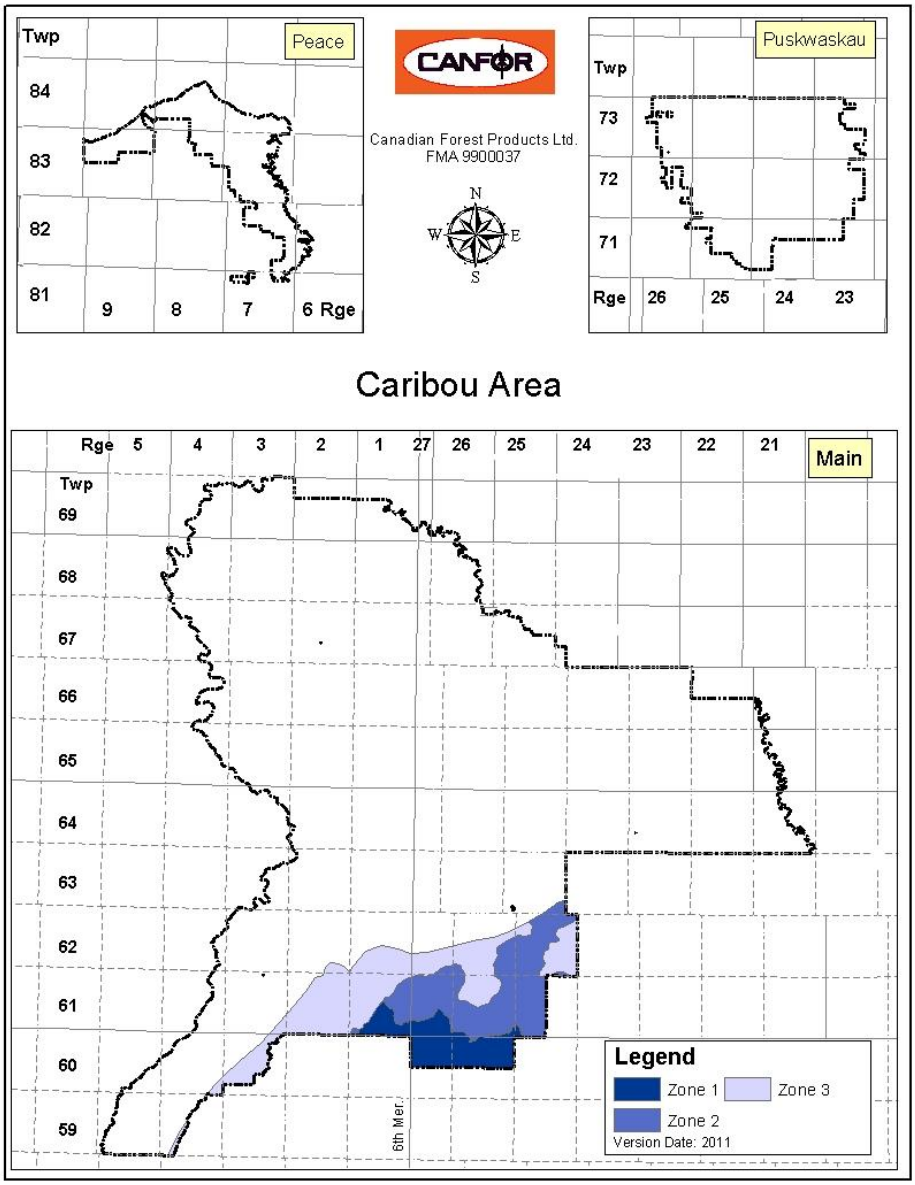
As the impacts to the Sustainable Forest Management Plan from the mountain pine beetle are better understood, further refinements to this plan may be required.

3.3 Woodland Caribou

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

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 . 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 Canadian Standards Association Certification Process

The Canadian Standards Association Sustainable Forest Management 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 Canadian Standards Association standard expects compliance with existing forest policies, laws and regulations.[3]

Participants under the Canadian Standards Association 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 Canadian Standards Association standard must incorporate Canadian Standards Association defined systems components into an internal environmental management system (Sec 4.1.2 following).

For a tenure holder seeking certification to the Canadian Standards Association Sustainable Forest Management standard, the Defined Forest Area Sustainable Forest Management Plan or a licensee-specific plan, complimentary to the Defined Forest Area Sustainable Forest Management Plan, is developed. The licensee-specific plans may contain additional information such as their Defined Forest Area and internal means to monitor and measure the Defined Forest Area Sustainable Forest Management Plan components.

Applicants seeking registration to the Canadian Standards Association 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 Canadian Standards Association registration process are as follows.

4.1.1 Public/Aboriginal Involvement: Performance Requirements & Measures

The Canadian Standards Association 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.

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

Each of these criteria has a number of "elements" that further define the criteria. The criteria and associated elements are all defined under the Canadian Standards Association standard and must be addressed during development of the Sustainable Forest Management Plan. The criteria are endorsed by the Canadian Council of Forest Ministers and are aligned with international criteria. New to the Canadian Standards Association Standard (Z809-08 version) is the requirement to carry out specific discussion on selected forest management topics during the public participation process. Also new are the requirements for the Sustainable Forest Management Plan 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 Sustainable Forest Management Plan. There must be at least one indicator for each element and associated value. Core indicators have been included in the Canadian Standards Association standard for nearly all elements. Additionally, local indicators can be added to the Sustainable Forest Management Plan.

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 Sustainable Forest Management Plan for the Defined Forest Area, 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 Forest Management Advisory Committee 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 Sustainable Forest Management Plan 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 Sustainable Forest Management Plan performance measures. This annual report is provided to the Forest Management Advisory Committee for review and comment. Annual monitoring of achievements against performance measures, and comparison of the actual results to forecasts, enables the Sustainable Forest Management Plan to be continually improved. Continuous improvement is mandated by the Canadian Standards Association standard.

For a forest tenure holder registered to the Canadian Standards Association 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 Sustainable Forest Management Plan and continues to meet the Canadian Standards Association Standard. Audit summaries are available to the public.

4.1.3 Internal Infrastructure: Systems Components

The Canadian Standards Association Sustainable Forest Management 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. Systems components include:

- **Commitment:** A demonstrated commitment to developing and implementing the Sustainable Forest Management Plan.
- **Public and Aboriginal Groups participation:** The Canadian Standards Association standard requires informed, inclusive and fair consultation with Aboriginal Groups and members of the public during the development and implementation of the Sustainable Forest Management Plan.
- **Canadian Standards Association-aligned management system:** The management system is an integral part of implementation of the Sustainable Forest Management Plan and is designed to meet Canadian Standards Association 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 Forest Management System, the effectiveness of the Sustainable Forest Management Plan is to continually improve 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 Canadian Standards Association Registration

Following completion of a sustainable forest management plan and the development of an environmental management system in accordance with the Canadian Standards Association standard, a licensee may apply for registration of its Defined Forest Area. The determination of whether all the components of a Sustainable Forest Management system applied to a Defined Forest Area are in place and functional involves an on-the-ground audit of the Defined Forest

Area 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 Defined Forest Area are being achieved. The registration of a licensee's Defined Forest Area follows a successful registration audit by an eligible independent third party auditor who has assessed and determined:

- an Sustainable Forest Management Plan, that meets the Canadian Standards Association 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;
- a Forest Management System has been developed and is being used to manage and direct achievement of the Sustainable Forest Management Plan performance measures; and
- progress toward achieving the targets is being monitored, and monitoring results are being used for continual improvement of the Sustainable Forest Management Plan 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 Canadian Standards Association performance measures;
- meetings with government officials to discuss licensee performance and government involvement in development of the Sustainable Forest Management Plan;
- 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 Canfor's Forest Management System, including the requirement that regulatory standards and policy requirements are met or exceeded.

4.2 The Defined Forest Area Sustainable Forest Management Planning Process

The Sustainable Forest Management Plan was developed by Canfor Alberta on advice and recommendations provided by the Forest Management Advisory Committee. 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

Forest Management Advisory Committee assisted Canfor Alberta in developing the Sustainable Forest Management Plan by identifying local values, objectives, indicators and targets and evaluating the effectiveness of the plan.

Members of Forest Management Advisory Committee 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. Environment and Sustainable Resource Development provided technical support to the

Sustainable Forest Management planning process, including information on resources and policy issues. The group developed, and was guided by, the Terms of Reference and Procedures. The Terms of Reference is consistent with the Canadian Standards Association standard, and specifies that the process for developing the Sustainable Forest Management Plan must be open and transparent. (A copy of the current Terms of Reference is located in Appendix 5). As part of the updating of the Sustainable Forest Management Plan to meet the requirements of the revised 2008 Canadian Standards Association standard (Z809-08), considerable discussion occurred on specific topics related to the six Criteria.

Forest Management Advisory Committee 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 Sustainable Forest Management Plan.

5.0 Strategy Guiding the Sustainable Forest Management Plan

5.1 Land Use Framework

Alberta has initiated the Land Use Framework 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 Sustainable Forest Management Plan 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 Forest Management Plan as defined in the Forest Management Agreement (Alberta. 1999) with the Province. The Alberta Forest Management Planning Standard is the guiding document for the completion of the Forest Management Plan. Environment and Sustainable Resource Development created the Alberta Forest Management Planning Standard with the Canadian Standards Association Z809 process as a guiding document. For this reason, there is significant synergy between Forest Management Plans and Sustainable Forest Management Plans. 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.

5.3 Sustainable Forest Management Plan Strategy for the Defined Forest Area

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

- reflect key goals, objectives and direction of the Forest Management Plan;
- 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 Sustainable Forest Management Plan objectives and targets. These strategies document the relevance of the indicator to the Sustainable Forest Management Plan and sustainability, and summarize actions required to meet the target. Applicable strategies are identified for each indicator in Section 7 of the Sustainable Forest Management Plan.

5.4 Additional Guidance

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

6.0 Values & Objectives

Forest Management Advisory Committee has identified local values and objectives for each of the Canadian Standards Association defined elements. The values and objectives were developed in earlier Sustainable Forest Management Plans (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 Canadian Standards Association standard) as well as local indicators and their respective targets have been developed to meet these local values and objectives. Sustainable Forest Management Plan 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 Defined Forest Area.

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 Defined Forest Area 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 Defined Forest Area, 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 Sustainable Forest Management 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 Sustainable Forest Management Plan 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 Sustainable Forest Management Plan. The Defined Forest Area 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 Sustainable Forest Management Plan 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 Sustainable Forest Management Plan 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 Sustainable Forest Management Plan 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 Sustainable Forest Management Plan.

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 Sustainable Forest Management Plan. 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 Sustainable Forest Management Plan performance reporting. To obtain current information please refer to the most recent Annual Performance Monitoring Report located www.Canfor.com

7.4 Forecasting

Forecasts are the projection of expected or desired future condition. A variety of models have been used in the development of these projections. Where appropriate, these projections have been incorporated into the Sustainable Forest Management Plan targets as expected response or outcomes for each target. Forecasting of many of the Sustainable Forest Management Plan indicators and targets has occurred during the development of the Forest Management Plan. The model used in the Timber Supply Analysis for the Forest Management Plan uses these indicators and targets as inputs and constraints that interact with each other. The model works to find a balance and optimal solution to meet these constraints and targets, which results in the selection of a Preferred Forest Management Scenario Spatial Harvest Sequence. The outputs from the Preferred Forest Management Scenario are quantitative forecasts of the indicators and targets of the Sustainable Forest Management Plan.

Examples of this are Indicators 1.1.2 Distribution of Forest Type, 1.1.3b) Patch Size and 1.1.3c) Seral Stage. A change to one will change the results of others. Many quantative indicators have tables indicating the current state and forecast over the 200 year planning period.

Other indicators and targets are qualitative, and although they are not based on quantitative model outputs they are based on local values, sound science, and legislation. In these cases, achievement of the target is deemed to achieve the values and objectives the indicator represents. In these cases, the forecast is the desired, future condition of the value and objective.

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 Response

Canfor Alberta’s Sustainable Forest Management Plan is also used to address Annex 4 of the Alberta Forest Management Planning Standard (2006) for the Forest Management Plan. Annex 4 requires that the company state a response for each target to indicate what action will be taken to appropriately address those targets that are not met.

7.7 Indicators in the Sustainable Forest Management Plan

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 (ESRD VOIT 1.1.1.4)
Indicator Statement	**Uncommon (Forested/Woodland) plant communities maintained**
Description of indicator	Alberta Conservation Information Management System develops tracking lists of elements that are considered of high conservation priority because they are rare or special in some way. Maintenance of uncommon (Forested/Woodland) 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, will be maintained on the Defined Forest Area 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 Defined Forest Area may require special management considerations. The Alberta Conservation Information Management System website provides information on the type and potential location of uncommon (forested/woodland) plant communities. www.tpr.alberta.ca/parks/heritageinfocentre/default.aspx

Means of Achieving Objective & Target (Strategies)

Three steps are required; mapping of potential locations, training in identification, and, development of protection strategies for identified sites. The Alberta Conservation Information Management System plant community maps are compared annually to any new proposed harvest areas and roads to identify potential overlap between planned blocks and potential areas of S1 and S2 forested/woodland communities. Training on identification of S1 and S2 forested/woodland plant communities (Appendix 6) will be provided to employees and contractors. Finally, when S1 and S2 forested/woodland plant communities are identified during the field operations stage, strategies to protect and mitigate impact will be developed in consultation with the Government.

Current Status

Alberta Conservation Information Management System has added Canfor to its uncommon plant communities update notification list.
(http://tpr.alberta.ca/parks/heritageinfocentre/datarequests/default.aspx)
All planning and permitting staff and contractors are given the uncommon (Forest/Woodland) plant communities list and the form for reporting uncommon plant communities to Alberta Conservation Information Management if they are found in the Defined Forest Area.

Canfor has developed an uncommon (forest/woodlands) Plant Community Identification Manual that will assist field personnel in identifying these communities. The identification manual also includes uncommon plant community reporting procedures and forms and will be distributed to all Planning and Permitting staff and contractors to be used for the 2014 field season.

Forecast

Uncommon forested/woodland plant communities will be maintained into the future.

Legal Requirements

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

Monitoring & Measurement

Annual:

The following will occur:

- A list demonstrating that Final Harvest Plans were compared to Alberta Conservation Information Management System classification and mapping for potential overlap will be maintained;
- training of planning employees will be recorded in the Eclipse Training Database;
- field contractor training will be recorded on the prework form; and
- all field confirmed sites will be reported to Alberta Conservation Information Management and management strategies developed.

Reporting Process

Results will be reported in the Annual Performance Monitoring Report and all field confirmed sites will be reported to Alberta Conservation Information Management System.

Acceptable Variance

No variance; 100% of identified uncommon (Forested/Woodland) plant communities will be maintained.

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.

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 Defined Forest Area**
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.

Means of Achieving Objective & Target (Strategies)

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 Defined Forest Area. Silviculture plans will be implemented and results will be monitored. The broad forest types were derived from stratification used in the Forest Management Plan.

Current Status

The percent distribution of forest types (Table 2) greater than 20 years of age across the Defined Forest Area is 32% treed conifer, 13% treed broadleaf and 55% treed mix (2010 baseline derived from Alberta Vegetation Inventory).

Table 2. Distribution of Forest Types (Ha)

Year	Treed Conifer (ha)	Treed Broad Leaf (ha)	Treed Mixed (ha)	Treed Conifer (%)	Treed Broad Leaf (%)	Treed Mixed (%)
Current	127,300	50,974	218,756	32%	13%	55%
10	105,752	31,921	223,333	29%	9%	62%
20	101,702	30,552	208,766	30%	9%	61%
50	117,352	43,591	148,134	38%	14%	48%
100	95,619	40,756	195,745	29%	12%	59%
200	141,480	37,065	193,961	38%	10%	52%

Forecast

Healthy ecosystems with a diversity of native (treed conifer, treed broad leaf, treed mixed) species maintained at endemic and sustainable levels as predicted in Table 2 for years 10, 20, 50, 100 and 200.

Legal Requirements

Not applicable

Monitoring & Measurement

Periodic:

The percentage of area by forest type will be compared to the spatial harvest sequence of the preferred forest management scenario every 2 years to ensure that the forest types meets the levels identified and is therefore trending towards levels identified over the long-term.

Reporting Process

The results will be reported in the Annual Performance Monitoring Report.

Acceptable Variance

+/- 5% of the baseline percent for all three forest types

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.

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 (ESRD VOIT 1.1.1.2b)
Indicator Statement	**Area of old interior forest by Natural Region by cover class across the Defined Forest Area**
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	**100% of area of old interior forest will be within the 10 year forecast by Natural Region**
Description of target	The amount of old interior forest is derived from the approved forest cover database (Alberta Vegetation Inventory) 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 and the timber supply model spatially projects 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.

Means of Achieving Objective & Target (Strategies)

The starting levels of old interior forest are derived from the land base summaries of the Alberta Vegetation Inventory data using old interior forest criteria. These levels are listed by Natural Region and cover class groups in Table 3. Modeling was completed and the Preferred Forest Management Scenario selected to ensure that these levels could be achieved at key points in time (current, 10, and 50 years).

Current Status

Table 3 shows the current amount of area of old interior forest by Natural Region and cover class.

Table 3. Old Interior Forest by Natural Region

Natural Region	Cover Group	Old Interior Forest Area (ha)					
		Current	Year 10	Year 20	Year 50	Year 100	Year 200
Boreal	C	490	611	1,068	6,634	10,504	14,003
	CD	146	284	331	357	1,033	1,207
	D	120	4	106	4,005	6,991	6,648
	DC	77	169	247	856	1,930	1,945
	Du	-	-	-	38	3,449	3,589
Boreal Total		**834**	**1,069**	**1,751**	**11,889**	**23,907**	**27,392**
Foothills	C	5,773	8,467	12,801	21,698	25,337	30,438
	CD	303	86	208	330	464	653
	D	2	4	11	53	174	348
	DC	101	128	122	163	302	418
	Du	-	-	-	-	90	145
Foothills Total		**6,178**	**8,684**	**13,143**	**22,244**	**26,366**	**32,001**
Total		**7,012**	**9,753**	**14,894**	**34,133**	**50,272**	**59,392**

Forecast

Old interior forest by Natural Region will be maintained at target levels outlined in Table 3 through time.

Legal Requirements

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

Monitoring & Measurement

Periodic:

The timber supply model forecasts the area of old interior forest by Natural Region from the Preferred Forest Management Scenario. Checks will be completed every 5 years to verify trend towards meeting predicted levels in Table 3.

Reporting Process

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

Acceptable Variance

Area of old interior forest will not be less than 90% the current hectares by Natural Region of each cover class.

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.

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	(ESRD VOIT 1.1.1.2a)
Indicator Statement	**Range of patch sizes by subunit and entire Defined Forest Area**
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 similar criteria. Patch dynamics are explored showing how patch distributions change in a variety of classification-dependent ways as the landscape ages.
Target	**Patch size distribution will achieve natural patch size distribution levels over the 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 (Forest Management Agreement 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

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						

Means of Achieving Objective & Target (Strategies)

The model used for the timber supply analysis was constrained to achieve the targeted natural disturbance patch size classes defined in Table 4 over the 200 year planning horizon. The outputs of the Preferred Forest Management Scenario are summarized in Table 5, which demonstrates that through the 200 year planning horizon patch size distribution is trending towards the natural levels. Actual harvest levels will be compared to the Spatial Harvest Sequence of the Preferred Forest Management Scenario to ensure that the patch size distribution meets the levels identified in Table 5 and is therefore trending towards the natural levels identified in Table 4 over the long-term.

Current Status

The current patch size distribution is illustrated in Table 5.

Forecast

The natural range of patch size distribution will be achieved as outlined in Table 4, over the 200 year planning horizon.

Table 5. Current and Forecast Patch Size Distribution

Reporting Areas	Year	Percent by Area		
		1–100 ha	100–500 ha	500+ ha
FMA Area	Current	68	28	4
	10	50	35	14
	20	41	38	22
	50	46	26	28
	100	40	30	30
	200	29	26	46
Main	Current	80	20	0
	10	53	35	12
	20	43	36	20
	50	43	26	31
	100	36	32	32
	200	18	27	55
Peace	Current	79	21	0
	10	50	21	29
	20	49	51	0
	50	31	16	53
	100	49	51	0
	200	23	25	52
Puskwaskau	Current	86	14	0
	10	49	33	18
	20	23	27	50
	50	26	24	50
	100	28	24	48
	200	23	16	61

Legal Requirements

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

Monitoring & Measurement

Periodic:

The timber supply model forecasts the area of old interior forest by Natural Region from the Preferred Forest Management Scenario. Checks will be completed every 5 years to verify trend towards meeting predicted levels.

Reporting Process

At the end of year 5, the actual patch size distribution will be compared to the targets and reported in the Annual Performance Monitoring Report.

Acceptable Variance

+/-10% of the Preferred Forest Management Scenario 10 year of the forecast.

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.

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 VOIT 1.1.1.1)
Indicator Statement	**Percent of area of pioneer, young and old forest by Natural Region across the Defined Forest Area**
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	**100% of pioneer, young and old forest by Natural Region will meet the Preferred Forest Management Scenario forecast**
Description of target	The land base summaries from the Alberta Vegetation Inventory will provide the amount of old, mature and young forest within the gross and net land bases. The models used to determine the annual allowable cut will be constrained to ensure that seral stage targets are achieved.

Basis for the Target

Seral stage targets are based on the natural range of variation and the assumption that all native species and ecological processes are more likely to be maintained if managed forests are made to resemble forests created by natural disturbance agents, such as wildfires and wind. If anthropocentric disturbance regimes mimic naturally occurring disturbances we are more likely to achieve biodiversity objectives over the long-term.

Historically in Alberta, Boreal Forest and the Foothills Natural Regions experienced frequent wildfires that ranged in size from small spot fires to large fires covering thousands of hectares. Natural burns generally contained unburned patches of forest, which result in a landscape of even-aged regenerating stands containing older patches of remnant forest. The implementation of a fire suppression policy circa 1950, timber harvesting and other industrial activities all had an impact on the makeup of the forest in the Defined Forest Area. Effective fire suppression within Canfor's

Defined Forest Area resulted in an average annual burn rate of 12.5 ha/year between 1986-2000 (Canfor, 2001).

The following describes the process used to determine the seral stage distribution for the Forest Management Agreement area under an historic natural disturbance regime.

Establish Fire Return Intervals (FRI) for Current Status (1999) and Pre-Suppression (1950)

The literature review carried out by Olympic Resource Management (2000) concluded that the Boreal Forest and the Foothills Natural Regions in the Defined Forest Area have different fire history and natural disturbance patterns. The Lower and Upper Foothills Natural Subregions are grouped into a single Foothills Region and the Central and Dry Mixedwood Subregions are grouped into the Boreal Forest Natural Region. Fire cycle analysis indicates that the current fire return interval is 85 years for the Boreal Forest Natural Region and 100 years for the Foothills Natural Region. The inventory was then "rolled-back" to 1950 to estimate the fire return interval for the pre-suppression period thought to be closer to the "natural" fire cycle. Under naturally occurring processes, the average fire return interval was determined to be approximately 40 years for Boreal Forest and 60 years for the Foothills Natural Regions. Natural fire return interval values were used to derive the upper and lower boundaries of natural variation within the Defined Forest Area.

Establish Combined Seral Stage Age Class Boundaries for the Boreal Forest and Foothills Natural Regions

The five seral stage categories identified in Table 6, define age ranges by yield group to which a forest cover stand belong. These age ranges reflect total stand age and have been adjusted from previous analyses to include the years to breast height and to be consistent with the yield curves used in the forest estate model.

Table 6. Seral Stage Age by Yield Group

Yield Group	Species	Pioneer	Young	Mature	O.Mature	Old	Years to BH
1	AW	0-6	7-26	27-76	77-116	117+	6
2	AW	0-6	7-26	27-76	77-116	117+	6
3	SW	0-15	16-55	56-95	96-135	136+	15
4	BW	0-6	7-26	27-76	77-116	117+	6
5	FB	0-15	16-55	56-115	116-135	136+	15
6	SW	0-15	16-55	56-95	96-135	136+	15
7	PB	0-6	7-26	27-86	87-116	117+	6
8	PL	0-10	11-50	51-90	91-130	131+	10
9	PL	0-10	11-40	41-80	81-130	131+	10
10	PL	0-10	11-50	51-100	101-130	131+	10
11	PL	0-10	11-50	51-100	101-130	131+	10
12	SB	0-20	21-70	71-150	151-170	171+	20
13	SB	0-20	21-70	71-160	161-180	181+	20
14	SB	0-20	21-60	61-120	121-150	151+	20
15	SW	0-15	16-55	56-105	106-135	136+	15
16	SW	0-15	16-55	56-105	106-135	136+	15
17	SW	0-15	16-55	56-105	106-135	136+	15

The seral stage categories in Table 6 and the area distributions of each category by region and yield group were used to calculate area-weighted age class boundaries for each region. This is

necessary for the next step where "age cut-offs" are used to estimate the natural seral proportions for each region as suggested in ORM 2000. Table 7 shows the average age cut-offs for each Natural Region and seral stage category.

Table 7: Weighted Age Class Boundaries[4]

Natural Region	Seral Stage					Area %
	Pioneer	Young	Mature	O. Mature	Old	
Boreal	10	42.8	96.1	131.1	131.1+	48%
Foothills	10	51.4	105.1	137.9	137.9+	52%

Determining the Natural Seral Stage Distribution

With an estimate of the FRI, the expected age class distribution can be readily calculated using the cumulative negative exponential distribution[5] as suggested in ORM 2000. The proportion of area less that age can be calculated using:

[1] $$area < t = 1 - \exp(-[t / FRI])$$

Where:
t = the weighted age class boundary (age) for a seral stage and natural region; and
FRI = the fire return interval for that natural region.

Using the average fire return interval figures for current status (ORM, 2000) and the above equation, the seral stage distribution targets for each Natural Region are shown in Table 9. However, as reported in ORM 2000, the actual natural fire return intervals, in the absence of active fire suppression are actually substantially lower.

Based on the established pre-suppression FRI ranges (ORM, 2000), the adjusted area distribution was determined within each successive seral stage and for each region. Table 8 summarizes the pre-suppression seral stage distribution levels within each Natural Region and are used as target threshold levels in the model.

Table 8: Natural Seral Stage Targets Based on Pre-Suppression Forest

Natural Region	Seral Stage					FRI
	Pioneer	Young	Mature	O. Mature	Old	
Boreal	22%	44%	25%	5%	4%	40
Foothills	15%	42%	25%	7%	10%	60
FMA Area	19%	43%	25%	6%	7%	

Seral stage targets in the model are based on the seral stage percent distributions by Natural Region presented in Table 9. These threshold values are applied by Natural Region as maximum values for the pioneer and young seral stages and minimum values for old forest. No targets are applied to mature and over-mature as these targets will generally be achieved if the targets for the other three seral stages are met.

[4] Note: ages represent total stand age.
[5] The underlying assumption of this method is that the burn rates are independent of forest age (age invariance).

Means of Achieving Objective & Target (Strategies)

The timber supply analysis outlines current and future seral stage distribution of the Preferred Forest Management Scenario over the 200-year planning horizon. Actual harvest levels will be compared to the Spatial Harvest Sequence of the Preferred Forest Management Scenario to ensure that the seral stage distributions by Natural Regions meet the levels identified in Table 9 and is therefore achieving the natural levels identified in Table 8 over the long-term.

Current Status

The current distribution of gross forest landbase by seral stage is illustrated in Table 9.

Forecast

The natural range of seral stage distribution will be achieved as outlined in Table 9, over the 200-year planning horizon.

Table 9. Percentage Distribution of Gross Forested Land Base By Seral Stage

Natural Region	Year	Percent by Area				
		Pioneer	Young	Mature	O. Mature	Old
Boreal	Current	6%	7%	55%	28%	4%
	10	8%	11%	45%	28%	8%
	20	8%	17%	38%	27%	10%
	50	20%	22%	19%	25%	15%
	100	6%	23%	46%	6%	19%
	200	9%	24%	37%	7%	23%
Foothills	Current	9%	18%	32%	30%	11%
	10	13%	22%	27%	24%	14%
	20	11%	28%	27%	18%	15%
	50	14%	34%	27%	12%	14%
	100	14%	36%	27%	5%	18%
	200	13%	12%	32%	17%	26%

Legal Requirements

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

Monitoring & Measurement

Periodic:

Actual harvest levels will be compared to the Spatial Harvest Sequence of the Preferred Forest Management Scenario forecasts every 5 years to ensure that the seral stage distribution by Natural Region meets the levels identified in Table 9 and is therefore trending towards the natural levels identified in Table 8 over the long-term.

Reporting Process

At the end of year 5, the actual pioneer, young and old seral stage distribution by Natural Region will be compared to the targets and reported in the Annual Performance Monitoring Report.

Acceptable Variance

+/-20% of the Preferred Forest Management Scenario 10 year of the forecast

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.

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 Defined Forest Area**
Description of indicator	The retention of representative, un-harvested patches within harvest area boundaries
Target	**No less than 4% of the 5 year rolling average harvested area (ha) 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.

Means of Achieving Objective & Target (Strategies)

The design and layout phase will identify planned retention. The Final Harvest Plan includes a summary table of blocks and block areas, in which columns will be added to show the amount of area within the block boundaries that will be designated as retention. Planned patches may be selected for a variety of reasons; including watercourse buffers, steep slopes, raptor nests, seepage areas, cabins, etc. The retention areas will be classified as non-merchantable and merchantable. The merchantable class will be further divided into broad cover groups (coniferous, coniferous/deciduous, deciduous, deciduous/coniferous and deciduous with coniferous understory for the purpose of showing timber volume. 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.

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 annual allowable cut timber drain if any merchantable retention occurred.

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

Current Status

The total harvested area from May 1, 2011 to April 30, 2012 (2011 timber year) was 2,893 ha. 5.6% of the total area was left as structural retention, of which 4.7% was merchantable.

Table 10. Percent of Structure Retention by Broad Cover Group

Broad Cover Group	% Merch Retention area	% Non-merch Retention area	Merch Retention Volume (m3)		
			Conifer	Decidous	Total
C	2.9%	0.7%	14420.1	1939.6	16359.7
CD	0.5%	0.1%	1774.7	1728.8	3503.5
D	0.1%	0.0%	13.4	424.4	437.8
DC	1.1%	0.0%	1899.2	4993.0	6892.2
Du	0.1%	0.0%	258.0	678.2	936.124
Other NM		0.00			
Total	**4.7%**	**0.9%**	**18365.4**	**9763.9**	**28129.3**

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, healthy ecosystems with a diversity and abundance of native species and habitats will be maintained.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards; Occupational Health and Safety Act; and Forest and Prairie Protection Act.

Monitoring & Measurement

Annual:

The amount of structure retained on harvest areas will be measured annually by using GPS technology or interpreted digital imagery.

Reporting Process

Structure retention will be calculated on previous year's harvested blocks using digital imagery and results will be reported in the Annual Performance Monitoring Report. The Annual Performance Monitoring Report will list current and historical retention achievement as a summary for all blocks in a given year.

Acceptable Variance

No less than 3.5% of the 5 year rolling average harvested area (ha) will be left un-harvested as structural retention.

Response

Adjust activities.

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 (ESRD VOIT 1.1.2.1a)
Indicator Statement	**Percent of blocks meeting dispersed retention levels as prescribed in the site plan/logging plans**
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

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.

The retention of single live and dead trees and patches of large live trees in harvest areas creates habitat in harvested areas that is similar to that found within burned and other naturally disturbed areas.

Means of Achieving Objective & Target (Strategies)

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 Defined Forest Area:

- 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.

Current Status

New strategy will be fully implemented on any blocks planned after May 1st 2013.

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, healthy ecosystems with a diversity and abundance of native species and habitats will be maintained.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards; Occupational Health and Safety Act; and Forest and Prairie Protection Act.

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 Annual Performance Monitoring Report.

Acceptable Variance

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

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.

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 1.1.1.6 & 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, with riparian management requirements in forest operations**
Description of target	Operating Ground Rules 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.

Means of Achieving Objective & Target (Strategies)

Block and road layout prior to harvest requires the identification of all riparian areas (as per Operating Ground Rules). Operating and road maintenance plans will include operational strategies for riparian areas.

Current Status

One non-compliance related to riparian management requirements was reported in Canfor's Incident Tracking System in the 2012 timber year. In that incident, a portion of a creek was aerial sprayed with herbicide.

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, it is anticipated that properly functioning riparian systems leading to the conservation of fish habitat and water quality will be maintained.

Legal Requirements

Timber Management Regulations; Canfor Forest Management Agreement area Operating Ground Rules; Federal Fisheries Act; Water Act; and Alberta Forest Management Planning Standard, Annex 4 – Performance Standards

Monitoring & Measurement

Annual:

Self-reporting, Internal/External audits, final harvest inspections, and Forest Operations Monitoring Program.

Reporting Process

The Annual Performance Monitoring Report will list any non-conformance and non-compliance incidents that occurred during the previous year's activities. This list will be a summary of incidents reported in the incident tracking system.

Acceptable Variance

Zero non-compliances, specific to Operating Ground Rules, with riparian management requirements in forest operations.

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 VOIT 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 burned areas that have salvage plans will be implemented in conformance with Alberta Environment and Sustainable Resource Development's 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.

Means of Achieving Objective & Target (Strategies)

Fire histories are obtained from the Province. Salvage plans will be developed and implemented as per the Environment and Sustainable Resource Development Directive.

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 Forest Management Agreement area 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.

Current Status

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

Forecast

By following the Fire Salvage Planning and Operations Directive 2007-1, it is anticipated that forest growth will be maintained and balanced to allow some burned areas to remain as habitat for plants and animals that benefit from such areas.

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

Annual:

Fire histories are obtained from the Province. All fires larger than 10 hectares in merchantable stands will be reported in the Annual Performance Monitoring 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

Fires with more than 10 hectares of merchantable timber and the approved Salvage Plan will be listed in the Annual Performance Monitoring Report. Total area burned and area not harvested will be reported.

Acceptable Variance

No variance; 100% of burned areas that have salvage plans will be implemented in conformance with Environment and Sustainable Resources Development directive.

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.

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 VOIT 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 with significant blowdown (>10ha), a minimum of 25% of the area 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 blowdown habitat for their survival as identified in annex 4 of the Alberta Forest Management Planning Standard.

Means of Achieving Objective & Target (Strategies)

Staff or government may identify areas of blowdown during their field duties. All areas larger than 10 hectares will be tracked and summarized in the Annual Performance Monitoring Report. Salvage plans will ensure that at least 25% of the cumulative area is not salvaged.

Current Status

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

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, it is anticipated that forest growth will be maintained and balanced to allow some blowdown areas to remain as habitat for plants and animals that benefit from such areas.

Legal Requirements

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

Monitoring & Measurement

Annual:

Areas of un-salvaged vs salvaged blowdown larger than 10 hectares will be reported annually in the Annual Performance Monitoring Report.

Reporting Process

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

Acceptable Variance

No variance; A minimum of 25% of blowdown areas will be left un-salvaged.

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.

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 VOIT 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 Environment and Sustainable Resource Development.

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 Defined Forest Area 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 Forest Management Agreement area Operating Ground Rules 7.7.4.2 (ESRD. 2011) to avoid disturbing Trumpeter Swans during the breeding season.

Means of Achieving Objective & Target (Strategies)

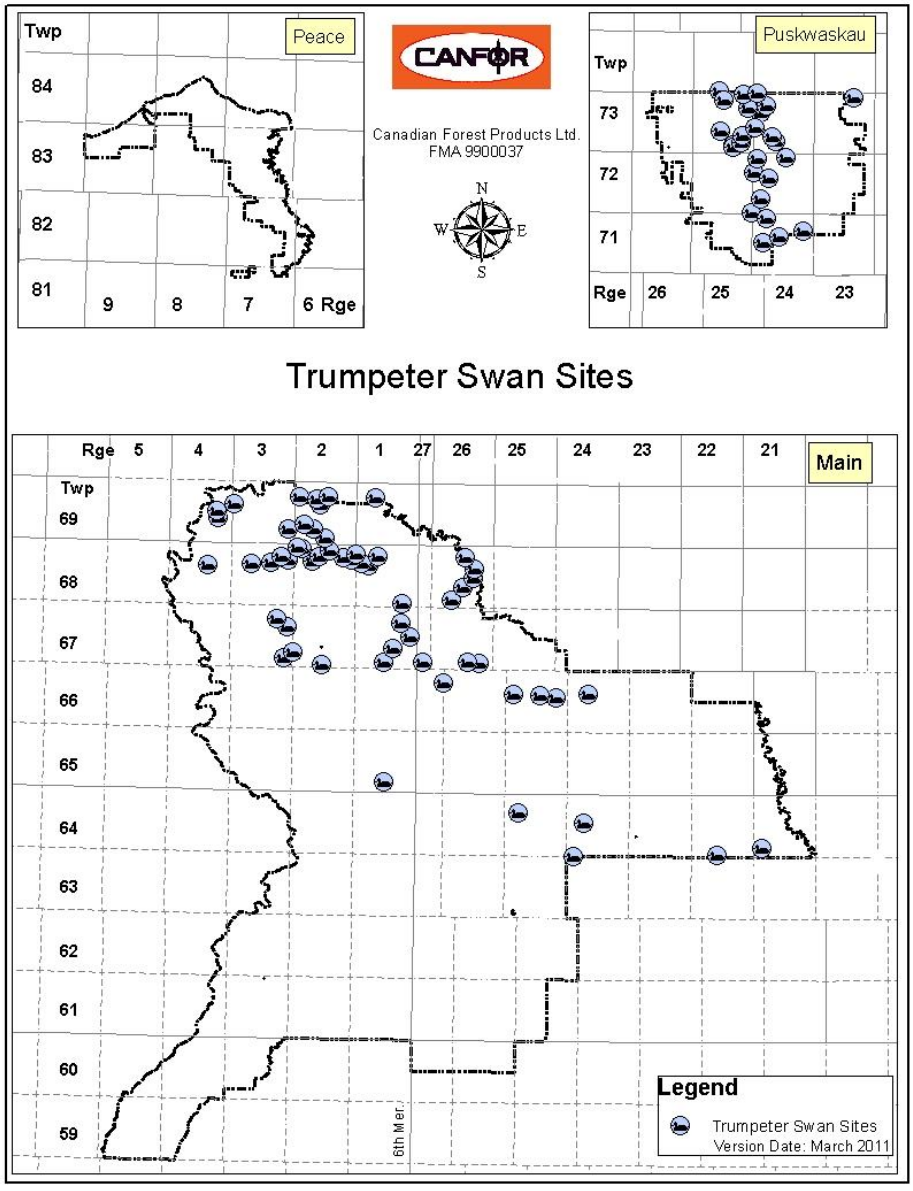
Canfor staff will check annually in the spring with Environment and Sustainable Resource Development Fish and Wildlife for any new or excluded Trumpeter Swan sites in the Defined Forest Area. At the preliminary design phase, those Trumpeter Swan sites will be identified and a no harvest buffer within 200m of site during winter harvest and 800m during summer harvest will be planned. At the strategic level, the Trumpeter Swan buffer areas will be withdrawn from the timber harvesting landbase.

Current Status

Trumpeter Swans are currently designated as threatened under the Wildlife Act. There is a relativity healthy population of Trumpeter Swans on the Defined Forest Area. There are 105 Trumpeter Swan breeding lakes requiring 200 meter and 800 meter buffers in the Defined Forest Area.

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

Figure 7: Trumpeter Swan Sites



Forecast

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 Forest Management Agreement area 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 Geographic Information System. Any overlaps will be considered as an infraction, unless approved in the Final Harvest Plan for some overriding reason.

Reporting Process

Infractions will be recorded in Canfor's Incident Tracking System and reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance unless there is an approved ground rule deviation

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.

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.

Means of Achieving Objective & Target (Strategies)

Canfor Forest Management Agreement area 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.

Current Status

To date 106 significant wildlife mineral licks have been conserved within the Forest Management Agreement area.

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, it is anticipated that wildlife species diversity and habitat will be maintained through the conservation of wildlife mineral licks.

Legal Requirements

Canfor Forest Management Agreement area 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 updated annually. All blocks from the previous harvest season will be spatially compared to Canfor's wildlife mineral lick layer to ensure that no infraction has occurred unless approved in the Final Harvest Plan for some overriding reason.

Reporting Process

Infractions will be recorded in Canfor's Incident Tracking System and reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance unless there is an approved ground rule deviation.

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.

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 VOIT 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*[6] 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 mountain pine beetle. It will identify the most susceptible stands and direct Forest Management Agreement area 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".* Mountain pine beetle Action Plan December 2007 - Long-Term Actions (ESRD. 2007a).

Canfor's Healthy Pine Strategy (HPS) Forest Management Plan 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 Forest Management Agreement area 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.

Means of Achieving Objective & Target (Strategies)

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.

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 11 shows the current status of the 20/30 rule within the Caribou Zone.

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

Forecast

These three targets are dependent of each other; through implementing the three targets collectively, high value intact Caribou habitat will be maintained into the future.

Table 11. Percentage of Forested Land base <30 years within Caribou Range

Caribou Zone	Year	Gross Forested Area < 30 Years	
		Area (ha)	%
All	Current	8,674	13%
	10	12,798	19%
	20	12,574	19%
	50	13,540	20%
	100	12,508	18%
	200	3,499	5%

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 Alberta Vegetation Inventory with harvested areas and other industrial activities using the Digital Integrated Dispositions 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.

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

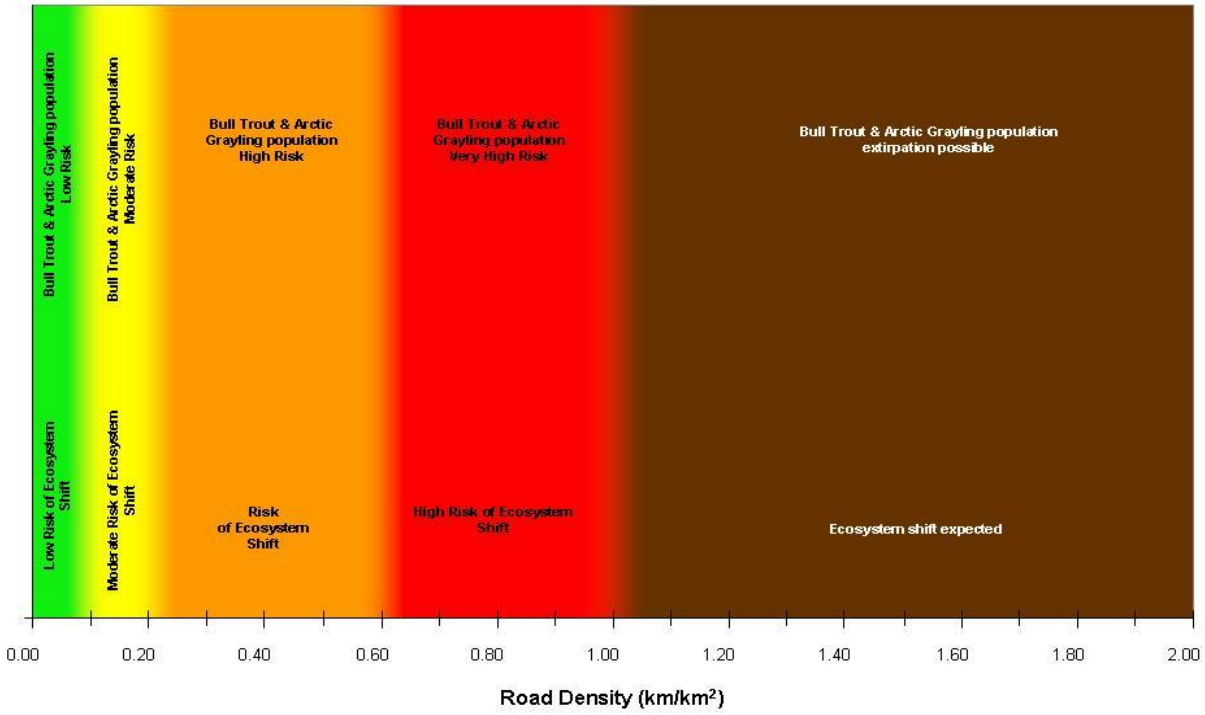
1.2.2b) Bull Trout and Arctic Grayling Fish Risk

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	1.2.2 Degree of suitable habitat in the long term for selected focal species, including species at risk (ESRD VOIT 1.2.1.1)
Indicator Statement	**Fish risk ranking for Bull Trout and Arctic Grayling**
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. 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	**100% of watersheds with a high or very high fish risk ranking and >25% Canfor influence will be assessed using Canfor's Fish Risk Flow Chart and have mitigations strategies scheduled and implemented**
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. 2012). The Alberta Endangered Species Conservation Committee classifies Arctic Grayling as Sensitive in the current General Status of Alberta Wild Species report and Species of Special Concern. It has been recommended by Environment and Sustainable Resource Development Fisheries Management to use road density in conjunction with Environment and Sustainable Resource Development's "Conceptual Approach to Fish Risk" as a method to calculate risk ranking for both species.

Figure 8: Bull Trout and Arctic Grayling Population Risk



Means of Achieving Objective & Target (Strategies)

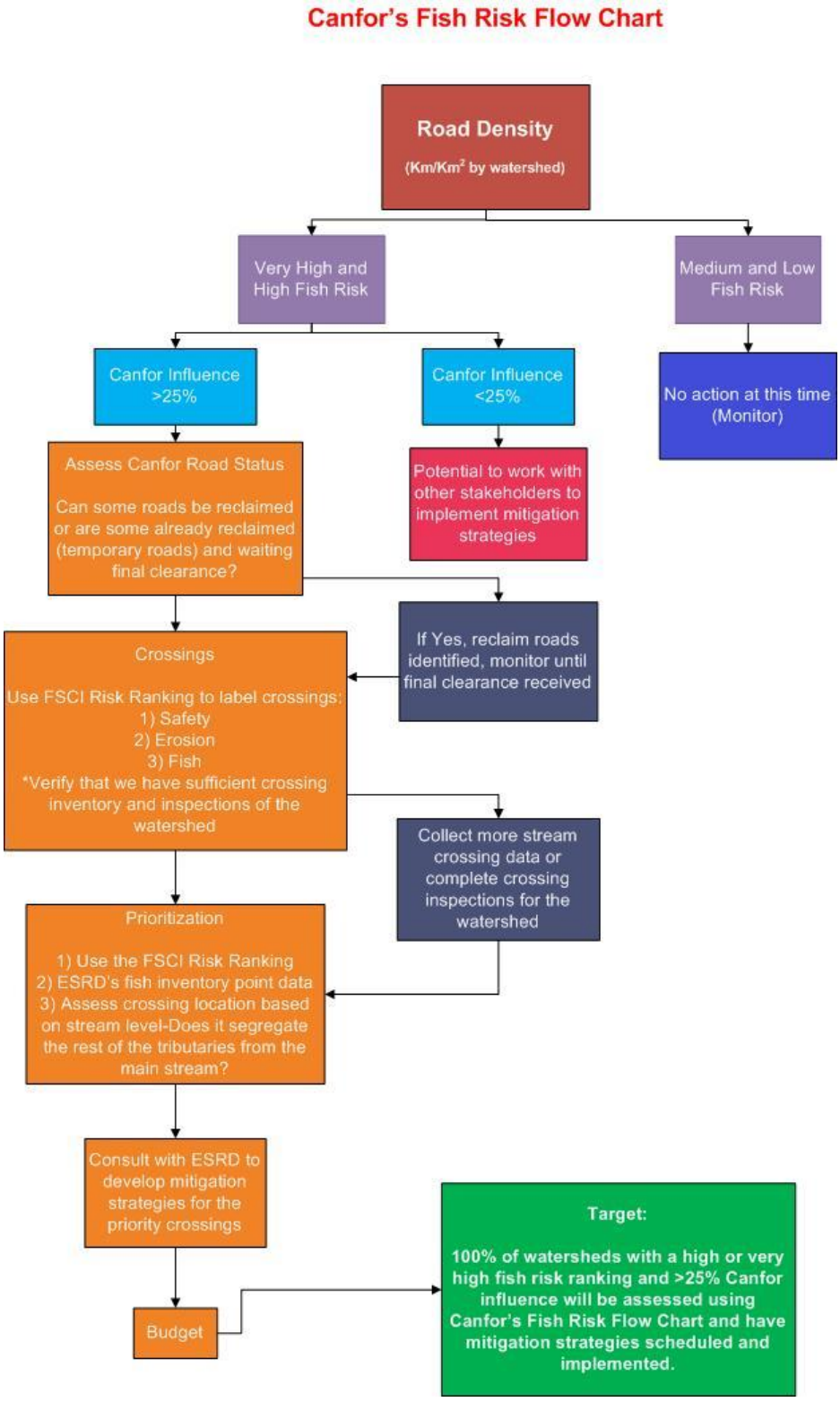
Road density is a metric to measure fish risk. Bull trout and Arctic Grayling habitat is not only impacted by Canfor Alberta's roads, but also roads of municipal, government and other industrial users. Canfor Alberta's current road layer will be updated with new License of Occupation roads and temporary roads used for extraction of timber. All temporary roads that have received a block final clearance or that are known to have been deactivated permanently will be removed. The road density from this calculation will determine the fish risk ranking based on Environment and Sustainable Resource Development's "Conceptual Approach to Fish Risk".

Through monitoring fish risk using road densities, forest managers and government will be able to identify the higher risk watersheds and collaboratively work with government to 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 at the strategic and operation planning stages
- Road-stream crossings
  - Crossing inventory and monitoring program;
  - Identification and remediation plan for crossings;
  - 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

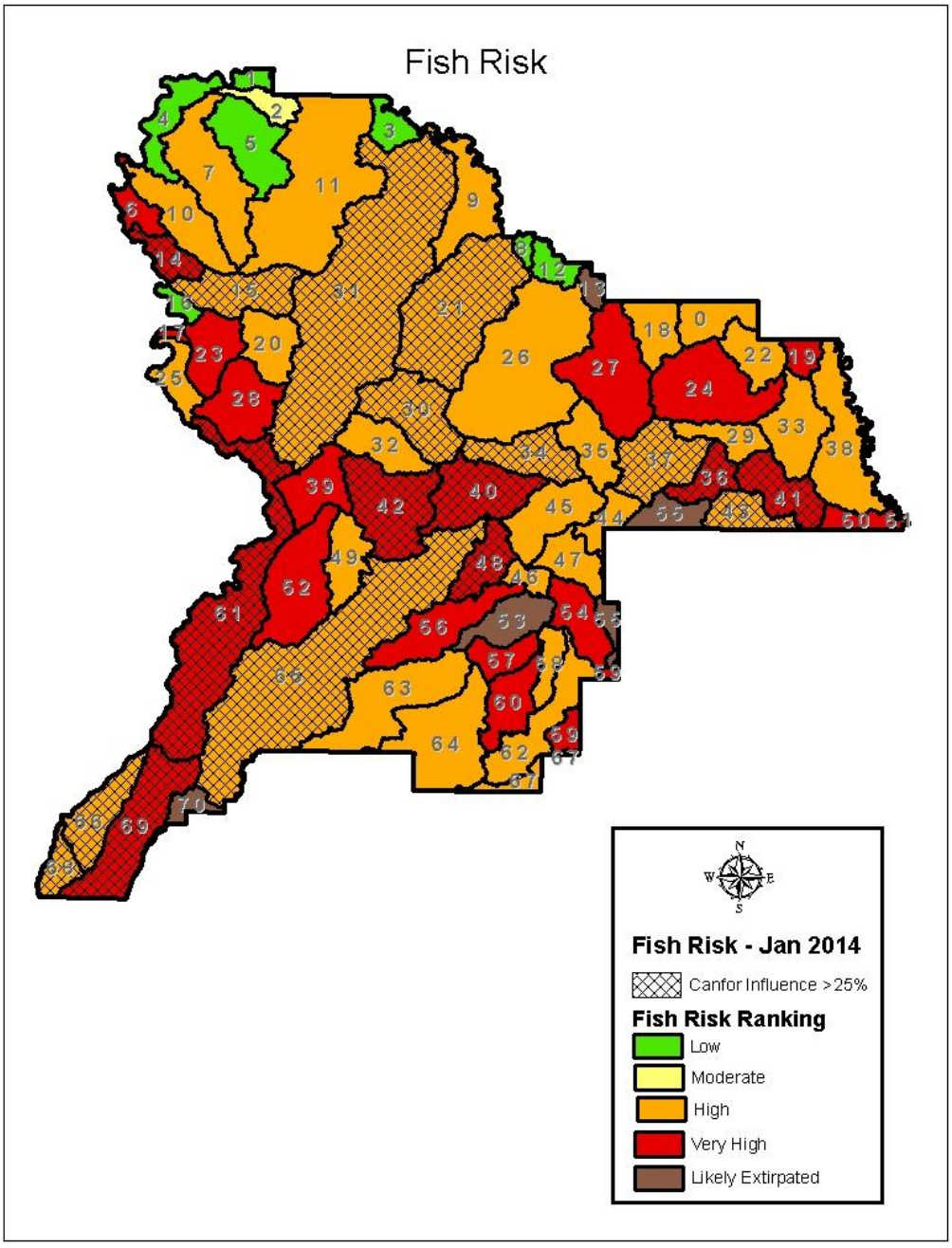
In consultation with Environment and Sustainable Resource Development Fish and Wildlife, Canfor has developed Canfor's Fish Risk Flow Chart (figure 9). This chart will be used to prioritize watersheds and crossings for the scheduling and implementation of mitigation strategies based on risk to fish.

Figure 9: Canfor's Fish Risk Flow Chart



Current Status

Figure 10: Fish Ranking



Forecast

Viable Bull Trout and Arctic Grayling populations will be maintained on the landscape.

Legal Requirements

Canfor Forest Management Agreement area Operating Ground Rules; Alberta Forest Management Planning Standard; Federal Species at Risk Act; Alberta Wildlife Act

Monitoring & Measurement

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 parcel of the Defined Forest Area. The watersheds will be assessed and prioritized using Canfor's Fish Risk Flow Chart. All planned mitigation strategies will be entered into the Foothills Stream Crossing Partnership database and completed activities reported in Canfor's Annual Operating Plan Completed Structure Maintenance Table.

Reporting Process

Fish risk ranking by watershed will be reported in the Annual Performance Monitoring Report. Mitigation strategies to reduce fish risk, plans for implementation, and completion status will also be reported in Canfor's Annual Operating Plan Completed Structure Maintenance table and summarized in the Annual Performance Monitoring Report.

Acceptable Variance

90% of identified very high and high risk watersheds with >25% Canfor influence will have mitigation strategies scheduled and implemented according to plan.

Response

If the target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, this will be communicated to Environment and Sustainable Resource Development and course of action will be determined.

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 Forest Management Plan in maintaining that habitat type.
Target	**100% of area of Barred Owl habitat will be within the 10 year forecast**
Description of target	The Alberta Vegetation Inventory 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.).

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.

Means of Achieving Objective & Target (Strategies)

The Barred Owl model developed by Environment and Sustainable Resource Development will be run concurrently with timber supply scenarios. The outputs of the model will be used to support future management decisions that may influence potential Barred Owl habitat. Operating plans will be consistent with the spatial harvest sequence of the Preferred Forest Management Scenario.

Current Status

Table 12 below indicates the results of the current Preferred Forest Management Scenario.

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, it is anticipated that Barred Owl habitat will be maintained.

Table 12. Area of Suitable Barred Owl Habitat

Year	Suitable Barred Owl Habitat (ha)[7]
Current	631,901
10	611,119
20	607,187
50	608,872
100	599,323
200	636,956

[7] The Barred Owl habitat model uses a raster based data set with a cell size of 2370m X 2370m. In order to represent the true extent of the habitat, the cells that overlap with the FMA boundary have not been clipped to the boundary. As such, the total of the suitable and unsuitable habitat is (by design) greater than the gross FMA area.

Legal Requirements

Alberta Forest Management Planning Standard; Federal Species at Risk Act; Alberta Wildlife Act

Monitoring & Measurement

Periodic:

The timber supply model forecasts the area of Barred Owl habitat from the Preferred Forest Management Scenario. Checks will be completed every 5 years to verify trend towards meeting the predicted levels.

Reporting Process

At the end of year 5, the actual amount of area of Barred Owl habitat will be compared to the target and reported in the Annual Performance Monitoring Report.

Acceptable Variance

+/- 20% of the Preferred Forest Management Scenario for the 10 year of the forecast.

Response

If the target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, this will be communicated to Environment and Sustainable Resource Development and course of action will be determined.

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 1.1.1.3a)
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 10% of the current levels in individual Defined Forest Area parcels (Main, Puskwaskau & Peace) and Grizzly Bear and Caribou wildlife areas**
Description of target	Density of roads (License of Occupation and Temporary non-reclaimed) is a measure of industrial footprint.

Basis for the Target

The basis for the target is to minimize the footprint as it relates to roads and to align with an already identified target within the "Berland Regional Access Development Plan" Foothills Landscape Management Forum (August 22, 2011) and Environment and Sustainable Resource Development Action Plan for West Central Caribou 2008 (ESRD. 2008). Grizzly bear mortality has been correlated with road density, more roads usually equate to more human use. 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 are used to evaluate habitat suitability for Grizzly Bears (Gibeau. 2000).

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

For Caribou, the *Environment and Sustainable Resource Development 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".*

Means of Achieving Objective & Target (Strategies)

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. The road density from this calculation will be used to assess the target.

Current Status

Table 13. 2011 Road Area Density (km/km^2)

Area	2011 Road (Km)	2012 Road (Km)	Area (Km^2)	2011 Density (Km / Km^2)	2012 Density (Km / Km^2)	Percent Change from Current Density
Main	2567	2717	5509	0.47	0.49	106%
Peace	177	190	241	0.73	0.79	107%
Puskwaskau	173	173	697	0.25	0.25	100%
Caribou Area	365	378	713	0.51	0.53	103%
Grizzly Bear Range	1053	1091	1899	0.55	0.57	104%

Forecast

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

Legal Requirements

Canfor Forest Management Agreement area Operating Ground Rules; Alberta Forest Management Planning Standard; Federal Species at Risk Act; Alberta Wildlife Act

Monitoring & Measurement

Annual:

Annually report the road density (km/km^2) by reporting areas as indicated in *Table 13*.

Reporting Process

Report results in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; Do not exceed 10% of the current road density levels.

Response

If the target is not met, a root cause analysis will be completed to determine cause. Once cause is determined, this will be communicated to Environment and Sustainable Resource Development 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 1.3.1.2)
Indicator Statement	**Regeneration will be 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	**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 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 1.3.1.1 & 1.3.1.2)
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 outline the rules for the use of seed and vegetative material that can be used in reforestation programs. The purpose of Forest Genetics Resources Management System 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. Forest Genetics Resources Management System ensures that there is genetic diversity in those seedlots. Forest Genetics Resources Management System applies to both forest collected and orchard seed.

Means of Achieving Objective & Target (Strategies)

Silviculture staff are required to follow Forest Genetics Resources Management System.

Current Status

In the past, Canfor Alberta has had some minor incidents with adherence to Forest Genetics Resources Management System and its predecessor, Standards for Tree Improvement in Alberta that were reported in past Annual Performance Monitoring Reports. Staff training and modifications to the reforestation planning tools has reduced the probability of re-occurrence.

Forecast

Through proper implementation of the Forest Genetics Management System, it is anticipated that genetic diversity on the Defined Forest Area will be maintained.

Legal Requirements

Timber Management Regulations; Alberta Forest Genetic Resources Management and Conservation Standards; Alberta Forest Management Planning Standard, Annex 4-Performance Standards

Monitoring & Measurement

Annual:

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.

Reporting Process

All contraventions will be recorded in Canfor's Incident Tracking System and reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; All regeneration will be consistent with the Forest Genetics Resources Management System

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.

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 kilometer of legally protected park areas**
Description of target	 Canfor has committed to notify the government of operations planned to occur near neighbouring protected areas to ensure that the surrounding ecological values of the protected area are maintained.

Basis for the Target

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

Means of Achieving Objective & Target (Strategies)

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.

Current Status

Between May 1, 2012 and April 30, 2013, Canfor harvested blocks in the Peace parcel of the Defined Forest Area which is located directly adjacent to the Dunvegan West Wildland Provincial Park. Multiple harvested blocks were located within 1km of the park boundary and Canfor initiated consultation with the province prior to the harvesting of these blocks. The province did not have any objections to the harvesting of the blocks within 1km of the Provincial Park and requested that due to the high incidence of Mountain Pine Beetle in the area that Canfor harvest the pine up to the edge of the banks of the Peace River. After harvesting activities were completed, Canfor installed Provincial Park Boundary signs at the request of Alberta Tourism, Parks and Recreation at the boundaries of the blocks and the Provincial Park.

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, it is anticipated that the ecological values of the protected areas will be maintained. Consultation with protected area agencies will occur.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards

Monitoring & Measurement

Annual:

Evidence that consultation has occurred within operations within 1km of protected park boundaries will be recorded in Canfor's Creating Opportunities for Public Involvement database.

Reporting Process

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

Acceptable Variance

No variance; All planned harvest within one kilometre of a Protected Park Area will show consultation records.

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.

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**
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 Defined Forest Area. These areas must be managed to ensure these values are maintained.

Means of Achieving Objective & Target (Strategies)

Canfor operations are directed by the Operating Ground Rules and Forest Management Plan. Each of these includes considerations for sites of biological significance. All operating plans are reviewed, approved, and monitored by the Province to ensure that the intent of the Operating Ground Rules and the Forest Management Plan are being implemented on the ground.

Current Status

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

Forecast

Through proper implementation of the Forest Management Plan, Sustainable Forest Management Plan, and Operating Ground Rules, sites of biological significance will be protected and ecological values maintained on the Defined Forest Area.

Legal Requirements

Canfor Forest Management Agreement area Operating Ground Rules

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards

Monitoring & Measurement

Annual:

Operating Plans and approval documents will be reviewed annually to determine the number of additional sites of biological significance.

Reporting Process

All new identified sites will be summarized in Annual Performance Monitoring Report.

Acceptable Variance

No variance; All identified special biologically significant sites will have management strategies developed with the Province.

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.

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 significance; and Aboriginal values, knowledge and uses
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 (No ESRD VOIT)
Indicator Statement	**Percent 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, Environment and Sustainable Resource Development 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.

Means of Achieving Objective & Target (Strategies)

Canfor Alberta uses a database called Creating Opportunities for Public Involvement to keep record of all attempts to consult, items discussed, actions, and follow-up. The details that are entered into Creating Opportunities for Public Involvement 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; 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 Creating Opportunities for Public Involvement 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.

Forecast

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 Creating Opportunities for Public Involvement 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. Archeological assessments are tracked for all blocks in Canfor's Resources Database. Status reports can be created from this database as a method of monitoring.

Reporting Process

Enter the number of historic, sacred and culturally important sites, forest values, traditional knowledge and uses that have been identified in Canfor's Creating Opportunities for Public Involvement database and report in Alberta Environment and Sustainable Resource Development's Record of Consultation. A summary of the records entered into Canfor's Creating Opportunities for Public Involvement database will be provided in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; 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	(ESRD VOIT 2.1.1.1)
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.

Means of Achieving Objective & Target (Strategies)

All harvested blocks will have reforestation strategies/activities scheduled for completion no more than 2 years after harvest.

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.

Forecast

By following the “Means of Achieving Objective and Target (Strategies)” sections of this indicator, it is anticipated that the productive capacity of the forested landbase will be maintained.

Legal Requirements

Timber Management Regulation

Canfor Forest Management Agreement area Operating Ground Rules

Monitoring & Measurement

Annual:

A database query of the reforestation activities completed by April 30th of the following year will be compared to the harvesting report. Any blocks that do not meet the 2-year reforestation requirement will be reported as an infraction in Canfor's Incident Tracking System.

Reporting Process

The Annual Performance Monitoring Report will summarize any infractions that are entered into the Incident Tracking System regarding blocks not being reforested within 2-years of being harvested.

Acceptable Variance

No variance; 100% of all harvested blocks will be reforested within 2 years.

Planting of top piles and roads are not considered in this target 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.

Means of Achieving Objective & Target (Strategies)

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.

Current Status

Establishment surveys are conducted every second May. Harvested blocks that are 5-7 years old are pooled and surveyed in one year. Canfor completed establishment surveys on the

Defined Forest Area in 2011 and has scheduled the next set of surveys for 2013, therefore the results are for establishment surveys completed from May 1, 2011- April 30, 2012.

There were 3 blocks that did not meet the reforestation criteria set out in the Regeneration Standards of Alberta. These blocks received prompt retreatment.

Forecast

By following the "Means of Achieving Objective and Target (Strategies)" sections of this indicator, it is anticipated that the productive capacity of the forested landbase will be maintained.

Legal Requirements

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

Timber Management Regulations

Regeneration Standards of Alberta

Monitoring & Measurement

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. Any blocks that did not receive remedial treatment within 12 months of the regeneration survey date will be entered into Canfor's Incident Tracking System as an infraction.

Reporting Process

All blocks requiring remedial treatment are reported to Alberta Reforestation Information System and all infractions entered into Canfor's Incident Tracking System will be summarized in the Annual Performance Monitoring Report.

Acceptable 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 target is 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 2.1.1.1 and 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 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 Timber Supply Analysis. 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. Regeneration Standards of Alberta provides the tools to measure and report the growth predictions of reforested stands in comparison to the yield expectations of the Timber Supply Analysis.

Means of Achieving Objective & Target (Strategies)

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 Regeneration Standards of Alberta performance survey. The Regeneration Standards of Alberta process provides the tools to measure and compare yields.

Current Status

Blocks surveyed to date under the Regeneration Standard of Alberta process were originally managed to meet the 1991 coniferous free-to-grow standards. Under the inception of the new RSA, deciduous stocking is identified and managed differently than had been done under the 1991 standard. To address this issue going forward, in 2011 Canfor implemented a revised process in which blocks are checked within one year after harvest to identify areas where deciduous regeneration is growing within the blocks so that they can be correctly declared and managed.

Table 14. 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
2012	1998/1999	Deciduous	0	0.15	2.75	na	na
		Deciduous/Conifer	7	1.71	1.80	2.06	0.31
		Conifer/Deciduous	23	1.76	0.91	2.33	0.62
		Conifer	39	2.26	0.22	3.10	0.12

Forecast

By following the “Means of Achieving Objective and Target (Strategies)” section of this indicator, it is anticipated that the regenerated stand yields will meet or exceed the yield assumptions of the Timber Supply Analysis and ensure sustainable forest harvest levels and healthy forest ecosystems are maintained into the future.

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 Regeneration Standards of Alberta results are accumulated and incorporated into future forest management plan Timber Supply Analysis.

Annual:

All Regeneration Standards of Alberta program results will be reviewed and compared to Forest Management Plan mean annual increment targets. Some years may not have results, as the surveys may be completed every second year.

Reporting Process

The Annual Performance Monitoring Report 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 Sustainable Forest Management Plan. Results are also reported to Environment and Sustainable Resource Development and are entered into their Alberta Reforestation Information System database.

Acceptable 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, and the 5 year average must meet the mean annual increment targets for the current quadrant period.

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.

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 weeds are plants which have the potential for rapid spread and major crop losses. Weeds in this category are to be controlled to prevent spreading.
Target	**100% of noxious weeds identified along Canfor Alberta's License of Occupation roads will have treatments scheduled and completed according to the plan**
Description of target	The purpose of this target is to monitor the success of Canfor's 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.*

Means of Achieving Objective & Target (Strategies)

All Alberta, FMG Canfor staff are required to complete noxious weed training. Throughout the year, Canfor FMG Alberta staff and the municipal weed inspectors collect locations and species of weeds identified on the Defined Forest Area. The data is entered into the Cengea Solutions Inc. database and is compiled in the Road Maintenance Plan. The Road Maintenance Plan lists the treatment activities that are scheduled for mid-July through the end of August.

Current Status

100% of the identified noxious weeds were treated in Canfor's Defined Forest Area along Canfor held dispositions (License of Occupation, Miscellaneous Surface Lease, Surface Materials Lease) as scheduled in 2012 Road Maintenance Plan.

Forecast

By following Means of Achieving Objective and Target (Strategies)" section of this indicator, it is anticipated that native species diversity will be preserved.

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:

Schedule newly identified and completed treatments as identified in the Road Maintenance Plan.

Reporting Process

The Weed Control Activities are stored in Canfor Alberta's Roads Database and will be reported in the Annual Performance Monitoring Report.

Acceptable Variance

90% of identified weeds must be treated

Response

Adjust activities

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 Defined Forest Area 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 Alberta will minimize the conversion of forested land to non-forested lands in their operations.
Target	**Forest management company activities not to exceed 3% reduction in gross Defined Forest Area over the life of the Forest Management Agreement (May 26, 1964)**
Description of target	The Defined Forest Area 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 Defined Forest 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 will not be tracked in this indicator. However, Canfor does have indirect influence in the amount of forest converted to non-forest as indicated in strategies below.

Means of Achieving Objective & Target (Strategies)

Several strategies can be employed to achieve this target.

1. Will work with other industrial users to coordinate plans. The Foothills Landscape Management Forum 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

Current Status

Canfor has not exceeded the three percent land base conversion to non-forest conditions as of May 1st, 2013. Currently 1,457.9 ha is under disposition with the government, which represents 0.22 percent of the total Defined Forest Area of 644,695 ha.

Forecast

Minimizing landbase conversion to non-forested conditions and maintenance of the forested landbase will result in sustainable forest ecosystems.

Legal Requirements

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

Monitoring & Measurement

Annual

The Defined Forest Area gross area is 644,695 hectares. Conversion to non-forest landuse includes construction of roads, gravel pits, camp clearings etc. All new dispositions will be reported in the Annual Performance Monitoring Report.

Reporting Process

Total area of Canfor dispositions added annually in the Annual Performance Monitoring Report. 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.

Acceptable Variance

No variance; Forest management company activities will not exceed 3% reduction in gross area Defined Forest Area over the life of the Forest Management Agreement (May 26, 1964)

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.

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	**Percent 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 into 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 is developed as per the legal requirements of the Forest Management Agreement (Alberta. 1999). The Timber Supply Analysis involves the calculation of the long-term harvest level. Monitoring of the actual harvest level compared to the annual allowable cut 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.

Means of Achieving Objective & Target (Strategies)

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 is prepared annually to summarize the harvested volumes and compares them to the annual allowable cut. In the fifth year of the quadrant, the company planners and management will adjust the harvest level to ensure that the quadrant allowable harvest is not exceeded.

Current Status

The current conifer harvest levels are at 75% and deciduous harvest levels are at 43%. Plans are projected to be slightly under the approved conifer harvest level and the deciduous harvest level will be also under as Tolko's oriented stranboard plant is still not operating upon completion of year five.

Table 15. Current Quadrant Approved Level of Harvest

Timber Disposition	Quadrant Period 1	Quadrant Harvest Level (m3)	Harvested as of April 30, 2013 (m3)	Percent	Remaining (m3)
FMA9900037	May 1, 2009 - April 30, 2013	3,575,000	2,685,607	75%	839,393
DTA150001	May 1, 2009 - April 30, 2013	458,848	69,186	15%	389,662
DTA150002	May 1, 2009 - April 30, 2014	839,085	51,288	6%	747,974
DTA150003	May 1, 2009 - April 30, 2013	1,662,369	1,509,629	91%	152,740

Forecast

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

Actual annual harvested volume is obtained from the Timber Product Revenue (TPR) audit from Environment and Sustainable Resource Development and is reported in the General Development Plan and the Annual Performance Monitoring Report. Evaluation of performance to this target will be done when TPR audited quadrant volumes are available.

Acceptable Variance

The actual quadrant harvest volume will not exceed 5% of the allowable harvest level.

Response

Adjust activities

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	**Percent 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 Forest Management Agreement area 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.

Means of Achieving Objective & Target (Strategies)

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 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.

Current Status

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

Table 16. Percent of Blocks Exceeding 5% Soil Disturbance with Prior Approval

# of Harvested Blocks in 2012 TY	# of Blocks Exceeding 5% Soil Disturbance	# of Blocks Exceeding 5% Soil Disturbance with Prior Approval	% of Blocks Exceeding 5% Soil Disturbance with Prior Approval
78	5	5	100%

Forecast

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 3.1.1.1

Monitoring & Measurement

Annual:

The percent of road area is calculated and reported annually to the Province. After harvesting is completed, area of as built roads will be recalculated and compared to the approved blocks that exceeded the 5% disturbance.

Reporting Process

Any blocks that exceeded the 5% disturbance and that did not receive approval at time of Annual Operating Plan submission or approval during harvesting will be reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; 100% of harvested blocks will not exceed 5% soil disturbance without government approval as outlined in Canfor Operating Ground Rules.

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

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	**Percent 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 significant 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 incident tracking system. Action plans and mitigation strategies will be in place in incident tracking system.

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.

Means of Achieving Objective & Target (Strategies)

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.

Current Status

All Canfor Alberta incidents of significant erosion and slumping are tracked in incident tracking system. Action plans have contributed to improved practices during the term of the 2005 Sustainable Forest Management Plan.

Table 17. 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..

Forecast

Productive forest soils with minimized losses from forest operations.

Legal Requirements

Canfor Forest Management Agreement area Operating Ground Rules, Timber Management Regulation, Soil Guidelines

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

Monitoring & Measurement

Annual:

Ensure that identified soil erosion and slumping events have a mitigation strategy entered into Incident Tracking System and those scheduled strategies are completed in accordance to the plan.

Reporting Process

Annual Performance Monitoring Report will document all incidents in Incident Tracking System and document the percentage with mitigation strategies in place.

Acceptable Variance

No variance; All reportable incidents will have mitigation strategies implemented within one year of identification.

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.

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 1.1.2.1b)
Indicator Statement	**Percentage of harvested area by subunit with coarse woody debris equivalent to pre-harvest conditions**
Description of indicator	Coarse woody debris 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. *Canadian Standards Association 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 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. Coarse woody debris 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.

Means of Achieving Objective & Target (Strategies)

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

Current Status

The Table below is an indication of the amounts of Pre-Harvest coarse woody debris by yield group. The current harvesting practices, such as on the stump processing, non-utilization of Mountain Pine Beetle dead trees and deciduous all contribute to amount of onsite coarse woody debris.

Table 18. Pre-Harvest Coarse Woody Debris by Yield Group

Yield Group	Description	Pre-Harvest CDW (m3/ha)	Number of Plots
1	AW+(S)-AB AW	89	13
2	AW+(S)-CD AW	108	54
3	AWSW/PBSW/BWSW	75	117
4	BW/BWAW+(S) BW	96	4
5	FB+OTHERS FB	241	55
6	H+(S)/S AW	136	15
7	PB+(S) PB	130	7
8	PL/PLFB+(H) PL	101	302
9	PLAW/AWPL PL	78	46
10	PLSB+OTHERS PL	80	63
11	PLSW/SWPL+(H) PL	136	140
12	SBLT/LTSB (G,M,F) SB	80	71
14	SBPL/LTSBSW/SBFB SB	70	75
15	SW/SWFB+(H)-AB SW	120	124
16	SW/SWFB+(H)-CD SW	125	316
17	SWAW/SWAWPL SW	86	246

Species: PL = Lodgepole pine; SW = White spruce; SB = Black spruce; FB = Balsam fir; LT = Tamarack larch; AW = White aspen (Aspen); BW = White birch; H = Generic for any deciduoud species (aspen, birch); S = Generic for any coniferous species (pine, spruce, etc.) OTH = includes other unidentified species when FB or PLSB are identified as the main leading species

Species descriptors: AB = refers to A and B stand densities (A being lower stems per ha than B); CD = refers to C and D stand densities (D being the highest stems per ha therefore the most dense type of stand); G,M,F = Timber productivity rating (site index) - "good, medium, fair"; U = timber productivity rating - uncommercial stand type

Forecast

It is anticipated that the long-term management of coarse woody debris will maintain ecosystem integrity.

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 coarse woody debris as outlined in ”Canfor Coarse Woody Debris Best Management Practices Appendix 7”

Reporting Process

Report the percent of harvest blocks with retained coarse woody debris in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; 100% of subunits (Peace, Puskwaskau and Main) will meet or exceed coarse woody debris conditions equivalent to the pre-harvest state.

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.

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	**Watersheds with high 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: Environment and Sustainable Resource Development John Diiwu 2011*
Target	**100% of watersheds with a high 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 Defined Forest Area and to successfully implement approved mitigation strategies on watersheds identified as potentially high risk (equivalent clear-cut area >50%).

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)

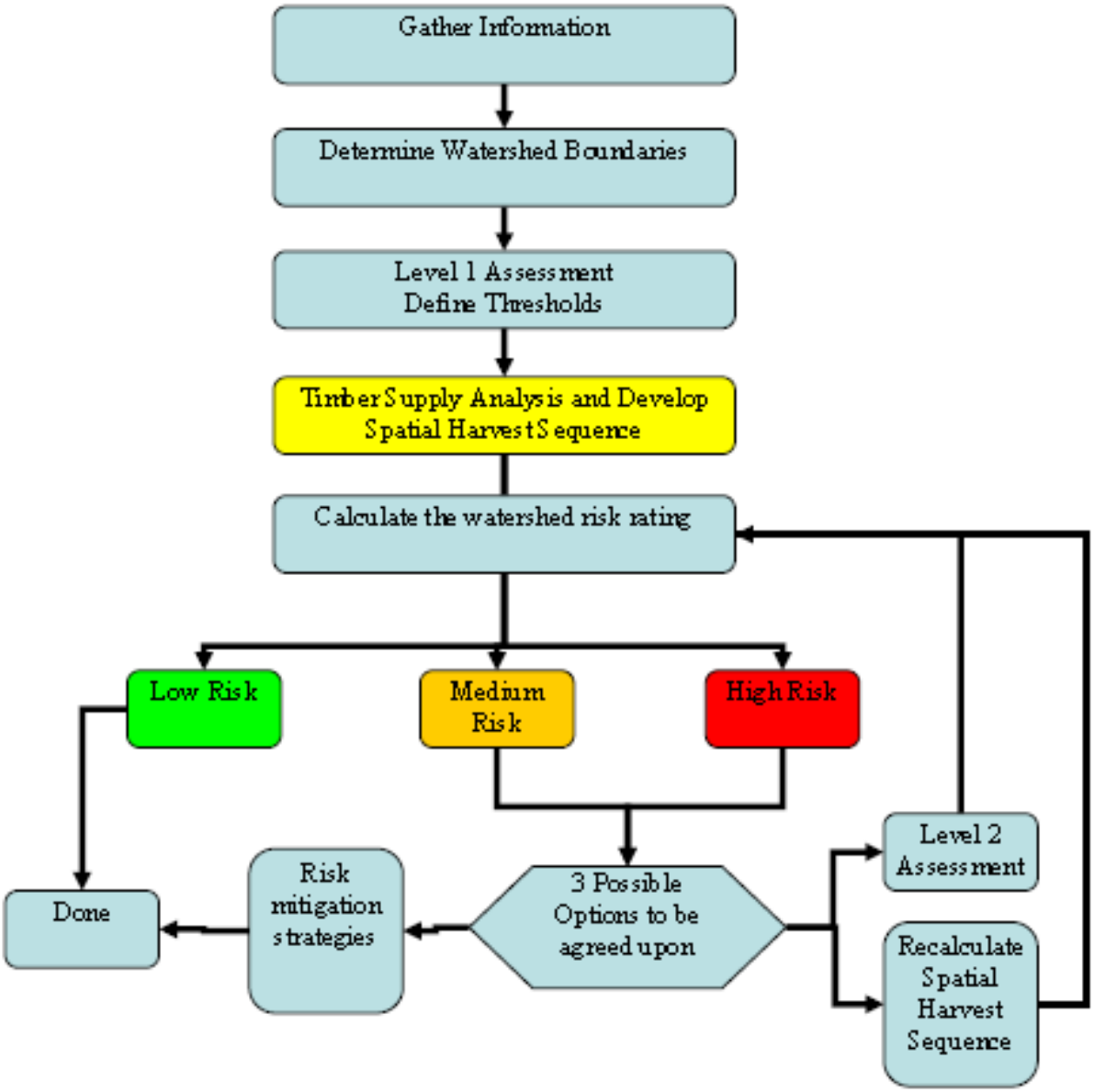
Means of Achieving Objective & Target (Strategies)

The strategy used in equivalent clear-cut area threshold and hazard levels calculations was developed by Environment and Sustainable Resource Development, and will be used for the 2014 forest management plan using the Preferred Forest Management Scenario spatial harvest sequence.

Those watersheds for which high impacts are projected will have mitigation strategies implemented, in consultation with and recommended by Environment and Sustainable Resource Development, 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 11: ECA Threshold and Hazard Levels

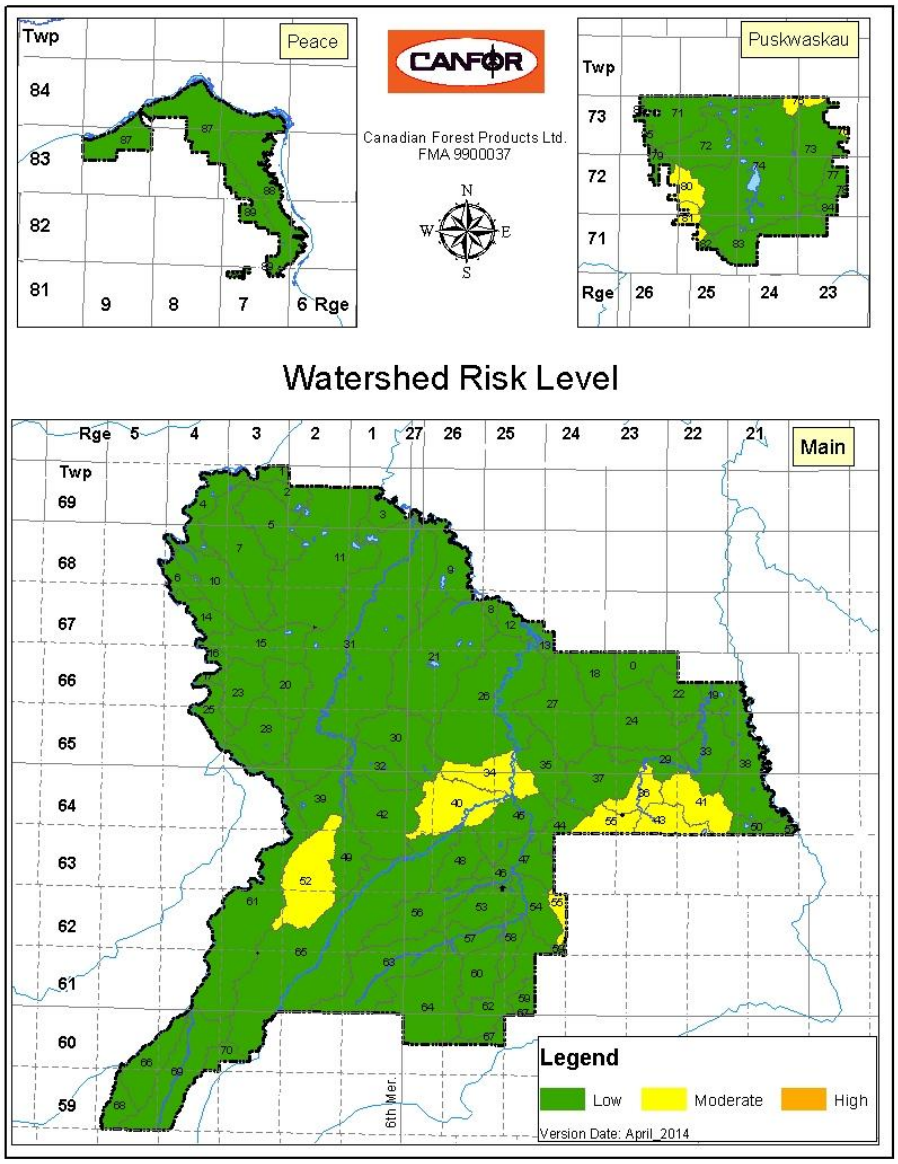


Report mitigation strategies on high risk level watersheds for periods 1 and 2 (1 period = 5 yrs.) scheduled for completion in 2012.

Current Status

Environment and Sustainable Resource Development created new watersheds utilizing LiDAR. The current status was calculated by following Environment and Sustainable Resource Development procedures outlined in Figure 11 and results in Figure 12.

Figure 12: Watershed Risk Level



Forecast

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

Table 19. Watershed ECA (%)

Watershed	ECA (%) By Reporting Period					
	Current	10 Years	20 Years	50 Years	100 Years	200 Years
0	21%	37%	33%	19%	71%	73%
1	9%	9%	7%	21%	23%	24%
2	2%	15%	16%	23%	20%	19%
3	1%	46%	58%	57%	55%	56%
4	9%	19%	48%	52%	20%	18%
5	1%	7%	8%	19%	12%	12%
6	22%	41%	42%	32%	33%	38%
7	5%	14%	17%	35%	25%	19%
8	7%	8%	15%	65%	30%	43%
9	8%	7%	24%	54%	25%	29%
10	18%	43%	45%	30%	38%	40%
11	5%	15%	22%	40%	23%	23%
12	13%	20%	38%	42%	29%	32%
13	15%	10%	7%	32%	40%	34%
14	14%	24%	29%	33%	30%	28%
15	18%	31%	40%	47%	18%	18%
16	28%	28%	64%	52%	2%	3%
17	2%	0%	18%	57%	12%	8%
18	22%	20%	16%	38%	54%	58%
19	5%	2%	1%	56%	28%	28%
20	18%	18%	25%	55%	28%	17%
21	16%	16%	22%	44%	45%	44%
22	14%	12%	11%	50%	42%	45%
23	24%	28%	39%	57%	34%	26%
24	22%	22%	27%	42%	38%	31%
25	11%	12%	38%	68%	15%	12%
26	19%	16%	12%	31%	56%	59%
27	23%	27%	25%	29%	51%	37%
28	13%	16%	25%	54%	27%	15%
29	22%	27%	39%	44%	42%	37%
30	21%	24%	26%	49%	45%	45%
31	10%	14%	22%	59%	29%	27%
32	17%	17%	20%	36%	34%	25%
33	22%	17%	21%	27%	53%	52%
34	48%	37%	27%	16%	73%	68%
35	29%	30%	28%	35%	57%	55%
36	42%	51%	57%	46%	55%	28%
37	29%	35%	41%	54%	42%	35%
38	15%	13%	12%	29%	47%	46%
39	27%	26%	26%	23%	35%	19%
40	33%	30%	28%	35%	50%	36%
41	38%	44%	54%	45%	40%	28%
42	22%	19%	17%	29%	43%	27%
43	39%	45%	51%	40%	51%	34%

Watershed	ECA (%) By Reporting Period					
	Current	10 Years	20 Years	50 Years	100 Years	200 Years
44	31%	35%	42%	45%	31%	42%
45	27%	22%	18%	32%	31%	32%
46	10%	16%	19%	41%	27%	8%
47	21%	20%	18%	31%	29%	27%
48	20%	29%	40%	45%	39%	16%
49	24%	21%	21%	44%	44%	34%
50	27%	28%	32%	33%	31%	21%
51	7%	4%	3%	38%	17%	20%
52	32%	33%	35%	38%	54%	35%
53	23%	30%	34%	41%	41%	20%
54	18%	15%	13%	20%	21%	13%
55	38%	47%	48%	37%	41%	26%
56	28%	41%	47%	41%	44%	17%
57	23%	28%	31%	29%	28%	14%
58	15%	14%	20%	26%	24%	11%
59	5%	11%	18%	16%	21%	6%
60	13%	20%	27%	29%	30%	8%
61	23%	28%	34%	40%	43%	22%
62	7%	11%	19%	21%	22%	7%
63	17%	27%	30%	21%	26%	9%
64	2%	9%	19%	19%	21%	7%
65	31%	40%	45%	36%	48%	23%
66	17%	44%	59%	48%	54%	15%
67	4%	2%	10%	9%	18%	7%
68	16%	36%	57%	56%	38%	11%
69	20%	51%	61%	45%	57%	23%
70	26%	28%	30%	27%	32%	9%
71	25%	19%	16%	19%	59%	56%
72	25%	24%	22%	24%	63%	64%
73	25%	21%	16%	40%	55%	64%
74	24%	19%	15%	32%	45%	51%
75	37%	34%	29%	37%	39%	54%
76	44%	42%	37%	4%	8%	38%
77	15%	7%	3%	23%	60%	64%
78	12%	4%	1%	2%	70%	83%
79	9%	37%	52%	29%	60%	76%
80	31%	24%	15%	14%	79%	60%
81	35%	23%	13%	11%	83%	48%
82	20%	10%	4%	6%	76%	80%
83	24%	14%	8%	15%	60%	66%
84	18%	8%	3%	0%	58%	68%
85	13%	7%	4%	10%	70%	75%
87	18%	15%	13%	12%	9%	11%
88	18%	19%	20%	39%	18%	36%
89	10%	20%	27%	25%	5%	9%

	Low		Medium		High

Legal Requirements

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

Water Act

Monitoring & Measurement

Annual:

Determine the watershed risk rankings. Report on which of those watersheds has mitigation strategies implemented.

Reporting Process

In the Annual Performance Monitoring Report, report on watersheds with a high risk level and the mitigation strategies implemented on watersheds where operational harvesting activities occurred.

Acceptable Variance

No variance; All high risk ranked watersheds with scheduled operations will have mitigation strategies completed, in consultation with Environment and Sustainable Resource Development.

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.

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 (ESRD VOIT 1.1.2.3)
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.

Means of Achieving Objective & Target (Strategies)

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 Environment 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.

Current Status

Canfor Alberta utilizes the Foothills Stream Crossing Program to identify risk. The Foothills Stream Crossing Program is administered by the Foothills Research Institute. The program is a creditable standardized procedure that is used by other forest companies and other industrial users across Alberta.

Stream crossing inspections are completed in June and early July of each year. Any crossing inspections that indicate a high risk for safety are addressed immediately. As of 2012, remediation plans including the recommendations from the inspections for all medium and high hazard drainage structures are developed within six months of the stream crossing inspections. These remediation plans are scheduled to be implemented on a priority basis.

Currently there are 160 crossings inspected, 86 (54%) pose a high risk to water quality and 58 (36%) pose a medium risk.

Over the next five-year period, Canfor Alberta should have all the initial inspections 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.

Table 20. Percent of Crossings in Remediation Plan

Risk Ranking	Number of crossings by Risk	Percent of Total Crossings	Percent of Crossings in Remediation Plan	Number of Crossings in Remediation Plan that have been Repaired	Percent of Crossings in Remediation Plan that have been Repaired
High Risk Inspections	86	54%	100%	4	5%
Medium Risk Inspections	58	36%	100%	2	3%
Low Risk Inspections	15	9%	0%	0	0%
No Risk Inspections	1	1%	0%	0	0%
Total Crossings Inspected	160	100%	100%	6	4%

Forecast

Through the implementation of the "Means of Achieving Objective and Target (Strategies)", it is anticipated that the reduction in the number of high-risk drainage structures in sensitive watersheds will improve the quality of water on the Defined Forest Area in the long-term.

Legal Requirements

Federal Fisheries Act

Canfor Forest Management Agreement area 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 number of crossings that received required maintenance will be compared to the number of crossings scheduled for repairs and maintenance in the remediation plan. The results of this comparison will be reported in the Annual Performance Monitoring Report.

Acceptable Variance

90% 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.

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.

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**
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 Operating Ground Rules apply to all smaller crossings not covered by the Code.

Means of Achieving Objective & Target (Strategies)

The Annual Operating 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 approval of this plan will ensure that all crossings were planned in accordance to the Code or the Operating Ground Rules, whichever apply.

Current Status

Work was completed on 21 stream crossings within the in the 2012 timber year. All work was completed within the Code of Practice for Watercourse Crossings and Operating Ground Rules.

Forecast

It is anticipated that through ensuring that all active operations at water crossings, including maintenance and construction, are completed and approved to the standards of the Code of Practice for Watercourse Crossings and the Operating Ground Rules that water quality will be maintained.

Legal Requirements

Code of Practise for Water Course Crossings, Section 7 to 9 and Schedule 2,

Water Act,

Timber Management Regulations,

Canfor Forest Management Agreement area Operating Ground Rules.

Alberta Forest Management Planning Standard, Annex 4 – Performance Standards

Monitoring & Measurement

Annual:

The Annual Operating Plan includes a Road Maintenance, Construction and Abandonment Plan. 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. 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 checked off to confirm that the planned work meets the applicable requirements and the timing planned to implement.

Reporting Process

The Annual Performance Monitoring Report will summarize:

- the number of new crossings constructed;
- the number of crossings for which maintenance was planned in the Road Maintenance Construction and Abandonment Plan and of those the maintenance work that was completed;
- which criteria applied to the crossings; and
- whether the criteria were followed.

Acceptable Variance

No variance; 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 Operating Ground Rules.

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.

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 (ESRD VOIT 4.1)
Indicator Statement	**The tonnes of carbon stored is each of the carbon pools**
Description of indicator	Carbon Budget Models are available to evaluate the management scenarios.
Target	**Achieve 100% of the carbon stored in each of the carbon pools as defined by the Preferred Forest Management Scenario forecast**
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 Defined Forest Area. 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.

In addition to the model run, Canfor will be developing a strategy for all Canfor Sustainable Forest Management Plans. The strategy will include:

- Maintain some old growth on the land base for carbon storage
  - The Canadian Standards Association 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 Defined Forest Area". The actual targets will vary for each Sustainable Forest Management Plan. For Sustainable Forest Management reporting we would use the current condition for 1.1.3c and apply it to 4.1.1
- Prompt reforestation for carbon uptake
  - Canadian Standards Association core indicator 2.1.1a reforestation success also applies to criterion 4 in the standard. Canfor's core indicator statement is "Average regeneration delay for stands established annually".
- Minimize permanent access structures to maintain forest productivity for carbon uptake
  - Canadian Standards Association 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 Defined Forest Area converted to non-forest use". The target for most plans relates to the total amount of road required to fully develop the Defined Forest Area to extract timber and varies from 3% to 7%.
- Increase fiber utilization for carbon sequestration and replacement of fossil fuels.

Means of Achieving Objective & Target (Strategies)

The CFS-CBM-3 model developed by the Canadian Forest Service has been used to forecast the amount of carbon stored in each carbon pool under the Preferred Forest Management Scenario. Following this harvest forecast will result in achieving these target values on the ground.

Current Status

The current status is indicated in the table below.

Forecast

The table below shows the forecast tonnes of carbon in each of the carbon pools.

Table 21. Carbon Sequestration by Carbon Pool

Year	Carbon Sequestration by Carbon Pool (millions of tonnes of C)			
	Above Ground Biomass	Below Ground Biomass	Dead Organic Matter	Soil Biomass
Current	29.0	6.6	48.0	52.4
10	27.1	6.2	47.5	52.8
20	26.0	5.9	47.1	53.4
50	23.5	5.4	44.3	53.4
100	21.9	5.0	39.7	51.1
200	26.8	6.1	40.4	51.2

Legal Requirements

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

Monitoring & Measurement

Periodic:

Future forest modelling will include this indicator and changes to management assumptions will be assessed based on their impacts to carbon sequestration.

Reporting Process

The summary of results of the CFS-CBM-3 modelling process will be provided in the Annual Performance Monitoring Report and Forest Management Plan.

Acceptable Variance

+/-20% of the Preferred Forest Management Scenario for the 10 year forecast values.

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.

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	4.2.1 & 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 Defined Forest Area 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 3% reduction in gross forest land base in the Defined Forest Area over the life of the Forest Management Agreement area**
Description of target	The Defined Forest Area 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 Defined Forest 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 Defined Forest Area (no ESRD VOIT)
Indicator Statement	**Percent 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 Defined Forest Area (ESRD VOIT 5.2.2.1)
Indicator Statement	**Maintenance of recreational areas for non-timber values**
Description of indicator	The company will maintain recreational areas on the Defined Forest Area for public use.
Target	**Canfor Alberta will maintain a minimum of 3 recreational areas for use by the public within Defined Forest Area**
Description of target	Canfor Alberta will maintain recreational areas, such as campsites, on the Defined Forest Area for public use.

Basis for the Target

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

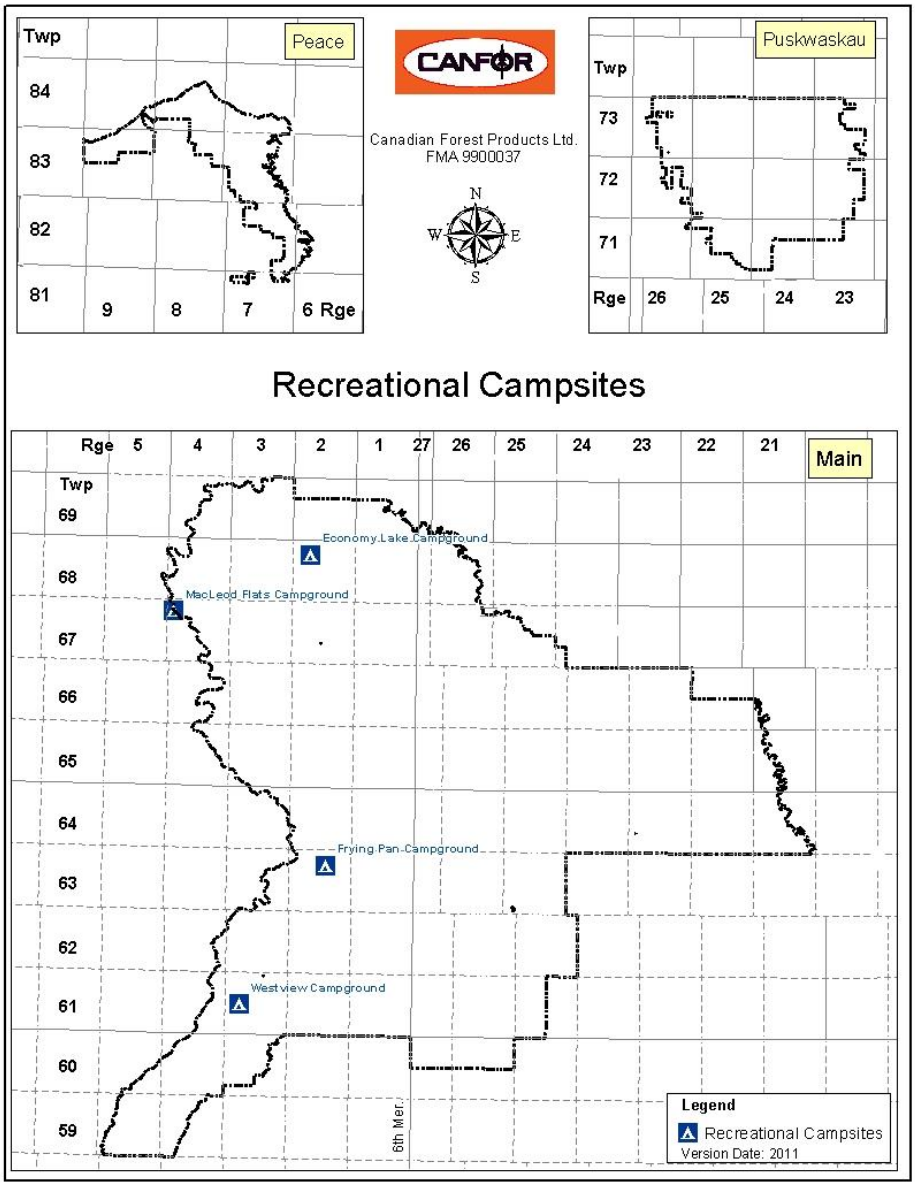
Means of Achieving Objective & Target (Strategies)

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

Current Status

Canfor Alberta currently maintains four recreational areas on the Defined Forest Area.

Figure 13: Recreational Campsites



Forecast

Recreational campsites on the Defined Forest Area will be continually available for public use, thus ensure that the common non-timber value of recreation is maintained.

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 Annual Performance Monitoring Report will report on the number of recreational areas maintained annually.

Acceptable Variance

No variance; Canfor Alberta will maintain a minimum of 3 recreational areas for use by the public within Defined Forest Area.

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

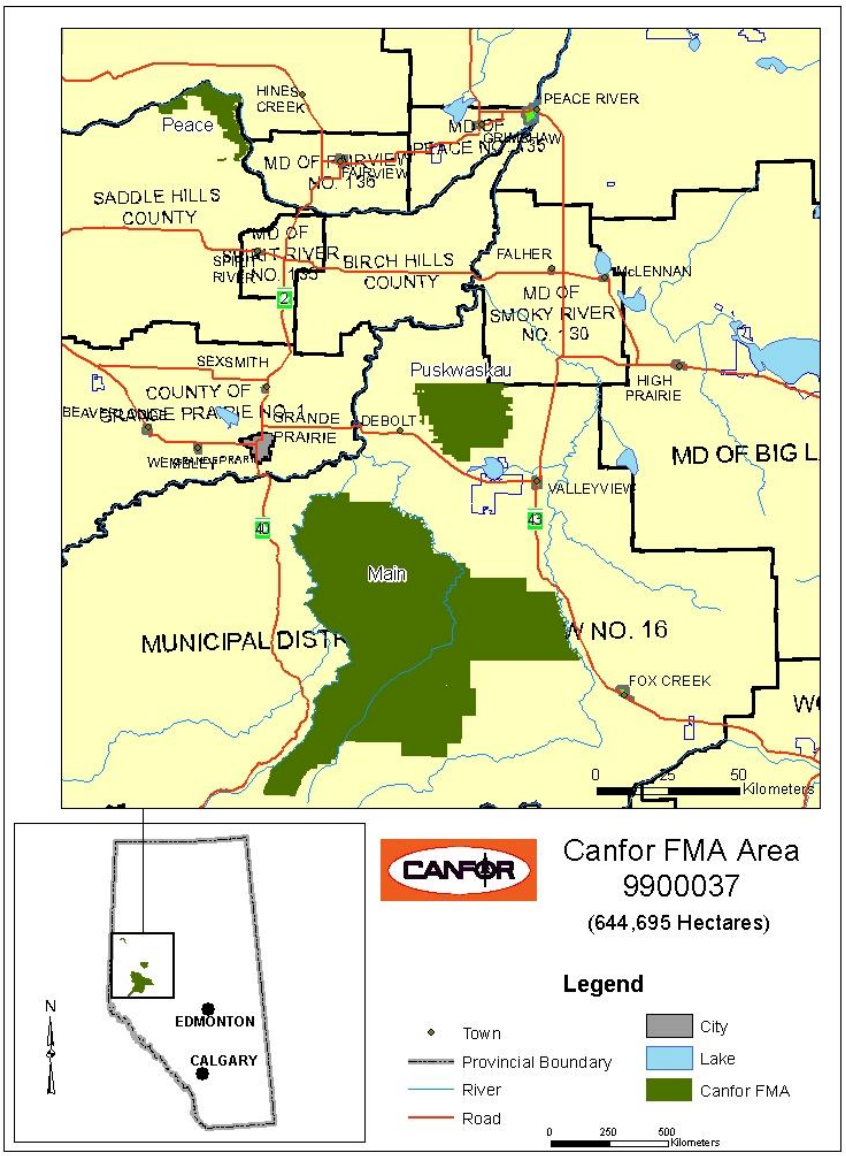
This target demonstrates Canfor Alberta's involvement in the local community. There are many biological and ecological benefits provided by forests. They also contribute social and economic benefits. Forests represent not only a return on investment (measured, for example, in dollar value, person-days, donations, etc.) for the organization but also a source of income and non-financial benefits for Defined Forest Area-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.

Means of Achieving Objective & Target (Strategies)

Opportunities will be provided to local contractors.

Figure 14: Forest Management Agreement area Locations with MDs



Current Status

During the five year period from 2008-2012, 89% of the dollars paid by Canfor Alberta were for local contract services.

Table 22. Investment in Local Communities

Contribution	2008	2009	2010	2011	2012
Local Contract Services ($ millions)	34.4	31.3	34.9	34.2	49.5
Non-Local Contract Services ($ millions)	5.9	3.4	5.0	4.1	5.5
subtotal	40.2	34.7	39.9	38.4	55.0
% Local Contract Services (5 year rolling avg.)	**85%**	**87%**	**87%**	**87%**	**89%**

Forecast

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

Legal Requirements

None

Monitoring & Measurement

Annual:

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 Defined Forest Area from suppliers and contractors within local communities. Canfor Alberta will track all spending pertaining to forest related activities (operations, management) within the Defined Forest Area, 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 Defined Forest Area. Local communities have been defined by the Forest Management Advisory Committee as those adjacent to the Forest Management Agreement 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 Sustainable Forest Management Plan. In 2011, the list was expanded, with discussions with Forest Management Advisory Committee, to include; MD of Peace River No 135, MD of Fairview No 136, Northern Lights County, Clearhills County, and Mackenzie County.

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 Annual Performance Monitoring Report.

Acceptable Variance

No variance; Over a rolling 5-year period, a minimum of 75% of Canfor Alberta forest operations dollars paid for contract services will be expended locally

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 FMG Alberta 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.

Means of Achieving Objective & Target (Strategies)

Canfor Alberta has maintained a strong community presence since 1964 and will continue to provide financial/in-kind support in the local community.

Current Status

For the 2012 fiscal year, Canfor provided financial support to 6 community events and services:

1. Shock Trauma Air Rescue Service Foundation (STARS);
2. Grande Prairie Regional Emergency Medical Services (GPREMS);
3. QE11 Hospital Foundation;
4. United Way;
5. Girl Guides of Canada; and
6. Clear Hills Agri-show.

Canfor provided in-kind support to 5 community events and services:

1. Salvation Army (food bank and adopt a family);
2. Odessey House (items for the house);
3. Nitehawk Ski Patrol (office space);
4. Arbour Day (Canfor foresters presentations to school classrooms); and
5. Walk through the Forest (hosted a wildlife booth with Canfor forester presenters).

Forecast

Through providing in kind and financial support to local communities, Canfor is contributing to the sustainability and well-being of the communities it operates in.

Legal Requirements

None

Monitoring & Measurement

Annual:

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

Reporting Process

The number of community events or services that Canfor has provided financial/in-kind support will be reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; Canfor will provide financial/in-kind support to a minimum of 8 community events or services.

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 required 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.

Means of Achieving Objective & Target (Strategies)

Forest planning and operations are conducted with a genuine focus on worker safety and environmental stewardship. Canfor Alberta uses the FMG Training Matrix and 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.

Current Status

Canfor records from May 1, 2012 to April 30, 2013 show that all FMG Alberta employees and DFA-related contractors have been given the required environmental and safety training as outlined by company training procedures.

Forecast

It is expected that maintaining an active environmental and safety training program will lead to 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 required environmental and safety training will be tracked in Canfor's Eclipse training database and contractor pre-work forms, as a percentage of all employees and contractor employees that work on the Defined Forest Area.

Reporting Process

All training provided to employees will be tracked in Canfor's Eclipse training database and all training provided to contractors will be recorded in the contractor pre-work form. The training will be summarized from Eclipse and the pre-work forms and any training that was not completed will be reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; 100% of Canfor FMG Alberta employees and contractors have required environmental and safety training.

Response

Ensure prompt completion of outstanding training.

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 Defined Forest Area**
Description of target	The level of direct and indirect employment will be calculated and reported annually.

Basis for the Target

"The Canadian forest industry is a major employer nationwide. While the forest industry contributes to the economic, environmental and social welfare of all Canadians, these contributions are particularly important in many rural and Aboriginal communities, where forest-related work is often the main source of income." (Natural Resources Canada).

Canfor Alberta contributes to direct and indirect employment within the local region and to sustainable harvesting by adhering to their apportioned harvest volume within Defined Forest Area. 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.

Means of Achieving Objective & Target (Strategies)

Maintain harvest levels

Current Status

Canfor's production volume continues to be at or near the annual allowable cut level, therefore direct and indirect employment levels are stable.

Table 23. Level of Direct and Indirect Employment

	Production Volume (M3)	Employment
Potential	715,000	2,932
2012	704,942	2,890

Forecast

Harvesting in relation to the allocated annual allowable cut will provide and maintain employment and taxation revenue to local communities.

Legal Requirements

None

Monitoring & Measurement

Annual:

The coniferous annual allowable cut for the Defined Forest Area is 715,000 m3. Using a multiplier of 4.1 jobs per 1000 m3, the level of direct and indirect employment was 3,146 jobs. Natural Resources Canada Annual Report 2013 website https://cfs.nrcan.gc.ca/publications/download-pdf/35191 is approximately 4.1 direct and indirect jobs per 1000 m3 of harvest.)

Reporting Process

In the Annual Performance Monitoring Report, report the annual production volume and the calculated number of jobs, annually. Show the trend from previous years.

Acceptable Variance

No variance; Report annually on trend of Canfor Alberta's level of direct and indirect jobs created from the Defined Forest Area

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 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.

Means of Achieving Objective & Target (Strategies)

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.

Current Status

In the 2012 timber year, one local Aboriginal community was offered opportunity to bid on the clearing, grubbing, and burning of a new Satellite Yard located at km 288 on the Canfor Lease Cut-off Road. The bid was awarded to the Aboriginal community and they completed the work during February and March 2013.

Canfor also helped fund an Aboriginal economic opportunity through the Foothills Landscape Management Forum Road Patrol Project in which members of a local Aboriginal Community were hired to monitor public access in caribou ranges and collect data on wildlife sightings.

Forecast

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 tracking system. An annual report from Creating Opportunities for Public Involvement will summarize the number of opportunities offered and reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance

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	Aboriginal and treaty rights
Objective	Aboriginal and treaty rights will be understood and 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 FMG 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 FMG Alberta Forestry Supervisors, Coordinators, Superintendents, 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, Canfor Alberta recognizes that employees require credible and effective Aboriginal awareness training.

Means of Achieving Objective & Target (Strategies)

There are 3 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.

Current Status

This is a new target and will be reported in the next Annual Performance Monitoring Report.

Forecast

Relationship between Canfor FMG 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 employees a better understanding and respect for these values in the planning process and during operations.

Legal Requirements

None

Monitoring & Measurement

Annual:

Canfor's Eclipse training tracking database will keep records of all staff training. Report annually the percent of Canfor FMG 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.

Acceptable Variance

A minimum of 75% of Canfor FMG Alberta staff receives a minimum of one credible and effective training session every two years.

Response

Ensure prompt completion of outstanding training

6.1.2 Forest Management Plan Communicated to Aboriginal Groups

Criterion 6. Society's Responsibility	**Element 6.1:** Aboriginal and Treaty Rights
Value	Aboriginal and treaty rights
Objective	Aboriginal and treaty rights will be understood and 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 Forest Management Plan
Target	**Opportunity to communicate key components of the Forest Management Plan have been communicated to each affected local Aboriginal group**
Description of target	The Forest Management Plan will be communicated to Aboriginal groups through direct consultation and participation in the Forest Management Advisory Committee.

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 must be communicated with Aboriginal Groups identified as having some interest in the Forest Management Area.

The Alberta Forest Management Planning Standard (ver. 4.1-April 2006), also details Environment and Sustainable Resource Development'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.

Means of Achieving Objective & Target (Strategies)

A description of Canfor Alberta's intent to ensure successful communication of the Forest Management Plan to Aboriginal groups is outlined in Canfor's Terms of Reference 2012 Forest Management Plan for Canfor Forest Management Agreement area 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 members are directly involved in the development of the Values, Objectives, Indicators, and Targets that form the basis of the Sustainable Forest Management Plan as well as the mandatory values, objectives, indicators and targets identified by Environment and Sustainable Resource Development 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 Forest Management Plan and engage in consultation as per Alberta's Aboriginal Groups Consultation Guidelines and Environment and Sustainable Resource Development Lands and Forestry First Nations Consultation Operating Procedures.

Current Status

Throughout the last three years Canfor has contacted the three Aboriginal groups (Aseniwuche Winewak Nation, Horse Lake First Nation, and Sturgeon Lake Cree Nation) identified as having some interest in the Defined Forest Area in regards to the development the Forest Management Plan. Canfor has provided opportunities for participation with the Forest Management Advisory Committee in the development of Values, Objectives, Indicators and Targets that will be included in the Forest Management Plan, as well as opportunities to attend Open Houses, and have made presentations to the three Aboriginal Communities to provide information on how a FMP is developed and to discuss how the Aboriginal Communities wish to be involved.

Forecast

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

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

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

Monitoring & Measurement

Periodic:

All communication as it relates to the Forest Management Plan will be recorded in Canfor's Creating Opportunities for Public Involvement database.

Reporting Process

During the development of a Forest Management Plan, each opportunity offered and materials/presentations given to each of the Aboriginal communities will be entered into Canfor's Creating Opportunities for Public Involvement tracking system and reported in Alberta Environment and Sustainable Resource Development's Record of Consultation. A report from Creating Opportunities for Public Involvement describing these opportunities will be summarized and reported in the Annual Performance Monitoring Report. Records of attendance at Forest Management Advisory Committee meetings will also be maintained in addition to the Creating Opportunities for Public Involvement summary.

Acceptable Variance

No variance; Opportunity to communicate key components of the forest management plan have been communicated to each affected local Aboriginal group.

Response

Adjust activities

6.1.3 Conformance with Plans to Address Aboriginal Values

Criterion 6. Society's Responsibility	**Element 6.1:** Aboriginal and Treaty Rights
Value	Aboriginal and treaty rights
Objective	Aboriginal and treaty rights will be understood and 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	**Percent 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.

Means of Achieving Objective & Target (Strategies)

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. This database requires that an action plan be put in place to address the non-conformance and develop further preventative measures.

Current Status

100% of forest operations were in conformance with operation/site plans in regards to Aboriginal forest values, traditional knowledge, and uses during the 2012 year.

Forecast

Aboriginal forest values, traditional knowledge and use will be respected.

Legal Requirements

Canfor Forest Management Agreement area 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:

All communication and actions as it relates to operational/site plans will be recorded in Canfor's Creating Opportunities for Public Involvement database.

Reporting Process

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, which will be summarized in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; All operational/site plans that have been developed to address Aboriginal forest values, traditional knowledge and uses will be implemented.

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.

6.2.1 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; Aboriginal values, knowledge, and uses
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	**Percent 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.

Refer to indicator 1.4.2 for the detailed write up.

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 Defined Forest Area**
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.

Means of Achieving Objective & Target (Strategies)

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 Defined Forest Area. 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.

Current Status

In the 2012 timber year, Canfor actively initiated and participated in relationships with five forest products businesses within the vicinity of the DFA.

Table 24. Relationships with Forest Products Businesses

Forest Industry User	Evidence of Relationship
Ainsworth Engineering	Incidental Agreements
DMI	Quarterly Operations Meetings
Tolko	Consultation on AOP/GDP
Weyerhaeuser	Pulp Agreement
Miller Western	Benchmarking Activities
Total # of Relationships	5

Forecast

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 Defined Forest Area.

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 Defined Forest Area.

Reporting Process

In the Annual Performance Monitoring Report, report on the number of purchase, sale or trade relationships with other forest dependant businesses within, or in the vicinity, of the Defined Forest Area. Tracking is the number of relationships, not the number of transactions within each relationship.

Acceptable Variance

No variance; Canfor Alberta will maintain a minimum of four relationships with other forest products businesses.

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.

6.3.2 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 Defined Forest Area-related contractors and their unions to improve and enhance safety standards, procedures, and outcomes in all Defined Forest Area-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 Partnerships In Injury Reduction program.
Target	**100% of Canfor FMG Alberta and eligible Defined Forest Area related contractors will obtain and maintain a Certificate of Recognition or equivalent**
Description of target	Certificate of Recognition 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

Means of Achieving Objective & Target (Strategies)

The Partnerships in Injury Reduction program encourages the development of effective workplace health, safety and disability management programs in Alberta. Partnerships in Injury Reduction has 13 certifying partners; a Certifying Partner is responsible for assessing the quality of health and safety management systems in Alberta. Companies entering the Partnerships in Injury Reduction program work towards attaining a Certificate of Recognition. A Certificate of Recognition 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 Certificate of Recognition 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 Certificate of Recognition expires after three years, another external audit must be conducted to renew the Certificate of Recognition.

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 Defined Forest Area-related contractors will implement and maintain a Partnerships in Injury Reduction safety program and achieve a Certificate of Recognition.

Current Status

Canfor FMG Alberta has implemented Partnerships in Injury Reduction safety program and has a current Certificate of Recognition. Partnerships in Injury Reduction 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 Certificate of Recognition or equivalent (i.e. BC Safe Companies) certified since 2009.

Forecast

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 Certificate of Recognition during the reporting year. The indicator will be considered met for Defined Forest Area-related contractors if they maintain a Certificate of Recognition or equivalent 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 Annual Performance Monitoring Report as to whether Canfor FMG Alberta and eligible Defined Forest Area-related contractors have retained Certificate of Recognition or equivalent.

Acceptable Variance

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

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.

6.3.3 Partnerships in Injury Reduction 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 Partnerships In Injury Reduction.
Target	**100% of recommendations from Partnerships in Injury Reduction audit will be addressed and action plans developed**
Description of target	A Partnerships in Injury Reduction 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 program management review is an opportunity to continuously improve Canfor FMG safety program.

Means of Achieving Objective & Target (Strategies)

The previous indicator 6.3.2 talks about obtaining and maintaining a Certificate of Recognition. Certificate of Recognition certification 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 Certificate of Recognition. 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 and recorded in Canfor's Safety Pages.

Annually, there is a Forest Management Group Occupational Health and Safety 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 Occupational Health and Safety 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.

Current Status

There were no recommendations to Canfor FMG Alberta from the 2012 Partnerships in Injury Reduction audit; therefore no action plans were required.

Forecast

Continuous improvement and enhancement of 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 Annual Performance Monitoring Report. Canfor FMG Alberta and Mill are audited together; however, each party addresses their own recommendations.

Acceptable Variance

No variance; Canfor will address all issues in the review of the safety program.

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.

6.4.1 Engaged and Active 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	6.4.1 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 in all four targets**
Description of target	Target of 80% satisfaction in: Meeting and Forest Management Advisory Committee Process, Forest Management Advisory Committee Meeting Facilitation, Meeting Logistics, and Yearly Assessment.

Basis for the Target

The Forest Management Advisory Committee was established in 1995 to assist Canfor Alberta in developing the Forest Management Plan and a Sustainable Forest Management Plan in 1999 by identifying local values, objectives, indicators and targets. The Sustainable Forest Management Plan is an evolving document that will be reviewed for effectiveness and revised as needed with the assistance of Forest Management Advisory Committee to address changes in forest condition and local community values. Ensuring the continuing interest and participation of the Forest Management Advisory Committee is an integral part of a dynamic and responsive Sustainable Forest Management 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.

Means of Achieving Objective & Target (Strategies)

Canfor Alberta will provide all Forest Management Advisory Committee 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 Forest Management Advisory Committee. The survey content and process will be that described in the Forest Management Advisory Committee Terms of Reference (Canfor, 2012b). All survey questions will have a one to four scoring assessment with one being very poor and four being very satisfied.

Current Status

Canfor's Forest Management Advisory Committee members filled out a *Forest Management Advisory Committee Evaluation Form* after the May 16 and November 21, 2012 meetings. The combined results for the year were 89% satisfaction.

Forecast

An active, engaged, and satisfied Forest Management Advisory Committee will be maintained to ensure that local values are considered in forest management planning.

Legal Requirements

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

Monitoring & Measurement

Annual:

Forest Management Advisory Committee 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 Annual Performance Monitoring Report.

Acceptable Variance

A minimum of 70% annual satisfaction from surveys from all four targets.

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.

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 Forest Management Advisory Committee provides knowledge for better dialogue and ultimately better decisions.
Target	**Provide one educational opportunity per Forest Management Advisory Committee meeting, plus one field tour opportunity per year**
Description of target	Annually, Canfor Alberta will make available to the Forest Management Advisory Committee 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 Forest Management Advisory Committee 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 Sustainable Forest Management 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 Sustainable Forest Management targets, handouts, Forest Management Plans, and/or local associations updates/briefing (e.g. Canadian Boreal Forest Agreement, Mighty Peace Watershed Alliance).

Means of Achieving Objective & Target (Strategies)

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

Current Status

During the 2012 calendar year the following three education opportunities and one field tour were provided:

1. Canadian Boreal Forest Agreement – BC/AB Regional Working Group Status Report was presented on May 16 from Jim Stephenson of Canfor;
2. Foothills Landscape Management Forum (Berland-Smoky Regional Access Development Plan) was also presented on May 16 from Jim Stephenson of Canfor;
3. Watercourse Crossing and Summer Harvest Operations field tour occurred on August 21; and
4. Gord Stenhouse Presentation: The Foothills Research Institute (FRI) Grizzly Bear Program – accomplishments to date and new research to support recovery Grizzly Bear was delivered on November 21.

Forecast

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

Legal Requirements

None.

Monitoring & Measurement

Annual:

Report in the Annual Performance Monitoring Report the number of educational opportunities and field tours presented to the Forest Management Advisory Committee as recorded in the Forest Management Advisory Committee meeting minutes.

Reporting Process

Forest Management Advisory Committee meeting minutes contain supporting documentation that is reported in Annual Performance Monitoring Report.

Acceptable Variance

No variance; Opportunities will be provided

Response

Adjust activities

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.

Means of Achieving Objective & Target (Strategies)

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

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 Sustainable Forest Management targets, handouts, Forest Management Plans, field tours, local associations updates/briefing.

Current Status

Canfor provided three opportunities for information/training/capacity development in the 2012 timber year. Presentations were made to Aseniwuche Winewak Nation, Horse Lake First Nations, and Sturgeon Lake Cree Nation communities to provide information on what a Forest Management Plan is, the components of a Forest Management Plan, to introduce the concept of Values, Objectives Indicators and Targets, and how the Aboriginal groups can provide input into the development of the Forest Management Plan. Members from each of the communities attended the presentations, asked questions and received information about Canfor's operations.

Forecast

Increased Aboriginal knowledge in forest planning and operations that is open, inclusive, responsive to Aboriginal concerns, and grounded in science.

Legal Requirements

None.

Monitoring & Measurement

Annual:

All opportunities offered as it relates to information/training/capacity development will be recorded in Canfor's Creating Opportunities for Public Involvement database.

Reporting Process

All opportunities and associated completed activities will be entered into the Creating Opportunities for Public Involvement database and reported in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; Greater than or equal to 1 Aboriginal information/training/capacity development opportunity per year

Response

Adjust activities

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 to the community 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.

Means of Achieving Objective & Target (Strategies)

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 and General Development Plan open houses;
5. Field tours; and
6. The Grande Prairie and Area Environmental Sciences Education Society.

Current Status

Canfor Alberta provided 6 educational opportunities in 2012.

Forecast

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:

Number of educational opportunities provided.

Reporting Process

List the type and number of opportunities Canfor Alberta offered annually in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; At least five opportunities will be provided annually.

Response

Adjust activities

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 (ESRD VOIT 6.2.1.1)
Indicator Statement	**CSA Z809-08 Sustainable Forest Management Plan 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 Plan, Annual Performance Monitoring report available to public annually on Canfor's external website**
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 Defined Forest Area. Annual reporting of the Sustainable Forest Management 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 Sustainable Forest Management Plan and is an avenue to review their effectiveness.

Means of Achieving Objective & Target (Strategies)

Canfor Corporation maintains a website www.canfor.com that makes the Sustainable Forest Management Plan Annual Performance Monitoring Report publicly available.

Current Status

Canfor Alberta's 2012 Annual Performance Monitoring Report has been updated on Canfor's external website. All Annual Performance Reports are on the website since 2001.

Forecast

Public awareness and understanding of the SFM Plan and annual performance relative to the Plan's targets.

Legal Requirements

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

Monitoring & Measurement

Annual:

Annual Performance Monitoring Report will be made publically available on Canfor's external website.

Reporting Process

Report in the Annual Performance Monitoring Report.

Acceptable Variance

No variance; The Sustainable Forest Management Plan and the Annual Performance Monitoring Report will be available digitally on Canfor's external website.

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 (ESRD VOIT 6.2.1.1)
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, 2013) 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.

Means of Achieving Objective & Target (Strategies)

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.

Current Status

This target is a continuation from the 2005 Sustainable Forest Management Plan. During 2012, there were no public inquiries reported.

Forecast

Canfor's commitment to be responsive to public inquiries will be maintained.

Legal Requirements

Alberta Forest Management Planning Standard, Annex 4-Performance Standards

Monitoring & Measurement

Annual:

As per Canfor's Forest Management System, all public inquiries are recorded in Creating Opportunities for Public Involvement or Incident Tracking System. 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 Incident Tracking System database will be reviewed annually and the resultant data reported in the *Annual Performance Monitoring Report*.

Acceptable 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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Appendix 2 Canadian Standards Association 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 Defined Forest Area	Natural ecosystems on the landscape	All ecosystems are represented on the landscape at current levels	1.1.1 Ecosystem area by type	Uncommon (Forested/Woodland) plant communities maintained	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 Defined Forest Area	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 Defined Forest Area	100% of area of old interior forest will be within the 10 year forecast by Natural Region
				No CSA Core Indicator	b) Range of patch sizes by subunit and entire Defined Forest Area	Patch size distribution will achieve natural patch size distribution levels over the 200 year planning horizon
				Forest area by seral stage or age class	c) Percent of area of pioneer, young and old forest by Natural Region across the Defined Forest Area	100% of pioneer, young and old forest by Natural Region will meet the Preferred Forest Management Scenario forecasts
				1.1.4 Degree of within-stand structural retention	a) Percent of total annual harvested area retained in openings across the Defined Forest Area	No less than 4% of the 5 year rolling average harvested area (ha) 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 plans	100% of blocks prescribed to have dispersed retention will meet the levels as identified in site/logging plans
					c) Number of non-compliances where forest operations are not consistent with riparian management requirements as identified in operational plans	Zero non-compliances, specific to Operating Ground Rules, with riparian management requirements in forest operations
					d) Area of un-salvaged burned forest	100% of burned areas that have salvage plans will be implemented in conformance with Environment and Sustainable Resources Development directive
					e) Area of un-salvaged blowdown	In areas with significant blowdown (>10ha), a minimum of 25% of the area 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 Defined Forest Area are maintained through time, including habitats for known occurrences of species at risk	Habitat Representation	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 harvest 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
			Habitat for focal species 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 landbase 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	100% of watersheds with a high or very high fish risk ranking and >25% Canfor influence will be assessed using Canfor's Fish Risk Flow Chart and have mitigations strategies scheduled and implemented
					c) Amount of Barred Owl habitat available for breeding pairs.	100% of area of Barred Owl habitat will be within the 10 year forecast
					d) Density (lineal km/km2) of open (License of Occupation and Temporary non-reclaimed) roads	Density of open roads (lineal km/km2) not to exceed 10% of the current levels in individual Defined Forest Area parcels (Main, Puskwaskau & Peace) and Grizzly Bear and caribou wildlife areas
			Current species diversity is maintained on the landscape	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	100% conformance with the Alberta Forest Genetics Resources Management and Conservation Standards
	CSA Element			**CSA Core Indicator**	**Indicator Statement**	**Target**
	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	No core indicator in Z809-08	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 seedling deployment
	CSA Element	**Value**	**Objective**	**CSA Core Indicator**	**Indicator Statement**	**Target**
	1.4 Protected Areas and Sites of Special Biological and Cultural Significance 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 Defined Forest Area and implement management strategies appropriate to their long-term maintenance	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 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 activities will occur within one kilometer of legally protected park areas
				1.4.1 Proportion of identified sites with implemented management strategies	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
		Identified protected areas and sites that have special biological significance; and Aboriginal values, knowledge and uses	The natural states and processes to maintain protected areas and sites that have special biological and cultural significance will be conserved; and early and effective consultation with Aboriginal peoples will be provided	1.4.2 Protection of identified sacred and culturally important sites	Percent 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 communication 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 blocks will be reforested within 2 years
			Forest ecosystem health will be maintained		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 (TSA) in the Regeneration Standards of Alberta performance survey process
					d) Noxious weed program implementation	100% of noxious weeds identified along Canfor Alberta's LOC roads will have treatments scheduled and completed according to the plan
	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 landbase in the Defined Forest Area converted to non-forest landuse through forest management activities.	Forest management company activities not to exceed 3% reduction in gross Defined Forest Area over the life of the Forest Management Agreement (May 26, 1964)
			Maintain productive harvest level	2.2.2 Proportion of the calculated long-term sustainable harvest level that is actually harvested	a) Percent of volume harvested compared to long-term approved harvest level	Not to exceed 100% of the approved harvest level (Annual Allowable Cut) over 5 years (5 year 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) Percent 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 Canfor Operating Ground Rules
			Soil erosion will be minimized		b) Percent of soil erosion and slumping incidences with mitigation strategies implemented	100% of known erosion and slumping events caused by forest operations will have mitigation strategies implemented within one year of identification
			Maintain on-site coarse woody debris	3.1.2 Level of downed woody debris	Percentage of harvested area by subunit with coarse woody debris equivalent to pre-harvest conditions	100% of subunits (Peace, Puskwaskau and Main) will meet or exceed coarse woody debris conditions equivalent to the pre-harvest 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) Watersheds with high risk level assessments with mitigation strategies implemented	100% of watersheds with a high 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
			Impact 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	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 tonnes of carbon stored is each of the carbon pools	Achieve 100% of the carbon stored in each of the carbon pools as defined by the Preferred Forest Management Scenario forecast
	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	4.2.1 (2.2.1) Additions and deletions to the forest area	Percent of gross forested landbase in the Defined Forest Area converted to non-forest landuse through forest management activities.	Forest management company activities not to exceed 3% reduction in gross Defined Forest Area over the life of the Forest Management Agreement (May 26, 1964)

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	Aboriginal and treaty rights	Aboriginal and treaty rights will be understood and 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, Superintendents, 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 FMG 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	Percent 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; Aboriginal values, knowledge, and uses.	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	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. 1.4.2 Protection of identified sacred and culturally important sites.	Percent 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 communication 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 with forest products businesses annually within the vicinity of the Defined Forest Area
		Worker Safety	Effective worker safety program	6.3.2 Evidence of co-operation with Defined Forest Area-related workers and their unions to improve and enhance safety standards, procedures, and outcomes in all Defined Forest Area-related workplaces and affected communities	Implementation and maintenance of a certified safety program	100% of Canfor FMG Alberta and eligible Defined Forest Area-related contractors will obtain and maintain a Certificate of Recognition 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 Partnerships in Injury Reduction 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 it's progress	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 established and maintained and satisfaction survey implemented	80% annual satisfaction from surveys in all four targets
				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 Forest Management Advisory Committee meeting, plus one field tour opportunity per year
				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 processes and human interactions with forest ecosystems			6.5.1 The number of educational opportunities provided to the community	The number of educational opportunities provided to the community	A minimum of 5 educational opportunities provided to the community annually
				6.5.2 Availability of summary information on issues of concern to the public	a) CSA Z809-08 Sustainable Forest Management Plan monitoring report made available to the public annually	CSA Z809-08 Sustainable Forest Management Plan, Annual Peformance Monitoring report available to public annually on Canfor's external website
					b) Percentage of public inquiries that receive an initial contact	100% of all inquiries receive 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

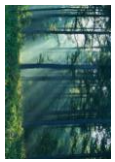
Core Indicator (Z809-08)	*Proposed Indicator Statement (Z809-08)*
4.1.1 Net carbon uptake	Maintain the retention of existing (or replacement of) old forest retention area
2.1.1 Reforestation success	Average Regeneration delay for stands established annually
2.2.1 Additions and deletions to the forest 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

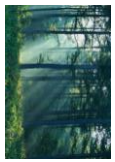
ANNEX 4 - Performance Standards

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
			1.1.1.6 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[5] 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

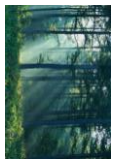


ANNEX 4 - Performance Standards

CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target	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 burned 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
	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



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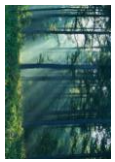
CCFM Criterion	CSA SFM Element	Value	Objective	Indicator	Target[1]	Means to Identify Target[2]	Legal / Policy Requirements	Means of achieving Objective and Target[3]	Monitoring and Measurement	Reporting	Acceptable Variance	Response
	1.4 Protected Areas - Respect protected areas identified through government 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	ARUS or equivalent reports	Timber Management Regulation	Silviculture program	Regeneration surveys	ARUS, AOP, Stewardship Report	None	Alberta adjusts AAC
				Cumulative % of reforested areas that meet reforestation target	As above	ARUS 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 2006-06	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 based 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.

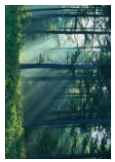
[7] Interior forest: a forested area greater than 100 hectares in size located beyond edge effect buffer zone [7.2] along the forest edge [7.1]. For interior forest objective use a common age definitions for all cover classes to prevent breaking up forest patches that have a common origin date.

[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.
ALBERTA OPERATIONS

Forest Management Agreement (FMA 9900037)

FOREST MANAGEMENT ADVISORY COMMITTEE

TERMS OF REFERENCE
Approved: November 21, 2012

INTRODUCTION

Canfor - Alberta has been working responsibly with the Forest Management Advisory Committee to develop creditable, Sustainable Forest Management Plans for the past 17 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.

BACKGROUND

In July of 1999, Canadian Forest Products Ltd. (Canfor) formally announced its commitment to seek sustainable forest management certification of the company's forestry operations under the Canadian Standards Association (CSA) Sustainable Forest Management (SFM) standard.

As a preparatory step to sustainable forest management certification, Canfor developed a Forest Management System (FMS) for the company's woodlands operations. In December 1999, this system was certified to the ISO 14001 standard developed by the International Organization for Standardization. The Company's FMS 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 Canfor's *Environment Policy, May 2011 and Sustainable Forest Management Commitments, May 2012* (Appendix 1 and 2). 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 "*provide opportunities for interested parties to have input into our sustainable forest management planning activities"*. Canfor's Sustainable Forest Management Commitments include a commitment *"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"*.

CSA requires "*extensive public participation in the development of its Standards. In this Standard, the public identifies forest values of specific importance to environmental, social, and economic concerns and needs. Public also takes part in the forest managing process and works with organizations to identify and select SFM objectives, indicators, and targets to ensure that these values are addressed.*"

Alberta Forest Management Planning Standard requires public participation. This Standard indicates that Canfor must provide meaningful opportunities for participation in the planning process.

Canfor Alberta's Forest Management Agreement (FMA) area encompasses a small area north and west of Spirit River bordering the Peace 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, Spirit River, Grande Cache and Grande Prairie. For certification

with CSA, this FMA will serve as the Defined Forest Area (DFA). The attached map (Appendix 3) 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 Alberta FMA area. The terms of reference were revised and adopted to reflect this additional role.

In 2000, Canfor and the FMAC developed the values, goals, indicators, and objectives for the SFMP, which was submitted for certification.

The Detailed Forest Management Plan (DFMP) (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 2010 the FMAC provided input for the Healthy Pine Strategy DFMP Amendment.

The Healthy Pine Strategy DFMP Amendment was approved by Alberta Government in January 2010.

From 2010 - 2012 the FMAC worked with Canfor in development of values, objectives, indicators, and targets for a new SFMP based on the new CSA-Z809-08 standard for re-certification in 2012.

Annually the SFMP annual performance monitoring report is supplied to the FMAC. Indicators and targets that “Do not meet” are reviewed and addressed. Canfor will also bring forward, if any, recommended changes to indicators and/or targets for acceptance by the FMAC. Once accepted, Canfor then updates the current SFMP to reflect these changes.

Annually Canfor is audited by a third party to maintain CSA certification. Canfor takes part in an internal audit process as well.

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. The FMAC will work with Canfor Alberta 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, access and select one or more possible strategies;
3) Review the SFM plan;
4) Design monitoring programs, evaluate results and recommend improvements; and
5) 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 Management Plan; and
2) In partnership with Canfor, will review, refine and implement the Public Involvement Program.

B. Operating Rules

1) Rules and 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) Meetings
   a) Semi-annual meetings, unless additional meetings are required.
      i) At each meeting, there will be an educational opportunity provided.
   b) Meeting dates:
      i) Will be confirmed jointly between Canfor and the FMAC.
   c) 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.
   d) Meeting Location:
      i) Meetings will be held at a time and place most suitable to the members of the group; and
   e) 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.
   f) Material, if available, will be provided for review in advance of meetings.

C. 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.
   d) Canfor will provide one field tour opportunity annually.

2) External:
   a) The Annual Performance Monitoring Report summarizes the progress that Canfor - Alberta has achieved in SFM requirements. This is distributed to the FMAC;
   b) Canfor will provide information to a broader public about the progress being made in the implementation of the CSA Standard through Canfor's website (http://www.canfor.com/);
   c) Canfor will make allowances for different linguistic, cultural, geographical or informational needs of interested parties as necessary;
   d) Only authorized members of the FMAC 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 recommendations will be reported to the Forest Management Group Managers and then to the Corporate Environmental Management Committee.

D. 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.

E. 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 Society
      Alberta Trappers Association
      Aseniwuche Winewak Nation
      Canadian Association of Petroleum Producers (CAPP)
      City of Grande Prairie
      DFA Related Worker
      Ducks Unlimited
      Grande Prairie #1, County of
      Grande Prairie and District Chamber of Commerce
      Grande Prairie Forest Educator
      Grande Prairie Regional College
      Grande Prairie Regional Tourism Association
      Horse Lake First Nations
      M.D. of Greenview No. 16
      Métis Nation Zone 6
      Métis Nation of Alberta
      Public member(s) at large
      Peace Wapiti School Division No. 76
      Saddle Hills County
      South Peace Environmental Association
      Sturgeon Lake Cree Nation
      Town of Grande Cache
      Town of Spirit River
      Town of Valleyview
      And others as identified by the 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
      Ainsworth Engineered
      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;
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 a 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 restricted involvement in discussion and decision making for the conflicting topic.

3) Non-members:
   a) Non-members are by invitation and/or by request only;
   b) Non-members are welcome to observe the FMAC meetings, but will not receive print materials;
   c) Non-members may participate in discussions or make presentations only with agreement by the group, chairperson or facilitator;
   d) Forestry students are encouraged to attend as non-members; and
   e) 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 the 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 involvement process;
   e) To provide the necessary human, physical, financial, and technological resources to the FMAC as necessary and reasonable;
   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(l);
   g) Provide the Forest Management Advisory Committee Evaluation Form (Appendix 4) (to be voluntarily filled out by FMAC members) at each meeting and report (the calculated satisfaction on each of the four sections of the evaluation) results with the minutes from each meeting to the members; and
   h) Distribute Sustainable Forest Management Plan, meeting minutes, annual performance monitoring report and other materials deemed necessary.

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) Chairperson/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.

F. 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 chairperson/facilitator would identify when this would occur.

G. Dispute Resolution Mechanism

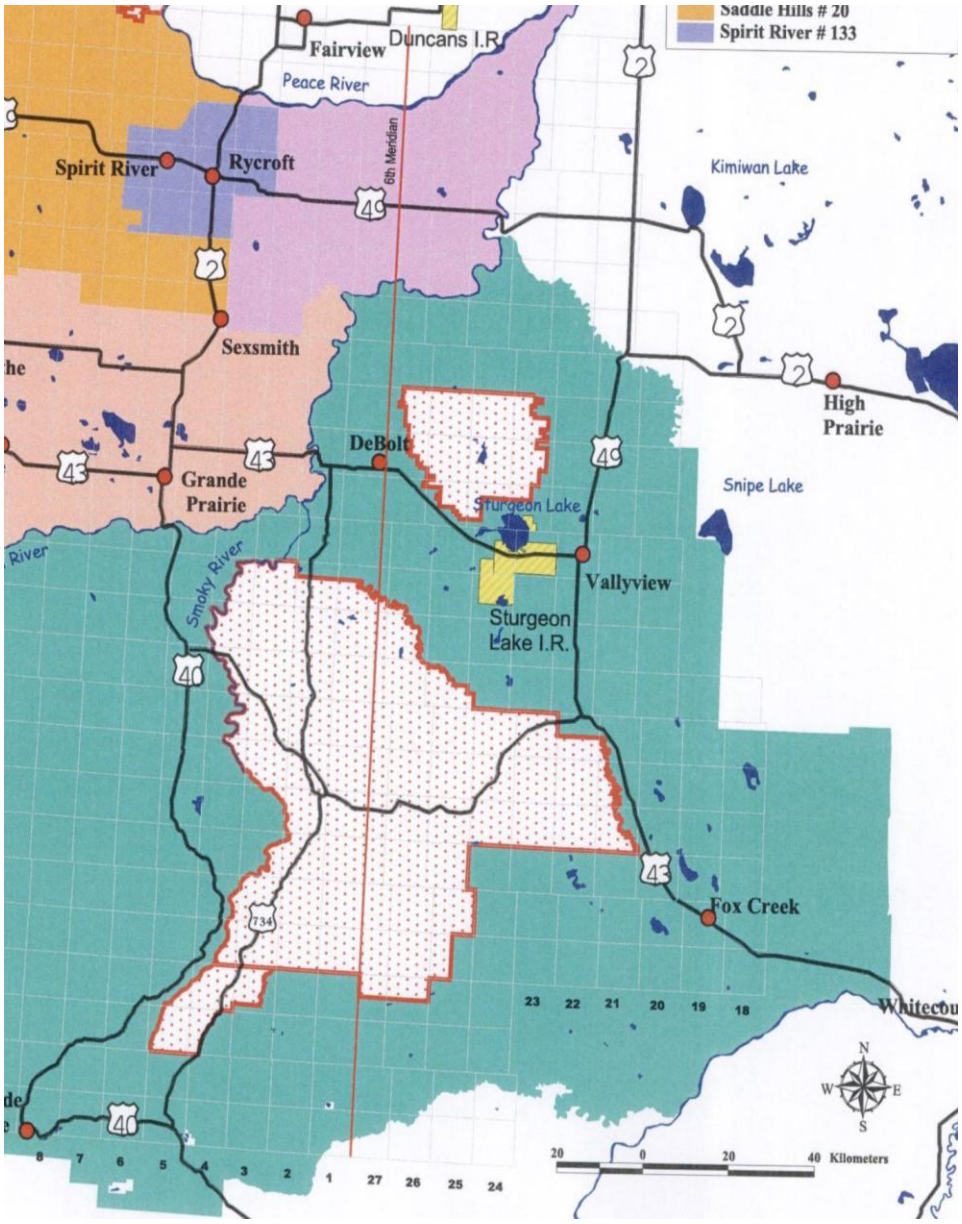
1) Process Issues:
   a) The chairperson/facilitator will resolve process issues.

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.

H. 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.

The revision of the Terms of Reference requires the approval of the FMAC and Canfor.


Saddle Hills # 20
Spirit River # 133
Fairview
Duncans I.R.
Peace River
6th Meridian
Spirit River
Rycroft
Kimiwan Lake
Sexsmith
High Prairie
DeBolt
Grande Prairie
Sturgeon Lake
Snipe Lake
Smoky River
Vallyview
Sturgeon Lake I.R.
Fox Creek
Kilometers

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

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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

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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

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

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

Watershed Analysis Procedures for the Detailed Forest Management Plans

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.

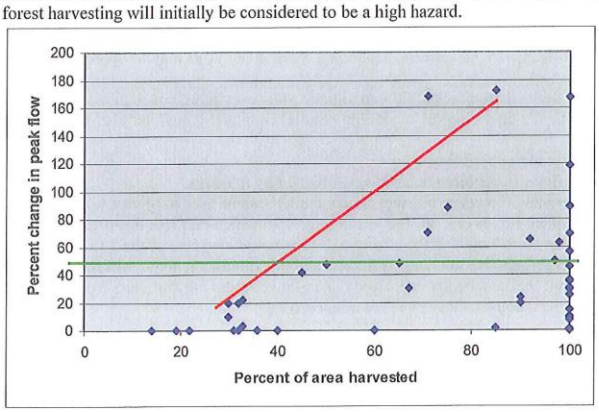

Figure 1. Data from watershed experiments.

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.

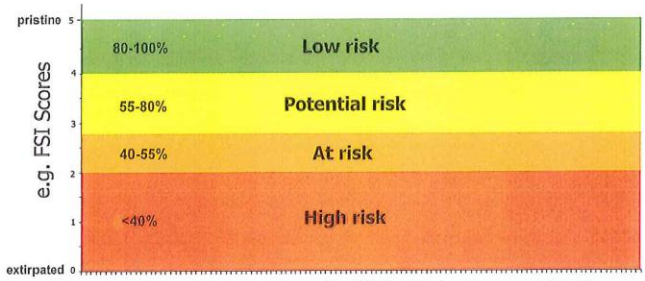

Figure 2. Example of fish-based risk categories used by ASRD, Fisheries Management Branch, showing the relative (%) ranges that correspond to fish indicator metrics. Categories are based on international (IUCN) setpoints.

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.

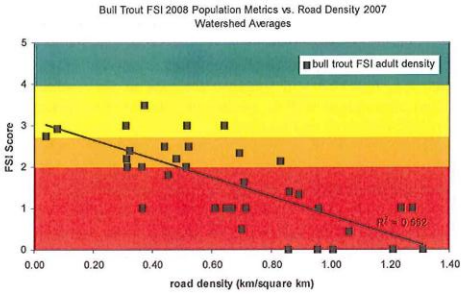

Figure 3. Bull trout Fish Sustainability Index 2008- watershed average adult density scores vs. watershed average road density for all FSI watershed units with bull trout (n=35). Color ranges represent ASRD, Fisheries Management risk categories (low = green; yellow=potential risk; orange=at risk; red=high 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.

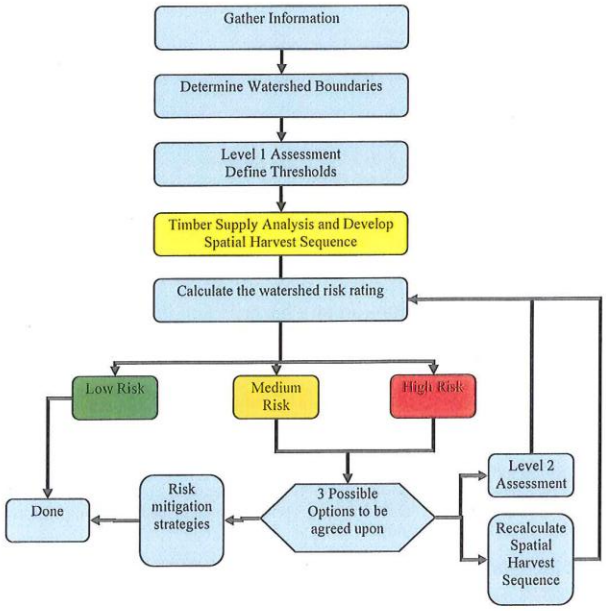

Figure 4. Diagram of the Watershed Assessment Procedure.

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:

$$ECA_W = \frac{\sum_{s}^{S} ECA_i}{A_{H60}} \quad [3]$$

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 Alberta Vegetation Inventory 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 allocates rights to harvest deciduous trees such as aspen and balsam poplar. A Deciduous Timber Allocation 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 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 harvested by the organization by the organization. Spatial harvest sequences 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