# APPENDIX A

# LCS MOU BETWEEN CANFOR AND BCTS

# Mackenzie Sustainable Forest Management Plan (MK SFMP)
# Steering Committee
# Memorandum of Understanding

## Background

A partnership between ***BC Timber Sales*** **(BCTS)** and ***Canadian Forest Products Ltd*****. (Canfor)** was formed in order to work together to develop a Sustainable Forest Management Plan (SFMP) for their combined operations in the Mackenzie TSA.

Participation in the development of the MK SFMP will require BCTS and Canfor (the partners) to work within a public process to develop SFM Indicators Measures and Targets. The partners will use the SFM Indicators Measures and Targets to monitor progress, publicly report, and promote continuous improvement of the MK SFMP.

## Goals

The MK SFMP partners agree to the following goals:

1. To jointly develop an SFMP (covering the operating areas of the partners within the Mackenzie Forest District) that meets the requirements of the CSA SFM standard (Z809-02).

   ***Note:*** *Each of the partners will decide for themselves the brand and timing of certification, if any. The SFM Plan will be developed using the CSA Z809-02 standard.*

2. To work collaboratively over the term of the plan to fulfill the MK SFMP commitments including, data collection and monitoring, participating in public processes, producing public reports, and continuous improvement.

## Term

The term of this agreement is 4 years, expiring on October 31, 2010. The agreement may be amended from time to time to accommodate change as directed by the steering committee.

## Business Case

Although the initial reason for the MK SFMP is to promote SFM certification there are other value added benefits. The significant benefits of the MK SFMP are described below:

1. Maintain market access through SFM certification of wood chip and log supply;
2. Streamlining government and industry planning processes;
3. Enhancing local public acceptance of our practices; and
4. Leveraging value from our collective effort.

<u>Maintain market access through SFM certification of log and chip supply</u>

*Time Inc*. announced that by 2006 they will require > 80% of their Canadian pulp supply to be SFM certified. Several pulp mills, each possibly supplied by the partners, have made commitments to their customers to supply SFM certified pulp and have, in turn, asked their suppliers to deliver SFM certified chips. Other influential customers such as *The Home Depot* and *Centex Homes* are also considering such third-party certification requirements for solid wood products. Supporting the MK

SFMP will provide a significant component of SFM certification under either the CSA or the SFI standards.

Streamlined government and industry planning processes

Streamlining the planning processes by providing for a collaborative central plan will reduce costs, reduce confusion, and increase effectiveness of forest management practices across many "shared" landscapes. The recent advent of results-based forest legislation (FRPA) will provide opportunities for companies to collaborate on innovative solutions, which can reduce our costs and provide much more flexibility to access the timber resource. However, these opportunities can only be accessed provided the forest industry can demonstrate cumulative impacts of forest practices across a given landscape.

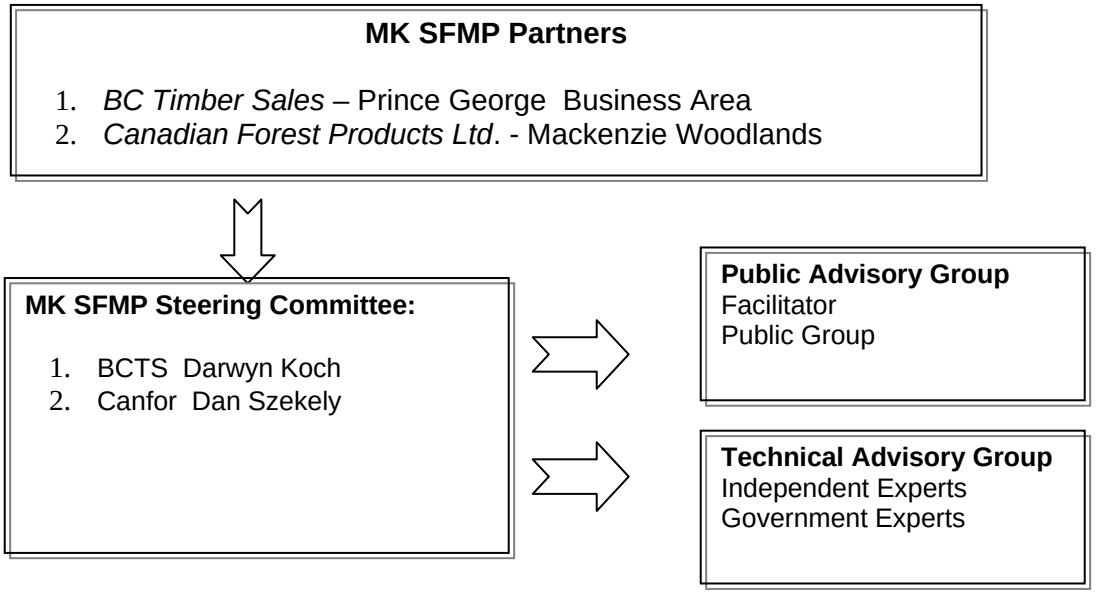
Enhancing public acceptance of our practices

The MK SFMP will promote meaningful public involvement by providing a process that is inclusive and transparent, and where accountabilities are clear. The MK SFMP process will provide confidence in forest management at the local community level. If there is no venue for public discussion of forest management then resource managers will bear the brunt of public dissatisfaction with unresolved issues.

Leveraging value from our collective effort

Organizations interested in SFM certification (particularly CSA) will have a fixed cost to produce and maintain an SFMP. It makes sense to join together at this time to collaborate towards a common SFM Plan and share the fixed cost over time. This is the most cost effective solution.

## MK SFMP Organizational Structure




Steering Committee (SC) members may be changed at the discretion of each of the partners as required. The partners will also keep alternates aware and current of the process and progress of the SC in achieving the desired goals.

## Basic Principles

The partners are agreeing to follow these basic principles:

Time Frame

Target completion date for the development of the SFM Plan including Measures and Targets development, forecasting, and monitoring and reporting protocols is **October 31, 2006**.

Agreement between the partners

All decisions related to the development and maintenance of the SFM plan will be by consensus of both partners. If consensus cannot be reached then the issue will be dealt with using the Dispute Resolution mechanism outlined below.

Indicators

Existing publicly developed Indicators and Measures will be used where possible. Where additional Indicators or Measures are required to meet the standard, efforts will focus on currently available and practical data / research. We will agree on a set of draft Indicators and Measures to take to the public.

Funding

The cost estimate for development of the MK SFMP is $240,000, including facilitation of the PAG and resource analysis. It is anticipated that most of the development costs will be funded through the licensee's Forest Investment Accounts (FIA)[1]. All costs that are not FIA eligible will be shared according to the 50% even split formula.

Where practicable and permissible under the terms of the respective FIA Land Base Investment Program (LBIP) agreements, development of the SFMP will be shared according to the 50% even split formula. Where this is not possible because of disparities within the funding allocation of the licensees;

1. The partner with the lesser FIA allocation will provide funding to the greatest extent possible through their allocation,
2. The partner with the greater FIA allocation will provide the remainder of the required funding, or provide funding to the greatest extent possible through their allocation, whichever is less,
3. In recognition that the partner with greater FIA allocation will have provided a greater amount of the required funds, the partner with the lesser FIA allocation will give consideration to transferring FIA funding to the partner with the greater FIA allocation at some future date.

Facilitator

A facilitator will be hired to co-ordinate and run public meetings, provide support and information to public members as needed and arrange for technical experts as required.

New Partners

This agreement may be amended by the Steering Committee at any time to accommodate a licensee (replaceable or non-replaceable) operating in the Mackenzie Forest District wishing to join in the partnership later.

## Roles

The partners agree to the following structure and roles:

[1] Although this document refers specifically to the Forest Investment Account, other similar programs may also be used should the FIA Program be discontinued during the term of this agreement.

Steering Committee

The Steering Committee will provide corporate direction on the development of the MK SFMP. The Steering Committee will be actively involved in the public participation processes, gathering and evaluating data, reporting, continuously improving the plan over time, and ensuring that the MK SFMP commitments are implemented within their organizations. The Steering Committee will meet at least twice per year following the implementation of the plan to review this agreement, continuous improvement, and any other business related to the MK SFMP.

Public Advisory Group (PAG)

The Steering Committee will form a PAG and retain a facilitator to manage the meetings and complete a Terms of Reference. The role of the PAG is to provide the Steering Committee with public input on the Indicators, Measures and Targets that will form the basis of the MK SFMP consistent with the terms of the CSA Standard (Z809-02).

Technical Advisory Group (TAG)

The Steering Committee will ask experts to assist in the development of the MK SFMP. Experts may be used to assist directly in the development of Indicators, Measures and Targets, present technical concepts to the PAG, or analyze and forecast information. Experts from government agencies or the private sector may be involved in the MK SFMP at the request of the Steering Committee. The use of experts will be consistent with the terms of the CSA Standard (Z809-02).

## Third Party Contracts

The partners acknowledge that where one of the partners holds a contract with a third party pertaining to SFM Plan development, that partner is executing the contract on behalf of all signatories to this Agreement. Partners will give due consideration to other signatories in the execution of the contract without bias or undue influence. Any deliverables arising from a third party contract will be made freely accessible to all partners, including progress and monitoring reports.

## Documentation, Record Keeping and Reports

While it is the intent of this process to minimize the time and effort required for each of the partners to achieve the desired outcome, it is recognized that each partner will seek certification at their own discretion. As such, it will be required that each partner maintains their own records and reports to meet the required standard and facilitate the audit process. The partners therefore agree that any records and/or reports arising from the SFM Plan development will be distributed to all signatories to this agreement. To facilitate this, the partners agree that documents, records, and reports will be maintained on a Ministry of Forests Sharepoint site (https://sharepoint.forests.gov.bc.ca/MKSFMP-SC.) Access to the Sharepoint site is to be granted only at the discretion and agreement of the Steering Committee.

The purpose of the Sharepoint site is to:

1. Facilitate the sharing and exchange of documents, records, and reports,
2. Provide a mechanism to ensure that document control meets the requirements of each partner's management system,
3. Ensure that each partner is using the most current documents, records, or reports in the implementation of the SFM Plan,
4. Provide a mechanism whereby each partner is notified of any changes made to a document, record, or report.

The partners also agree that whenever a document, report, or record is reviewed by any party outside of the Steering Committee or immediate members of their respective organizations (i.e. has been presented to the Public Advisory Group, internally audited, or externally audited) such a document, record, or report becomes an official version and is to be archived in a manner consistent with the terms of each partner's management system once it has become obsolete.

Notwithstanding proprietary data, products, or processes (see below), the partners acknowledge that as much of the Work is to be funded under FIA, any records and/or reports arising from the Work are in the public domain and must be freely accessible to all parties and the public. The partners agree that upon submission to the required repository, all partners will:

1) Receive a copy of the submission concurrently with submission to the required repository or,
2) Be notified within two days of the submission and the repository to which it was submitted.

The partners agree that the results of Work not funded under FIA will be distributed to all partners within fourteen days of the completion of such Work.

## Dispute Resolution

Disputes that may arise between the partners will be referred to mediation and, if not resolved through mediation, will be referred to arbitration. A party to a dispute may commence proceedings to resolve the dispute by delivering to the other party(s) to this Agreement a notice of dispute specifying the nature of the dispute and requesting mediation. The parties must then agree upon a mediator. If the parties cannot agree upon a mediator within seven days of the dispute notice being delivered then a mediator may be appointed by an independent third party agreed to by the parties.

If a mediator cannot bring a resolution to the dispute within seven days of being agreed upon or appointed, or upon earlier written notice by the mediator to the parties that the dispute is not likely to be resolved through mediation, a party may commence arbitration proceedings by delivering a notice of arbitration to the other party(s). The parties must then agree upon an arbitrator. If the parties cannot agree upon an arbitrator within seven days of the dispute notice being delivered then an arbitrator may be appointed by an independent third party agreed to by the parties. Any decision arising from the mediation process or arbitration process will be binding to this Agreement.

## Communications

During the term of this agreement, the partners recognize that good communication is essential for the success in achieving the desired results. Components have been identified for communication internal to the Public Advisory Group, external to the public, and internal to the Mackenzie Sustainable Forest Management Steering Committee.

<u>Internal to PAG</u>

a) The Mackenzie Sustainable Forest Management Steering Committee (SC) will ensure meeting minutes are distributed following each meeting.
b) The SC will keep a reference copy of the PAG meeting minutes.
c) The SC will provide the PAG with information as it applies to the function and business of the PAG. Confidential business information such as financial or human resource information may be deemed sensitive or proprietary and may not be released.
d) The SC will provide the PAG an opportunity to comment annually on the groups Terms of Reference, the Mackenzie SFM plan, and the Mackenzie SFM annual report.

External to Public

a) The SC will provide a digital copy of the Mackenzie SFM plan and the Mackenzie SFM annual report on their external websites (if available).
b) The SC will evaluate on an annual basis communication opportunities to promote awareness of sustainable forest management and to share information with the Public Advisory Group and the local public. Opportunities would include such items as open houses, workshops, tours, newsletters, posters, emails, website, newspaper ads, newspaper articles, press releases, fact sheets, brochures, trade shows, and signage.
c) The SC will support and evaluate opportunities to partner with other community organizations/groups that promote SFM (i.e. McGregor Model Forest Association, Mackenzie LRMP, other licensees).

Internal to SFM-SC

a) The SC will annually review and keep current the MK SFMP Memorandum of Understanding for implementing the SFM plan and PAG process.
b) The SC will meet frequently to ensure progress towards the SFM plan and underlying commitments are followed through on.
c) Progress towards the SFM commitments in the Mackenzie SFM will be reported annually in accordance with the signatories existing Management System and/or Standard Procedures. In addition, PAG and general public feedback on SFM progress will be communicated to the partner's senior Managers.

## Products and Product Use

Should the exchange of proprietary data, products, or processes be required (the Products), the partners agree that;

1) The partner from whom the Products were obtained has and retains full ownership of the Products and all copies of the Products in either digital and/or hardcopy format.

2) The partner from whom the Products were obtained hereby grants the other partner(s) non-exclusive rights to use the Products as described in this Agreement and in accordance to the terms and conditions of this Agreement.

3) The other partner(s) shall use the Products for the sole and exclusive purpose of executing their commitments as agreed to under this Agreement.

4) The other partner(s) shall not use the Products except as provided in this Agreement.

5) The other partner(s) shall not duplicate the Products except for the following:
    a. The other partner(s) may make copies for backup purposes, or
    b. The other partner(s) may make copies for the legitimate purpose of executing their commitments as agreed to under this Agreement.

6) The other partner(s) acknowledges that the partner from whom the Products were obtained is the sole and rightful owner of any copies or duplicates developed by the other partner(s), in either a digital or hardcopy format, and are to be returned to the partner from whom the Products were obtained.

7) The other partner(s) acknowledges that the partner from whom the Products were obtained is the sole and rightful owner of any product that might arise as a result of any modification or manipulation of the data, either spatial or tabular.

8) The other partner(s) shall return all original and/or copies or duplicates of the Product to the partner from whom the Products were obtained within thirty (30) days of termination of this agreement or, at the partner from whom the Products were obtained discretion, be destroyed or otherwise be rendered unusable.

9) Upon return and/or destruction of the Products, the other partner(s) will supply the partner from whom the Products were obtained with written confirmation that all original and/or copies or duplicates and/or modifications and/or manipulations of the Product have been returned and/or destroyed or otherwise been rendered unusable, signed by an Authorized Signatory of the other partner(s).

**Signatures**

BC Timber Sales
Prince George Business Area

Ian Hamann, P. Eng. R.P.F.
Timber Sales Manager

Nov. 06, 2006
Signature / Date

Canadian Forest Products Ltd.
Mackenzie Woodlands

John Moreland
Woodlands Manager

Nov 02/07
Signature / Date

## Record of Revisions

| Date | Section | Change | Acknowledgements |
|---|---|---|---|
| Sept. 12, 2006 | Record of Revisions | Added “Record of Revisions” section | Canfor SC Rep. |
| Sept. 12, 2006 | Documentation, Record Keeping and Reports | Added section pertaining to posting and maintenance of documents on the Sharepoint site. | SFG Rep. |
| Nov. 1, 2006 | Background & throughout document | Amended reference to licensees to be inclusive of BCTS by using term “the partners”. Updated reference to “SFM-SC” to “SC” | BCTS SC Rep |
| December 1, 2008 | MK SFMP Organizational Structure | Change the steering committee members, update footer. | BC Timber Sales SC Rep |

# APPENDIX B

## MACKENZIE SFMP PUBLIC ADVISORY GROUP

# TABLE OF PAG SECTOR REPRESENTATIVES AND ALTERNATES

(as of September, 2008)

Mackenzie SFMP Public Advisory Group (as of September, 2008)

| Sector: | Representative | | Alternate | |
|---|---|---|---|---|
| Academia | | | | |
| Agriculture/Ranching | Ken Reierson | | Mary Reierson | |
| Contractors – Forestry | | | | |
| Environment/ Conservation | Vi Lambie | (250) 997-6876 | Ryan Bichon | 997-4601 |
| First Nations | | | | |
| General Public | Tom Briggs | 997-3212 | | |
| Germansen Landing | Nancy Perreault | | | |
| Labour – CEP | Bob LaVallee | 997-3351 | | |
| Labour – PPWC | Jamin Parker | 997-3866 | | |
| Local Government | Stephanie Killam | 997-xxxx | Warren Waycheshen | 997-4138 |
| McLeod Lake Indian Band | Keinan Carty | 250) 750-6857 | Lionel Chingee | |
| Mining/Oil & Gas | Tom Michael | 997-3005 | | |
| Noostel Keyoh | Jim Besherse | | Sadie Jarvis | (250) 967-4878 |
| Prospectors | | | | |
| Public Health & Safety | MaryAnne Arcand | (604) 891-1259 | Keith Playfair | 250.612.7086 |
| Recreation – Commercial | | | | |
| Recreation – Non-commercial | Vida Tattrie | 250-997-6913 | | |
| Recreation – Non-commercial (motorized) | Mike Broadbent | 997-6069 | | |
| Saulteau First Nation | Harley Davis | XXXXX | | |
| Small Business – Germansen Landing | Janet Besherse | | Don Jarvis | (250) 967-4878 |
| Small Business – Mackenzie | Bruce Bennett | 997-6537 | | |
| Trapping | Lawrence Napier | | Josef Kollbrand | 997-3385 |
| West Moberly First Nations | Teena Demeulemeester | | | |
| Woodlot | Brent Sinclair | 997-3402 | | |




# Mackenzie SFMP

CANFOR

FOREST SERVICE BRITISH COLUMBIA

BCTS
BC Timber Sales
Prince George Business Area



# Mackenzie Sustainable Forest Management Plan

## Public Advisory Group

Terms Of Reference

October 28, 2008

# 1. Background

## 1.1 Purpose of Sustainable Forest Management Plan

As society has been increasingly affirming a wider set of values that forests can provide, the forest industry has witnessed a distinct change in the philosophy of forest management. Though timber may still be the primary economic value from the forests, a wider range of economic, environmental and social values is being demanded.

Forest management now involves the sustainable management of a much larger spectrum of values and at the same time ensuring that the benefits we enjoy from the forests today do not impact on the ability of subsequent generations to enjoy benefits from the forests in the future. This concept is commonly referred to as "Sustainable Forest Management" (SFM). Sustainable Forest Management (SFM) refers to being economically sustainable on public land, respecting the social needs of the public, and sustaining viable ecosystems. The objective of SFM is to concurrently balance the sustainability of forestry-related ecological, social and economic values for a defined area.

SFM has gained acceptance at the international, national, and local levels. Furthermore, SFM has attracted the attention of buyers of forest products who are increasingly demanding that the industry demonstrate that products are derived from forests managed on a sustainable basis. As a result, forest certification has emerged as a dominant factor in the forest industry in order to provide assurances to buyers of wood products that the management of forests meets identified standards that are considered critical for SFM. As British Columbia forest companies have evolved and have become dependent on the global marketplace for the export of forest products, the issues of sustainable forest management and forest certification have become paramount.

Canadian Forest Products Ltd., in partnership with other licensees, academics, resource specialists, government agency staff, interested parties, and other related organizations has designed an integrated framework for sustainable forest management across its divisions. This Sustainable Forest Management (SFM) Framework has become a credible alternative to current forest management planning in the interior of British Columbia.

The primary purposes of Canadian Forest Products Ltd. and BC Timber Sales Prince George Business Area are to:

a. Rely on the SFM Framework as the conceptual forest management strategy for the certification effort in Mackenzie;

b. Jointly develop an Sustainable Forest Management Plan (SFMP) within the geographic area of the Mackenzie Forest District to meet the SFM standard requirements (Z809-02) developed by the Canadian Standards Association (CSA);

c. Support a public advisory process to:

- Identify and select indicators, measures and targets, based on the SFM framework and any other criteria relevant to the DFA;
- Develop, assess, and select alternative strategies;
- Review the SFMP;
- Design monitoring programs, evaluate results and recommend improvement; and
- Discuss and resolve any issues relevant to SFM in the DFA;

d. Work together to fulfill the SFMP commitments including data collection and monitoring, participating in public processes, producing public reports, and continuous improvement.

The SFMP may be used by Canadian Forest Products Ltd. and BC Timber Sales Prince George Business Area to prepare for eventual certification under the Canadian Standards Association's (CSA) SFM Standard (Z809-02).

This SFMP is intended to be consistent with all existing legislation and other strategic plans.

### 1.2 Mackenzie SFMP Steering Committee

The current Mackenzie SFMP Steering Committee for the Mackenzie SFMP consists of representatives from BC Timber Sales Prince George Business Area (BCTS) and Canadian Forest Products Ltd. (Canfor).

### 1.3 Defined Forest Area

The SFMP applies to only the Defined Forest Area (DFA). A DFA is a specified area of forest, including land and water. The DFA for this SFMP is within the Mackenzie Forest District, excluding areas such as private lands, woodlots, Williston Reservoir, Indian reserves, Large Parks and Treaty 8 Lands[1]. The DFA boundaries are shown on the map provided in Appendix A.

### 1.4 Public Advisory Group

The Public Advisory Group (PAG) for the Mackenzie SFMP is comprised of individuals representing the interests listed in section 6.1.1. who voluntarily participate in the PAG process. As outlined in these terms of reference, the PAG will specifically work under the Defined Goals (section 2) as an open, transparent and accountable process. The Mackenzie SFMP Steering Committee and the PAG recognize and agree that Aboriginal participation in the public participation process will not prejudice Aboriginal and Treaty rights.

### 1.5 Legislation

The Mackenzie SFMP Steering Committee and the PAG shall ensure that the indicators, measures and targets are consistent with current relevant government legislation, regulations and policies. The Mackenzie SFMP Steering Committee and the PAG must also respect the findings of any formal public participation processes that have developed values, objectives, indicators, or targets relating to the CSA SFM elements at a landscape or regional level in the area in which the DFA is situated.

## 2. Defined Goal

The goal of the Mackenzie SFMP is to demonstrate commitment to sustainable forest management for the DFA. The Mackenzie SFMP Steering Committee, with input from the PAG, will be responsible for developing and implementing the SFMP.

The PAG will have the opportunity to work with the Mackenzie SFMP Steering Committee to:

a. Identify and select indicators, measures and targets, based on the SFM framework and any other criteria relevant to the DFA;
b. Develop, assess, and select alternative strategies;
c. Review the SFMP;
d. Design monitoring programs, evaluate results and recommend improvement; and
e. Discuss and resolve any issues relevant to SFM in the DFA.

[1] Refers to fee simple and reserve lands

# 3. Timelines

Key dates for developing the SFMP:

| | | *To be completed by:* | *Completed on:* |
|---|---|---|---|
| a. | Invitations sent to potential participants and newspaper ads published | January 15, 2006 | Letters - January 10, 2006<br>Ads - January 17 & 24, 2006 |
| b. | Public Open House | January 21, 2006 | January 23, 2006 |
| c. | Initial Public Advisory Group meeting | January 28, 2006 | January 31, 2006 |
| d. | PAG input into the CSA matrix | June 2006 | May 9, 2006 |
| e. | Strategic scenario analysis | September 2006 | October 17, 2006 |
| f. | Review of draft SFMP by PAG | October 2006 | October 2006 |
| g. | SFM Certification Audits | November 2006 | November 2006 – February 2007 |
| h. | Review of Final SFMP by PAG | April 29, 2008 | April 29, 2008 |

Following the completion of the SFMP, it is estimated that the PAG meeting schedule would include 2–3 meetings per year (as required) beginning in 2007.

# 4. Communication

## 4.1 Between the PAG and Mackenzie SFMP Steering Committee

a. The Mackenzie SFMP Steering Committee will ensure that the PAG meeting summaries are distributed to the PAG within one week
b. The Mackenzie SFMP Steering Committee will strive to provide background and technical information to the PAG as related to the PAG's defined role, including information related to the DFA and SFM requirements. Confidential business information of the Mackenzie SFMP Steering Committee such as financial or human resource information may be deemed sensitive or proprietary and may not be released.
c. The Mackenzie SFMP Steering Committee will respond to all recommendations from the PAG. The Mackenzie SFMP Steering Committee will indicate how they applied the recommendations or provide reasons for not applying them. The meeting summary will capture the reasons for not implementing any PAG recommendations, whole or in part.
d. The Mackenzie SFMP Steering Committee will provide a copy of the SFMP and annual reports to the PAG.
e. The Mackenzie SFMP Steering Committee may caucus prior to responding to the PAG.

## 4.2 With the Public

a. The Mackenzie SFMP Steering Committee will make copies of the SFMP and annual reports available to the public.
b. When communicating to the media and external parties about the SFMP and PAG process, the PAG and the Mackenzie SFMP Steering Committee will speak only on behalf of their own personal perspectives, will be respectful of each other, and avoid characterizing their comments as representing the PAG or the Mackenzie SFMP Steering Committee. They will also inform the PAG and Mackenzie SFMP Steering Committee of their communication with the media.
c. The PAG and Mackenzie SFMP Steering Committee may invite the media to attend meetings as observers with advance notification to the PAG and Mackenzie SFMP Steering Committee.

# 5. Resources

## 5.1 Travel Expenses

a. Air travel from Tsay Keh and Fort Ware will be reimbursed for PAG representatives (or in their absence, their alternates). When necessary, mileage between these villages to catch flights to attend Mackenzie PAG meetings will be reimbursed.
b. Mileage to and from PAG meetings for those PAG representatives (or in their absence, their alternates) traveling more than 25 kilometers each way to the meeting site will be reimbursed per kilometer at the provincial government rate. Mileage for those PAG representatives (or in their absence, their alternates) traveling between Tsay Keh or Kwadacha to/from Mackenzie will be reimbursed at the discretion of the Mackenzie SFMP Steering Committee. PAG representatives (or in their absence, their alternates) traveling from outside the Mackenzie Forest District must obtain approval for travel expenses from the Mackenzie SFMP Steering Committee before the meeting.
c. Overnight accommodation for PAG representatives and alternates traveling to PAG meetings will be reimbursed if pre-approved by the Mackenzie SFMP Steering Committee. As a general principle, accommodation should be economical.
d. Expense forms with copies of receipts for the above must be submitted to Canfor-Mackenzie within two weeks following the PAG meeting.

## 5.2 Meeting Expenses

a. The Mackenzie SFMP Steering Committee will provide meeting rooms, meals, refreshments, a facilitator, and a scribe.
b. The Mackenzie SFMP Steering Committee will provide adequate material and other resources to assist the PAG in understanding the relevant concepts.

# 6. Responsibilities

## 6.1 Public Advisory Group

### 6.1.1 Membership Structure

The PAG reflects a range of interests in the DFA. Members of each identified sector will select one representative and one alternate to participate in the PAG. Each representative and alternate will be allowed to represent only one of the sectors listed in Appendix B.

In addition to members of the public participating in the PAG, Aboriginal peoples have a unique legal status and may possess special knowledge concerning Sustainable Forest Management based on their traditional practices and experience. Each of the local First Nations listed below will be encouraged to invite their members to participate in the Mackenzie SFMP PAG. Members of each of the local First Nations attending PAG meetings will be invited to select a representative and alternate to participate in the PAG:

- Kwadacha First Nation
- McLeod Lake Band
- Nak'azdli First Nation

- Saulteau First Nations
- Takla Lake First Nation
- Tsay Keh Dene
- West Moberly First Nations

### 6.1.2 Selection of the PAG

a. The Mackenzie SFMP Steering Committee will recruit potential local PAG representatives and alternates through mailed invitations to individuals, an open house, posters, and advertisements through local media.
b. Interested parties and the Mackenzie SFMP Steering Committee will review the potential membership at the initial PAG meeting. The Mackenzie SFMP Steering Committee will compile all names of potential representatives. Potential representatives for each interest area will discuss and agree as to who will stand as representative(s) and alternate(s). If they unable to select a representative or alternate for the interest area, then the Mackenzie SFMP Steering Committee will recommend a solution.
c. Once the PAG is established, the PAG and the Mackenzie SFMP Steering Committee can recommend changes in PAG structure, list of interests, and potential members.
d. The Mackenzie SFMP Steering Committee, in consultation with the PAG, approves appointments and replacement of PAG representatives and alternates.

### 6.1.3 Responsibilities of PAG Representatives

PAG representatives are responsible for:

a. Providing input related to the Defined Goals (defined in Section 2);
b. Being prepared, informed and ready for meetings;
c. Requesting of the Mackenzie SFMP Steering Committee an advisor to provide information when the PAG considers this necessary;
d. Acting as a liaison between the PAG and others from the interest area they are representing;
e. Assuming responsibility towards reaching consensus on recommendations to the Mackenzie SFMP Steering Committee;
f. Attending meetings. It is recognized that PAG representatives may miss some meetings due to the nature of their work or other activities;
g. Informing their alternate and the facilitator if unable to attend a PAG meeting. If a PAG representative misses more than two consecutive meetings without a valid reason and without notifying his/her alternate and the facilitator, the Mackenzie SFMP Steering Committee may, based on consultation with the PAG, replace or remove that representative;
h. Ensuring that the alternate is informed, up-to-date and prepared prior to the alternate participating in a PAG meeting. This includes providing the alternate with a past meeting summary in a timely, effective fashion; and
i. Providing their input on upcoming agenda items when they are aware that they will be absent from a PAG meeting. They may provide their information to another PAG member or the Mackenzie PAG Steering Committee to present at the PAG meeting or forward it in writing to the facilitator who will then provide to the Mackenzie PAG Steering Committee or a specified PAG member to present at the meeting.

### 6.1.4 Responsibilities of PAG Alternates

An alternate may be appointed for each PAG representative. The PAG alternate is responsible for:

a. Attending PAG meetings on behalf of the representative. When doing so, the alternate agrees to work according to the Terms of Reference; and
b. Coming informed, up-to-date, and prepared for discussions and decision-making based on briefings by the representative when attending on behalf of the representative.

## 6.2 Mackenzie SFMP Steering Committee

The Mackenzie SFMP Steering Committee is responsible for:

a. Providing and clarifying information to the PAG as related to the Defined Goals. Where possible, this material will be provided in advance of the meeting;
b. Providing the PAG with necessary and reasonable human, physical, financial, information and technological resources;
c. Where possible, informing the PAG (via the agenda) of any advisor attending a meeting;
d. Not participating in reaching consensus on recommendations by the PAG;
e. Considering and responding to the recommendations of the PAG;
f. Making decisions regarding sustainable forest management and certification; and
g. Preparing the PAG meeting agendas and summaries.

## 6.3 Advisors

The Mackenzie SFMP Steering Committee will invite advisors, as required, to provide technical information and advice to the PAG. These advisors could be from government agencies, professional organizations, academia, consulting firms, or other sources. Advisors are responsible for:

a. Providing and/or clarifying technical or legal information as requested; and
b. Not participating in reaching consensus on recommendations by the PAG.

## 6.4 Observers

The public is welcome to participate in discussions at PAG meetings. They may not participate in reaching consensus on recommendations by the PAG.

## 6.5 Facilitator

The PAG facilitator is responsible for:

a. Ensuring that PAG meetings address the agreed-upon agenda items;
b. Starting and ending meetings at the times stated in the agenda;
c. Managing and implementing the Terms of Reference, including the appropriate participation of the PAG, the Mackenzie SFMP Steering Committee, advisors, and observers;
d. Enabling equitable opportunity by all PAG representatives (or in their absence, their alternates) to participate in the meetings;
e. Working to clarify interests and issues, and help the PAG build recommendations;
f. Not participating in reaching consensus on recommendations by the PAG;

g. Distributing the agenda prior to each PAG meeting; and
h. Distributing the PAG meeting summaries following each PAG meeting.

# 7. Conflict of Interest

The PAG recognizes that a conflict of interest could occur if there is a potential for a representative (or his or her alternate) to personally and directly benefit from specific recommendations from the PAG. Therefore, if a PAG representative or alternate has a perceived or real conflict of interest that could result in a potential exclusive personal economic benefit in relation to his or her input to the Defined Goals, that representative or alternate, other PAG representatives and alternates, or a member of the Mackenzie SFMP Steering Committee must state the potential conflict. The PAG and the Mackenzie SFMP Steering Committee will then decide on what actions are needed.

Potential actions could include asking the representative or alternate to:

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

# 8. Operating Guidelines

## 8.1 Meetings Guidelines

All participants in this process agree to:

a. Arrive on time;
b. Be prepared for each meeting;
c. Follow the speakers list;
d. Be respectful;
e. Be concise; and
f. Stay on topic.

## 8.2 Meeting Agenda and Schedule

The meeting agenda and schedule may change if agreed to by the PAG and Mackenzie SFMP Steering Committee.

### 8.2.1 Meeting Agenda

a. Meeting agendas will address the needs of the SFMP and CSA requirements.
b. The PAG may provide input to meeting agendas during each meeting.
c. The agenda will include proposed objectives for the meeting.

### 8.2.2 Meeting Schedule

a. The PAG and Mackenzie SFMP Steering Committee will agree upon meeting dates.
b. Meetings will be held as needed to monitor and review the SFMP.

# 9. Decision Making and Methodology

a. Anyone attending PAG meetings may participate in the discussions. However, only representatives will participate in making decisions, that is, recommendations to the Mackenzie SFMP Steering Committee.
b. The PAG agrees to work by consensus. Consensus is defined as no PAG representative substantially disagreeing on an issue and being willing to proceed to the next step. The PAG will work to identify the underlying issues, seek compromise, identify alternatives, and clarify information. The PAG shall make every effort to achieve consensus in a positive and respectful manner, and commits to arriving at the best solution possible.
c. The PAG will not revisit past decisions unless the PAG representatives agree to do so.
d. A quorum for any meeting of the PAG shall be greater than 50% of the average number of PAG representatives attending the past five (5) meetings.

# 10. Dispute Resolution Mechanism

## 10.1 Process Issues

The facilitator will resolve process issues.

## 10.2 Technical Issues

a. Where an impasse is reached, the representation(s) with the outstanding issue shall offer solutions or options for resolution.
b. If the impasse remains, the generally agreed-upon decision, along with the dissenting view(s), will be forwarded to the Mackenzie SFMP Steering Committee.

# 11. Review and Revisions

The PAG and Mackenzie SFMP Steering Committee will review and agree upon the Terms of Reference at least annually.

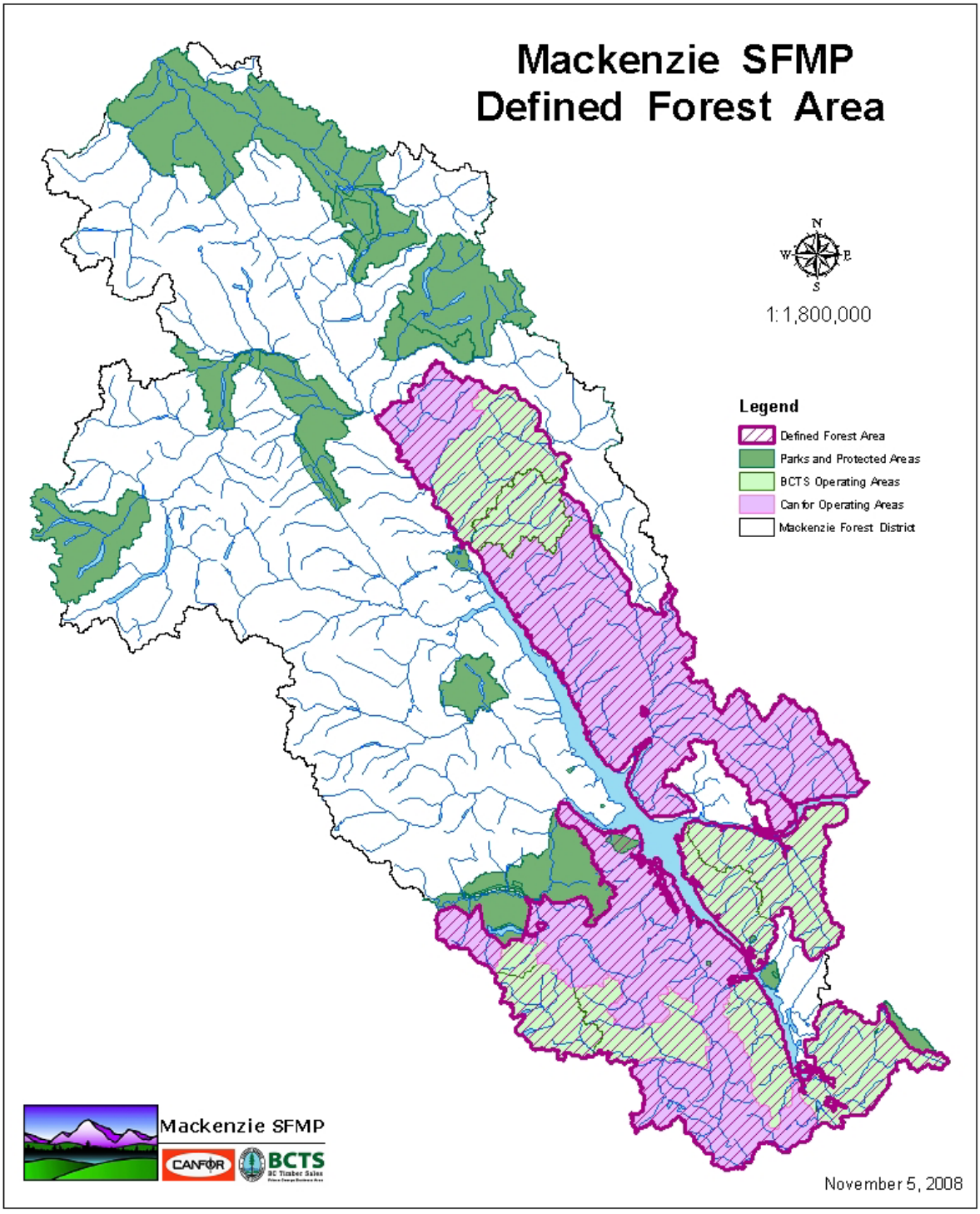
## Approved:

Public Advisory Group Date: January 31, 2006
Mackenzie SFMP Steering Committee Date: January 31, 2006

## Revised:

Public Advisory Group Date: October 28, 2008
Mackenzie SFMP Steering Committee Date: October 28, 2008

# Appendix A
## Map of the Defined Forest Area (DFA)



# Appendix B
# Public Advisory Group Sectors

Academia
Agriculture/Ranching
Contractors – Forestry
Environment/ Conservation
First Nations[2]
General Public
Germansen Landing
Labour – CEP
Labour – PPWC
Local Government
McLeod Lake Indian Band
Mining/Oil & Gas
Noostel Keyoh
Public Health & Safety
Recreation – Commercial
Recreation – Non-commercial
Saulteau First Nation
Small Business – Germansen Landing
Small Business – Mackenzie
Small Community
Trapping
West Moberly First Nation
Woodlot

**Approved:**

| | |
|---|---|
| Public Advisory Group | Date: January 31, 2006 |
| Mackenzie SFMP Steering Committee | Date: January 31, 2006 |

**Revised:**

| | |
|---|---|
| Public Advisory Group | Date: October 28, 2008 |
| Mackenzie SFMP Steering Committee | Date: October 28, 2008 |

[2] This sector is open to allow participation of any First Nations person wishing to contribute

# APPENDIX C

# STAKEHOLDER ANALYSIS

This Appendix contains the Stakeholder Analysis completed for the DFA. The information is maintained by the signatories to the SFM Plan and is updated periodically. Due to the necessity of listing names and personal information in the Stakeholder Analysis, the document is not included in the SFM Plan that is publicly available due to privacy issues.

# APPENDIX D

# SFMP LINKAGES TO FOREST LEGISLATION AND POLICY, PROVINCIAL STRATEGIES AND SUPPORTING DOCUMENTS AND INITIATIVES

Table 1: SFMP linkages to selected federal and provincial legislation and policy.

| Federal and Provincial Legislation and Policies | Linkage to SFMP |
|---|---|
| Committee On the Endangered Wildlife in Canada (COSEWIC) | Under the Species at Risk Act, COSEWIC was established as an independent body of experts responsible for identifying and assessing species considered being at risk of extinction or extirpation. Appendix F contains a COSEWIC list for the Mackenzie DFA. Minimizing forest harvesting impacts on these species will be implemented through the SFMP. |
| Forest Act | The Forest Act provides the Forest Service with the authority to: determine an AAC; authorize timber harvesting (cutting permits); enter into road permits and road use permits; and establish designated areas to protect forest land. The Forest Act provides the basis for tenure agreements, AAC determination and operational permits that serve as implementation tools for the SFMP. |
| Forest and Range Practices Act (FRPA) | In January 2004, FRPA and its regulations were brought into force, enabling forest and range licensees to move to a more results-based regime for forest and range practices. Licensees will have until December 2006 to operate under the old FPC or switch to the streamlined FRPA regulations. The SFMP must meet or exceed the results-based requirements of FRPA. FSPs are mandatory under FRPA and describe planned harvesting and road building activities. |
| Forest Practices Code Act and Regulation (FPC) | Much of the FPC Act and Regulations have been repealed as a result of the implementation of FRPA and the Wildfire Act. Licensees will have to December 2006 to operate under the FPC. FDPs are required under the FPC and describe planned harvesting and road building activities. FDPs will expire December 2006. |
| Old Growth Management Order | A Provincial Non-Spatial Old-Growth Order legally establishes old growth objectives for landscape units across the province of British Columbia. The order will apply to the approximately two-thirds of the province where objectives for old growth have not already been formally established. The order is primarily concerned with the management of forest resources on Crown land and will apply to FSPs prepared under the FRPA. |

| Federal and Provincial Legislation and Policies | Linkage to SFMP |
|---|---|
| Ungulate Winter Range (UWR) Order | UWR is defined as an area that contains habitat that is necessary to meet the winter habitat requirements of an ungulate species. UWRs are based on our current understanding of ungulate habitat requirements in winter, as interpreted by the Ministry of Environment (MOE) regional staff from current scientific and management literature, local knowledge, and other expertise from the region. See http://www.env.gov.bc.ca/wld/uwr/ungulate_app.html for UWRs located in this district. |

Table 2: SFMP linkages to selected provincial strategic plans.

| Strategic Plans and Initiatives | Linkages to SFMP |
|---|---|
| Mackenzie Land and Resource Management Plan (LRMP), November, 2000 | The Mackenzie LRMP has identified six zone categories to guide management and resource development: protected areas, settlements, enhanced, general, special and special wildland. The LRMP has also identified wildlife, recreation, access, agriculture, and biodiversity objectives for each Resource Management Zone.<br>The LRMP was considered in the development of this SFMP. |
| Protected Areas Strategy (PAS) | The PAS was developed by government to put aside 12% of British Columbia as parks and protected areas by the year 2000 in order to protect representative ecosystems throughout the province. Protected areas were developed through the LRMP process in order to preclude timber harvest in these areas and to protect high value habitat, critical habitat and unique landscape areas.<br>There are several protected areas found adjacent to the DFA that will contribute to the conservation of biological diversity in the DFA and the greater TSA. |
| Timber Supply Review (TSR) for Mackenzie TSA | The main objectives of the TSR are to:<br>▪ identify the economic, environmental and social information that reflects the current forest management practices— including their effects on the short- and long-term timber supply;<br>▪ identify where improved information is required for future timber supply forecasts; and<br>▪ provide the Chief Forester with information to make any necessary adjustments to the allowable annual cuts for the next five years.<br>The SFMP addresses the first and second objectives. It is anticipated that once the SFMP is fully implemented, the nature of TSR will change to become part of the development of the SFMP. |
| Mackenzie TSA TSR2, April 2001 | TSR2 Data Package Submission (April 2001) provides the inventory base and analysis rigor to assess SFM. |

| | |
|---|---|
| Mackenzie TSA Rational for AAC Determination, October, 2001 & Supporting Reports | All TSR reports are important for SFM Planning given the mandate and scope of TSR. These reports provide DFA specific information for the analysis process. The SFMP will build on this process. |
| Mackenzie TSA Silviculture Strategy (Type I), March 2000 | The Type I Silviculture Strategy identifies the critical issues in timber supply, derives objectives with respect to those issues, specifies regimes to meet those issues and identifies the regime activities that can be implemented in the next five years. These issues will be addressed within the SFMP. |
| Mackenzie TSA Type II Incremental Silviculture Analysis (October 2003) | The Type II Incremental Silviculture Analysis identifies critical issues and objectives in timber supply and associated uncertainties, and specifies incremental (i.e. non-obligation) silviculture regimes that may be utilized to achieve these objectives. Regimes may be used to guide future practices should sustainability targets require them. |
| DFAM Forest Health Strategy, Mackenzie TSA, March, 2006 | The Mackenzie Forest Health strategy identifies the known forest health factors in the TSA, provides links to specific strategies and tactics that apply to those forest health factors, and identifies and justifies any deviations from currently available pest management practices (e.g., FPC Guidebooks).<br><br>The SFMP works under the concept that natural disturbance is an input rather than a driver of forest management. Therefore, it is important that management agencies, licensees and stakeholders understand and incorporate historic and current natural disturbance agents into SFM. |
| Identified Wildlife Management Strategy (IWMS) | The term "Identified Wildlife" refers to species at risk and regionally important wildlife that the Minister of Water, Land and Air Protection, designates as requiring special management attention under the FRPA.<br><br>The IWMS provides direction, policy, procedures and guidelines for managing Identified Wildlife. The goals of the strategy are to minimize the effects of forest and range practices on Identified Wildlife. Identified Wildlife are managed through the establishment of wildlife habitat areas (WHAs) and the implementation of general wildlife measures (GWMs) or through other management practices specified in strategic or landscape level plans.<br><br>The Identified Wildlife Management Strategy (IWMS) Version 2004 was released in May 2004. |
| Caribou Management Strategy | A caribou management strategy was identified in the LRMP to provide direction that is incremental to the Biodiversity Guidebook to provide for the maintenance of caribou as well as other species. |
| Grizzly Bear | A grizzly bear management strategy was identified in the LRMP to |

| | |
|---|---|
| Management Strategy | provide direction for the maintenance of grizzly bear as well as other species. |

Table 3: SFMP linkages to selected supporting documentation and initiatives.

| Initiative | Linkages to SFMP |
|---|---|
| Defined Forest Area Management (DFAM) | DFAM is a policy framework developed by MoFR to provide multi-licensee management for TSAs. Currently, the signatories are responsible for collaborative tasks on the TSA, including collection of appropriate inventories, timber supply analysis and forest health actions.<br>The SFMP furthers this initiative through a collaborative process for hierarchical planning and sustainability analyses that address ecological as well as socio-economic values. |
| Landscape Objectives Working Group | The Landscape Objective Working Group (LOWG) is a government-led process responsible for delineating spatially-defined OGMAs for priority Landscape Units within the TSA. These OGMAs will become the basis for the measurement of targets developed under the SFMP. |
| Forest Investment Account (FIA) | FIA provides funding to forest sector associations, researchers, tenure holders, manufacturers and government agencies to:<br>support sustainable forest management practices,<br>improve the public forest asset base; and<br>promote greater returns from the utilization of public timber.<br>FIA funding has provided financial support for many of the projects testing SFM concepts including the resultant SFMP. |
| FIA – Land Based Investment Rationale (LBIR) | LBIR establishes land-based resource issues with respect to biological needs and local forest management priorities through collaboration between government, licensees and key stakeholders. The intent of this initiative is to provide managers with the information required to support informed resource management investment decisions. |
| Resource Management Plan for the Prince George Forest Region, Mackenzie District 2001-2005 | The Resource Management Plan was a predecessor process to LBIR. It provided a listing of key issues on the land base, developed through a collaborative process. Key issues identified by the Plan are addressed within the SFMP. |
| Canadian Standards Association (CSA) | CSA Standard Z809-02 outlines the application of CCFM SFM criteria and CSA SFM elements. The Standard sets the general requirements of SFM as well as the requirements of a SFMP. The Standard emphasizes the role of public involvement in the process of setting locally appropriate Indicators, measures, and targets.<br><br>This SFMP supports the requirements of CSA Standard Z809-02 with respect to SFM and the planning process (Table 4). |

| | |
|---|---|
| | Performance requirements for SFM identified by CSA are outlined in Table 5. |
| Canfor's ISO 14001 Forest Management System Manual (FMS) May, 2006 | The National ISO 14001 EMS provides organizations with the elements of an effective management system. This system was developed in a manner that is easily integrated with other management systems. The EMS provides the management system framework required for CSA Standard Z809-02. Compliance with all regulatory requirements is described within the EMS.<br><br>The EMS provides the foundation for the management system of the SFMP. The primary linkages between the EMS and SFM focus on Canfor's roles and responsibilities as well as requirements for tracking, monitoring, corrective actions, internal and external audits, reporting of performance and regulatory compliance. |
| BCTS, SFMS – ISO 14001, certification Jan 25, 2006 | BCTS Prince George Business Area (PGBA) has designed a Sustainable Forest Management System (SFMS) which integrates environmental performance components consistent with the ISO 14001 standard and SFM components complying with the CSA Z809 (02) standard. The PGBA participates in three SFM plans for the Prince George DFA, the TFL 30 DFA and the Mackenzie DFA. Roles and responsibilities are defined for all components of the SFMS. The SFMS committee periodically reviews performance and sets priorities for improvements. |

Table 4. General requirements for Sustainable Forest Management (SFM) as recommended by the Canadian Standards Association (CSA) and the sections of the Sustainable Forest Management Plan (SFMP) for the Mackenzie Defined Forest Area within which those requirements are addressed.

| CSA General Requirements for SFM | Location in SFMP |
|---|---|
| Compliance with relevant legislation on the DFA | 3.5.3 Responsibilities |
| Appropriate Criteria, Indicators, Measures and Targets that clearly address the CCFM SFM criteria and CSA SFM elements identified in CSA Standard Z809 | 5.2 Criteria, Indicators, Measures and Targets<br>Also see Table 2 for an expanded description of this general requirement with respect to DFA-Specific Performance Requirements. |
| Ongoing and meaningful public participation | 3.5.1 Public Involvement<br>3.5.2. First Nations Involvement |
| Progress towards, or achievement of, performance targets | 6.2 Design of Sustainability Scenarios<br>8.0 Adaptive Management<br>Appendix G: Indicator/Measure Status Report<br>Appendix H: A Comparative Analysis of Alternative Strategies |

| | |
|---|---|
| Continual improvement in performance | 2.1 Purpose and Context<br>8.0 Adaptive Management<br>Annual Report – Year 2006 (to be developed at conclusion of reporting period) |
| A comprehensive description of the DFA | 3.2 The Plan Area<br>Appendix I: Land Base Summary Of The DFA |
| A summary of the most recent forest management plan and management outcomes, including the conclusions drawn in the management review | 4.2 Practices Analysis<br>6.1 Assessment of Current Conditions<br>Appendix I: Land Base Summary Of The DFA |
| A description of the monitoring program | 5.2 Criteria, Indicators, Measures and Targets<br>8.1 Monitoring Plan |
| A demonstration of the links between short-term operational plans and the SFMP | 5.2 Criteria, Indicators, Measures and Targets<br>Appendix E: General Linkages Between Operational Plans And The SFMP |

Table 5. Performance requirements for Sustainable Forest Management (SFM) as recommended by the Canadian Standards Association (CSA) and the sections of the Sustainable Forest Management Plan (SFMP) for the Mackenzie Defined Forest Area within which those requirements are addressed.

| Performance Requirements | Location in SFMP |
|---|---|
| For each element, one or more DFA-specific values shall be identified. | 5.2 Criteria, Indicators, Measures and Targets |
| For each value, one or more objectives shall be set. | 5.2 Criteria, Indicators, Measures and Targets |
| For each value, one or more indicators shall be identified. Indicators shall be quantitative where feasible. | 5.2 Criteria, Indicators, Measures and Targets |
| For each indicator, data on the current status shall be provided, and one target shall be set. | 5.2 Criteria, Indicators, Measures and Targets<br>Appendix G: Indicator/Measure Status Report<br>Annual Report – Year 2006 (to be developed at conclusion of reporting period) |
| Each target shall specify acceptable levels of variance for the indicator and clear time frames for achievement. | 5.2 Criteria, Indicators, Measures and Targets |
| Alternative strategies shall be identified and elaborated. | 5.2 Criteria, Indicators, Measures and Targets<br>6.2 Design of Sustainability Scenarios<br>Appendix H: A Comparative Analysis of Alternative Strategies |
| Forecasts shall be prepared for the expected responses of each indicator to each alternative strategy. | 5.2 Criteria, Indicators, Measures and Targets |
| Assumptions and analytical methods used for making each forecast shall be described. | 5.2 Criteria, Indicators, Measures and Targets |

| | |
|---|---|
| During plan implementation, measurements shall be taken for each indicator at appropriate times and places. Measurement results shall be interpreted in the context of the forecasts in the SFMP (i.e., a comparative analysis of actual and expected outcomes). | 5.2 Criteria, Indicators, Measures and Targets<br>8.1 Monitoring Plan<br>8.2 Evaluation & Analysis<br>Annual Report – Year 2006 (to be developed at conclusion of reporting period) |

# APPENDIX E

## GENERAL LINKAGES BETWEEN OPERATIONAL PLANS AND THE SFMP

Table 1: General linkages between operational plans and the SFMP.

| Operational Plans | Linkages to SFMP |
|---|---|
| FDP (and associated amendments)<br>Canfor – June, 2002<br>BCTS – July, 2000 | An FDP details forest development activities for the Canfor Mackenzie Operations. These development activities are proposed within the Mackenzie TSA for a 5-year period. An FDP is a requirement under FPC Regulations. An FDP provides the information necessary to allow the public, affected stakeholders and the District Manager to determine that the plan meets the requirements of the FPC and associated regulations and effectively manages the forest resource and related resources. Under the new FRPA legislation, the FDP will be replaced by an FSP. |
| Forest Stewardship Plan,<br>Canfor – December, 2006 (yet to be approved)<br>BCTS – November, 2006 (yet to be approved) | The FSP links government objectives to practices on the ground through various results and strategies. Under the new FRPA legislation, the FSP will be one of the only operational plans that will be submitted to government for approval.<br><br>The FSP is a landscape level plan that will be the primary driver of site-specific operational plans, following the requirements and strategies of SFM and the SFMP. The responsibility of the individual licensee is to ensure that SFM principles are upheld through implementation of this and other operational plans.<br><br>The FSP will replace the FDP. The current FDP for Canfor's Mackenzie Division is approved until March 31, 2007. Once the FSP is approved for Canfor's Mackenzie Division (projected for December 2006), it is anticipated that site level plans that reflect SFM will be developed and implemented.<br><br>BCTS' FSP will replace the current FDP upon approval. Site plans developed after the FSP is approved will be crafted to meet the results and strategies in the FSP and achieve the targets set out in the SFMP. |

# APPENDIX F

## FEDERAL AND PROVINCIAL LISTINGS OF VULNERABLE AND THREATENED PLANTS AND ANIMALS IN THE DFA.

A current listing of federal and provincial species of concern that occur in the DFA is provided below. For updates to the listing see http://srmapps.gov.bc.ca/apps/eswp/.

Table 1. A listing of federal and provincial species of concern that occur in the DFA.

| Class (English) | English Name | Scientific Name | Provincial Rank* | COSEWIC Rank |
|---|---|---|---|---|
| Birds | Sandhill Crane | *Grus canadensis* | Special Concern | |
| Bony Fishes | Bull Trout | *Salvelinus confluentus* | Special Concern | |
| | Arctic Grayling (Williston Watershed population) | *Thymallus arcticus* pop. 1 | Threatened | |
| Gastropods | Rocky Mountain Capshell | *Acroloxus coloradensis* | Special Concern | |
| Insects | Red-disked Alpine | *Erebia discoidalis* | Special Concern | |
| | Quebec Emerald | *Somatochlora brevicincta* | Special Concern | |
| | Forcipate Emerald | *Somatochlora forcipata* | Special Concern | |
| Mammals | Wolverine, *luscus* subspecies | *Gulo gulo luscus* | Special Concern | Special Concern |
| | Caribou (northern mountain population) | *Rangifer tarandus* pop. 15 | Special Concern | Special Concern |
| | Caribou (southern mountain population) | *Rangifer tarandus* pop | Not on website Threatened | Threatened |
| | Grizzly Bear | *Ursus arctos* | Special Concern | Special Concern |
| | Fisher | *Martes pennanti* | Special Concern | |
| | Northern Long-eared Myotis | *Myotis septentrionalis* | Special Concern | |
| Ferns | least moonwort | *Botrychium simplex* | Special concern | |
| Dicots | western dogbane | *Apocynum* x *floribundum* | Special concern | |
| | tundra milk-vetch | *Astragalus umbellatus* | Special concern | |
| | gray-leaved draba | *Draba cinerea* | Special concern | |

| | | | | |
|---|---|---|---|---|
| | small-fruited willowherb | *Epilobium leptocarpum* | Special concern | |
| | northern daisy | *Erigeron uniflorus* ssp. *eriocephalus* | Special concern | |
| | northern bog bedstraw | *Galium labradoricum* | Special concern | |
| | Rocky Mountain sandwort | *Minuartia austromontana* | Special concern | |
| | small white waterlily | *Nymphaea leibergii* | Special concern | |
| | Maydell's locoweed | *Oxytropis maydelliana* | Special concern | |
| | pale poppy | *Papaver alboroseum* | Special concern | |
| | western Jacob's-ladder | *Polemonium occidentale* ssp. *occidentale* | Special concern | |
| | five-leaved cinquefoil | *Potentilla nivea* var. *pentaphylla* | Special concern | |
| | birdfoot buttercup | *Ranunculus pedatifidus* ssp. *affinis* | Special concern | |
| | arctic dock | *Rumex arcticus* | Special concern | |
| | snow pearlwort | *Sagina nivalis* | Special concern | |
| | dotted saxifrage | *Saxifraga nelsoniana* ssp. *carlottae* | Special concern | |
| | umbellate starwort | *Stellaria umbellata* | Special concern | |
| | prairie golden bean | *Thermopsis rhombifolia* | Threatened | |
| Monocots | bog rush | *Juncus stygius* | Special concern | |

* Provincially a species of special concern is blue listed; a threatened species is red listed.

# APPENDIX G

# INDICATOR/MEASURE STATUS REPORT

This appendix shows the current status of each indicator/measure for the 2005-2006 reporting period at the plan initiation stage. The status report will remain the benchmark for comparison to future annual reports.

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-1.1. The percentage of old and mature plus old seral stage by landscape unit group and BEC variant for CFLB within the DFA.**

**TARGET:** **as per the Mackenzie TSA Biodiversity Order**
**VARIANCE:** **-0%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| | |
|---|---|
| **MEASUREMENT UNIT:** | Old and mature plus old |
| **SPATIAL/GEOGRAPHIC SCALE:** | Landscape Unit and BEC variant |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Spatial forest cover data |
| **MEASUREMENT METHOD:** | Spatial analysis of seral stage by BEC zone and LU Grouping based on most recent forest cover data and harvest proposals. |
| **CALCULATION:** | (Area of old forest/forested area) x 100, (Area of old + mature forest/forested area) x 100, by LU Grouping and BEC zone. |
| **DEFINITIONS/ASSUMPTIONS:** | The Biodiversity order for the Mackenzie TSA, as drafted March 4, 2006, is intended to be established by order in council in 2008 and has been used as the basis for this measure. |
| **KNOWLEDGE GAPS:** | Require updated forest cover data. VRI on-going project but not anticipated to be completed for 4-5 years. |
| **COST:** | In-house. |

Old and Mature + Old Seral Stage distribution status and targets by Landscape Unit and BEC groupings.

| | | | | Old seral stage | | | | Mat + old seral stage | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Landscape Unit Grouping** | **Biodiversity Emphasis** | **Biogeoclimatic Group** | Forested area | Target area | Current area | Target % | Current % | Target area | Current area | Target % | Current % |
| Akie, Akie River | enhanced | BWBSdk1 | 58,283 | 5,245 | 34,434 | 9% | 59% | 8,164 | 52,923 | 14% | 91% |
| Akie, Akie River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 33,070 | 3,638 | 13,594 | 11% | 41% | 3,661 | 24,302 | 11% | 73% |
| Akie, Akie River | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 2,512 | 0 | 1,461 | 0% | 58% | 2,135 | 2,347 | 85% | 93% |
| Blackwater | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 21,457 | 1,931 | 11,717 | 9% | 55% | 3,010 | 14,644 | 14% | 68% |
| Blackwater | enhanced | SBSvk, SBSwk2 | 58,921 | 5,303 | 11,102 | 9% | 19% | 8,876 | 16,781 | 15% | 28% |
| Blackwater + Muscovite Lake Park + Black Old | enhanced | SBSmk1, SBSmk2, BWBSdk1 | 93,243 | 10,257 | 25,017 | 11% | 27% | 10,316 | 34,649 | 11% | 37% |

**Mackenzie Defined Forest Area**
**Current Status Table**

| | | | | Old seral stage | | | | Mat + old seral stage | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Landscape Unit Grouping** | **Biodiversity Emphasis** | **Biogeoclimatic Group** | Forested area | Target area | Current area | Target % | Current % | Target area | Current area | Target % | Current % |
| Buffalohead | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 631 | 0 | 388 | 0% | 61% | 537 | 586 | 85% | 93% |
| Buffalohead + Ed Bird Estella Park | enhanced | BWBSdk1 | 26,597 | 2,394 | 16,608 | 9% | 62% | 3,728 | 22,520 | 14% | 85% |
| Buffalohead + Ed Bird Estella Park | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 27,563 | 3,032 | 10,622 | 11% | 39% | 3,052 | 16,907 | 11% | 61% |
| Clearwater | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 44,160 | 8,390 | 30,867 | 19% | 70% | 15,911 | 35,358 | 36% | 80% |
| Clearwater | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 10,205 | 918 | 1,741 | 9% | 17% | 2,868 | 5,310 | 28% | 52% |
| Clearwater | general | SBSvk, SBSwk2 | 22,139 | 1,992 | 7,191 | 9% | 32% | 6,879 | 11,379 | 31% | 51% |
| Collins-Davis | enhanced | ESSF wc3, ESSF wk2 | 34,794 | 6,611 | 15,059 | 19% | 43% | 6,620 | 22,917 | 19% | 66% |
| Collins-Davis | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 50,228 | 4,521 | 16,373 | 9% | 33% | 7,053 | 34,999 | 14% | 70% |
| Collins-Davis | enhanced | BWBSdk1 | 14,256 | 1,568 | 3,056 | 11% | 21% | 1,577 | 6,691 | 11% | 47% |
| Collins-Davis | enhanced | SBSwk2 | 32,666 | 2,940 | 4,502 | 9% | 14% | 4,931 | 12,451 | 15% | 38% |
| Collins-Davis | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 5,417 | 0 | 3,180 | 0% | 59% | 4,605 | 4,536 | 85% | 84% |
| Collins-Davis | enhanced | SBSmk1, SBSmk2 | 22,173 | 1,996 | 2,923 | 9% | 13% | 3,351 | 6,758 | 15% | 30% |
| Connaghan Creek, Eklund, Jackfish, South Germanson-Upper Manson | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 32,181 | 4,184 | 15,426 | 13% | 48% | 13,542 | 29,771 | 42% | 93% |
| Connaghan Creek, Eklund, Jackfish, South Germanson-Upper Manson | special | BWBSdk1 | 14,840 | 2,374 | 538 | 16% | 4% | 5,061 | 12,855 | 34% | 87% |
| Connaghan Creek, Eklund, Jackfish, South Germanson-Upper Manson | special | SBSmk1, SBSmk2 | 6,389 | 1,022 | 2,863 | 16% | 45% | 2,181 | 5,048 | 34% | 79% |
| Connaghan Creek, Eklund, Jackfish, South Germanson-Upper Manson | special | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 2,139 | 0 | 1,768 | 0% | 83% | 1,818 | 2,120 | 85% | 99% |
| Gaffney, Manson River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 80,685 | 7,262 | 39,255 | 9% | 49% | 11,348 | 58,429 | 14% | 72% |
| Gaffney, Manson River | enhanced | SBSvk, SBSwk2 | 6,053 | 545 | 1,394 | 9% | 23% | 910 | 2,113 | 15% | 35% |
| Gaffney, Manson River | enhanced | SBSmk1, SBSmk2 | 76,067 | 8,367 | 29,076 | 11% | 38% | 8,426 | 37,821 | 11% | 50% |
| Germansen Mountain | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 8,274 | 745 | 3,663 | 9% | 44% | 1,160 | 7,635 | 14% | 92% |

**Mackenzie Defined Forest Area**
**Current Status Table**

| | | | | Old seral stage | | | | Mat + old seral stage | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Landscape Unit Grouping** | **Biodiversity Emphasis** | **Biogeoclimatic Group** | Forested area | Target area | Current area | Target % | Current % | Target area | Current area | Target % | Current % |
| Gillis, Klawli | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 81,128 | 7,302 | 38,620 | 9% | 48% | 22,786 | 69,484 | 28% | 86% |
| Gillis, Klawli | general | BWBSdk1 | 5,467 | 601 | 974 | 11% | 18% | 1,263 | 4,826 | 23% | 88% |
| Gillis, Klawli | general | SBSmk1, SBSmk2 | 13,956 | 1,535 | 5,240 | 11% | 38% | 3,224 | 7,338 | 23% | 53% |
| Kennedy | special | ESSF wc3, ESSF wk2 | 13,079 | 3,662 | 11,806 | 28% | 90% | 7,063 | 12,139 | 54% | 93% |
| Kennedy | special | SBSvk, SBSwk2 | 5,710 | 742 | 1,250 | 13% | 22% | 2,644 | 1,441 | 46% | 25% |
| Lower Akie, Lower Pesika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 4,557 | 592 | 1,537 | 13% | 34% | 1,914 | 2,987 | 42% | 66% |
| Lower Akie, Lower Pesika | special | BWBSdk1 | 14,607 | 2,337 | 4,249 | 16% | 29% | 4,993 | 8,779 | 34% | 60% |
| Lower Ospika | general | ESSF wc3, ESSF wk2 | 14,563 | 2,767 | 7,545 | 19% | 52% | 5,278 | 10,855 | 36% | 75% |
| Lower Ospika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 36,502 | 3,285 | 17,603 | 9% | 48% | 10,249 | 21,443 | 28% | 59% |
| Lower Ospika | general | SBSvk, SBSwk2 | 6,089 | 548 | 1,868 | 9% | 31% | 1,900 | 3,053 | 31% | 50% |
| Lower Ospika | general | SBSmk1, SBSmk2 | 20,804 | 2,288 | 7,106 | 11% | 34% | 4,821 | 7,599 | 23% | 37% |
| Lower Ospika | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 2,491 | 0 | 1,440 | 0% | 58% | 2,124 | 2,141 | 85% | 86% |
| Misinchinka | enhanced | SBSmk1, SBSmk2 | 4,798 | 0 | 1,198 | 0% | 25% | 535 | 1,502 | 11% | 31% |
| Misinchinka | | ESSF wc3, ESSF wk2 | 39,055 | 7,420 | 29,176 | 19% | 75% | 7,442 | 32,344 | 19% | 83% |
| Misinchinka, Tudyah B | enhanced-general | SBSvk, SBSwk2 | 32,602 | 2,934 | 15,436 | 9% | 47% | 0 | 18,776 | 0% | 58% |
| Morfee | general | SBSvk, SBSwk2 | 62,011 | 5,581 | 27,103 | 9% | 44% | 19,355 | 36,810 | 31% | 59% |
| Morfee | general | SBSmk1, SBSmk2 | 958 | 105 | 156 | 11% | 16% | 221 | 178 | 23% | 19% |
| Nabesche | general | SBSvk, SBSwk2 | 131,735 | 11,856 | 22,773 | 9% | 17% | 41,142 | 54,121 | 31% | 41% |
| Nabesche | general | ESSF wc3, ESSF wk2 | 43,911 | 8,343 | 30,589 | 19% | 70% | 15,830 | 34,675 | 36% | 79% |
| Nabesche | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 24,491 | 2,204 | 16,427 | 9% | 67% | 6,877 | 20,360 | 28% | 83% |
| Nabesche | general | BWBSmw1, BWBS wk2 | 9,759 | 1,073 | 2,148 | 11% | 22% | 2,268 | 5,190 | 23% | 53% |
| Nabesche | general | SBSmk1, SBSmk2 | 4,479 | 493 | 633 | 11% | 14% | 1,035 | 1,236 | 23% | 28% |
| Nabesche | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 6,058 | 0 | 4,852 | 0% | 80% | 5,154 | 5,380 | 85% | 89% |
| Nation | special | SBSmk1, SBSmk2 | 10,415 | 1,666 | 2,629 | 16% | 25% | 3,550 | 4,444 | 34% | 43% |
| Parsnip + Heather Dina Park + Patsuk ER | general | ESSF wc3, ESSF wk2 | 25,418 | 4,829 | 16,609 | 19% | 65% | 9,156 | 21,370 | 36% | 84% |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSvk, SBSwk2 | 16,363 | 1,473 | 3,940 | 9% | 24% | 5,106 | 8,828 | 31% | 54% |

**Mackenzie Defined Forest Area**
**Current Status Table**

| | | | | Old seral stage | | | | Mat + old seral stage | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Landscape Unit Grouping** | **Biodiversity Emphasis** | **Biogeoclimatic Group** | Forested area | Target area | Current area | Target % | Current % | Target area | Current area | Target % | Current % |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSmk1, SBSmk2 | 15,825 | 1,741 | 3,908 | 11% | 25% | 3,693 | 7,292 | 23% | 46% |
| Pesika | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 26,532 | 2,388 | 11,196 | 9% | 42% | 7,430 | 18,217 | 28% | 69% |
| Pesika | general | BWBS dk1 | 7,967 | 876 | 1,398 | 11% | 18% | 1,835 | 4,856 | 23% | 61% |
| Philip | enhanced | SBSmk1, SBSmk2 | 107,012 | 0 | 22,360 | 0% | 21% | 11,867 | 40,108 | 11% | 37% |
| Philip | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 57,876 | 0 | 25,697 | 0% | 44% | 8,157 | 34,425 | 14% | 59% |
| Philip Lake, Tudyah A | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 4,134 | 0 | 1,407 | 0% | 34% | 1,168 | 2,385 | 28% | 58% |
| Philip Lake, Tudyah A | general | SBSmk1, SBSmk2 | 11,439 | 0 | 3,177 | 0% | 28% | 2,648 | 5,736 | 23% | 50% |
| Philip, Philip Lake, Tudyah A | enhanced | SBSvk, SBSwk2 | 5,002 | 450 | 776 | 9% | 16% | 755 | 1,535 | 15% | 31% |
| Schooler | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 37,044 | 3,334 | 16,289 | 9% | 44% | 10,400 | 20,832 | 28% | 56% |
| Schooler | general | BWBSmw1, BWBS wk2 | 15,469 | 1,702 | 2,128 | 11% | 14% | 3,566 | 4,567 | 23% | 30% |
| Schooler | | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 3,459 | 0 | 2,276 | 0% | 66% | 2,941 | 2,661 | 85% | 77% |
| Selwyn | special | ESSFwc3, ESSFwk2 | 12,397 | 3,471 | 10,336 | 28% | 83% | 6,695 | 12,075 | 54% | 97% |
| Selwyn | special | SBSvk, SBSwk2 | 15,478 | 2,012 | 3,836 | 13% | 25% | 7,138 | 6,062 | 46% | 39% |
| Selwyn | special | BWBSmw1, BWBS wk2 | 4,325 | 692 | 625 | 16% | 14% | 1,474 | 1,526 | 34% | 35% |
| Tudyah B | general | SBSmk1, SBSmk2 | 3,104 | 0 | 509 | 0% | 16% | 722 | 1,055 | 23% | 34% |
| Twenty Mile | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 13,246 | 1,192 | 7,437 | 9% | 56% | 3,719 | 12,466 | 28% | 94% |
| Twenty Mile | general | BWBS dk1 | 3,211 | 353 | 711 | 11% | 22% | 743 | 2,777 | 23% | 86% |
| Upper Ospika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 18,677 | 2,428 | 14,142 | 13% | 76% | 7,849 | 17,967 | 42% | 96% |
| Upper Ospika | special | SBSmk1, SBSmk2 | 2,721 | 435 | 2,287 | 16% | 84% | 926 | 2,424 | 34% | 89% |
| Upper Ospika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 1,971 | 256 | 1,481 | 13% | 75% | 828 | 1,842 | 42% | 93% |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-1.2. The percentage of interior old forest by landscape unit group and BEC variant for CFLB**
**TARGET:** **To be determined.**
**VARIANCE:** **-0%**
**REPORT YEAR:** **2005/06**

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## Draft order: March 4, 2006

Compare draft order to current status from FES Indicator Mapping project.

| | |
|---|---|
| **MEASUREMENT UNIT:** | Old interior forest |
| **SPATIAL/GEOGRAPHIC SCALE:** | Landscape Unit and BEC variant |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Spatial forest cover data |
| **MEASUREMENT METHOD:** | Spatial analysis of old seral stage with 200 meter buffer applied by BEC zone and LU Grouping based on most recent forest cover data and harvest |
| **CALCULATION:** | (Area of old interior forest/forested area) x 100, by LU Grouping and BEC |
| **DEFINITIONS/ASSUMPTIONS:** | Old interior forest is defined as defined as that portion of an old seral stage forest that is not influenced by the edge effect. It is assummed that a 200 meter buffer is required to negate any potential edge effect. |
| **KNOWLEDGE GAPS:** | |
| **COST:** | In-house. |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** 1-1.3.The amount of landscape-level biodiversity reserves within the
**TARGET:** > area set aside
**VARIANCE:** -0.5% variance
**REPORT YEAR:** 2005/06

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| Landscape Level Biodiversity Reserve | Area | DFA Area: | 2,117,199 |
|---|---|---|---|
| | | Percent | Percent in DFA |
| Protected Areas & Parks | 6,629 | 0.3% | |
| Old Growth Management Areas | | 0.0% | |
| Wildland RMZs | | 0.0% | |
| Recreational Parks | | 0.0% | |
| Reserves from the Crown Land Plan | | 0.0% | |
| UWRs | 7,925 | 0.4% | |
| **TOTAL** | 14,554 | | **0.7%** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | Landscape level |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | |
| **MEASUREMENT METHOD:** | |
| **CALCULATION:** | |
| **DEFINITIONS/ASSUMPTIONS:** | |
| **KNOWLEDGE GAPS:** | OGMAS once established will form part of this target. New UWR may also cange number. |
| **COST:** | |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-1.4 Hectares of unauthorized forestry-related harvesting or road construction within protected areas or established old growth management areas (OGMA).**

**TARGET:** **0**

**VARIANCE:** **0**

**REPORT YEAR:** **2005/06**

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| Signatory | Protected Areas or Established Old Growth Management Areas | | |
|---|---|---|---|
| | Area of Harvesting | Area of Road Construction | |
| Canfor | 0.0 | 0.0 | |
| BCTS | 0.0 | 0.0 | Total in DFA |
| **TOTAL** | 0.0 | 0.0 | **0.0** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Spatial coverage |
| | **BCTS** | Spatial coverage, Genus, ITS |
| **MEASUREMENT METHOD:** | **Canfor** | Review spatial overlay of finalised and/or draft OGMA's and Protected Areas |
| | **BCTS** | Review spatial overlay of finalised and/or draft OGMA's and Protected Areas |
| **CALCULATION:** | | Forest operations - (ha.) of unauthorized forestry related harvesting and road construction within OGMA or PA |
| **DEFINITIONS/ASSUMPTIONS:** | | In absence of formally identified spatial OGMA's, draft OGMA's will be managed as if established. Protected Areas and OGMA' s should be identified as constrained on FDP and FSP's, and operations should not be planned/scheduled to conflict with these areas. |
| **KNOWLEDGE GAPS:** | **Canfor** | Most LUs do not have approved or draft spatial OGMAs. |
| | **BCTS** | Don't have approved spatially identified OGMA's formally established |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 1-1.5. Percent productive forest by BEC variant represented within the Non-harvestable land base.
**TARGET:** To be determined.
**VARIANCE:**
**REPORT YEAR:** 2005/06

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| BEC Variant | Defined Forest Area (ha) | Timber Harvesting Land Base (ha) | Percent of DFA | Non-harvestable Land Base | Percent of DFA |
|---|---|---|---|---|---|
| AT | | | 0.0% | | 0.0% |
| BWBS dk1 | | | 0.0% | | 0.0% |
| BWBS mw1 | | | 0.0% | | 0.0% |
| BWBS wk2 | | | 0.0% | | 0.0% |
| ESSF mv2 | | | 0.0% | | 0.0% |
| ESSF mv3 | | | 0.0% | | 0.0% |
| ESSF mv4 | | | 0.0% | | 0.0% |
| ESSF mvp | | | 0.0% | | 0.0% |
| ESSF wc3 | | | 0.0% | | 0.0% |
| ESSF wcp | | | 0.0% | | 0.0% |
| ESSF wk2 | | | 0.0% | | 0.0% |
| SBS mk1 | | | 0.0% | | 0.0% |
| SBS mk2 | | | 0.0% | | 0.0% |
| SBS wk1 | | | 0.0% | | 0.0% |
| SBS wk2 | | | 0.0% | | 0.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Landscape Unit and BEC variant |
| **FREQUENCY OF COLLECTION:** | | |
| **TIME PERIOD:** | | |
| **DATA SOURCE:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **CALCULATION:** | | |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | |
| | **BCTS** | |
| **COST:** | | |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-2.1.Percent area by patch size by landscape unit group and Natural Disturbance Types.**
**TARGET:** **as per Table 12 below**
**VARIANCE:** **-0%**
**REPORT YEAR:** **2005/06**

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| | |
|---|---|
| **MEASUREMENT UNIT:** | Patch size (ha) |
| **SPATIAL/GEOGRAPHIC SCALE:** | Landscape Unit and BEC variant |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Spatial forest cover data |
| **MEASUREMENT METHOD:** | Spatial analysis of patch size (small, medium, large) applied by BEC zone and LU Grouping based on most recent forest cover data and harvest proposals. |
| **CALCULATION:** | (Sum of patch areas by size group/forested area) x 100, by LU Grouping |
| **DEFINITIONS/ASSUMPTIONS:** | Old interior forest is defined as defined as that portion of an old seral |
| **KNOWLEDGE GAPS:** | |
| **COST:** | In-house. |

Table 12 Patch size categories for resource management zones

| RMZ | NDT | Patch size distribution | | |
|---|---|---|---|---|
| General + Special | 1 | <40 ha | 40-80 ha | 80-250 ha |
| | 2 | <40 ha | 40-80 ha | 80-250 ha |
| | 3 | <40 ha | 40-250 ha | 250-1000 ha |
| Enhanced | 1 | <40 ha | 40-80 ha | 80-250 ha |
| | 2 | <40 ha | 40-80 ha | 80-250 ha |
| | 3 | <40 ha | 40-250 ha | 250-5000 ha |
| Caribou Management Strategy Areas | 2 | <40 ha | 40-250 ha | 250-5000 ha |
| | 3 | <40 ha | 40-250 ha | 250-5000 ha |

Table 13. Current early seral patch size distribution in the enhanced resource management zone

| LU Grouping | NDT | BEC | Patch size category | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | <40 ha | | 40- 80 ha* | | 250 ha+ * | |
| | | | <40 ha | | 40-250 ha** | | 250 -5000 ha** | |
| | | | Target | Actual | Target | Actual | Target | Actual |
| Akie | 2 | **ESSF mv4** | 35% | 7% | 35% | 16% | 30% | 77% |
| | 2 | SWB mk | 35% | 56% | 35% | 44% | 30% | 0% |
| | 3 | BWBS dk1 | 15% | 8% | 15% | 27% | 70% | 65% |
| Blackwater / Muscovite | 2 | **SBS wk2** | 35% | 12% | 35% | 15% | 30% | 73% |
| | 2 | ESSF mv3 | 35% | 10% | 35% | 47% | 30% | 43% |
| | 3 | **SBS mk1** | 15% | 0% | 15% | 2% | 70% | 98% |
| | 3 | SBS mk2/ BWBS dk1 | 15% | 11% | 15% | 15% | 70% | 74% |
| Buffalohead / Ed Bird - Estella | 2 | **ESSF mv4** | 35% | 17% | 35% | 33% | 30% | 50% |
| | 2 | **SWB mk** | 35% | 14% | 35% | 2% | 30% | 84% |
| | 3 | BWBS dk1 | 15% | 8% | 15% | 26% | 70% | 66% |
| | 3 | SWB mks | 35% | 0% | 35% | 0% | 30% | 100% |
| Collins - Davis | 1 | **ESSF wc3** | 35% | 44% | 35% | 0% | 30% | 56% |
| | 1 | ESSF wk2 | 35% | 22% | 35% | 23% | 30% | 55% |
| | 2 | ESSF mv4 | 35% | 2% | 35% | 16% | 30% | 82% |
| | 2 | SBS wk2 | 35% | 7% | 35% | 19% | 30% | 75% |
| | 3 | **BWBS dk1** | 15% | 3% | 15% | 35% | 70% | 62% |
| | 3 | **SBS mk2** | 15% | 7% | 15% | 23% | 70% | 71% |
| Eklund | 2 | **ESSF mv3** | 35% | 7% | 35% | 31% | 30% | 62% |
| | 2 | **SBS wk2** | 35% | 8% | 35% | 0% | 30% | 92% |
| | 3 | BWBS dk1 | 15% | 0% | 15% | 0% | 70% | 0% |
| | 3 | SBS mk1 | 15% | 33% | 15% | 65% | 70% | 3% |
| Gaffney | 2 | ESSF mv3 | 35% | 12% | 35% | 18% | 30% | 70% |
| | 2 | SBS wk2 | 35% | 5% | 35% | 21% | 30% | 74% |
| | 3 | **SBS mk1/ mk2** | 15% | 7% | 15% | 27% | 70% | 66% |
| Lower Akie | 2 | **ESSF mv4** | 35% | 0% | 35% | 0% | 30% | 0% |
| | 3 | BWBS dk1 | 15% | 1% | 15% | 27% | 70% | 72% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mackenzie Townsite | 2 | SBS wk2 | 35% | 39% | 30% | 31% | 30% | 30% |
| | 3 | SBS mk1/ mk2 | 15% | 17% | 15% | 44% | 70% | 39% |
| Philip/Philip Lake | 2 | **ESSF mv3** | 35% | 6% | 35% | 12% | 30% | 82% |
| | 2 | SBS wk2 | 35% | 7% | 35% | 14% | 30% | 79% |
| | 3 | SBS mk1 | 15% | 4% | 15% | 12% | 70% | 84% |
| | 3 | **SBS mk2** | 15% | 100% | 15% | 0% | 70% | 0% |

* Patch size category for NDT 1 and 2

** Patch size category for NDT 3

Shaded cells represent patch size percentages that have are below the target. Unshaded cell are above the targets

Akie River, Morfee and Upper Ospika LU have been ommitted from this table as no data exists

Table 14. Current early seral patch size distribution in the general and special resource management zones.

| **LU Grouping** | **NDT** | **BEC** | **Patch size category** | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | <40 ha | | 40- 80 ha* | | 250 ha+ * | |
| | | | <40 ha | | 40-250 ha** | | 250 -5000 ha** | |
| | | | Target | Actual | Target | Actual | Target | Actual |
| Clearwater | 1 | **ESSF wk2** | 35% | 14% | 35% | 27% | 30% | 59% |
| | 2 | **SBS wk2** | 35% | 28% | 35% | 21% | 30% | 51% |
| Lower Ospika | 1 | **ESSF wc3** | 35% | 18% | 35% | 5% | 30% | 77% |
| | 2 | **ESSF mv4** | 35% | 7% | 35% | 16% | 30% | 77% |
| | 2 | **ESSF wk2** | 35% | 4% | 35% | 12% | 30% | 85% |
| | 2 | **SBS wk2** | 35% | 24% | 35% | 23% | 30% | 53% |
| | 3 | SBS mk2 | 15% | 11% | 15% | 22% | 70% | 67% |
| Lower Pesika | 2 | ESSF mv4 | 35% | 0% | 35% | 0% | 30% | 0% |
| | 3 | BWBS dk1 | 15% | 0% | 15% | 0% | 70% | 0% |
| Nabesche | 1 | **ESSF wk2** | 35% | 36% | 35% | 15% | 30% | 49% |
| | 2 | **ESSF mv4** | 35% | 6% | 35% | 7% | 30% | 87% |
| | 2 | **SBS wk2** | 35% | 56% | 35% | 10% | 30% | 34% |
| | 3 | **BWBS dk1** | 15% | 10% | 15% | 51% | 70% | 39% |
| | 3 | **SBS mk2** | 15% | 0% | 15% | 33% | 70% | 67% |
| Nation | 2 | SBS wk2 | 35% | 15% | 35% | 0% | 30% | 85% |
| | 3 | SBS mk1 | 15% | 8% | 15% | 12% | 70% | 80% |
| | 3 | **SBS mk2** | 15% | 30% | 15% | 26% | 70% | 44% |
| Parsnip | 1 | ESSF wc3/ ESSF wk3 | 35% | 11% | 35% | 11% | 30% | 78% |
| | 2 | SBS wk2/vk | 35% | 8% | 35% | 9% | 30% | 83% |
| | 3 | SBS mk2 | 15% | 4% | 15% | 26% | 70% | 70% |
| Pesika | 2 | **ESSF mv4** | 35% | 0% | 35% | 24% | 30% | 76% |
| | 3 | BWBS dk1 | 15% | 27% | 15% | 73% | 70% | 0% |
| Schooler | 1 | **BWBS dk1** | 15% | 4% | 15% | 96% | 70% | 0% |
| | 2 | **ESSF mv4** | 35% | 6% | 35% | 17% | 30% | 77% |
| Selwyn | 1 | **ESSF wk2/wc3** | 35% | 0% | 35% | 0% | 30% | 100% |
| | 2 | **SBS wk2** | 35% | 18% | 35% | 34% | 30% | 48% |
| | 3 | **BWBS dk1** | 15% | 100% | 15% | 0% | 70% | 0% |
| Tudyah | 3 | SBS mk1 | 15% | 6% | 15% | 12% | 70% | 81% |

* Patch size category for NDT 1 and 2

** Patch size category for NDT 3

Shaded cells represent patch size percentages that have are below the target. Unshaded cell are above the targets

Akie River, Morfee and Upper Ospika LU have been ommitted from this table as no data exists.

Table 15. Current early seral patch size distribution in the caribou management strategy areas.

| **LU Grouping** | **NDT** | **BEC** | **Patch size category** | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | <40 ha | | 40-250 ha** | | 250 -5000 ha** | |
| | | | Target | Actual | Target | Actual | Target | Actual |
| Connaghan Creek | 2 | ESSF mv3 | 35% | 16% | 35% | 28% | 30% | 56% |
| | 3 | **SBS mk1** | 15% | 59% | 15% | 41% | 70% | 0% |

**Mackenzie Defined Forest Area**
**Current Status Table**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Germansen Mountain | 2 | ESSF mv3 | 35% | 0% | 35% | 39% | 30% | 61% |
| | 3 | **BWBS dk1** | 15% | 0% | 15% | 100% | 70% | 0% |
| Gillis | 2 | ESSF mv3 | 35% | 5% | 35% | 19% | 30% | 77% |
| | 3 | **BWBS dk1/ SBS mk1** | 15% | 17% | 15% | 22% | 70% | 62% |
| Jackfish | 2 | ESSF mv3 | 35% | 0% | 35% | 0% | 30% | 100% |
| | 3 | **BWBS dk1/ SBS mk1** | 15% | 9% | 15% | 37% | 70% | 54% |
| Klawli | 2 | **ESSF mv3** | 15% | 5% | 15% | 13% | 70% | 82% |
| | 3 | SBS mk1 | 15% | 4% | 15% | 15% | 70% | 81% |
| Manson River | 2 | **ESSF mv3** | 35% | 7% | 35% | 43% | 30% | 50% |
| | 2 | **SBS wk2** | 35% | 47% | 35% | 28% | 30% | 26% |
| | 3 | SBS mk1/ SBSmk2 | 15% | 11% | 15% | 37% | 70% | 53% |
| Misinchinka | 1 | **ESSF wk2** | 35% | 15% | 35% | 68% | 30% | 17% |
| | 2 | **SBS wk2** | 35% | 16% | 35% | 27% | 30% | 57% |
| | 3 | SBS mk1/ mk2 | 15% | 7% | 15% | 39% | 70% | 54% |
| South Germansen - Upper Manson | 2 | ESSF mv3 | 35% | 32% | 35% | 3% | 30% | 65% |
| | 3 | **BWBS dk1** | 15% | 25% | 15% | 73% | 70% | 2% |
| | 3 | **SBS mk1** | 15% | 11% | 15% | 0% | 70% | 89% |
| Twenty Mile | 2 | ESSF mv3 | 35% | 6% | 35% | 50% | 30% | 44% |
| | 3 | **BWBS dk1** | 15% | 0% | 15% | 33% | 70% | 68% |

Shaded cells represent patch size percentages that have are below the target. Unshaded cell are above the targets

Akie River, Morfee and Upper Ospika LU have been omitted from this table as no data exists.

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-2.2. Percentage of cut blocks that exceed coarse woody debris requirements.**
**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Number of Blocks Harvested | Number of Blocks That Exceed CWD Requirements | Percent | |
|---|---|---|---|---|
| Canfor | 35 | 35 | 100.0% | **Percent in DFA** |
| BCTS | 34 | 30 | 88.2% | |
| **TOTAL** | 69 | 65 | | **94.2%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Cutblock |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | January 1 - December 31 |
| **DATA SOURCE:** | **Canfor** | Residue and waste surveys, Genus, Genus ITS |
| | **BCTS** | Residue and waste surveys |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for harvested blocks with a final inspection completed during the time period and their associated CWD requirements. These will be cross-referenced with the residue and waste surveys to determine if CWD requirements were achieved. Genus ITS will be also queried for all incidents during the same period to determine if any incidents pertaining to non- |
| | **BCTS** | All blocks that had harvest complete during fiscal 2006 were residue and waste surveyed. The waste survey results of dispersed m3/ha were then correlated with the Coarse Woody Debris requirements outlined in the Forest Development Plan, Silviculture Prescription or Site Plan. Any block that has the resultant Residue and Waste volumes per hectare (with measured Grade 3 and 4 additions) exceeding the Coarse Woody Debris requirements, then, are deemed to have Coarse Woody Debris requirements that exceed those outlined in the operational plans. |
| **CALCULATION:** | | (Total number of blocks harvested / number of blocks that exceed CWD requirements) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Coarse Woody Debris requirements are defined as legal requirements or requirements otherwise stipulated in an operational plan. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Coarse Woody Debris requirements are not specifically monitored at the harvest inspection stage, as no system is in place to conduct these measurements. Residue and waste surveys can provide some of this information, but significantly underestimates the amount of Coarse Woody debris. A business process needs to be designed to effectively measure the amount of Coarse Woody Debris that is being maintained on each block. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 1-2.3. Percentage of cut blocks that meet or exceed wildlife tree patch requirements.
**TARGET:** 100%
**VARIANCE:** 0%
**REPORT YEAR:** 2005/06

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| Signatory | Number of Blocks Harvested | Number of Blocks Meeting Retention Requirements | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 35 | 35 | 100.0% | |
| BCTS | 34 | 33 | 97.1% | |
| **TOTAL** | 69 | 68 | | **98.6%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Cutblock |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS, Site Plans, FHI |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for forest operations with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with retention requirements occurred. The results will be tallied and recorded. |
| | **BCTS** | ArcMap Spatial WTP area. - re-measured post-harvest if varied from the harvest SIte Plan. |
| **CALCULATION:** | | (Blocks meeting retention requirements / Blocks harvested) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-2.4. The percentage of forest operations consistent with riparian management requirements as identified in operational plans and/or site plans.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

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| Signatory | Number of Forest Operations with Riparian Management Strategies Identified in Operational Plans | | | | Forest Operations Completed in Accordance with Identified Strategies | Percent | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | 78 | 35 | 43 | 156 | 156 | 100.0% | Percent in DFA |
| BCTS | 1 | 24 | 4 | 29 | 29 | 100.0% | |
| **TOTAL** | 79 | 59 | 47 | 185 | 185 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest Operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Stand level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for forest operations with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with riparian management strategies occurred. |
| | **BCTS** | Cut block and road review,-determine which SP's, Road Designs, Timber Sales, Road and Site Preparation contracts have Riparian Mgmt. strategies identified, review final harvest inspections, road inspections, and site preparation projects for conformance |
| **CALCULATION:** | | (Forest Operations consistent with riparian management requirements/Forest Operations) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Forest operations include all activities directly associated with harvesting, road construction, BCTS construction contracts, or mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Other forest operations, such as planting, brushing and road deactivation need to be analyzed to determine if they also need to be included in the scope of "forest operations." |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-2.5. Trend towards unmanaged species composition on managed stands by BEC zone on the THLB**
**TARGET:** **To be determined**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Species | | Species Composition | | | |
|---|---|---|---|---|---|
| | | BWBS | ESSF | SBS | SWB |
| Hybrid Spruce (Sx) | Canfor | | | | |
| | BCTS | | | | |
| | Total | | | | |
| | Target | | | | |
| Lodgepole Pine (Pl) | Canfor | | | | |
| | BCTS | | | | |
| | Total | | | | |
| | Target | | | | |
| Subalbine Fir (Bl) | Canfor | | | | |
| | BCTS | | | | |
| | Total | | | | |
| | Target | | | | |
| Trembling Aspen (At) | Canfor | | | | |
| | BCTS | | | | |
| | Total | | | | |
| | Target | | | | |
| Cottonwood (Ac) | Canfor | | | | |
| | BCTS | | | | |
| | Total | | | | |
| | Target | | | | |
| White Birch (Ep) | Canfor | | | | |
| | BCTS | | | | |
| | Total | | | | |
| | Target | | | | |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Percent Species |
| **SPATIAL/GEOGRAPHIC SCALE:** | | BEC Zone |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, RESULTS |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Species composition of blocks declared free growing will be queried from Genus. The species composition will be area weighted by BEC zone and compared to the target species composition for that BEC. The results will be recorded and reported out on. |
| | **BCTS** | |
| **CALCULATION:** | | Area weighted species percent - target species percent |
| **DEFINITIONS/ASSUMPTIONS:** | | Target species composition is based on unmanaged stands. Species composition of managed stands is based on area weighted percent species composition at free growing measured by inventory label for all stands declared FG within the reporting period by BEC zone. |
| **KNOWLEDGE GAPS:** | **Canfor** | Unmanaged species composition by BEC on the THLB is required. Current inventory is out-dated. |
| | **BCTS** | |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-2.6. The percentage of forest operations consistent with approved provincial Caribou Ungulate Winter Range (UWR) requirements.**
**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Forest Operations Completed | | | | Forest Operations Completed in Accordance with Caribou UWR Requirements | Percent | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | 78 | 35 | 43 | 156 | 156 | 100.0% | Percent in DFA |
| BCTS | 2 | 34 | 18 | 54 | 54 | 100.0% | |
| **TOTAL** | 80 | 69 | 61 | 210 | 210 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Landscape level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Ministry of Environment UWR Maps |
| | **BCTS** | GENUS, Site Plans, Ministry of Environment UWR Maps |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried to determine the number of forest operations completed. Genus will also be queried for blocks with measures prescribed fo caribou UWRs. A spatial analysis will be used to confirm which blocks have UWR requirements. Blocks with prescribed measures and/or fall within caribou UWRs will be cross-referenced for consistency with UWR requirements. The results will be recorded and reported out on. |
| | **BCTS** | Document if measures in Site Plans, Road Layout and Designs, timber sale licences and contracts are complied with. In addition ensure that the above documents have captured requirements for UWR. |
| **CALCULATION:** | | (Forest operations completed in accordance with UWR requirements / Total forest operations completed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Forest operations include all activities directly associated with harvesting, roac construction, BCTS construction contracts, or mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Other forest operations, such as planting, brushing and road deactivation need to be analyzed to determine if they also need to be included in the scope of "forest operations." |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-2.7. The percentage of identified unnatural known sediment occurrences where mitigating actions were taken**
**TARGET:** **100%**
**VARIANCE:** **-5%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Identified Unnatural Sediment Occurances | Number of Identified Unnatural Sediment Occurances With Mitigating Actions Taken | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 2 | 2 | 100.0% | |
| BCTS | 3 | 3 | 100.0% | |
| **TOTAL** | 5 | 5 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Unnatural known sediment occurances |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Stand level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS, FSR Inspections |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | Field Inspections |
| **CALCULATION:** | | (Total number of mitigation actions taken / total number of mitigation actions required) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Unnatural known sediment occurences include failed drainage structures/erosion control measures, improperly installed sediment/erosion control measures, or the absence of appropriate sediment/erosion control measures that result in the deposition of sediment into a classified stream, lake, or wetland. This measure does not apply to non-classified drainages. Water body classification is as per the Riparian Management Guidebook. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Areas not planned for inspections -staff/contractors report events and investigated by Eng Tech. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-2.8. The percentage of stream crossings that are appropriately designed and properly installed and or removed.**
**TARGET:** **100%**
**VARIANCE:** **-5%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Stream Crossings | | | Number of Stream Crossings | | | | |
|---|---|---|---|---|---|---|---|---|
| | Installed | Removed | Total | Appropriately designed and properly installed | Properly removed | Total | Percent | |
| Canfor | 0 | 0 | 0 | 0 | 0 | 0 | 0% | Percent in DFA |
| BCTS | 15 | 10 | 15 | 15 | 10 | 15 | 100% | |
| TOTAL | 15 | 10 | 15 | 15 | 10 | 15 | | 100.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Stream crossings |
| **SPATIAL/GEOGRAPHIC SCALE:** | | |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus ITS, FHR, FSR Project Report, TSL Critical Site Factors Sheet |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | Field Inspections |
| **CALCULATION:** | | (Number of stream crossings properly designed, installed, or removed / Number of stream crossings installed or removed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | This measure does not apply to non-classified drainages. Water body classification is as per the Riparian Management Guidebook. For BCTS assumes all classified drainages identified. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Classified streams need to be identified at planning stage, in prework, added to a ledger and to ensure inspection/reporting |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 1-2.9 Percent of watersheds containing approved or proposed development with Peak Flow Index (PFI) calculations completed.
**TARGET:** 100% by September 2007
**VARIANCE:** +7 months
**REPORT YEAR:** 2005/06

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| 1-2.9 | Number of watersheds with approved/proposed development in the DFA | Number of watersheds with PFI calculations | Percent |
|---|---|---|---|
| | | | 0.0% |
| TOTAL | 0 | 0 | |

| | |
|---|---|
| MEASUREMENT UNIT: | Watershed |
| SPATIAL/GEOGRAPHIC SCALE: | Landscape |
| FREQUENCY OF COLLECTION: | N/A |
| TIME PERIOD: | |
| DATA SOURCE: | |
| MEASUREMENT METHOD: | |
| CALCULATION: | |
| DEFINITIONS/ASSUMPTIONS: | |
| KNOWLEDGE GAPS: | |
| COST: | |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-2.10 Percentage of road construction or deactivation projects where prescribed revegetation occurs within 12 months of disturbance**
**TARGET:** **100%**
**VARIANCE:** **-10%**
**REPORT YEAR:** **2005/06**

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| Signatory | Total Number of Projects Where Revegatation is Prescribed During Period. | Number of Prescribed Revegetation Projects Completed During Period. | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | | | 0.0% | |
| BCTS | 2 | 0 | 0.0% | |
| TOTAL | 2 | 0 | | 50.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Revegetation project |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Stand level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus and/or internal database |
| | **BCTS** | FHR, FSR seeding contract report |
| **MEASUREMENT METHOD:** | **Canfor** | Dependant on process developed. Genus will be queried for forest operations completed during the time period 12 months previous to the current time period. A database (Genus or internally developed database) will then query these operations to determine which operations prescribed revegetation and when this was completed. The two will be cross-referenced to determine if any revegetation fell outside the 12-month window. The results will be recorded and reported out on.. |
| | **BCTS** | Field Inspection |
| **CALCULATION:** | | (Operations completed in accordance with revegetation requirements / Operations completed requiring revegetation) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | For BCTS assume that all roads will have revegetation prescribed - TSL roads and FSRs |
| **KNOWLEDGE GAPS:** | **Canfor** | Tracking method to be developed. |
| | **BCTS** | inconsistant contractual requirement for revegetation in TSL documents, goal has no match to legislative requirements (reveg. required only where erodible soils evident), no established policy to revegetate FSRs, inconsistent enforcement of license obligations due to lack of staff knowledge |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 1-2.11. Percent compliance with Chief Forester's Standards for Seed Use.
**TARGET:** 100%
**VARIANCE:** 0%
**REPORT YEAR:** 2005/06

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| Signatory | Seedlings Planted | Seedlings Planted in Accordance With Chief Forester's Standards for Seed Use | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 2,677,480 | 2,677,480 | 100.0% | |
| BCTS | 303,878 | 303,878 | 100.0% | |
| **TOTAL** | 2,981,358 | 2,981,358 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | # Seedlings |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus |
| | **BCTS** | Genus, Opening Files (seedlot maps), SPAR |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for the total trees planted and RESULTS submissions, Genus, PlantWizard® and Genus ITS will be monitored for compliance. The number of trees in non-compliance will then be summed and reported out on. |
| | **BCTS** | # seedlings planted |
| **CALCULATION:** | | (Seedlings planted in DFA in accordance with standards / Total seedlings planted in DFA) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | As per sections 8.8 and 8.9 of the *Chief Foresters Standards for Seed Use (Nov.20,2004)* , Canfor and BCTS are required to ensure that 95% of the seedlings they plant on the TSA comply with the requirements of sections 8.2 through 8.7. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-2.12 Percentage of planned roads that have an environmental risk assessment completed.**
**TARGET:** **100%**
**VARIANCE:** **≤10%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Roads Constructed | Number of Constructeded Roads With an Environmental Risk Assessment | Percent | |
|---|---|---|---|---|
| Canfor | 73 | 73 | 100.0% | **Percent in DFA** |
| BCTS | 33 | 33 | 100.0% | |
| **TOTAL** | 106 | 106 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Planned roads |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Stand level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all roads constructed during the time period. Genus will then be queried for the environmental assessment on these roads. The two will be cross-referenced and instance where an assessment was not completed noted. |
| | **BCTS** | |
| **CALCULATION:** | | (Number of roads constructed with assessment completed during planning / Number of roads constructed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Constucted roads are used as a basis for the population for administrative ease as many roads may be planned and constructed in relatively short periods. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

## 1-3.1 Repeat of 1-2.6

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**Summary Sheet**

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 1-3.2. Percent of appropriate personnel trained to identify Species at Risk in the DFA.
**TARGET:** 100%
**VARIANCE:** ≤10%
**REPORT YEAR:** 2005/06

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| Signatory | Number of Appropriate Personnel | Number of Appropriate Personnel Trained to Identify Species at Risk | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 16 | 1 | 6.3% | |
| BCTS | 40 | 36 | 90.0% | |
| **TOTAL** | 56 | 37 | | **66.1%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Personnel |
| **SPATIAL/GEOGRAPHIC SCALE:** | | N/A |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Training records |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Training records will be queried to determine who has been trained and referenced to a list of personnel requiring training. The results will be recorded. |
| | **BCTS** | Training records will be queried to determine who has been trained and referenced to a list of personnel requiring training. The results will be recorded. |
| **CALCULATION:** | | (Personnel trained to identify Species at Risk / Total number of personnel ) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Personnel are defined as persons directly involved in; 1) the planning or development of cutblocks or roads, or 2) staff that are responsible for implementing and supervising forest operations. A forest operation is defined as any activity deemed to require a final inspection under the respective signatories EMS. |
| **KNOWLEDGE GAPS:** | **Canfor** | Development and delivery of training package required. |
| | **BCTS** | SFMS system does not include Contractors in it's scope for SAR training in the 2005 fiscal. Numbers reported are for staff only. System is being amended to include contractors in the scope for the 2006. BCTS provided training for planning and layout contracts and thier staff, records are on file. |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-3.3 Percent of Species at Risk in the DFA that have management strategies developed by April 2007.**
**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Species at Risk in the DFA | Number of Species at Risk with Management Strategies Developed by April 2007 | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | | | 0.0% | |
| BCTS | 33.0 | 33.0 | 100.0% | |
| **TOTAL** | 33 | 33 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Species at Risk |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Landscape |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Schedule 1 - Species at Risk Act. |
| | **BCTS** | Sum of animal (13) and plant species (20) at risk for 2006 with Mgt Strategies (taken from Identification and Management of Species and Plant Communities at Risk: BC Timber Sales Prince George Business Area. Will monitor and update list annually. |
| **MEASUREMENT METHOD:** | **Canfor** | The number of Schedule 1 species at risk and the number of corresponding management strategies will be totalled. |
| | **BCTS** | Annual review of Federal and Provincial Species at risk listings and update strategies accordingly. |
| **CALCULATION:** | | (Number of Species at Risk with Management Strategies developed / Number of Species at Risk) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Species at risk are defined as species under Schedule 1 of the Species at Risk Act |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house / BCTS-cost for annual updates to species at risk training / stategies |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-3.4 Percent LRMP Resource Management Zone (RMZ) specific wildlife species with management strategies by April 2007.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

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| Signatory | Number of RMZ-Specific Wildlife Species | Number of RMZ-Specific Wildlife Species with Management Strategies Developed by April 2007 | Percent | |
|---|---|---|---|---|
| Canfor | 14 | 3 | 21.4% | Percent in DFA |
| BCTS | 14 | | 0.0% | |
| **TOTAL** | 28 | 3 | | **10.7%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Wildlife species. |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Landscape |
| **FREQUENCY OF COLLECTION:** | | by April 1, 2007 |
| **TIME PERIOD:** | | N/A |
| **DATA SOURCE:** | **Canfor** | Mackenzie LRMP |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | The number of wildlife species and the number of corresponding management strategies will be totalled. |
| | **BCTS** | |
| **CALCULATION:** | | (Number wildlife species / Number of wildlife species with Management Strategies) X 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | RMZ specific wildlife species are: arctic grayling, bull trout, eagles, elk, lake trout, marten, moose, mountain goat, northern goshawk, osprey, peregrine falcon, rainbow trout, stone sheep, trumpeter swan. Management strategies developed may not be RMZ-specific. |
| **KNOWLEDGE GAPS:** | **Canfor** | Management strategies required by April 2007. |
| | **BCTS** | |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** **1-3.5 Percentage of forest operations consistent with Species at Risk in the DFA management strategies as identified in operational plans, tactical plans and/or site plans**

**TARGET:** **100%**

**VARIANCE:** **-5%**

**REPORT YEAR:** **2005/06**

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| Signatory | Number of Forest Operations with Apecies at Risk Management Strategies Identified in Operational Plans | | | | Forest Operations Completed in Accordance with Identified Strategies | Percent | Percent in DFA |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | 78 | 35 | 43 | 156 | 156 | 100.0% | |
| BCTS | 0 | 0 | 0 | 0 | 0 | 0.0% | |
| **TOTAL** | 78 | 35 | 43 | 156 | 156 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS - Final harvest inspections \ contract summaries |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for forest operations with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with Species at Risk management strategies occurred. The results will be tallied and recorded. |
| | **BCTS** | All blocks that had harvest complete or mechanical site preparation during fiscal 2006 were queried. Total blocks that have species at risk strategies specified in the operational plans were summarized, and of the blocks that did have those strategies, number of blocks that were completed in accordance with the strategies were summarized. If a block has been identified as requiring specific strategies, and operations inspections found that there was a deviation from the requirements, than the operation is not deemed to be completed with accordance of the same. |
| **CALCULATION:** | | (Operations completed in accordance with identified strategies / Total forest operations completed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | A Forest Operation is defined as any activity deemed to require a final inspection under the respective signatories EMS with the exception of silvicultural activities other than mechanical site preparation. All site plans and Silviculture Prescriptions that have not yet had MSP done, will need to be reviewed after April 2007 for |
| **KNOWLEDGE GAPS:** | **Canfor** | Development of Species at Risk management strategies required by April 2007. |
| | **BCTS** | Other forest operations, such as planting, brushing and road deactivation need to be analyzed to determine if they also need to be included in the scope of "forest operations." |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-3.6 Percentage of forest operations consistent with LRMP Resource Management Zone (RMZ) specific wildlife species management strategies as identified in operational plans, tactical plans and/or site plans.**

**TARGET:** **100%**
**VARIANCE:** **-5%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Forest Operations with RMZ-Specific Wildlife Management Strategies Identified in Operational Plans | | | | Forest Operations Completed in Accordance with Identified Strategies | Percent | Percent in DFA |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | | | | 0 | | 0.0% | |
| BCTS | 0 | 0 | 0 | 0 | 0 | 100.0% | |
| **TOTAL** | 0 | 0 | 0 | 0 | 0 | | % |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS - Final harvest inspections \ contract summaries |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for forest operations with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with RMZ-specific wildlife management strategies occurred. The results will be tallied and recorded. |
| | **BCTS** | All blocks that had harvest complete or mechanical site preparation during fiscal 2006 were queried. Total blocks that have RMZ-specific wildlife strategies speciefied in the operational plans were summarized, and of the blocks that did have those strategies, number of blocks that were completed in accordance with the strategies were summarized. If a block has been identified as requiring specific strategies, and operations inspections found that there was a deviation from the requirements, than the operation is not deemed to be completed with accordance of the same. |
| **CALCULATION:** | | (Operations completed in accordance with identified strategies / Operations with management strategies in plans) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | A Forest Operation is defined as any activity deemed to require a final inspection under the respective signatories EMS with the exception of silvicultural activities other than mechanical site preparation. All site plans and Silviculture Prescriptions |
| **KNOWLEDGE GAPS:** | **Canfor** | Development of management strategies required by April 2007. All site plans and Silviculture Prescriptions that have not yet had MSP done, will need to be reviewed after April 2007 for consistancy with RMZ specific wildlife species management |
| | **BCTS** | Other forest operations, such as planting, brushing and road deactivation need to be analyzed to determine if they also need to be included in the scope of "forest operations." |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **1-3.7 Report out on the annual results from the Mugaha Marsh bird banding station.**
**TARGET:** **Report out on**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| | |
|---|---|
| **MEASUREMENT UNIT:** | N/A |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Mugaha Marsh Banding Station annual report. |
| **MEASUREMENT METHOD:** | N/A |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | Reporting of results is dependant on the continued existence of the bird banding program. It is assumed that the program will continue to exist. |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

**Mugaha Marsh Banding Station Banding Totals**

| Species | Number Banded | | | Total |
|---|---|---|---|---|
| | July | August | September | |
| Sharp-shinned Hawk | 1 | 1 | 1 | 3 |
| Wilson's Snipe | 1 | | | 1 |
| Calliope Hummingbird | 2 | | | 2 |
| Rufous Hummingbird | 4 | 1 | | 5 |
| Yellow-bellied Sapsucker | 8 | | 1 | 9 |
| Hybrid Sapsucker | 4 | | 1 | 5 |
| Downy Woodpecker | 8 | | 1 | 9 |
| Hairy Woodpecker | 3 | | | 3 |
| Flicker Intergrade | | 1 | | 1 |
| Western Wood-Pewee | 5 | | | 5 |
| Yellow-bellied Flycatcher | | 2 | 1 | 3 |
| Alder Flycatcher | 3 | 27 | 2 | 32 |
| Least Flycatcher | 59 | 31 | | 90 |
| Hammond's Flycatcher | 13 | 33 | 1 | 47 |
| Dusky Flycatcher | 9 | 10 | 1 | 20 |
| Northern Shrike | | | 1 | 1 |
| Solitary Vireo | | 2 | 2 | 4 |
| Cassin's Vireo | | 1 | 2 | 3 |
| Warbling Vireo | 26 | 14 | | 40 |
| Red-eyed Vireo | | 1 | | 1 |
| Barn Swallow | 1 | | | 1 |
| Black-capped Chickadee | 7 | 11 | 5 | 23 |
| Boreal Chickadee | | | 1 | 1 |
| Red-breasted Nuthatch | | 2 | 1 | 3 |
| Brown Creeper | | 3 | 2 | 5 |
| Winter Wren | | 1 | | 1 |
| Golden-crowned Kinglet | 1 | 36 | 37 | 74 |
| Ruby-crowned Kinglet | 35 | 152 | 423 | 610 |
| Gray-cheeked Thrush | | | 1 | 1 |
| Swainson's Thrush | 22 | 40 | 5 | 67 |
| Hermit Thrush | 1 | 2 | 10 | 13 |
| American Robin | 6 | | 1 | 7 |
| Varied Thrush | 1 | | 1 | 2 |
| Bohemian Waxwing | 2 | | | 2 |
| Cedar Waxwing | 9 | 4 | | 13 |
| Tennessee Warbler | 11 | 19 | 3 | 33 |

**Mugaha Marsh Banding Station Returns July 18-31, 2006**

| Species | Year | Total |
|---|---|---|
| Downy Woodpecker | 1 (04) | 1 |
| Flicker Intergrade | 1 (00) | 1 |
| Alder Flycatcher | 1 (03) | 1 |
| Least Flycatcher | 1 (05) | 1 |
| Solitary Vireo | 1 (04) | 1 |
| Warbling Vireo | 2 (05) | 2 |
| Black-capped Chickadee | 1 (05) | 1 |
| Swainson's Thrush | 1(02), 1(04) | 2 |
| Yellow Warbler | 2 (05), 1 (03) | 3 |
| Yellow Warbler | 2 (05), 1 (03) | 3 |
| Magnolia Warbler | 1 (05) | 1 |
| American Redstart | 4 (05), 2 (03) | 6 |
| Northern Waterthrush | 1 (05), 3 (03), 2 | 7 |
| Common Yellowthroat | 1 (05) | 1 |
| Common Yellowthroat | 1 (05) | 1 |
| Song Sparrow | 1 (05), 1 (03) | 2 |
| Oregon Junco | 2 (04) | 2 |
| **Total** | | **36** |

**Mackenzie Defined Forest Area**
**Current Status Table**

| | | | | |
|---|---|---|---|---|
| Orange-crowned Warbler | 12 | 99 | 95 | 206 |
| Yellow Warbler | 44 | 44 | 8 | 96 |
| Magnolia Warbler | 19 | 66 | 4 | 89 |
| Yellow-rumped Warbler | 10 | 90 | 136 | 236 |
| Audubon Warbler | 3 | 19 | 30 | 52 |
| Myrtle's Warbler | | 2 | 16 | 18 |
| Townsend's Warbler | 1 | 25 | 8 | 34 |
| Blackpoll Warbler | 8 | 35 | 3 | 46 |
| American Redstart | 119 | 132 | 17 | 268 |
| Ovenbird | 1 | 2 | 1 | 4 |
| Northern Waterthrush | 53 | 52 | 1 | 106 |
| MacGillivray's Warbler | 3 | 27 | 1 | 31 |
| Common Yellowthroat | 41 | 114 | 102 | 257 |
| Wilson's Warbler | 4 | 42 | 54 | 100 |
| Western Tanager | 12 | | | 12 |
| American Tree Sparraow | | 1 | 12 | 13 |
| Chipping Sparrow | 2 | 8 | 1 | 11 |
| Savannah Sparrow | | 11 | 12 | 23 |
| Fox Sparrow | | | 4 | 4 |
| Song Sparrow | 24 | 12 | 5 | 41 |
| Lincoln's Sparrow | 24 | 19 | 23 | 66 |
| Swamp Sparrow | 6 | 4 | 3 | 13 |
| White-throated Sparrow | 2 | 9 | 11 | 22 |
| Gambel's White-crowned Sparrow | | 11 | 30 | 41 |
| Golden-crowned Sparrow | | 1 | | 1 |
| Dark-eyed Junco | 12 | 18 | 47 | 77 |
| Slate-coloured Junco | | | 1 | 1 |
| Oregon Junco | 5 | 81 | 76 | 162 |
| Rusty Blackbird | 2 | 4 | 2 | 8 |
| Brown-headed Cowbird | 1 | | | 1 |
| Purple Finch | 5 | | | 5 |
| Pine Siskin | | 1 | 5 | 6 |
| **Total birds banded** | **655** | **1323** | **1212** | **3190** |
| **Net Hours** | **799** | **2181** | **1463** | **4443** |

## 1-4.1 Repeat of 1-1.3

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**Summary Sheet**

## 1-4.2 Repeat of 1-1.4

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**Summary Sheet**

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-4.3. Percent of appropriate personnel trained to identify sites of biological significance in the DFA.**
**TARGET:** **100%**
**VARIANCE:** **≤10%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Appropriate Personnel | Number of Appropriate Personnel Trained to Identify Sites of Biological Significance | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 18 | 0 | 0.0% | |
| BCTS | 40 | 36 | 90.0% | |
| **TOTAL** | 58 | 36 | | **62.1%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Personnel |
| **SPATIAL/GEOGRAPHIC SCALE:** | | |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Training records |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Training records will be queried to determine who has been trained and referenced to a list of personnel requiring training. The results will be recorded. |
| | **BCTS** | Training records will be queried to determine who has been trained and referenced to a list of personnel requiring training. The results will be recorded. |
| **CALCULATION:** | | % = (Personnel trained / Personnel directly involved in forest operations) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Personnel are defined as persons directly involved in; 1) the planning or development of cutblocks or roads, or 2) staff that are responsible for implementing and supervising forest operations. A forest operation is defined as any activity deemed to require a final inspection under the respective signatories EMS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | SFMS system does not include Contractors in it's scope for SAR training in the 2005 fiscal. Numbers reported are for staff only. System is being amended to include contractors in the scope for the 2006. BCTS provided training for planning and layout contracts and thier staff, records are on file. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-4.4 Percent of sites of biological significance that have management strategies developed by April 2007.**

**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Sites of Biological Significance Identified | Number of Sites of Biological Significance with Management Strategies Developed by April 2007 | Percent | |
|---|---|---|---|---|
| Canfor | | | 0.0% | Percent in DFA |
| BCTS | 0 | 0 | 0.0% | |
| **TOTAL** | 0 | 0 | | **0.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Sites of biological significance. |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Landscape |
| **FREQUENCY OF COLLECTION:** | | by April 1, 2007 |
| **TIME PERIOD:** | | N/A |
| **DATA SOURCE:** | **Canfor** | Documented strategies, procedures, etc. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | The number of sites of biological significance and the number of corresponding management strategies will be totalled. |
| | **BCTS** | |
| **CALCULATION:** | | (No. of management strategies for sites of biological significance/ No. of sites of biological significance) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Sites of Biological Significance are defined as sites which support red & blue listed plant communities and rare ecosystems and include features such as bald eagle or osprey nests, mineral licks, species at risk habitats and others provided by |
| **KNOWLEDGE GAPS:** | **Canfor** | Management strategies required by April 2007. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **1-4.5 Percentage of forest operations consistent with sites of biological significance management strategies as identified in operational plans, tactical plans and/or site plans**

**TARGET:** **100%**

**VARIANCE:** **-5%**

**REPORT YEAR:** **2005/06**

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| Signatory | Number of Forest Operations with Sites of Biological Significance Management Strategies Identified in Operational Plans | | | | Forest Operations Completed in Accordance with Identified Strategies | Percent | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | | | | 0 | | 0.0% | Percent in DFA |
| BCTS | 0 | 1 | 0 | 1 | 1 | 100.0% | |
| **TOTAL** | 0 | 1 | 0 | 1 | 1 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS |
| **MEASUREMENT METHOD:** | **Canfor** | GENUS, GENUS ITS |
| | **BCTS** | Genus, Genus ITS - Final harvest inspections \ contract summaries |
| **CALCULATION:** | | (Operations completed in accordance with identified strategies / Total operations with sites of biological significance management strategies) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Forest operations include all activities directly associated with harvesting, road construction, BCTS construction contracts, or mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | Management strategies to be developed by April 2007. |
| | **BCTS** | Biological sites need to be identified for BCTS operations, and management strategies developed that are consistent with DFA strategies.Other forest activities (ie. planting, brushing and road deactivation) need to be analyzed to determine if they also need to be included in the scope of "forest operations." |
| **COST:** | | In-house |

## 2-1.1 Repeat of 1-2.2

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**Summary Sheet**

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **2-1.2 The percentage of forest operations consistent with soil conservation standards as identified in operational plans and/or site plans.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

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| Signatory | Number of Forest Operations | | | | Forest Operations Completed in Accordance with Soil Conservation Standards | Percent | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | 78 | 35 | 43 | 156 | 156 | 100.0% | Percent in DFA |
| BCTS | | 34 | 18 | 52 | 52 | 100.0% | |
| **TOTAL** | 78 | 69 | 61 | 208 | 208 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | GENUS, GENUS ITS |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for forest operations with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with soil conservation standards. The results will be tallied and recorded. |
| | **BCTS** | Ocular estimates in the course of scheduled field inspections, and detailed site disturbance surveys where required as per BCTS Standard Operating Procedure. |
| **CALCULATION:** | | (Forest operations completed in accordance with standards / Forest operations completed) X 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Forest operations include all activities directly associated with harvesting, road construction, BCTS construction contracts, or mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Training required in order to ensure that staff are effectively conducting ocular estimates on harvesting and mechanical site preparation operations. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **2-1.3 The percentage of forest operations consistent with terrain management requirements as identified in operational plans and/or site plans**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Number of Forest Operations with Terrain Management Requirements Identified in Operational Plans | | | | Forest Operations Completed in Accordance with Requirements | Percent | Percent in DFA |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | | | | 0 | | 0.0% | |
| BCTS | | 6 | | 6 | 6 | 100.0% | |
| **TOTAL** | 0 | 6 | 0 | 6 | 6 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for forest operations with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with terrain management requirements or landslide occurred. The results will be tallied and recorded. |
| | **BCTS** | |
| **CALCULATION:** | | (Operations completed in accordance with terrain management requirements / Total operations with terrain management requirements) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Terrain Management requirements includes assessments. Forest operations include all activities directly associated with harvesting, road construction, BCTS construction contracts, or mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** **2-1.4 The number of EMS reportable spills.**
**TARGET:** **0%**
**VARIANCE:** **<5**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of EMS Reportable Spills | | | | | | | Total for DFA |
|---|---|---|---|---|---|---|---|---|
| | Petroleum Products | Pesticides | Antifreeze | Battery Acid | Grease | Paints and Solvents | Total | |
| Canfor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| BCTS | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| **TOTAL** | 1 | 0 | 0 | 0 | 0 | 0 | | **1** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Spills |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus ITS |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Genus ITS will be queried for all incidents involving spills. The number of spills will be recorded. |
| | **BCTS** | Genus ITS will be queried for all incidents involving spills. The number of spills will be recorded. |
| **CALCULATION:** | | Sum of EMS reportable spills |
| **DEFINITIONS/ASSUMPTIONS:** | | An EMS reportable spill is as per the signatories' respective management systems. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **2-1.5 Variance between average preharvest and post harvest Site Index (at Free Growing) by inventory type group for cutblocks.**
**TARGET:** **>0%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| 2-1.5 | Inventory Type Group | | | | | |
|---|---|---|---|---|---|---|
| | SBS Pl | SBS Sx | BWBS Pl | BWBS Sx | ESSF Pl | ESSF Sx |
| Pre-harvest SI | | | | | | |
| Post-harvest SI | | | | | | |
| **VARIANCE:** | 0 | 0 | 0 | 0 | 0 | 0 |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Cutblock |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | |
| **CALCULATION:** | | |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | |
| | **BCTS** | |
| **COST:** | | |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **2-2.1 Area of THLB converted to non-forest land use through forest management activities.**
**TARGET:** **<5% annually**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| | Total THLB | Area Converted to Non-forest Land | Percent of THLB Area | Percent in DFA |
|---|---|---|---|---|
| DFA | 922,293 | 6,829 | 0.7% | |
| TOTAL | 922,293 | 6,829 | | 0.7% |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Genus |
| **MEASUREMENT METHOD:** | Area converted to non-forest land through forest management activities will be determined through a GIS analysis of spatial data, and the area recorded. The percent area of the THLB occupied by non-forest land will then be reported out on. |
| **CALCULATION:** | (Area converted through forest management activities/ THLB area) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | Non-forest land is defined as permanent roads and landings, Special Use Permits, Camps, and Log Dumps. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **2-2.2 The percentage of gross cutblock area occupied by total permanent access structures.**
**TARGET:** **<5%**
**VARIANCE:** **+1%**
**REPORT YEAR:** **2005/06**

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| Signatory | Total Cutblock Area Harvested | Total Cutblock Area in Permanent Access Structures | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 2876.6 | 72.4 | 2.5% | |
| BCTS | 2858.2 | 58.4 | 2.0% | |
| **TOTAL** | 5734.8 | 130.8 | | **2.3%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus |
| | **BCTS** | GENUS |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks with a final harvest inspection completed during the time period. Genus will then be queried for total block area and area under PAS for these blocks. Total block area and PAS area will be summed and recorded. |
| | **BCTS** | GENUS Query for all blocks that achieved a Harvest Complete stage during the reporting period. Where GENUS has not been updated to reflect SP amendments, SP data is being used, where field inspections show that roads have been built as per SP. |
| **CALCULATION:** | | (Area of permanent access structures / gross cutblock area ) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | This measure pertains only to in-block access structures. Permanent access structures are defined as permanent roads and landings. Gross cutblock area is gross area less natural non-productive (NP) areas. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | BCTS process for updating GENUS upon receiving SP amendments from licensees needs to be refined. In some cases, amendments were received decreasing amount of PAS, but GENUS not updated. BCTS to design business process that will facilitate more accurate post-harvest depiction of PAS%. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **2-2.3 Inclusion of access management in communication strategies with stakeholders.**
**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Communication Strategies with Stakeholders | Number of Communication Strategies That Include Access Management | Percent | |
|---|---|---|---|---|
| Canfor | | | 0.0% | Percent in DFA |
| BCTS | | | 0.0% | |
| **TOTAL** | 0 | 0 | | **0.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Communication strategy |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **CALCULATION:** | | (Number of strategies that include access management / Number of strategies) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Communication strategies are defined as mutually agreed to requirements for notification and/or input on forest operations. The measure addresses the consideration of access management in the development of the communication strategy, however the communication strategy may not include access management, if that is what is agreed to by the parties. |
| **KNOWLEDGE GAPS:** | **Canfor** | Development of communication strategies required. |
| | **BCTS** | |
| **COST:** | | |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** 2-3.1 Percent of harvested blocks declared Stocked prior to the regeneration date.
**TARGET:** 100%
**VARIANCE:** ≤5%
**REPORT YEAR:** 2005/06

back to Summary Sheet

| Signatory | Area Required to Meet Regeneration Date During Period | Area Meeting Regeneration Date | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 4,526.5 | 4,526.5 | 100.0% | |
| BCTS | 177.7 | 177.1 | 99.7% | |
| **TOTAL** | 4,704.2 | 4,703.6 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectare |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus |
| | **BCTS** | RESULTS "regeneration report" |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks with a regeneration date that came due during the time period and their associated area. Genus will then query these blocks to determine when regeneration was declared. The two will be cross-referenced to determine if there were any instances where the regeneration date was not met. |
| | **BCTS** | RESULTS is queried to determine reporting population, and number of blocks that have met regen delay milestone. |
| **CALCULATION:** | | (Total area with regen met / Area with regen due) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Area is net area to be reforested (NAR). A block is deemed to be stocked when such a declaration is made in RESULTS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** **2-3.2 Percent of harvested blocks declared Free Growing prior to the late free growing assessment date.**

**TARGET:** **100%**

**VARIANCE:** **≤5%**

**REPORT YEAR:** **2005/06**

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| Signatory | Area Required to Meet Free Growing During Period | Area Meeting Free Growing | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 2671.8 | 2671.8 | 100.0% | |
| BCTS | 595.1 | 595.1 | 100.0% | |
| **TOTAL** | 3266.9 | 3266.9 | | 100.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectare |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus |
| | **BCTS** | RESULTS free growing report |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks with a free growing date that came due during the time period and associated area. Genus will then query these blocks to determine when free growing was declared. The two will be cross-referenced to determine if there were any instances where the free growing date was not met. |
| | **BCTS** | RESULTS is queried to determine reporting population, and number of blocks that have met free growing milestone. |
| **CALCULATION:** | | (Total area with late free growing met / Total area with free growing due) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Area is net area to be reforested (NAR). A block is deemed to be free growing at the completion of the survey confirming its free growing status. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **2-3.3 Percent compliance with stocking levels and species composition requirements contained in operational plans**
**TARGET:** **100%**
**VARIANCE:** **≤5%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Area Reforested During Period | Area Compliant With Stocking Levels and Species Composition Requirements | Percent | |
|---|---|---|---|---|
| Canfor | 3340.3 | 3340.3 | 100.0% | Percent in DFA |
| BCTS | 193.3 | 193.3 | 100.0% | |
| **TOTAL** | 3533.6 | 3533.6 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectare |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus |
| | **BCTS** | Genus and Opening files |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks that were reforested during the time period and associated area and stocking requirements. Genus will then query these blocks to determine stocking levels and species composition following reforestation. The two will be cross-referenced to determine if there were any instances where stocking levels and/or species composition requirements date were not met. |
| | **BCTS** | As above. Additionally, seedlot maps from opening files were cross-referenced as spatial information for planting activities for this reporting period has not yet been put in Genus. |
| **CALCULATION:** | | (Total area reforested / Total area reforested in accordance with requirements) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Area is net area to be reforested (NAR). For this reporting period, an SU is deemed reforested once the SU has been planted. BCTS is working towards declaring regeneration delay met at the time of planting but this will not be fully achieved until the April 1, 2007 to March 31, 2008 reporting period. At that time, an SU will be deemed reforested once the regen delay has been declared. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

## 2-3.4 Repeat of 1-2.5

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## 2-4.1. Repeat of 2-1.3

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**Summary Sheet**

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** 2-5.1 Number of hectares (area) damaged by accidental forestry-related industrial fires.
**TARGET:** <100 ha
**VARIANCE:** +5 ha
**REPORT YEAR:** 2005/06

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| Signatory | Number of Accidental Forestry Related Industrial Fires | Total Hectares Damaged | |
|---|---|---|---|
| Canfor | 0.0 | 0.0 | |
| BCTS | 0.0 | 0.0 | Total in DFA |
| TOTAL | 0 | | 0.0 |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Ministry of Forests Protection Branch annual summary of forest fires |
| | **BCTS** | Ministry of Forests Protection Branch annual summary of forest fires |
| **MEASUREMENT METHOD:** | **Canfor** | Ministry of Forests and Range will be asked for data on fires and their origin in the DFA. Any fires that are determined to have started as a result of industrial activities will be noted and the area recorded. Field staff and Incident Reports will also be consulted. |
| | **BCTS** | Number of fires by size. Fires less than 1 ha in size not counted. |
| **CALCULATION:** | | Numbers of fires, exclusive of private land |
| **DEFINITIONS/ASSUMPTIONS:** | | Damaged is defined as resulting in the death of trees. Forestry-related industrial fire is defined as a fire originating as a result of forest operations, whether by human error or machinery. A forest operation is defined as any activity deemed to require a final inspection under the respective signatories EMS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **2-5.2 Percentage of identified risk factors with updated management strategies.**
**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Identified Risk Factors | Number of Identified Risk Factors with Updated Management Strategies | Percent | |
|---|---|---|---|---|
| Canfor | 24 | 8 | 33.3% | **Percent in DFA** |
| BCTS | | | 0.0% | |
| **TOTAL** | 24 | 8 | | **33.3%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Identified risk factors. |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Mackenzie TSA Forest Health Strategy and Tactical Plan, documented strategies, procedures, etc. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | The number of identified risk factors and the number of corresponding management strategies will be totalled. |
| | **BCTS** | |
| **CALCULATION:** | | (Number of identified risk factors in the DFA / Number of identified risk factors with updated management strategies) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

## 2-5.3. Repeat of 1-2.11

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### 3-1.1. Repeat of 2-2.1

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**Summary Sheet**

## 3-1.2. Repeat of 1-2.2

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### 3-1.3. Repeat of 2-3.1

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### 3-1.4. Repeat of 2-3.2

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### 3-1.5. Repeat of 2-3.3

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## 3-1.6. Repeat of 2-1.2

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### 3-3.1. Repeat of 2-2.1

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## 3-3.2. Repeat of 2-3.3

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## 3-3.3. Repeat of 2-3.1

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## 3-3.4. Repeat of 2-3.2

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**Summary Sheet**

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **4-1.1 Actual harvest volume compared to the apportionment across the DFA over each 5 year cut control period.**

**TARGET:** **≤100%**

**VARIANCE:** **±10%**

**REPORT YEAR:** **2005/06**

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| Signatory | 5 year volume apportioned | Actual volume cut in cut control period | Years into cut control | Percent of 5 year cut control* | |
|---|---|---|---|---|---|
| Canfor | 6,447,759 | 5,076,107 | 4 | **78.7%** | **Percent in DFA** |
| BCTS | 2454793 | 1335266 | 4 | **54.4%** | |
| **TOTAL** | **8,902,552** | **6,411,373** | | | **72.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Cubic meter |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | |
| **TIME PERIOD:** | | |
| **DATA SOURCE:** | **Canfor** | From cut control letters for Forest Licences or best information available at the time |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Cut control volumes billed during the period will be reported. |
| | **BCTS** | |
| **CALCULATION:** | | (Actual volume cut / 5 year volume apportioned) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | *Annual report will record the cumulative volume from the start of the cut control period, however, the target and variance pertains only to the five-year cut control period. Years into cut control is at the time of reporting. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | BCTS is different |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **4-1.2 Percent compliance with waste and residue standards.**
**TARGET:** **100%**
**VARIANCE:** **≤5%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Number of Blocks Compliant | Number of Blocks Harvested | Percent | |
|---|---|---|---|---|
| Canfor | | | 0.0% | Percent in DFA |
| BCTS | 34 | 34 | 100.0% | |
| **TOTAL** | 34 | 34 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Cutblock |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Residue and Waste Survey reports |
| | **BCTS** | Residue and Waste Survey reports |
| **MEASUREMENT METHOD:** | **Canfor** | Results of waste and residue assessments will be reviewed to determine how many blocks exceed waste and residue standards. The results will be totaled and reported out on. |
| | **BCTS** | Residue and Waste Survey reports are queried and benchmarked against allowable limits by block |
| **CALCULATION:** | | (Blocks compliant / Blocks harvested) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | None. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** 4-2.1 Canfor to provide opportunities to purchase wood from private enterprises.
**TARGET:** Opportunity exists
**VARIANCE:** 0%
**REPORT YEAR:** 2005/06

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| Vendor | Volume Purchased ($m^3$) | | | TOTAL |
|---|---|---|---|---|
| | Apr. 04- Mar. 05 | Apr. 05- Mar. 06 | Apr. 06- Oct. 06 | |
| Timber sale and Salvage | 182,043.6 | 205,277.9 | 90,309.0 | 477,630.6 |
| Woodlot | 71,007.4 | 108,857.8 | 78,263.0 | 258,128.3 |
| Private | 82,041.6 | 181,359.6 | 6,022.0 | 269,423.1 |
| **Total** | **335,092.6** | **495,495.3** | **174,594.0** | **1,005,181.9** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Cubic metres |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be reviewed to determine amount of wood purchased from private enterprises. |
| **CALCULATION:** | | Sum of volume purchased from private enterprises. |
| **DEFINITIONS/ASSUMPTIONS:** | | This measure pertains only to Canfor. Wood purchased from private enterprises include wood purchased from woodlots, NRFLs, private owners, salvage purchases, and purchases from enterprises that have been awarded licenses from BCTS other than Canfor. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 4-2.2 The number of first order wood products produced from trees harvested from the DFA.
**TARGET:** 5
**VARIANCE:** -2
**REPORT YEAR:** 2005/06

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| Signatory | Raw logs | House logs | Lumber | Custom cut lumber | Trim Blocks | Pulp chips | OSB strands | Hog | Wood shavings | Plywood | Veneer | Pole Logs | Railway tie logs | Sawdust | Instruments | Finger joint | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canfor | | | 1 | | 1 | 1 | | | 1 | | | | | 1 | | | 5 |
| BCTS | 1 | | | | | | | | | | | | | | | | 1 |
| **TOTAL** | **1** | **0** | **1** | **0** | **1** | **1** | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **6** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | Timber Sales policy |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be reviewed to determine the array of products and/or by-products of the milling process that were sold or otherwise supplied for a specific purpose under agreement. These will be recorded. |
| | **BCTS** | BCTS sells timber on the stump, which is then harvested by TSL holders, and processed by various mills. BCTS has no control over the array of products that may be produced from our sales. |
| **CALCULATION:** | | Sum of first order wood products produced. |
| **DEFINITIONS/ASSUMPTIONS:** | | First order wood products are defined as per the table above. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 4-2.3 The percent of money spent on forest operations and management on the DFA provided from
**TARGET:** Report out on
**VARIANCE:** N/A
**REPORT YEAR:** 2005/06

back to Summary Sheet

| Signatory | Money Spent On Forest Operations/Management | Money Spent in NCI | Percent | |
|---|---|---|---|---|
| Canfor* | $90,700,000.00 | $86,500,000.00 | 95.4% | Percent in DFA |
| BCTS | $8,202,882.13 | $6,169,777.70 | 75.2% | |
| **TOTAL** | $98,902,882.13 | $92,669,777.70 | | **93.7%** |

*Estimate

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | **Canfor** | January 1 - December 31 |
| | **BCTS** | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be reviewed to determine the amount of money spent in the north-central interior and the amount of money spent in total on goods and services for forest operations or management. These will be summed and recorded. |
| | **BCTS** | |
| **CALCULATION:** | | (Money spent in NCI / Money spent) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Money spent does not include taxes. NCI is defined as Smithers to McBride and 100 Mile House to Fort St. John. Intent is, to the extent possible, support business within the NCI.This measure applies only to suppliers or contractors working on forest operations or management only ( not purchase wood or milling facilities). Businesses are deemed to be within the NCI if their principal place of business is in the NCI, or if the work is being completed out of an office located in the NCI. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** 4-2.4 The number of support opportunities provided to the public (stakeholders, residents and interested parties)

**TARGET:** Report out on

**VARIANCE:** N/A

**REPORT YEAR:** 2005/06

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| Signatory | Support Opportunities | | | | | Total for DFA |
|---|---|---|---|---|---|---|
| | | | | | | |
| Canfor | | | | | | |
| BCTS | | | | | | |
| TOTAL | | | | | | 0 |

| | | |
|---|---|---|
| MEASUREMENT UNIT: | | |
| SPATIAL/GEOGRAPHIC SCALE: | | |
| FREQUENCY OF COLLECTION: | | |
| TIME PERIOD: | Canfor | |
| | BCTS | |
| DATA SOURCE: | Canfor | |
| | BCTS | |
| MEASUREMENT METHOD: | Canfor | |
| | BCTS | |
| CALCULATION: | | |
| DEFINITIONS/ASSUMPTIONS: | | |
| KNOWLEDGE GAPS: | Canfor | |
| | BCTS | |
| COST: | | |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **4-2.5 Report out on the amount of money directed towards environmental projects.**
**TARGET:** **Report out on**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Signatory | Total Dollars Directed to Environmental Projects |
|---|---|
| Canfor | $ 234,614.00 |
| BCTS | $ - |
| **TOTAL** | **$ 234,614.00** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | TSA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | **Canfor** | April 1 - March 31 |
| | **BCTS** | |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | Supplier Report from CASS, FIA project files |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be reviewed to determine the amount of money directed by Canfor toward environmental projects. The amounts will be summed and recorded. |
| | **BCTS** | Records reviewed for expenditures for environmental projects and summed. |
| **CALCULATION:** | | Sum of dollars spent on environmental contracts. |
| **DEFINITIONS/ASSUMPTIONS:** | | Environmental projects are defined as projects intended to enhance or improve the knowledge, understanding, quality, or current status of plants, animals, ecological communities, and the forest as a whole, and are not an obligation of the signatory. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** 4-3.1 Taxes paid to governments.
**TARGET:** 100%
**VARIANCE:** 0%
**REPORT YEAR:** 2005/06

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| Signatory | Taxes Owed | Taxes Paid | Percent | |
|---|---|---|---|---|
| Canfor | $580,047.60 | $580,047.60 | 100.0% | Percent in DFA |
| BCTS | n/a | n/a | 0.0% | |
| TOTAL | $580,047.60 | $580,047.60 | | 100.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Operation |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | **Canfor** | January 1 - December 1 (fiscal Year) |
| | **BCTS** | |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be reviewed to determine the stumpage billed by |
| | **BCTS** | |
| **CALCULATION:** | | (Taxes paid / Taxes owed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Taxes include municipal taxes only. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | BCTS as an government organization does not own property and contributes through a lease agreement shared with the local district office. The provincial government is also GST exempt. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 4-3.2 Stumpage paid to government.
**TARGET:** 100%
**VARIANCE:** 0%
**REPORT YEAR:** 2005/06

back to Summary Sheet

| Canfor | Amount Owed | Amount Paid | Percent | Percent in DFA |
|---|---|---|---|---|
| Quota Wood | $26,656,574.00 | $26,656,574.00 | 100.0% | |
| Purchase Wood | $3,719,708.00 | $3,719,708.00 | 100.0% | |
| **TOTAL** | $30,376,282.00 | $30,376,282.00 | | **100.0%** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | Operation |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | January 1 - December 1 (fiscal Year) |
| **DATA SOURCE:** | Accounting records |
| **MEASUREMENT METHOD:** | Accounting records will be reviewed to determine the stumpage billed by government and the stumpage paid to gevernment. The results will be tallied and recorded. |
| **CALCULATION:** | (Amount paid / Amount billed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | This measure applies only to Licensees. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **4-4.1 The number of support opportunities provided to First Nations with Treaty area and/or asserted traditional territory within the DFA**
**TARGET:** **Report out on**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Signatory | | Support Opportunities | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Cash Donations | Product Donations | Resource or Worker Donations | Community/ cultural support and donation | Capacity building | Training/ education | |
| Canfor | Number | | | | | 88 | | |
| | Value | | | | | $288,000.00 | | |
| BCTS | Number | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Value | | | | | | | Total for DFA |
| **TOTAL** | | 0 | 0 | 0 | 0 | 88 | 0 | **88** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | TSA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | **Canfor** | January 1 - December 31 (fiscal year) |
| | **BCTS** | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be queried to determine support opportunities provided to First Nations. These will be totalled and reported out on. |
| | **BCTS** | |
| **CALCULATION:** | | Sum of support opportunities for First Nations |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | None |
| | **BCTS** | |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **4-4.2 The number of contract opportunities provided to First Nations with Treaty area and/or asserted traditional territory within the DFA.**
**TARGET:** **Report out on.**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Signatory | Contract Opportunities | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Employment | Road Building | Other Volume Purchased | Logging | Silvicultural forestry | Other contracts | Management services | Total for DFA |
| Canfor | | 1 | | 2 | 6 | | | |
| BCTS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **TOTAL** | 0 | 1 | 0 | 2 | 6 | 0 | 0 | **9** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Contract opportunities |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records, Tender documents, Communication records |
| | **BCTS** | Tender documents, contract summary, TSL review |
| **MEASUREMENT METHOD:** | **Canfor** | Supervisors and managers will be asked to identify First Nations with whom they have contracts, offers given to First Nations, and bids received from First Nations. These will be totaled and reported out on. |
| | **BCTS** | Number of contracts/TSL's of types indicated above that are awarded during the fiscal year to First Nations. |
| **CALCULATION:** | | Sum of contract opportunities |
| **DEFINITIONS/ASSUMPTIONS:** | | Contract Opportunities are defined as a direct award contract, an invitation to bid on a select tender, or a direct solicitation to submit a bid on an open tender. First Nations with Treaty area and/or asserted traditional territory within the DFA are Tsay Keh, Kwadacha, Nak'azdli, West Moberly, Saulteau, and Halfway River First Nations and the McLeod Lake and Takla Lake Bands |
| **KNOWLEDGE GAPS:** | **Canfor** | None |
| | **BCTS** | BC Gov't datasets do not record First nations status of suppliers, review needs to be done by someone kowlegeable of local FN suppliers. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 4-4.3 The total value of transactions undertaken with First Nations with Treaty area and/or asserted
**TARGET:** Report out on.
**VARIANCE:** N/A
**REPORT YEAR:** 2005/06

back to Summary Sheet

| Signatory | Transactions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Employment | Road Building | Volume Purchased | Community/ cultural support and donation | Logging | Silvicultural forestry | Capacity building | Other contracts | Purchases | Training/ education | Management services | |
| Canfor | $0.00 | $595,874.89 | $0.00 | $0.00 | $5,552,018.50 | $93,995.35 | $144,000.00 | $0.00 | $0.00 | $0.00 | $0.00 | |
| BCTS | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | Total for DFA |
| **TOTAL** | $0.00 | $595,874.89 | $0.00 | $0.00 | $5,552,018.50 | $93,995.35 | $144,000.00 | $0.00 | $0.00 | $0.00 | $0.00 | **$6,385,888.74** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | **Canfor** | January 1 - December 31 (fiscal year) |
| | **BCTS** | April 1-March 31 (fiscal year) |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | CAS, MAX accounting records, Invoice Payments |
| **MEASUREMENT METHOD:** | **Canfor** | Accounting records will be examined to determine the value of transactions undertaken with First Nations with Treaty and/or asserted traditional territory within the DFA. The total will be recorded |
| | **BCTS** | Accounting records for associated contracts (4-4.2) will be examined to determine the value of transactions. The total by category will be recorded. |
| **CALCULATION:** | | Sum of transactions with First Nations |
| **DEFINITIONS/ASSUMPTIONS:** | | The measure records the total value for all First Nations, not the value on a First Nation by First Nation basis. An entity is deemed to be First Nations if; 1) any of the principals is a member of a First Nation, 2) any of the principals is known to act as a representative for First Nations, 3) the majority of employees of the entity are members of a First Nation. A transaction is defined where there is an exchange of money from one party to the other party. As an example, volume purchased may be volume purchased by Canfor from First Nations, or volume purchased by First Nations from BCTS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None |
| | **BCTS** | None |
| **COST:** | | In-house |

# Mackenzie Defined Forest Area
# Current Status Table

**MEASURE:** **4-5.1 The percentage of DFA volume advertised for sale through open competitive bid.**
**TARGET:** **40%**
**VARIANCE:** **-5%**
**REPORT YEAR:** **2005/06**

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| Signatory | Total annual volume apportioned | Volume Advertised For Sale Through Open Competitive Bid (m3) | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 1,082,904 | | 0.0% | |
| BCTS | 698,830 | 623,824 | 89.3% | |
| Non-signatory | | | 0.0% | |
| **TOTAL** | 1,781,734 | 623,824 | | **35.0%** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Cubic meter |
| **SPATIAL/GEOGRAPHIC SCALE:** | Block level |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | January 1 - December 31 |
| **DATA SOURCE:** | Genus |
| **MEASUREMENT METHOD:** | |
| **CALCULATION:** | (Volume advertised for sale / Total annual volume) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | This measure is applicable only to BCTS. Volume is the cut control volume billed in that calender year from the Mackenzie Forest District. Annual volume is the apportioned volume in the DFA for each fiscal year. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **4-5.2 A competitive primary milling facility is sustained.**
**TARGET:** **≥2**
**VARIANCE:** **0**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Primary Milling | Number in DFA |
|---|---|---|
| Canfor | 2 | |
| **TOTAL** | 2 | **2** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Primary Milling Facilities |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | |
| **MEASUREMENT METHOD:** | Canfor currently runs two sawmills at its facility - A Mill and C Mill with an annual capacity of 502,000 Mfbm. |
| **CALCULATION:** | Sum of primary milling facilities supported by the DFA. |
| **DEFINITIONS/ASSUMPTIONS:** | A primary milling facility is defined as a segregated production facility for the primary breakdown of timber. It does not include facilities that may rely on by-products of the primary milling process (i.e. trim ends or saw dust). |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

## 4-6.1 repeat of 2.5.2

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**Summary Sheet**

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **4-6.2 Areas with stand damaging agents will be prioritized for treatment.**
**TARGET:** **100%**
**VARIANCE:** **-10%**
**REPORT YEAR:** **2005/06**

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| Signatory | Total Area With Stand Damaging Agents Identified | Area With Stand Damaging Agents that are prioritized for treatment | Percent | |
|---|---|---|---|---|
| Canfor | 1255994.0 | 1255994.0 | 100.0% | Percent in DFA |
| BCTS | 838043.0 | 838043.0 | 100.0% | |
| **TOTAL** | 2,094,037 | 2,094,037 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Hectares |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Landscape |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | |
| | **BCTS** | GENUS, DFAM / mapping? |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | Overlay our TSL's and treatment contracts with spatial locations of identified stand damaging agents annually. |
| **CALCULATION:** | | (Area with damaging agents prioritized for treatment / Total area with stand damaging agents identified) X 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Stand damaging agents would be continued to be identified by BCTS in conjunction with the MOF and Licensee's thoughout the DFA and spatial representation of these agents would be incorporated into GENUS and\or our planning process. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Ensure that we have an effective communication strategy between the Mackenzie Field Team and PGBA Planning Team. |
| **COST:** | | In-house |

4-6.3 Repeat of **2-5.1**

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**Summary Sheet**

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 5-1.1 List of existing and documented potential for marketed non-timber benefits
**TARGET:** Report out on
**VARIANCE:** N/A
**REPORT YEAR:** 2005/06

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| | List of Marketed Non-Timber Benefits Developed and Reported | List Updated | List Updated |
|---|---|---|---|
| Date | Due June, 2007. | | |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Report |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | N/A |
| **TIME PERIOD:** | N/A |
| **DATA SOURCE:** | PAG meeting summaries |
| **MEASUREMENT METHOD:** | A list of existing and documented potential marketed non-timber benefits will be developed by June, 2007. This list will be presented to PAG. PAG meeting summaries will be reviewed for reference to presentation of such a report. |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | Marketed non-timber benefits are defined as goods or services that may be sold for direct economic benefit, and that delivery of such a good or service is derived from forest resources, or is impacted by the quality or quantity of forest resources available. |
| **KNOWLEDGE GAPS:** | List needs to be developed. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **5-1.2 Description of potential implications of SFM practices on the amount and quality of marketed non-timber values.**
**TARGET:** **Report out on**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| | Description of Potential SFM Impacts on Marketed Non-Timber Benefits Developed and Reported | Description Updated | Description Updated |
|---|---|---|---|
| Date | | | |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Report |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | N/A |
| **TIME PERIOD:** | N/A |
| **DATA SOURCE:** | PAG meeting summaries |
| **MEASUREMENT METHOD:** | A description of potential implications of SFM practices on existing and potential marketed non-timber benefits will be developed in conjunction with Measure 5-1.1. This description will be presented to PAG. PAG meeting summaries will be reviewed for reference to presentation of such a report. |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | Marketed non-timber values are defined as goods or services that may be sold for direct economic benefit, and that delivery of such a good or service is derived from forest resources, or is impacted by the quality or quantity of forest resources available. |
| **KNOWLEDGE GAPS:** | Description needs to be developed. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **5-1.3 The percentage of forest operations consistent with range requirements as identified in operational plans and/or site plans.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

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| Signatory | Total Number of Forest Operations with Range Requirements | | | | Number of Forest Operations Consistent With Requirements | Percent | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | 78 | 35 | 43 | 156 | 156 | 100.0% | Percent in DFA |
| BCTS | 0 | 0 | 0 | 0 | 0 | 100.0% | |
| **TOTAL** | 78 | 35 | 43 | 156 | 156 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest Operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus, Genus ITS - Final harvest inspections \ contract summaries |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all activities with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with range requirements specified in operational, tactical, or site plans. The results will be tallied and recorded. |
| | **BCTS** | Genus will be queried for all activities with a final inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with range requirements specified in operational, tactical, or site plans. The results will be tallied and recorded. |
| **CALCULATION:** | | (Forest operations completed in accordance requirements / Forest operations completed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Forest operations include all activities directly associated with harvesting, road construction, BCTS construction contracts, or mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **6-1.1 Employment supported by each sector of the local economy (actual and percentage of**
**TARGET:** **Report out on.**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Employment Sector | Number Employed | Percent | |
|---|---|---|---|
| Forestry | 2022 | 66.9% | |
| Mining and processing | 12 | 0.4% | |
| Fishing and Trapping | 15 | 0.5% | |
| Agriculture and Food | 23 | 0.8% | |
| Tourism | 261 | 8.6% | |
| High Tech. | 17 | 0.6% | |
| Public Sector | 576 | 19.1% | |
| Construction | 50 | 1.7% | Percent in DFA |
| Other | 45 | 1.5% | |
| **TOTAL** | 3021 | | **100.0%** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Employment, percent employment |
| **SPATIAL/GEOGRAPHIC SCALE:** | TSA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | BC Stats, TSR Community Dependency Table |
| **MEASUREMENT METHOD:** | The number of persons employed by sector will be reported using the most current data sources available. The results will be reported out on. |
| **CALCULATION:** | Sum of persons employed by sector. |
| **DEFINITIONS/ASSUMPTIONS:** | None. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **6-1.2 Contribution of income sources from each sector of the local economy (actual and percentage of total income)**
**TARGET:** **Report out on.**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Employment Sector | Total Income (millions) | Percent | |
|---|---|---|---|
| Forestry | $97.0 | 80.4% | |
| Mining and processing | $0.2 | 0.2% | |
| Fishing and Trapping | $0.0 | 0.0% | |
| Agriculture and Food | $0.0 | 0.0% | |
| Tourism | $4.7 | 3.9% | |
| High Tech. | $0.0 | 0.0% | |
| Public Sector | $16.9 | 14.0% | |
| Construction | $1.5 | 1.2% | Percent in DFA |
| Other | $0.4 | 0.3% | |
| **TOTAL** | $120.7 | | **100.0%** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Income, percent income |
| **SPATIAL/GEOGRAPHIC SCALE:** | TSA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | 2001 Economic Dependancy Tables by Forest District, Statistics Canada |
| **MEASUREMENT METHOD:** | Statistics Canada will be asked to provide annual income numbers by sector. The results will be recorded. |
| **CALCULATION:** | Sum of before tax income by sector. |
| **DEFINITIONS/ASSUMPTIONS:** | Income is before tax as this removes the taxation variable. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **6-1.3 The number of opportunities given to businesses within, or immediately adjacent to the TSA to provide non-tendered services to forest management activities.**
**TARGET:** **Report out on.**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Signatory | Opportunities to Provide Non-Tendered Services | | Number in DFA |
|---|---|---|---|
| | Canfor | BCTS | |
| Logging and hauling | 3 | | |
| Road construction and maintenance | 6 | | |
| Silviculture | 3 | | |
| Operations | 7 | | |
| Planning and Administration | 6 | | |
| Miscellaneous Goods/Services | 10 | 2 | |
| **TOTAL** | 35 | 2 | **37** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Direct award opportunities. |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | Contract review |
| **MEASUREMENT METHOD:** | **Canfor** | Direct award contracts are identified during contract development, a summary will be requested from administrative staff. Managers and supervisors will be asked to identify any other services offered but not awarded to enterprises meeting the criteria. The total number will be summed and reported out on. |
| | **BCTS** | Review # of Direct Award contracts within defined area |
| **CALCULATION:** | | Sum of direct award opportunities. |
| **DEFINITIONS/ASSUMPTIONS:** | | Immediately adjacent is meant to capture businesses in McLeod Lake. Businesses with an office or mailing address within the TSA or in McLeod Lake will be included in the measure. Opportunities for non-tendered services are defined as vended purchases, direct award contracts or services agreements, offers of direct award contracts or services agreements, and opportunities given under "right of first refusal" agreements. Forest management activities is defined as all activities included under the scope of the signatories' respective EMS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None |
| | **BCTS** | None |
| **COST:** | | In-house |

## 6-4.1 Repeat of 4-2.2

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**Summary Sheet**

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **6-1.5 The number of support opportunities provided within, or immediately adjacent to, the TSA.**

**TARGET:** **Report out on**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Signatory | Support Opportunities | | | | |
|---|---|---|---|---|---|
| | Cash Donations | Product Donations | Resource or Worker Donations | Community Events | Total for DFA |
| Canfor | | | | | |
| BCTS | N/A | N/A | N/A | N/A | |
| **TOTAL** | $ - | $ - | $ - | $ - | $ - |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Dollars |
| **SPATIAL/GEOGRAPHIC SCALE:** | | TSA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | **Canfor** | January 1 - December 31 (fiscal year) |
| | **BCTS** | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Accounting records |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | |
| **CALCULATION:** | | |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** 7-1.1 Implement and update a comprehensive list of stakeholders and affected or interested
**TARGET:** 1
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| | List of Stakeholders and Affected or Interested Parties Developed | List Updated | List Updated | List Updated | List Updated | List Updated | List Updated |
|---|---|---|---|---|---|---|---|
| Date | Jul-03 | Aug-03 | Jan-06 | | | | |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Report |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Steering Committee SFM Review Meeting minutes. |
| **MEASUREMENT METHOD:** | Steering Committee SFM Review Meeting minutes will be reviewed for reference to updating of stakeholder list. |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **7-1.2 The number of opportunities for PAG to review and provide comment on the SFMP**
**TARGET:** **≥1**
**VARIANCE:** **0**
**REPORT YEAR:** **2005/06**

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| Opportunities for PAG to Provide Review and Comment. | | | | Total for DFA |
|---|---|---|---|---|
| Dates Opportunities Provided | | | | |
| 17-Oct-06 | 2007-03-28 | | | 2 |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Opportunities |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting summaries, PAG communications records |
| **MEASUREMENT METHOD:** | Communications records and PAG meeting summaries that have been accepted by the PAG will be reviewed for reference to providing review and comment on the SFMP. The number of times will be recorded. |
| **CALCULATION:** | Sum of opportunities to provide review and comment. |
| **DEFINITIONS/ASSUMPTIONS:** | An opportunity is defined as a specific solicitation for review and comment on the SFMP by the Steering Committee. |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-1.3 Number of Public Advisory Group meetings per year.
**TARGET:** ≥1
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| Year | PAG Meeting Dates | | | | | | | Total: |
|---|---|---|---|---|---|---|---|---|
| 2005-2006 | 31-Jan-06 | 14-Feb-06 | 28-Feb-06 | 14-Mar-06 | 28-Mar-06 | | | 5 |
| 2006-2007 | 11-Apr-06 | 25-Apr-06 | 09-May-06 | 17-Oct-06 | 20-Feb-07 | 28-Mar-07 | | 6 |

| | |
|---|---|
| **MEASUREMENT UNIT:** | PAG Meetings |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting summaries |
| **MEASUREMENT METHOD:** | PAG meeting summaries will be reviewed and meeting dates recorded. The number of meetings will also be totaled. |
| **CALCULATION:** | Sum of PAG meetings |
| **DEFINITIONS/ASSUMPTIONS:** | None. |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **7-1.4 The level of satisfaction of the PAG members with the process.**

**TARGET:** **100%**
**VARIANCE:** **-20%**
**REPORT YEAR:** **2005/06**

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| Mackenzie DFA SFM Plan PAG Meeting Evaluation Question January - March 31, 2006 | Meeting Date | Score | Percent (score / 5) | Variance (from 100%) |
|---|---|---|---|---|
| Question M12 - Are you satisfied with PAG process | 2006-01-31 | 4.0 | 80.0% | 20.0% |
| Question M12 - Are you satisfied with PAG process | 2006-02-14 | 4.4 | 88.0% | 12.0% |
| Question M12 - Are you satisfied with PAG process | 2006-02-28 | 4.2 | 84.0% | 16.0% |
| Question M12 - Are you satisfied with PAG process | 2006-03-14 | 4.7 | 94.0% | 6.0% |
| Question M12 - Are you satisfied with PAG process | 2006-03-28 | 4.4 | 88.0% | 12.0% |

| Mackenzie DFA SFM Plan PAG Meeting Evaluation Question April 1, 2006 - March 31, 2007 | Meeting Date | Score | Percent (score / 5) | Variance (from 100%) |
|---|---|---|---|---|
| Question M12 - Are you satisfied with PAG process | 2006-04-11 | 4.1 | 82.0% | 18.0% |
| Question M12 - Are you satisfied with PAG process | 2006-04-25 | 4.2 | 84.0% | 16.0% |
| Question M12 - Are you satisfied with PAG process | 2006-05-09 | 4.0 | 80.0% | 20.0% |
| Question M12 - Are you satisfied with PAG process | 2006-10-17 | 4.0 | 80.0% | 20.0% |
| Question M12 - Are you satisfied with PAG process | 2007-02-20 | 4.3 | 86.0% | 14.0% |
| Question M12 - Are you satisfied with PAG process | 2007-03-28 | 4.2 | 84.0% | 16.0% |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Satisfaction rating |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting evaluation forms |
| **MEASUREMENT METHOD:** | The scores and the number of respondents will be totaled for question M12 meeting evaluation forms from all PAG meetings during the period. The sum of the scores divided by the total number of respondents will give the average score. |
| **CALCULATION:** | (Sum of scores to M12/Total number of respondents) |
| **DEFINITIONS/ASSUMPTIONS:** | Satisfaction is defined as a rating of 4 or better. |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-1.5 Maintain and review at least annually and as required the Mackenzie SFMP PAG TOR, to
**TARGET:** ≥1
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| Review of ToR | | | | Total for DFA |
|---|---|---|---|---|
| Meeting Dates | | | | |
| 31-Jan-06 | 20-Feb-07 | | | 1 |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Reviews |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting summaries |
| **MEASUREMENT METHOD:** | PAG meeting summaries that have been accepted by the PAG will be reviewed for reference to maintaining and review of the TOR. The number of times will be recorded. |
| **CALCULATION:** | Sum of reviews of TOR in the accepted meeting summaries. |
| **DEFINITIONS/ASSUMPTIONS:** | |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **7-1.6 Survey residents, stakeholders and First Nations regarding their satisfaction with forest**
**TARGET:** **One survey in year 1, then survey every third year thereafter**
**VARIANCE:** **0**
**REPORT YEAR:** **2005/06**

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| | Survey of Residents, Stakeholders and First Nations | | | |
|---|---|---|---|---|
| | Dates Surveys Reported | | | |
| Target | 31-Mar-07 | 31-Mar-10 | 31-Mar-13 | 31-Mar-16 |
| Actual | | | | |
| Variance | | | | |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Opportunities |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting summaries, PAG communications records |
| **MEASUREMENT METHOD:** | Completion of the survey and results will be presented to PAG. PAG meeting summaries will be reviewed for reference to presentation of the results. These meeting dates will be recorded. |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | $35,000 |

# Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **7-1.7 Percentage of the public sectors as defined in the ToR invited to participate in the PAG process.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

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| Number of sectors with a representative identifed | Number of Sectors with no Representative With Invitations on File | Total Number Invited | Number of Public Sectors in Terms of Reference | Percent in DFA |
|---|---|---|---|---|
| 17 | 5 | 21 | 22 | **95.5%** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Satisfaction rating |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG communication records |
| **MEASUREMENT METHOD:** | PAG communication records will be cross-referenced with the list of public |
| **CALCULATION:** | ((Sectors with representatives + Sectors invited) / Public sectors defined in TOR) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | The measure pertains to the TOR in effect at March 31 of each year. |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **7-1.8 Percentage of PAG satisfaction with amount and timing of information presented for informed decision-making.**

**TARGET:** **100%**

**VARIANCE:** **-20%**

**REPORT YEAR:** **2005/06**

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| Mackenzie DFA SFM Plan Public Advisory Group Meeting Evaluation Question January - March 31, 2006 | | | | | | |
|---|---|---|---|---|---|---|
| | Question MQ 10 – Your overall satisfaction with the amount & timing of information presented? | | | Question MQ11 – Your overall satisfaction with the information? | | |
| Meeting Date | Score | Percent | Variance (from | Score | Percent | Variance (from |
| 2006-01-31 | 4.0 | 80.0% | 20.0% | 4.2 | 84.0% | 16.0% |
| 2006-02-14 | 4.0 | 80.0% | 20.0% | 4.2 | 84.0% | 16.0% |
| 2006-02-28 | 4.3 | 86.0% | 14.0% | 4.3 | 86.0% | 14.0% |
| 2006-03-14 | 4.6 | 92.0% | 8.0% | 4.5 | 90.0% | 10.0% |
| 2006-03-28 | 4.2 | 84.0% | 16.0% | 4.3 | 86.0% | 14.0% |

| Mackenzie DFA SFM Plan Public Advisory Group Meeting Evaluation Question April 1, 2006 - March 31, 2007 | | | | | | |
|---|---|---|---|---|---|---|
| | Question MQ 10 – Your overall satisfaction with the amount & timing of information presented? | | | Question MQ11 – Your overall satisfaction with the information? | | |
| Meeting Date | Score | Percent | Variance (from | Score | Percent | Variance (from |
| 2006-04-11 | | 0.0% | 0.0% | | 0.0% | 0.0% |
| 2006-04-25 | | 0.0% | 0.0% | | 0.0% | 0.0% |
| 2006-05-09 | | 0.0% | 0.0% | | 0.0% | 0.0% |
| 2006-10-17 | | 0.0% | 0.0% | | 0.0% | 0.0% |
| 2007-02-20 | | 0.0% | 0.0% | | 0.0% | 0.0% |
| 2007-03-28 | | 0.0% | 0.0% | | 0.0% | 0.0% |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Satisfaction rating |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting evaluation forms |
| **MEASUREMENT METHOD:** | The scores and the number of respondents will be totaled for questions M10 and M11 from meeting evaluation forms from all PAG meetings during the period. The sum of the scores divided by the total number of respondents will give the average score. |
| **CALCULATION:** | (Sum of scores to M10/Total number of respondents), (Sum of scores to M11/Total number of respondents) |
| **DEFINITIONS/ASSUMPTIONS:** | Satisfaction is defined as a rating of 4 or better. |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **7-1.9 Report out on consistency of indicators or measures with LRMP objectives.**
**TARGET:** **Report out on**
**VARIANCE:** **N/A**
**REPORT YEAR:** **2005/06**

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| Licensee | Consistency with Indicators Developed and Reported | Consistency with Measures Developed and Reported |
|---|---|---|
| Meeting Date | 14-Feb-06 | 29-Apr-08 |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Report |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | Mackenzie DFA SFM Plan, Mackenzie LRMP, PAG meeting summaries |
| **MEASUREMENT METHOD:** | The indicators and measures developed through the Mackenzie SFM Planning process will be cross-referenced to the general management objectives stated in the LRMP for consistency. The results will be reported in a table. PAG meeting summaries will be reviewed for reference to presentation of such a report. |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | Indicators or measures will be deemed consistent if, when implemented, they will meet the objectives as stated, or will assist in achieving the objective to the extent of the signatories' responsibilities. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **7-2.1 The number of opportunities given to the public and stakeholders to express forestry-related concerns and be involved in our planning processes.**

**TARGET:** **≥6**

**VARIANCE:** **-2**

**REPORT YEAR:** **2005/06**

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| Opportunity | The Number of Opportunities For Public And Stakeholders | | | |
|---|---|---|---|---|
| | Canfor | BCTS | Joint | Total |
| FSP original ads | X | | | 1 |
| FSP amendment ads | | | | 0 |
| FSP letters to stakeholders | X | | | 1 |
| PMP oringinal ads | X | X | | 2 |
| PMP letters to stakeholders | X | X | | 2 |
| PMP signage | X | | | 1 |
| FDP original ads | | | | 0 |
| FDP amendment ads | X | X | | 2 |
| FDP letters to stakeholders | X | X | | 2 |
| Field tours | | | | 0 |
| Newsletters | | | | 0 |
| Open houses | X | | X | 2 |
| Pag Meetings | | | X | 1 |
| LRMP meetings | | | X | 1 |
| Documented phone calls | X | | | 1 |
| Documented meetings | X | | | 1 |
| TOTAL | 10 | 4 | 3 | 17 |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Opportunity types |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | First Nations, FDP, FSP, PMP, Trapper, Guide, Range, and other files. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Files will be reviewed for various opportunities offered, the number of different opportunities will be recorded. |
| | **BCTS** | |
| **CALCULATION:** | | Sum of opportunity types given |
| **DEFINITIONS/ASSUMPTIONS:** | | This indicator tracks the number of different types of opportunites, ( by plan or by licencee), that the public has to provide input into the planning process, not the total number of opportunities. Documentation of opportunities are filed in the respective files (Trappers, Guides, First Nations, FDP, FSP, PMP, etc.). |
| **KNOWLEDGE GAPS:** | **Canfor** | None |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **7-2.2 Website containing SFM information relevant to the Mackenzie SFMP is developed and updated.**
**TARGET:** **1**
**VARIANCE:** **0**
**REPORT YEAR:** **2005/06**

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| Signatory | Website developed | Number in DFA |
|---|---|---|
| Canfor | | |
| BCTS | | |
| Joint | | |
| **TOTAL** | 0 | **0** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Websites |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | |
| **CALCULATION:** | | Sum of websites developed and maintained. |
| **DEFINITIONS/ASSUMPTIONS:** | | A website is defined as a publicly accessible site withou access restrictions. |
| **KNOWLEDGE GAPS:** | **Canfor** | None |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-2.3 The percent of timely responses to written and documented concerns.
**TARGET:** 100%
**VARIANCE:** -5%
**REPORT YEAR:** 2005/06

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| Signatory | Number of Written and Documented Concerns | Number Responded to in a Timely Manner | Percent | |
|---|---|---|---|---|
| Canfor | 4 | 4 | 100.0% | Percent in DFA |
| BCTS | | | 0.0% | |
| TOTAL | 4 | 4 | | 100.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Written and documented concerns |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | To be determined |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **CALCULATION:** | | (Timely responses / Written and documented concerns) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Timely is defined as a documented response sent within thirty days of the concern being raised. A concern is defined as a documented communication where there is an expectation of a response on the part of the signatories. A documented communication may be letters, e-mails, meeting minutes, or records of conversations and may be documented by either party. |
| **KNOWLEDGE GAPS:** | **Canfor** | Consolidation of existing issues required. Method of documenting, tracking, and measuring issues and how quickly they are responded to required. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-2.4 Distribution/access to SFM Plan, annual reports and audit results.
**TARGET:** 1
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| Opportunity | The Number of Distribution/Access Opportunities | | | |
|---|---|---|---|---|
| | Canfor | BCTS | Joint | Total |
| Newsletters | | | | 0 |
| Open houses | | | | 0 |
| PAG Meetings | | | 17-Oct-06 | 1 |
| Website | | 30-Apr-07 | 30-Apr-07 | 2 |
| Documented meetings | | | | 0 |
| TOTAL | 0 | 1 | 2 | 3 |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Opportunity types |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting summaries, PAG communication records |
| **MEASUREMENT METHOD:** | PAG meeting summaries that have been accepted by the PAG will be reviewed for reference to distribution of the SFM Plan, annual report, and audit results to the PAG. |
| **CALCULATION:** | Sum of distribution and access opportunities to the SFM Plan, annual reports and audit results. |
| **DEFINITIONS/ASSUMPTIONS:** | Distribution and access must be available for all documents listed, although they may be distributed or accessed at different times. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-2.5 The number of SFM educational opportunities and interactions provided.
**TARGET:** 2
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| Opportunity | The Number of SFM Educational Opportunities | | | |
|---|---|---|---|---|
| | Canfor | BCTS | Joint | Total |
| Field tours | | | | 0 |
| Newsletters | | | | 0 |
| Open houses | | | 1 | 1 |
| Presentations | | | 4 | 4 |
| Press Releases | | | 1 | 1 |
| Trade Shows, etc. | | | | 0 |
| TOTAL | 0 | 0 | 6 | 6 |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Opportunities |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Sign-in documents, press releases, trade show receipts |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Appropriate documents will be assembled and the number of opportunities will be totalled and recorded. |
| | **BCTS** | |
| **CALCULATION:** | | Sum of opportunities given |
| **DEFINITIONS/ASSUMPTIONS:** | | This indicator tracks the total number of opportunities, not the types of opportunities. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-2.6 Percentage of mutually agreed upon communication strategies met.
**TARGET:** 100%
**VARIANCE:** -5%
**REPORT YEAR:** 2005/06

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| Signatory | Total Number of Communication Strategies in place | Number of Communication Strategies met | Percent | |
|---|---|---|---|---|
| Canfor | | | 0.0% | Percent in DFA |
| BCTS | 0.0 | 0.0 | 0.0% | |
| TOTAL | 0 | 0 | | 0.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Issues raised |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | To be determined |
| | **BCTS** | KIT database / ITS records |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **CALCULATION:** | | ((The number of stakeholders X the number of communication strategies met by stakeholder) / total number of communication strategies required) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | |
| | **BCTS** | |
| **COST:** | | |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-3.1 Adaptive Management strategy is developed, documented, acted upon and reviewed.
**TARGET:** 1
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| | Adaptive Management Strategy | | | | Total for DFA |
|---|---|---|---|---|---|
| | Developed (Y/N) | Documented (Y/N) | Acted Upon (Y/N) | Reviewed (Y/N) | |
| Date | | | | | |
| Date | | | | | |
| Date | | | | | |
| Date | | | | | |
| TOTAL | | | | | 0 |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Adaptive Management Strategy |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | |
| | **BCTS** | |
| **CALCULATION:** | | |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | |
| | **BCTS** | |
| **COST:** | | |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 7-3.2 Monitoring plan for indicators is developed, documented, acted upon and reviewed.
**TARGET:** 1
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| | Monitoring Plan | | | | Total for DFA |
|---|---|---|---|---|---|
| | Developed (Y/N) | Documented (Y/N) | Acted Upon (Y/N) | Reviewed (Y/N) | |
| Date | | | | | |
| Date | | | | | |
| Date | | | | | |
| Date | | | | | |
| **TOTAL** | | | | | **0** |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Monitoring plan |
| **SPATIAL/GEOGRAPHIC SCALE:** | DFA |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | SFM documents, management review minutes, PAG meeting minutes |
| **MEASUREMENT METHOD:** | Presence of a monitoring plan is self-evident. Management review meeting minutes and PAG meeting minutes will be reviewed for evidence that the monitoring plan is acted upon and reviewed. This will be reported out on in the annual report. |
| **CALCULATION:** | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | None. |
| **KNOWLEDGE GAPS:** | None. |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** 7-3.3 Reports and analysis of monitoring information – Annual Report
**TARGET:** 100%
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| Annual Report Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Annual report |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | September 30 |
| **DATA SOURCE:** | PAG meeting summaries |
| **MEASUREMENT METHOD:** | PAG meeting summaries that have been accepted by the PAG will be reviewed for reference to a presentation of an annual report to the PAG. |
| **CALCULATION:** | Sum of PAG meetings |
| **DEFINITIONS/ASSUMPTIONS:** | It is assummed that meeting summaries accepted by the PAG that refer to the presentation of an annual report is documentation that such a report exists. |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** 8-1.1 Percentage of forest operations consistent with the Heritage Conservation Act.
**TARGET:** 100%
**VARIANCE:** 0%
**REPORT YEAR:** 2005/06

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| Signatory | Total Number of Forest Operations that have associated sites protected under the Heritage Conservation Act (pre 1846) | | | | Number of Forest Operations Completed in Accordance with the Heritage Conservation Act | | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | Percent | |
| Canfor | 0 | 0 | 0 | 0 | 0 | 100.0% | Percent in DFA |
| BCTS | 0 | 0 | 0 | 0 | 0 | 100.0% | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | | 100.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest Operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | GENUS (planning module, ITS), FHI's \ contract summaries. |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all activities with a final inspection completed during the time period. Genus ITS will be queried for all incidents and/or actions (as per Action Tracking form) during the same period. These will be cross-referenced to determine if any incidents pertaining to non-compliance with the Heritage Conservation Act. |
| | **BCTS** | Genus query for for any blocks or roads with Assessments (with or without results and strategies) under to the Heritage Conservation Act. This will be cross-referenced against ITS to report conformance against all completed Timber Sales and contracts completed during the reporting period. |
| **CALCULATION:** | | ((Activities complete - Incidents)/Activities complete) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | A Forest Operation is defined as any activity deemed to require a final inspection under the respective signatories EMS. Associated is defined as being on or near the roads or blocks with the activities. Commitments around post 1846 CMT's are included with this category. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **8-1.2 Maintain and review at least annually and as required the Mackenzie SFMP PAG Terms of Reference to recognize that First Nation participation in the public process will not prejudice First Nation rights and Treaty rights.**

**TARGET:** **≥1**
**VARIANCE:** **0**
**REPORT YEAR:** **2005/06**

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| Review of ToR and Recognition of Aboriginal and Treaty Rights | | | | |
|---|---|---|---|---|
| Meeting Dates | | | | Total for DFA |
| 31-Jan-06 | 20-Feb-07 | | | 1 |

| | |
|---|---|
| **MEASUREMENT UNIT:** | Reviews |
| **SPATIAL/GEOGRAPHIC SCALE:** | N/A |
| **FREQUENCY OF COLLECTION:** | Annually |
| **TIME PERIOD:** | April 1 - March 31 |
| **DATA SOURCE:** | PAG meeting summaries |
| **MEASUREMENT METHOD:** | PAG meeting summaries that have been accepted by the PAG will be reviewed for reference to a recognition that First Nation participation in the public process will not prejudice First Nation rights and Treaty rights, and that such a recognition is in the PAG Terms of Reference. The number of times such a recognition is raised in the accepted meeting summaries will be recorded. |
| **CALCULATION:** | Sum of recognitions in the accepted meeting summaries. |
| **DEFINITIONS/ASSUMPTIONS:** | |
| **KNOWLEDGE GAPS:** | None |
| **COST:** | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 8-2.1 The number of opportunities for First Nations to provide meaningful input into our planning processes.

**TARGET:** ≥2 per First Nation

**VARIANCE:** 0

**REPORT YEAR:** 2005/06

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| Opportunity | Signatory | First Nation | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Tsay Keh | Kwadacha | Takla Lake | Nak'azdli | McLeod Lake | West Moberly | Saulteau | Halfway River | |
| Open House | Canfor | 1 | 1 | 1 | 1 | 1 | 2 | 1 | | 8 |
| | BCTS | | | | | | | | | 0 |
| Scheduled Meetings | Canfor | 1 | 1 | | 1 | 2 | 2 | | | 7 |
| | BCTS | | | | | | | | | 0 |
| Letters | Canfor | 4 | 3 | 8 | 5 | 3 | 4 | 3 | 3 | 33 |
| | BCTS | | | | | | | | | 0 |
| Newspaper Ads | Canfor | 2 | 2 | 1 | 1 | 2 | 1 | 1 | | 10 |
| | BCTS | | | | | | | | | 0 |
| Pest Management Prescriptions | Canfor | | | | | | | | | 0 |
| | BCTS | | | | | | | | | 0 |
| Natural Resource Committee | Canfor | | | | | | | | | 0 |
| | BCTS | | | | | | | | | 0 |
| TOTAL | | 8 | 7 | 10 | 8 | 8 | 9 | 5 | 3 | **58** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Opportunities |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Consultation records, meeting records, letters, Records of Discussion |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. Currently, records from processes requiring consultation (IPMP, FDP, FSP, FIA, etc.) are reviewed to determine the number of opportunities given to First Nations. |
| | **BCTS** | |
| **CALCULATION:** | | Sum of opportunities given by First Nation |
| **DEFINITIONS/ASSUMPTIONS:** | | This indicator tracks the total number of opportunities, not the types of opportunities. |
| **KNOWLEDGE GAPS:** | **Canfor** | Definition of meaningful input, and planning processes required. While opportunities are documented, there is not yet a process to consolidate the various opportunities that may be provided (depending on above definitions). |
| | **BCTS** | |
| **COST:** | | |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **8-3.1 Percentage of issues raised by First Nations peoples evaluated and responded to in a timely manner by Canfor and BCTS.**

**TARGET:** **100%**
**VARIANCE:** **10%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Issues Raised by First Nations' Peoples | Number of Issues Evaluated and Responded to in a Timely Manner | Percent | |
|---|---|---|---|---|
| Canfor | | | 0.0% | Percent in DFA |
| BCTS | 0 | 0 | 100.0% | |
| **TOTAL** | 0 | 0 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Issues raised |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Communications database (under construction) |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Communications database will be developed to track communications to/from |
| | **BCTS** | |
| **CALCULATION:** | | (Timely responses/issues raised) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | Timely is defined as a documented response sent within thirty days of the issue being raised. An issue is defined as a documented communication where there is an expectation of a response on the part of the signatories, such as an expression of concern, request for information, or similar such requests. A documented communication may be letters, e-mails, meeting minutes, or records of conversations and may be documented by either party. |
| **KNOWLEDGE GAPS:** | **Canfor** | Consolidation of existing issues required. Method of documenting, tracking, and measuring issues and how quickly they are responded to required. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **8-3.2 Percentage of issues raised by First Nations' Chief & Council or their authorized representative developed into mutually agreed upon strategies.**

**TARGET:** **100%**
**VARIANCE:** **50%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Number of Issues Raised by First Nations' Chief & Council or Authorized Representatives | Number of Issues Developed Into Mutually Agreed Upon Strategies | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | | | 0.0% | |
| BCTS | | | 0.0% | |
| **TOTAL** | 0 | 0 | | **0.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Issues raised |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Communications database (under construction) |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Communications database will be developed to track communications to/from stakeholders, including First Nations. Database will be queried for communications from First Nations Chief, Council, or authorized representatives and any related communications for evidence that the issue was resolved through the development of a mutually-agreed upon strategy. |
| | **BCTS** | |
| **CALCULATION:** | | ((Completed Blocks - Incidents/Actions)/Completed Blocks) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | An issue is defined as a documented communication where there is an expectation of a response on the part of the signatories, such as an expression of concern, request for information, or similar such requests. A documented communication may be letters, e-mails, meeting minutes, or records of conversations and may be documented by either party. |
| **KNOWLEDGE GAPS:** | **Canfor** | Consolidation of existing issues required. Method of documenting, tracking, and measuring issues and their development into strategies required. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **8-4.1 Incorporation of mutually agreed upon strategies to address First Nation peoples' values, knowledge, and uses into SFMP, operational plans, tactical plans and/or site plans.**

**TARGET:** **100%**

**VARIANCE:** **50%**

**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Number of Mutually Agreed Upon Strategies | Number of Strategies Incorporated Into SFM, Operational, Tactical, or Site Plans. | Percent | |
|---|---|---|---|---|
| Canfor | | | 0.0% | Percent in DFA |
| BCTS | | | 0.0% | |
| **TOTAL** | 0 | 0 | | **0.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Mutually agreed upon strategies |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **CALCULATION:** | | |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | Consolidation of existing generic strategies required. Method of documenting, tracking, and measuring incorporation of strategies required. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 8-4.2 Percentage of forest operations consistent with mutually agreed upon strategies.
**TARGET:** 100%
**VARIANCE:** 50%
**REPORT YEAR:** 2005/06

back to Summary Sheet

| Signatory | Total Number of Forest Operations | | | | Number of Forest Operations Completed in Accordance with Agreed Upon Strategies | Percent | Percent in DFA |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Silviculture | Total | | | |
| Canfor | 0 | 0 | 0 | 0 | 0 | 0.0% | |
| BCTS | 0 | 0 | 0 | 0 | 0 | 0.0% | |
| **TOTAL** | 0 | 0 | 0 | 0 | 0 | | **0.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Mutually agreed upon strategies |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | To be determined. |
| | **BCTS** | |
| **CALCULATION:** | | |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | Consolidation of existing generic strategies required. Method of documenting, |
| | **BCTS** | |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **9-1.1 The percentage of harvest operations consistent with results or strategies for recreation values as identified in operational plans, tactical plans and/or site plans.**
**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Total Number of Harvest Operations | Number Completed in Accordance with Recreation Requirements | Percent | |
|---|---|---|---|---|
| Canfor | 35 | 35 | 100.0% | Percent in DFA |
| BCTS | 34 | 34 | 100.0% | |
| **TOTAL** | 35 | 35 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest Operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | GENUS (planning module, ITS), FHI's \ contract summaries. |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks with a final harvest inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with results or strategies specified in operational, tactical, or site plans. The results will be tallied and recorded. |
| | **BCTS** | Genus ITS query for recreational results and strategies ( FSP's / SP's)- measured against all completed Timber Sales and contracts completed during the reporting period. |
| **CALCULATION:** | | (Forest operations completed in accordance with results or strategies / Forest operations completed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | A Forest Operation is defined as any activity deemed to require a final inspection under the respective signatories EMS with the exception of silvicultural activities other than mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Need to develop a process to ensure inspections pick-up unique features identified in Operational Site Plans and, where applicable, that these features are carried forward to post-harvest activities. |
| **COST:** | | In-house |

**Mackenzie Defined Forest Area**
**Current Status Table**

**MEASURE:** **9-2.1 The percentage of harvesting and roadbuilding operations consistent with visual quality requirements as identified in operational, tactical and/or site plans.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

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| Licensee | Total Number of Operations | | | Operations with visual quality Requirements | Number of Forest Operations Completed in Accordance with Results or Strategies | Percent | |
|---|---|---|---|---|---|---|---|
| | Roads | Harvesting | Total | | | | |
| Canfor | 78 | 35 | 113 | | 113 | 100.0% | Percent in DFA |
| BCTS | 2 | 34 | 36 | 1 | 36 | 100.0% | |
| **TOTAL** | 80 | 69 | 149 | 1 | 149 | | **100.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest Operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks with a final harvest inspection completed during the time period. Genus ITS will be queried for all incidents during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-conformance with results or strategies specified in operational, tactical, or site plans. The results will be recorded and reported out on. |
| | **BCTS** | |
| **CALCULATION:** | | Harvesting and roadbuilding operations completed in accordance with visual quality requirements / Forest operations completed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | A Forest Operation is defined as any activity deemed to require a final inspection under the respective signatories EMS with the exception of silvicultural activities other than mechanical site preparation. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **9-2.2 Percentage of harvest operations consistent with visually effective green-up buffer along roads as identified in the Mackenzie LRMP.**

**TARGET:** **100%**

**VARIANCE:** **0%**

**REPORT YEAR:** **2005/06**

back to Summary Sheet

| Signatory | Number of Harvest Operations Completed | Number Consistent with Green-Up Buffers | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | 35 | 35 | 100.0% | |
| BCTS | 34 | 34 | 100.0% | |
| **TOTAL** | 69 | 69 | | 100.0% |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Forest operation |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Block level |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Spatial coverage, Genus ITS |
| | **BCTS** | GENUS, GENUS ITS |
| **MEASUREMENT METHOD:** | **Canfor** | Spatial coverages will be used to determine if any operations impacted green-up buffers. Genus ITS will be also queried for all incidents during the same period to determine if any incidents pertaining to non-conformance with visually effective green-up buffers requirements occurred. The results will berecorded and reported out on. |
| | **BCTS** | Road and block planning will incorporate buffer requirements during field layout and plans and inspections will monitor results. |
| **CALCULATION:** | | (Forest operations completed in accordance with green-up requirements / Forest operations completed) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | A Forest Operation is defined as blocks with harvest complete during the time period specified. |
| **KNOWLEDGE GAPS:** | **Canfor** | Will need spatial coverages for salvage permits and NRFLs to determine if they are consistent. Need to define the requirements under the LRMP. |
| | **BCTS** | Need spatial coverages to identify required buffers for incorporation into block and road Site Planning. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **9-3.1 Percent of identified unique and/or significant places and features of social, cultural or spiritual importance that are managed or protected.**

**TARGET:** **100%**
**VARIANCE:** **0%**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Identified Resource Features Within Areas of Operation | Number of Identified Resource Features Managed or Protected | Percent | Percent in DFA |
|---|---|---|---|---|
| Canfor | | | 0.0% | |
| BCTS | | | 0.0% | |
| **TOTAL** | 0 | 0 | | **0.0%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Identified resource features |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all activities with a final inspections completed during the time period. Genus ITS will be queried for all incidents and/or actions (as per Action Tracking form) during the same period. These will be cross-referenced to determine if any incidents or actions pertaining to the management or protection of identified resource features. The results will be tallied and recorded. |
| | **BCTS** | |
| **CALCULATION:** | | (Identified Features Managed or Protected/Identified Features) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | |
| **KNOWLEDGE GAPS:** | **Canfor** | Definition of identified resource feature required. Consolidated list of identified resource features required. Training for field personnel in identifying resource features when encountered. |
| | **BCTS** | |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 9-4.1 Written safety policies in place and full implementation is documented.
**TARGET:** 2
**VARIANCE:** 0
**REPORT YEAR:** 2005/06

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| Signatory | Writen Safety Policies in Place and Implementation Documented ? (Y/N) |
|---|---|
| Canfor | Y |
| BCTS | Y |
| **TOTAL** | **2** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Written safety policies implemented |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Organization |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Safety records, inspection checklists, training records |
| | **BCTS** | Ministry of Forests Mackenzie Forest District Occupational Health and Safety Committee training records. |
| **MEASUREMENT METHOD:** | **Canfor** | A Safe Work Procedures document is produced annually. The document is distributed and signed off by each employee. A record is kept of each employee that signed off on the procedures. This will document that the policies and procedures are in place. Records of monthly safety meetings and other forms, checklists, or records required under Canfor's Safety Program will document the implementation of the policies and procedures. |
| | **BCTS** | Mackenzie Forest District has implemented a safety program that is maintained in hard copy format. |
| **CALCULATION:** | | N/A |
| **DEFINITIONS/ASSUMPTIONS:** | | Safety policies are defined as all procedures and guidelines developed by the respective signatories pertaining to safety. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | None. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** **9-4.2 Number of lost time accidents in woodlands operations.**
**TARGET:** **0**
**VARIANCE:** **0**
**REPORT YEAR:** **2005/06**

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| Signatory | Number of Lost Time Accidents |
|---|---|
| Canfor | 0 |
| BCTS | 0 |
| **TOTAL** | **0** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Lost time accidents |
| **SPATIAL/GEOGRAPHIC SCALE:** | | Organization |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Safety records |
| | **BCTS** | Safety records |
| **MEASUREMENT METHOD:** | **Canfor** | Recordable injuries are tracked and reported monthly to Canfor Head Office and/or the Forest Industry Advisory Service (FIAS). These reports will be reviewed for Lost Time Accidents and reported. |
| | **BCTS** | All first aid incidents are tracked, and records maintained for the Mackenzie District office, which includes the BCTS Mackenzie Field Team component. These incidents are then followed to determine if any resulted in Lost Time Accidents are tracked by the Mackenzie Forest District. |
| **CALCULATION:** | | Sum of Lost Time Accidents |
| **DEFINITIONS/ASSUMPTIONS:** | | Lost Time Accident is defined as per WorkSafe BC. Woodlands operations is defined as direct employees whose work falls within the scope of the respective signatories' EMS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Lost Time Summaries need to be generated for BCTS staff and communicated to staff. |
| **COST:** | | In-house |

## Mackenzie Defined Forest Area
## Current Status Table

**MEASURE:** 9-5.1 Signage on FSRs and main haul roads to be kept current.
**TARGET:** 100%
**VARIANCE:** -5%
**REPORT YEAR:** 2005/06

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| Signatory | Number of Completed Industrial Activities with Signs Posted to Advise the Public | Number of Signs Removed Following Completion | Percent | |
|---|---|---|---|---|
| Canfor | 35 | 35 | 100.0% | Percent in DFA |
| BCTS | 34 | 24 | 71.0% | |
| **TOTAL** | 69 | 59 | | **85.5%** |

| | | |
|---|---|---|
| **MEASUREMENT UNIT:** | | Industrial Activity |
| **SPATIAL/GEOGRAPHIC SCALE:** | | DFA |
| **FREQUENCY OF COLLECTION:** | | Annually |
| **TIME PERIOD:** | | April 1 - March 31 |
| **DATA SOURCE:** | **Canfor** | Genus, Genus ITS |
| | **BCTS** | Genus ITS, FHR |
| **MEASUREMENT METHOD:** | **Canfor** | Genus will be queried for all blocks with a final harvest inspection completed during the time period. Genus ITS will be queried for all incidents and/or actions (as per Action Tracking form) during the same period. The two will be cross-referenced to determine if any incidents pertaining to non-removal of signs following harvest completion. |
| | **BCTS** | Field Inspections |
| **CALCULATION:** | | ((Completed Blocks - Incidents/Actions)/Completed Blocks) x 100 |
| **DEFINITIONS/ASSUMPTIONS:** | | The measure is intended to ensure that signage advising motorists of forest activities is kept current, such as "Active Logging" or "Truck Turning" signs. As the posting of such signs is dictated by the level of public use, it is assumed that if such signage is deemed to be required, then the road is a main haul road. FSRs are those roads designated as Forest Service Roads by the Ministry of Forests and Range. An industrial activity is defined as any activity deemed to require a final inspection under the respective signatories EMS. |
| **KNOWLEDGE GAPS:** | **Canfor** | None. |
| | **BCTS** | Inconsistent application of active logging and truck turning signs both from legislative and contractual requirements. |
| **COST:** | | In-house |

# APPENDIX H

# A COMPARATIVE ANALYSIS OF ALTERNATIVE STRATEGIES

A total of nine alternative strategies were developed, forecast, and analysed, including a base case scenario using current management practices. These strategies are:

**Scenario 1: Base Case**

Assumes current management practices as per TSR 2, with the following additions based on current DFA processes;

- Mountain pine beetle outbreak to continue until 2010
- Natural disturbance on NHLB
- Conditions and/or restrictions of all current draft and approved ungulate winter ranges (UWR) apply
- Harvesting priority is given to pine-leading stands

**Scenario 2: Habitat Richness Emphasis**

This is an attempt to simulate the impact of old growth management areas (OGMA) on the DFA. This scenario is based on;

- Apply old seral targets as a THLB reduction – 58% of reductions to come from the THLB. Apply a THLB reduction for each LU_BEC group old seral requirement.
- Apply interior old targets as a THLB reduction – 58% of reductions to come from the THLB. Apply a THLB reduction for each LU_BEC group old interior requirement.
- WTP retention increased to 20% in current Pl stands

**Scenario 3: Species Composition**

This scenario assumes that Balsam analysis units regenerate to 50% planted spruce and 50% natural balsam, that Spruce Medium analysis units regenerate to 80% planted spruce and 20% natural balsam, and that Spruce Poor analysis units regenerate to 70% planted spruce and 30% natural balsam.

**Scenario 4: Caribou Recovery Emphasis**

This scenario sees the application of the draft Caribou Recovery Action Plan (McNay, et al, 2006). This includes the following management considerations for the Scott and Wolverine caribou herds;

- Preferred Habitat Pine Lichen Winter Range and Post Rut Range – within each herd area, harvest 50% ± 10% on a 140 year rotation, then no harvesting in preferred area for 70 years. Must complete harvest within 20 years from the first harvest.
- Preferred Habitat for High Elevation Winter Range– within each herd area, maintain at least X% of the herd area >120 years and >15 metres. X% = (lower natural range of variability / potential range area)*100. Potential range area listed in Table 4 (pg 26) of Recovery Action Plan.

- Preferred Calving and Summer Range – within each herd area, maintain at least X% of the herd area. X% = (lower natural range of variability / potential range area)*100. Potential range area listed in Table 4 (pg 26) of Recovery Action Plan.

**Scenario 5: Non-Timber Economic Emphasis**

This scenario emphasizes the management for visual quality in both scenic areas and non-scenic areas and the application of a visually effective green-up requirement within 200 metres for the following roads the Thutade FSR and the old road through Manson Creek to Germansen Lake.

**Scenario 5A: Manual brushing**

Manual brushing (i.e. no herbicide use) to increase berry production and increase jobs is the focus of this scenario. The underlying assumption behind this scenario is that expenditures on brushing will remain static, resulting in lower productivity on managed stands as less area is brushed annually. This, in turn, increases rotation age.

**Scenario 6: Worst Case Forest Health on Mature Stands Emphasis**

This scenario applies the mountain pine beetle epidemic criteria to 2020 as per the Provincial Level Projection of the Current Mountain Pine Beetle Outbreak, April 2006.

**Scenario 6A: Unsalvaged Losses**

This scenario compounds Scenario 6 by adding an increase in spruce and balsam bark beetle outbreaks and in fire. Unsalvaged losses are doubled after they have been pro-rated to the DFA.

**Scenario 7: Worst Case Forest Health on Regenerating Stands Emphasis**

The scenario is intended to illustrate the effects of forest health problems on regenerated stands. For pine leading analysis units, the operational adjustment factor (OAF) is increased to 20%.

# Mackenzie Defined Forest Area

## SFM Indicator Forecasting


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SFM Indicator Forecasting
Mackenzie Defined Forest Area

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# 1 Introduction

This report contains an overview of data inputs, assumptions, baseline values, results and interpretations for the Sustainable Forest Management (SFM) indicator-forecasting project for the Mackenzie Defined Forest Area (DFA). The Mackenzie DFA is a subset of the Mackenzie Timber Supply Area (TSA) and it is also the area where Canadian Forest Products Ltd. and BC Timber Sales operate within the TSA.

This forecasting project supports the development of a sustainable forest management plan for the DFA and subsequent application for certification under the Canadian Standards Association (CSA). Note that both Canadian Forest Products Ltd. Mackenzie Division and BC Timber Sales in Mackenzie are seeking certification separately within this process.

# 2 Modelling Overview

Forests grow and die over long time periods and exist over significant areas of the landscape. They are complex ecosystems that contain intricate relationships between climate, soils, flora and fauna. We do not fully comprehend these relationships yet. Models provide us a method to attempt to define what we think we understand as a simplification of reality.

Modelling is a start not the end: The results from a modelling exercise will not answer all of the questions that we have. The opposite will likely occur; modelling may raise more questions than answers.

There is generally a need for very specific answers and results from forest related models even though they are often built on non-specific information and simple assumptions about how forests function. Models should not be depended on to provide exact results. Rather, they should be used to understand relative implications of decisions that need to be made.

Modelling should start out simply to allow maximum comprehension of the problem. Complexity can be added later in future iterations as data, rules, objectives and understanding improve.

There is uncertainty associated with multiple facets of modelling. Uncertainty can occur due to variation in the source data, how well the management problem is interpreted, how well the modeler translates that interpretation into model terms, how well the model accommodates that problem, and lastly how the modeler interprets the output.

Finally, prior to describing the scenarios, it is important to understand the data and assumptions that were used in the analysis of the scenarios that were completed. As mentioned, models are tools that simulate what might occur in the future under a rigid set of rules and relationships. Modelling – through scenario planning and forecasting - tests different rules and relationships to determine the likely impact or effect of those rules on the suite of indicators/measures that we are interested in.

Models tend to use information that is often not current as the process of modelling can be lengthy. Once results are available the data may be several years old. Nevertheless, the first step in modeling is to understand the data and assumptions that will largely dictate what kind of results a particular model will eventually produce.

# 3 Data Preparation

The following information provides a description of the key data and assumptions that were used in the forecasting of scenarios presented in this report. These assumptions are mainly adopted from the data package for the Timber Supply Review 2 (TSR 2) timber supply analysis. The data and assumptions were updated where necessary using the most current available information.

The budget and timeline for this analysis are considerably less than that allocated to analyses for the British Columbia Timber Supply Review process. Therefore, the base case forecast or any other forecast should not be construed as an update to the latest timber supply review for the Mackenzie TSA or a subset of it.

A dataset was compiled for the project using the following coverages:

- Forest Cover
- Landscape Units
- LU_BEC Groups
- LRMP-RMZ
- Parks and Protected areas
- Physical operability/logging system
- District haul zones
- VQOs
- Planning Cells
- ESAs
- Terrain Stability
- Ownership
- Community watershed (CMS)
- Recreation inventory
- Caribou (u7-001 and u7-009)
- Elk (u7-005, u7-008)
- Goat (u7-004)
- Stone Sheep (u7-006)
- LRMP Caribou habitat rating
- Mugaha marsh sensitive area proposal
- Woodlot update
- McLeod Treaty 8
- Kemess powerline and mine site
- JS Thrower's site index Analysis
- Provincial MPB projections (2005 flight)
- Operating areas
- Depletions up to 2006
- Forest development plans
- Defined Forest Area Boundary
- Roads
- Streams
- Forest Inventory Zone (FIZ)
- Wildlife habitat areas
- Draft OGMAs
- Agricultural Land Reserves (ALR)
- Crown land plans
- Indian Reserves
- Private leases

- Draft UWR (u7_007)
- Draft UWR (u7_017)
- Wildlife recovery plans (Chase, Scott, Takla, Wolverine herds)
- Proposed community forest
- SPU
- SPZ
- Road Buffer Coverage for LRMP Direction
- Tantalis Survey Parcels

In order to facilitate modeling using the Forest Simulation and Optimization System (***FSOS***), a spatial explicit model, the dataset was processed to eliminate polygons with area smaller than 1.0 ha. Note that polygons that were smaller than 1.0 ha due to ownership were not eliminated or combined with other polygons.

Riparian buffers, reserve zones and roads were not modeled spatially explicitly. Rather a percent reduction was applied to all polygons to account for riparian and roads.

The result of this spatial processing was a resultant with 302,329 polygons.

## *3.1 Definition of the timber harvesting landbase*

A timber harvesting landbase (THLB) was determined based on the area netdown logic outlined that eliminates the types of land that do not contribute to the current timber harvesting land base as described below in Table 1:

Table 1 - Netdown Table

| Land classification | Area (ha) | Net reduction (ha) | % of total area | % of CFLB | % of THLB |
|---|---|---|---|---|---|
| Total DFA area | 2,117,199 | | | | |
| Land not managed by the BC Forest Service | 33,297 | 33,297 | 1.6% | | |
| Kemess powerline and mine site | 2,648 | 1,457 | 0.07% | | |
| Non-forest or non-productive forest | 482,727 | 479,862 | 22.7% | | |
| Current Roads, trails, and landings | 7,069 | 6,829 | 0.3% | | |
| **Net Reduction to Total Area** | | **521,445** | **24.6%** | | |
| **Crown Forest Land Base (CFLB)** | **1,595,754** | | **75.4%** | | |
| Parks and Protected Areas, Wildland | 14,519 | 12,184 | | 0.8% | |
| Non-commercial_cover | 10,761 | 10,442 | | 0.7% | |
| Inoperable | 12,536 | 2,167 | | 0.1% | |
| Special_Planning Cells | 19 | 0 | | 0.0% | |
| Environmentally Sensitive Areas (ESA) | 190,920 | 183,814 | | 11.5% | |
| Non merchantable stands | 76 | 18 | | 0.0% | |
| Balsam marginal | 219,821 | 112,820 | | 7.1% | |
| Spruce marginal | 21,709 | 13,373 | | 0.8% | |
| Pine marginal | 35,491 | 26,431 | | 1.7% | |
| Deciduous marginal | 6,216 | 3,512 | | 0.2% | |
| Deciduous far | 40,910 | 33,634 | | 2.1% | |
| Problem forest types | 74,780 | 42,664 | | 2.7% | |
| Low volume stands | 235,326 | 66,155 | | 4.1% | |
| Low productivity stands | 121,890 | 44,549 | | 2.8% | |
| Wildlife Habitat Areas (WHA) | 43 | 35 | | 0.0% | |
| Ungulate Winter Range (UWR) | 49,745 | 7,925 | | 0.5% | |
| Wildlife Tree Patches (spatial) | 8,093 | 6,681 | | 0.4% | |
| Wildlife Tree Patches (non-spatial) | 73,679 | 35,821 | | 2.2% | |
| Riparian | 151,803 | 71,236 | | 4.5% | |
| **Net Reduction to CFLB** | | **673,461** | | **42.2%** | |
| **Current timber harvesting land base** | **922,293** | | | **57.8%** | |
| Future roads and trails | 95,274 | 41,503 | | 2.6% | |
| **Long-term timber harvesting land base** | | **880,790** | | **55.2%** | |

As illustrated in Table 1, the total land base prior to any reductions is 2,117,119 hectares. After removing areas that are not forest or not owned by the Crown there are approximately 1,595,714 hectares remaining, which are considered productive Crown forest land or **Crown Forest Land Base** (CFLB). This is the land base in which the forest and landscape based rules will apply such as seral stage targets and visuals quality objectives (VQO).

The land base available for operational forestry is called the timber harvesting land base (THLB). It is determined by further removing specific land conditions which are forested but may not be eligible or are only partially eligible for harvesting. This would include areas such as low productivity areas, riparian reserve zones, physically or economically inoperable areas. These are collectively referred to as the non-harvestable land base (NHLB). In the Mackenzie DFA the current THLB is 922,293 hectares. While harvesting takes place in the THLB, the NHLB contributes to forest/stand level resources management requirements (seral stage, VQOs, wildlife habitat).

### 3.1.1 Land not managed by the BC Forest Service

The following lands that are not forest or are not managed or owned by the Crown are excluded from the land base:

- Woodlots,
- Private leases,
- Agricultural land reserves,
- From the crown land plans: commercial, community settlement reserve area, industrial reserve, miscellaneous reserve, rural reserve development area, sand and gravel reserve (SGR), settlement reserve area.
- Indian reserves
- McLeod Treaty 8
- From the LRMP Category: ecological reserve, proposed protected, park, reserve land, settlement and water. [Note: the LRMP categories Enhanced, General, and Special will remain in the THLB]

### 3.1.2 Exclusion of the Kemess powerline and mine site.

The Kemess powerline has a 70m right-of-way, which was excluded from the CFLB. The mine site is excluded under 'urban' in the Non-Productive Descriptor in the forest inventory file.

### 3.1.3 Land classified as non-forest or non-productive forest

- Lakes, non-productive forest, rivers, swamps, urban, etc. as identified by Projected Type ID 6 and 8.
- Alpine areas identified by BEC.

### 3.1.4 Current Roads, trails, and landings (RTL)

All highways and larger municipal roads of a sufficient size to be mapped as polygons and classified as non-forest areas in the forest inventory file were deducted in the above section on Land Classified as Non-Forest or Non-Productive.

As described in TSR 2, to account for existing roads, a 4.5% reduction was applied to stands less than 40 years old and to stands with harvest history. The reduction was applied to the current productive forest land considered available for harvesting.

### 3.1.5 Land classified as Parks, Protected Areas and Wildland

- Protected areas and wildland as identified in the LRMP.
- Parks and protected areas as identified in the BC Parks maps.

### 3.1.6 Non-commercial cover

- Projected Type ID 5 and Non-Forest Descriptor = NCBR in VRI.

### 3.1.7 Inoperable areas

Areas identified as 'Helicopter' or 'Inoperable' in the district operability coverage.

### 3.1.8 Special planning cells

The following planning cells are excluded from the THLB: E022, G009, G010, G088, G045 G059, G017, G031, G068, G069, G060, G043, G044.

### 3.1.9 Environmentally sensitive areas

THLB reductions for ESAs were applied as per TSR 2. Note that ESA wildlife was replaced by Ungulate Winter Ranges and related management direction. Table 2 describes the reduction percent for different ESA categories.

Table 2: Reductions for environmentally sensitive areas (reference TSR 2)

| ESA category | ESA description | Reduction percent |
|---|---|---|
| Es1 | Extremely unstable soils | 100 |
| Es2 | Unstable soils but less than Es1 | 50 |
| Ep1 | Severe regeneration problems caused by geoclimatic factors | 100 |
| Ep2 | Regeneration problems caused by biotic factors | 70 |
| Ea | Severe snow chute and avalanche problems | 100 |
| Er1 | Exceptionally high recreational values | 100 |
| Er2 | High recreational values but less than Er1 | 70 |
| Eh1 | Extremely high watershed values | 100 |
| Eh2 | High watershed values but less than Eh1 | 70 |
| Ec | Areas of management concern (any of the categories noted above but surveyed prior to 1976). | 100 |

### 3.1.10 Non-Merchantable Forest Types

The following forest types were excluded from the THLB:

Table 3 – Non-Merchantable Forest Types

| Type group | Species | Area (ha) |
|---|---|---|
| 8 | FdDecid | 18 |
| 10 | CWFd | 10 |
| 12 | H | 19 |
| 15 | HB | 10 |
| 34 | L | 15 |
| 37 | DrConifer | 3 |

### 3.1.11 Marginal balsam, spruce, pine and deciduous stands

Table 4: Area exclusion factors for merchantable stands for conventional (Conv), cable, and helicopter (Heli) logging in near and far zones (TSR 2)

| Type group number (leading species) | Harvest zone: | Near | | | Far | | | |
|---|---|---|---|---|---|---|---|---|
| | Logging system: | Conv | Cable | Heli | Conv | Conv | Cable | Heli |
| | Age, height and stocking class | | | | slope <30 % | Slope ≥30 % | | |
| 18 – 20 | Age ≥ 7, Height<2 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| (Balsam) | 742, 842, 942 | 0 | 100 | 100 | 0 | 0 | 100 | 100 |
| B, BH, BS | 732, 832, 932 | 0 | 100 | 100 | 0 | 0 | 100 | 100 |
| 20 (BS) | Height ≥ 3, Stocking = 1 | 0 | 100 | 100 | 100 | 100 | 100 | 100 |
| | Stocking = 2 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | Height = 2, Stocking = 1 | 0 | 100 | 100 | 100 | 100 | 100 | 100 |
| 18 (B) | Height ≥ 3, Stocking = 1 | 0 | 100 | 100 | 100 | 100 | 100 | 100 |
| | Stocking = 2 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | Height = 2, Stocking = 1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | | | | | | | | |
| 21 – 26 | Age ≥ 7, Height <2, | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| (Spruce) | 742, 842, 942 | 0 | 100 | 100 | 0 | 0 | 100 | 100 |
| S, SF, SH, | 732, 832, 932 | 0 | 100 | 100 | 0 | 0 | 100 | 100 |
| SB, SPl, | Height ≥ 3 Stocking = 1 | 0 | 0 | 0 | 0 | 100 | 100 | 100 |
| & Sdec | Height ≥ 3 Stocking = 3 | 0 | 100 | 100 | 0 | 100 | 100 | 100 |
| | Height = 2, Stocking = 1, 2 | 0 | 100 | 100 | 0 | 100 | 100 | 100 |
| | | | | | | | | |
| 28 – 31 | Age ≥5, Height <2 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| (Pine) | 542, 642, 742, 842, 942 | 0 | 100 | 100 | 0 | 0 | 100 | 100 |
| Pl, PlF, | 532, 632, 732, 832, 932 | 0 | 100 | 100 | 0 | 0 | 100 | 100 |
| PlS, &PlDec | Height ≥ 3 Stocking = 1 | 0 | 100 | 100 | 0 | 100 | 100 | 100 |
| | Height ≥ 3 Stocking = 2, 3, 4 | 0 | 100 | 100 | 0 | 100 | 100 | 100 |
| | Height = 2, Stocking = 1, 2, 3, 4 | 0 | 100 | 100 | 0 | 100 | 100 | 100 |
| | | | | | | | | |
| 35,36, 40, 41, &42 (Cttnwd, Birch, & Aspen) | Age≥4, Height<2, All stock<br>Age≥4, Height≥2, Stock=1<br>Age≥4, Height≥2, Stocknot=1 | 100<br>0<br>100 | 100<br>100<br>100 | 100<br>100<br>100 | 100<br>100<br>100 | 100<br>100<br>100 | 100<br>100<br>100 | 100<br>100<br>100 |

**Notes:** (for Table 4)
100 indicates stands were excluded and 0 indicates that stands were not excluded.

### 3.1.12 Deciduous in far zone in north Peace Arm

Deciduous stands (inventory type id 35 to 42) are excluded if they are in Landscape unit 37 (Chase) and in the far haul zone.

### 3.1.13 Problem Forest Types

Physically operable stands that exceed the low site criteria but are not currently utilized because of low timber quality or low volume are often called problem forest types. Problem forest types in the Mackenzie TSA are defined as follows: coniferous stands greater than 140 years old and less than 11 metres in height; and deciduous stands greater than 80 years old with less than 17 metres in height

### 3.1.14 Sites with low timber potential

Sites with low timber potential were removed from the THLB using the same rules as in TSR 2. Table 5 illustrates the reductions used in the analysis due to low volume and low productivity.

Table 5: Reductions for low volume and low productivity

| species | Balsam | | | Spruce | | | Pine | | |
|---|---|---|---|---|---|---|---|---|---|
| **haul zone** | **age** | **Volume** | **Site Index** | **age** | **Volume** | **Site Index** | **age** | **Volume** | **Site Index** |
| near | | | | | | | | | |
| logging system | | | | | | | | | |
| conventional | 140 | 180 | 8.9 | 140 | 190 | 8.9 | 120 | 170 | 11.1 |
| conventional/cable | 140 | 180 | 8.9 | 140 | 200 | 9.2 | 120 | 190 | 11.7 |
| cable | 140 | n/a | n/a | 140 | 240 | 10.3 | 120 | n/a | n/a |
| | | | | | | | | | |
| Medium | | | | | | | | | |
| logging system | | | | | | | | | |
| conventional | 140 | 190 | 9.2 | 140 | 190 | 9.2 | 120 | 170 | 11.1 |
| conventional/cable | 140 | 200 | 9.4 | 140 | 200 | 9.4 | 120 | 200 | 12 |
| cable | 140 | n/a | n/a | 140 | 240 | 10.3 | 120 | n/a | n/a |
| | | | | | | | | | |
| far | | | | | | | | | |
| logging system | | | | | | | | | |
| conventional | 140 | n/a | n/a | 140 | 190 | 9.2 | 120 | 210 | 12.3 |
| conventional/cable | 140 | n/a | n/a | 140 | n/a | n/a | 120 | n/a | n/a |
| cable | 140 | n/a | n/a | 140 | n/a | n/a | 120 | n/a | n/a |

*Sites with low growing potential criteria and comments:*

1. Older stands were excluded from the timber harvesting land base if the specified minimum volume per hectare was not met.
2. Younger coniferous stands were excluded from the timber harvesting land base if their site index is less than specified (e.g. the minimum required to reach a volume of 140 $m^3$/ha by age 141).
3. Younger deciduous stands were excluded from the timber harvesting land base if their site index is less than specified (e.g. the minimum required to reach a height of 18 metres by age 81).
4. Old deciduous stands were excluded from the timber harvesting land base if their minimum volume per hectare did not reach 120 cubic meters per hectare at age 81.

### 3.1.15 Wildlife Habitat Area

The wildlife habitat area for mountain goat (Oreamnos americanus) will be not be harvested, as outlined in the *Order –Wildlife habitat area #ORAM-7-01*, therefore, this area is excluded from the THLB.

### 3.1.16 Ungulate winter range

Areas in the following UWR are excluded from the THLB:

- U7-004 (Brewster mountain goat).
- U7-006 (Peace Arm stone sheep).
- U7-009 (northern caribou): Caribou High (UWR Units #: PP-001, PP-002, PP-004).
- Draft U7-017 (mountain goat): U7017-03, UWR17-04, UWR17-05, and USR17-06 areas

### 3.1.17 Riparian Reserves Zones

An aspatial reduction of 7.7% was applied to all stands in the THLB to account for riparian.

### 3.1.18 Wildlife tree patches

WTPs in Canfor's and BCTS's operating areas were spatially removed from the THLB. The spatial WTPs reduced the THLB by 0.7%. An additional aspatial reduction of 3.9% was applied to the THLB. The total WTP reduction was then 4.6%, somewhat higher than that used in TSR 2 (4%).

### 3.1.19 Future Roads, trails, and landings

A 4.5% reduction was applied to stands after their first harvest to account for future roads.

# 4 Management Assumptions

## *4.1 Management Strategies for Non-Timber Values*

Non-timber forest values, such as wildlife habitat and visual quality, are managed through land reservation (see Table 1) and/or applying forest cover constraints or volume retention. The forest cover constraints and volume retention used in the analysis are summarized in this section.

### 4.1.1 Ungulate Management

Table 6 outlines the ungulate management constraints used in the analysis.

Table 6 – Ungulate management constraints.

| Order # | Species | Modelled Forest Cover Constraint | Scenario |
|---|---|---|---|
| U7-001 (approved) | Mountain caribou (Kennedy Siding) | Log approximately half the entire area at a time on a 100 year rotation, so 45-55% is 0-50 years old and 45-55% is 50-100 years old. | Base Case |
| U7-005 (approved) | Rocky mountain elk | Maintain a minimum of 40% forested stands ≥ 100 years. | Base Case |
| U7-008 (approved) | Rocky mountain elk | Maintain a minimum of 40% forested stands ≥ 100 years. | Base Case |
| U7-009 (approved) | Northern caribou | For Corridor UWR Unit # PP-003, maintain a minimum of 20% of forested stands as ≥ 100 years with no more than 20% of the unit being less than 3m green up condition at any time. | Base Case |
| U7-007 (draft) | Northern caribou | For each Terrestrial Lichen Habitat Aggregate (TLH Aggregate), harvesting can occur twice, each with a 140 year rotation and each time, the harvest can be 50% ± 20% of the total area. Must complete harvest within 20 years from the first harvest. | Caribou Recovery Scenario |
| U7-017 (draft) | UWR in the lower Akie and Pesika areas for Elk and moose | For UWR17-01 and USR17-02 areas,<br>≥16.7% of the UWR polygon has coniferous leading stands that are ≥ 100 years old.<br>≥ 25% of the UWR polygon has stands (regardless of leading species) that are ≥ 80 years old.<br>≥16.7% of the UWR polygon will be < 20 years old. | Base Case |

### 4.1.2 Known Scenic Areas

Table 7 illustrates the cover constraints that are applied to each individual known visual quality polygon as per the visual quality class.

Table 7 - Forest cover requirements for know scenic areas

| Resource emphasis | Forest cover objectives | | Constraints apply to |
|---|---|---|---|
| | Green-up height (metres) | Green-up maximum allowable disturbance % | |
| Visual quality — retention | 5 | 3 | Crown forested area |
| Visual quality — partial retention | 5 | 10 | Crown forested area |
| Visual quality — modification | 5 | 20 | Crown forested area |
| Visual quality — maximum modification | 5 | 32.5 | Crown forested area |

### 4.1.3 Seral Stage Requirements

Seral stage requirements were modeled as per ***the Draft Non-Spatial Order Establishing Landscape Biodiversity Objectives for the Mackenzie Forest District***. Table 8 shows all the landscape unit/biogeoclimatic group combinations and corresponding targets for mature and old, and old seral stages for the Mackenzie DFA in the analysis.

Table 8 – Landscape Unit and Biogeoclimatic Group Combinations, Mature/Old and Old Targets for the Mackenzie DFA

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Old Forest Target (min of CLFB) |
|---|---|---|---|---|
| Akie, Akie River | enhanced | BWBSdk1 | 11% | 11% |
| Akie, Akie River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | 9% |
| Akie, Akie River | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Blackwater | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | 9% |
| Blackwater | enhanced | SBSvk, SBSwk2 | 15% | 9% |
| Blackwater + Muscovite Lake Park + Blackwater Creek ER | enhanced | SBSmk1, SBSmk2, BWBSdk1 | 11% | 11% |
| Buffalohead | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Buffalohead + Ed Bird Estella Park | enhanced | BWBSdk1 | 11% | 11% |
| Buffalohead + Ed Bird Estella Park | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | 9% |
| Clearwater | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Clearwater | general | ESSFwc3, ESSFwk2 | 36% | 19% |
| Clearwater | general | SBSvk, SBSwk2 | 31% | 9% |
| Collins-Davis | enhanced | BWBSdk1 | 11% | 11% |
| Collins-Davis | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | 9% |
| Collins-Davis | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Collins-Davis | enhanced | ESSFwc3, ESSFwk2 | 19% | 19% |
| Collins-Davis | enhanced | SBSmk1, SBSmk2 | 15% | 9% |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Old Forest Target (min of CLFB) |
|---|---|---|---|---|
| Collins-Davis | enhanced | SBSwk2 | 15% | 9% |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | BWBSdk1 | 34% | 16% |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 42% | 13% |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | SBSmk1, SBSmk2 | 34% | 16% |
| Gaffney, Manson River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | 9% |
| Gaffney, Manson River | enhanced | SBSmk1, SBSmk2 | 11% | 11% |
| Gaffney, Manson River | enhanced | SBSvk, SBSwk2 | 15% | 9% |
| Germansen Mountain | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | 9% |
| Gillis, Klawli | general | BWBSdk1 | 23% | 11% |
| Gillis, Klawli | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Gillis, Klawli | general | SBSmk1, SBSmk2 | 23% | 11% |
| Kennedy | special | ESSFwc3, ESSFwk2 | 54% | 28% |
| Kennedy | special | SBSvk, SBSwk2 | 46% | 13% |
| Lower Akie, Lower Pesika | special | BWBSdk1 | 34% | 16% |
| Lower Akie, Lower Pesika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 42% | 13% |
| Lower Ospika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Lower Ospika | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Lower Ospika | general | ESSFwc3, ESSFwk2 | 36% | 19% |
| Lower Ospika | general | SBSmk1, SBSmk2 | 23% | 11% |
| Lower Ospika | general | SBSvk, SBSwk2 | 31% | 9% |
| Misinchinka | enhanced | ESSFwc 3, ESSFwk 2 | 19% | 19% |
| Misinchinka | enhanced | SBSmk1, SBSmk2 | 11% | n/a |
| Misinchinka, Tudyah B | enhanced-general | SBSvk, SBSwk2 | n/a | 9% |
| Morfee | general | SBSmk1, SBSmk2 | 23% | 11% |
| Morfee | general | SBSvk, SBSwk2 | 31% | 9% |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Old Forest Target (min of CLFB) |
|---|---|---|---|---|
| Nabesche | general | BWBSmw1, BWBSwk2 | 23% | 11% |
| Nabesche | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Nabesche | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Nabesche | general | ESSFwc3, ESSFwk2 | 36% | 19% |
| Nabesche | general | SBSmk1, SBSmk2 | 23% | 11% |
| Nabesche | general | SBSvk, SBSwk2 | 31% | 9% |
| Nation | special | SBSmk1, SBSmk2 | 34% | 16% |
| Osilinka | enhanced | BWBSdk1 | 11% | 11% |
| Parsnip | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Parsnip + Heather Dina Park + Patsuk ER | general | ESSFwc3, ESSFwk2 | 36% | 19% |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSmk1, SBSmk2 | 23% | 11% |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSvk, SBSwk2 | 31% | 9% |
| Pesika | general | BWBSdk1 | 23% | 11% |
| Pesika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Philip | enhanced | SBSmk1, SBSmk2 | 11% | n/a |
| Philip | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | n/a |
| Philip Lake, Tudyah A | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | n/a |
| Philip Lake, Tudyah A | general | SBSmk1, SBSmk2 | 23% | n/a |
| Philip, Philip Lake, Tudyah A | enhanced-general | SBSvk, SBSwk2 | n/a | 9% |
| Schooler | general | BWBSmw1, BWBSwk2 | 23% | 11% |
| Schooler | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |
| Schooler | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | 0% |
| Selwyn | special | BWBSmw1, BWBSwk2 | 34% | 16% |
| Selwyn | special | ESSFwc3, ESSFwk2 | 54% | 28% |
| Selwyn | special | SBSvk, SBSwk2 | 46% | 13% |
| Tudyah B | general | SBSmk1, SBSmk2 | 23% | n/a |
| Twenty Mile | general | BWBSdk1 | 23% | 11% |
| Twenty Mile | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | 9% |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Old Forest Target (min of CLFB) |
|---|---|---|---|---|
| Upper Ospika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk, ESSFwc3 | 42% | 13% |
| Upper Ospika | special | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 42% | 13% |
| Upper Ospika | special | SBSmk1, SBSmk2 | 34% | 16% |
| All Landscape Units | enhanced | BWBS - Deciduous | 13% | 13% |
| All Landscape Units | general | BWBS - Deciduous | 23% | 13% |
| All Landscape Units | special | BWBS - Deciduous | 34% | 19% |

Old forest is defined as greater than 120 years old and mature forest is defined as greater than 100 years old for biogeoclimatic (BEC) units SBSmk1 and SBSmk2. For deciduous leading stands in BWBS BEC units old forest is defined as greater than 100 years old and mature forest is defined as greater than 80 years old. For all other stands and BEC units old forest is defined as greater than 140 years old and mature forest is defined as greater than 100 years old.

## *4.2 Management Assumptions for Timber Production*

The following section outlines the inputs related to timber production.

### 4.2.1 Analysis Units

Forests are composed of stands, which at a very basic level can be described by the species present and their site productivity. As would be expected, stands with similar species and site productivity would also exhibit similar growth and development over time. In order to simplify the modelling of the hundreds of thousands of stands that are found in the Mackenzie DFA, they were aggregated into similar groups called analysis units. The analysis units used in this analysis are the same as those used in TSR 2.

Once the analysis units are defined their attributes are then applied to growth and yield models to specifically calculate the height growth and volume yield over time. Each forest stand or polygon in our dataset is sorted into a unique analysis unit, which then links it to the appropriate yield curve. When these stands are harvested the volume that corresponds to the specific age of harvest is referenced by the model and added to the total harvest volume.

Site productivity represents the ability of any land to produce timber volume. It typically is a function of environment: climate, soil nutrients, and moisture and their effect on tree growth. In forestry, site index as an indicator of site productivity is commonly defined as the height of a site tree at a reference age (50 years).

The yield and height growth functions used in this analysis were identical to the ones used in TSR 2. Growth and yield of natural stands was projected using Variable Density Yield Projection (VDYP) developed by the Ministry of Forest and Range (MoFR). For managed stands managed stands yield tables (MSYT) were used. These were developed using the Table Interpolation Program for Stand Yields (TIPSY) also developed by the MoFR. Table 9 defines the analysis units used in the analysis.

Table 9 - Definition of analysis units

| Analysis unit number and leading tree species | Inventory type groups | Site productivity | Site index range |
|---|---|---|---|
| 1. Balsam | 18-20 | good | =>13 |
| 2. Balsam | 18-20 | medium | 10<= <13 |
| 3. Balsam | 18-20 | poor | <10 |
| 4. Spruce | 21-26 | good | =>16 |
| 5. Spruce | 21-26 | medium | 10<= <16 |
| 6. Spruce | 21-26 | poor | <10 |
| 7. Pine | 28-31 | good | >17 |
| 8. Pine | 28-31 | medium | 14<= <17 |
| 9. Pine | 28-31 | poor | <14 |
| 10. Poplar/Cottonwood | 35,36 | good/medium | >18 |
| 11. Aspen | 41, 42 | good/medium | >18 |
| 12. Birch | 40 | good/medium | >18 |

### 4.2.2 Silviculture Regimes

Table 10 shows what regeneration assumptions were used in the base case of the analysis. A proportion of each analysis unit is assumed to be treated under a particular silviculture regime.

Table 10: Regeneration assumptions by analysis unit

| Analysis unit | Species composition | Regen delay (years) | OAFs (%) | | Regen method | Regen species | Percent (%) | Density initial (sph) |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | | | | |
| 1, 2, 3 | Balsam | 3 | 15 | 5 | Plant | Spruce | 100 | 1400 |
| 4, 5, 6 | Spruce | 3 | 15 | 5 | Plant | Spruce<br>pine | 80<br>20 | 1400 |
| 7, 8, 9 | Pine | 3 | 15 | 5 | Plant | Pine | 100 | 1300 |
| 10, 11 | Poplar/ cottonwood | 3 | 15 | 5 | Natural | Poplar/ cottonwood | 100 | 1400 |
| 12, 13 | Aspen | 3 | 15 | 5 | Natural | Aspen | 100 | 1400 |
| 14, 15 | Birch | 3 | 15 | 5 | Natural | Birch | 100 | 1400 |

### 4.2.3 Existing Managed Stands and Regeneration Assumptions

Existing managed stands are those areas of immature forest where the density (stems per hectare) was controlled, which justifies assigning the stands to managed stands yield tables (MSYT). Stands were randomly chosen to be managed or unmanaged based on the criteria set out in Table 11.

Table 11 - Existing managed stands

| | Area managed/unmanaged (%) | | |
|---|---|---|---|
| | Age 1 - 17 | Age 18 - 25 | Age 26 - 45 |
| Managed | 100 | 60 | 60 |
| Unmanaged | — | 40 | 40 |

### 4.2.4 Utilization Level

The utilization levels define the maximum stump height, minimum top diameter inside bark (dib) and minimum diameter at breast height (dbh) by species and were used in the analysis to calculate merchantable volume.

Table 12 - Utilization levels (reference TSR 2)

| Analysis unit | Utilization | | |
|---|---|---|---|
| | Minimum diameter at breast height (cm) | Maximum stump height (cm) | Minimum top diameter inside bark (cm) |
| All conifer units | 12.5 | 30 | 10 |
| All deciduous units | 12.5 | 30 | 10 |

The deciduous volume in coniferous-leading stands does not contribute to the estimated stand volumes.

### 4.2.5 Minimum Harvestable Ages (MHA)

Minimum harvestable age is the youngest age at which a stand is available for harvesting. In most cases, stands are harvested at age way beyond the minimum harvestable age due to cover constraints, harvest flow constraints or harvest priority. In Mackenzie the minimum harvest criteria is defined using minimum volume per hectare rather than age. The criteria varied depending on district haul zones and logging systems. Table 13 lists the minimum harvestable age by haul zone and harvest method for all species.

Table 13 – Minimum Harvest Criteria

| Haul Zone | Conventional Harvesting | Cable Harvesting |
|---|---|---|
| Near Zone | 140 $m^3$/ha | 200 $m^3$/ha |
| Far Zone | 160 $m^3$/ha | 250 $m^3$/ha |

### 4.2.6 Unsalvaged losses

Unsalvaged losses for the Mackenzie DFA were pro-rated based on the DFA's contribution to the Mackenie TSA THLB.

Table 14 – Unsalvaged Losses (reference TSR 2)

| Cause of loss | Unsalvaged Losses TSA ($m^3$/year) | Unsalvaged Losses DFA ($m^3$/year) |
|---|---|---|
| Fire | 39,900 | |
| Spruce bark beetle | 91 600 | |
| Balsam bark beetle | 40 500 | |
| Mountain pine beetle | 800 | |
| **Total** | **172 800** | **109,849** |

### 4.2.7 Initial harvest rate and stand scheduling rules

The initial harvest rate was set at 1,950,520 $m^3$/year. This consists of Canfor's allocation of 1,082,000 $m^3$, BCTS's allocation of 768,886 $m^3$ and DFA's portion of NRFL of 98,730 $m^3$. In addition, 100,000 $m^3$/year target was set for deciduous harvest from deciduous leading stands. Note that the deciduous harvest target is part of the total target of 1,950,520 $m^3$/year.

The harvest will initially focus on pine leading stands south of Omenica Park and south of the Peace Arm. After the initial prioritization of pine leading stands, the harvest schedule is be based on the relative oldest first rule.

## *4.3 Mountain Pine Beetle*

British Columbia - particularly the interior of the province - is currently under a mountain pine beetle (MPB) infestation. The infestation is epidemic in the Prince George TSA just south of the Mackenzie TSA and DFA. The infestation is not yet severe in the Mackenzie TSA, however, if it were to continue unabated it could threaten most of the mature and near-mature merchantable pine in the TSA. The MPB infestation and its projected spread were included in this analysis.

Mountain Pine Beetle attack assumptions in this study are based on the spatial year 3 results for the provincial level projection of the mountain pine beetle attack (BCMPB3; Eng et al 2006). The BCMPB3 data is advantageous for CSA forecasting because:

- It is the best available projection of how the beetle attack will proceed;
- It is spatial, allowing meaningful projections of other indicators that are spatially variable;
- Most of the assumptions about beetle are built into the projection, which reduces the research involved in creating and seeking approval for new assumptions.

This section briefly describes the BCMPB3 data and how it was incorporated into the CSA forecasting project.

#### 4.3.1.1 Year 3 BCMPB data

All data was provided on a 16-ha grid and is complete for the province. The "no harvest" scenario was used in forecasting MPB spread and impact. This scenario gives cumulative percent pine killed in each grid cell *assuming that there is no harvesting after 2005*. The projection is annual and proceeds until 2024, by which time most of the susceptible pine volume is killed. The data includes some of the input data such as age, ITG, total volume, pine volume, susceptibility in grid form.

#### 4.3.1.2 Application in CSA Forecasting

There were two main challenges in converting the BCMPB data into a form that we could use in the CSA forecasting project:

- Getting the grid data into the resultant polygons.
- Converting "% killed" to "% volume lost" using shelf life curves.

#### 4.3.1.3 Getting the grid data into the resultant polygons

Beetle attack in the BCMPB projection only occurs in susceptible grid cells. Simply rating the grid data onto the resultant is not sufficient for our purposes because it will "orphan" susceptible resultant polygons that occur in non-susceptible grid cells. There is also the inverse problem that pine could be killed in non-susceptible stands.

We classified resultant polygons into susceptible and non-susceptible using the same criteria used to classify the grid. Then, susceptible polygons were assigned the attack sequence of the nearest susceptible grid cell (within some tolerance: e.g. 1km). This process is illustrated in Figure 1.

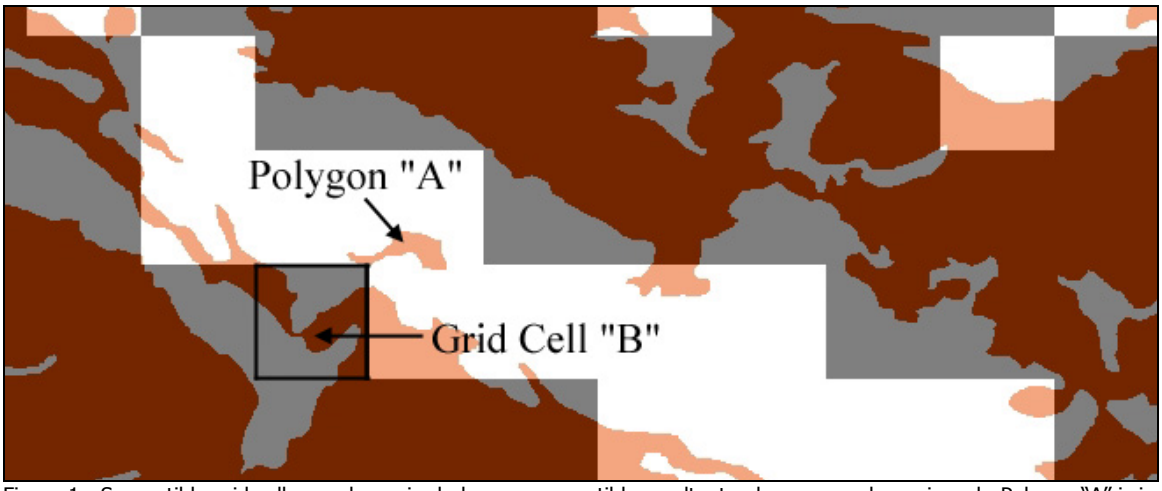


Figure 1 - Susceptible grid cells are shown in dark gray: susceptible resultant polygons are shown in red. Polygon "A" is in a non-susceptible grid cell. Our method assigned this polygon the attack sequence of grid cell "B."

#### 4.3.1.4 Converting "% killed" to "% volume lost" using shelf life curves

Once the BCMPB grid attributes were assigned to susceptible resultant polygons, each polygon had:

- An attack chronosequence of % pine volume killed (from BCMPB)
- A shelf life curve that varies depending on general climate categories ("Dry", "Moist", and "Wet" BGC subzones; also from BCMPB).

The chronosequence and shelf life curve were combined to produce a curve of percent pine removed from timber supply availability ("loss curve"). The loss curves were unique to each grid cell, and so were simplified to produce a dozen or so general loss curves. The general loss curves are the inputs to FSOS.

#### 4.3.1.5 Modeling beetle attack in the Forest Estate Model

A hypothetical loss curve is shown in Figure 2. This loss curve would be applied to the pine volume of all susceptible resultant polygons covered by the associated BCMPB grid cell.

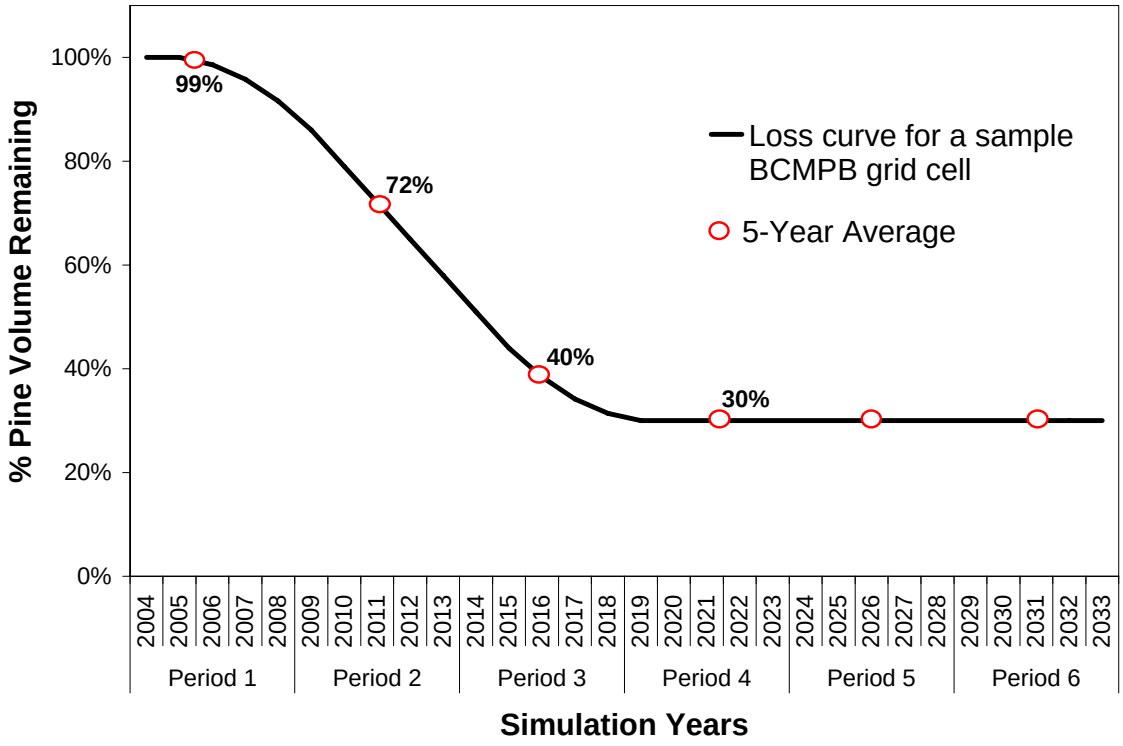


Figure 2: Volume loss curve for a hypothetical BCMPB grid cell.

Figure 3 gives an example of how the loss curve would be applied in a single resultant polygon. The hypothetical stand in this example contains a minority component of pine. It is 70 years old in 2004 (the start of the analysis). The yield adjustment for mountain pine beetle attack is 99% in 2004, meaning that the pine component of the stand is reduced by 1%. At age 75, the merchantability of some of the pine volume in the stand has begun to decrease, and the yield adjustment has dropped to 72% of the original merchantable pine volume. By 2019, at age 85, the shelf life of the attacked wood in the stand has passed, and the 30% pine component that is assumed to be unattacked continues to grow normally from this point on. The adjusted yield table would look different for a stand that is 100 years old in 2004, because the successive reductions to the yield table would begin at 100 years rather than at 70 years stand age.

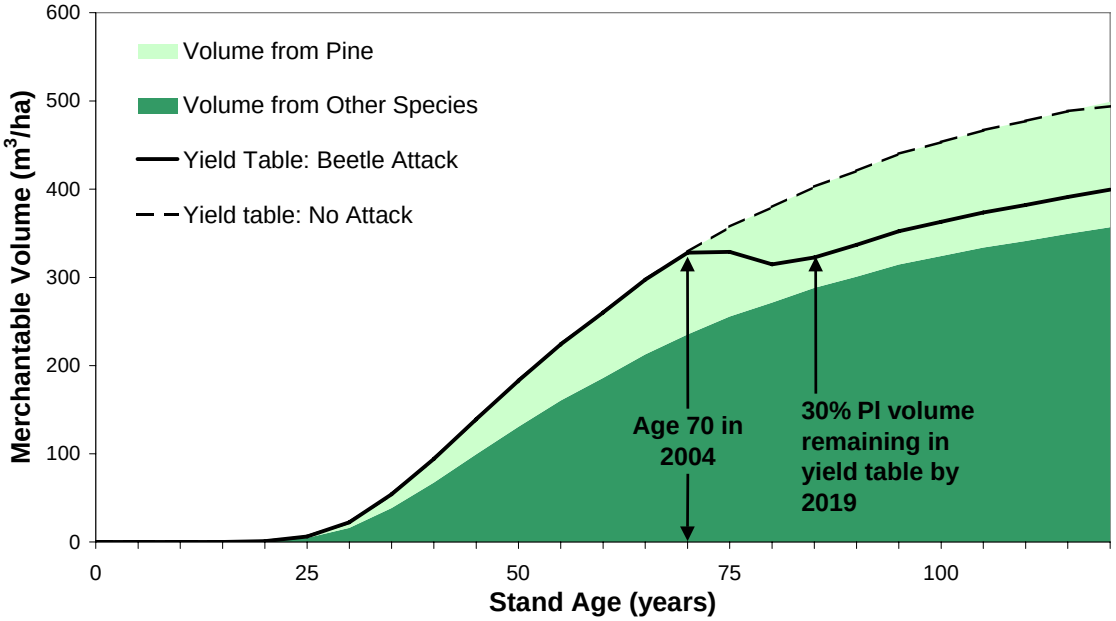


Figure 3: example of how the yield adjustment curves are applied to the yield tables of susceptible stands in the timber supply analysis.

#### 4.3.1.6 Shelf Life

The merchantability of beetle-killed wood remains an important uncertainty for projecting the timber supply impact of the MPB epidemic. The status quo shelf life assumption in most timber supply analyses to date have assumed 100% retention of merchantability for 10 years, after which the volume is no longer usable (BC MoF 2004; Foresite 2004). However, the year 3 BCMPB assumptions indicate that 10 years is probably an optimistic shelf life assumption for most TSAs.

The BCMPB assumptions provided "pessimistic", "conservative", and "optimistic" shelf life assumptions for "Dry", "Moist", and "Wet" groups of BGC subzones (Figure 4). An important distinction was made between shelf life for sawlogs and "alternative" volume (pulp, OSB, fuel, etc.). The conservative assumption is that all volume is available for sawlogs and alternative uses for 3-5 years after attack. No volume is available for sawlogs after 5-7 years, but decreasing volumes for alternative uses are available for 10-15 years after attack.

BCMPB "conservative" shelf life assumptions were used for the purposes of this project. The curves were applied to appropriate dry, moist, and wet subzones.To approximate the limitations on usage of beetle-killed wood for alternative uses, we used the average of the shelf life curves for sawlogs and alternative products.

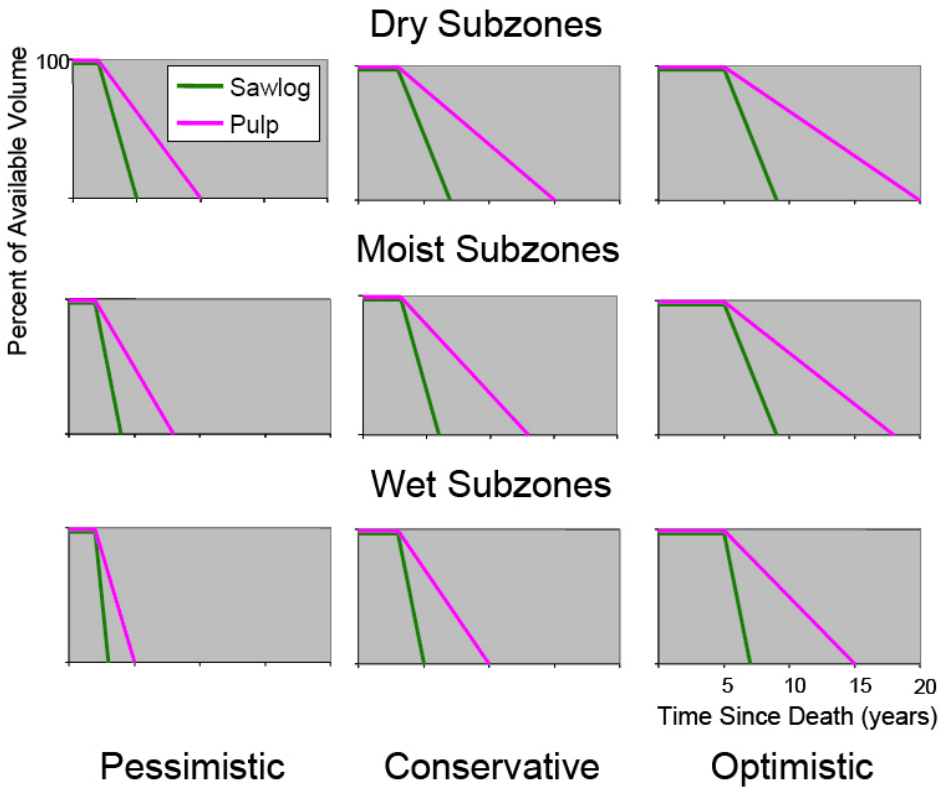


Figure 4: BCMPB shelf life assumptions for broad groups of climates. Shelf life is differentiated between sawlogs (green) and alternative products (red).

#### 4.3.1.7 Regeneration Delay

Unsalvaged stands with a low to moderate percentage of pine were assumed to continue to grow as mature stands. However, stands with a high component of pine were assumed to break up and regenerate naturally after beetle attack with a 10 year regeneration lag.

## *4.4 Natural disturbance in the non-timber harvesting land base*

A disturbance function was used in the non-timber harvesting land base to prevent it from continually aging and providing a disproportionate and often improbable amount of old forest conditions to satisfy landscape biodiversity requirements.

The document *Modeling Options for Disturbance Outside the THLB – Working Paper* provides direction for disturbing areas of the landscape outside of the THLB. There are a variety of possible approaches to applying a disturbance in the contributing non-harvesting land base. While each approach has its strengths and weaknesses there remains a significant amount of uncertainty as to what the most appropriate methodology would be.

The age reset by variant for the crown forested land base methodology was used in the analysis. The methodology (*Modeling Options for Disturbance Outside the THLB – Working Paper*) is as follows (Table 15):

Establish the age of old ((*Draft Non-Spatial Order Establishing Landscape Biodiversity Objectives for Mackenzie Forest District*) and estimated minimum target % of old seral (*Landscape Unit Planning Guide*

*Appendix 2*) that would be expected. Calculate a rotation age based on the age distribution described in step 1 (target age/(1-target %).

This analysis was completed on the BEC unit since the variants and NDTs represent the same groupings. In each BEC unit, when an area in the non-harvesting land base reaches the effective rotation age, as shown in Table 15, a 'disturbance' is modeled and the area goes though succession with the age set to 0.

Table 15 - Minimum target area to be disturbed annually in each BEC variant

| | | a | b | c |
|---|---|---|---|---|
| BEC Unit | NDT | Min. Target % Old | Age of Old | Effective Rotation Age (c/(1-a)) |
| ESSF wc 3, ESSFwcp, ESSFwk2 | 1 | 19 | 140 | 173 |
| ESSFmc, ESSFmcp, ESSFmv2, ESSFmv3, ESSFmv4, ESSF mvp, SBSvk, SBSwk1, SBSwk2, SWBmk, SBBmks | 2 | 9 | 140 | 154 |
| SBSmk1, SBSmk2 | 3 | 11 | 120 | 135 |
| BWBSdk1, BWBSmw1, BWBSwk2: Conifer | 3 | 11 | 140 | 158 |
| BWBSdk1, BWBSmw1, BWBSwk2: Deciduous | 3 | 11 | 100 | 112 |

# 5 Land Base Statistics

The next 3 figures provide some basic land base statistics for the Mackenzie DFA. Figure 5 shows the age class distribution for the CFLB. The DFA contains a significant amount of old forest. The current definition for old forest in Mackenzie is 120 or 140 years depending on the landscape unit and bec variant. Currently 60% of the CFLB is older than 120 years and 71% is older than 140 years.

Figure 6 shows the age class distribution by leading species group for the THLB within the Mackenzie DFA. As expected balsam and spruce stands are the oldest stands in the THLB. Pine stands occupy the majority of the THLB between ages 31 and 130.

Figure 7 illustrates the current species distribution in the THLB. The species distribution looks somewhat different depending whether the land base is classified by leading species or by percent in the forest inventory. However, in both cases pine is the most common species in the DFA. 41.4% of the stands in the THLB are pine leading. As per the inventory data 36.9% of the THLB is occupied by pine species. Next largest group is spruce with 38.0% or 35.3% depending on the classification method. Balsam is third (15.1% or 19.5%) and Aspen last (4.4% or 6.4%).

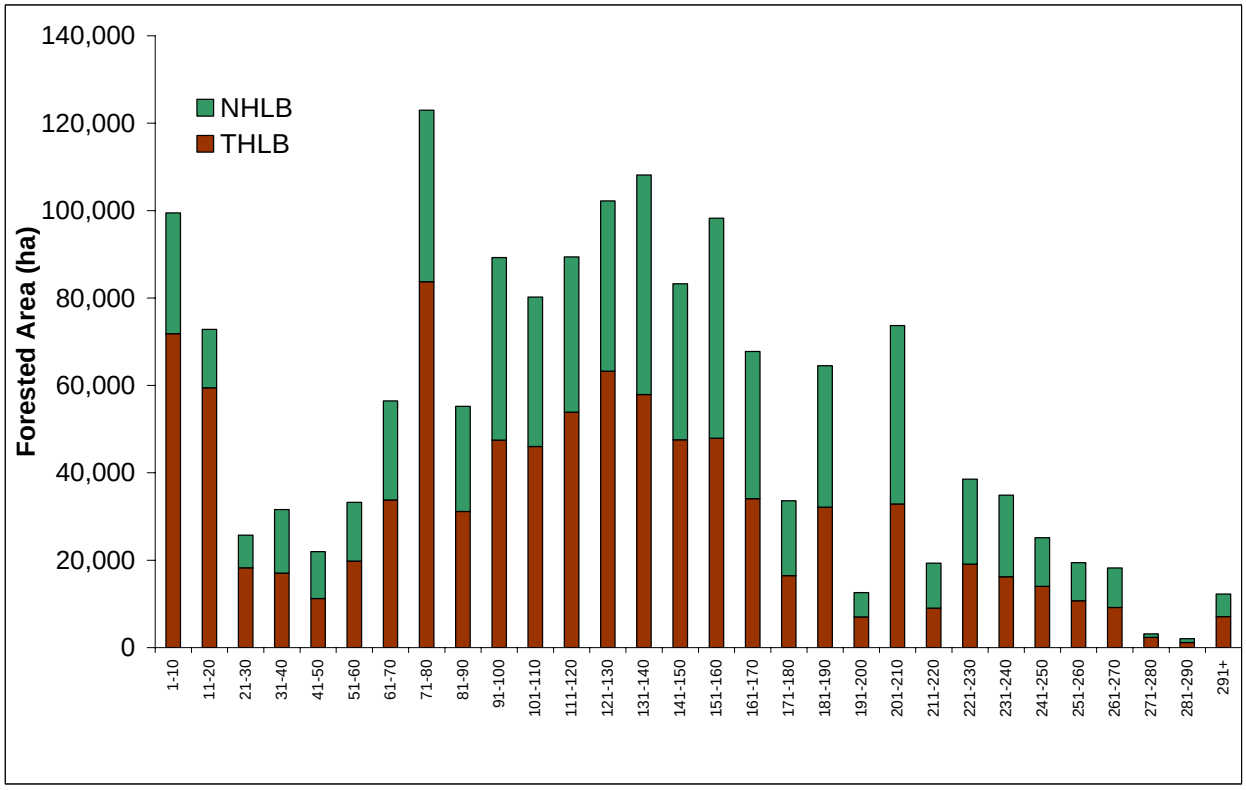


Figure 5 – Age class distribution in the Crown forested land base (CFLB).

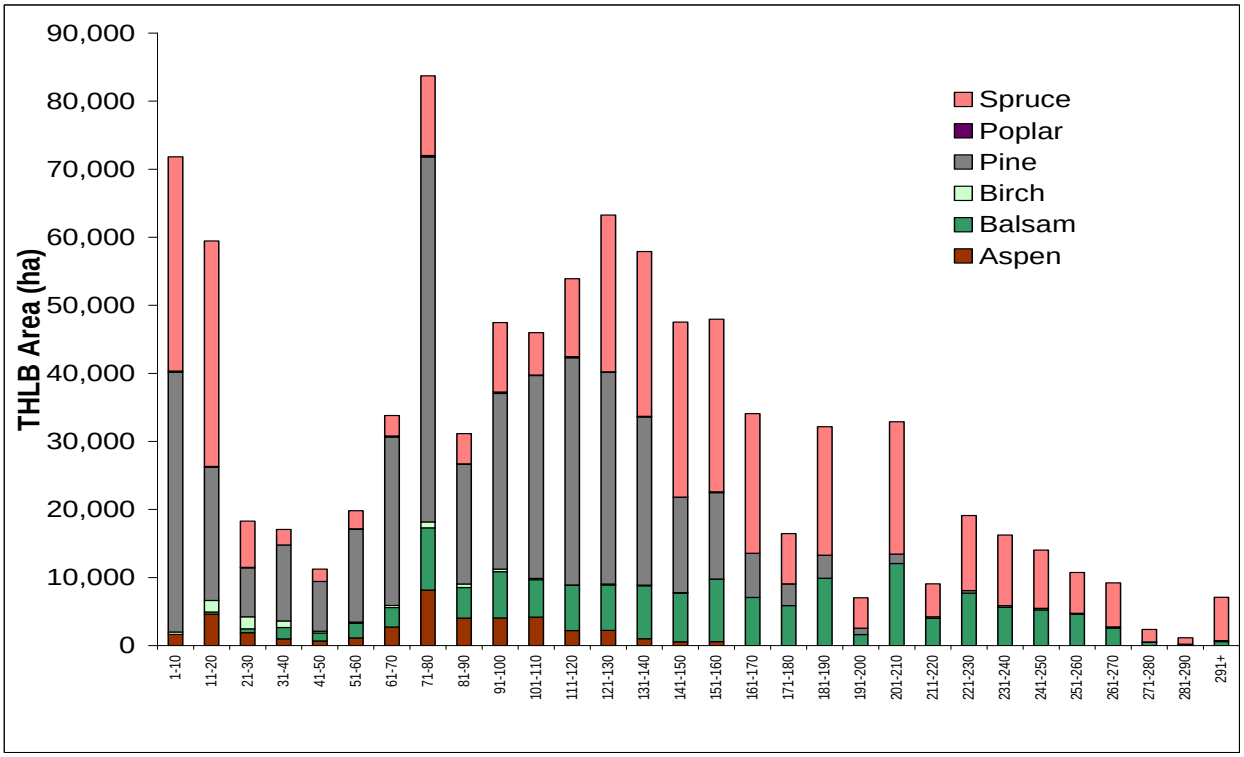


Figure 6 – Age class and species distribution in the timber harvesting land base (THLB).

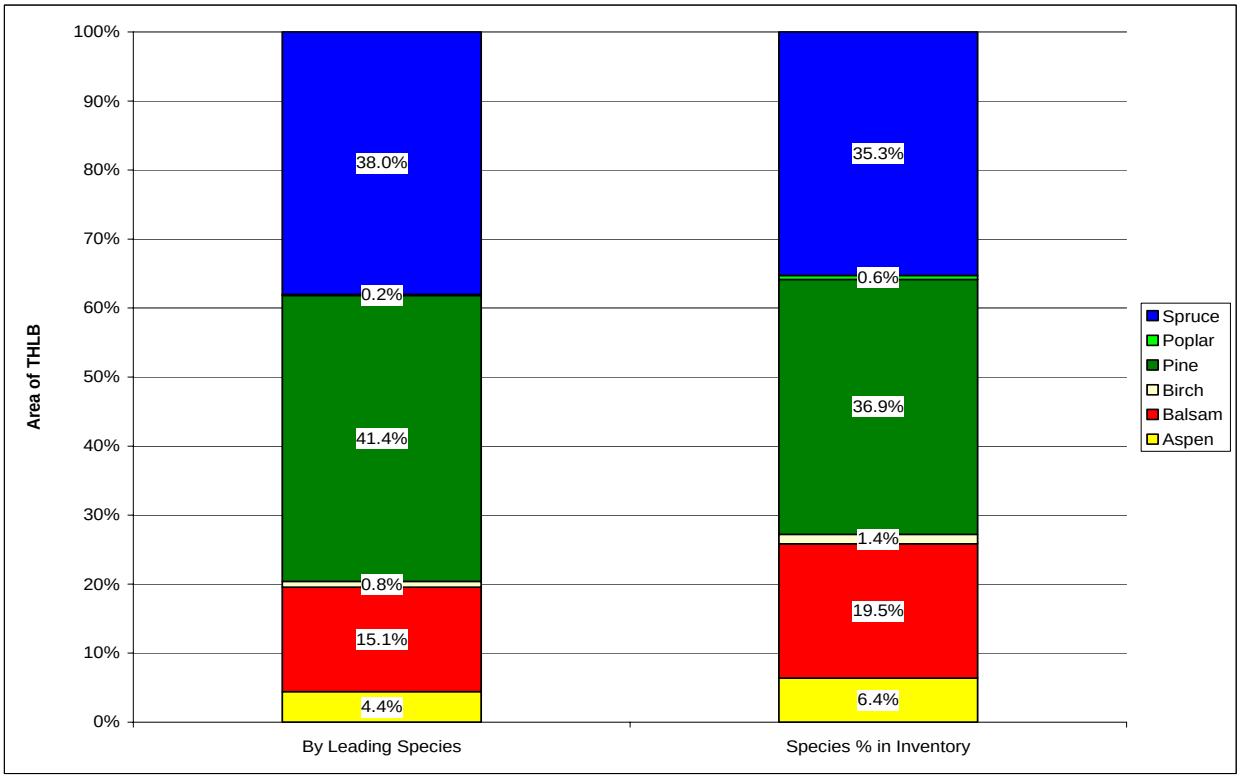


Figure 7 – Species distribution in the THLB by leading species and by species % in the inventory file.

# 6 Scenario Descriptions

The following scenarios were developed with Canfor and BCTS with the input from the Mackenzie DFA public advisory group (PAG).

1. Base Case
   Objective: to present a forecast that approximates current forest management by which all other scenarios can be compared.

   - Current management as per the most recent timber supply analysis, in this case TSR 2 plus;
   - Mountain pine beetle epidemic assumed to continue until 2010;
   - Natural disturbance in non-contributing land base;
   - Ungulate winter range – draft and approved;
   - Pine harvest priorities;
   - Visually effective green-up height.

2. Habitat Richness Emphasis
   Objective: to present a forecast that simulates the impact of spatially explicit old growth management areas (OGMA) in the land base. The assumptions were different compared to the base case in that:

   - 58% of the old growth requirements had to be met from the THLB. The 58% represents the current relationship between CFLB and THLB, i.e., the area of THLB is 58% of the CFLB. The additional polygons for these reserves were selected using the oldest and largest first rule;
   - WTP retention was increased to 20% in current pine leading stands to account for Chief Forester's Large Scale Salvage Operations Guidance.

3. Species Composition
   Objective: to present an alternate forecast that would utilize a more diverse species composition in its regeneration assumptions:

   - All balsam stands are assumed to regenerate 50/50 to natural balsam and planted spruce, rather than 100% planted spruce as in the base case;
   - Medium spruce sites are assumed to regenerate 80/20 to planted spruce and natural balsam, rather than 80% planted spruce and 20% planted pine as in the base case;
   - Poor spruce sites are assumed to regenerate 70/30 to planted spruce and natural balsam, rather than 80% planted spruce and 20% planted pine as in the base case.

4. Caribou Recovery
   Objective: to investigate the impact of applying caribou recovery planning requirements for Wolverine and Scott herds (Takla and Chase herds are located outside of the DFA):

   - **Wolverine Herd Preferred Habitat Pine Lichen Winter Range and Post Rut Range:** within each herd area, harvest 50% ± 10% on a 140 year rotation, then no harvesting in preferred area for 70 years. Must complete harvest within 20 years from the first harvest;

   - **Wolverine and Scott Herds Preferred Habitat for High Elevation Winter Range:** within each herd area, maintain at least 12% (Wolverine) and 10% (Scott) of the herd area >120 years and >15 meters.

     Minimum % = (lower natural range of variability / potential range area)*100. Potential range area listed in Table 4 (pg 26) of Recovery Action Plan. Lower natural range of variability was provided by Scott McNay.

Table 16 – Target for Caribou High Elevation Winter Range

| Herd | Lower Nat Range of Variability | Potential Range Area | Min % |
|---|---|---|---|
| Wolverine | 9,141 ha | 78,785 ha | 12% |
| Scott | 2,556 ha | 26,069 ha | 10% |

- **Wolverine and Scott Herds Preferred Calving and Summer Range:** within each herd area, maintain at least 23% (Wolverine) and 16% (Scott) of the herd area >120 years and >15 meters.

  Minimum % = (lower natural range of variability / potential range area)*100. Potential range area listed in Table 4 (pg 26) of Recovery Action Plan. Lower natural range of variability was provided by Scott McNay.

Table 17 – Target for Caribou Calving and Summer Range

| Herd | Lower Nat Range of Variability | Potential Range Area | Min % |
|---|---|---|---|
| Wolverine | 111,754 ha | 484,830 ha | 23% |
| Scott | 32,312 ha | 204,831 ha | 16% |

5. Non-Timber Economic Emphasis
   Objective: to investigate the impact of extending the management for visual quality to areas that have not been officially designated as scenic areas.

   - Utilize the vli_lrdw, tse_dmk and the visual landscape inventory coverage used in base case (vli_dmk);
   - Apply a visually effective green-up requirement within 200 metres for the following roads: Thutade FSR and the old road through Manson Creek to Germansen Lake.

6. Non-Timber Economic Emphasis – Manual Brushing
   Objective: to investigate the impact of extending the management for visual quality to areas that have not been officially designated as scenic areas plus manual brushing, instead of chemical treatments.

   - Utilize the vli_lrdw, tse_dmk and the visual landscape inventory coverage used in base case (vli_dmk);
   - Apply a visually effective green-up requirement within 200 metres for the following roads: Thutade FSR and the old road through Manson Creek to Germansen Lake.
   - Double the regeneration lag due more brush competition.

7. Worst Case Forest Health, Pine Beetle
   Objective: to investigate the impact of the predicted worst case MPB scenario.

   - Apply mountain pine beetle epidemic criteria to 2020 as per the Provincial Level Projection of the Current Mountain Pine Beetle Outbreak, April 2006.

8. Worst Case Forest Health, Pine Beetle, other Beetles and Fire
   Objective: to investigate the impact of the predicted worst case MPB scenario and the impact of other beetles.

- Apply mountain pine beetle epidemic criteria to 2020 as per the Provincial Level Projection of the Current Mountain Pine Beetle Outbreak, April 2006
- Increase spruce and balsam bark beetle outbreaks and fire. Double unsalvaged losses after they have been pro-rated to the DFA from the TSA.

9. Worst Case Forest Health, Emphasis on Regenerating Stands
   Objective: to investigate the impact of more mortality and failure in regenerated areas.

   - For pine leading analysis units, increase OAF 1 to 20%.

# 7 Forest Simulation and Optimization System (FSOS)

Model Name: FSOS

Model Developer: Dr. Guoliang Liu

Model Development: UBC, Hugh Hamilton Limited, Forest Ecosystem Solutions Ltd.

Model Type: Landscape Design Model

FSOS (Forest Simulation Optimization System) uses C++ programming language and can be run on a PC with standard operating systems. The model interfaces directly with Microsoft Access for data management. Although FSOS has both simulation and heuristic (pseudo-optimization) capabilities, only the time-step simulation mode was used in this analysis. Time-step simulation grows the forest based on growth and yield inputs and harvests resultant polygons based on user-specified harvest rules and constraints that cannot be exceeded. Using "hard" constraints and harvest rules instead of targets (as would be applied in the heuristic mode of FSOS) gives results that are repeatable and more easily interpreted.

A formal comparison of FSOS and FSSIM using a benchmark dataset was performed and submitted to the Ministry of Forests Timber Supply Branch in 1998 (Hugh Hamilton Limited 1998a). Acceptance notification correspondence was provided to Dave Waddell (currently Systems Forester, MoF Development & Policy Section) in September 1998, authorizing FSOS for use in Timber Supply Analysis to support AAC determinations in British Columbia.

FSOS has been used on over 24 forest management units (TFLs and TSAs) from small (<15,000 ha) to very large (> 9 million ha) forests throughout BC, Alberta, Manitoba and Ontario. Some of the management units that FSOS have been used in BC include: TFL 3, TFL 18, TFL 26, TFL 37, TFL 53, Soo TSA, Sunshine Coast TSA, Queen Charlotte TSA, Kingcome TSA and Kalum TSA. FSOS has been used directly in the preparation of 5 timber supply analysis that have been accepted by the chief forester in British Columbia.

# 8 Modeled Indicators

Based on the SFM indicator matrix only a subset of indicators was modeled. Many of the indicators in the matrix are not "modelable" with a forest level model and are therefore excluded from this list. Other measures may be "modelable" but are limited in terms of data available or knowledge of how these data change over time. As such, they are also excluded at this time. There should be an ongoing effort to improve the knowledge and data associated with all indicators and measures so that we can incorporate them into future analyses and forecasting. Some of the indicators and measures while included in the analysis may only apply as a static reduction and do not change over time. Even so, these features remain relevant to this project and are described in Table 18.

Table 18: Indicators and Measures modelled in the Scenario Forecasting

| Indicator | Forecasted and included in Scenarios | General Report | Modeled Target |
|---|---|---|---|
| Percent area of old and mature+old seral stage by landscape unit group and BEC variant for CFLB within the DFA. | Yes | Report forecasting old forest over time. | Yes |
| Percent of interior old forest by landscape unit group and BEC variant for CFLB within the DFA. | Yes | Report forecasting old interior over time. | No – only reporting. |
| The amount of established landscape-level biodiversity reserves within the DFA. | Yes | Assumed static as harvesting not allowed. | No - input variable/constraint |
| Percent productive forest by BEC variant represented within the Non-harvestable land base. | Yes | Assumed static as harvesting not allowed. | No - input variable/constraint. |
| Percent area by patch size class by landscape unit group and Natural Disturbance Types. | Yes | Report forecasting over time | No – only reporting. |
| Percentage of cutblocks that meet or exceed wildlife tree patch requirements. | Yes | Assumed static as harvesting not allowed. | No - input variable/constraint. |
| Trend toward unmanaged species composition on managed stands by BEC zone on the THLB. | Yes | Report forecasting over time. | Yes – one scenario attempts to model. |
| The percentage of forest operations consistent with approved provincial Caribou Ungulate Winter Range requirements. | Yes | Assume static | No – input variable/constraint. |
| Variance between average preharvest and post harvest Site Index (at Free Growing) by inventory type group for cutblocks. | Yes | Assume static | No - assume no change. |
| Area of THLB converted to non-forest land use through forest management activities. | Yes | Assume as per netdown assumptions. | No – input variable. |
| Actual harvest volume compared to the apportionment across the DFA over each 5 year cut control period. | Yes | Report forecasting. | No – only reporting predicted harvest volume. |

| Indicator | Forecasted and included in Scenarios | General Report | Modeled Target |
|---|---|---|---|
| Employment supported by each sector of the local economy (actual and percentage of total employment) | Yes | Report total employment due to harvesting only. | No – only reporting. |
| The percentage of forest operations consistent with visual quality requirements as identified in operational, tactical and/or site plans. | Yes | No report. | No - assume that visual quality constraints reflect indicator. |
| Percentage of operations consistent with visually effective green-up buffer along roads as identified in the Mackenzie LRMP. | Yes | No report | No - assume that green-up constraints in model reflect indicator. |

# 9 Base Case Results

## *9.1 Harvest Forecast*

Figure 8 illustrates the harvest forecast for the base case. As per Figure 8, after maintaining the initial harvest rate of 1,951,446 $m^3$/year for 5 years, the harvest rate can be increased to the long-term harvest level of 2,188,965 $m^3$/year by year 15. Note that while the initial harvest rate was set to reflect the allocation of the AAC within the TSA and subsequently DFA, the timber supply in the DFA would have allowed for the long-term harvest rate from the beginning of the planning horizon resulting in a flat-line timber supply.

Both Figure 8 and Figure 9 illustrate the harvest forecast for the deciduous leading stands in the DFA. The target harvest rate of 100,000 $m^3$ annually was only met during the first 5 years, after which the harvest had to be reduced to the long-term harvest level of approximately 51,500 $m^3$ per year. This may indicate that the supply of deciduous timber in the DFA is not as high as expected. However, the following should be considered:

- The modeling included only deciduous leading stands. No deciduous volumes mixed within conifer stands were considered.
- Growth and yield data for deciduous stands is incomplete. For this reason, it is assumed that all future deciduous stands grow at the same rate as the current deciduous stands. This approach may be conservative.

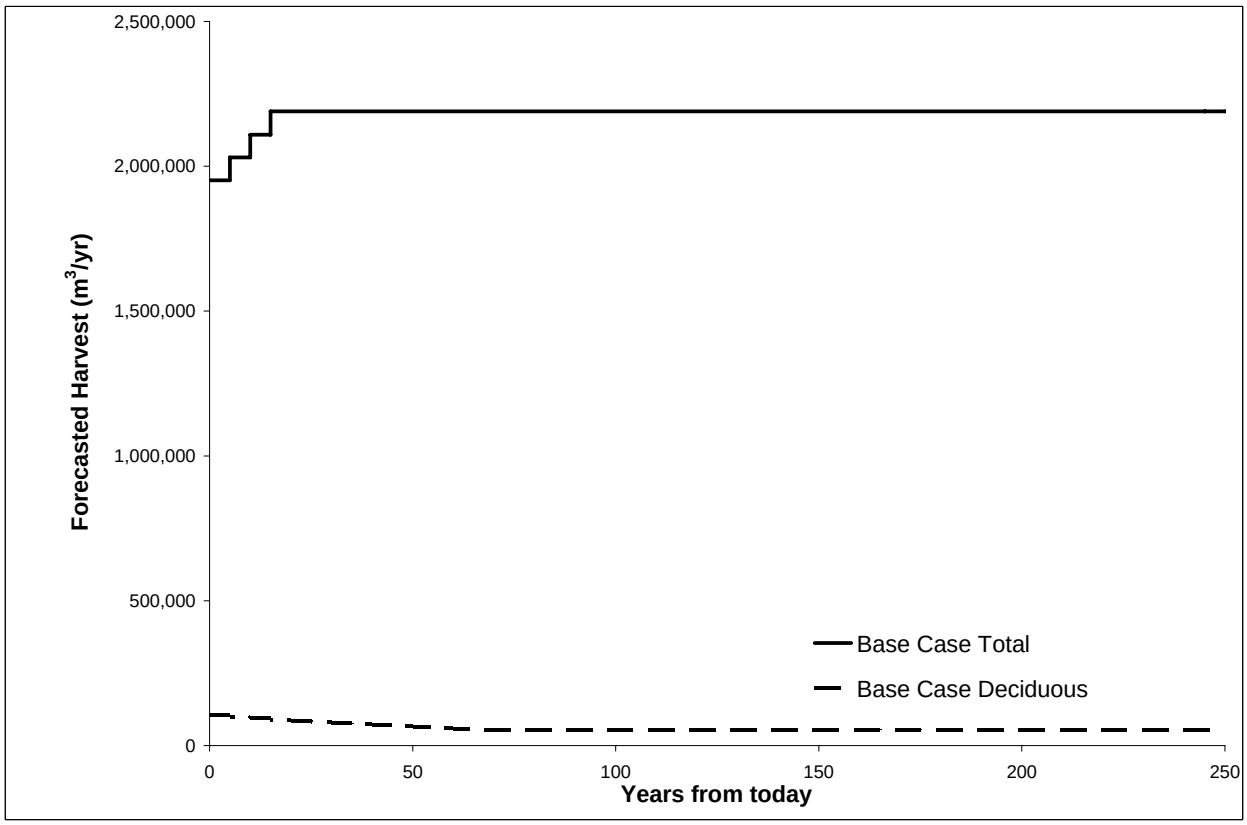


Figure 8 – Base Case timber supply forecast.

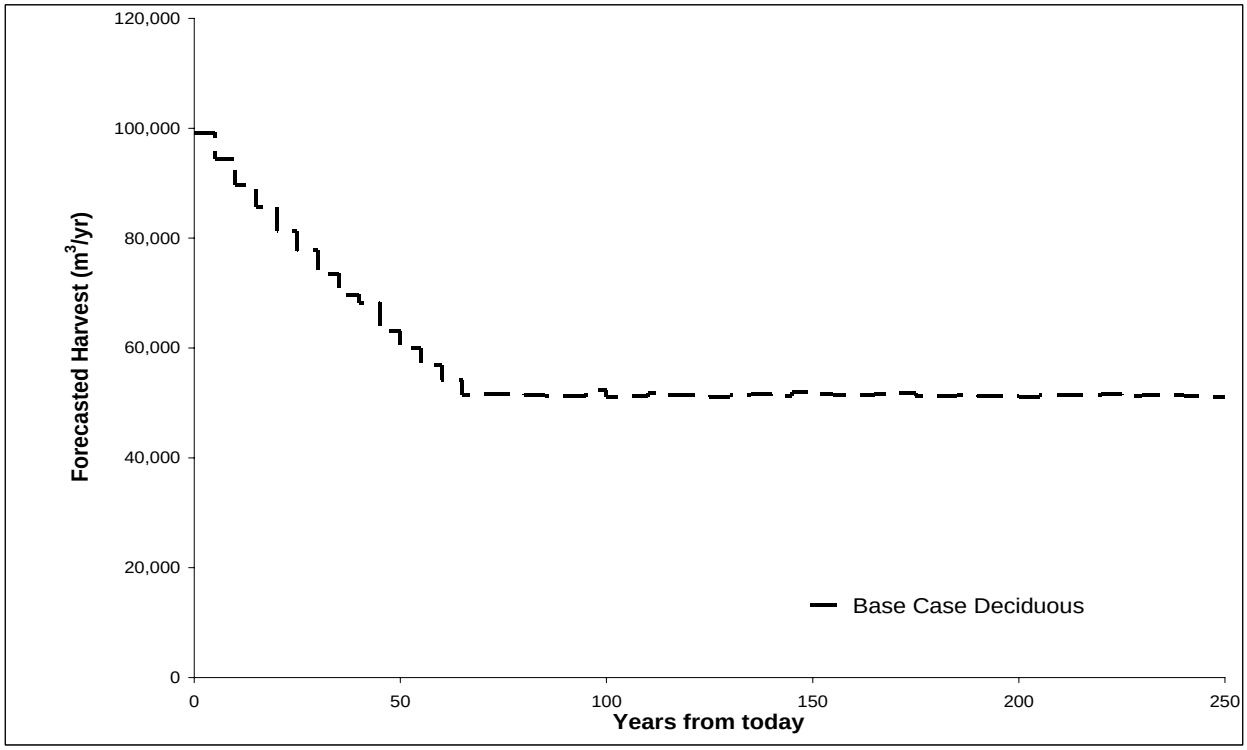


Figure 9 – Base Case timber supply forecast, deciduous leading stands.

Figure 10 shows the predicted harvest by species group; harvest is concentrated on existing pine stands to deal with the spreading MPB infestation. After most of the existing pine is harvested the timber supply depends on existing spruce leading and balsam leading stands (years 40 to 80).

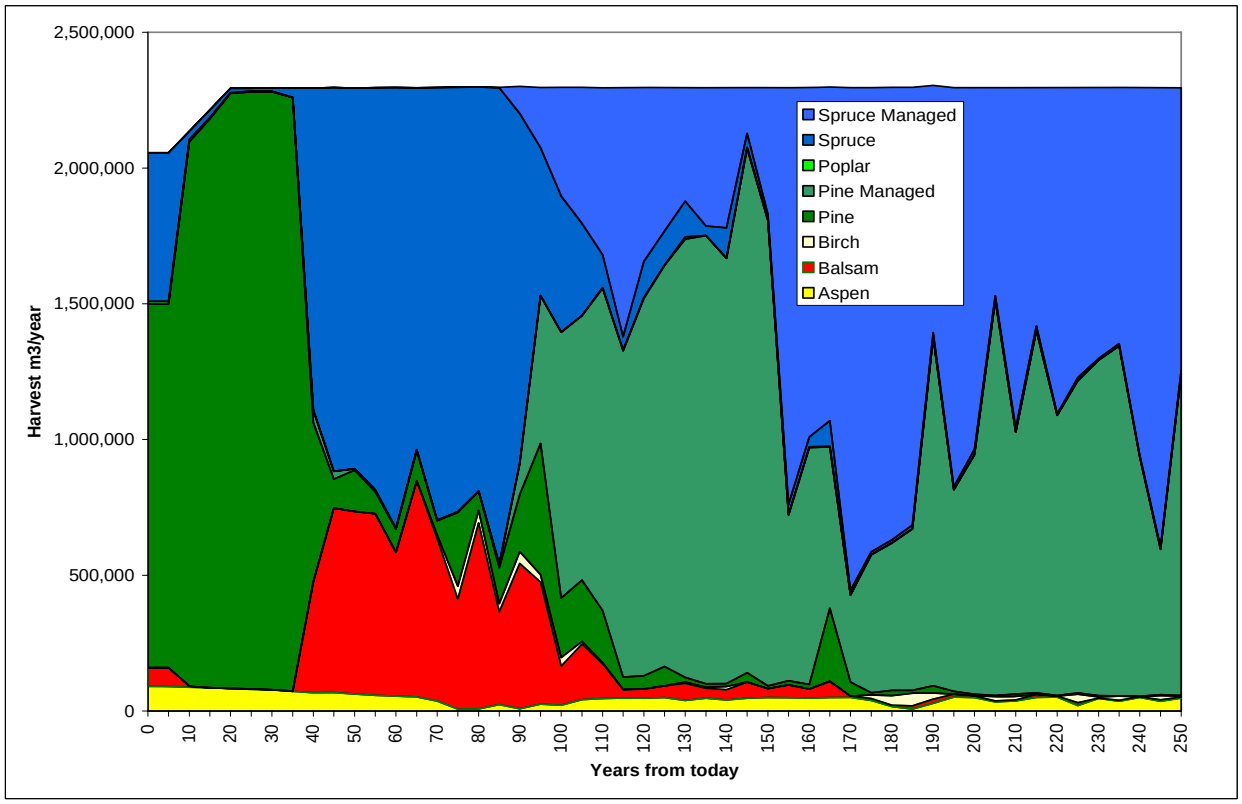


Figure 10 – Base Case harvest forecast by species group.

The growing stock for the base case is shown in Figure 11 and Figure 12. The long-term growing stock is maintained at a reasonably constant level starting around year 140. Figure 12 illustrates how the growing stock is predicted to be divided by different species groups over time. In the base case the share of pine and spruce leading stands of the total growing stock is predicted to increase over time, mainly at the expense of balsam leading stands.

The average harvest volume per hectare (Figure 13) for the base case starts at 270 $m^3$/ha. It reaches its lowest point of 255 $m^3$/ha at year 10, after which it slowly starts to increase. This trend is contrary to many timber supply situations, where the relative oldest first or oldest first harvest rules usually direct harvesting into oldest and higher volume stands. It is not the case here, because at the beginning of the planning horizon the harvest is focused on the pine leading stands regardless of their age (60 or older) due to the MPB infestation.

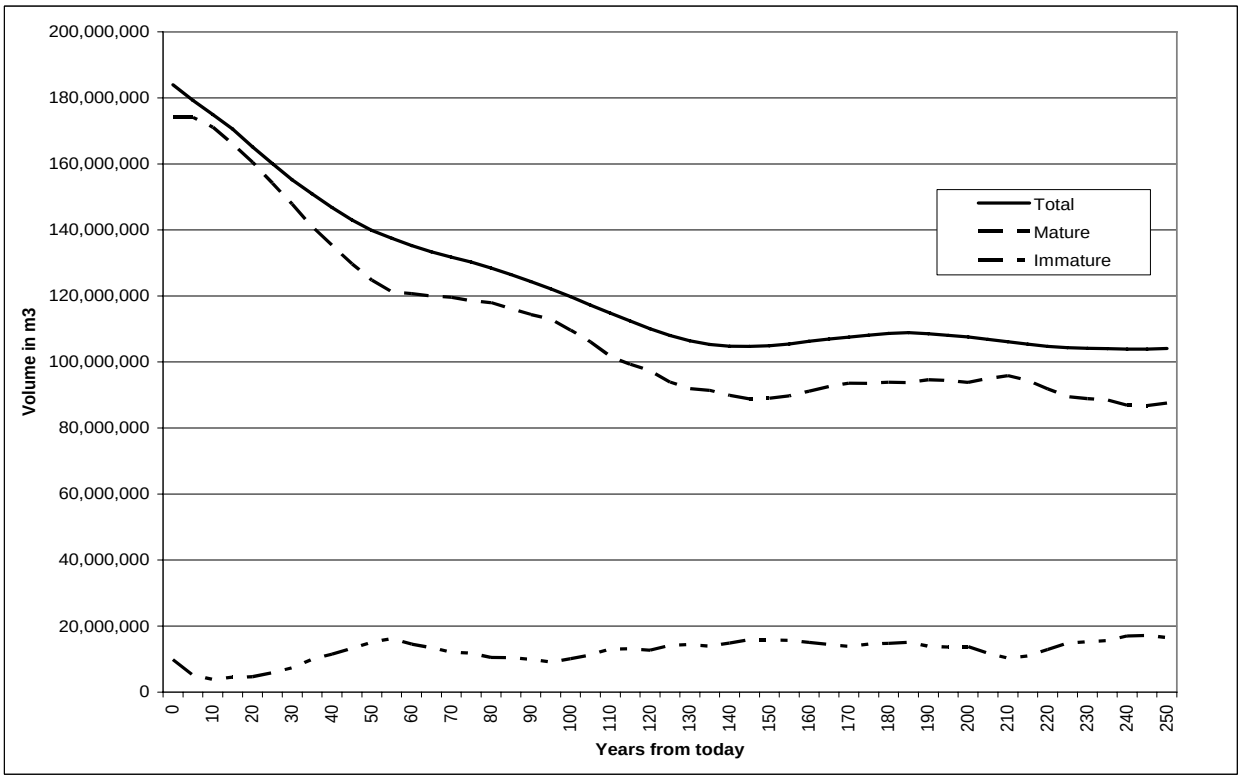


Figure 11 – Forecasted growing stock for the base case.

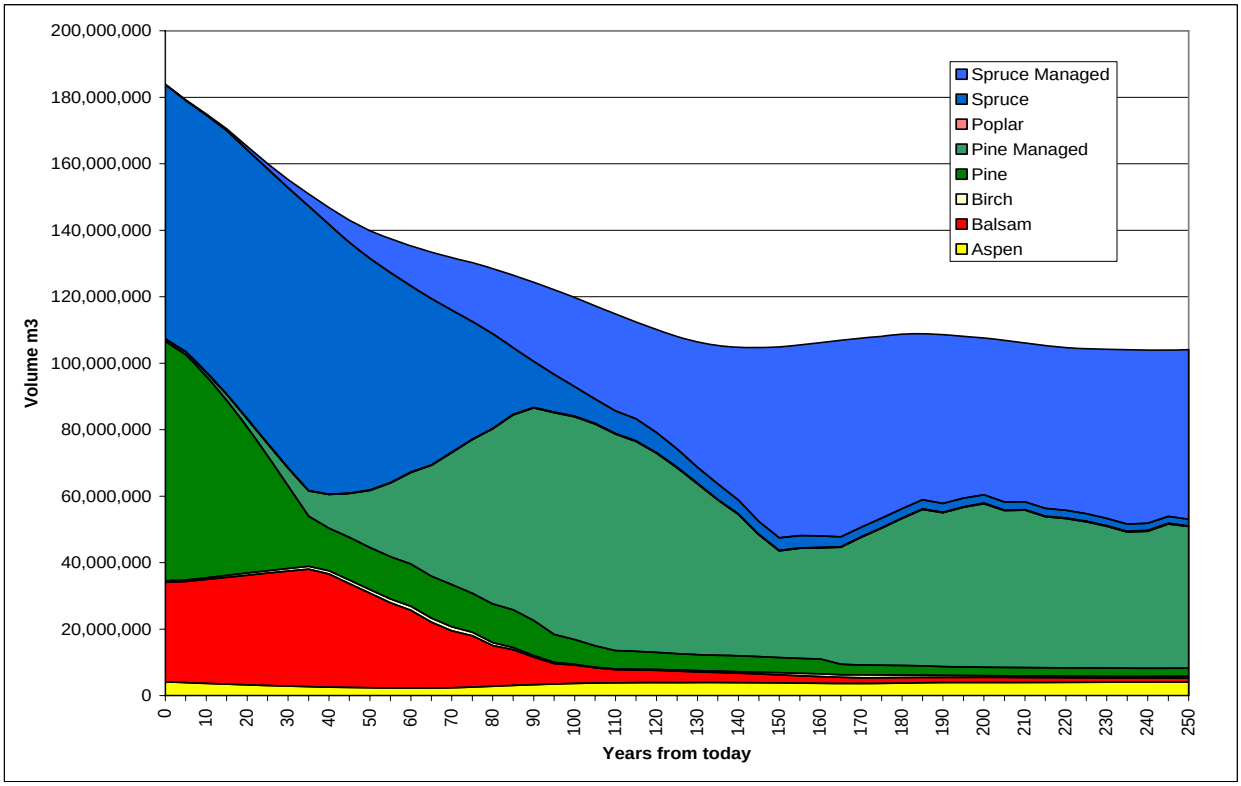


Figure 12 – Forecasted growing stock for the base case by species group.

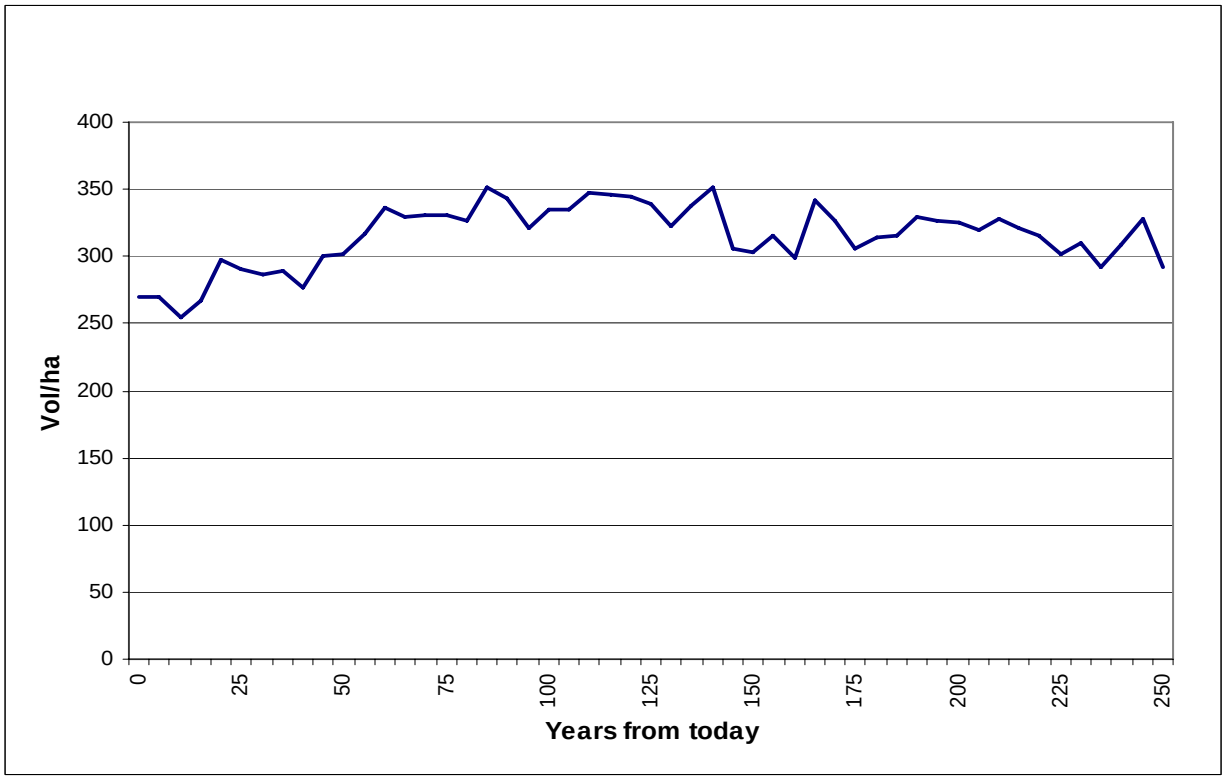


Figure 13 – Forecasted average harvest volume per hectare for the base case.

The trend for the average harvest age is shown in Figure 14. The priority on the harvest of pine results in the harvest of relatively young stands at the beginning of the planning horizon. The older stands in the land base are harvested between years 50 and 95 when the average harvest age reaches nearly 250. In the long term the average harvest age remains between 100 and 120.

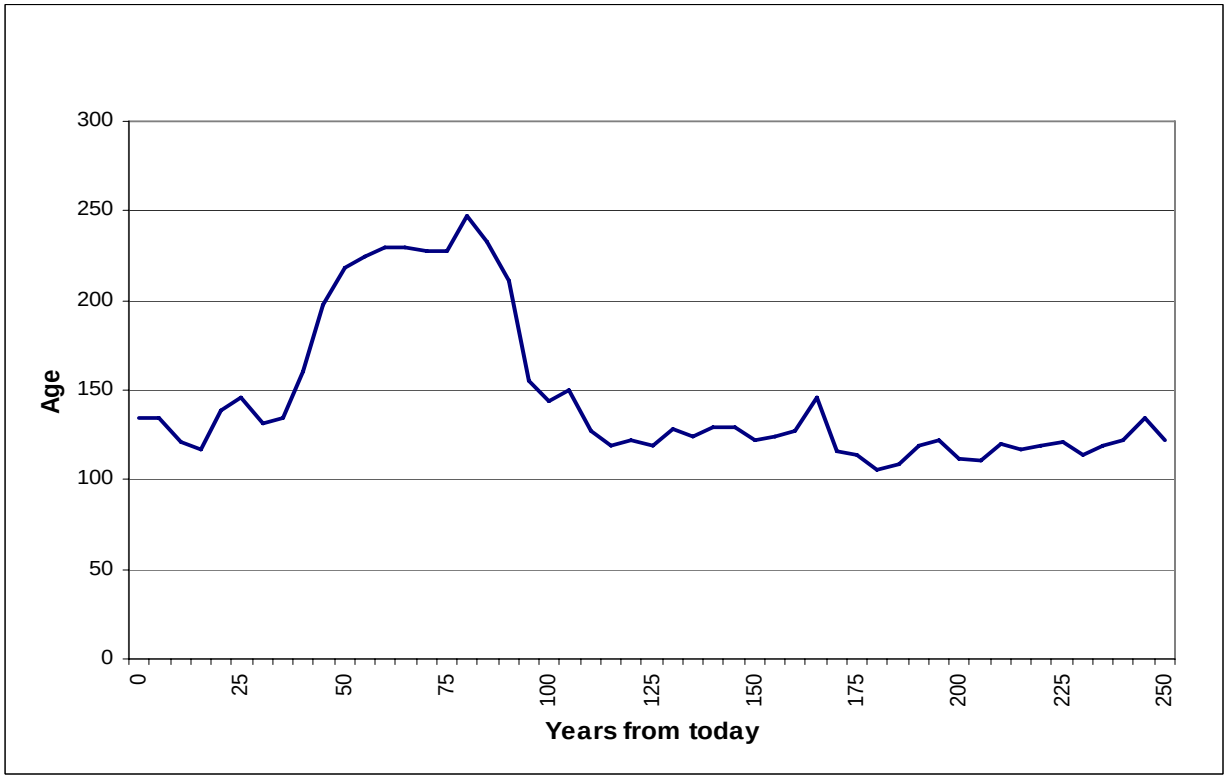


Figure 14 – Forecasted average harvest age for the base case.

## *9.2 Seral Targets*

Table 19 illustrates the achievement of mature and old targets within the DFA. Most targets are currently met and continue to be met throughout the planning horizon. Note that those landscape units with very high targets, for mature and old seral stages often run into a deficit due to natural disturbance assumptions used in the analysis (Figure 15). The largest deficits are encountered in those landscape units that are mostly outside of the THLB.

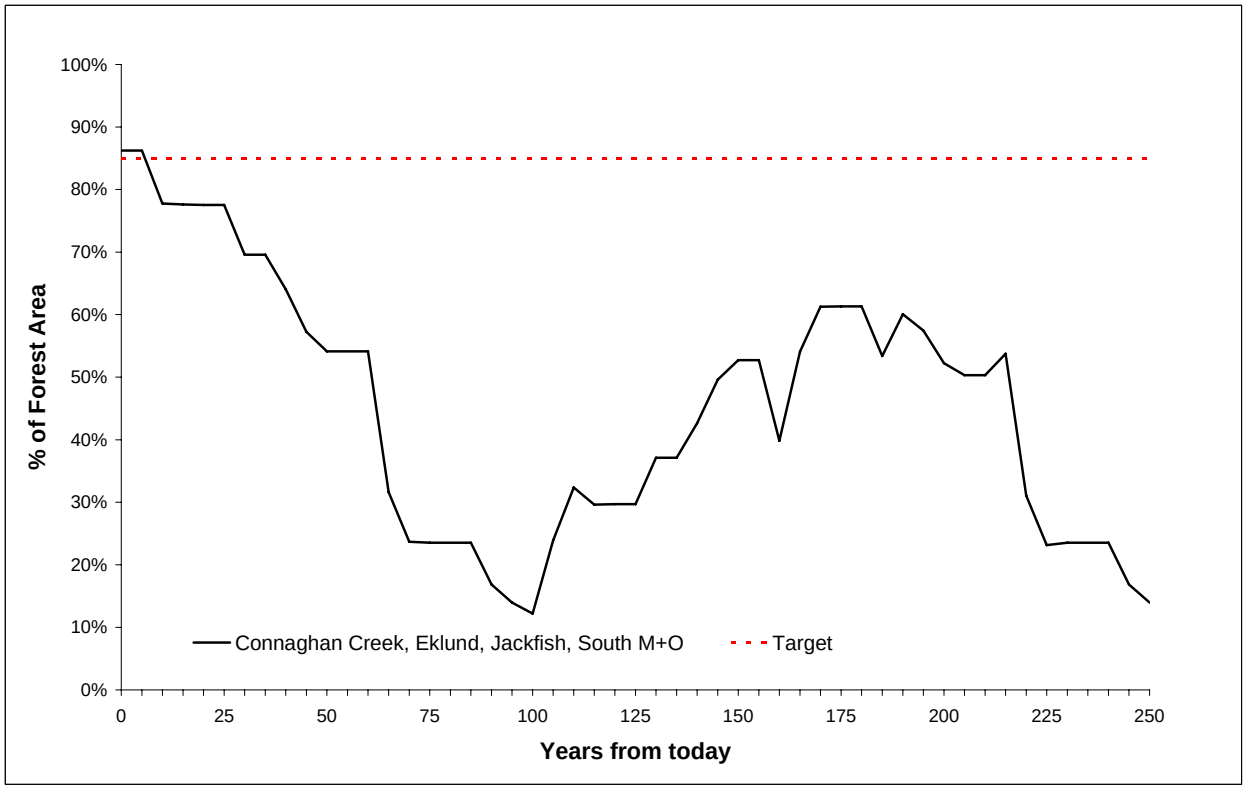


Figure 15 – Example where mature and old seral targets are not achieved throughout the planning horizon due to natural disturbance assumptions.

Table 19 – Achievement of Mature and Old Seral Targets, Base Case

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Akie, Akie River | enhanced | BWBSdk1 | 11% | Now |
| Akie, Akie River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Akie, Akie River | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Now, deficit later |
| Blackwater | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Blackwater | enhanced | SBSvk, SBSwk2 | 15% | Now |
| Blackwater + Muscovite Lake Park + Blackwater Creek ER | enhanced | SBSmk1, SBSmk2, BWBSdk1 | 11% | Now |
| Buffalohead | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Now |
| Buffalohead + Ed Bird Estella Park | enhanced | BWBSdk1 | 11% | Now |
| Buffalohead + Ed Bird Estella Park | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Clearwater | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Clearwater | general | ESSFwc3, ESSFwk2 | 36% | Now |
| Clearwater | general | SBSvk, SBSwk2 | 31% | Now |
| Collins-Davis | enhanced | BWBSdk1 | 11% | Now |
| Collins-Davis | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Collins-Davis | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Now, deficit later |
| Collins-Davis | enhanced | ESSFwc3, ESSFwk2 | 19% | Now |
| Collins-Davis | enhanced | SBSmk1, SBSmk2 | 15% | Now |
| Collins-Davis | enhanced | SBSwk2 | 15% | Now |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | BWBSdk1 | 34% | Now |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 42% | Now |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Now, deficit later |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | SBSmk1, SBSmk2 | 34% | Now |
| Gaffney, Manson River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Gaffney, Manson River | enhanced | SBSmk1, SBSmk2 | 11% | Now |
| Gaffney, Manson River | enhanced | SBSvk, SBSwk2 | 15% | Now |
| Germansen Mountain | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Gillis, Klawli | general | BWBSdk1 | 23% | Now |
| Gillis, Klawli | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Gillis, Klawli | general | SBSmk1, SBSmk2 | 23% | Now |
| Kennedy | special | ESSFwc3, ESSFwk2 | 54% | Now |
| Kennedy | special | SBSvk, SBSwk2 | 46% | 25 years |
| Lower Akie, Lower Pesika | special | BWBSdk1 | 34% | Now |
| Lower Akie, Lower Pesika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 42% | Now |
| Lower Ospika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Lower Ospika | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Now |
| Lower Ospika | general | ESSFwc3, ESSFwk2 | 36% | Now |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Lower Ospika | general | SBSmk1, SBSmk2 | 23% | Now |
| Lower Ospika | general | SBSvk, SBSwk2 | 31% | Now |
| Misinchinka | enhanced | ESSFwc 3, ESSFwk 2 | 19% | Now |
| Misinchinka | enhanced | SBSmk1, SBSmk2 | 11% | Now |
| Morfee | general | SBSmk1, SBSmk2 | 23% | 20 years |
| Morfee | general | SBSvk, SBSwk2 | 31% | Now |
| Nabesche | general | BWBSmw1, BWBSwk2 | 23% | Now |
| Nabesche | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Nabesche | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Never |
| Nabesche | general | ESSFwc3, ESSFwk2 | 36% | Now |
| Nabesche | general | SBSmk1, SBSmk2 | 23% | Now |
| Nabesche | general | SBSvk, SBSwk2 | 31% | Now |
| Nation | special | SBSmk1, SBSmk2 | 34% | Now |
| Osilinka | enhanced | BWBSdk1 | 11% | Now |
| Parsnip | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Parsnip + Heather Dina Park + Patsuk ER | general | ESSFwc3, ESSFwk2 | 36% | Now |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSmk1, SBSmk2 | 23% | Now |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSvk, SBSwk2 | 31% | Now |
| Pesika | general | BWBSdk1 | 23% | Now |
| Pesika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Philip | enhanced | SBSmk1, SBSmk2 | 11% | Now |
| Philip | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 14% | Now |
| Philip Lake, Tudyah A | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Philip Lake, Tudyah A | general | SBSmk1, SBSmk2 | 23% | Now |
| Schooler | general | BWBSmw1, BWBSwk2 | 23% | Now |
| Schooler | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Schooler | general | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 85% | Never |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Mature and Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Selwyn | special | BWBSmw1, BWBSwk2 | 34% | Now |
| Selwyn | special | ESSFwc3, ESSFwk2 | 54% | Now |
| Selwyn | special | SBSvk, SBSwk2 | 46% | 15 years |
| Tudyah B | general | SBSmk1, SBSmk2 | 23% | Now |
| Twenty Mile | general | BWBSdk1 | 23% | Now |
| Twenty Mile | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 28% | Now |
| Upper Ospika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk, ESSFwc3 | 42% | Now |
| Upper Ospika | special | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 42% | Now |
| Upper Ospika | special | SBSmk1, SBSmk2 | 34% | Now |
| Akie, Akie River | enhanced | BWBS - Deciduous | 13% | Now |
| Buffalohead, Estella | enhanced | BWBS – Deciduous | 13% | Now |
| Collins-Davis | special | BWBS – Deciduous | 13% | Now |
| Lower Akie, Lower Pesika | special | BWBS – Deciduous | 34% | 45 years |
| Selwyn | special | BWBS – Deciduous | 34% | Now |

Figure 16 depicts the overall achievement of the old seral in the DFA. The total amount of old forest stays significantly higher than the target throughout the planning horizon mainly due to the large areas of old forest within the NHLB. The contribution to old forest from the THLB remains substantial throughout the planning horizon as well.

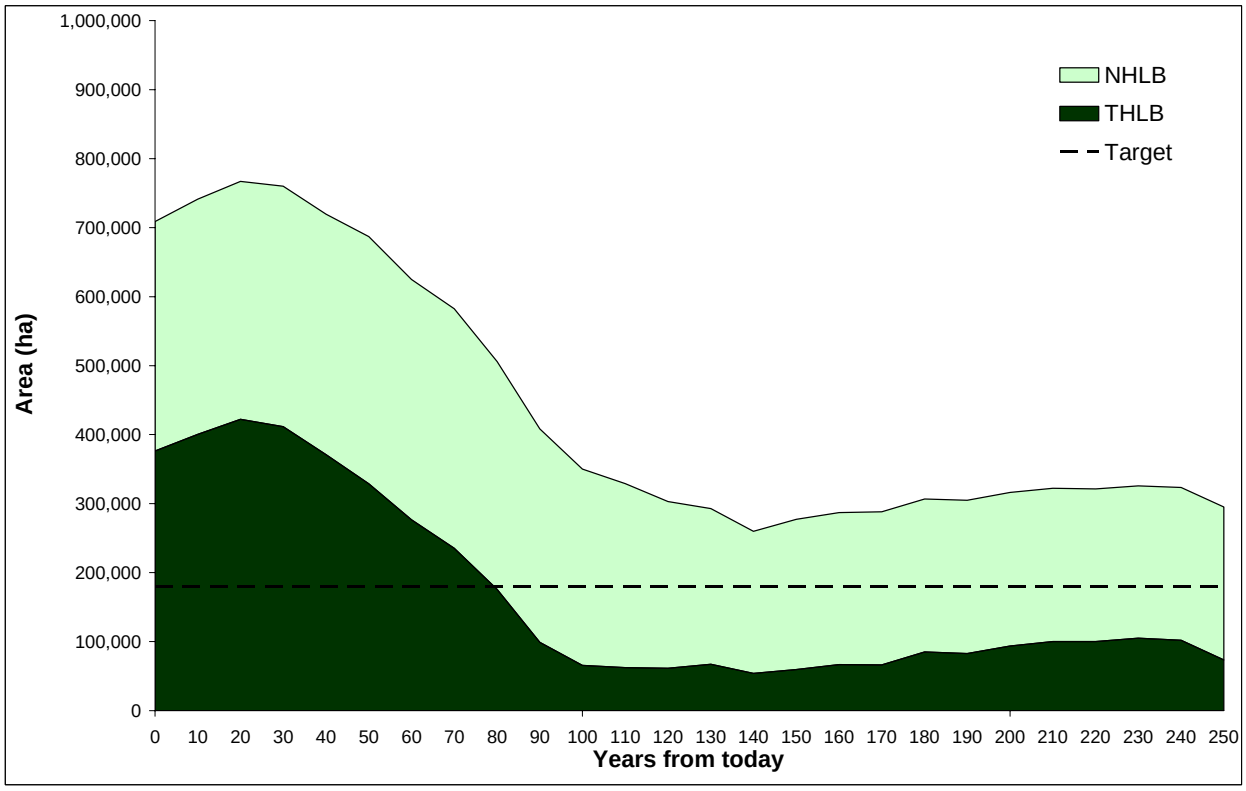


Figure 16 – Old forest in the DFA as per the base case.

Table 20 illustrates the achievement of old targets within the DFA. Most targets are currently met and continue to be met throughout the planning horizon. In some cases, the natural disturbance assumptions cause minor seral stage target violations (Figure 17).

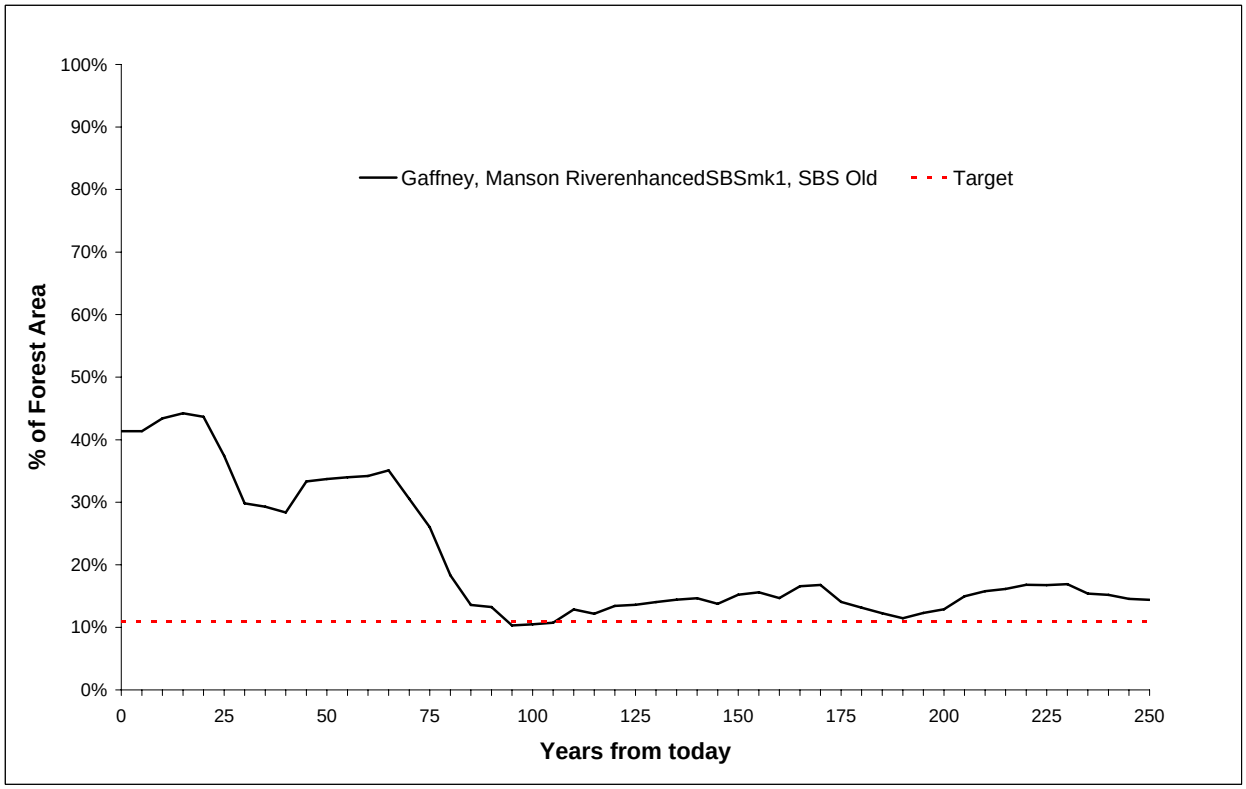


Figure 17 - Example of small violations of old seral targets due to natural disturbance assumptions.

Table 20 - Achievement of Old Seral Targets, Base Case

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Akie, Akie River | enhanced | BWBSdk1 | 11% | Now |
| Akie, Akie River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Akie, Akie River | enhanced | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 0% | Now |
| Blackwater | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Blackwater | enhanced | SBSvk, SBSwk2 | 9% | Now |
| Blackwater + Muscovite Lake Park + Blackwater Creek ER | enhanced | SBSmk1, SBSmk2, BWBSdk1 | 11% | Now |
| Buffalohead + Ed Bird Estella Park | enhanced | BWBSdk1 | 11% | Now |
| Buffalohead + Ed Bird Estella Park | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Clearwater | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Clearwater | general | ESSFwc3, ESSFwk2 | 19% | Now |
| Clearwater | general | SBSvk, SBSwk2 | 9% | Now |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Collins-Davis | enhanced | BWBSdk1 | 11% | Now |
| Collins-Davis | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Collins-Davis | enhanced | ESSFwc3, ESSFwk2 | 19% | Now |
| Collins-Davis | enhanced | SBSmk1, SBSmk2 | 9% | Now |
| Collins-Davis | enhanced | SBSwk2 | 9% | Now |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | BWBSdk1 | 16% | 15 years |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 13% | Now |
| Connaghan Creek, Eklund, Jackfish, South Germansen-Upper Manson | special | SBSmk1, SBSmk2 | 16% | Now |
| Gaffney, Manson River | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Gaffney, Manson River | enhanced | SBSmk1, SBSmk2 | 11% | Now |
| Gaffney, Manson River | enhanced | SBSvk, SBSwk2 | 9% | Now |
| Germansen Mountain | enhanced | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Gillis, Klawli | general | BWBSdk1 | 11% | Now |
| Gillis, Klawli | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Gillis, Klawli | general | SBSmk1, SBSmk2 | 11% | Now |
| Kennedy | special | ESSFwc3, ESSFwk2 | 28% | Now |
| Kennedy | special | SBSvk, SBSwk2 | 13% | Now |
| Lower Akie, Lower Pesika | special | BWBSdk1 | 16% | Now |
| Lower Akie, Lower Pesika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 13% | Now |
| Lower Ospika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Lower Ospika | general | ESSFwc3, ESSFwk2 | 19% | Now |
| Lower Ospika | general | SBSmk1, SBSmk2 | 11% | Now |
| Lower Ospika | general | SBSvk, SBSwk2 | 9% | Now |
| Misinchinka | enhanced | ESSFwc 3, ESSFwk 2 | 19% | Now |
| Misinchinka, Tudyah B | enhanced-general | SBSvk, SBSwk2 | 9% | Now |
| Morfee | general | SBSmk1, SBSmk2 | 11% | Now |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Morfee | general | SBSvk, SBSwk2 | 9% | Now |
| Nabesche | general | BWBSmw1, BWBSwk2 | 11% | Now |
| Nabesche | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Nabesche | general | ESSFwc3, ESSFwk2 | 19% | Now |
| Nabesche | general | SBSmk1, SBSmk2 | 11% | Now |
| Nabesche | general | SBSvk, SBSwk2 | 9% | Now |
| Nation | special | SBSmk1, SBSmk2 | 16% | Now |
| Osilinka | enhanced | BWBSdk1 | 11% | Now |
| Parsnip | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Parsnip + Heather Dina Park + Patsuk ER | general | ESSFwc3, ESSFwk2 | 19% | Now |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSmk1, SBSmk2 | 11% | Now |
| Parsnip + Heather Dina Park + Patsuk ER | general | SBSvk, SBSwk2 | 9% | Now |
| Pesika | general | BWBSdk1 | 11% | Now |
| Pesika | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Philip, Philip Lake, Tudyah A | enhanced-general | SBSvk, SBSwk2 | 9% | Now |
| Schooler | general | BWBSmw1, BWBSwk2 | 11% | Now |
| Schooler | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Selwyn | special | BWBSmw1, BWBSwk2 | 16% | 10 years |
| Selwyn | special | ESSFwc3, ESSFwk2 | 28% | Now |
| Selwyn | special | SBSvk, SBSwk2 | 13% | Now |
| Twenty Mile | general | BWBSdk1 | 11% | Now |
| Twenty Mile | general | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk | 9% | Now |
| Upper Ospika | special | ESSFmc, ESSFmv2, ESSFmv3, ESSFmv4, SWBmk, ESSFwc3 | 13% | Now |
| Upper Ospika | special | ESSFmcp, ESSFmvp2, ESSFmvp3, ESSFmvp4, ESSFwcp3, SWBmks | 13% | Now |
| Upper Ospika | special | SBSmk1, SBSmk2 | 16% | Now |
| Akie, Akie River | enhanced | BWBS - Deciduous | 13% | Now |
| Buffalohead, Estella | enhanced | BWBS – Deciduous | 13% | 10 years |

| Landscape Units and Landscape Unit Groups | Biodiversity Emphasis | Biogeoclimatic Group | Old Forest Target (min of CLFB) | Target Met |
|---|---|---|---|---|
| Collins-Davis | special | BWBS – Deciduous | 13% | Now |
| Lower Akie, Lower Pesika | special | BWBS – Deciduous | 19% | 20 years |
| Selwyn | special | BWBS – Deciduous | 19% | Now |

## *9.3 Old Interior Forest*

Figure 18 illustrates the overall target area for old interior forest, current area of old interior forest in the DFA and a forecasted area of old interior forest 20 years from now for the base case. Due to the large area of old forest in the DFA there is currently significantly more old interior forest than required.

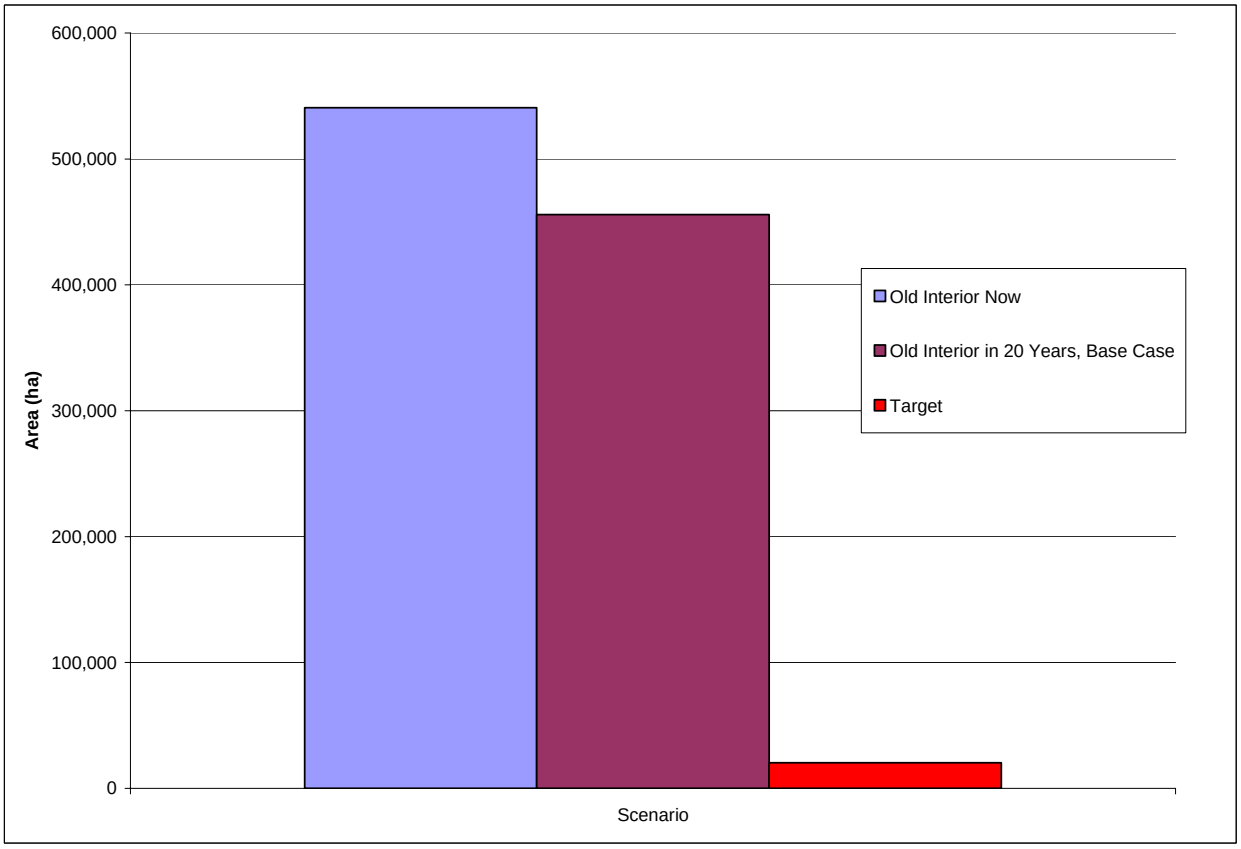


Figure 18 – Old interior forest now and 20 years from now in the base case.

## *9.4 Early Seral Patch Size Distribution*

Table 21 illustrates the current early seral patch size distribution and a forecasted early seral patch size distribution 20 years from now for the base case. Note that the forecasted result is an outcome of the harvest schedule and no spatial targets were applied in the model to achieve any specific patch size distributions.

Table 21 – Early seral patch size distribution now and 20 years from now in the base case.

| **Natural Disturbance Type (NDT)** | **Patch Size** | | | |
|---|---|---|---|---|
| | <40 ha | 40 - 250 ha | 250 - 5,000 ha | >5,000 ha |
| NDT 2 | **Target % of early seral** | | | |
| | 30 - 40 % | 30 - 40 % | 20 -40 % | 0% |
| | **Current Patch Size Distribution** | | | |
| | 4.6% | 31.3% | 60.2% | 4% |
| | | | | |
| NDT 3 | **Target % of early seral** | | | |
| | 10 -20 % | 10 -20 % | 60 -80 % | 0% |
| | **Current Patch Size Distribution** | | | |
| | 4.0% | 21.0% | 58.6% | 16.3% |
| **Natural Disturbance Type (NDT)** | **Patch Size** | | | |
| | <40 ha | 40 - 250 ha | 250 - 5,000 ha | >5,000 ha |
| NDT 2 | **Target % of early seral** | | | |
| | 30 - 40 % | 30 - 40 % | 20 -40 % | 0% |
| | **Patch Size Distribution in 20 years** | | | |
| | 9.4% | 21.5% | 42.7% | 26% |
| | | | | |
| NDT 3 | **Target % of early seral** | | | |
| | 10 -20 % | 10 -20 % | 60 -80 % | 0% |
| | **Patch Size Distribution in 20 years** | | | |
| | 7.3% | 14.3% | 44.4% | 34.0% |

## *9.5 Ungulates*

Figure 19 illustrates that very little of the total volume was harvested from ungulate management areas in the base case. The base case applied the most recent approved ungulate winter range legislation and draft winter ranges.

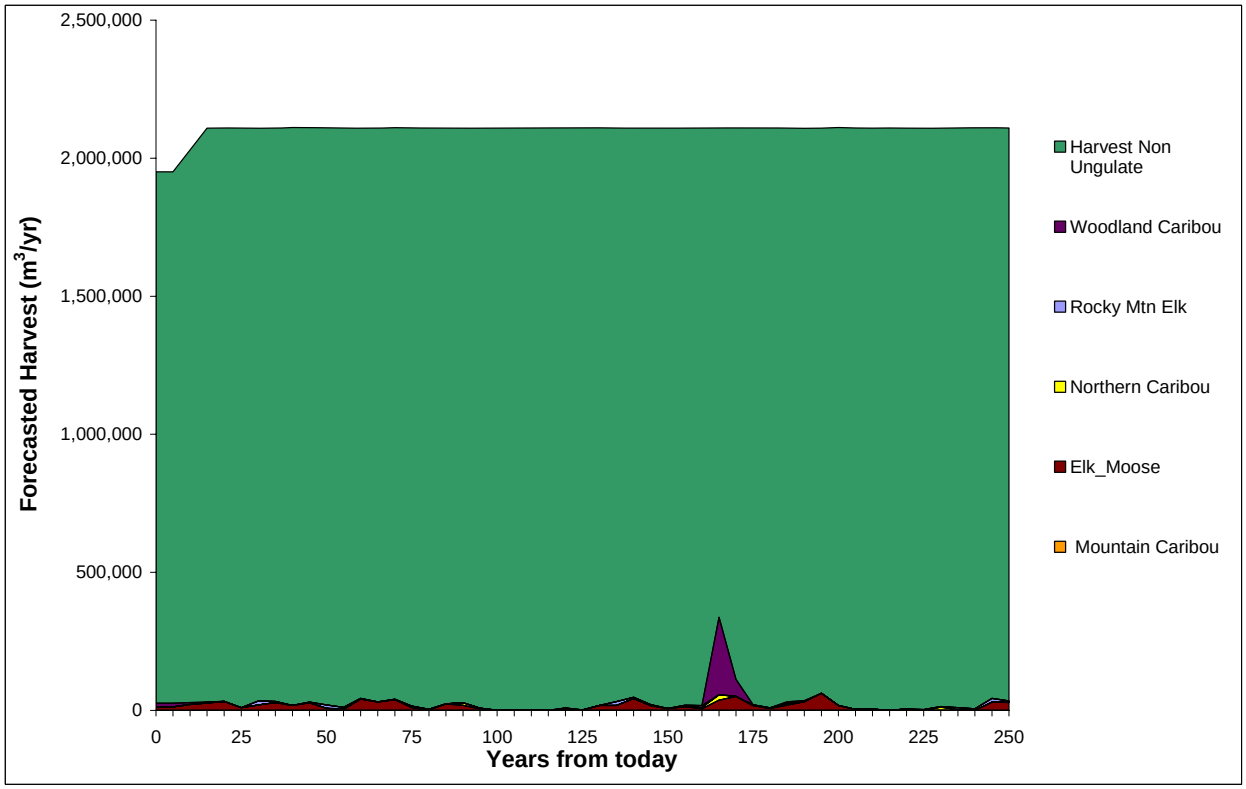


Figure 19 – Harvesting in ungulate areas in the base case.

## *9.6 Visual Quality*

Visual quality objectives were modeled in the base case for only those scenic areas that had been made officially known. As with the ungulate management, very little of the total harvest comes from visually sensitive areas (Figure 20).

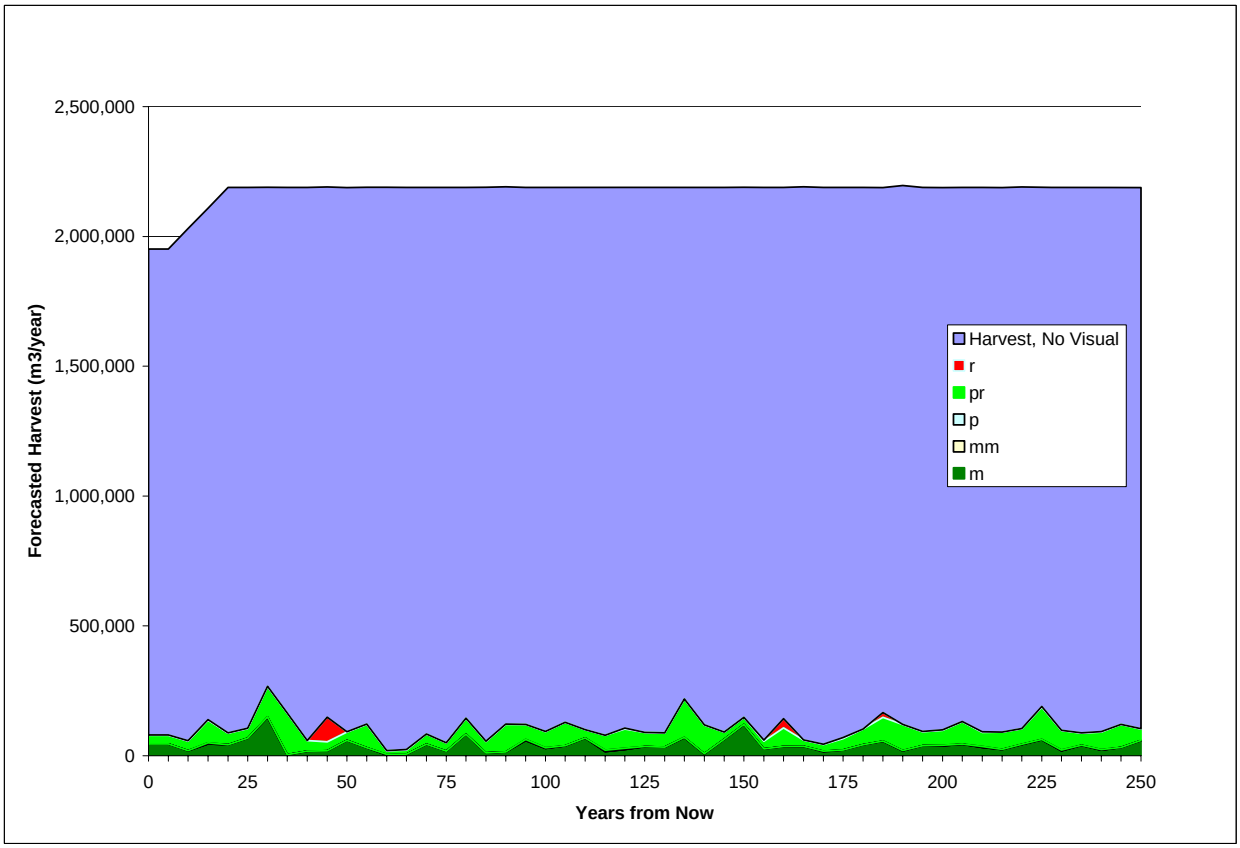


Figure 20 – Harvesting in visual areas in the base case.

## *9.7 Mountain Pine Beetle*

The MPB epidemic as modeled does not appear to have a significant impact on the DFA timber supply. This is likely due to the fact that the epidemic has not spread extensively in the Mackenzie DFA as of yet. Also, the base case assumed that the harvest will be concentrated in the pine leading stands either already attacked or susceptible to the beetle attack. As a result of this assumption the timber supply model was able to salvage almost the entire beetle affected area, which prevented significant timber supply impacts (Figure 21).

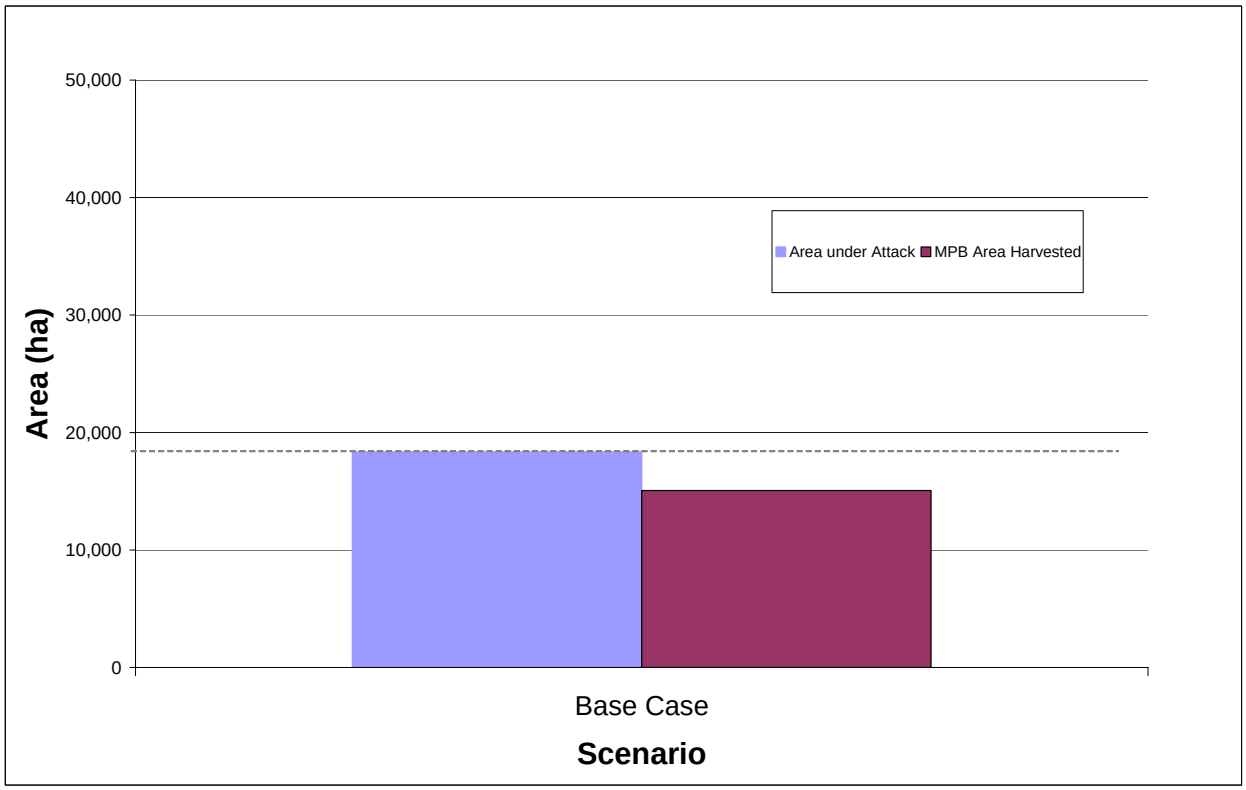


Figure 21 – Area under MPB attack in the base case versus MPB area harvested.

# 10 Scenario Analysis Results

## *10.1 Scenario Harvest Forecasts*

### 10.1.1 Habitat Richness Emphasis Scenario

The objective of this scenario was to present a forecast that simulates the impact of spatially explicit old growth management areas (OGMA) in the land base. The assumptions were different compared to the base case in that:

- 58% of the old growth requirements had to be met from the THLB. The 58% represents the current relationship between CFLB and THLB, i.e., the area of THLB is 58% of the CFLB. The additional polygons for these reserves were selected oldest and largest first;
- WTP retention was increased to 20% in current pine leading stands to account for Chief Forester's Large Scale Salvage Operations Guidance.

Figure 22 illustrates the forecasted harvest for the habitat richness emphasis scenario compared to the base case. Reserving large areas of THLB reduced the long-term harvest level only (10.8%), while the short term was not affected.

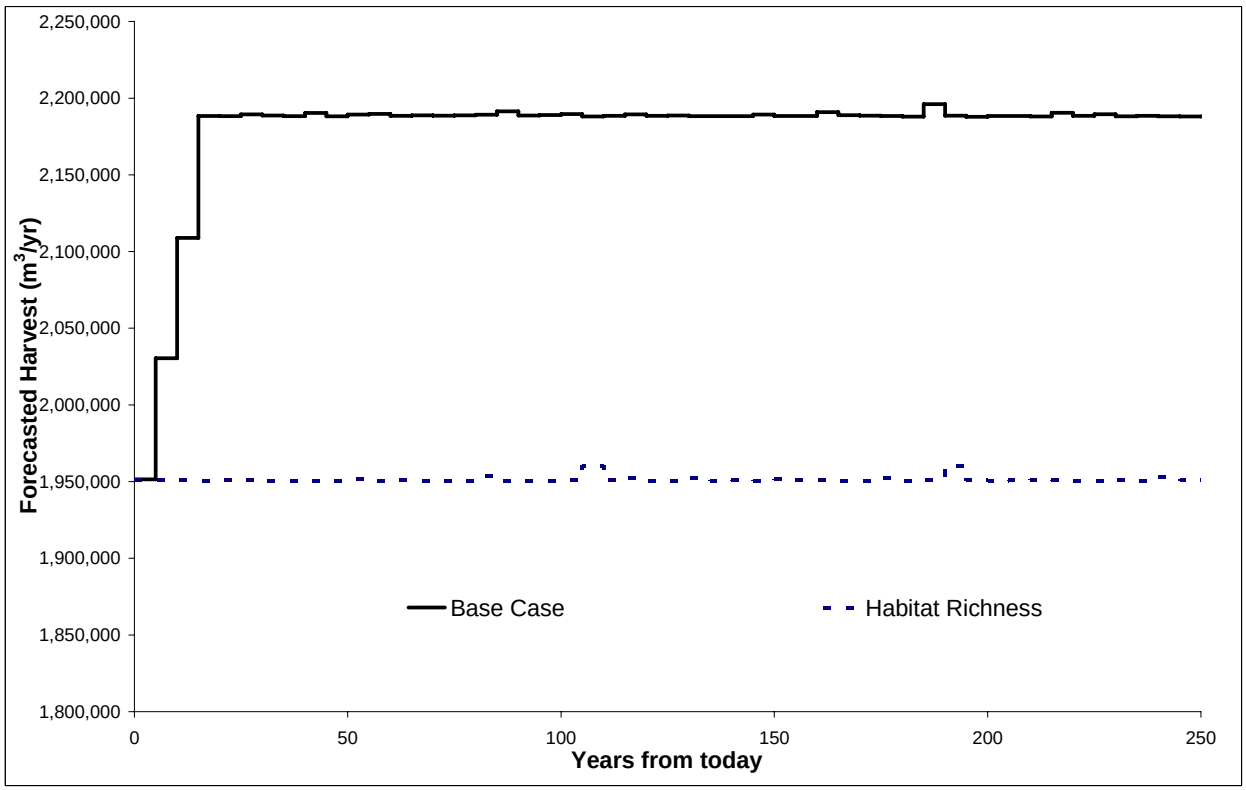


Figure 22 – Forecasted harvest, habitat richness emphasis scenario.

Table 22 – Habitat richness scenario compared to the base case.

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Habitat Richness Scenario** | 1,951,466 | 0 | 1,951,368 | -10.8% |

### 10.1.2 Species Composition Scenario

The objective of this scenario was to present an alternate harvest forecast that would utilize a more diverse species composition in its regeneration assumptions:

- All balsam stands were assumed to regenerate 50/50 to natural balsam and planted spruce, rather than 100% planted spruce as in the base case;
- Medium spruce sites were assumed to regenerate 80/20 to planted spruce and natural balsam, rather than 80% planted spruce and 20% planted pine as in the base case;
- Poor spruce sites were assumed to regenerate 70/30 to planted spruce and natural balsam, rather than 80% planted spruce and 20% planted pine as in the base case.

The differences from the base case were non-existent in the short term; however, the differences were more notable in the medium and long term. The medium and long-term harvest forecast was 7.1% lower than that of the base case.

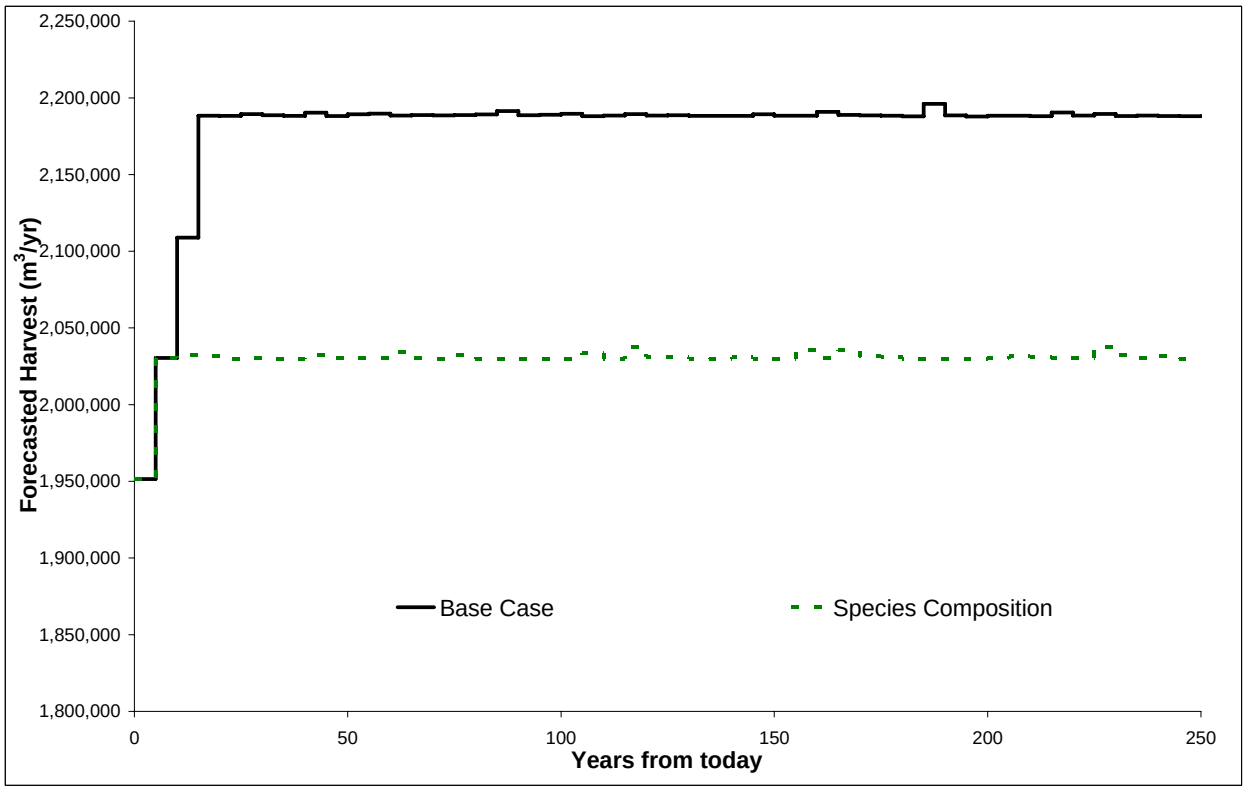


Figure 23 – Forecasted harvest, species composition scenario.

Table 23 – Species composition scenario compared to the base case.

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Species Composition Scenario** | 1,951,466 | 0 | 2,031,181 | -7.1% |

### 10.1.3 Caribou Recovery Scenario

The objective of this scenario was to investigate the impact of applying caribou recovery planning requirements for Wolverine and Scott herds. As Figure 24 and Table 24 indicate, applying caribou recovery requirements had no impact in the timber supply in the short term and a small impact in the medium and long term.

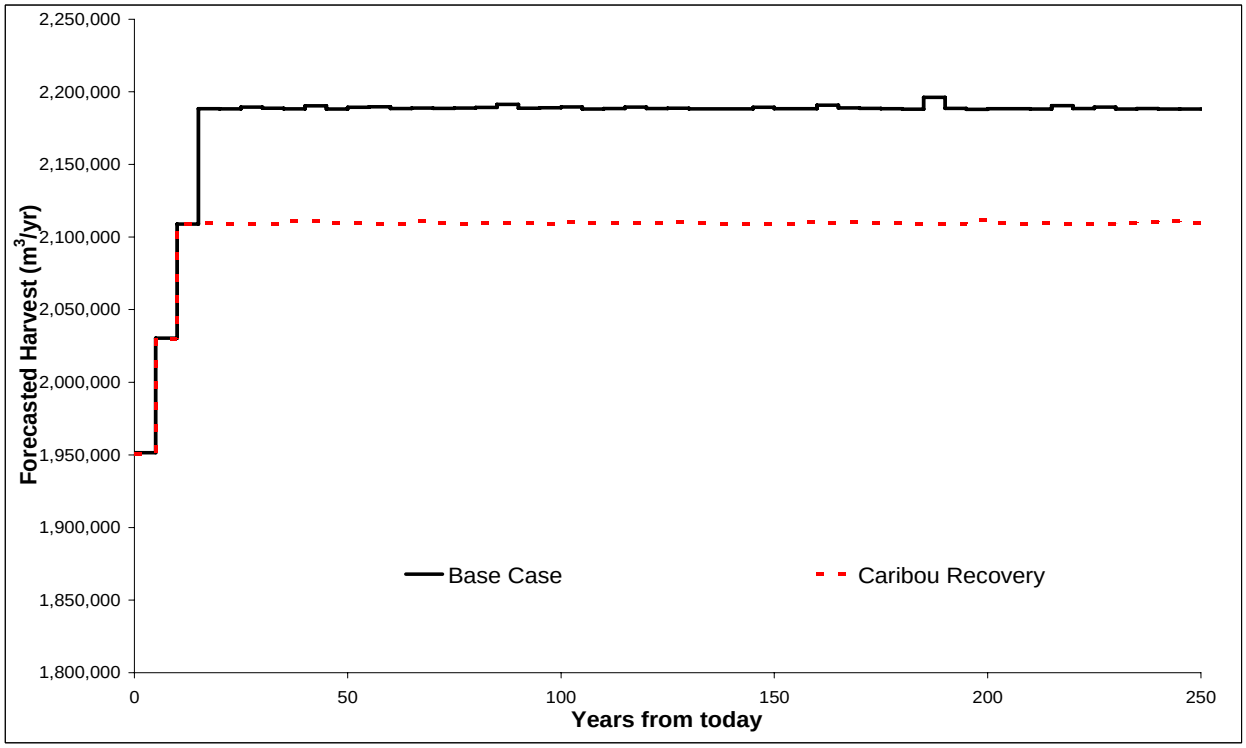


Figure 24 – Forecasted harvest, caribou recovery scenario

Table 24 – Caribou recovery scenario compared to the base case.

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Caribou Recovery Scenario** | 1,951,466 | 0 | 2,109,640 | -3.6% |

### 10.1.4 Non-Timber Economic Emphasis and Non-Timber Economic Emphasis plus Manual Brushing

The objective of the first of these two scenarios was to investigate the impact of extending the management for visual quality to areas that have not been officially designated as scenic areas.

- Utilize the vli_lrdw, tse_dmk and the visual landscape inventory coverage used in base case (vli_dmk);
- Apply a visually effective green-up requirement within 200 metres for the following roads: Thutade FSR and the old road through Manson Creek to Germansen Lake.

The second of these scenarios added manual brushing. It was assumed that manual brushing rather than chemical brush treatments would be used in securing successful reforestation. The modelling of manual brushing was done by doubling the regeneration lag to account for more brush competition.

The harvest forecasts are shown in Figure 25. Managing additional visually sensitive areas as scenic areas had no impact on the timber supply. Using manual brushing instead of the chemical approach reduced the medium and long term harvest level by 3.5%.

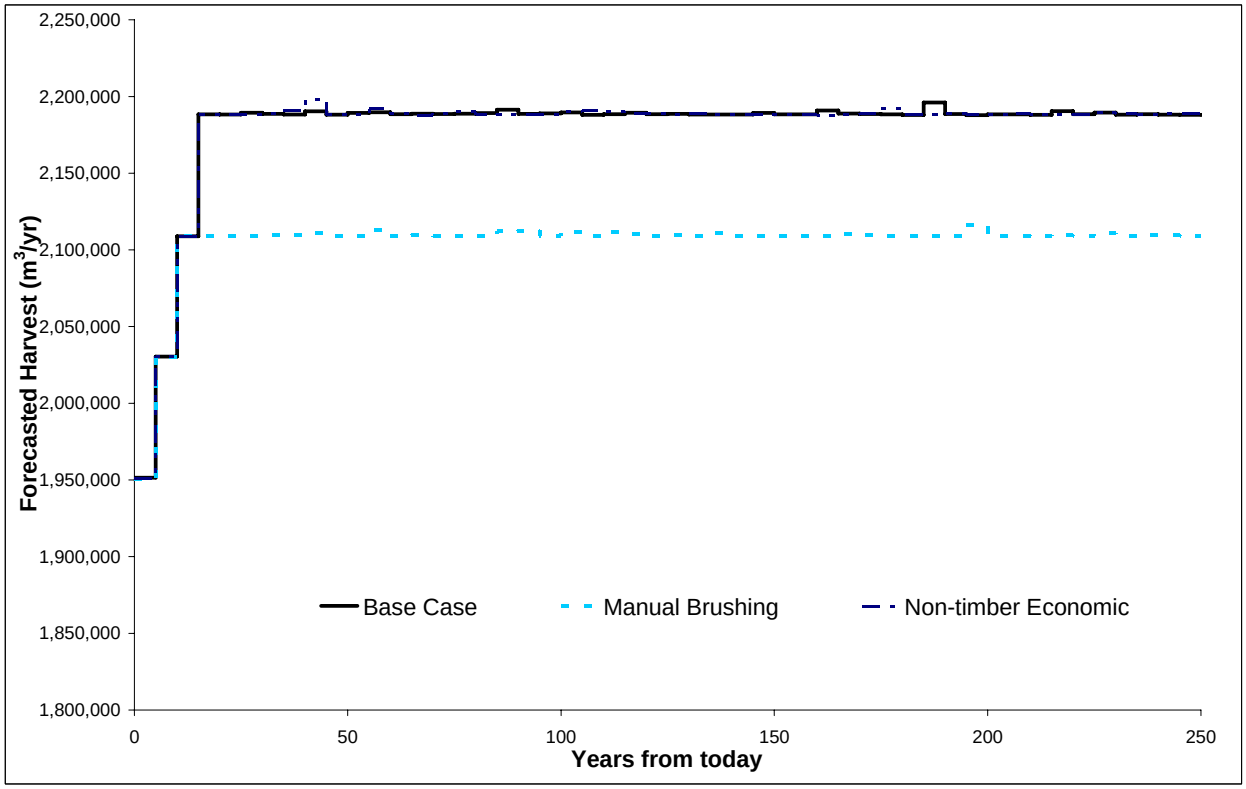


Figure 25 – Forecasted harvest, Non-timber economic emphasis scenario and non-timber economic emphasis plus manual brush scenarios.

Table 25 – Non-timber economic scenarios compared to the base case

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Non-timber Economic Emphasis Scenario** | 1,951,466 | 0 | 2,187,383 | 0% |
| **Non-timber Economic Emphasis plus Manual Brush Scenario** | 1,951,466 | 0 | 2,109,785 | -3.5% |

### 10.1.5 Worst Case MPB and Worst Case MPB and Other Beetles Scenarios

The objective of the first of these two scenarios was to investigate the impact of the predicted worst case MPB outcome on the forecast indicators. This was done by applying the mountain pine beetle epidemic criteria to 2020 as per the Provincial Level Projection of the Current Mountain Pine Beetle Outbreak, April 2006.

The second of these scenarios added an increased spruce and balsam bark beetle outbreaks and fire. The unsalvaged losses were doubled in this scenario compared to the base case.

The worst case MPB scenario reduced the medium and long term harvest by approximately 3.5%. There was no timber supply impact in the short term.

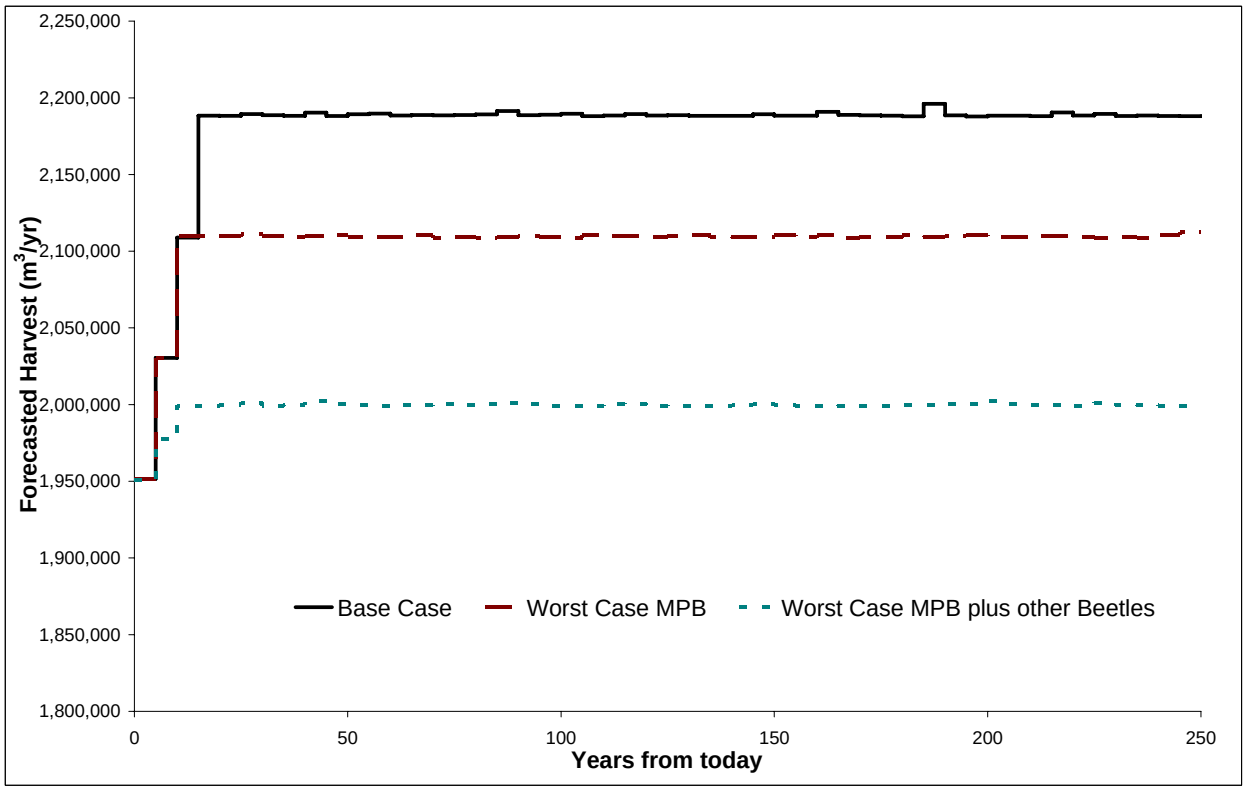


Figure 26 – Forecasted harvest, Worst case MPB and worst case MPB plus other beetles scenarios.

Table 26 – Worst case MPB and other beetle scenarios compared to the base case.

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Worst Case MPB Scenario** | 1,951,466 | 0 | 2,109,671 | -3.5% |
| **Worst Case MPB plus other Beetles Scenario** | 1,951,466 | 0 | 1,999,826 | -8.6% |

Figure 27 illustrates the predicted harvest by species group in the worst case MPB scenario. Much of the pine harvest occurs within the next 25 years; before the forecasted MPB epidemic kills and renders the pine stands economically worthless. Between years 30 and 75 the timber supply is in the DFA is depended on existing spruce stands and balsam stands.

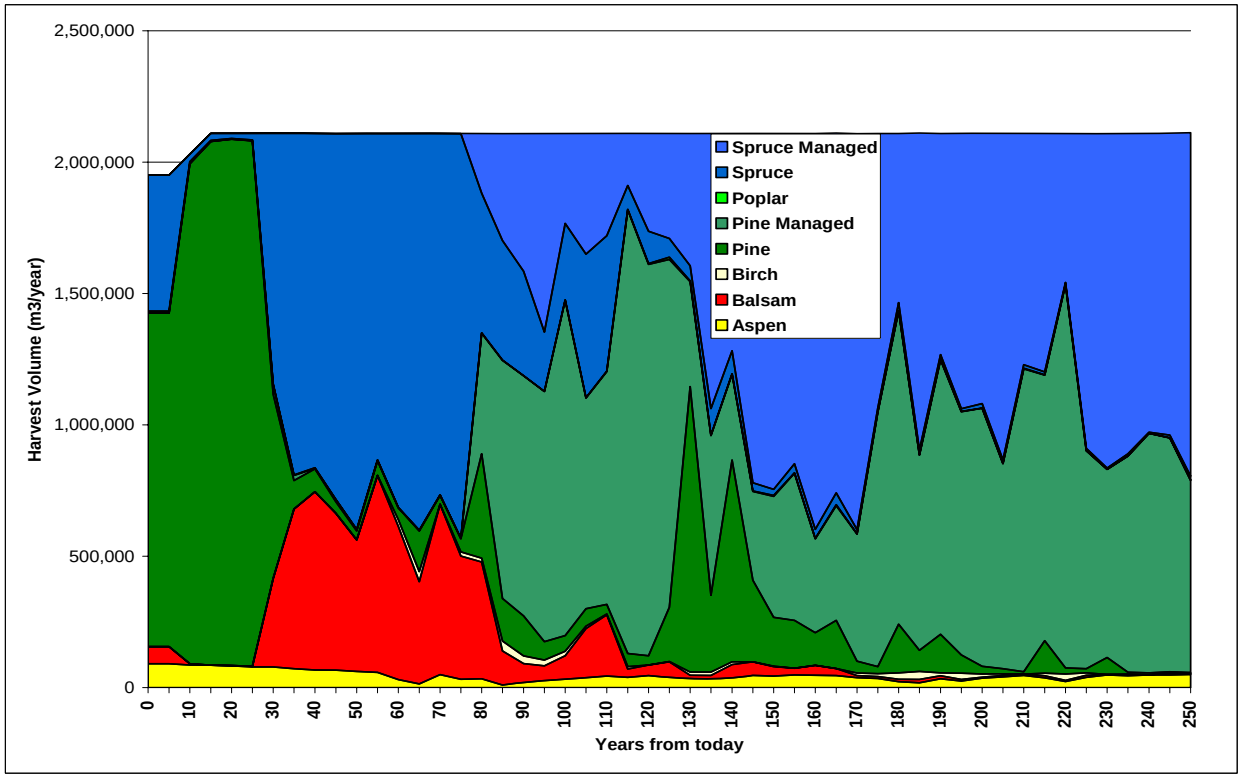


Figure 27 – Worst case MPB harvest forecast by species group.

Figure 28 shows the diminishing pine growing stock as a result of harvesting and MPB epidemic. It also shows how balsam and existing spruce stands provide the source of harvesting in the mid term and how managed spruce and pine stands gradually take over in the long term.

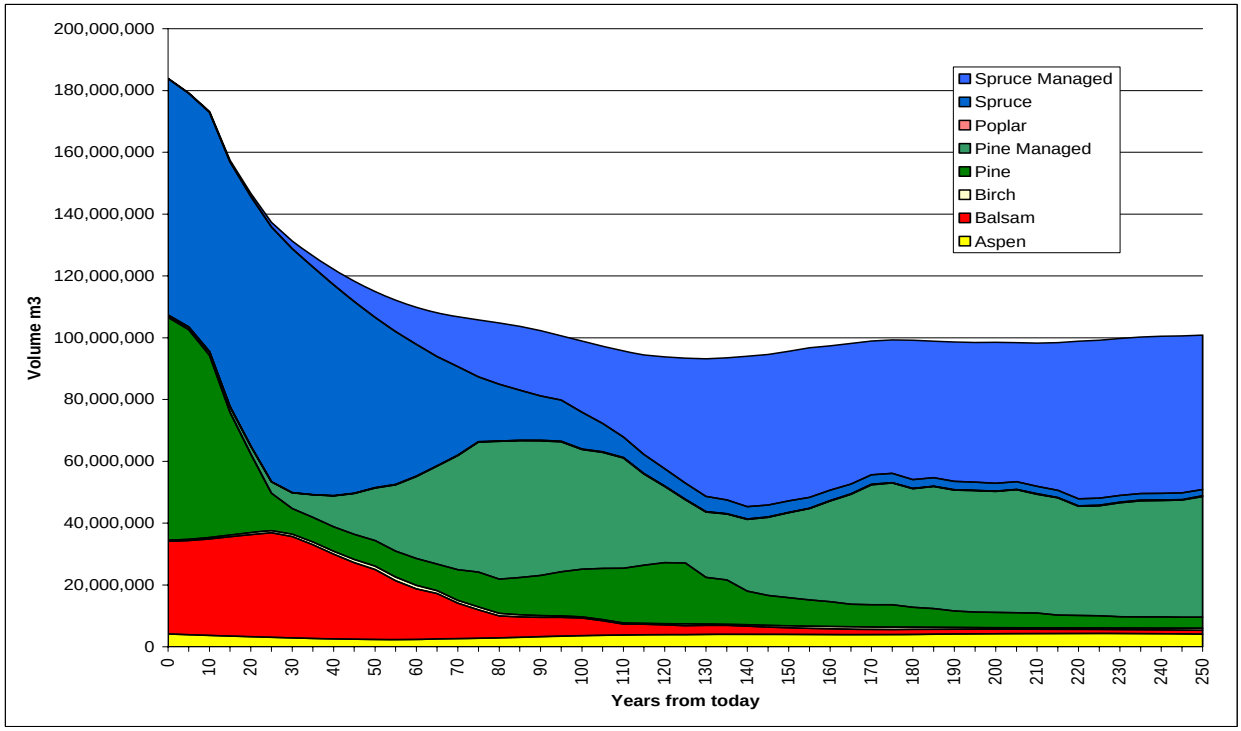


Figure 28 – Forecasted growing stock in the worst case MPB scenario.

### 10.1.6 Worst Case Forest Health, Emphasis on Regenerating Stands

The objective of this scenario was to investigate the impact of more mortality and failure in regenerated areas. This was simulated in the analysis by increasing the OAF 1 to 20% pine leading analysis units. The medium and long term timber supply was reduced by 3.5% compared to the base case (Figure 29).

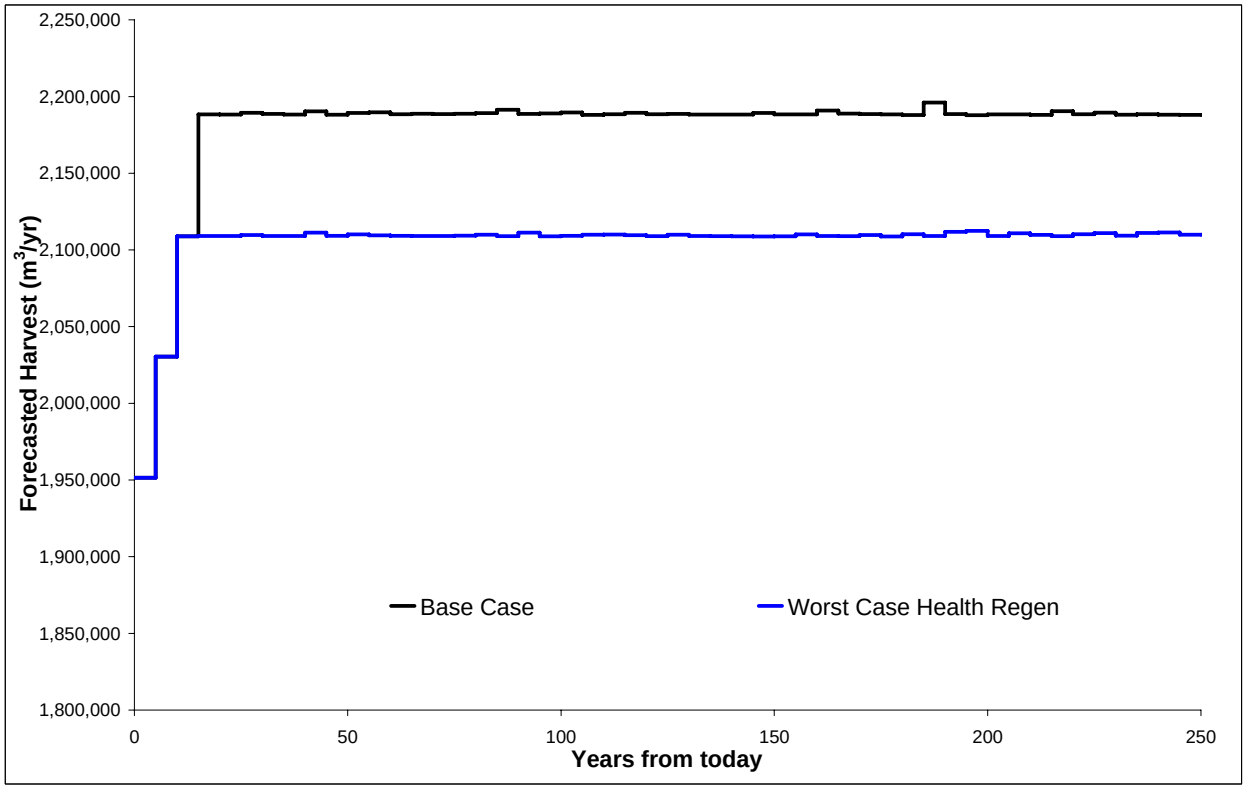


Figure 29 – Forecasted harvest, worst case forest health, emphasis on regenerating stands.

Table 27 – Worst case forest health, emphasis on regenerating stands compared to the base case.

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Worst Case Forest Health, Regeneration** | 1,951,466 | 0 | 2,109,695 | -3.5% |

### 10.1.7 Summary

Table 28 summarizes the harvest forecasts for all scenarios.

Table 28 – Harvest forecast summary for all scenarios

| Scenario | Short-Term Harvest (m3/year) | Change from Base Case | Mid and Long Term Harvest (m3/year) | Change from Base Case |
|---|---|---|---|---|
| **Base Case** | 1,951,446 | n/a | 2,187,297 | n/a |
| **Habitat Richness Scenario** | 1,951,466 | 0 | 1,951,368 | -10.8% |
| **Species Composition Scenario** | 1,951,466 | 0 | 2,031,181 | -7.1% |
| **Caribou Recovery Scenario** | 1,951,466 | 0 | 2,109,640 | -3.6% |
| **Non-timber Economic Emphasis Scenario** | 1,951,466 | 0 | 2,187,383 | 0% |
| **Non-timber Economic Emphasis plus Manual Brush Scenario** | 1,951,466 | 0 | 2,109,785 | -3.5% |
| **Worst Case MPB Scenario** | 1,951,466 | 0 | 2,109,671 | -3.5% |
| **Worst Case MPB plus other Beetles Scenario** | 1,951,466 | 0 | 1,999,826 | -8.6% |
| **Worst Case Forest Health, Regeneration** | 1,951,466 | 0 | 2,109,695 | -3.5% |

## *10.2 Losses to MPB*

All scenarios attempt to harvest all MPB susceptible pine stands by prioritizing the harvest of these stands. In those scenarios, where the MPB infestation was not assumed to continue after 2010, very little volume is predicted to be lost within the THLB (Figure 30). It appears that it may be possible to harvest most of the attacked and susceptible stands before the deterioration of the timber.

For those scenarios, where the MPB epidemic was assumed to continue until 2020 the volume losses are estimated to be between 25 and 30 million $m^3$.

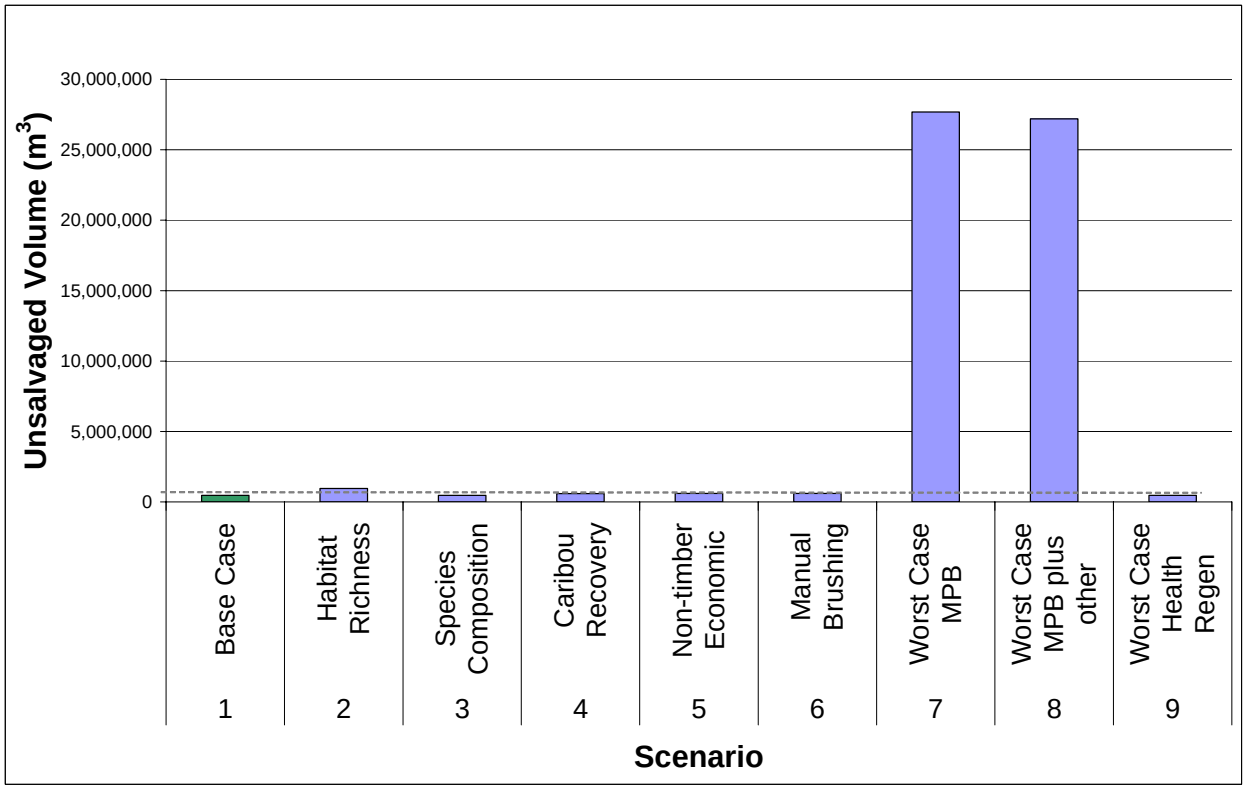


Figure 30 – Predicted unsalvaged losses due to the MPB epidemic for all scenarios.

## *10.3 Old Forest*

Figure 31 illustrates the area of old forest achieved for each scenario. As expected the higher old forest objectives through permanently reserved THLB areas resulted in more old forest over time in the habitat richness emphasis scenario.

In the sort and medium term the scenario that assumed the worst case MPB infestation in addition to other significant beetle and fire damage had the least area of old forest; losses to MPB, other beetles and fire required more harvest to maintain timber supply, which in turn reduced the amount of old forest. In the long run, the differences were less pronounced.

Other scenarios did not differ significantly from the base case. Note that all scenarios stayed above the overall old forest target.

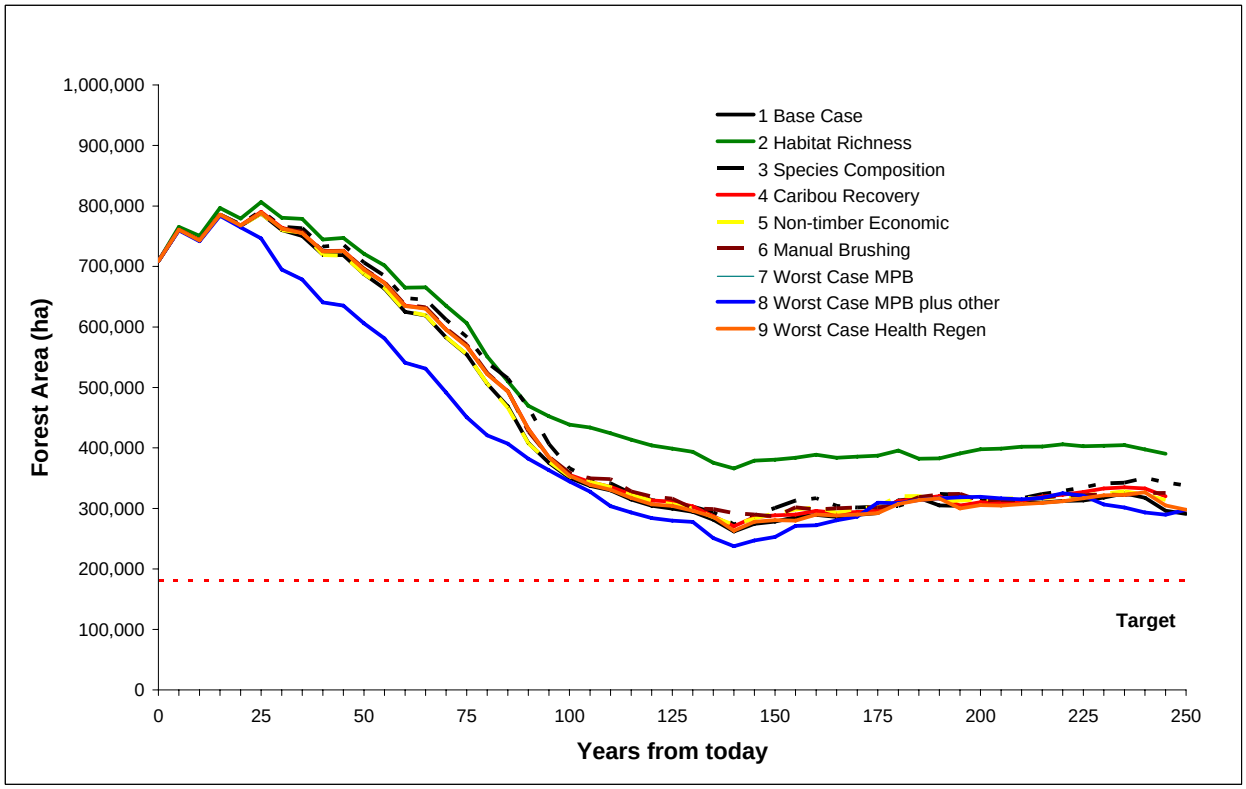


Figure 31 – Old forest comparison.

### 10.3.1 Old Interior Forest

No special targets were applied in the model to achieve a specific distribution of old forest or interior old forest. However, as a general rule the more old forest one has, the more opportunity there is to create interior old forest. Figure 32 illustrates that while the habitat richness scenario maintained more old growth in the DFA, it also maintained somewhat more interior old forest during the first 20 years of the planning horizon.

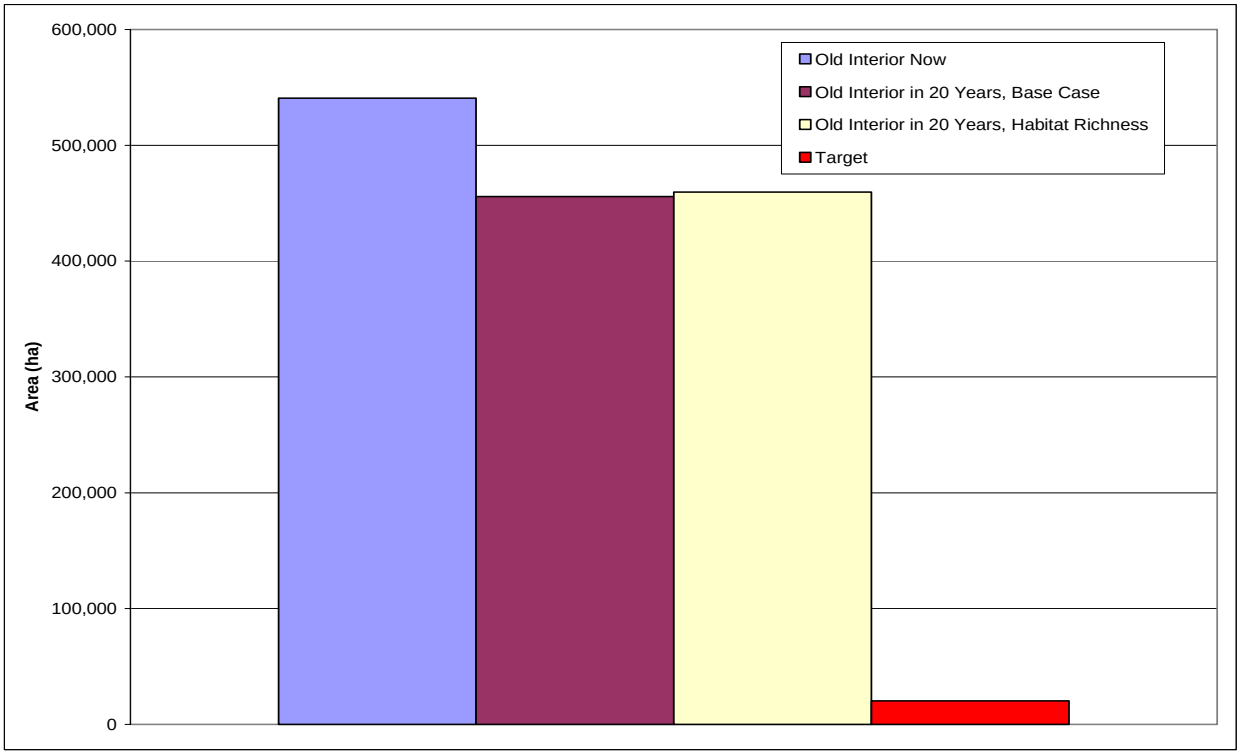


Figure 32 – Old interior forest; base case and habitat richness scenario.

## *10.4 Early Seral Patch Size Distribution*

No spatial targets were applied in the model to achieve any specific early seral patch size distribution. It is assumed that any differences between scenarios are coincidental. The targets identified in the sustainable forest management plan can be achieved through proper tactical and operational planning.

## *10.5 Direct and Indirect Employment (AAC related)*

Figure 33 and Figure 34 illustrate predicted short, medium and long term employment (direct and indirect) levels resulting from forecasted harvest for all scenarios. The employment levels are based on a generalized multiplier of 1.22 for the Price George TSA used in the MoF timber supply review in 2000. The figures below are only for purposes of comparison and intended to show relative differences between different scenarios.

Higher harvest levels may not result in predicted increases in employment levels locally as milling capacity may become a limited factor. Also, lower harvest levels tend to decrease AAC related employment levels; however, employment in other areas, such as tourism may increase. These kinds of potential changes are not reflected in the employment forecast.

In the short term the predicted AAC related employment level is the same for all scenarios. In the medium and long terms the differences are still relatively small with those scenarios that predict lower long-term harvest levels also forecasting somewhat lower long-term employment levels.

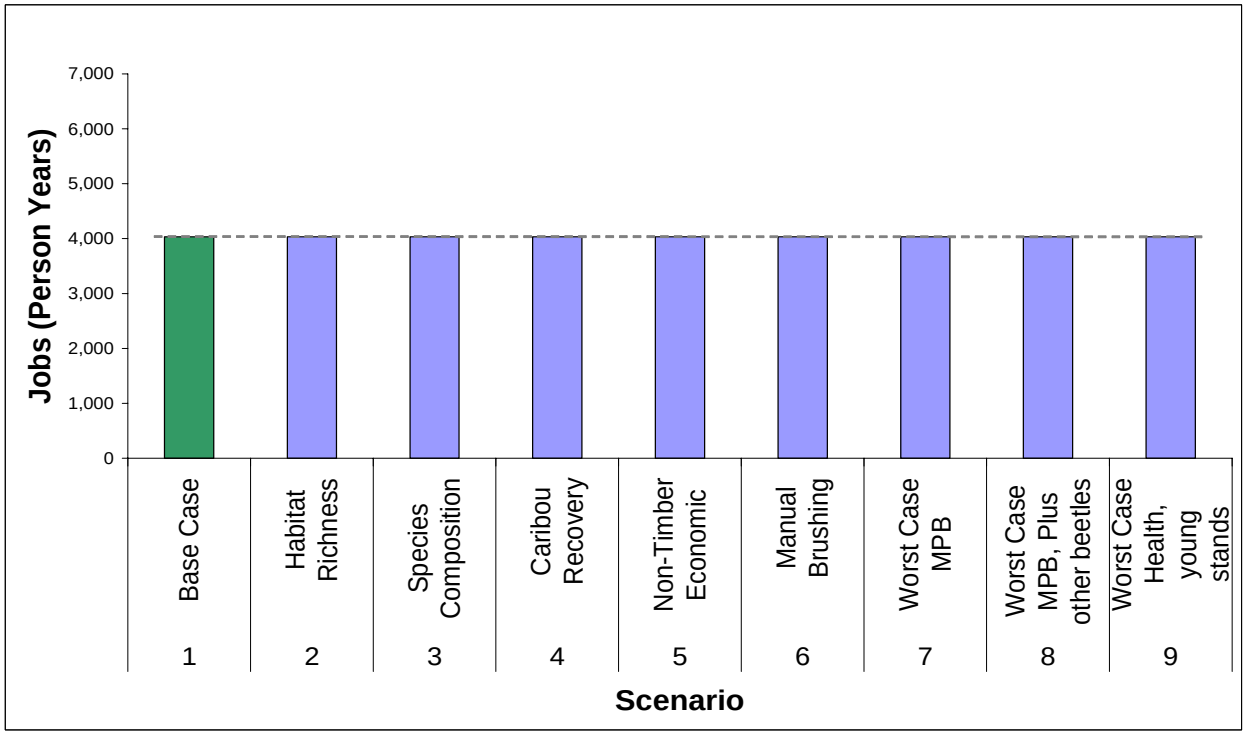


Figure 33 – Forecasted direct and indirect employment (AAC related) for the next 10 years.

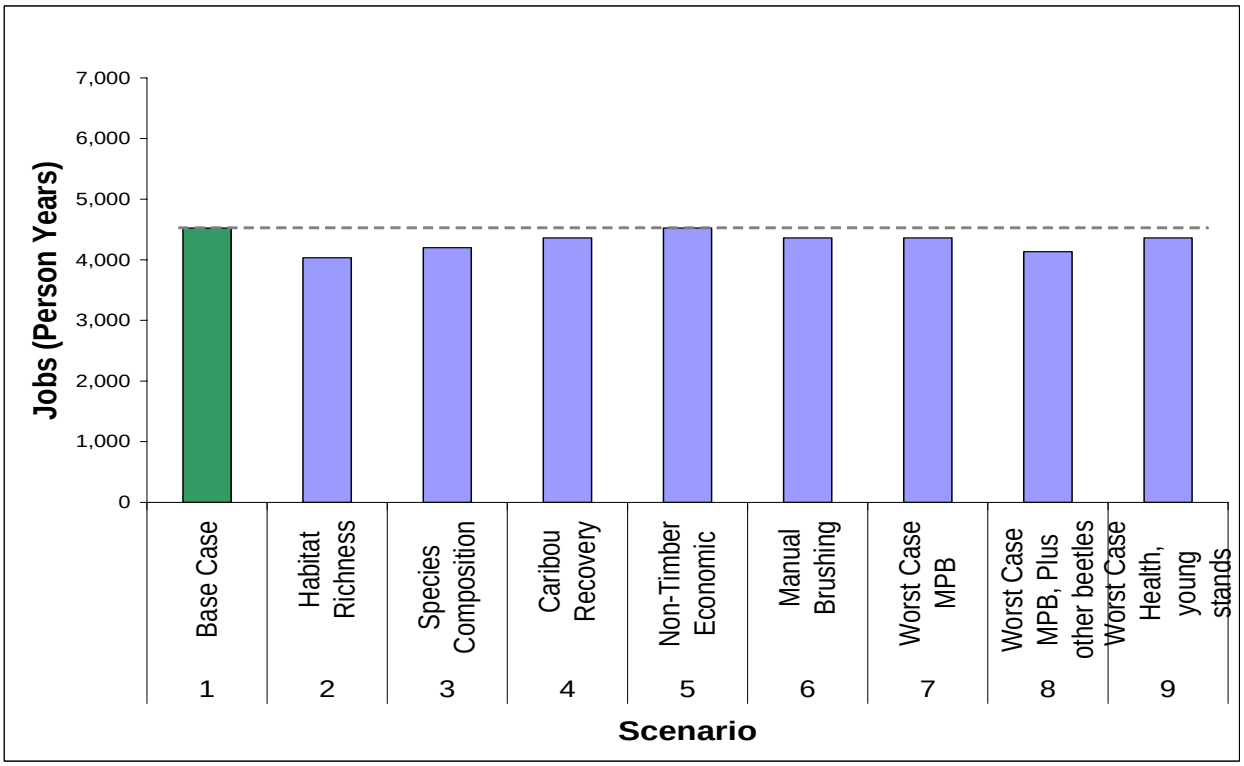


Figure 34 - Forecasted direct and indirect employment (AAC related) in the medium and long term.

## *10.6 Summary*

Table 29 summarizes the analysis results by assigning minus signs (-), plus signs (+), or no change sign (0) on each scenario depending how they compared to base case. Some of the results are implied: caribou habitat was not compared between habitat richness scenario and other scenarios, however it was assumed that large permanent reserves of old growth would likely increase/improve caribou habitat as well.

Table 29 – Summary of Analysis Results

| Indicator | Base Case | Habitat Richness | Species Composition | Caribou Recovery | Non-Timber Economic | Manual Brushing | Worst Case MPB | Worst Case MPB plus other Beetles | Worst Case Health, Young Stands |
|---|---|---|---|---|---|---|---|---|---|
| **Timber Harvest** | o | -- | -- | - or o | o | - | - | -- | - |
| **Old Forest** | o | + | o | o | o | o | o | - or o | o |
| **Old Interior Forest** | o | + | o | o | o | o | o | - or o | o |
| **Ungulates** | o | + or o | o | + | o | o | o | o | o |
| **Patches** | o | o | o | o | o | o | o | o | o |
| **Scenic Areas** | o | + or o | o | o | + | + | o | o | o |
| **Wildlife Tree Retention** | o | + | o | o | o | o | o | o | o |
| **Species Diversity** | o | + or o | + | o | o | o | o | o | o |
| **Employment** | o | -- | -- | - or o | o | - or o | - | -- | - |

# 11 Conclusions

The development of a credible sustainable forest management (SFM) plan within a management unit requires a temporal assessment of potential forest management strategies. This assessment should be based on the best available quantitative information for each of the ecological, economic and social values of interest in the management unit.

Under the Sustainable Forest Management Framework currently being used by Canfor Ltd., tactical planning involves the analysis and interpretation of how operational practices are contributing to the achievement of strategic level objectives on the land base. A set of Criteria and Indicators (C&I) and associated measures of sustainability identify the specific resources and targets that define the desired future forest condition (DFC). Forecasting is an activity that assists forest practitioners and decision makers in long-term planning for SFM by evaluating the effects of management practices on the DFC and in identifying practices that will be effective in meeting specific management targets over the long-term.

The goal of this project was to provide analysis services in forecasting the outcomes of several forest management strategies to support Canfor and BCTS in their effort to fulfill certification requirements for the Mackenzie DFA by the Canadian Standards Association (CAN CSA Z809).

There are many criteria and indicators in the Mackenzie DFA SFM plan; however, many of them cannot be currently forecast through modeling due to lack of data. Particularly, we do not have information on how some specific indicators may behave or develop in the future. The first task in the project was to develop a list of indicators that could be modeled using traditional forest estate modeling techniques.

Next a base case scenario was developed. The role of the base case was to represent current forest management in the DFA. Also, the base case was used as the benchmark against which all the other scenarios were compared.

Analyses that predict the development of indicators many decades into the future have number of uncertainties associated with them. Most predictions are made based on past development of indicators and it is never certain whether the indicators develop the same way in the future as they have in the past. For some indicators there are no past data, however, predictive models are still being used for these indicators in forecasting. For all the above reasons, it is important that these kinds of analyses are taken as giving direction, rather than forecasting a certain course of development.

# References

British Columbia Ministry of Forests and British Columbia Ministry of Environment , Lands and Parks 1999. *Landscape Unit Planning Guide.* Province of British Columbia, Victoria, BC.

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British Columbia Ministry of Forests 2004. *Prince George TSA. Rationale for Allowable Annual Cut (AAC) Determination.* Province of British Columbia, Victoria, BC.

Government of British Columbia, May 2004. *Order Establishing Provincial Non-Spatial Old Growth Objectives*.

Eng at al. 2006. *Provincial–Level Projection of the Current Mountain Pine Beetle Outbreak: Update of the infestation projection based on the 2005 Provincial Area Overview of Forst Health and revisions to "the model" (BCMPB.v3)*

# APPENDIX I

# LAND BASE SUMMARY OF THE DFA

Mackenzie DFA Sustainable Forest Management Plan

# APPENDIX I: LAND BASE SUMMARY OF THE DFA

*Table 1: Summary of Land Classification in the DFA*

| Land Classification | | Total Area (ha) | Net Reduction Area (ha) | Area (ha) |
|---|---|---|---|---|
| **DFA Area** | | | | **2,117,199** |
| | Land Not BCFS | 33,297 | 33,297 | |
| Exclusions | Kemess | 2,648 | 1,457 | |
| | NF/NP | 482,727 | 479,862 | |
| | Current RTL | 7,069 | 6,829 | |
| **Total Exclusions** | | | **521,445** | |
| **Crown Forest Land Base** | | | | **1,595,754** |
| | Parks, etc | 14,519 | 12,184 | |
| | Non-commercial cover | 10,761 | 10,442 | |
| | Inoperable | 12,536 | 2,167 | |
| | Special Planning Cells | 19 | 0 | |
| | ESA | 190,920 | 163,814 | |
| | Non-merchantable | 76 | 18 | |
| CFLB | Balsam marginal | 219,821 | 112,820 | |
| Reductions | Spruce marginal | 21,709 | 13,373 | |
| (NHLB) | Pine marginal | 35,491 | 26,431 | |
| | Deciduous marginal | 6,216 | 3,512 | |
| | Deciduous Far | 40,910 | 33,634 | |
| | Problem Forest | 74,780 | 42,664 | |
| | Low volume | 235,326 | 66,155 | |
| | Low productivity | 121,890 | 44,549 | |
| | WHA | 43 | 35 | |
| | UWR | 49,745 | 7,925 | |
| | WTP (spatial) | 8,093 | 6,681 | |
| | WTP (non-spatial) | 73,679 | 35,821 | |
| | Riparian | 151,803 | 71,236 | |
| **Total Reductions to CFLB (NHLB)** | | | **673,461** | |
| **Current THLB** | | | | **922,293** |
| | Future RTL | 95,274 | 41,503 | |
| **Future THLB** | | | | **880,790** |
| | | | | |
| Total Current and Future Reductions: | | | | 1,236,409 |
| Future THLB | | | | 880,790 |

# Ministry of Forests - Apportionment System
## TSA AAC, Apportionment and Commitments

**Parameters:** **TSA Name:** **MacKenzie TSA** **TSA:** **16**
**Northern Interior Forest Region**
**Report Effective Date:** **2006-08-18**

## A) ALLOWABLE ANNUAL CUT (AAC)

(Section 8, Forest Act)

Effective Date: 2001-12-01
Determination Date: 2001-10-11
AAC (m3): 3,050,000

| Partition | m3 | % |
|---|---|---|
| Conventional | 2,950,000 | 96.72 |
| Deciduous leading stands | 100,000 | 3.28 |
| **Total** | **3,050,000** | **100** |

## B) APPORTIONMENT

(Section 10, Forest Act)

Effective Date: 2005-10-30
Determination Date: 2006-01-14

**i) Cubic Meters (m3)**

| | Total m3 | % | Partition: Conventional | % | Partition: Deciduous leading | % |
|---|---|---|---|---|---|---|
| Forest Licences Replaceable | 2,059,795 | 67.53 | 2,059,795 | 69.82 | | |
| Forest Licences Non-Replaceable | 156,808 | 5.14 | 106,808 | 3.62 | 50,000 | 50.00 |
| TSL > 10000 m3 Replaceable | 0 | 0.00 | | | | |
| TSL <= 10000 m3 Replaceable | 0 | 0.00 | | | | |
| TSL (WITH AAC), NON REPLACEABLE | 0 | 0.00 | | | | |
| Pulpwood Agreement TSL | 0 | 0.00 | | | | |
| BCTS Timber Sale Licence/Licence | 768,886 | 25.21 | 718,886 | 24.37 | 50,000 | 50.00 |
| BCTS Forest Licence Non-Replacea | 0 | 0.00 | | | | |
| TSA BC Timber Sales Temporary AA | 0 | 0.00 | | | | |
| Woodlot Licence | 8,000 | 0.26 | 8,000 | 0.27 | | |
| Community Forest Agreement | 0 | 0.00 | | | | |
| Forest Service Reserve | 56,511 | 1.85 | 56,511 | 1.92 | | |
| **Total** | **3,050,000** | **100.00** | **2,950,000** | **100.00** | **100,000** | **100.00** |

**Ministry of Forests - Apportionment System**
**TSA AAC, Apportionment and Commitments**

**Parameters:** **TSA Name:** **MacKenzie TSA** **TSA:** **16**
**Northern Interior Forest Region**
**Report Effective Date:** **2006-08-18**

## C) COMMITMENTS

| | | | | Total m3 | Conventional | Deciduous leading stands | NON-AAC Lump Sum Volume |
|---|---|---|---|---|---|---|---|
| **Forest Licences** | A15384 | CANADIAN FOREST PRODUCTS LTD. | | 1,082,904 | 1,082,904 | | |
| **Replaceable** | A15385 | ABITIBI CONSOLIDATED COMPANY OF | | 932,500 | 932,500 | | |
| | | | **Total** | **2,015,404** | **2,015,404** | | |
| **Forest Licences** | A62356 | TAKLA DEVELOPMENT CORPORATION | | | | | 36,663 |
| **Non-Replaceable** | A62375 | TSAY KEH DENE BAND | | 53,404 | 53,404 | | |
| | A64289 | KWADACHA NATURAL RESOURCES AGENC | | 53,404 | 53,404 | | |
| | A71017 | AINSWORTH LUMBER CO. LTD. | | 50,000 | | 50,000 | |
| | | | **Total** | **156,808** | **106,808** | **50,000** | **36,663** |
| | | | **Total Commitments** | **2,172,212** | **2,122,212** | **50,000** | **36,663** |

NOTE
NON-AAC Lump sum Volume: Lump Sum volumes that originated from a licence under-cut or from undersold volumes in the competitive program.
These volumes do not form an integral part of the current AAC for the TSA and therefore are excluded from the totals.

# Ministry of Forests - Apportionment System
## TSA AAC, Apportionment and Commitments

**Parameters:**

**TSA Name:** **MacKenzie TSA** **TSA:** **16**

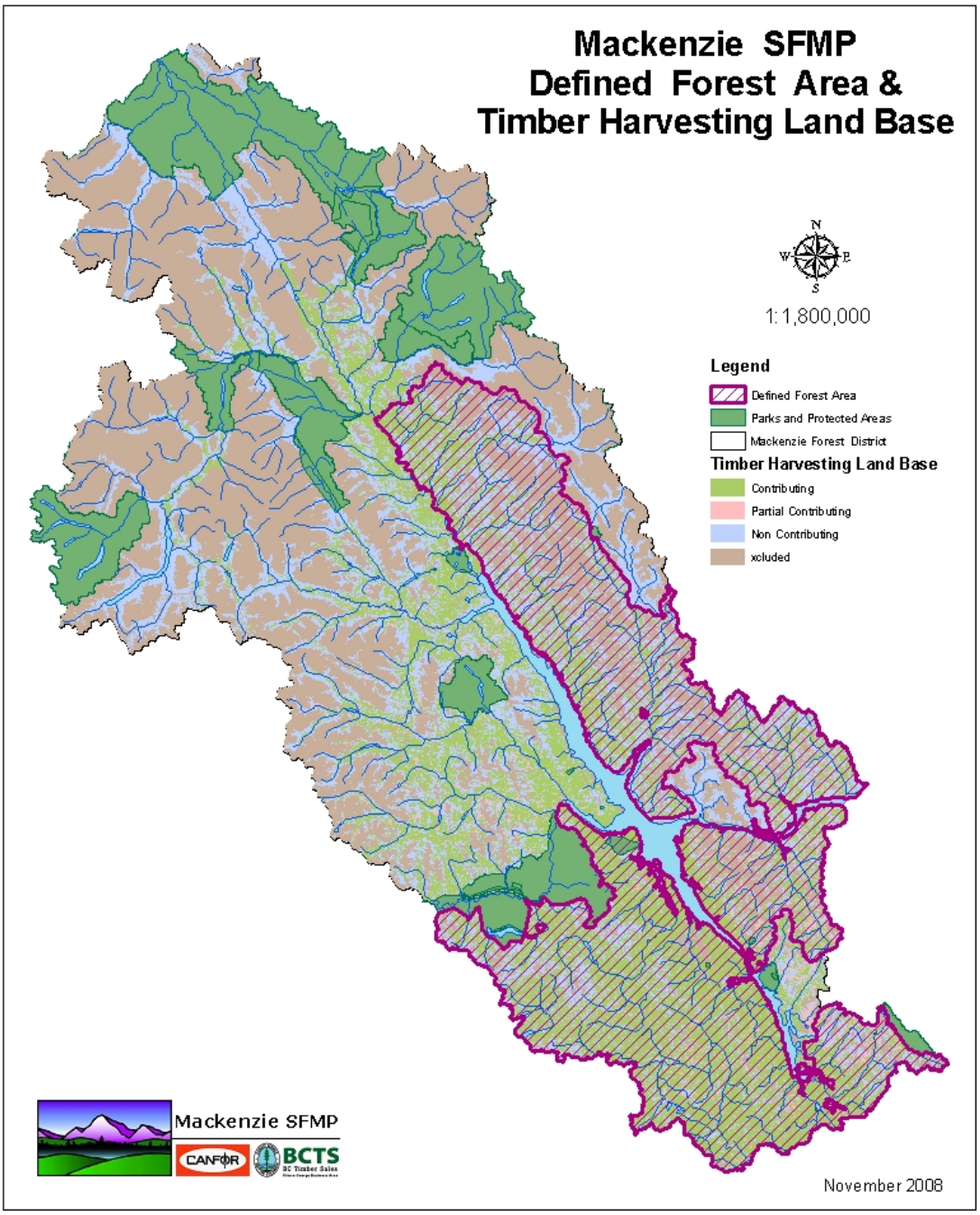
**Northern Interior Forest Region**

**Report Effective Date:** **2006-08-18**

# APPENDIX J

## MAPS

This Appendix contains maps of the DFA and other associated indicator maps.


Mackenzie SFMP
Defined Forest Area &
Timber Harvesting Land Base
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Legend
Defined Forest Area
Parks and Protected Areas
Mackenzie Forest District
Timber Harvesting Land Base
Contributing
Partial Contributing
Non Contributing
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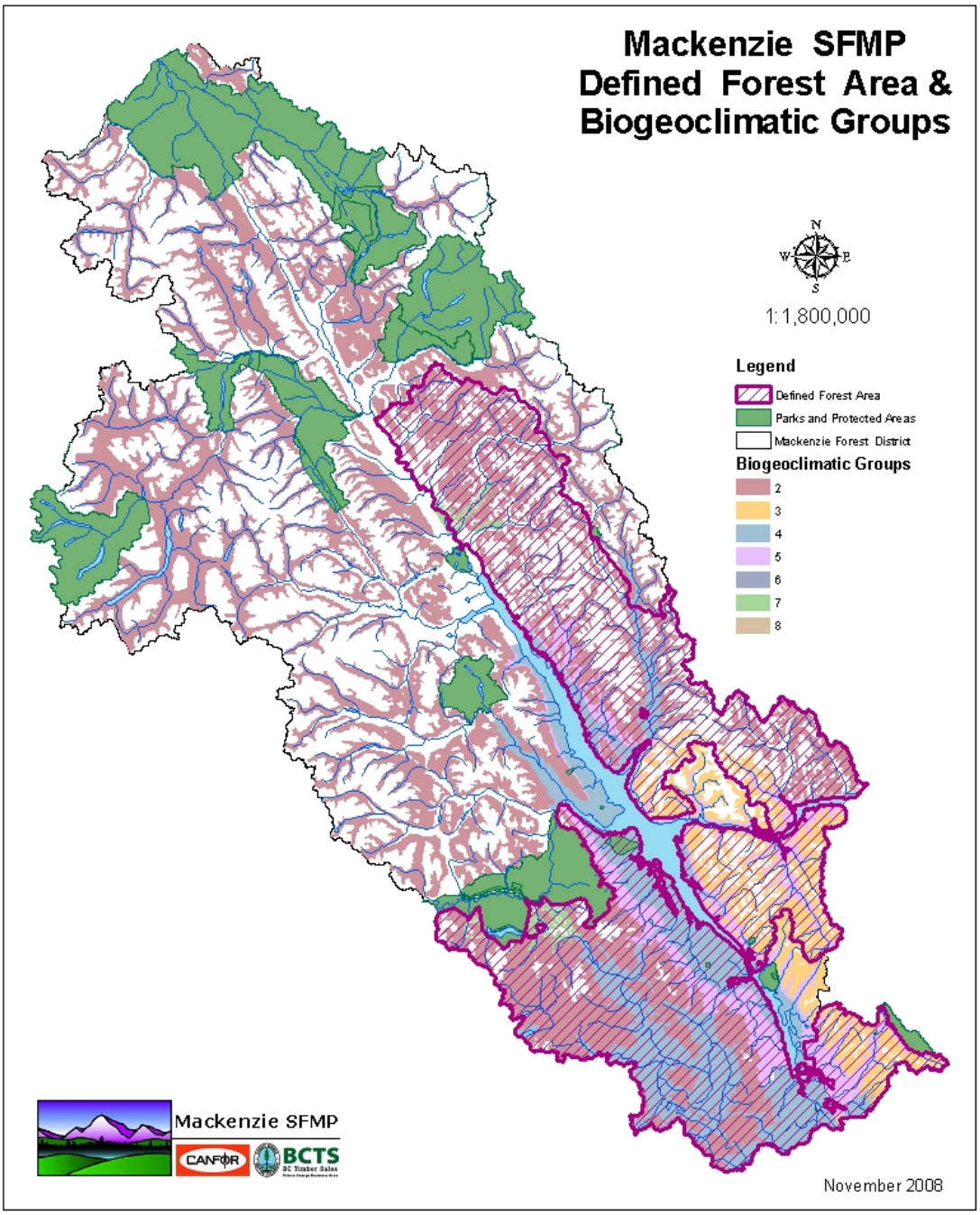
Mackenzie SFMP
CANFOR
BCTS
November 2008


Mackenzie SFMP
Defined Forest Area &
Biogeoclimatic Groups
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1:1,800,000
Legend
Defined Forest Area
Parks and Protected Areas
Mackenzie Forest District
Biogeoclimatic Groups
2
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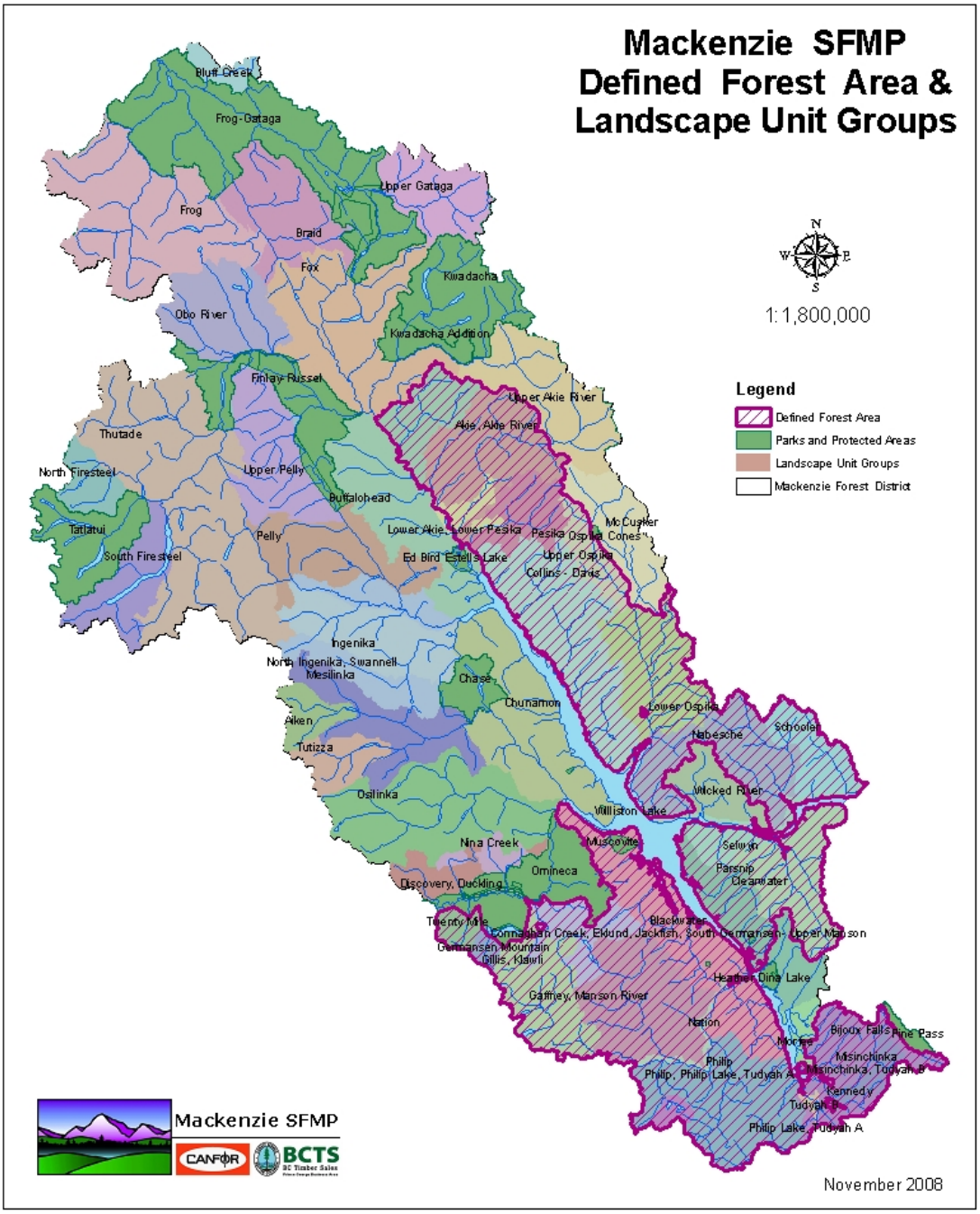
Mackenzie SFMP
CANFOR
BCTS
BC Timber Sales
November 2008


Mackenzie SFMP
Defined Forest Area &
Landscape Unit Groups
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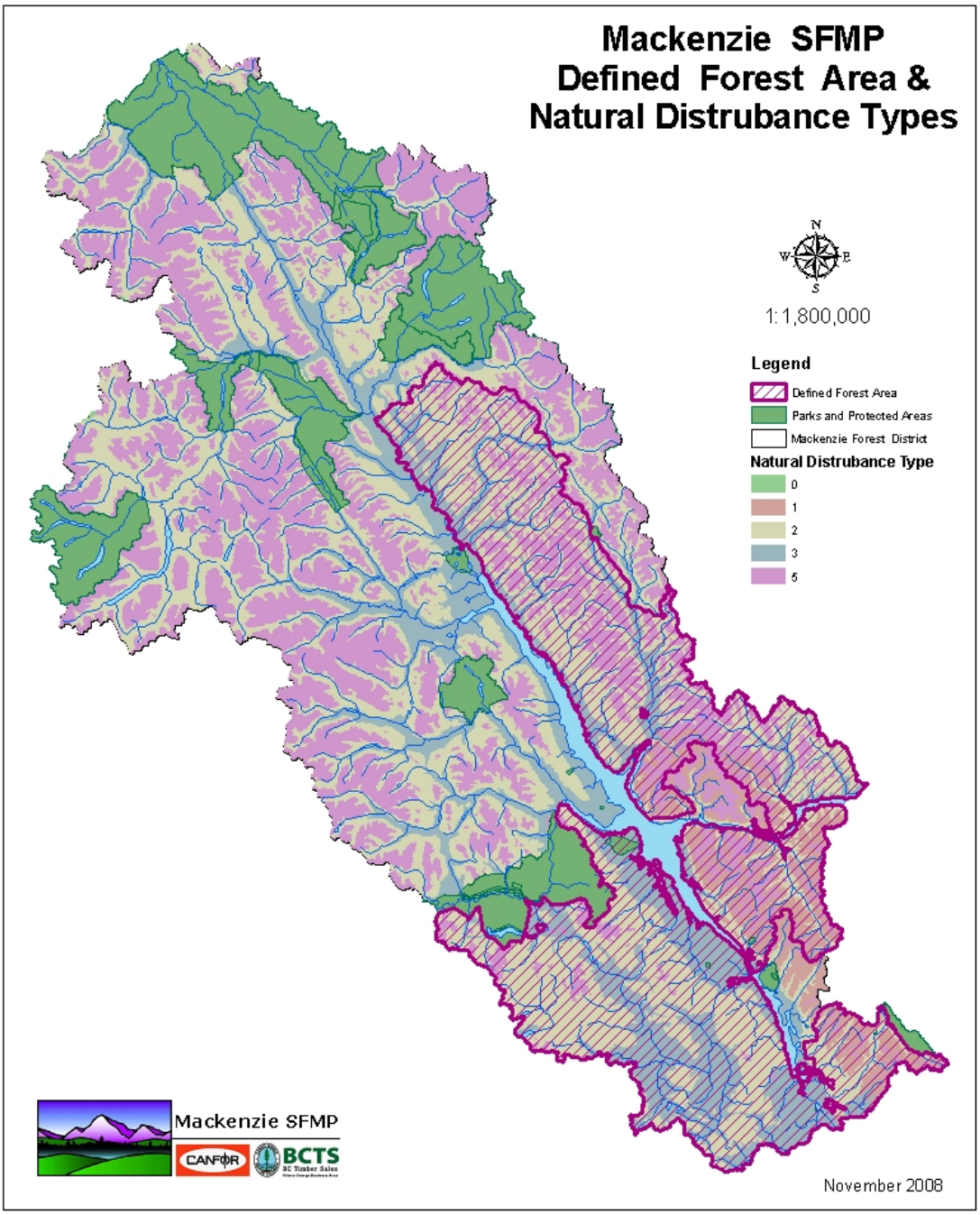
Legend
Defined Forest Area
Parks and Protected Areas
Landscape Unit Groups
Mackenzie Forest District
Bluff Creek
Frog-Gataga
Upper Gataga
Frog
Braid
Fox
Kwadacha
Obo River
Kwadacha Addition
Finlay-Russet
Upper Akie River
Akie, Akie River
Thutade
North Firesteel
Upper Pelly
Buffalohead
Tatlatui
Pelly
South Firesteel
Lower Akie, Lower Pesika
Pesika
Ospika Cones
McCusker
Upper Ospika
Ed Bird Estella Lake
Collins - Davis
Ingenika
North Ingenika, Swannell
Mesilinka
Chase
Chunamon
Lower Ospika
Aiken
Tutizza
Nabesche
Schooler
Osilinka
Wicked River
Williston Lake
Muscovite
Nina Creek
Selwyn
Parsnip
Omineca
Clearwater
Discovery, Duckling
Twenty Mile
Blackwater
Connaghan Creek, Eklund, Jackfish, South Germansen
Upper Manson
Germansen Mountain
Gillis, Kluwli
Heather, Dina Lake
Gaffney, Manson River
Nation
Bijoux Falls, Pine Pass
Misinchinka
Misinchinka, Tudyah B
Philip
Philip, Philip Lake, Tudyah A
Kennedy
Tudyah B
Philip Lake, Tudyah A
Mackenzie SFMP
CANFOR
BCTS
BC Timber Sales
November 2008


Mackenzie SFMP
Defined Forest Area &
Natural Distrubance Types
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Legend
Defined Forest Area
Parks and Protected Areas
Mackenzie Forest District
Natural Distrubance Type
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3
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Mackenzie SFMP
CANFOR
BCTS
November 2008

# APPENDIX K

# SUSTAINABLE FOREST CRITERIA AND INDICATOR MATRIX

This Appendix contains the:

- *Sustainable Forest Criteria And Indicator Matrix* agreed to by consensus of the Public Advisory Group on October 28, 2008 and a
- *Comparison SFM Framework to CSA SFM Z809:2002*.

| CSA SFM Z809:2002 | | | SFM Framework |
|---|---|---|---|
| **CSA Element** | **Element short description** | **Element long description** | **Framework Indicator** |
| 1.1 | Ecosystem Diversity | Conserve ecosystem diversity at the landscape level by maintaining the variety of communities and ecosystems that naturally occur in the DFA. | 1-1. Ecologically distinct habitat types are represented in an unmanaged state in the DFA to sustain lesser known species and ecological function. |
| 1.1 | Ecosystem Diversity | Conserve ecosystem diversity at the landscape level by maintaining the variety of communities and ecosystems that naturally occur in the DFA. | 1-2. The amount, distribution, and heterogeneity of terrestrial and aquatic habitat types elements and structure important to sustain biological richness are sustained. |
| 1.2 | Species Diversity | Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained through time | 1-2. The amount, distribution, and heterogeneity of terrestrial and aquatic habitat types elements and structure important to sustain biological richness are sustained. |
| 1.2 | Species Diversity | Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained through time | 1-3. Productive populations of selected species or species guilds are well distributed throughout the range of their habitat |
| 1.3 | Genetic Diversity | Conserve genetic diversity by maintaining the variation of genes within species. | 1-2. The amount, distribution, and heterogeneity of terrestrial and aquatic habitat types elements and structure important to sustain biological richness are sustained. |
| 1.3 | Genetic Diversity | Conserve genetic diversity by maintaining the variation of genes within species. | 1-4. Government designated protected areas and sites of special biological significance are sustained at the site and sub regional level |
| 1.4 | Protected Areas and Sites of Special Biological Significance | Respect protected areas identified through government processes. Identify sites of special biological significance within the DFA and implement management strategies appropriate to their long-term maintenance. | 1-4. Government designated protected areas and sites of special biological significance are sustained at the site and sub regional level |
| 2.1 | Forest Ecosystem Resilience | Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions. | 2-5. Natural disturbance levels and risk levels are managed for such that resistance to catastrophic change and the ability to recover on the landscape level is sustained |
| 2.2 | Forest Ecosystem Productivity | Conserve forest ecosystem productivity and productive capacity by maintaining ecosystem conditions that are capable of supporting naturally occurring species. | 1-2. The amount, distribution, and heterogeneity of terrestrial and aquatic habitat types elements and structure important to sustain biological richness are sustained. |
| 3.1 | Soil Quality and Quantity | Conserve soil resources by maintaining soil quality and quantity. | 2-1. Biological components of forest soils are sustained |
| 3.1 | Soil Quality and Quantity | Conserve soil resources by maintaining soil quality and quantity. | 2-4. No net detrimental loss in productivity as a result of forestry-related slope instability |
| 3.2 | Water Quality and Quantity | Conserve water resources by maintaining water quality and quantity. | 1-2. The amount, distribution, and heterogeneity of terrestrial and aquatic habitat types elements and structure important to sustain biological richness are sustained. |
| 4.1 | Carbon Uptake and Storage | Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems. | 3.3. The processes that take carbon from the atmosphere and store it in forest ecosystems are sustained |
| 4.1 | Carbon Uptake and Storage | Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems. | 3-1. The forest ecosystem carbon pool for the defined management area is maintained or increased. |
| 4.1 | Carbon Uptake and Storage | Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems. | 3-2. The forest products carbon pool is maintained or increased. |
| 4.2 | Forest Land Conversion | Protect forestlands from deforestation or conversion to non-forests. | 2-2. Area disturbed as a result of forestry activities is minimized |
| 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. | 2-3. Total growing stock of merchantable and non-merchantable tree species on forest land available for timber production |
| 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. | 4-1. Timber harvesting continues to contribute to economic well-being |
| 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. | 4-5. A competitive, diversified forestry sector exists |
| 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. | 4-6. Levels of forest damaging events or agents are managed such that their economic impact is minimized |

| CSA SFM Z809:2002 | | | SFM Framework |
|---|---|---|---|
| **CSA Element** | **Element short description** | **Element long description** | **Framework Indicator** |
| 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. | 5-1. Amount and quality of marketed non-timber forest resources does not decline over the long-term |
| 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. | 9-1. Resources and opportunities for recreation (including quality of experience) are maintained or enhanced |
| 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. | 9-2. Visual quality of harvested/managed landscape is acceptable to a broad range of stakeholders/visitors |
| 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. | 9-3. Forest management conserves unique or significant places and features of social, cultural, spiritual importance |
| 5.2 | Communities and Sustainability | Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and to participate in their use and management. | 4-2. Citizens continue to receive a portion of the benefits |
| 5.2 | Communities and Sustainability | Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and to participate in their use and management. | 7-1. Forest management planning adequately reflects the interests and issues raised by the public (stakeholders, residents and interested parties) in the DFA through an effective and meaningful (to the participants) public participation process |
| 5.2 | Communities and Sustainability | Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and to participate in their use and management. | 7-2. Information is exchanged between DFA forest resource managers and the public through a varied and collaborative planning approach in order to facilitate capacity building in the community |
| 5.3 | Fair Distribution of Benefits and Costs | Promote the fair distribution of timber and non-timber benefits and costs. | 4-2. Citizens continue to receive a portion of the benefits |
| 5.3 | Fair Distribution of Benefits and Costs | Promote the fair distribution of timber and non-timber benefits and costs. | 4-3. Governments continue to receive a portion of the benefits |
| 5.3 | Fair Distribution of Benefits and Costs | Promote the fair distribution of timber and non-timber benefits and costs. | 4-4. Opportunities to share a portion of the benefits exist for First Nations |
| 5.3 | Fair Distribution of Benefits and Costs | Promote the fair distribution of timber and non-timber benefits and costs. | 6-1. Employment and income sources and their contribution to the local economy continue to be diversified |
| 6.1 | Aboriginal and Treaty Rights | Recognize and respect Aboriginal and treaty rights. | 8-1. Forest management recognizes and respects Aboriginal and treaty rights |
| 6.1 | Aboriginal and Treaty Rights | Recognize and respect Aboriginal and treaty rights. | 8-2. Local management is effective in controlling maintenance of, and access to resources for First Nations |
| 6.1 | Aboriginal and Treaty Rights | Recognize and respect Aboriginal and treaty rights. | 8-3. The relationship between forest management and First Nations culture is acknowledged as important |
| 6.1 | Aboriginal and Treaty Rights | Recognize and respect Aboriginal and treaty rights. | 8-4. First Nations are provided with detailed, reciprocal knowledge pertaining to forest use as well as forest management plans prior to governmental approval and implementation |
| 6.2 | Respect for Aboriginal Forest Values, Knowledge, and Uses | Respect traditional Aboriginal forest values and uses identified through the Aboriginal input process. | 8-1. Forest management recognizes and respects Aboriginal and treaty rights |
| 6.2 | Respect for Aboriginal Forest Values, Knowledge, and Uses | Respect traditional Aboriginal forest values and uses identified through the Aboriginal input process. | 8-2. Local management is effective in controlling maintenance of, and access to resources for First Nations |
| 6.2 | Respect for Aboriginal Forest Values, Knowledge, and Uses | Respect traditional Aboriginal forest values and uses identified through the Aboriginal input process. | 8-3. The relationship between forest management and First Nations culture is acknowledged as important |

| CSA SFM Z809:2002 | | | SFM Framework |
|---|---|---|---|
| **CSA Element** | **Element short description** | **Element long description** | **Framework Indicator** |
| 6.2 | Respect for Aboriginal Forest Values, Knowledge, and Uses | Respect traditional Aboriginal forest values and uses identified through the Aboriginal input process. | 8-4. First Nations are provided with detailed, reciprocal knowledge pertaining to forest use as well as forest management plans prior to governmental approval and implementation |
| 6.3 | Public Participation | Demonstrate that the SFM public participation process is designed and functioning to the satisfaction of the participants. | 7-1. Forest management planning adequately reflects the interests and issues raised by the public (stakeholders, residents and interested parties) in the DFA through an effective and meaningful (to the participants) public participation process |
| 6.3 | Public Participation | Demonstrate that the SFM public participation process is designed and functioning to the satisfaction of the participants. | 7-2. Information is exchanged between DFA forest resource managers and the public through a varied and collaborative planning approach in order to facilitate capacity building in the community |
| 6.4 | Information for Decision-Making | Provide relevant information to interested parties to support their involvement in the public participation process, and increase knowledge of ecosystem processes and human interactions with forest ecosystems. | 7-1. Forest management planning adequately reflects the interests and issues raised by the public (stakeholders, residents and interested parties) in the DFA through an effective and meaningful (to the participants) public participation process |
| 6.4 | Information for Decision-Making | Provide relevant information to interested parties to support their involvement in the public participation process, and increase knowledge of ecosystem processes and human interactions with forest ecosystems. | 7-2. Information is exchanged between DFA forest resource managers and the public through a varied and collaborative planning approach in order to facilitate capacity building in the community |
| 6.4 | Information for Decision-Making | Provide relevant information to interested parties to support their involvement in the public participation process, and increase knowledge of ecosystem processes and human interactions with forest ecosystems. | 7-3. An adaptive management program is implemented for all levels of the Framework (Strategic, Tactical, Operational) |
| N/A | N/A | N/A | 9-4. Worker safety is maintained within acceptable levels |

**Mackenzie SFMP**

CANFOR BCTS BC Timber Sales

# CANFOR - MACKENZIE/BCTS DEFINED FOREST AREA
## SUSTAINABLE FOREST MANAGEMENT PLAN
### SUSTAINABLE FOREST CRITERIA AND INDICATOR MATRIX

**A Framework for Sustainable Forest Management**

Revision table

| | | | | Previous Version | Amended Version | Rationale | | | PAG Approval Date |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 1-2.11 Percent compliance with Chief Forester's Standards for Seed Use. | Remove measure | Redundant - declaring a block stocked (2-3.1) means it must also be compliant with the Chief Foresters' Standard. Updates to SFMP text to refer to Chief Forester's Standards for seed use. | | | 20-Feb-07 |
| | | | | 2-3.1 Percent of harvested blocks declared Stocked prior to the regeneration date. | Percent of harvested blocks declared Stocked prior to the regeneration date consistent with operational plans. | PAG request to maintain consistent wording. | | | 20-Feb-07 |
| | | | | 2-5.1 Measured annually. Refinement of the target will be done pending analysis (Sept. 2006). Target combined between Canfor and BCTS. | Measured annually. Only fires > 1ha recorded. Refinement of the target will be done pending analysis (Sept. 2006). Target combined between Canfor and BCTS. | Revised comment to reflect MoFR protection branch process for tracking hectares burned. | | | 20-Feb-07 |
| | | | | 2-5.3 Percent compliance with Chief Forester's Standards for Seed Use. | Remove measure | Redundant - declaring a block stocked (2-3.1) means it must also be compliant with the Chief Foresters' Standard. Updates to SFMP text to refer to Chief Forester's Standards for seed use. | | | 20-Feb-07 |
| | | | | 4-3.1 Taxes paid to governments. | Municipal taxes paid to government. | GST and corporate tax tracked by head office, not by division. Not possible to assign taxes to division. | | | 20-Feb-07 |
| | | | | 7-2.2 Website containing SFM information relevant to the Mackenzie SFMP is developed and updated. | Remove measure | PAG satisfied with material presented on Canfor and BCTS websites if invitation to join PAG included on site. | | | 20-Feb-07 |
| | | | | 7-2.4 Measured annually. Will also post on public website. | Canfor and BCTS to update annually their respective webpages with current documents. | PAG amended comment to clarify intent to make documentation available to the public at least once per year. | | | 20-Feb-07 |
| | | | | 8-4.2 Percentage of forest operations consistent with mutually agreed upon strategies. | 8-4.2 Percentage of forest operations consistent with mutually agreed upon strategies developed with First Nations. | Measure needed to be specific to stagegies devloped with first nations as originally intended by PAG. | | | 20-Feb-07 |
| | | | | 9-1.1 The percentage of harvest operations consistent with results or strategies as identified in operational plans, tactical plans and/or site plans. | The percentage of harvest operations consistent with results or strategies for recreation values as identified in operational plans, tactical plans and/or site plans. | Clarify that measure is explicit to recreation values. | | | 20-Feb-07 |
| | | | | 9-2.1 The percentage of forest operations consistent with visual quality requirements as identified in operational, tactical and/or site plans. | The percentage of harvesting and road building operations consistent with visual quality requirements as identified in operational, tactical and/or site plans. | To be consistent with other measures. | | | 20-Feb-07 |
| | | | | 9-2.2 Percentage of operations consistent with visually effective green-up buffer along roads as identified in the Mackenzie LRMP. | Percentage of harvest operations consistent with visually effective green-up buffer along roads as identified in the Mackenzie LRMP. | Specifying harvest operations limits harvesting without unduly isolating timber by restricting road ingress and silviculture activities are moot after harvesting. | | | 20-Feb-07 |
| | | | | 9-3.1 Percent of identified resource features that are managed or protected. | Percent of identified unique and/or significant places and features of social, cultural or spiritual importance that are managed or protected. | Clarify that the measure is specific to the indicator. | | | 20-Feb-07 |
| | | | | 5-1.2 Report out – dependent on list developed in 5-1.1 and report out by June 30, 2007. | Report out – dependent on list developed in 5-1.1 and report out by on or before March 31, 2008 | Revised comment to reflect that report is to be completed in Fiscal 07/08. | | | 28-Mar-07 |
| | | | | 1-1.1 Percent area of old and mature+old seral stage by landscape unit group and BEC variant for CFLB within the DFA. | 1-1.1 Percent area of old seral stage by landscape unit group and BEC Group for CFLB within the DFA. | Update the measure statement and the comments to reflect the requirements of the approved old growth order. | | | |
| | | | | 1-1.2 Percent of interior old forest by landscape unit group and BEC variant for CFLB within the DFA. | 1-1.2 Percent of interior old forest by landscape unit group and NDT for CFLB within the DFA. | Update the measure statement and the comments to reflect the requirements of the approved old growth order. | | | |
| | | | | 1-1.5 Percent productive forest by BEC variant represented within the Non-harvestable land base. | | Delete this measure because BEC variant is too course of a scale to be an effective measure of Biodiveristy. PEM is a more appropriate tool to use, when it becomes available. | | | |
| | | | | 1-2.5 Trend toward unmanaged species composition on managed stands by BEC zone on the THLB. | | Delete this measure because the numbers indicate that managed stands at free growing have more species diversity than unmanaged stands. | | | |
| | | | | 2-1.5 Variance between average preharvest and post harvest Site Index (at Free Growing) by inventory type group for cutblocks. | | Delete measure because stands at free growing are generally too short to use growth intercept as a measure of site index. For this reason, we rely on SI-BEC as the tool to use to estimate site index at free growing. | | | |
| | | | | 2-3.5 Trend toward unmanaged species composition on managed stands by BEC zone on the THLB. | | Delete this measure because the numbers indicate that managed stands at free growing have more species diversity than unmanaged stands. | | | |
| | | | | 2-5.2 Comments: Catastrophic change associated with forest health, global climate change, etc. Initial completion March 31, 2007. | 2-5.2 Comments: This measure will concentrate on the ranked forest health factors identified in the the annual strategic forest health plan. | Refine the measure to concentrate efforts on the ranked forest health factors only. | | | |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | Ecological | | CI. Biological richness and its associated values are sustained in the defined forest area (DFA) | 1-1. Ecologically distinct habitat types are represented in an unmanaged state in the DFA to sustain lesser known species and ecological function. | 1-1.1 Percent area of old seral stage by landscape unit group and BEC group for CFLB within the DFA. | Targets as per the Mackenzie TSA Biodiversity Order. | 0% | Canfor and BCTS to monitor BEC groups for recruitment areas when within 10% or within 1000 ha of target (whichever is less). Excludes parks which encompass whole Landscape Units. | | | Consensus - Mar. 28, 06 |
| 1 | 1.1 | Ecological | | | | 1-1.2 Percent of interior old forest by landscape unit group and BEC group for CFLB within the DFA. | Targets as per the Mackenzie TSA Biodiversity Order. | 0% | Excludes parks which encompass whole Landscape Units. | | | Consensus - Mar. 28, 06 |
| 1 | 1.1 | Ecological | | | | 1-1.3 The amount of established landscape-level biodiversity reserves within the DFA. | ≥ area set aside across the DFA. | -0.5% | Parks, Protected Areas, Wildland RMZs, OGMAs, WHAs, UWR (List to be included in the SFMP). | | | Consensus - Mar. 28, 06 |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | Ecological | | | | 1-1.4 Hectares of unauthorized forestry-related harvesting or road construction within protected areas or established old growth management areas (OGMA). | 0 ha | 0 | OGMAs to be established in Mackenzie TSA. Draft OGMAs are to be managed as if established. | | | Consensus - Mar. 28, 06 |
| | | | | | | 1-1.5 Percent productive forest by BEC variant represented within the Non-harvestable land base. | Target to be established following analysis (Sept. 2006). | | | | | Consensus - May 9, 06 |
| 1 | 1.2 | Ecological | | | 1-2. The amount, distribution, and diversity of terrestrial and aquatic habitat types, structure and elements important to biological richness are sustained. | 1-2.1 Percent area by patch size class by landscape unit group and Natural Disturbance Types. | Trend towards targets in LRMP | | Patch is combined areas of harvesting within 20 years of age that are generally within 400 metres of each other including unharvested areas in-between. Measured biannually. | | | Consensus - Mar. 28, 06 |
| 1 | 1.2 | Ecological | | | | 1-2.2 Percentage of cutblocks that exceed coarse woody debris requirements. | 100% | 0% | Legal or requirements specified in operational plan. Measured annually. | | | Consensus - Mar. 28, 06 |
| 1 | 1.2 | Ecological | | | | 1-2.3 Percentage of cutblocks that meet or exceed wildlife tree patch requirements. | 100% | 0% | Legal or requirements specified in operational and/or site plan. Measured annually. | | | Consensus - Mar. 28, 06 |
| 1 | 1.2 | Ecological | | | | 1-2.4 The percentage of forest operations consistent with riparian management area requirements as identified in operational plans and/or site plans. | 100% | 0% | Measured annually. | | | Consensus - Mar. 28, 06 |
| 1 | 1.2 | Ecological | | | | 1-2.5 Trend toward unmanaged species composition on managed stands by BEC zone on the THLB. | Target to be established following analysis (Sept. 2006). | | Area weighted percent species composition at free growing measured by inventory label for all stands declared FG within the reporting period. Measured annually. | | | Consensus - Mar. 28, 06 |
| 2 | 2.2 | Ecological | | | | 1-2.6 The percentage of forest operations consistent with approved provincial Caribou Ungulate Winter Range requirements. | 100% | 0% | Measured annually. Subject to adaptive management requirements of CSA and effectiveness monitoring (PAG comment request). | | | Consensus - Mar. 28, 06 |
| 3 | 3.2 | Ecological | | | | 1-2.7 The percentage of identified unnatural sediment occurrences where mitigating actions were taken. | 100% | ≤5% | Mitigating actions may include referral to appropriate party. Measured annually. | | | Consensus - Mar. 28, 06 |
| 3 | 3.2 | Ecological | | | | 1-2.8 Percentage of stream crossings appropriately designed and properly installed and/or removed. | 100% | ≤5% | Measured annually. | | | Consensus - Mar. 28, 06 |
| 3 | 3.2 | Ecological | | | | 1-2.9 Percent of watersheds containing approved or proposed development with Peak Flow Index calculations completed. | 100% by Sept 2007 | +7 months | LRMP 6.6 | | | Consensus - Apr. 11, 06 |
| 3 | 3.2 | Ecological | | | | 1-2.10 Percentage of road construction or deactivation projects where prescribed revegetation occurs within 12 months of disturbance. | 100% | ≤10% | This will meet the LRMP requirement for reduction of noxious weeds. Revegetation may include grass seeding, willow cuttings, etc. | | | Consensus - Mar. 28, 06 |
| 3 | 3.2 | Ecological | | | | 1-2.12 Percentage of planned roads that have an environmental risk assessment completed. | 100% | ≤10% | Measured annually. | | | Consensus - Mar. 28, 06 |
| 1 | 1.2 | Ecological | | | 1-3. Productive populations of selected species or species guilds are well distributed throughout the range of their habitat. | 1-3.1 The percentage of forest operations consistent with approved provincial Caribou Ungulate Winter Range requirements. | 100% | 0% | Measured annually. Subject to adaptive management requirements of CSA and effectiveness monitoring (PAG comment request). Comment for Indicator 1.3: "Productive" means self-perpetuating, sustainable and viable. | | | Consensus - Apr. 11, 06 |
| 1 | 1.2 | Ecological | | | | 1-3.2 Percent of appropriate personnel trained to identify Species at Risk in the DFA. | 100% | ≤10% | Measured annually. | | | Consensus - Apr. 11, 06 |
| 1 | 1.2 | Ecological | | | | 1-3.3 Percent of Species at Risk in the DFA that have management strategies developed by April 2007. | 100% | 0% | Measured annually. Subject to adaptive management requirements of CSA and effectiveness monitoring (PAG comment request). | | | Consensus - Apr. 11, 06 |
| 1 | 1.2 | Ecological | | | | 1-3.4 Percent LRMP Resource Management Zone (RMZ) specific wildlife species with management strategies by April 2007. | 100% | 0% | The RMZ strategy is only applicable to the RMZs in which these species have been identified. Measured annually. | | | Consensus - Apr. 11, 06 |
| 1 | 1.2 | Ecological | | | | 1-3.5 Percentage of forest operations consistent with Species at Risk in the DFA management strategies as identified in operational plans, tactical plans and/or site plans. | 100% | ≤5% | Measured annually. Commencing after April 2007. | | | Consensus - Apr. 11, 06 |
| 1 | 1.2 | Ecological | | | | 1-3.6 Percentage of forest operations consistent with LRMP Resource Management Zone (RMZ) specific wildlife species management strategies as identified in operational plans, tactical plans and/or site plans. | 100% | ≤5% | Measured annually. Commencing after April 2007. | | | Consensus - Apr. 11, 06 |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1-3.7 Report out on the annual results from the Mugaha Marsh bird banding station. | Report out on | | Annually. | | | Consensus - May 9, 06 |
| 1 | 1.4 | Ecological | | | 1-4. Government designated protected areas and sites of special biological significance are sustained at the site and sub regional level | 1-4.1 The amount of established landscape-level biodiversity reserves within the DFA. | ≥ area set aside across the DFA. | -0.5% | Parks, Protected Areas, Wildland Resource Management Zones, OGMAs, WHAs, UWR (List to be included in the SFMP). | | | Consensus - Apr. 11, 06 |
| 1 | 1.4 | Ecological | | | | 1-4.2 Hectares of unauthorized forestry-related harvesting or road construction within protected areas or established old growth management areas (OGMA). | 0 ha | 0 ha | OGMAs to be established in Mackenzie TSA. Draft OGMAs are to be managed as if established. | | | Consensus - Apr. 11, 06 |
| 1 | 1.4 | Ecological | | | | 1-4.3 Percent of appropriate personnel trained to identify sites of biological significance in the DFA. | 100% | ≤10% | Measured annually. | | | Consensus - Apr. 11, 06 |
| 1 | 1.4 | Ecological | | | | 1-4.4 Percent of sites of biological significance that have management strategies developed by April 2007. | 100% | 0% | Measured annually. "Sites" refers to features that can be found in the field. Management strategies address types of sites, not necessarily specific sites. | | | Consensus - Apr. 11, 06 |
| 1 | 1.4 | Ecological | | | | 1-4.5 Percentage of forest operations consistent with sites of biological significance management strategies as identified in operational plans, tactical plans and/or site plans. | 100% | ≤5% | Measured annually commencing after April 2007. | | | Consensus - Apr. 11, 06 |
| Criterion 3 | 3.1 | Environmental | 2 | C II. The productive capability of forest ecosystems within the Timber Harvesting Landbase (THLB) is sustained. | 2-1. Biological components of forest soils are sustained. | 2-1.1 Percentage of cutblocks that exceed coarse woody debris requirements. | 100% | 0% | Legal or requirements specified in operation plan. Measured annually. | | | Consensus - Feb. 28, 06 |
| | | | | | | 2-1.2 The percentage of forest operations consistent with soil conservation standards as identified in operational plans and/or site plans. | 100% | 0% | Measured annually. Operational plan requirements are specific to each block based on soil hazard assessment. | | | Consensus - Feb. 28, 06 |
| | | | | | | 2-1.3 The percentage of forest operations consistent with terrain management requirements as identified in operational plans and/or site plans. | 100% | 0% | Measured annually. Operational plan requirements are specific to each block based on terrain stability indicators. | | | Consensus - Feb. 28, 06 |
| | | | | | | 2.1.4 The number of EMS reportable spills. | 0 | < 5 | Measured annually. Report on spills and actions taken. EMS as per Canfor and BCTS (and listed in SFMP). Add definition of running water and applicability to standing water. Variance is combined between Canfor and BCTS. | | | Consensus - Mar. 14, 06 |
| | | | | | | 2-1.5 Variance between average preharvest and post harvest Site Index (at Free Growing) by inventory type group for cutblocks. | > 0 | 0% | Interim measure - Measured annually, includes blocks at late free growing date within reporting period. | | | Consensus - Feb. 28, 06 |
| | | | | | 2-2. Productive land-base loss as a result of forestry activities is minimized. | 2-2.1 Area of THLB converted to non-forest land use through forest management activities. | <5% | 0% | Refinement of the target will be done pending analysis. | | | Consensus - Feb. 28, 06 |
| | | | | | | 2-2.2 The percentage of gross cutblock area occupied by total permanent access structures. | <5% | 1% | Averaged annually. | | | Consensus - Feb. 28, 06 |
| | | | | | | 2-2.3 Inclusion of access management in communication strategies with stakeholders. | 100% | 0% | Measured annually. Intent is to coordinate access to minimize area of roads. | | | Consensus - Feb. 28, 06 |
| | | | | | 2-3. Total growing stock of merchantable and non-merchantable tree species on forest land available for timber production. | 2-3.1 Percent of harvested blocks declared Stocked prior to the regeneration date consistent with operational plans. | 100% | ≤5% | Measured annually. Query blocks where RD is in this reporting period. | | Mackenzie | Consensus - Feb 20, 07 |
| | | | | | | 2-3.2 Percent of harvested blocks declared Free Growing prior to the late free growing assessment date. | 100% | ≤5% | Measured annually. Query blocks where LFG is in this reporting period. | | Mackenzie | Consensus - Mar 14, 05 |
| | | | | | | 2-3.3 Percent compliance with stocking levels and species composition requirements contained in operational plans. | 100% | 0% | Measured annually. | 2-3.2: 100% of Canfor and BCTS blocks are regenerated to the stocking standards as | Mackenzie | Consensus - Mar 14, 06 |
| 1 | 1.2 | Ecological | | | | 2.3-4 Trend toward unmanaged species composition on managed stands by BEC zone on the THLB. | Target to be established following analysis (Sept. 2006). | | Area weighted percent species composition at free growing measured by inventory label for all stands declared FG within the reporting period. Measured annually. | | | Consensus - Mar 14, 06 |
| | | | | | 2-4. No net detrimental loss in productivity as a result of forestry-related slope instability. | 2-4.1 The percentage of forest operations consistent with terrain management requirements as identified in operational plans and/or site plans. | 100% | 0% | Measured annually. Operational plan requirements are specific to each block based on terrain stability indicators. | | | Consensus - Mar 14, 06 |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2-5 Natural disturbance levels and risk levels are managed for such that resistance to catastrophic change and the ability to recover on the landscape level is sustained. | 2-5.1 Number of hectares (area) damaged by accidental forestry-related industrial fires. | <100 ha | +5ha | Measured annually. Only fires > 1ha recorded. Refinement of the target will be done pending analysis (Sept. 2006). Target combined between Canfor and BCTS. | Unknown | | Consensus - Feb 20, 07 |
| | | | | | | 2-5.2 Percentage of identified risk factors with updated management strategies. | 100% | 0% | Catastrophic change associated with forest health, global climate change, etc. Initial completion March 31, 2007. | | Mackenzie | Consensus - Mar 14, 06 |
| | | | | C III. Forest ecosystem contributions to global ecological cycles are sustained within the DFA. | 3-1. The forest ecosystem carbon pool for the defined management area is maintained or increased. | 3-1.1 Area of THLB converted to non-forest land use through forest management activities. | <5% | 0% | Refinement of the target will be done pending analysis. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-1.2 Percentage of cutblocks that exceed coarse woody debris requirements. | 100% | 0% | Legal or requirements specified in operation plan. Measured annually. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-1.3 Percent of harvested blocks declared Stocked prior to the regeneration date. | 100% | ≤5% | Measured annually. Query blocks where RD is in this reporting period. | | | Consensus with one abstention - Mar 14, 06 |
| | | | | | | 3-1.4 Percent of harvested blocks declared Free Growing prior to the late free growing assessment date. | 100% | ≤5% | Measured annually. Query blocks where LFG is in this reporting period. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-1.5 Percent compliance with stocking levels and species composition requirements contained in operational plans. | 100% | 0% | Measured annually. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-1.6 The percentage of forest operations consistent with soil conservation standards as identified in operational plans and/or site plans. | 100% | 0% | Measured annually. Operational plan requirements are specific to each block based on soil hazard assessment. | | | Consensus - Mar 14, 06 |
| | | | | | 3-3. The processes that take carbon from the atmosphere and store it in forest ecosystems are sustained. | 3-3.1 Area of THLB converted to non-forest land use through forest management activities. | <5% | 0% | Refinement of the target will be done pending analysis. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-3.2 Percent compliance with stocking levels and species composition requirements contained in operational plans. | 100% | 0% | Measured annually. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-3.3 Percent of harvested blocks declared Stocked prior to the regeneration date. | 100% | ≤5% | Measured annually. Query blocks where RD is in this reporting period. | | | Consensus - Mar 14, 06 |
| | | | | | | 3-3.4 Percent of harvested blocks declared Free Growing prior to the late free growing assessment date. | 100% | ≤5% | Measured annually. Query blocks where LFG is in this reporting period. | | | Consensus - Mar 14, 06 |
| | | Economic | 4 | C IV. The flow of economic benefits from forests through the forest industry is sustained. | 4-1. Timber harvesting continues to contribute to economic well-being. | 4-1.1 Actual harvest volume compared to the apportionment across the DFA over each 5 year cut control period. | 100% | +/- 10% | Reported annually. Measured on anniversary of cut control period. | | Prince George | Consensus - May 9, 06 |
| 5 | | Economic | | | | 4-1.2 Percent compliance with waste and residue standards. | 100% | ≤5% | Measured annually. Number of inspections indicating compliance. | | | Consensus - May 9, 06 |
| 5 | | Economic | | | 4-2. The public (stakeholders, residents and interested parties) continues to receive a portion of the benefits. | 4-2.1 Canfor to provide opportunities to purchase wood from private enterprises. | Opportunity exists | N/A | Private enterprises include any legal source such as woodlot owners, mining claims, private land, non-replaceable forest licenses, etc. | | Fort Nelson | Consensus - Apr 25, 06 |
| | | | | | | 4-2.2 The number of first order wood products produced from trees harvested from the DFA. | 5 | ≤2 | | | Prince George | Consensus - Apr 25, 06 |
| | | | | | | 4-2.3 The percent of money spent on forest operations and management on the DFA provided from northern central interior (NCI) suppliers (Stumpage not included). | Report out on | | NCI is defined as Smithers to McBride and 100 Mile House to Fort St. John. Intent is, to the extent possible, support business within the NCI. | | Vanderhoof | Consensus - Apr 25, 06 |
| | | | | | | 4-2.4 The number of support opportunities provided to the public (stakeholders, residents and interested parties). | Report out on | | Support opportunities include community support services, *pro bono* work, training opportunities to small contractors, etc. (Canfor only) - Report out on dollars spent and types of opportunities offered. | | | Consensus - Apr 25, 06 |
| | | | | | | 4-2.5 Report out on the amount of money directed towards environmental projects. | Report out on | | Refers to inventory, monitoring, research and enhancement. | | | Consensus - May 9, 06 |
| | | | | | 4-3. Governments continue to receive a portion of the benefits. | 4-3.1 Municipal taxes paid to governments. | 100% | 0% | Measured annually. | | Quesnel | Consensus - Feb 20, 07 |
| | | | | | | 4-3.2 Stumpage paid to government. | 100% | 0% | Measured annually. | | Vanderhoof, TFL 30 | Consensus - Apr 25, 06 |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4-4. Opportunities to receive a portion of the benefits exist for First Nations. | 4-4.1 The number of support opportunities provided to First Nations with Treaty area and/or asserted traditional territory within the DFA. | Report out on | | Support opportunities include community support services, *pro bono* work, training opportunities, etc. (Canfor only). Report out the number of opportunities provided and the number of First Nations provided with opportunities. | | | Apr 25, 06 Indicator accepted - with 1 dissension; measure accepted - with 1 dissension |
| | | | | | | 4-4.2 The number of contract opportunities provided to First Nations with Treaty area and/or asserted traditional territory within the DFA. | Report out on | | Report out on the number of opportunities provided and the number of First Nations provided with opportunities. | | | Apr 25, 06 Measure accepted - with 1 dissension |
| | | | | | | 4-4.3 The total value of transactions undertaken with First Nations with Treaty area and/or asserted traditional territory within the DFA. | Report out on | | Transactions include monetary donations and contracts. | | | Consensus - Apr 25, 06 |
| | | | | | 4-5. A competitive, diversified forestry sector exists. | 4-5.1 The percentage of DFA volume advertised for sale through open competitive bid. | 40% | -5% | Measured annually. DFA volume is defined as Canfor and BCTS apportionment. | | Prince George | Consensus - May 9, 06 |
| | | | | | | 4-5.2 A competitive primary milling facility is sustained. | ≥2 | 0 | Canfor only. | | Fort Nelson | Consensus - May 9, 06 |
| | | | | | 4-6. Levels of forest damaging events or agents are managed such that their economic impact is minimized. | 4-6.1 Percentage of identified risk factors with updated management strategies. | 100% | 0% | Repeat measure. Catastrophic change associated with forest health, global climate change, etc. Initial completion March 31, 2007. | | | Consensus - May 9, 06 |
| | | | | | | 4-6.2 Areas with stand damaging agents will be prioritized for treatment. | 100% | -10% | Measured annually. Treatment may include harvesting. Some PAG members do not want chemical treatment used or have a specific concern about the use of MSMA. Stand damaging agents do not include competitive vegetation. | | TFL 30, Prince George | Consensus - May 9, 06 |
| | | | | | | 4-6.3 Number of hectares (area) damaged by accidental forestry-related industrial fires. | <100 ha | +5ha | Repeat measure. Measured annually. Refinement of the target will be done pending analysis (Sept. 2006). Target combined between Canfor and BCTS. | | | Consensus - May 9, 06 |
| | | Economic | 5 | C V. The flow of marketed non-timber economic benefits from forests is sustained. | 5-1. Amount and quality of marketed non-timber forest resources does not decline over the long-term. | 5-1.1 List of existing and documented potential for marketed non-timber benefits. | Report out on | | Develop a list for the management unit – completion June 30, 2007. | | | Indicator: Consensus with one abstention- May 9, 06. Measure: Consensus - May 9, 06 |
| | | | | | | 5-1.2 Description of potential implications of SFM practices on the amount and quality of marketed non-timber values. | Report out on | | Report out – dependent on list developed in 5-1.1 and report out by on or before March 31, 2008 | | | Consensus - May 9, 06 Amended Mar 28, 2007 |
| | | | | | | 5-1.3 The percentage of forest operations consistent with range requirements as identified in operational plans and/or site plans. | 100% | 0% | Measured annually | | | Consensus - May 9, 06 |
| | | Economic | 6 | C VI. Forest management contributes to a diversified local economy. | 6-1. Employment and income sources and their contribution to the local economy continue to be diversified. | 6-1.1 Employment supported by each sector of the local economy (actual and percentage of total employment). | Report out on | | Report out in conjunction with TSR. Local economy is defined as the TSA and areas immediately adjacent to the TSA. | | | Consensus - May 9, 06 |
| | | | | | | 6-1.2 Contribution of income sources from each sector of the local economy (actual and percentage of total income). | Report out on | | Report out in conjunction with TSR. | | | Consensus - May 9, 06 |
| | | | | | | 6-1.3 The number of opportunities given to businesses within, or immediately adjacent to the TSA to provide non-tendered services to forest management activities. | Report out on | | Measured annually. Report out on the number of opportunities provided and the number of businesses provided with opportunities. | | | Consensus - May 9, 06 |
| | | | | | | 6.1-4 The number of first order wood products produced from trees harvested from the DFA. | 5 | ≤2 | Repeated measure. Measured annually. | | | Consensus - May 9, 06 |
| | | | | | | 6-1.5 The number of support opportunities provided within, or immediately adjacent to, the TSA. | Report out on | | Repeat of measure 4-4.1. Support opportunities include community support services, *pro bono* work, training opportunities, etc. (Canfor only). Report out the number of opportunities provided and the number of communities, organizations, or individuals provided with opportunities. | | | Consensus - May 9, 06 |
| 6 | 6.3 | Social | 7 | C VII. Decisions guiding forest management on the DFA are informed by and respond to a wide range of social and cultural values. | 7-1. Forest management planning adequately reflects the interests and issues raised by the public (stakeholders, residents and interested parties) in the DFA through an effective and meaningful (to the participants) public participation process. | 7-1.1 Implement and update a comprehensive list of stakeholders and affected or interested parties. | 1 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 7-1.2 The number of opportunities for PAG to review and provide comment on the SFMP. | ≥1 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.3 Number of Public Advisory Group meetings per year. | ≥ 1 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.4 The level of satisfaction of the PAG members with the process. | 100% | -20% | To be measured after each meeting, based on the average result of question M12 from the PAG meeting evaluation form. Satisfaction is defined as a rating of 4 or better. Results to be provided at the following meeting. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.5 Maintain and review at least annually and as required the Mackenzie SFMP PAG TOR, to ensure a credible and transparent process. | ≥1 | 0 | Measured annually | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.6 Survey residents, stakeholders and First Nations regarding their satisfaction with forest management (process and outcomes). | once in year 1, every 3 years thereafter | 0 | Survey population to include residents of rural communities. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.7 Percentage of the public sectors as defined in the ToR invited to participate in the PAG process. | 100% | 0% | Measured annually. Includes also those sectors that may have been removed from the TOR (lack of representation). | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.8 Percentage of PAG satisfaction with amount and timing of information presented for informed decision-making. | 100% | -20% | To be measured after each meeting, based on the average result of question M10 from the PAG meeting evaluation form. Satisfaction is defined as a rating of 4 or better. Results to be provided at the following meeting. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-1.9 Report out on consistency of Indicators or measures with LRMP objectives. | Report out on | | For areas common to both plans. PAG wants to ensure that SFMP measures reflect LRMP intent. | | | Consensus - May 9, 06 |
| | 6.4 | Social | 7 | | 7-2. Information is effectively exchanged between DFA forest resource managers and the public through a varied and collaborative planning approach to facilitate mutual understanding and recognition. | 7-2.1 The number of opportunities given to the public and stakeholders to express forestry-related concerns and be involved in our planning processes. | 6 | -2 | Measured annually, opportunities may include PAG, open houses, annual reports, referrals, mailings, etc. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-2.3 The percent of timely responses to written and documented concerns. | 100% | -5% | Measured annually. Timely response is defined as 30 days from receipt. Includes letters, email, and faxes. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-2.4 Distribution/access to SFM Plan, annual reports and audit results. | 1 | 0 | Canfor and BCTS to update annually their respective web pages with current documents. | | | Consensus - Feb 20, 07 |
| | | | | | | 7-2.5 The number of SFM educational opportunities and interactions provided. | 2 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-2.6 Percentage of mutually agreed upon communication strategies met. | 100% | -5% | Communication strategies are on an individual basis. April 2007 | | | Consensus - May 9, 06 |
| Clause 4.1, 4.2, 7 | CSA clause 4.1, 4.2, 7 | Social | 7 | | 7-3. An adaptive management program is implemented for all levels of the Framework (Strategic, Tactical, Operational). | 7-3.1 Adaptive Management strategy is developed, documented, acted upon and reviewed. | 1 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-3.2 Monitoring plan for indicators is developed, documented, acted upon and reviewed. | 1 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |
| | | | | | | 7-3.3 Reports and analysis of monitoring information – Annual Report | 1 | 0 | Measured annually. | | | Consensus - Feb. 14, 06 |
| | | Social | 8 | C VIII. Forest management sustains or enhances the cultural (material and economic), health (physical and spiritual) and capacity benefits that First Nations derive from forest resources. | 8-1. Forest management recognizes and respects First Nations rights and Treaty rights. | 8-1.1 Percentage of forest operations consistent with the Heritage Conservation Act. | 100% | 0% | Measured annually. | | | Apr 25, 06 Indicator accepted - with 2 dissentions. Measure accepted with 1 dissention. |
| | | | | | | 8-1.2 Maintain and review at least annually and as required the Mackenzie SFMP PAG Terms of Reference to recognize that First Nation participation in the public process will not prejudice First Nation rights and Treaty rights. | ≥1 | 0 | Measured annually. | | | Apr 25, 06 Measure accepted with 1 dissention |
| | | | | | 8-2. First Nations are provided with detailed, meaningful, and reciprocal knowledge pertaining to forest use as well as forest management plans prior to government approval and implementation. | 8-2.1 The number of opportunities for First Nations to provide meaningful input into our planning processes. | ≥2 per First Nation | 0 | Measured annually. Target is combined between Canfor and BCTS and relates to First Nations with Treaty area and/or asserted territory in the DFA. | | | Apr 25, 06 Indicator and measure accepted - with 1 dissension |

| CCFM Criterion | CSA SFM Element | Value | FW Criteria | Criteria | Indicator | Measure | Target | Variance | Comments | Current Status | Source | PAG Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 8-3. The relationship between forest management and First Nations' culture and tradition is acknowledged as important. | 8-3.1 Percentage of issues raised by First Nations peoples evaluated and responded to in a timely manner by Canfor and BCTS. | 100% | 10% | Measured annually. | | | Apr 25, 06 Indicator and measure accepted - with 1 dissension |
| | | | | | | 8-3.2 Percentage of issues raised by First Nations' Chief & Council or their authorized representative developed into mutually agreed upon strategies. | 100% | 50% | Measured annually. Over time the intent is to decrease the variance. Canfor and BCTS are committed to addressing issues which are within their forest management purview. Report out on the number of communication protocols established with First Nations. | | | Apr 25, 06 Measure accepted - with 1 dissension |
| | | | | | 8-4. Local management is effective in controlling their impact on the maintenance of and access to resources for First Nations. | 8-4.1 Incorporation of mutually agreed upon strategies to address First Nation peoples' values, knowledge, and uses into SFMP, operational plans, tactical plans and/or site plans. | 100% | 0% | Measured annually. Intention is to incorporate the strategy into any one or all of the plans mentioned. | | | Apr 25, 06 Indicator accepted - with 2 dissensions, measure accepted with 1 dissention |
| | | | | | | 8-4.2 Percentage of forest operations consistent with mutually agreed upon strategies developed with First Nations. | 100% | 0% | Measured annually. Starts after mutually agreed upon strategies are in place. | | | Apr 25, 06 Measure accepted - with 1 dissension Amended Feb 20, 07 |
| | | Social | 9 | C IX. Forest management sustains ongoing opportunities for a range of quality of life benefits. | 9-1. Resources and opportunities for recreation (including quality of experience) are maintained or enhanced. | 9-1.1 The percentage of harvest operations consistent with results or strategies for recreation values as identified in operational plans, tactical plans and/or site plans. | 100% | 0% | Measured annually. Maintain existing access and integrity of recreation sites and trails. Resources and opportunities for recreation include berry picking, wildflowers (sensitive), bird watching, hiking, snowmobiling, canoeing, hunting, fishing, camping, skiing, etc. | | | Consensus - Feb 20, 07 |
| | | | | | 9-2. Visual quality of harvested/managed landscape is acceptable to a broad range of stakeholders/visitors. | 9-2.1 The percentage of harvesting and road building operations consistent with visual quality requirements as identified in operational, tactical and/or site plans. | 100% | 0% | Measured annually. | | | Consensus - Feb 20, 07 |
| | | | | | | 9-2.2 Percentage of harvest operations consistent with visually effective green-up buffer along roads as identified in the Mackenzie LRMP. | 100% | 0% | Measured annually. Harvesting may be allowed for forest health or salvage purposes. | | | Consensus - Feb 20, 07 |
| | | | | | 9-3. Forest management conserves unique and/or significant places and features of social, cultural or spiritual importance. | 9-3.1 Percent of identified unique and/or significant places and features of social, cultural or spiritual importance that are managed or protected. | 100% | 0% | Measured annually. Identified resources include those identified within the FPC/FRPA or the Mackenzie LRMP. | | | Consensus - Feb 20, 07 |
| | | | | | 9-4. Worker safety is maintained. | 9-4.1 Written safety policies in place and full implementation is documented. | 2 | 0 | Measured annually. One per organization. | | | Consensus - May 9, 06 |
| | | | | | | 9-4.2 Number of lost time accidents in woodlands operations. | 0 | 0 | Measured annually. Includes Canfor and BCTS staff. | | | Consensus - May 9, 06 |
| | | | | | 9-5. Forest management considers public health and safety implications. | 9-5.1 Signage on FSRs and main haul roads to be kept current. | 100% | -5% | Measured annually for current operations. | | | Consensus - May 9, 06 |

# APPENDIX L

# GLOSSARY OF TERMS AND ABBREVIATIONS

**Updated to October 15. 2006**

# A

***AAC Apportionment*:** the distribution of the AAC for a TSA among timber tenures by the Minister in accordance with Section 10 of the Forest Act.

***Abiotic factors:*** the non-living components of the environment, such as air, rock s, soil, water, peat, and plant litter.

***Aboriginal (Source CSA):*** "'aboriginal peoples of Canada' [which] includes Indian, Inuit, and Métis peoples of Canada" (Constitution Act, 1982, Subsection 35 (2)).

***Aboriginal Resource site/unit (Source CSA):*** an investigated unit identified by the aboriginal communities/bands that provides resources for food or culture uses (e.g. ceremonies). Each site is described by its band, location and resource type, use and quality on a monthly basis. This information is confidential and not released without a band's permission.

***Aboriginal Rights (Source CSA):*** "rights that some Aboriginal peoples of Canada hold as a result of their ancestors' long-standing use and occupancy of the land".
**Note:** *"The rights of certain Aboriginal peoples to hunt, trap, and fish on ancestral lands are examples of Aboriginal rights. Aboriginal rights vary from group to group depending on the customs, practices, and traditions that have formed part of their distinctive cultures". (The State of Canada's Forests 2001/2002).*

***Aboriginal title (Source CSA):*** "a legal term that recognizes the interest of Aboriginals in the land. It is based on their long-standing use and occupancy of the land as descendants of the original inhabitants of Canada" *(The State of Canada's Forests 2001/2002).*

***Accreditation (Source CSA):*** the procedure by which the Standards Council of Canada (SCC) gives formal recognition that a registrar (certifier) is deemed competent to carry out specific tasks.

***Active floodplain:*** the level area with alluvial soils adjacent to streams that is flooded by stream water on a periodic basis and is at the same elevation as areas showing evidence of flood channels free of terrestrial vegetation, recently rafted debris or fluvial sediments newly deposited on the surface of the forest floor or suspended on trees or vegetation, or recent scarring of trees by material moved by flood waters.

***Adaptive management:*** adaptive management rigorously combines management, research, monitoring, and means of changing practices so that credible information is gained and management activities are modified by experience.

***Adaptive management (Source CSA):*** a learning approach to management that recognizes substantial uncertainties in managing forests and incorporates into decisions experience gained from the results of previous actions

***Additive effects:*** effects on biota of stress imposed by one mechanism, contributed from more than one source (e.g., sediment-related stress on fish imposed by sediment derived from stream bank sources and from land surface sources). (See also cumulative effects).

***Administrative law:*** the branch of the law which deals with the actions of government vis a vis the public.

***Administrative review:*** an appeal of a determination under Sections 78 to 85 of the Forest & Range Practices Act.

***Advanced regeneration:*** trees that have become established naturally under a mature forest canopy and are capable of becoming the next crop after the mature crop is removed.

***Adverse slope:*** an uphill incline for hauling or skidding of logs or other loads.

***Aerial photography:*** photos taken from the air at regular, spatial intervals and used in photo interpretation to provide much information about forests and landforms.

***Afforestation:*** the establishment of trees on an area that has lacked forest cover for a very long time or has never been forested.

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

***Aggradation:*** accumulation of sediment in a stream channel on an alluvial fan or on a floodplain. Also applied to sediment accumulation on slopes.

***Aggregated retention:*** retaining trees in patches throughout a cutblock or cutting unit.

***Airtanker:*** a fixed-wing aircraft fitted with tanks and equipment for dropping suppressants or retardants.

***Alienation:*** any land that has had its "right-to-use" transferred from the Crown through grant, lease, or permit or has a special interest noted, as in reserves. Land so designated may be permanent or temporary.

***All-aged stand:*** see uneven-aged stand.

***Allowable Annual Cut (AAC):*** The allowable rate of timber harvest from a specified area of land. The chief forester sets AACs for timber supply areas(TSAs) and tree farm licences (TFLs) in accordance with Section 8 of the Forest Act.

***Amortization:*** a procedure by which the capital cost of projects, such as roads or bridges, is written off over a specified period of time as the timber volumes developed by the projects are harvested and extracted.

***Anadromous:*** fish that breed in fresh water but live their adult life in the sea. On the Pacific coast, anadromous fish include all the Pacific salmon, steelhead trout, some cutthroat trout and Dolly Varden char, lampreys and eulachons.

***Analysis unit:*** the basic building blocks around which inventory data and other information are organized for use in forest planning models. Typically, these involve specific tree species or type groups that are further defined by site class, geographic location or similarity of management regimes.

***Animal Unit Month (AUM):*** the amount of forage required for one month by an average animal of the genus Bos (i.e., a cow) aged 6 months or older.

***Aquatic habitat:*** habitat where a variety of marine or freshwater flora and fauna occur for long periods throughout the year. Examples include tide pools, estuaries, bogs, ponds and potential underwater diving areas.

***Archaeological site:*** a location that contains physical evidence of past human activity and that derives its primary documentary and interpretive information through archaeological research techniques. These resources are generally associated with both the pre-contact and post-contact periods in British Columbia. These resources do not necessarily hold direct associations with living communities.

***Artificial regeneration:*** establishing a new forest by planting seedlings or by direct seeding (as opposed to natural regeneration).

***Aspect:*** the direction toward which a slope faces.

***Auditor (Source CSA):*** a person qualified to undertake audits. Note: For SFM registration audits, auditors are qualified according to the requirements set out in CAN-P-14B and CAN-P-1518.

***Available timber (see also Operable timber):*** timber which is available for harvest after due recognition of constraints to protect the environment and other forest uses.

***Available volumes:*** the portion of total inventory volumes that is available for harvesting after all management constraints on timber harvesting have been considered, including definition of the timber harvesting land base, age of tree merchantability, deferrals and any other priorities or constraints on timber harvesting.

***Average long term yield:*** the annual average of the total yield over the next 200 years minus unsalvaged losses. This figure is generally greater than the long run sustained yield due to the influence of cutting old growth timber in the first few decades.

***Avoidable waste:*** the volume of timber left on the harvested area that should have been removed in accordance with the utilization standards in the cutting authority. It does not include the volume of timber that could not be removed because of physical impediments, safety considerations, or other reasons beyond the control of the licensee. Avoidable waste volumes are billed monetarily, as well as for cut control.

***Azimuth:*** the horizontal angle or bearing of a point measured from the true (astronomic) north. Used to refer to a compass on which the movable dial (used to read direction) is numbered in 360. (See: Bearing and Compass).

# B

***Backlog:*** a Ministry of Forests term applied to forest land areas where silviculture treatments such as planting and site preparation are overdue. Planting is considered backlog if more than 5 years have elapsed since a site was cleared (by harvesting or fire) in the interior and more than 3 years on the coast of British Columbia.

***Backlog area:*** an area from which the timber was harvested, damaged or destroyed before October 1, 1987 and that in the district manager's opinion is insufficiently stocked with healthy well spaced trees of a commercially acceptable species.

***Backpack sprayer:*** spray unit with plastic containers on a backpack frame. Used by individual operator to apply chemicals, such as herbicides.

***Backspar trail:*** a bladed or non-bladed pathway over which mobile backspar equipment travels.

***Bank full height:*** that elevation which characterizes the cross-sectional area of the active stream channel.

***Bareroot seedling:*** stock whose roots are exposed at the time of planting (as opposed to container or plug seedlings). Seedlings are grown in nursery seedbeds and lifted from the soil in which they are grown to be planted in the field.

***Basal area (Source FRPA): (a)*** for the purposes of stocking standards, the cross-sectional area per hectare of the crop trees, and ***(b)*** for the purposes of retention of basal area in a riparian management zone, the cross-sectional area per hectare of standing trees, whether living or dead. .

***Base case:*** the current socioeconomic conditions related to the existing forest land management strategy and the expected socioeconomic conditions if the strategy remains unchanged.

***Baseline information:*** information collected to provide a standard against which future measurements can be compared.

***Basic silvicultural practices:*** maintenance of the productivity of forest sites, restocking of denuded forest lands with commercial tree species within three years for areas west of the Coast Range and five years for areas in the Interior, protection against damage by fire, insects and diseases to predetermined standards.

***Basic silviculture:*** harvesting methods and silviculture operations including seed collecting, site preparation, artificial and natural regeneration, brushing, spacing and stand tending, and other operations that are for the purpose of establishing a free growing crop of trees of a commercially valuable species and are required in a regulation

***Bearing:*** a direction on the ground or on a map defined by the angle measured from some reference direction: this may be true (geographic) north, magnetic north, or grid north.

***Bed load:*** particulates that are transported along the channel bottom in the lower layers of streamflow by rolling and bouncing.

***Benefit/cost analysis:*** a technique for comparing alternate courses of action by an assessment of their direct and indirect outputs (benefits) and inputs (costs). Benefits and costs are usually defined in economic and social terms.

***Biodiversity (biological diversity(Source FRPA)):*** the biological diversity of plants, animals and other living organisms in all their forms and levels of organization, including the biological diversity of genes, species and ecosystems

***Biodiversity (biological diversity) II (Source CSA):*** “the variability among living organisms from all sources, including inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (Environment Canada, *Canadian Biodiversity Strategy*).

***Biogeoclimatic Classification system (BEC):*** A classification system which was adopted by the British Columbia Ministry of Forests in the 70’s as a method to classify and manage sites on an ecosystem-specific basis. The combination of vegetation, geology, and climate concepts form the basis for division of Biogeoclimatic Zones in British Columbia.

***Biogeoclimatic unit:*** part of the biogeoclimatic ecosystem classification system. The recognized units are a synthesis of climate, vegetation and soil data and defined as classes of geographically related ecosystems that are distributed within a vegetationally inferred climatic space.

***Biogeoclimatic zone:*** The highest level of classification and represent areas of broad macroclimate. They are generally named after dominant tree species and a descriptor of the general climate or region. In British Columbia, there are 14 biogeoclimatic zones identified. Examples include the ESSF - Engelmann Spruce Subalpine Fir zone and BWBS - Boreal White and Black Spruce Zone.

***Biological control:*** the use of biotic agents such as insects, nematodes, fungi, and viruses for the control of weeds and other forest pests.

***Biological herbicide:*** a naturally occurring substance or organism which kills or controls undesirable vegetation. Preferred over synthetic chemicals because of reduced toxic effect on the environment.

***Biological legacies:*** features which remain on a site or landscape after a natural disturbance. These legacies include live and dead trees, coarse woody debris, soil organic matter, plants, fungi, micro-organisms and seeds.

***Biomass:*** the dry weight of all organic matter in a given ecosystem. It also refers to plant material that can be burned as fuel.

***Biosphere:*** that part of the earth and atmosphere capable of supporting living organisms.

***Biota:*** all living organisms of an area, taken collectively.

***Birddog aircraft:*** an aircraft carrying the person (air attack officer) who is directing fire bombing action on a wildfire.

***Bladed trail:*** a constructed trail that has a width greater than 1.5 m and a mineral soil cutbank height greater than 30 cm.

***Blowdown (windthrow):*** uprooting by the wind. Also refers to a tree or trees so uprooted.

***Blue-listed species:*** see sensitive/vulnerable species.

***Bole:*** trunk of a tree.

***Bonus bid:*** means a bid

(a) Tendered in order to acquire the right to harvest timber under an agreement under this Act,
(b) Calculated on a dollar value per cubic metre of competitive species and forest products harvested and measured in compliance with the agreement, and
(c) Payable from time to time in accordance with the agreement

***Botanical forest products:*** prescribed plants or fungi that occur naturally on Crown forest land. There are seven recognized categories: wild edible mushrooms, floral greenery, medicinal products, fruits and berries, herbs and vegetables, landscaping products and craft products.

***Breast height:*** the standard height, 1.3 m above ground level, at which the diameter of a standing tree is measured.

***Broadcast burning:*** a controlled burn, where the fire is intentionally ignited and allowed to proceed over a designated area within well-defined boundaries, for the reduction of fuel hazard after logging or for site preparation before planting. Also called slash burning.

***Browse:*** shrubs, trees and herbs that provide food for wildlife.

***Brush rake:*** a blade with teeth at the bottom, attached to a cat or skidder, used in mechanical site preparation. It penetrates and mixes soil and tears roots.

***Brushing:*** a silviculture activity done by chemical, manual, grazing, or mechanical means to control competing forest vegetation and reduce competition for space, light, moisture, and nutrients with crop trees or seedlings.

***Bucking:*** cutting a felled tree into specified log lengths for yarding and hauling; also, making any bucking cut on logs.

***Buffer strip:*** a strip of land (often including undisturbed vegetation) where disturbance is not allowed or is closely monitored to preserve or enhance aesthetic and other qualities along or adjacent to roads, trails, watercourses and recreation sites.

***Buffer zone:*** see Pesticide buffer zone.

# C

***Cable logging:*** a yarding system employing winches, blocks, and cables.

***Cambium:*** a single layer of cells between the woody part of the tree and the bark. Division of these cells results in diameter growth of the tree through formation of wood cells (xylem) and inner bark (phloem).

***Campfire:*** a fire, not bigger than 1 m in height and 1 m in diameter, built for the purpose of cooking or providing warmth.

***Canadian Forest Fire Weather Index (FWI) System:*** A subsystem of the Canadian Forest Fire Danger Rating System. The components of the FWI System provide numerical ratings of relative fire potential in a standard fuel type (i.e. a mature pine stand) on level terrain, based solely on consecutive observations of four fire weather elements measured daily at noon (1200 hours local standard time or 1300 hours daylight saving time) at a suitable fire weather station; the elements are dry bulb temperature, relative humidity, wind speed, and precipitation. The system provides a uniform method of rating fire danger across Canada.

***Canopy:*** the forest cover of branches and foliage formed by tree crowns.

***Canopy closure:*** the progressive reduction of space between crowns as they spread laterally, increasing canopy cover.

***Capability mapping:*** a habitat interpretation for a species which describes the greatest potential of a habitat to support that species. Habitat potential may not be reflected by the present habitat condition or successional stage.

***Carbon balance:*** the concentration of carbon released into the atmosphere compared to the amounts stored in the oceans, soil and vegetation.

***Carrying capacity:*** the average number of livestock and/or wildlife that can be sustained on a management unit, compatible with management objectives for the unit. It is a function of site characteristics, management goals, and management intensity.

***Catchment basin:*** a hole dug adjacent to a culvert inlet to allow coarser particles to settle out.

***CCFM:*** Canadian Council of Forest Ministers

***Certificate of registration (registration certificate) (Source CSA):*** the official document issued by a registrar to an organization upon successful completion of the registration process, including the registration audit.

***Certification/registration (Source CSA)***: the result of a successful registration audit to this Standard, whereby the registrar issues a certificate of registration and adds the organization's registration to a publicly available list maintained by the registrar. The certification process is described in Annex A.

***Certified pesticide applicator:*** an individual certified (through examination) by the Pesticide Management Branch to use or supervise the use of pesticides in a specific management category.

***Certifier (registrar) (Source CSA):*** an independent third party that is accredited by the Standards Council of Canada as being competent to register organizations with respect to nationally and internationally recognized standards.

***Chain:*** a measuring tape, often nylon, 50 m or 75 m in length, used to measure distances. This term is derived from an old unit of measurement: (80 Ch=1 mile).

***Characteristic visual landscape:*** the naturally appearing landscape within a scene or scenes being viewed.

***Chlorosis:*** blanched or yellowish coloring in plants caused by nutrient or light deficiency.

***Choker:*** a noose of wire rope used for skidding or yarding logs. See Highlead system.

***Christmas tree permit:*** a legal document that authorizes the holder to harvest, or grow and harvest, Christmas trees on Crown land.

***Class A streams:*** see Fisheries stream Class A.

***Classified areas:*** areas based on provincial criteria and classification systems which will be identified and mapped according to the Regulations and Field Guides of the Forest Practices Code: riparian management areas, lakeshore management areas, and wildlife habitat areas. These areas, established by a district manager in consultation with a

designated B.C. Environment official, guide operations on a site-specific basis and require a combination of forest practices.

***Cleaning:*** a release treatment made in a stand not past the sapling stage to free the favoured trees from less desirable species of the same age that overtop them or are likely to do so.

***Clearcut:*** an area of forest land from which all merchantable trees have recently been harvested.

***Clearcutting:*** the process of removing all trees, large and small, in a stand in one cutting operation.

***Clearcutting silvicultural system:*** a system in which the crop is cleared from an area at one time and an even-aged, replacement stand is established. It does not include clearcutting with reserves. Clearcutting is designed so that most of the opening has full light exposure and is not dominated by the canopy of adjacent trees (this produces an open area climate). The minimum size of a clearcut opening is generally considered to be 1 ha.

***Clearcutting with reserves:*** a variation of the clearcut silvicultural system in which trees are retained, either uniformly or in small groups, for purposes other than regeneration.

***Climax forest:*** a forest community that represents the final stage of natural forest succession for its environment.

***Clinometer:*** a simple instrument for measuring vertical angles or slopes. In forestry, used to measure distance and tree heights.

***Clone:*** a plant which is genetically identical to the parent plant. Produced asexually, e.g., from cuttings or suckers.

***Close utilization:*** maximum stump height of 30 cm; minimum top dib of 10 cm. See: Utilization standards.

***Closed canopy:*** the description given to a stand when the crowns of the main level of trees forming the canopy are touching and intermingled so that light cannot reach the forest floor directly.

***Coarse filter approach:*** an approach to maintaining biodiversity that involves maintaining a diversity of structures within stands and a diversity of ecosystems across the landscape. The intent is to meet most of the habitat requirements of most of the native species. (see also Fine filter approach).

***Coarse Woody Debris (CWD):*** sound and rotting logs and stumps that provide habitat for plants, animals, and insects and a source of nutrients for soil development.

***Codominant:*** in stands with a closed canopy, those trees whose crowns form the general level of the canopy and receive full light from above, but comparatively little from the sides. In young stands, those trees with above average height growth.

***Commercial thinning:*** a silviculture treatment that 'thins' out an overstocked stand by removing trees that are large enough to be sold as products such as poles or fence posts. It is carried out to improve the health and growth rate of the remaining crop trees.

***Community watersheds:*** watersheds that have a drainage area no greater than approximately 500 km2, and that are licensed for community water use by the Water Management Branch of the Ministry of Environment, Lands and Parks. They include municipal and other waterworks and water user communities. Water user communities, as defined in the Water Act, have six or more licensed water users (registered with the Water Management Branch) extracting water from the same source. The district manager, in agreement with a designated Environment official, may identify other watersheds as community watersheds.

***Compartment:*** a geographic unit defined for the purposes of forest administration and inventory. The boundaries follow permanent physical features or legal demarcation where appropriate.

***Compass:*** instrument used to determine the direction of magnetic north. See Bearing and Azimuth.

***Competing vegetation:*** vegetation that seeks and uses the limited common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth.

***Compliance (Source CSA):*** the conduct or results of activities in accordance with legal requirements.

***Component (Source CSA):*** an individual section of the SFM system, e.g., policy, planning, implementation and operation, checking and corrective action, or management review.

***Composition:*** the proportion of each tree species in a stand expressed as a percentage of either the total number, basal area or volume of all tree species in the stand.

***Cone rake:*** a device for collecting cones from a standing tree. It is lowered, usually from a helicopter, over the crown of a tree. Cones or cone-bearing branches are removed and retrieved by the machine.

***Conformance (Source CSA):*** meeting non-legal requirements such as policies, work instructions, or standards (including this Standard).

***Conifer:*** cone-bearing trees having needles or scale-like leaves, usually evergreen, and producing wood known commercially as 'softwoods'.

***Conifer release:*** to 'release' established coniferous trees from a situation in which they have been suppressed by thinning out undesirable trees and shrubs which have overtopped them. Carried out to improve the growth of the coniferous trees released. See Brushing.

***Conk:*** a hard, fruiting body containing spores of a wood-decaying fungus.

***Consensus option:*** a management option that has a broad base of community and interest group support.

***Consequences, potential:*** a component of risk rating. Potential consequences are the detrimental events that could result from a hazard event.

***Conservation:*** management of the human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. It includes the preservation, maintenance, sustainable utilisation, restoration and enhancement of the environment.

***Conservation biology:*** the discipline that treats the content of biodiversity, the natural processes that produce it and the techniques used to sustain it in the face of human-caused environmental disturbance.

***Container seedling:*** seedling grown in small container in a controlled environment. See: Plug and bareroot seedling.

***Continual improvement (Source CSA):*** the ongoing process of enhancing SFM performance, resulting from experience and the incorporation of new knowledge in line with the organization's SFM policy and from the application of the SFM requirements.

***Contour map:*** a topographic map which portrays relief by means of lines which connect points of equal elevation.

***Contractual framework:*** where forest practices are primarily regulated by contracts.

***Control points:*** a system of points with established positions or elevations, or both, which are used as fixed references in positioning map features.

***Conventional ground skidding:*** any combination of rubber-tired or tracked skidding equipment.

***Conventional logging:*** any combination of mechanical or hand felling and rubber-tired or tracked skidding equipment. In the interior, cable
logging is not considered conventional; on the coast, it is.

***Coordinated Resource Management Plan (CRMP):*** a specific type of sub-unit plan. To date it has been used mainly for managing Crown and alienated grazing lands. This plan involves consultation with resource agencies and resource users in establishing objectives in the management and development of a specific area.

***Coppice (coppicing):*** the tendency of certain tree and brush species (such as red alder and bigleaf maple) to produce a large number of shoots when a single or few stems are mechanically removed but the root system left intact.

***Cord:*** 128 cubic feet of stacked round wood (whole or split, with or without bark) containing wood and airspace, with all the pieces of similar length and lined up on approximately the same direction. Example: a pile of firewood 4'x4'x8'.

***Corduroy:*** logs placed transversely along a road, usually with branches intact, and covered with fill material, to "float" the road over soft subsoils.

***Corrective action (Source CSA):*** action to eliminate the cause of a detected nonconformity or other undesirable situation. **Note:** *There can be more than one cause for a nonconformity. Corrective action is taken to prevent recurrence, whereas preventive action is taken to prevent occurrence.*

***Corridor:*** a band of vegetation, usually older forest, which serves to connect distinct patches on the landscape. Corridors are part of the Forest Ecosystem Network (FEN) and by providing connectivity permit the movement of plant and animal species between what would otherwise be isolated patches.

***Critical wildlife habitat:*** part or all of a specific place occupied by a wildlife species or a population of such species and recognized as being essential for the maintenance of the population.

***Critical winter range:*** forested habitat, usually stands of mature or old-growth conifers, which provides deer and elk with resources critical to survival during severe winters.

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

***Crop tree:*** a tree in a young stand or plantation selected to be carried through to maturity until an interim or final harvest.

***Cross-ditch:*** a ditch excavated across the road at an angle and at a sufficient depth, with armouring as appropriate, to divert both road surface water and ditch water off or across the road.

***Cross-drain culvert:*** a culvert used to carry ditch water from one side of the road to the other.

***Crown:*** the live branches and foliage of a tree.

***Crown class:*** see Codominant, Dominant, Intermediate or Overtopped.

***Crown closure:*** the condition when the crowns of trees touch and effectively block sunlight from reaching the forest floor.

***Crown density:*** the amount, compactness or depth of foliage of a tree crown.

***Crown Forested Land Base (CFLB):*** The land base contributing to old growth and wildlife tree retention targets includes all Crown forest, including tree farm license land and any private land associated with a tree farm license. The forested portions of, provincial parks, protected areas, ecological reserves and federal parks as noted above should also be included in the Crown forested land base. (This is slightly different from the TSR process, as parks and protected areas would be removed from the Crown forested land base).

***Crown land:*** land that is owned by the Crown. Referred to as federal Crown land when it is owned by Canada, and as provincial Crown
land when owned by a province.

***Cruise:*** the systematic measurement of a forested area designed to estimate to a specified degree of accuracy the volume of timber it contains, by evaluating the number and species of trees, their sizes and conditions.

***CSA:*** Canadian Standards Association

***Cull:*** trees or logs or portions thereof that are of merchantable size but are rendered unmerchantable by defects.

***Culmination age:*** the age at which the stand, for the stated diameter limit and utilization standard, achieves its maximum average rate of volume production (the Mean Annual Increment, or MAI) is maximized.

***Cultural diversity:*** the variety and variability of human social structures, belief systems and strategies for adapting to biological situations and changes in different parts of the world.

***Cultural heritage resources:*** archaeological sites, First Nations traditional use sites, and structural features and landscape features of cultural or historic significance. As defined in the Forest Act, a cultural heritage resource is an object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to the Province, a community or an aboriginal people.

***Culture:*** the sum of ways of living built up by a group of human beings, which is transmitted from one generation to another.

***Culvert:*** a transverse drain pipe or log structure covered with soil and lying below the road surface.

***Cumulative effects:*** effects on biota of stress imposed by more than one mechanism (e.g., stress in fish imposed by both elevated suspended sediments concentrations in the water and by high water temperature).

***Cut:*** the excavation required to lower the natural ground line to the desired road profile.

***Cut-and-fill:*** system of bench construction on hillslopes to produce road rights-of-way and landings whereby convex slopes are excavated and concave slopes (gullies) are filled; also, excavation of the upslope side of the right-of-way, and fill on the down slope side. (so called half-bench construction).

***Cut bank:*** the excavated bank from a ditch line to the top of the undisturbed slope of a road.

***Cut control:*** a set of rules and actions specified in the Forest Act that describes the allowable variation in the annual harvest rate either above or below the allowable annual cut approved by the chief forester.

***Cut period:*** the interval between major harvesting operations in the same stand.

***Cutblock:*** a specific area, with defined boundaries, authorized for harvest.

***Cutblock adjacency requirements:*** integrated resource management requirements that specify the desired spatial relationships among cutblocks.

***Cut slope:*** the face of an excavated bank required to lower the natural ground line to the desired road profile.

***Cutting authority:*** as defined in the Forest Practices Code of British Columbia Cutblock and Road Review Regulation a cutting permit or an application for a cutting permit or a timber sale licence or a timber sale licence that has been advertised.

***Cutting cycles:*** the planned, recurring interval of time between successive cuttings in a crop or stand.

***Cutting permit:*** a legal document that authorizes the holder to harvest trees under a licence issued under the Forest Act.

***Cutting plan:*** a plan for harvesting the timber from an area defined within a cutting permit. This plan must be approved by the Forest Service before operations may begin.

# D

***Damaged timber:*** timber that has been affected by injurious agents such as wind (as in the case of blowdown), fire, insects, or disease.

***Danger tree:*** a live or dead tree whose trunk, root system or branches have deteriorated or been damaged to such an extent as to be a potential danger to human safety.

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

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

***Debris flows:*** mixture of soil, rock, wood debris and water which flows rapidly down steep gullies; commonly initiate on slopes greater than 30 %, but may run out onto footsteps of low gradient.

***Debris initiation and transport hazard:*** the relative risk of gully wall failure and/or debris movement in gully channels, as tempered by the stream runout distance.

***Deciduous:*** perennial plants which are normally leafless for some time during the year.

***Declination (magnetic):*** the angle between true (geographic) north and magnetic north (direction of the compass needle). Declination varies from place to place and can be 'set' on a compass for a particular location.

***Deferred area:*** an area specified in a higher level plan where timber harvesting or other forest development activities have been postponed for a period of time or that the district manager has determined should not be harvested or otherwise developed until a higher level plan for the area is completed.

***Deficit forest:*** a forest in which existing stands cannot provide enough harvest volume to maintain the harvest at the level of long run sustained yield until the stands created when existing stands are cut become available for harvest. See also Surplus forest.

***Defined forest area (DFA) (Source CSA):*** a specified area of forest, including land and water (regardless of ownership or tenure) to which the requirements of this Standard apply. The DFA may or may not consist of one or more contiguous blocks or parcels.

***Defoliator:*** an agent that damages trees by destroying leaves or needles.

***Deforestation:*** clearing an area of forest on a non-temporary basis for another use. Clearcutting (even with stump removal), if shortly followed by reforestation for forestry purposes, is not deforesting.

***Deforestation II (Source CSA):*** "clearing an area of forest for another long-term use" *(The State of Canada's Forests 2001/2002*).

***Degradation:*** the diminution of biological productivity or diversity.

***Deleterious substance:*** any substance that, if added to water, would degrade or alter the quality of the water so that it becomes deleterious to fish or fish habitat, or becomes unsuitable for human consumption or any other purpose for which it is legally licensed (such as irrigation and livestock watering).

***Depletion:*** an income tax allowance reflecting the purchase price paid for merchantable timber, usually on fee simple land. Also, a term used to refer to the process of harvesting your growing stock.

***Designated area:*** an identifiable geographic unit of the forest land base that requires a specific combination of forest practices too adequately protect important resource values.

***Designated heritage trail:*** a heritage trail designated under the Heritage Conservation Act.

***Designated official:*** not a defined term in the Forest & Range Practices Act. However, commonly used to refer to a person designated by name or title to be a designated energy, mines and petroleum resources official, designated environment official, or designated forest official.

***Designated skid road/skid trail:*** a pre-planned network of skid roads or skid trails, designed to reduce soil disturbance and planned for use in subsequent forestry operations in the same area. Multiple passes by tracked or rubber-tired skidders or other equipment are anticipated.

***Designated wilderness:*** see Wilderness area.

***Desired future stand condition:*** a description of the characteristics of the future stand.

***Desired plant community:*** a plant community that produces the kind, proportion, and amount of vegetation necessary for meeting or exceeding the land use plan or plan objectives established for an ecological site. The desired plant community must be consistent with the site's capability to produce the desired vegetation through management, land treatment, or a combination of the two.

***Determination:*** any act, omission, decision, procedure, levy, order or other determination made under the Forest & Range Practices Act or the Regulations or Standards made under that act by an official or a senior official.

***Detrimental soil disturbance:*** changes caused by forest practices in the physical, chemical, or biological properties of the soil, including the organic forest floor and the mineral soil extending from the surface to the depth at which the unweathered parent material is encountered. Such changes may result in a loss of productive growing site, reduced site productivity, or adverse impacts on resource values.

***Development:*** the advancement of the management and use of natural resources to satisfy human needs and improve the quality of human life. For development to be sustainable it must take account of social and ecological factors, as well as economic ones, of the living and non-living resource base, and of the long-term and short-term advantages and disadvantages of alternative actions.

***Development objectives:*** the short-term (often 5-year) planning objectives for a specific management area.

***Development plan:*** a specific plan outlining harvesting, road construction, protection, and silviculture activities over the short-term (often 5 years) in accordance with the approved forest management plan.

***Dewatering:*** condition in stream channel when all the water flow occurs within the permeable streambed sediments, so no surface water is left; common in small streams with considerable accumulations of gravel.

***DFA:*** Defined forest area

***DFA-related worker (Source CSA):*** any individual employed by the organization to work for wages or a salary who does not have a significant or substantial share of the ownership in the employer's organization and does not function as a manager of the organization.

***Diameter limit:*** the removal of trees from a stand, based on the criterion of diameter. Generally, trees of less than a predetermined diameter are left unharvested.

***Diameter tape:*** a graduated tape based on the relationship of circumference to diameter which provides direct measure of tree diameter when stretched around the outside of the tree, usually at breast height. See DBH.

***DIB (diameter inside bark):*** the diameter of a tree or log excluding bark thickness.

***Dibble:*** a tool used to make holes in the ground for planting tree seedlings.

***Difficult site:*** forest sites with environmental conditions that are unfavourable for tree establishment and growth.

***Direct seeding:*** the application of tree seed to a denuded area to regenerate it with commercially valuable species.

***Disc trencher:*** a machine designed for mechanical site preparation. It provides continuous rows of planting spots rather than intermittent patches as provided by patch scarifiers. Consists of scarifying steel discs equipped with teeth.

***Discretionary authority:*** the power to make a decision where the choice of whether to make a decision is that of the decision maker.

***Dispersed retention:*** retaining individual trees scattered throughout a cutblock.

***District manager:*** the manager of a Forest Service district office, with responsibilities as outlined in the Forest Act, Ministry of Forests Act, and Range Act.

***Disturbance:*** a discrete event, either natural or human-induced, that causes a change in the existing condition of an ecological system.

***Ditch block:*** a blockage that is located directly downgrade of a cross-drain culvert or cross-ditch and designed to deflect water flow from a ditch into a cross-drain culvert.

***DOB (diameter outside bark):*** the diameter of a tree or log including bark thickness.

***Dominant:*** trees with crowns extending above the general level of the canopy and receiving full light from above and partly from the side; taller than the average trees in the stand with crowns well developed.

***Dot grid:*** a transparent sheet of film (overlay) with systematically arranged dots, each dot representing a number of area units. Used to determine areas on maps, aerial photos, plans, etc.

***Down-rated bridges:*** bridges whose carrying capacity has been reduced.

***Drag scarification:*** a method of site preparation that disturbs the forest floor and prepares logged areas for regeneration. Often carried out by dragging chains or drums behind a skidder or tractor.

***Drainage basin:*** area of the earth's surface from which surface drainage all flows to a single outlet stream (a watershed in North America).

***Drainage structures:*** include metal and wooden culverts, open-faced culverts, bridges, and ditches.

***Drainage system:*** a system designed to control the flow of water within a road prism.

***Drawdown:*** the process of reducing allowable annual cuts to a sustainable level.

***Duff:*** the layer of partially and fully decomposed organic materials lying below the litter and immediately above the mineral soil. It corresponds to the fermentation (F) and humus (H) layers of the forest floor. When moss is present, the top of the duff is just below the green portion of the moss.

***Dust palliatives:*** chemicals or compounds applied to road surfaces to reduce dust created by traffic.

# E

***Ecological balance:*** a state of dynamic equilibrium within a community of organisms in which genetic, species and ecosystem diversity remain relatively stable, subject to gradual changes through natural succession.

***Ecological classification:*** an approach to categorizing and delineating, at different levels of resolution, areas of land and water having similar characteristic combinations of the physical environment (such as climate, geomorphic processes, geology, soil and hydrologic function), biological communities (plants, animals, microorganisms and potential natural communities) and the human dimension (such as social, economic, cultural and infrastructure).

***Ecological health:*** both the occurrence of certain attributes that are deemed to be present in a healthy, sustainable resource, and the absence of conditions that result from known stresses or problems affecting the resource.

***Ecological integrity:*** the quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future.

***Ecological reserve:*** areas of Crown land which have the potential to satisfy one or more of the following criteria:

- areas suitable for scientific research and educational purposes associated with studies in productivity and other aspects of the natural environment;
- areas which are representative of natural ecosystems;
- areas in which rare or endangered native plants or animals may be preserved in their natural habitat; and
- areas that contain unique geological phenomena.

***Ecological units:*** areas of land with similar biological, geological, and climatic environments.

***Ecologically suitable species:*** coniferous or deciduous tree species that are naturally adapted to a site's environmental conditions, including the variability in these conditions that may occur over time.

***Economically operable:*** forest stands for which log prices exceed harvesting costs, including profit and return to capital.

***Ecoregion classification:*** the ecoregion classification system is used to stratify B.C.'s terrestrial and marine ecosystem complexity into discrete geographical units at five different levels. The two highest levels, Ecodomains and Ecodivisions, are very broad and place B.C. globally. The three lowest levels, Ecoprovinces, Ecoregions and Ecosections, are progressively more detailed, narrow in scope and relate segments of the province to one another. They describe areas of similar climate, physiography, oceanography, hydrology, vegetation and wildlife potential.

***Ecosystem:*** a functional unit consisting of all the living organisms (plants, animals, and microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size-a log, pond, field, forest, or the earth's biosphere-but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem, old-growth ecosystem, or range ecosystem.

***Ecosystem II (Source CSA):*** a dynamic complex of plants, animals, and micro-organisms and their non-living environment, interacting as a functioning unit. Note: “The term ‘ecosystem’ can describe small-scale units, such as a drop of water, as well as large-scale units, such as the biosphere” (Environment Canada, Canadian Biodiversity Strategy).

***Ecosystem integrity:*** the soundness or wholeness of the processes and organisms composing the ecosystem.

***Ecosystem management:*** the use of an ecological approach to achieve productive resource management by blending social, physical, economic and biological needs and values to provide healthy ecosystems.

***Ecosystem productivity:*** the ability of an ecosystem to produce, grow or yield products - whether trees, shrubs or other organisms.

***Ecotone:*** a transition area between two adjacent ecological communities usually exhibiting competition between organisms common to both.

***Edatope:*** refers to a specific combination of soil moisture regime and soil nutrient regime.

***Edge:*** the outer band of a patch that has an environment significantly different from the interior of the patch.

***Edge/area ratio:*** length of forest edge per cutblock area.

***Edge effect:*** habitat conditions (such as degree of humidity and exposure to light or wind) created at or near the more-or-less well-defined boundary between ecosystems, as, for example, between open areas and adjacent forest.

***Element:*** an identifiable component, process or condition of an ecosystem.

***Element II (Source CSA):*** a concept used to define the scope of each CCFM SFM criteria. Each CCFM SFM criterion contains several elements. The CSA SFM elements were derived from the national-scale elements developed by the CCFM for more specific local applications. The elements serve to elaborate and specify the scope of their associated criterion.

***End haul:*** to move excavated material from one section of the road to another or to a disposal site, during road construction or modification.

***Endangered species:*** see Threatened or endangered species.

***Endemic species:*** a species whose natural occurrence is confined to a certain region and whose distribution is relatively limited.

***Entrainment:*** mobilization, by flowing water, of sediment or organic debris from the bed or banks of a stream channel.

***Entrenched:*** a legislative requirement which previously may only have been required by contract or policy.

***Environment (Source CSA):*** the surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and the interrelations of these elements.

***Environmental rehabilitation:*** measures undertaken to remedy environmental damage done to the land.

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

***Erosion***: The wearing away of natural (earth) and unnatural (embankment, slope protection, structure, etc.) surfaces by actions of external forces. Generally refers to the wearing away of the earth's surface by flowing water. *From "Certified Professional in Erosion and Sediment Control Exam Workbook", Jan 28 2005 Glossary Amendment*

***Erosion control plan:*** Generic measures to put into place to limit the possibility of sediment entering a stream. Specific plans may be required on high risk.

***Even-aged:*** a forest stand or forest type in which relatively small (10-20 year) age differences exist between individual trees. Even-aged stands are often the result of fire, or a harvesting method such as clearcutting or the shelterwood method.

***Even-aged silvicultural system:*** a silvicultural system that is designed to regenerate and maintain an even-aged stand. Clearcutting, seed tree, and shelterwood are even-aged systems.

***Even-aged stand:*** a stand of trees consisting of one or two age classes. Even-aged stands are often the result of fire, or a harvesting method such as clearcutting or shelterwood.

***Even flow:*** in harvest scheduling, the requirement that the harvest level in each period be equal to the harvest level in the preceding period.

***Evergreen:*** never entirely without green foliage, leaves persisting until a new set has appeared.

***Excavated trail:*** a constructed trail that has a width greater than 1.5 m and a mineral soil cutbank height greater than 30 cm.

***Extension services:*** assistance provided to woodland operators. May include help with the preparation of forest management plans, cutting permits, marking trees for selective cutting, and guidance in carrying out slash disposal, site preparation, planting, etc.

***Existing visual condition:*** the present level of landscape alteration caused by resource development activities and expressed in terms of the visual quality objective categories.

# F

***Falldown effect:*** a decline in timber supply or harvest level associated with the transition from harvesting the original stock of natural mature timber over one rotation to harvesting at a non declining level (typically equal to the annual increment) after conversion to a forest with a balanced age class structure.

***Feller-buncher:*** a harvesting machine that cuts a tree with shears or a saw and then piles it.

***Felling and bucking:*** the process of cutting down standing timber and then cutting it into specific lengths for yarding and hauling.

***Fertilization:*** the addition of fertilizer to promote tree growth on sites deficient in one or more soil nutrients. Also used to improve the vigour of crop trees following juvenile spacing or commercial thinning.

***Fill:*** material used to raise the desired road profile above the natural ground line.

***Fill bank:*** the fill material used to shape a road from the outer edge of the travelled portion to its intersection with the existing ground profile.

***Fill-in planting:*** planting required to supplement poorly stocked natural regeneration or to replace seedlings that have died on previously planted sites.

***Fill slope:*** the face of an embankment required to raise the desired road profile above the natural ground line.

***Fine filter approach:*** an approach to maintaining biodiversity that is directed toward particular habitats or individual species that might fall through the coarse filter. These habitats may be critical in some way and the species threatened or endangered.

***Fire danger:*** an assessment of both fixed and variable factors of the fire environment, which determine the ease of ignition, rate of spread, difficulty of control, and the fire impact.

***Fire hazard:*** the potential fire behaviour for a fuel type, regardless of the fuel type's weather-influenced fuel moisture content or its resistance to fireguard construction. Assessment is based on physical fuel characteristics, such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

***Fire impact(s):*** the immediately evident effect of fire on the ecosystem in terms of biophysical alterations (e.g., crown scorch, mineral soil erosion, depth of burn, fuel consumption).

***Fireline:*** that portion of the fire upon which resources are deployed and actively engaged in suppression action. In a general sense, the working area around a fire.

***Fire management:*** the activities concerned with the protection of people, property and forest areas from wildfire and the use of prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social and economic criteria.

***Fire retardant:*** a substance that by chemical or physical action reduces flammability of combustibles.

***Fire risk:*** the probability or chance of fire starting determined by the presence and activities of causative agents.

***Fire season:*** the period(s) of the year during which firs are likely to start, spread and do damage to values-at-risk sufficient to warrant organized fire suppression; a period of the year set out and commonly referred to in fire prevention legislation. In B.C. the fire season is considered to extend from April 1 to October 31.

***Fire suppressant:*** an agent directly applied to burning fuels to extinguish the flaming and smouldering or glowing stages of combustion.

***Fire suppression:*** all activities concerned with controlling and extinguishing a fire following its detection. Synonymous with fire control.

***Fire Weather Index (FWI):*** Canadian Forest Fire Weather Index System

***Firebreak:*** see Fuelbreak.

***Fireguard:*** a strategically planned barrier, either manually or mechanically constructed, intended to stop a fire or retard its rate of spread and from which suppression action is carried out to control a fire; the constructed portion of a control line.

***First Nations rights***: for the purposes of this document the First Nations rights are to be understood to be the same as Aboriginal rights and two terms may be used interchangeably.

***First order stream:*** stream originating in a seepage zone or spring, with no entering tributaries; the most headward channels in the drainage network.

***First Order Wood Product:*** means wood cut and prepared primarily for processing into wood pulp, paper, paper products, lumber, compressed board or any product manufactured from wood fibre, including Christmas trees, sawmill chips, pulpwood chips, fuel chips and any wood fibre intended for use in heat or power generation.

***First pass:*** the first of two or more planned entries over a specific period of time (usually one rotation) to harvest timber.

***Fish-bearing waters:*** lakes, streams, and ponds that have resident fish populations.

***Fisheries-sensitive zones:*** side and back channels, valley wall ponds, swamps, seasonally flooded depressions, lake littoral zones and estuaries that are seasonally occupied by over- wintering anadromous fish.

***Fisheries stream class A:*** streams or portions of streams that are frequented by anadromous salmonids and/or resident game fish or regionally significant fish species; or streams that have been identified for fishery enhancement in an approved fishery management plan.

***Fixed area plot sampling method:*** a controlled cruise method where small plots of a fixed size are used to sample a portion of a forest area to obtain information (such as tree volume) that can be used to describe the whole area.

***Flood discharge criteria:*** the volume of flood that a bridge or culvert must be designed to accommodate.

***Floodplain:*** a level, low-lying area adjacent to streams that is periodically flooded by stream water. It includes lands at the same elevation as areas with evidence of moving water, such as active or inactive flood channels, recent fluvial soils, sediment on the ground surface or in tree bark, rafted debris, and tree scarring.

***Fluvial processes:*** all processes and events by which the configuration of a stream channel is changed; especially processes by which sediment is transferred along the stream channel by the force of flowing water.

***Flyrock:*** rock displaced by blasting and propelled beyond recoverable limits.

***Foliar analysis:*** chemical evaluation of the status of plant nutrients or the plant-nutrient requirements of a soil by the analysis of leaves or needles.

***Forage:*** grasses, herbs and small shrubs that can be used as feed for livestock or wildlife.

***Ford:*** a dip constructed in the roadbed at a stream crossing, instead of a culvert or bridge. The streambed must be of erosion-resistant material, or such material must be placed in contact with the streambed.

***Forecast (Source CSA):*** an explicit statement of the expected future condition of an indicator.

***Forest:*** (from Forestry Canada- a glossary of forestry terms) A plant community predominantly of trees and other woody vegetation growing more or less closely together.

***Forest II (Source CSA):*** an ecosystem dominated by trees and other woody vegetation growing more or less closely together, its related flora and fauna, and the values attributed to it.

***Forest Appeals Commission (FAC):*** the Forest Appeals Commission is the independent appeal body established under the Forest & Range Practices Act to hear appeals from certain enforcement determinations.

***Forest condition (Source CSA):*** the state of the forest ecosystem as determined by a range of variables associated with forest structure, composition, and processes.

***Forest cover:*** forest stands or cover types consisting of a plant community made up of trees and other woody vegetation, growing more or less closely together.

***Forest cover map:*** a map showing relatively homogeneous forest stands or cover types, produced from the interpretation of aerial photos and information collected in field surveys. Commonly includes information on species, age class, height class, site, and stocking level.

***Forest cover type:*** a descriptive term used to group stands of similar characteristics and species composition (due to given ecological factors) by which they may be differentiated from other groups of stands.

***Forest development plan:*** an operational plan guided by the principles of integrated resource management (the consideration of timber and non timber values), which details the logistics of timber development over a period of usually five years. Methods, schedules, and responsibilities for accessing, harvesting, renewing, and protecting the resource are set out to enable site-specific operations to proceed.

***Forest Development Review Committee (FDRC):*** the group made up of government organizations, stakeholders, licensees, and the general public that is responsible for reviewing development plans.

***Forest ecology:*** the relationships between forest organisms and their environment.

***Forest Ecosystem Network (FEN):*** a planned landscape zone that serves to maintain or restore the natural connectivity within a landscape unit. A forest ecosystem network consists of a variety of fully protected areas, sensitive areas, classified areas, and old-growth management areas.

***Forest fire:*** any wildfire or prescribed fire that is burning in forest, grass, alpine or tundra vegetation types.

***Forest floor:*** layers of fresh leaf and needle litter, moderately decomposed organic matter, and humus or well-decomposed organic residue.

***Forest floor displacement hazard:*** a ranking of the potential adverse impacts on forest productivity resulting from removal of the accumulated organic matter that constitutes the forest floor. It is determined in accordance with procedures set out in the Ministry of Forests' publication "Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook," as amended from time to time.

***Forest health:*** a forest condition that is naturally resilient to damage; characterized by biodiversity, it contains sustained habitat for timber, fish, wildlife, and humans, and meets present and future resource management objectives.

***Forest health agents:*** biotic and abiotic influences on the forest that are usually a naturally occurring component of forest ecosystems. Biotic influences include fungi, insects, plants, animals, bacteria, and nematodes. Abiotic influences include frost, snow, fire, wind, sun, drought, nutrients, and human-caused injury.

***Forest health treatments:*** the application of techniques to influence pest or beneficial organism populations, mitigate damage, or reduce the risk of future damage to forest stands. Treatments can be either proactive (for example, spacing trees to reduce risk of attack by bark beetles) or reactive (for example, spraying insecticides to treat outbreaks of gypsy moth).

***Forest interior conditions:*** conditions found deep within forests, away from the effect of open areas. Forest interior conditions include particular microclimates found within large forested areas.

***Forest inventory:*** an assessment of forest resources, including digitized maps and a database which describes the location and nature of forest cover (including tree size, age, volume and species composition) as well as a description of other forest values such as soils, vegetation and wildlife features.

***Forest land (Assessment Act):*** land which has as its highest and best use the growing and harvesting of trees, including land which is being managed in accordance with a forest management plan approved under regulations, but does not include a farm.

***Forest land (Ministry of Forests):*** provincial forests and other unalienated Crown lands for which the Ministry of Forests is responsible, including both forested lands and non-forested lands such as tundra, wetlands, rangelands, deserts, rock, and ice.

***Forest land (B.C. Assessment Authority):*** land having as it's highest and best use the growing and harvesting of trees.

***Forestland (Source CSA):*** land supporting forest growth or capable of doing so, or, if totally lacking forest growth, bearing evidence of former forest growth and now in disuse.

***Forest landscape:*** a portion of the land that the eye can see in one glance and in which the forest is the most dominant element.

***Forest licence:*** a forest licence allows orderly timber harvest over a portion of a sustained yield management unit, and the timely reforestation of harvested areas according to a strategic resource management plan prepared by the Forest Service for each timber supply area. The licence has a term of 15 to 20 years, generally replaceable every five years (some are non-replaceable) and operating areas that shift over time. Once an area is harvested and reforested the licensee moves to another part of the timber supply area. A forest licence specifies an annual allowable cut, requires a management and working plan, and specified management activities.

***Forest management:*** the practical application of scientific, economic and social principles to the administration and working of a forest for specified objectives. Particularly, that branch of forestry concerned with the overall administrative, economic, legal and social aspects and with the essentially scientific and technical aspects, especially silviculture, protection and forest regulation.

***Forest management cycle:*** the phases that occur in the management of a forest including harvesting, site preparation, reforestation, and stand tending.

***Forest management plan:*** a general plan for the management of a forest area, usually for a full rotation cycle, including the objectives, prescribed management activities and standards to be employed to achieve specified goals. Commonly supported with more detailed.

***Forest mensuration:*** the measurement of volume, growth and development of individual trees and stands, and the various products obtained from them.

***Forest officer:*** a person employed by the B.C. Ministry of Forests who is designated by the minister, chief forester, or regional manager to be a forest officer, through name or title.

***Forest operations:*** All mechanical actions which include: road, harvesting and silviculture activities.

***Forest planning model:*** an analytical model (usually computer-based) that successively harvests and grows collections of forest stands over a period of several decades according to specific data and management assumptions.

***Forest practice:*** (1) Any activity that is carried out on forest land to facilitate the use of forest resources, including but not limited to timber harvesting, road construction, silviculture, grazing, recreation, pest control, and wildfire suppression.

***Forest practice (FRPA):*** (2) means each of the following activities carried out by the government or by a holder of an agreement under the *Forest Act* on private land subject to a tree farm licence, community forest agreement or a woodlot licence or on Crown forest land

(a) timber harvesting, road construction, road maintenance, road use, road deactivation, silviculture treatments, including grazing for the purposes of brushing, botanical forest product collecting and fire use, control and suppression;
(b) any other activity that is carried out by the government or by the holder of an agreement under the *Forest Act*

***Forest Practices Board (FPB):*** the Forest Practices Board is t he "public watchdog" agency established under the Forest & Range Practices Act to audit the activities of both the forest industry and the government.

***Forest Practices Code (FPC):*** the Forest Practices Code is a term commonly used to refer to the Forest Practices Code of British Columbia Act, the regulations made by Cabinet under the act and the standards established by the chief forester. The term may sometimes be used to refer to field guides as well. It should be remembered that unlike the act, the regulations and standards, field guides are not legally enforceable.

***Forest profile:*** the range of forest conditions that exists across the landscape, including such factors as timber species, quality, condition and age, location, elevation, topography, accessibility, and economic viability.

***Forest renewal:*** the renewal of a tree crop by either natural or artificial means.

***Forest Service road:*** a road constructed, modified or maintained by the minister under the provisions of the Forest Act or declared a Forest
Service road. Forest Service roads are used to provide access to managed forest land.

***Forest tree breeding:*** the genetic study of trees to solve some specific problem or to produce a specially desired product.

***Forest tree improvement:*** the control of parentage combined with other silvicultural activities (such as site preparation or fertilizing) to improve the overall yield and quality of products from forest lands.

***Forest type:*** a group of forested areas or stands of similar composition (species, age, height, and stocking) which differentiates it from other such groups.

***Forest type labels:*** the symbols which are used to code information about forest types on a forest cover map, such as site, disturbance, age and height class, species, stocking.

***Forest type lines:*** lines on a map or aerial photo outlining forest types.

***Forest yield:*** see Allowable Annual Cut.

***Forest yield regulation:*** the administrative and technical process which facilitates yield control (regulation), often narrowly interpreted as a process that ensures regular and sustained forest yields.

***Forested Plant Community:*** A unit of vegetation with a relatively uniform species composition and physical structure that includes a forest canopy. Forested plant communities tend to have characteristic environmental features such as bedrock geology, soil type, topographic position, climate, and energy, nutrient and water cycles.

***Forester:*** a person engaged in the profession of forestry. In some countries the term is restricted to those who received formal post-secondary education in forestry or who possess the equivalent qualifications. A forester may or may not be a Registered Professional Forester, which is a legally-recognized title.

***Forestry:*** the science, art and practice of managing and using for human benefit the natural resources that occur on and in association with forest lands.

***Fragmentation:*** the process of transforming large continuous forest patches into one or more smaller patches surrounded by disturbed areas. This occurs naturally through such agents as fire, landslides, windthrow and insect attack. In managed forests timber harvesting and related activities have been the dominant disturbance agents.

***Free-growing:*** young trees that are as high or higher than competing brush vegetation with one metre of free-growing space surrounding their leaders. As defined by legislation, a free growing crop means a crop of trees, the growth of which is not impeded by competition from plants, shrubs or other trees. Silviculture regulations further define the exact parameters that a crop of trees must meet, such as species, density and size, to be considered free growing.

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

***Free use permits:*** an agreement entered into under Part 3, Division 9 of the Forest Act, which provides for the cutting and utilization of Crown timber for very specific purposes, free of stumpage assessment.

***Freshet:*** high stream flow, usually confined to the stream channel and caused by a regularly recurring hydrological phenomenon (e.g., the snowmelt freshet) (regional term).

***Fruiting body:*** the reproductive part of a fungus that contains or bears spores. Also known as a conk.

***Fry***: the young stage of fishes (i.e., less than one year old), particularly after the yolk sac has been absorbed.

***Fuelbreak:*** an existing barrier or change in fuel type (to one that is less flammable than that surrounding it), or a wide strip of land on which the native vegetation has been modified or cleared, that act as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire.

***Fuel management:*** the planned manipulation and/or reduction of living or dead forest fuels for forest management and other land use
objectives (such as hazard reduction, silvicultural purposes, wildlife habitat improvement) by prescribed fire, mechanical, chemical or biological means and/or changing stand structure and species composition.

***Fuelwood:*** trees used for the production of firewood logs or other wood fuel.

***Full bench cut:*** forming the roadway entirely in cut.

***Full-tree harvesting:*** a tree harvesting process that includes removing the trunk, branches and in some instances the roots from a forested site. In Canada this process is used to control root diseases.

# G

***Genetic diversity***: variation among and within species that is attributable to differences in hereditary material.

***Genetically improved seed and/or vegetative propagules:*** seed or propagule that originate from a tree breeding program and that have been specifically designed to improve some attribute of seeds, seedlings, or vegetative propagules selection.

***Genotype:*** the entire genetic constitution, or the sum total of genes of an organism, in contrast to the phenotype.

***Geographic information system (GIS):*** a computer system designed to allow users to collect, manage and analyze large volumes of spatially referenced information and associated attribute data.

***Geotextile filter fabric:*** a synthetic material placed on the flat, under road fill, with the primary functions of layer separation, aggregate confinement, and distribution of load.

***Girdling:*** to kill a tree by severing or damaging the cambium layer and interrupting the flow of food between the leaves and the rest of the tree. A method of 'brushing' carried out using a hatchet or special tool to cut through the bark and cambium of the tree.

***Goal:*** goals provide general purpose and direction. They are the end result of ultimate accomplishment toward which an effort is directed. They generally should reflect perceived present and future need. They must be capable of being effectively pursued.

***Grading:*** classifying timber, lumber or logs according to quality or end-use.

***Grapple yarder:*** a machine used in harvesting to bring logs into a landing. The grapple closes like teeth around the log and is controlled by the machine operator.

***Grazing lease:*** a lease of Crown land issued for grazing purposes under the Land Act.

***Grazing schedule:*** sets out the class and number of livestock that can use an area described in the schedule, the dates the livestock can use the area and other prescribed information.

***Grazing season:*** a period during which livestock may graze on Crown land under a grazing licence or grazing permit.

***Green tree retention:*** the reservation of live trees of a specific species and size from harvesting, to achieve a site-specific objective.

***Greenbelt:*** an extensive area of largely undeveloped or sparsely occupied land associated with a community set aside to contain development, preserve the character of the countryside and community and provide open space.

***Greened-up :*** a cutblock that supports a stand of trees that has attained the green-up height specified in a higher level plan for the area, or in the absence of a higher level plan for the area, has attained a height that is 3 m or greater, and if under a silvicultural prescription, meets the stocking requirements of that prescription, or if not under a silviculture prescription, meets the stocking specifications for that biogeoclimatic ecosystem classification specified by the regional manager.

***Gross total volume:*** volume of the main stem of the tree including stump and top. Volume of the stand including all trees.

***Ground-based systems:*** logging systems that employ ground-based equipment such as feller-bunchers, hoe chuckers, skidders, and forwarders.

***Ground truthing:*** the use of a ground survey to confirm the findings of an aerial survey or to calibrate quantitative aerial observations.

***Groundwater:*** water below the level of the water table in the ground; water occupying the sub-surface saturated zone.

***Group selection:*** see Selection silvicultural system.

***Growing stock:*** the sum of all trees in a forest or specified part of it.

***Grubbing and retention:*** removal of stumps, roots, embedded logs, organics, and unsuitable soils before or concurrently with subgrade construction.

***Guidebooks:*** part of the Forest Practices Code but not included in the legislation (Exception: Fish Stream Crossing Guidebook). Guidebooks support the Regulations and Standards by stipulating detailed tolerances and evaluation criteria and by providing recommended procedures, processes, and results. Guidebooks may also contain new guidelines and recommendations which are still being tested or are awaiting formal approval. Specifications provided by guidebooks become legally enforceable when inserted in plans, prescriptions, and contracts.

***Guideline:*** an optional practice or new practice not currently in the Forest Practices Code. Although guidelines are generally voluntary, the implication is that practitioners will use these concepts and principles in meeting their resource objectives.

***Gully assessment procedure:*** a procedure for determining gully sediment and debris transport potential, and suggested management strategies.

# H

***Habitat:*** the place where an organism lives and/or the conditions of that environment including the soil, vegetation, water, and food.

***Habitat enhancement:*** any manipulation of habitat that improves its value and ability to meet specified requirements of one or more species.

***Habitat management:*** management of the forest to create environments which provide habitats (food, shelter) to meet the needs of particular organisms.

***Hack and squirt:*** a method of conifer release and juvenile spacing where the bark of a tree is cut (hack) and herbicides are injected (squirt) to kill the tree.

***Hardwoods:*** trees which are generally deciduous, broad leafed species such as oak, alder or maple.

***Harvest cut:*** the felling of the mature crop of trees either as a single clearcut or a series of regeneration cuttings.

***Harvest forecast:*** the flow of potential timber harvests over time. A harvest forecast is usually a measure of the maximum timber supply that can be realized, over time, for a specified land base and set of management assumptions.

***Harvest pattern:*** the spatial distribution of cutblocks and reserve areas across the forested landscape.

***Harvest rate:*** the rate at which timber is harvested, commonly expressed as an (AAC).

***Harvest schedule:*** a document listing the stands to be harvested year or period, usually showing types and intensities of harvests for each stand, as well as a timetable for regenerating currently non-productive areas.

***Harvesting:*** the practice of felling and removing trees or the removal of dead or damaged trees from an area.

***Harvesting method:*** the mix of felling, bucking, and yarding (skidding) systems used in logging a stand of timber.

***Harvesting prescription:*** detailed plan on how, when, and where timber will be harvested from an area.

***Harvesting system:*** the mix of felling, bucking and yarding systems used in logging a stand of timber.

***Hauling:*** a general term for the transportation of logs from one point to another, usually from a landing to the mill or shipping point.

***Hazard:*** a state that may result in an undesired event, the cause of risk. Hazard can apply to the probability of tree mortality or damage by an insect or disease and also represents material or fuel that will ignite and burn.

***Hazardous or danger tree:*** a tree or any component of a tree that has sufficient structural infirmity to be identified as having a high risk of falling and causing personal or property damage.

***Hazards, potential:*** a component of risk rating. Potential hazards are the detrimental events that could result from inappropriate harvesting
practices.

***Healthy ecosystem:*** an ecosystem in which structure and functions allow the maintenance of biodiversity, biotic integrity and ecological processes over time.

***Heartwood:*** the inner core of a woody stem composed of nonliving cells and usually differentiated from the outer wood layer (sapwood) by its darker colour. See Cambium.

***Height class:*** any interval into which the range of tree heights is divided for classification and use, commonly 3 m, 5 m, or 10 m classes.

***Height/diameter curve:*** a graphic representation of the relationship between individual tree heights and diameters used to determine tree volumes in localized areas.

***Helitack:*** initial attack on wildfires involving the use of helicopters and trained crews, deployed as a complete unit.

***Helitanker:*** a helicopter equipped with a helitank - a specially designed tank used for transporting and dropping suppressants or retardants.

***Helitorch:*** a specialized drip torch, using a gelled fuel, slung and activated from a helicopter.

***Herbicide:*** chemical substances or living organisms (called bioherbicides) used to kill or control vegetation such as brush, weeds, and competing or undesirable trees.

***Heritage areas:*** sites of historical, architectural, archaeological, paleontological, or scenic significance to the province.

***Heritage trail:*** a trail having cultural significance by reason of established aboriginal use or use by early immigrants.

***Highgrading:*** the removal of only the best trees from a stand, often resulting in a residual stand of poor quality trees.

***High hazard (forest health):*** physical characteristics (including tree species, composition, age, and size) and biogeoclimatic factors that make a forest highly susceptible to attack by damaging agents.

***High sensitivity areas:*** areas having special concerns, issues, or the potential for negative impacts on resource values, including any soils with high hazard or very high hazard for compaction, erosion, mass wasting, or displacement.

***High value stream:*** as defined in the Forest Practices Code of British Columbia Cutblock and Road Review Regulation a high value fish-bearing stream and a stream in a community watershed.

***Higher level plan:*** strategic or operational plans that provide direction to any lower level of plans, prescriptions or forest practices.

Higher level plans include:

- a plan formulated pursuant to Section 4(c) of the Ministry of Forests Act,
- a management plan as defined in the Forest Act,
- an objective for a resource management zone,
- an objective for a landscape unit or sensitive area,
- an objective for a recreation site, recreation trail or interpretive forest site, and
- a plan or agreement declared to be a higher level plan by the minister or the lieutenant governor.

Plans which might be declared to be a higher level plan by the minister or the lieutenant governor include plans such as Land Resource Management Plans and Local Resource Use Plans.

***Highlead system:*** logging system that uses cables rigged to a spar high above the ground so that one end of the logs can be lifted during yarding.

***Hip chain:*** a device used to measure distance by means of an anchored filament wrapped around a wheel that revolves as you walk (handy for measuring distances on your own).

***Historical variation:*** the range of the spatial, structural, compositional and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

***Hoe-chucking:*** a logging system that uses an excavator or hoe to yard logs to the roadside and/or landing.

***Human dimension:*** an integral component of ecosystem management that recognizes people are part of ecosystems, that people's pursuits
of past, present, and future desires, needs and values (including perceptions, beliefs, attitudes and behaviours) have and will continue to influence ecosystems and that ecosystem management must include consideration of the physical, emotional, mental, spiritual, social, cultural and economic well-being of people and communities.

***Human impact or influence:*** a disturbance or change in ecosystem composition, structure or function caused by humans.

***Humus:*** a general term for the more or less decomposed plant and animal residues in the lower organic soil layer.

***Hydrology:*** the science that describes and analyzes the occurrence of water in nature, and its circulation near the surface of the earth.

***Hydroseeding:*** the application of seed in a water slurry that contains fertilizer, a soil binder and/or mulch.

***Hypsometer:*** a simple instrument, often a stick or other straight edge, used to measure the heights of trees on the basis of similar angles.

## I

***Immature:*** trees or stands that have grown past the regeneration stage, but are not yet mature.

***Immature timber:*** stands of timber where the age of the leading species in a stand is less than the specified cutting age. Cutting ages are established to meet forest management objectives. Usually stands with lodgepole pine and whitebark pine or a deciduous species as the leading species are considered as immature timber when the stand age is less than 81 years. Otherwise, all stands having conifers other than lodgepole pine and whitebark pine as the leading species are immature when the stand age is less than 121 years.

***Impact assessment:*** a study of the effect of resource development on other resources.

***Improvement cutting:*** the removal of trees of undesirable species, form or condition from the main canopy of the stand to improve the health, composition and value of the stand.

***Increment:*** the increase in diameter, basal area, height, volume, quality or value of individual trees or stands during a given period.

***Increment borer:*** a tool used to extract a core of wood from a living tree for the purpose of studying the annual growth rings of the tree.

***Increment core:*** that part of the cross section of a tree extracted by an increment borer. Used to determine tree age and growth pattern.

***Incremental silviculture:*** a Ministry of Forests term that refers to the treatments carried out to maintain or increase the yield and value of forest stands. Includes treatments such as site rehabilitation, conifer release, spacing, pruning, and fertilization. Also known as intensive silviculture. See Basic silviculture.

***Independent (impartial) (Source CSA):*** free from bias. Note: A registrar is not considered independent (impartial) if, in the two years preceding an audit, it or any of its personnel, subcontractors, or related bodies provide or have provided assistance or consulting services to the organization being audited and, as a result of the audit, certified (see definition of Related body).

**Indicator:** A measure of an aspect of the criterion; a quantitative or qualitative variable which can be measured or described and which, when observed periodically, demonstrates trends (Santiago Declaration in Montreal Process 1995). Indicators are used in monitoring the effectiveness of activities, in terms of outcomes, as opposed to compliance monitoring in a rule-based approach.

***Indicator species:*** species of plants used to predict site quality and characteristics.

***Industrial operation:*** operations such as land clearing, timber harvesting, timber processing, mechanical site preparation and other silvicultural treatments, mining, and road construction.

***Initial attack:*** the action taken to halt the spread or potential spread of a fire by the first fire fighting force to arrive at the fire.

***Initial mature inventory:*** that portion of the existing total mature forest inventory which is available for harvest. This portion reflects all management constraints that are necessary to protect the environment and other forest uses and varies with the constraints identified for each option.

***Inner gorge:*** a stream reach or portion of stream that is bounded by steep hillslopes (> 40% sideslope) and terminates upslope into more gentle topography.

***Inoperable lands:*** lands that are unsuited for timber production now and in the foreseeable future by virtue of their: elevation; topography; inaccessible location; low value of timber; small size of timber stands; steep or unstable soils that cannot be harvested without serious and irreversible damage to the soil or water resources; or designation as parks, wilderness areas, or other uses incompatible with timber production.

***Insloping:*** shaping the road surface to direct water onto the cut side of the road. Integrated resource management (IRM): the identification and consideration of all resource values, including social, economic, and environmental needs, in land use and development decision making. It focuses on resource use and land use and management, and is based on a good knowledge of ecological systems, the capability of the land, and the mixture of possible benefits.

***Integrated resource use:*** a decision making process whereby all resources are identified, assessed and compared before land use or resource management decisions are made. The decisions themselves, whether to approve a plan or carry out an action on the ground, may be either multiple or single use in a given area. The application of integrated resource management results in a regional mosaic of land uses and resource priorities which reflect the optimal allocation and scheduling of resource uses.

***Intensive silviculture:*** See Incremental silviculture.

***Interested party (Source CSA):*** an individual or organization interested in and affected by the activities of the management of a DFA.

***Interior:*** the geographic area east of the Cascade Mountains, as officially delineated by the Cascade Mountains Administrative Line through British Columbia from Washington state to Alaska, including the portions of the Kalum Forest District and Cariboo Forest Region lying west of the line, but excluding the lower Fraser River area south of Hell's Gate (south of Boston Bar), taking in the Coquihalla, Silverhope, and Skagit River drainages lying east of the line.

***Interior conditions:*** at a point where edge effects no longer influence environmental conditions within a patch, interior conditions are achieved. For coastal B.C. forests, the edge effect is generally felt for a distance equivalent to 2 to 4 times average tree height into the stand. The effects usually involve light intensity, temperature, wind, relative humidity and snow accumulation and melt. See Edge effect.

***Intermediate:*** intermediate trees have crowns below, but still extending into, the general level of the canopy and receive a little direct light from above but none from the sides.

***Interpretive forest site:*** a designated forest site and ancillary facilities developed by the Ministry of Forests to interpret, demonstrate, or facilitate the discussion of the natural environment, forest practices, and integrated resource management.

***Inter-tree distance:*** the distance between tree boles, usually used in the context of thinning. Recommended guidelines for inter-tree distances
are established for different thinning programs depending on site variables, the species and age of trees, and management objectives.

***Inventory, forest:*** a survey of a forest area to determine such data as area, condition, timber, volume and species for specific purposes such as planning, purchase, evaluation, management or harvesting.

***ISO 14001 (Source CSA):*** an internationally recognized environmental management system standard published in 1996 and revised in 2004 by the International Organization for Standardization. The ISO 14001 Standard has been approved as a National Standard of Canada by the Standards Council of Canada.

# J

***Joint administration:*** a term referring to the joint powers of the Ministry of Forests, Ministry of Environment and the Ministry of Energy, Mines and Petroleum Resources to enforce the Forest Practices Code. It is also used to refer to the involvement of the Ministry of Forests and the Ministry of Environment in certain aspects of strategic and operational planning**.**

***Judicial review:*** a review of a decision by a court authorized and conducted under the Judicial Review Procedure Act primarily concerned with the fairness of the procedures used to make a decision, whether or not the decision maker was acting within his or her jurisdiction , and errors of law.

***Juvenile spacing:*** a silvicultural treatment to reduce the number of trees in young stands, often carried out before the stems removed are large enough to be used or sold as a forest product. Prevents stagnation and improves growing conditions for the remaining crop trees so that at final harvest the end-product quality and value is increased. Also called precommercial thinning.

# K

***Key area:*** a relatively small area selected because of its location, use, or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management.

***Key species:*** forage species that must, because of their high degree of use, be considered in the management program.

***Keystone species:*** a species that plays an important ecological role in determining the overall structure and dynamic relationships within a biotic community. A keystone species presence is essential to the integrity and stability of a particular ecosystem.

# L

***Ladder fuels:*** fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to the ease of torching and crowning.

***Lake:*** a naturally occurring static body of water greater than 2 m in depth and greater than 1 ha in size, or a licensed reservoir.

***Lakeshore management area:*** the lands directly adjacent to a lake, in which forest practice standards are designed to maintain the unique combination of fish, wildlife, water, and recreation values that occur on and around lakes.

***Land and Resource Management Plan (LRMP):*** a strategic, multi-agency, integrated resource plan at the subregional level. It is based on the principles of enhanced public involvement, consideration of all resource values, consensus-based decision making, and resource sustainability.

***Land-use planning:*** the process by which decisions are made on future land uses over extended time periods, that are deemed to best serve the general welfare.

***Landform:*** a landscape unit that denotes origin and shape, such as a floodplain, river terrace, or till plain.

***Landing:*** an area modified by equipment that is designed for accumulating logs before they are transported.

***Landing pile or cull pile:*** an area of piled slash, logging residue, and stumps, created as a result of harvesting operations and the construction of roads and landings.

***Landscape:*** the fundamental traits of a specific geographic area, including its biological composition, physical environment and anthropogenic or social patterns.

***Landscape ecology:*** the study of the distribution patterns of communities and ecosystems, the ecological processes that affect those patterns and changes in pattern and process over time.

***Landscape inventory:*** see Visual landscape inventory.

***Landscape level:*** a watershed, or series of interacting watersheds or other natural biophysical (ecological) units, within the larger Land and Resource Management Planning areas. This term is used for conservation planning and is not associated with visual landscape management and viewscape management.

***Landscape sensitivity:*** a component of the landscape inventory that estimates the sensitivity of the landscape based on: the visual prominence of importance of features; conditions that affect visual perception; and social factors that contribute to viewer perceptions.

***Landscape unit:*** a planning area, up to 100 000 ha in size, based on topographic or geographic features such as a watershed or series
of watersheds. They are established by the Ministry of Forests' district manager in consultation with a designated B.C. Environment official to ensure Crown land in a provincial forest and private land in a tree farm licence or woodlot licence are managed and used in accordance with Section 2 of the Forest Practices Code of British Columbia Act.

***Landscape unit objectives:*** objectives established for a landscape unit to guide forest development and other operational planning. Landscape objectives are established by the Ministry of Forests' district manager and a designated B.C. Environment official.

***Large Organic Debris (LOD):*** entire trees or large pieces of trees that provide channel stability or create fish habitat diversity in a stream channel.

***Large woody debris:*** a large tree part, conventionally a piece greater than 10 cm in diameter and 1 m in length.

***Leader:*** the length of tree stem from the top of the tree down to the first set of branches, representing one year of growth and reflecting the tree's vigour and the site's growing potential.

***Leave trees:*** all trees, regardless of species, age, or size, remaining on a harvested area as a result of a predetermined silviculture prescription to address a possible range of silviculture or resource needs.

***Legally Reportable Spill:*** a release or discharge into the environment of a substance in an amount equal to or greater than quantity spilled. *From Jan 28 2005 Glossary Amendment*

| Substance | Quantity Spilled* |
|---|---|
| Gasoline, diesel, engine oil, hydraulic oil | 100 L |
| Antifreeze (undiluted) | 5 L |
| Battery acid | 5kg |
| Grease | 100 L |
| Paints and solvents | 100 L |

**Amounts taken from provincial Spill Reporting Regulation, Jan 1, 2005.*

***Licence to cut:*** an agreement under the Forest Act allowing a person who purchases or occupies land, and who does not otherwise have the right to harvest Crown timber from the land, to cut and/or remove timber on the land.

***Licensee***: means a party required to prepare a forest development plan under the *Forest Practices Code of B.C. Act* or a forest stewardship plan under the *Forest and Range Practises Act*. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

***Lightning detection system:*** a network of electronic field sensors linked to a central computer to detect, triangulate, plot the location of and record cloud-to-ground lightning flashes in real time over a predetermined area.

***Limiting factor:*** a factor present in an environment in such short supply that it limits growth or some other life process.

***Linear developments:*** straight line industrial development that is typical of power lines, highways, gas lines, and seismic activities.

***Litter layer:*** the layer of organic debris, mainly bark, twigs, and leaves, on the forest floor.

***Littoral zone:*** the shore zone between the high and low water mark.

***Livestock:*** as defined in the Range Act means animals of the genus Bos, horses, mules, asses, sheep and goats, but does not include wildlife designated under the Wildlife Act, exotic game animals, buffalo, swine or poultry but does include llamas.

***Local Resource Use Plan (LRUP):*** a plan approved by a district manager for a portion of a timber supply area or tree farm licence that provides management guidelines for integrating resource use in the area. Such a plan may become a higher level plan if declared to be so by the Ministers or Cabinet.

***Log boom:*** floating logs tied together in rafts to be towed by boat to their destination.

***Logging:*** see Harvesting.

***Logging (cutting) plan:*** a map, along with a written plan, describing the road building, harvesting, and other related operations that are submitted for a forest officer's approval to ensure that the applicable standards and obligations stat ed in the Pre-Harvest Silviculture Prescription and the harvesting agreement are met.

***Logging trail:*** a narrow, temporary path used by harvesting equipment.

***Long Run Sustainable Yield (LRSY):*** the long run sustainable yield for any Timber Supply Area (TSA) is equal to the culmination of mean annual increment weighted by area for all productive and utilizable forest land types in that TSA including all not satisfactorily restocked, disturbed stocking doubtful, and potentially usable non-commercial cover.

***Long term (Source CSA):*** in the context of making forecasts regarding forest structure and composition, at a minimum, twice the average life expectancy of the predominant trees in a DFA, up to a maximum of 300 years.

***Lopping:*** chopping branches, tops and small trees after felling into lengths such that the resultant slash will lie close to the ground.

***Lopping and scattering:*** lopping the slash created after felling and spreading it more or less evenly over the ground without burning.

***Loss factors:*** reductions made to gross timber volumes to allow for decay, waste, and breakage.

***Low Ground Pressure (LGP) machines:*** machines that exert a total ground pressure of less than 43.4 KPa (6.3 pounds per square inch).

# M

***Major culvert:*** a stream culvert having a pipe diameter of 2000 mm or greater, or a maximum design discharge of 6 m3/sec or greater.

***Managed forest land:*** forest land that is being managed under a forest management plan utilizing the science of forestry.

***Management plan:*** a management plan or management and working plan approved under a tree farm licence, woodlot licence, pulpwood
agreement or forest licence. Contains inventory and other resource data.

***Management area:*** stands or forest types that require similar management practices and can be grouped for treatment as a management unit.

***Management assumptions:*** approximations of management objectives, priorities, constraints and other conditions needed to represent forest management actions in a forest planning model.

***Management option:*** a prescription of management activities over time that will achieve specified management objectives.

***Management plan:*** detailed long-term plan for a forested area. Contains inventory and other resource data.

***Management unit plan:*** the third level of planning in the Ministry of Forests hierarchical planning system. A plan prepared for a Timber Supply Area which takes into account regional goals and land use interactions. Management unit plans provide a basis for Forest Service programs. The annual allowable cut for the management unit is calculated on the basis of the management unit plan.

***Management zone:*** the outer portion of a riparian management area situated adjacent to a stream, lake, or wetland and established to conserve and maintain the productivity of aquatic and riparian ecosystems when harvesting is permitted.

***Map folio:*** a series of maps bound together, often produced as overlays of information, e.g., soils, fish, water, forest, and wildlife.

***Marine-sensitive zones:*** herring spawning areas, shellfish beds, marsh areas, aquaculture sites, juvenile salmonid rearing areas, and adult salmon holding areas.

***Mass wasting:*** movement of soil and surface materials by gravity.

***Mature:*** trees or stands that are sufficiently developed to be harvestable.

***Mature timber:*** stands of timber where the age of the leading species in a stand is greater than the specified cutting age. Cutting ages are established to meet forest management objectives. Usually stands with lodgepole pine or a deciduous species as the leading species are classified as mature timber when the stand age is greater than 80 years. Otherwise, all stands having conifers other than lodgepole pine and whitebark pine as the leading species are mature when the stand age is greater than 120 years.

***Maximum density:*** the maximum allowable stand density above which stands must be spaced to a target density of well-spaced acceptable stems to achieve free-growing status.

***Mean Annual Increment (MAI):*** the average annual increase in volume of individual trees or stands up to the specified point in time. The MAI changes with different growth phases in a tree's life, being highest in the middle years and then slowly decreasing with age. The point at which the MAI peaks is commonly used to identify the biological maturity of the stand and its readiness for harvesting.

***Measure:*** represent the actual “things” or land-based resources that are tracked over time and space. They provide the on-the-ground link to indicators, criteria and values, and signal the trend for each resource

***Mechanical site preparation:*** any activity that involves the use of mechanical machinery to prepare a site for reforestation.

***Mechanized access and use:*** refers to access and use by, for example, mountain bikes and other bicycles, hang gliders, and other human-powered mechanized equipment. Associated facilities include aircraft landing facilities, boat docks, and heliports.

***Mechanized stand tending treatment:*** any stand tending activity that involves the use of mechanical machinery to treat a stand.

***Memorandum of understanding (MOU):*** an agreement between ministers defining the roles and responsibilities of each ministry in relation to the other or others with respect to an issue over which the ministers have concurrent jurisdiction.

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

***Merchantable volume:*** the amount of sound wood in a single tree or stand that is suitable for marketing under given economic conditions.

***Meridian line:*** a north-south reference line often appearing on maps. Meridian lines are also etched into the bearing plate on a compass.

***Microclimate:*** generally the climate of small areas, especially insofar as this differs significantly from the general climate of the region. Stands often create microclimates.

***Microsite:*** a small area which exhibits localized characteristics different from the surrounding area. For example, the microsites created by a rock outcrop with thin soils, or the shaded and cooled areas created on a site by the presence of slash.

***Mineral soil:*** soil consisting predominately of, and having its properties determined by, inorganic matter. Usually contains less than 20 per cent organic matter.

***Minimum utilization standard:*** included in every licence authorizing the harvesting of timber, a standard which is expressed as a maximum stump height, diameter at stump height, and top diameter and which can vary by species and timber supply area (and supply blocks within timber supply areas).

***Mixed stand:*** a stand composed of two or more tree species.

***Modified burning zone:*** a zone within or adjacent to a smoke-sensitive area that requires special considerations and burning techniques, even under favourable conditions, to maintain air quality within a smoke-sensitive area.

***Monoculture:*** in general, even-aged, single-species forest crops.

***Mortality:*** death or destruction of forest trees as a result of competition, disease, insect damage, drought, wind, fire and other factors (excluding harvesting).

***Motorized access and use:*** refers to access and use by, for example, float planes, helicopters, fixed-wing aircraft, motorboats, motor bikes, all-terrain vehicles, snowmobiles, and motorized equipment.

***Multiple use:*** a system of resource use where the resources in a given land unit serve more than one user. Multiple use can be effected in three ways:

- different uses of adjacent sub-areas which together form a composite multiple use area;
- the alternation in time of different uses on the same areas; and
- more than one use of an area at one time.

In multiple use planning, where differing resource uses are conducted at the same time on the same area and conflicts between users will occur, one resource is determined to be the dominant use and all other secondary uses are integrated only in-so-far as they are compatible with the first. Often multiple use planning sacrifices the production of the individual resources in favour of the over-all mix of resource uses that brings the greatest social and economic benefits.

***Multiple Use Sustained Yield Calculation (MUSYC):*** a linear programming forest planning model developed by the United States Forest Service. MUSYC is currently used as the British Columbia Forest Service's standard forest planning model for carrying out TSA timber supply computer analysis.

***Mycorrhiza:*** a rootlet of a higher plant modified through integral association with a fungus to form a constant structure which differs from either component but is attached to the root system and functions somewhat as a rootlet. It is usually considered to be beneficial to the associated plant.

# N

***Natural boundary:*** the visible high water mark of any lake, stream, or other body of water where the presence and action of the water are so common and usual and so long continued in all ordinary years as to mark upon the soil of the bed of the lake, river stream, or other body of water a character distinct from that of the banks, both in vegetation and in the nature of the soil itself.

***Natural disturbance regimes:*** the historic patterns (frequency and extent) of fire, insects, wind, landslides and other natural processes in an area.

***Natural Disturbance Types (NDT):*** Land areas which can be characterized by different natural disturbance regimes. Stand-initiating disturbances are those processes that largely terminate the existing forest stand and initiate secondary succession in order to produce a new stand. The disturbance agents are mostly wildfires, windstorms and, to a lesser extent, insects and landslides. Five NDTs have been defined and mapped for British Columbia. They are:

NDT1 – ecosystems with rare stand-initiating events,
NDT2 – ecosystems with infrequent stand-initiating events,
NDT3 – ecosystems with frequent stand-initiating events,

NDT4 – ecosystems with frequent stand-maintaining fires, and
NDT5 – alpine tundra and subalpine parkland.

***Natural Forest Area***: means an area in the mountain pine beetle infested units which is in a stage of transition and could be in one or more of the following stages: old forest; dying forests; dead forests; or, young natural forests (which have not been harvested). *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

***Natural justice:*** a set of procedures designed to ensure that decisions are made fairly.

***Natural range barrier:*** a river, rock face, dense timber or any other naturally occurring feature that stops or significantly impedes livestock movement to and from an adjacent area.

***Natural regeneration:*** the renewal of a forest stand by natural seeding, sprouting, suckering, or layering seeds may be deposited by wind, birds or mammals.

***Natural resource:*** means land, water and atmosphere, their mineral, vegetable and other components, and includes flora and fauna on or in them.

***Naturally resistant seed sources:*** tree species or provenances that have been shown to exhibit increased resistance to some specific pest, over that of the species or provenance that would normally be used in artificial regeneration in a particular situation.

***Natural stream flow:*** unrestricted stream flow that accommodates fish passage.

***Net down procedure:*** The process of identifying the net land base, which is the number of hectares of forest land which actually contribute to the allowable annual cut. The process involves "netting down" the TSA gross area to the TSA gross forest area then to the TSA net forest area. Areas and/or volumes are sequentially deleted or reduced from the gross land base for a number of considerations, including: private ownership, non- forest or non-productive, environmentally sensitive, unmerchantable and inaccessible.

***Net land base:*** see Net down procedure.

***Net present value (NPV):*** a stand's present worth before harvesting once costs associated with its establishment and tending have been subtracted.

***Net volume:*** volume of the main stem excluding stump and top as well as the defective and decayed wood of trees or stands.

***New forestry:*** a philosophy or approach to forest management that has as its basic premise the protection and maintenance of ecological systems. In new forestry the ecological processes of natural forests are used as a model to guide the design of the managed forest.

***Non-designated wilderness:*** Areas within the provincial forest that have been zoned as wilderness through approved integrated resource management plans including regional land-use plans and Land and Resource Management Plans (LRMPs).

***Non-forest land:*** land not primarily intended for growing or supporting a forest.

***Non-timber resource values:*** values within the forest other than timber which include but are not limited to biological diversity, fisheries, wildlife, minerals, water quality and quantity, recreation and tourism, cultural and heritage values, and wilderness and aesthetic values.

***Non-timber resources:*** resources other than timber, such as recreation, aesthetics, wildlife, fish, forage, range, water, and soils.

***Normal forest:*** an outdated concept, drawing on the idea of a norm or standard forest structure against which existing forest structures can be compared. A normal forest is a forest composed of even-aged fully-stocked stands representing a balance of age classes such that for a specified rotation period, one age class can be harvested in each year. At the end of the rotation, the stands that were harvested first in the cycle would be ready for harvesting again.

***Not Satisfactorily Restocked (NSR):*** productive forest land that has been denuded and has failed, partially or completely, to regenerate either naturally or by planting or seeding to the specified or desired free growing standards for the site.

***No-work zones:*** areas in which equipment and people are not allowed during forestry operations, usually for safety or ecological reasons.

***Noxious weeds:*** any weed so designated by the Weed Control Regulations and identified on a regional district noxious weed control list.

***Nurse log:*** a larger and decomposing fallen log which acts as a germination substrate for tree species establishing in the understory. Such logs provide moisture, nutrients and often some degree of elevation above other potentially competing vegetation on the forest floor.

# O

***Objective:*** the end result(s) that must be achieved through management at any given administrative level. Objectives are quantified and indicate time and agency responsibility.

***Objective II (Source CSA):*** a broad statement describing a desired future state or condition of a value.

***Old Forest***: means > 140 year old stands*, from available forest inventory sources, for all natural disturbance units with the exception of:

- the Moist Interior – plateau sub-unit – all biogeoclimatic variants; and,
- the Omineca Valley – SBSdk, SBSdw3, BWBSdk1, SBSmc2, SBSmk1; and,
- the McGregor Plateau – SBSmk1 and SBSmh;
- where old forests will be considered to be those stands >120 years.

*In the ICH units, it is realized that the definition of old forest requires more discussion and a process will be developed in 2005 to deal with this issue. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

***Old growth:*** old growth is a forest that contains live and dead trees of various sizes, species, composition, and age class structure. Old-growth forests, as part of a slowly changing but dynamic ecosystem, include climax forests but not sub-climax or mid-seral forests. The age and structure of old growth varies significantly by forest type and from one biogeoclimatic zone to another.

***Old-growth attributes:*** structural features and other characteristics of old-growth forests, including: large trees for the species and site; wide variation in tree sizes and spacing; accumulations of large dead standing and fallen trees; multiple canopy layers; canopy gaps and understory patchiness; elements of decay such as broken or deformed tops or trunks and root decay; and the presence of species characteristic of old growth.

***Old-growth management areas:*** areas which contain, or are managed to replace, specific structural old-growth attributes and which are mapped out and treated as special management areas.

***Old Interior Forest***: means an area of "old forest" or "natural forest area" which buffered from younger age classes or disturbance. The baseline analysis for this objective used 200m as the buffered distance to calculate the amount of old interior forest. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

***Operable forest:*** that portion of the production forest that, under current market conditions, can be harvested at a profit.

***Operable land:*** all lands that are not considered inoperable lands (see Inoperable lands).

***Operable timber:*** see also Timber operability. Available timber that can be economically logged with present harvesting methods after consideration of access, timber quality and market price.

***Operability line:*** a line drawn on a map to differentiate between areas that are operable and those that are not, given status quo harvesting and reforestation technology. Inoperable areas are not economically viable to harvest without seriously impairing the site or other resource values. The operability line is used to determine the operable land base in long-run, sustained yield calculations.

***Operating area:*** geographic sub-units of timber supply areas that have been assigned to individual major licensees for the purposes of long-term planning. The boundaries are subject to change as the timber profile within a timber supply area changes over time.

***Operational cruise:*** an estimate, to a specified degree of accuracy, of the volume of timber on an area to be harvested.

***Operational plan:*** means a forest stewardship plan, woodlot licence plan, range use plan or range stewardship plan..

***Option:*** a set of assumptions representing a possible management direction. Options are constructed as a normal part of a planning process in order to provide a framework for analysis and to facilitate management decision-making.

***Organic soil:*** soil containing a high proportion (greater than 20 or 30 percent) of organic matter.

***Organization (Source CSA):*** a company, corporation, firm, enterprise, authority, or combination thereof, whether incorporated or not, public or private, that has its own functions and administration and that, for the purposes of this Standard, applies for certification. Note: For organizations with more than one operating unit (for example, a division), a single operating unit may be defined as an organization.

***Orthophoto:*** a completely rectified copy of an original photograph. All variations in scale and displacements, due to relief, have been eliminated, hence the name ortho (correct) photography. Orthorphoto and orthophoto map are synonymous, an orthophoto is, very simply, a photo map.

***Outslope:*** to shape the road surface to direct water away from the cut slope side of the road.

***Overlanding:*** placing road construction fill over organic soil, stumps and other plant materials, corduroy or geotextiles, any of which is required to support the fill.

***Overlay:*** a transparent sheet (either clear or mylar matte film material) accompanying a map, on which information, colouring, or symbols are entered so that when the overlay is placed on the map the effect is identical to having entered the overlay information on the map, itself.

***Overmature:*** in even-aged management, those trees or stands past the mature stage.

***Overstorey:*** that portion of the trees in a forest of more than one storey forming the upper or uppermost canopy layer.

***Overtopped:*** trees with crowns entirely below the general level of the crown cover receiving little or no direct light from above or from the sides.

***Overtopping:*** vegetation higher than the favoured species, as in brush or deciduous species shading and suppressing more desirable coniferous trees.

# P

***Partial cutting:*** a general term referring to silvicultural systems other than clearcutting, in which only selected trees are harvested. Partial cutting systems include seed tree, shelterwood, selection, and clearcutting with reserves.

***Pass:*** in timber harvesting, one of a planned sequence of harvesting operations designed to harvest a management unit over an extended period of time in discrete phases, so that the size of individual cutblocks and the total area harvested in any one pass does not exceed prescribed limits.

***Patch:*** a stand of similar-aged forest that differs in age from adjacent patches by more that 20 years. When used in the design of landscape patterns, the term refers to the size of either a natural disturbance opening that led to even-aged forests or an opening created by cutblocks. *From the "Biodiversity Guidebook (Sept 1995)" and released as part of the Feb 18 2005 Glossary Amendment*

***Patch cutting:*** a silvicultural system that creates openings less than 1 hectare in size and is designed to manage each opening as a distinct even-aged opening.

***Patch logging:*** a modification of the clearcutting system whereby patches of from about 5 to 200 hectares are logged as single settings and separated for as long as practicable (preferably until the regeneration is adequately shading the forest floor) by living forest. This secures the optimum dispersal of seed and avoids the high fire hazard represented by large continuous areas of slash.

***Pathological rotation age:*** the maximum rotation age through which a stand of trees may be grown without significant volume loss from disease. The stand age at which annual volume loss from disease equals annual volume increment.

***Peace officer:*** a person employed for the preservation and maintenance of public peace, typically a police officer, police constable, mayor, sheriff or sheriff officer, warden, corrections officer, or any other permanent employee of a penitentiary, prison, or correctional centre.

***Performance-based logging:*** "performance-based logging" means approval of future logging activities contingent upon a company's current practices. Until a company is in compliance with the Forest Practices Code the Government may refuse to enter into a new or replacement agreements, approve new logging plans, and issue new cutting permits.

***Periodic harvest (periodic cut):*** the removal of several years' accumulated AAC in one year or other period.

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

***Permanent Access Structure:*** an un-rehabilitated road, excavated or bladed trail, landing, pit, or quarry, which no longer contributes to the Timber Harvesting Land base (THLB). *From Jan 28 2005 Glossary Amendment*

***Permanent bridge:*** a bridge having all its major components constructed of steel, concrete, or pressure-treated timber.

***Personnel (Source CSA):*** management, contractors, and DFA-related workers employed by the organization.

***Pest:*** any forest health agent designated as detrimental to effective resource management.

***Pest incidence:*** a measurement of the presence and magnitude of pests within a given area.

***Pesticide:*** any substance or mixture of substances (other than a device) intended for killing, controlling, or managing insects, rodents, fungi, weeds, and other forms of plant or animal life that are considered to be pests as defined under the B.C. Pesticide Control Act.

***Pesticide buffer zone:*** a strip of land between the 10 m pesticide-free zone and the pesticide treatment area for preventing entry of pesticides or pesticide residues by drift, runoff, or leachate into the pesticide-free zone.

***Phenotype:*** an organism as observed by its visible characteristics, resulting from the interaction of its genotype with the environment.

***Phloem:*** a layer of tree tissue just inside the bark that conducts food from the leaves to the stem and roots. See Cambium.

***Pioneer plants:*** a succession term for plants capable of invading bare sites, such as a newly exposed soil surface, and persisting there, i.e., 'colonizing' until supplanted by invader or other succession species.

***Pitch tubes:*** a tubular mass of resin that forms on the surface of bark at bark-beetle entrance holes.

***Planned grazing system:*** a system approved by the regional manager or district manager respecting the use of land for grazing and the dispersal of livestock over land.

***Planning:*** the determination of the goals and objectives of an enterprise and the selection, through a systematic consideration of alternatives, of the policies, programs and procedures for achieving them. An activity devoted to clearly identifying, defining, and determining courses of action, before their initiation, necessary to achieve predetermined goals and objectives.

***Planning horizon:*** the time period which will be considered in the planning process.

***Planning term:*** the term of the actual plan before it must be updated.

***Plant community:*** an assemblage of plants occurring together at any point in time, thus designating no particular ecological status.

***Plant harvesting:*** the collection of plant life including, but not limited to, bark, berries, boughs, branches, burls, cones, conks, ferns, flowers,
grasses, herbs, fungi, lichens, mosses, mushrooms, roots, sedges, shrubs, sprays and twigs.

***Planting:*** establishing a forest by setting out seedlings, transplants or cuttings in an area.

***Plot:*** a carefully measured area laid out for experimentation or measurement.

***Plug:*** a seedling grown in a small container under carefully controlled (nursery) conditions. When seedlings are removed from containers for planting, the nursery soil remains bound up in their roots. See Bareroot seedling.

***Plus tree:*** a phenotype judged (but not proven by test) to be unusually superior in some quality or qualities such as an exceptional growth rate relative to the site, desirable growth habit, high wood quality, exceptional apparent resistance to disease and insect attack or to other adverse locality factors.

***Point sampling:*** a method of selecting trees for measurements and of estimating stand basal area at a sample location or point sample. Also called plotless cruising, angle count method, Bitterlich method. A 360 degree sweep is made with an angle gauge about a fixed point and the stems with breast height diameters appearing larger than the fixed angle subtended by the angle gauge are included in the sample.

***Policies:*** statements on how the authority is to achieve its goals and objectives with regard to a specific subject area or class of subject areas, e.g., a policy for development on floodplains.

***Polygon:*** a closed geometric entity used to graphically represent area features with associated attributes.

***Potentially unstable soil area:*** any area where there is a moderate to very high likelihood of slope failure following conventional road construction or timber harvesting.

***Precommercial thinning:*** see Juvenile spacing.

***Pre-harvest silviculture assessment (or survey):*** the survey carried out on a stand prior to logging to collect specific information on the silvicultural conditions such as planting survival, free-growing status, stocking, etc. See: Silviculture survey.

***Pre-Harvest Silviculture Prescription (PHSP):*** a document that applies site-specific field data and develops forest management prescriptions for areas in advance of logging. Replaced under the Forest Practices Code by Silviculture Prescriptions.

***Prescribed burning:*** the knowledgeable application of fire to a specific unit of land to meet predetermined resource management objectives.

***Prescription:*** a course of management action prescribed for a particular area after specific assessments and evaluations have been made.

***Preservation:*** the action of reserving, protecting or safeguarding a portion of the natural environment from unnatural disturbance. It does not imply preserving an area in its present state, for natural events and natural ecological processes are expected to continue. Preservation is part of, and not opposed to, conservation.

***Preventive action (Source CSA):*** action to eliminate the cause of a potential nonconformity or other undesirable situation. Note: There can be more than one cause for a potential nonconformity. Preventive action is taken to prevent occurrence, whereas corrective action is taken to prevent recurrence.

***Prime mover:*** heavy equipment used to tow other machines such as disc trenchers for site reparation.

***Prism:*** an optical instrument used as an angle gauge, consisting of a thin wedge of glass which establishes a fixed (critical) angle of projection in a point sample.

***Private woodlot owner (Source CSA):*** an individual, or a group of individuals, who privately owns forestland. For the purposes of this Standard, private woodlots are those recognized as “woodlots” by the woodlot owner association in each province.

***Problem forest type:*** non-merchantable forest types, including: stands of unfavourable stocking (i.e., dense small trees), low productivity sites and decadent stands with high waste and breakage.

***Procedure:*** a particular way of accomplishing an objective; generally refers to the method rather than the result. Procedures are usually developed to describe the methods for implementing policy.

***Proclamation date:*** the date on which a statute has legal effect.

***Production forest:*** the forest used for production of various commodities , for example timber.

***Productive forest land:*** forest land that is capable of producing a merchantable stand within a defined period of time.

***Productivity (Source CSA):*** the natural ability of a forest ecosystem to capture energy, support life forms, and produce goods and services.

***Professional engineer, professional geoscientist:*** a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia.

***Professional forester:*** see Registered professional forester.

***Protected areas:*** areas such as provincial parks, federal parks, wilderness areas, ecological reserves, and recreation areas that have protected designations according to federal and provincial statutes. Protected areas are land and freshwater or marine areas set aside to protect the province's diverse natural and cultural heritage.

***Protected Areas (Source CSA):*** an area protected by legislation, regulation, or landuse policy to control the level of human occupancy or activities. Note: “Categories of protected areas include protected landscapes, national parks, multiple use management areas, and nature (wildlife) reserves” (The State of Canada’s Forests 2001/2002). *From March 16 2005 Glossary Amendment and CSA*

***Protection forest:*** forest maintained on steep, unstable slopes to prevent accelerated erosion.

***Protocol agreements:*** an agreement between two or more ministries or two or more areas of the same ministry stating the role of each party
in relation to the other or others with respect to an issue, or issues over which the parties have concurrent jurisdiction.

***Provenance:*** the geographical area and environment to which the parent trees and other vegetation are native, and within which their genetic constitution has been developed through natural selection.

***Provincial forest:*** forest land designated under Section 5 of the Forest Act. The Lieutenant Governor in Council may designate any forest land as a provincial forest. The uses of provincial forests include timber production, forage production, forest recreation, and water, fisheries and wildlife resource purposes.

***Provincial forest inventory:*** a description of the quantity and quality of forest trees, non-wood values, and many of the characteristics of the land base compiled from statistical data for the forest lands of the province.

***Pruning:*** the manual removal, close to or flush with the stem, of side branches, live or dead, and of multiple leaders from standing, generally plantation-grown trees. Pruning is carried out to improve the market value of the final wood product by producing knot-free wood for the improvement of the tree or its timber.

***Public:*** the entire population of British Columbia, including all organizations, companies, and groups.

***Public hearing:*** a hearing formally advertised and convened to afford any person who deems their interest in property to be affected by a proposal an opportunity to be heard by the Forest Service. The Forest Service is not required to follow the tenor of the statements made at the hearing. A public hearing must be convened in respect of tree farm licence applications.

***Public highway:*** a highway for which public money has been spent and which is dedicated to public use by a plan deposited in the Land Titles Office for the district in which the road is situated.

***Public involvement:*** the procedures for obtaining and considering the views of the general public in planning and decision-making processes.

***Pulpwood agreement:*** a pulpwood agreement allows the holder of a wood-fibre processing facility to harvest Crown pulp timber, if sufficient quantities of raw material are not available to the holder from other sources. An agreement covers a 25-year term, may be replaceable every ten years and applies to a large area in one or more timber supply areas. Harvesting authority is provided through a timber sale licence where the licensee is responsible for all operational planning, development, basic silviculture and forest protection.

# Q

***Quasi-judicial:*** a decision made by a government official or tribunal which involves the application of policy to a particular set of facts requiring the exercise of discretion and the application of the principles of natural justice.

# R

***Range development:*** any practice, treatment or structure designed to achieve plant community, production and integrated resource management goals.

***Range enhancement:*** any treatment, development, or structure designed to achieve or maintain the desired plant community.

***Range of variability:*** the spectrum of conditions possible in ecosystem composition, structure and function considering both temporal and spatial factors.

***Range type:*** a defined area with specific physical characteristics, which differs from other areas in its ability to produce distinctive kinds and amounts of vegetation and in its response to management.

***Range use plan:*** an operational plan that describes the range and livestock management measures that will be implemented to ensure that range resources are protected and that the management objectives for other identified resource values are achieved.

***Rangelands:*** a broad category of land characterized by native plant communities that are often associated with grazing. Rangelands are managed by ecological rather than agronomic methods.

***Rate-of-cut:*** the proportion of the watershed area allowed to be cut each year.

***Reach:*** a length of stream channel, (lake or inlet) exhibiting, on average, uniform hydraulic properties and morphology.

***Reconnaissance:*** the field examination of a proposed road location to determine its feasibility and possible impact on other resources, and to lay out the proposed centreline.

***Recreation:*** any physical or psychological revitalization through the voluntary pursuit of leisure time. Forest recreation includes the use and enjoyment of a forest or wildland setting, including heritage landmarks, developed facilities, and other biophysical features.

***Recreation feature:*** a biological, physical, cultural or historic feature that has recreational significance or value.

***Recreation feature objective:*** a resource management objective which reflects how a recreational feature or features will be managed, protected, or conserved.

***Recreation feature significance:*** the quality, uniqueness, and availability of a recreation feature as classified in the recreation inventory.

***Recreation features inventory:*** one component of the Recreation Inventory. The identification, classification, and recording of the types and locations of biophysical recreation and cultural features, existing and potential recreation activities, feature significance and feature sensitivity.

***Recreation inventory:*** the identification, classification and recording of recreation features, visual landscapes, Recreation Opportunity Spectrum (ROS), recreation features of rivers and specific point locations of recreation sites, trails, caves etc.

***Recreation Opportunity Spectrum (ROS):*** a mix of outdoor settings based on remoteness, area size, and evidence of humans, which allows for a variety of recreation activities and experiences. The descriptions used to classify the settings are on a continuum and are described as: rural, roaded resource, semi-primitive motorized, semi-primitive non- motorized, and primitive.

***Recreation Opportunity Spectrum objectives:*** resource management objectives in approved integrated resource management plans, reflecting the desired Recreation Opportunity Spectrum setting to provide for specific types of recreation opportunities and experiences.

***Recreation resource:*** a recreation feature, a scenic or wilderness feature or setting that has recreational significance or value or a recreation facility.

***Recreation site:*** a site and its ancillary facilities developed by the B.C. Ministry of Forests for recreation or to protect a recreation resource.

***Recreation trail:*** a trail and its ancillary facilities developed by the B.C. Ministry of Forests for recreation or to protect a recreation resource.

***Recreation value:*** see Recreation resource.

***Red-listed species:*** see Threatened or endangered species.

***Referral:*** the process by which applications for permits, licences, leases, etc., made to one government agency by an individual or industry are given to another agency for review and comment.

***Reforestation:*** the natural or artificial restocking (i.e., planting, seeding) of an area with forest trees. Also called forest regeneration.

***Regeneration:*** the renewal of a tree crop through either natural means (seeded on-site from adjacent stands or deposited by wind, birds, or animals) or artificial means (by planting seedlings or direct seeding).

***Regeneration delay:*** the maximum time allowed in a prescription, between the start of harvesting in the area to which the prescription applies, and the earliest date by which the prescription requires a minimum number of acceptable well-spaced trees per hectare to be growing in that area.

***Regeneration survey:*** carried out to determine the initial restocking of a site. It is used to describe the number of trees on a site that have reached acceptable standards.

***Regional plan:*** the second level of planning in the Ministry of Forests hierarchical planning system. The regional forestry plan contains forest management alternatives based on a detailed analysis of timber supply within the region. Regional priorities for integrated use are identified and taken into account in setting production goals for timber, range, and forest recreation.

***Regional Resource Management Committee (RRMC):*** a committee comprised of senior regional representatives of government agencies responsible for or affected by resource management decisions who meet in each of the six regions in British Columbia on a regular or periodic basis to consider resource management problems.

***Regionally important species:*** the regionally identified sensitive/vulnerable (blue-listed) species and those species not at risk but which require identification and protection of habitat critical at specific periods of their life cycle, and which are thus essential to the maintenance of their populations (e.g., moose, deer, and mountain goat).

***Registered Professional Forester (RPF):*** a person registered under the Foresters Act, who performs or directs works, services, or undertakings that require specialized knowledge, training, and experience in forestry.

***Registrar/certifier (Source CSA):*** an independent third party that is accredited by the Standards Council of Canada as being competent to register organizations with respect to nationally and internationally recognized standards.

***Registration applicant (Source CSA):*** an organization that has applied to an accredited registrar for certification to this Standard.

***Registration audit (Source CSA):*** a systematic and documented verification process used to obtain and evaluate evidence objectively in order to determine whether the organization meets the SFM requirements set out in this Standard.

***Registration/certification (Source CSA):*** the result of a successful certification process in conformance with this Standard, whereby the registrar issues a certificate of registration and adds the organization's certification to a publicly available list maintained by the registrar (see Annex A).

***Reinventory:*** the complete restratification of an area on recent, mid-scale aerial photographs based on extensive field work.

***Related body (Source CSA):*** a body linked to the registrar/certifier by common ownership or directors, contractual arrangement, a common name, informal understanding, or other means such that the related body has a vested interest in the outcome of an audit or has the potential ability to influence the outcome of an audit.

***Release:*** freeing a tree or group of trees from more immediate competition by cutting or otherwise eliminating growth that is overtopping or closely surrounding them.

***Remediation:*** measures undertaken in respect to an area of land to remedy contravention of the Forest Practices Code.

***Remote Automatic Weather Station (RAWS):*** a weather station at which the services of an observer are not required. A RAWS unit measures selected weather elements automatically and is equipped with telemetry apparatus for transmitting the electronically recorded data via radio, satellite or by a landline communication system at predetermined times on a user-requested basis.

***Remote sensing:*** any data or information acquisition technique that utilizes airborne techniques and/or equipment to determine the characteristics of an area.

***Reportable erosion event:*** a natural or man-made disturbance to the forest land base which is causing or will likely cause substantial environmental impacts, or which is a threat to life or property.

***Reportable Spills*:** Any amount of the above substances released into a stream, lake, wetland or moving water is reportable. *From Jan 28 2005 Glossary Amendment*

***Reserve:*** an area of forest land that, by law or policy, is not available for harvesting. Areas of land and water set aside for ecosystem protection, outdoor and tourism values, preservation of rare species, gene pool, wildlife protection etc, and includes old growth management areas, parks and protected areas". *From Jan 28 2005 Glossary Amendment*

***Reserve zone:*** the inner portion of a riparian management area situated adjacent to a stream, lake, or wetland and established to conserve and maintain the productivity of aquatic and riparian ecosystems when harvesting is not permitted.

***Reserved trees:*** trees specifically reserved from harvesting and often referenced in Pre Harvest Silviculture Prescriptions or cutting authorities or by map notations.

***Reserves:*** the retention of live or standing dead trees, pole size or larger, on site following harvest for purposes other than regeneration. Reserves can be uniformly distributed as single trees or left in small groups, and they can be used with any silvicultural system.

***Residual basal area:*** the basal area per hectare of acceptable trees left standing after harvest.

***Residual stand structure:*** the age class or height structure of the stand or remaining trees after harvesting.

***Residuals (residual trees):*** trees left standing after harvesting.

***Residue:*** the volume of timber left on the harvested area which meets or exceeds the size requirements but is below the log grade requirements of the minimum utilization standards in the cutting authority. It is part of the allowable annual cut for cut control.

***Resilience:*** the ability of an ecosystem to maintain diversity, integrity and ecological processes following disturbance.

***Resistance to control:*** the relative ease of establishing and holding a fireguard and/or securing a control line as determined by the difficulty of control and resistance to fireguard construction.

***Resource features:*** localized resource values or sites of special interest, such as caves, raptor-nesting trees, mineral licks, heritage sites, and recreation trails.

***Resource folio:*** a collection of resource capability and forest inventory maps, other resource data, interpretations, and management objectives for each resource sector. General prescriptions are developed to achieve the stated integrated use of objectives. A resource folio forms the basis for the timber licensee's development plan or working plan.

***Resource industry:*** an industry based on the primary resources obtained from agriculture, fisheries, forestry or mining.

***Resource Management Zone (RMZ):*** an area established by the chief forester in accordance with any policy direction from Cabinet or designated ministers. Resource management zones are used to implement broad land use policy, as provided in land and resource management plans or other Cabinet-level directives. An RMZ might include a major travel corridor which has scenic values or an area managed for intensive timber production such as Crown land in a provincial forest and private land in a tree farm licence or woodlot licence that must be managed and used in accordance with the requirements of Section 2 of the Forest Practices Code of British Columbia Act.

***Resource Management Zone objectives:*** provide strategic direction on a regional or subregional scale (1:100 000 to 1:250 000 map scale). The chief forester is authorized by the Ministers of the Ministry of Forests, Ministry of Environment, and Ministry of Energy, Mines and Petroleum Resources to establish RMZs and associated objectives, in consultation with other resource agencies.

***Resource values:*** products or commodities associated with forest lands and largely dependent on ecological processes. These include, but are not limited to, water quality and quantity, forage, fish, wildlife, timber, recreation, energy, minerals, and cultural and heritage resources.

***Restoration:*** the return of an ecosystem or habitat to its original community structure, natural complement of species and natural functions.

***Retention:*** retaining or saving a portion of the original stand in a cluster or clump. Retention visual quality objective: a visual landscape strategy derived from landscape analysis which applies to areas of high landscape value (for example, continuously forested or steep slopes facing important viewpoints or recreation use areas, foreground areas adjacent to important viewpoints or recreation use areas, and certain shorelines). Forest management activities may be present, but should not be noticed by the average viewer. Some visual change may be discernible, but should not be recognized as being different from existing natural features in the landscape.

***Right-of-way:*** the strip of land over which a power line, railway line, road, etc., extends.

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

***Riparian Management Area (RMA):*** a classified area of specified width surrounding or adjacent to streams, lakes, riparian areas, and wetlands. The RMA includes, in many cases, adjacent upland areas. It extends from the top of the streambank (bank full height) or from the edge of a riparian area or wetland or the natural boundary of a lake outward to the greater of: 1) the specified RMA distance, 2) the top of the inner gorge, or 3) the edge of the flood plain. Where a riparian area or wetland occurs adjacent to a stream or lake, the RMA is measured from the outer edge of the wetland.

***Riparian management zone:*** the area within and adjacent to riparian and other wetlands required to meet the structural and functional attributes of riparian ecosystems.

***Riprap:*** an apron of coarse rock installed over the fillslope to prevent erosion.

***Risk:*** the probability of an undesirable event occurring within a specified period of time. With regard to insect populations, risk involves components to evaluate the likelihood of an outbreak, the likelihood of trees being attacked (susceptibility) or the likelihood of trees being damaged (vulnerability). In fire prevention, risk involves those things or events that cause fires to start (including the physical igniting agents and people).

***Risk rating (assessment):*** the process of identifying the degree of risk that timber harvesting imposes on adjacent and downslope social, economic, and forest resource values. The severity of each potential hazard and the magnitude of the potential consequences that correspond to each hazard provide the overall risk associated with harvesting a site.

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

***Road location line:*** the marked location of proposed roads.

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

***Road prism:*** the area of the ground containing the road surface cut slope and fill slope.

***Rotation:*** the planned number of years between the formation or regeneration of a tree crop or stand and its final cutting at a specified stage of maturity. Can be based on physical, biological, pathological or economic criteria.

***Rotation age:*** the age at which a stand is considered mature and ready for harvesting.

***Roundwood:*** sections of tree stems, with or without bark. Includes logs, bolts, posts, and pilings.

***RPF:*** see Registered Professional Forester.

***Rules:*** informal working term for draft forest practices requirements proposed for the Forest Practices Code. Following review and public input, Rules may be incorporated into the Forest Practices Code of British Columbia Act or in Regulations under the Act.

# S

***Salmonid:*** a fish of the fish family Salmonides; for example salmon, trout and chars.

***Salvage harvesting:*** logging operations specifically designed to remove damaged timber (dead or in poor condition) and yield a wood product. Often carried out following fire, insect attack or windthrow.

***Sanitation treatment:*** tree removal or modification operations designed to reduce damage caused by forest pests and to prevent their spread.

***Sapling:*** a loose term for a young tree no longer a seedling but not yet a pole, about 1 - 2 m high and 2 - 4 cm DBH, typically growing vigorously and without dead bark or more than an occasional dead branch. Also, a young tree having a DBH greater than 1 cm but less than the smallest merchantable diameter.

***Sapwood:*** the light-coloured wood that appears on the outer portion of a cross-section of a tree. See Cambium.

***Scaling:*** the measuring of lengths and diameters of logs and calculating deductions for defect to determine volume.

***Scalping:*** site preparation method which exposes favourable mineral soil for tree seedlings to be planted in.

***Scarification:*** a method of seedbed preparation which consists of exposing patches of mineral soil through mechanical action.

***SCC:*** Standards Council of Canada

***Scenic area:*** any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the district manager.

***Screefing:*** removal of herbaceous vegetation and soil organic matter to expose a soil surface for planting.

***Second growth:*** a forest or stand that has grown up naturally after removal of a previous stand by fire, harvesting, insect attack or other cause.

***Second pass:*** the next entry to harvest timber after green-up (or other recovery objective) occurs.

***Secondary channel:*** subordinate channel in a stream reach with more than one channel; minor channel in a floodplain.

***Sediment***: Fragmentary material that originates from the weathering of rocks and is transported by, suspended in, or deposited by water. *From "Certified Professional in Erosion and Sediment Control Exam Workbook", Jan 28 2005 Glossary Amendment*

***Sedimentation***: Gravitational deposit of transposed material in flowing or standing water (i.e. the deposition of eroded material). *From "Certified Professional in Erosion and Sediment Control Exam Workbook", Jan 28 2005 Glossary Amendment*

***Sediment occurrence:*** Deposition of sediment into a stream as a result of failed drainage structures/erosion control measures or improper or lacking erosion control measures.

***Seedlot:*** a quantity of cones or seeds having the same species, source, quality and year of collection.

***Seed orchard:*** a plantation of specially selected trees that is managed for the production of genetically improved seed.

***Seed source:*** the locality where a seedlot was collected. If the stand from which collections were made was exotic, the place where its seed originated is the original seed source.

***Seed tree silvicultural system:*** an even-aged silvicultural system in which selected trees (seed trees) are left standing after the initial harvest to provide a seed source for natural regeneration. Seed trees can be left uniformly distributed or in small groups. Although regeneration is generally secured naturally, it may be augmented by planting. Seed trees are often removed once regeneration is established or may be left as reserves.

***Seed trees:*** trees selected to be left standing to provide seed sources for natural regeneration. Selection is usually on the basis of good form and vigour, the absence of serious damage by disease, evidence of the ability to produce seed, and wind firmness.

***Seedbed:*** in natural regeneration, the soil or forest floor on which seed falls; in nursery practice, a prepared area over which seed is sown.

***Seedling:*** a young tree, grown from seed, from the time of germination to the sapling stage, having a DBH equal or less than 1 cm.

***Seedlots:*** seed from a particular collection event, either from a single tree collection or a pooling of seed from many trees.

***Seepage zone:*** an area on a hillslope or at the slope base where water frequently or continuously springs to the surface.

***Seismic line:*** a constructed trail used for seismographic exploration.

***Selection silvicultural system:*** a silvicultural system that removes mature timber either as single scattered individuals or in small groups at relatively short intervals, repeated indefinitely, where the continual establishment of regeneration is encouraged and an uneven-aged stand is maintained. As defined in the Forest Practices Code of British Columbia Operation Planning Regulation, group selection removes trees to create openings in a stand less than twice the height of mature trees in the stand.

***Selective logging:*** removal of certain trees in a stand as defined by specific criteria (species, diameter at breast height, or height and form). It is analogous to high grading. Not to be confused with the selection silvicultural system.

***Semi-permanent bridge:*** a bridge having a substantial proportion of its components constructed of steel, concrete, or timber that has been pressure-treated with a suitable preservative.

***Senior official:*** a senior official means:

- a district manager or regional manager,
- a person employed in a senior position in the Ministry of Forest, Ministry of Environment, or

the Ministry of Energy, Mines and Petroleum Resources, who is designated by name or title to be a senior official for the purposes the Act by the minister of that ministry.

***Sensitive areas:*** small areas designated to protect important values during forest and range operations. These areas, established by a Ministry of Forests district manager in consultation with a designated B.C. Environment official, guide operations on a site-specific basis and require a combination of forest practices. Sensitive areas will be mapped by resource agencies, and include regionally significant recreational areas, scenic areas with high visual quality objectives, and forest ecosystem networks.

***Sensitive areas objectives:*** to adequately manage, protect, and conserve the resources of the area. Sensitive areas may be designated under the Forest Practices Code of British Columbia Act, through a planning process, or by the Ministry of Forests district manager and designated B.C. Environment official (for example, forest ecosystem networks and the setting of visual quality objectives for sensitive scenic areas).

***Sensitive resource area:*** an identifiable geographic unit of the forest land base that requires a specific combination of forest practices to adequately protect important resource values.

***Sensitive slopes:*** any slope identified as prone to mass wasting.

***Sensitive soils:*** forest land areas that have a moderate to very high hazard for soil compaction, erosion, displacement, mass wasting or forest floor displacement.

***Sensitive/vulnerable species:*** species identified as "blue listed" by the Ministry of Environment, these are indigenous species that are not threatened but are particularly at risk.

***Sensitive watershed:*** a watershed that is used for domestic purposes or that has significant downstream fisheries values, and in which the quality of the water resource is highly responsive to changes in the environment. Typically, such watersheds lack settlement ponds, are relatively small, are located on steep slopes, and have special concerns such as extreme risk of erosion.

***Seral stage:*** any stage of development of an ecosystem from a disturbed, unvegetated state to a climax plant community.

***Settlement pond:*** larger than a catchment basin and preferably with lower velocity waterflows that enable suspended sediment to settle before the flow is discharged into a creek.

***SFM:*** Sustainable forest management

***SFM performance (Source CSA):*** the assessable results of SFM as measured by the level of achievement of the targets set for a DFA.

***SFM policy (Source CSA):*** a statement by the organization of intentions and principles in relation to SFM, which provides a framework for objectives, targets, practices, and actions.

***SFM requirements (Source CSA):*** the public participation, performance, and system requirements found in Clauses 4, 5, 6, and 7.

***SFM system (Source CSA):*** the structure, responsibilities, practices, procedures, processes, and time frames set by a registrar for implementing, maintaining, and improving SFM.

***Shade tolerance:*** the capacity of a tree or plant species to develop and grow in the shade of, and in competition with, other trees or plants.

***Shearing:*** in Christmas tree culture, to prune the branches to make dense foliage and give the tree a conical shape.

***Shelterwood silvicultural system:*** a silvicultural system in which trees are removed in a series of cuts designed to achieve a new even-aged stand under the shelter of remaining trees.

***Short-term operational plans (Source CSA):*** annual or five-year plans.

***Sidecast:*** moving excavated material onto the downslope side of a temporary access structure, excavated or bladed trail, or landing during its construction.

***Sills:*** a single structural member used as a foundation to transfer the loads from the bridge superstructure to the supporting soil.

***Silvics:*** the study of the life history, requirements and general characteristics of forest trees and stands in relation to the environment and the practice of silviculture.

***Silvicultural system:*** a process that applies silviculture practices, including the tending, harvesting, and replacing of a stand, to produce a crop of timber and other forest products. The system is named by the cutting method with which regeneration is established. The six classical systems are seed tree, shelterwood, selection, and clearcut.

***Silviculture:*** the art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

***Silviculture prescription:*** a site-specific integrated operational plan, designated in the Forest Practices Code, to carry out one or a series of silviculture treatments.

***Silviculture regime:*** a series of site-specific silviculture treatments planned over time.

***Silviculture survey:*** a sampling procedure to determine silvicultural conditions such as planting survival, free-growing status, stocking, etc., leading to management decisions. See: Pre-Harvest Silviculture Assessment.

***Silviculture treatment:*** any silviculture activity on forest stands to meet stand-specific objectives.

***Silviculture treatments:*** activities that ensure the regeneration of young forests on harvested areas and enhance tree growth and improve wood quality in selected stands.

***Single tree selection:*** see Selection silvicultural system.

***Site:*** an area described or defined by its biotic, climatic, and soil conditions in relation to its capacity to produce vegetation; the smallest planning unit.

***Site class:*** the measure of the relative productive capacity of a site for a particular crop or stand, generally based on tree height at a given age and expressed as either good, medium, poor or low.

***Site index:*** an expression of the forest site quality of a stand, at a specified age, based either on the site height, or on the top height, which is a more objective measure.

***Site Plan:*** a plan prepared in accordance with Division 2 of the Forest & Range Practices Act and which must meet the content requirements of Part 3 Section 34 of the Forest Planning and Practices Regulation.

***Site preparation:*** the treatment of the soil and ground vegetation to prepare the soil surface as a favourable seedbed for either naturally or artificially disseminated seed or for planted seedlings.

***Site productivity:*** the inherent capabilities of a site to produce or provide the commodities or values for which the area will be managed in accordance with Section 4 of the Ministry of Forests Act, that is, timber, forage, recreation, fisheries, wildlife, and water.

***Site rehabilitation:*** the conversion of the existing unsatisfactory cover on highly productive forest sites to a cover of commercially valuable species.

***Site sensitivity:*** an assessment of the susceptibility of a site to soil-degrading processes, such as soil compaction, erosion, mass wasting, and forest floor displacement.

***Site-specific:*** pertaining to a specific planning unit.

***Sites of Biological Significance:*** Sites which support red & blue listed plant communities and rare ecosystems and include features such as bald eagle or osprey nests, mineral licks, species at risk habitats and others provided by government

***Situation Report (SITREP):*** an itemized list and/or written account, usually issued on a daily basis, detailing the status of various fire-related activities. A SITREP generally contains information on fire occurrence and area burned to date, fire suppression resources committed to going fires and resources on standby, number of fires in the various stages of control, fire danger class, fire weather forecast and forest closures (if any).

***Skid road:*** a bladed or backhoe-constructed pathway where stumps are removed within the running surface as necessary. Skid roads are suitable only for tracked or rubber-tired skidders bringing trees or logs from the felling site to a landing.

***Skid trail:*** a random pathway travelled by ground skidding equipment while moving trees or logs to a landing. A skid trail differs from a skid road in that stumps are cut very low and the ground surface is mainly untouched by the blades of earth moving machines.

***Skidder:*** a wheeled or tracked vehicle used for sliding and dragging logs from the stump to a landing.

***Skidding:*** the process of sliding and dragging logs from the stump to a landing, usually applied to ground-based as opposed to highlead operations.

***Skyline:*** a type of cable logging system in which a skyline is stationary and a carriage moves along it carrying logs above the ground, from the felling site to the landing.

***Slash:*** the residue left on the ground as a result of forest and other vegetation being altered by forest practices or other land use activities.

***Slide:*** a mass movement process in which slope failure occurs along one or more slip surfaces and in which the unit generally disintegrates into a jumbled mass en route to its depositional site. A debris flow or torrent flow may occur if enough water is present in the mass.

***Slope failure:*** see Slide.

***Slope processes:*** all processes and events by which the configuration of the slope is changed; especially processes by which rock, surficial materials and soil are transferred downslope under the dominating influence of gravity.

***Slope stability:*** susceptibility of a slope to erosion and slides.

***Slump:*** a mass movement process in which slope failure occurs on a usually curved slip surface and the unit moves downslope as an intact block, frequently rotating outward. Slumps appear as discrete block movements, often in place, whereas slides usually break up and travel downslope.

***Small Business Forest Enterprise Program (SBFEP):*** this program permits the Ministry of Forests to sell Crown timber competitively to individuals and corporations who are registered in the SBFEP.

***Small-scale forestry:*** in general, non-industrial forestry operations. In B.C., small-scale forestry operations are carried out by woodlot licensees, Indian bands, municipalities and private landowners.

***Smoke management:*** the scheduling and conducting of a prescribed burning program under predetermined burning prescriptions and firing
techniques that will minimize the adverse effects of the resulting smoke production in smoke-sensitive areas.

***Smoke-sensitive area:*** an area that has been identified in which smoke accumulations may cause a safety or public health hazard, or may unreasonably deny aesthetic enjoyment to the public.

***Snag:*** a standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

***Softwoods:*** cone-bearing trees with needle or scale-like leaves such as Douglas-fir, western red cedar and ponderosa pine.

***Soil:*** the naturally occurring, unconsolidated mineral or organic material at the surface of the earth that is capable of supporting plant growth. It extends from the surface to 15 cm below the depth at which properties produced by soil-forming processes can be detected. The soil-forming processes are an interaction between climate, living organisms, and relief acting on soil and soil parent material. Unconsolidated material includes material cemented or compacted by soil-forming processes. Soil may have water covering its surface to a depth of 60 cm or less in the driest part of the year.

***Soil displacement hazard:*** a soil displacement hazard as determined in accordance with procedures set out in the Ministry of Forests' publication "Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook," as amended from time to time.

***Soil disturbance:*** disturbance caused by a forest practice on an area covered by a silviculture prescription or stand management prescription including areas occupied by excavated or bladed trails of a temporary nature, areas occupied by corduroyed trails, compacted areas, and areas of dispersed disturbance.

***Soil disturbance hazard:*** an assessment of the susceptibility of a soil to adverse impacts on its productive capability due to soil compaction, soil puddling, surface erosion, mineral soil displacement, mass wasting, or forest floor displacement.

***Soil erosion:*** the wearing away of the earth's surface by water, gravity, wind, and ice.

***Soil pit:*** an excavation into the mineral soil of sufficient depth to allow assessment of variability in soil physical properties within a defined area of land.

***Soil productivity:*** the capacity of a soil, in its normal environment, to support plant growth.

***Soil verification pit:*** an excavation into the mineral soil of sufficient depth to allow assessment of the soil properties used to evaluate soil
productivity and sensitivity to forest management-related disturbances. This generally requires an excavation 90 cm deep unless a watertable, compact soil, or bedrock is encountered closer to the soil surface, in which case the depth to one of these layers is the minimum depth of pit required.

***Spacing:*** the removal of undesirable trees within a young stand to control stocking, to maintain or improve growth, to increase wood quality and value, or to achieve other resource management objectives.

***Special forest products:*** The following are designated to be special forest products under section 1 of the *Forest Act*: Christmas trees, firewood, mining timbers, stakes and sticks, cants, posts and rails (split and round), shake and shingle bolts, blocks and blanks, and shakes.

***Special sale area:*** see Regulated unit.

***Species:*** a singular or plural term for a population or series of populations of organisms that are capable of interbreeding freely with each other but not with members of other species. Includes a number of cases:

- endemic species: a species originating in, or belonging to, a particular region. Both "endemic" and " "indigenous are preferred over "native."
- exotic species: a species introduced accidentally or intentionally to a region beyond its natural range. "Exotic" is preferred over "alien," "foreign" and "non-native.'
- subspecies: a subdivision of a species. A population or series of populations occupying a discrete range and differing genetically from other subspecies of the same species.

***Species at risk:***

a) any wildlife species that, in the opinion of the Deputy Minister of Environment, Lands and Parks, or a person authorized by that deputy minister, is threatened, endangered, sensitive or vulnerable,
b) any threatened and endangered plants or plant communities identified by the Deputy Minister of, Environment, or any person authorized by that deputy minister, as requiring protection and
c) regionally important wildlife as determined by the Deputy Minister of Environment, Lands and Parks or a person authorized by that deputy minister.

***Species at Risk in the DFA:*** Provincial identified wildlife, endangered and threatened species as identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC's - Federal), animal species and forested plant communities listed as red and blue by the B.C. Conservation Data Center (CDC) and plant species listed as red by the CDC. *From March 16 2005 Glossary Amendment*

***Species composition:*** the percentage of each recognized tree species comprising the forest type based upon the gross volume, the relative number of stems per hectare or basal area.

***Species conversion:*** a change from one tree species to another.

***Species guild:*** Any group of species that exploit the same class of environmental resources in a similar way. (e.g. nectar feeders, desert lizards, terrestrial salamanders, insectivorous birds.)

***Spot burning:*** a modified form of broadcast burning in which only the larger accumulations of slash are fired and the fire is confined to these spots.

***Spring:*** a flow of ground water emerging naturally onto the earth's surface and used as a domestic water source within a community watershed. The watershed area of a spring is defined as the total recharge area of the spring.

***Stabilized road width:*** the width of the traveled portion of the road that has been surfaced with material of sufficient strength and quantity to support the intended traffic.

***Stagnant:*** of stands whose growth and development have all but ceased due to poor site and/or excessive stocking.

***Stand:*** a community of trees sufficiently uniform in species composition, age, arrangement, and condition to be distinguishable as a group from the forest or other growth on the adjoining area, and thus forming a silviculture or management entity.

***Stand composition:*** the proportion of each tree species in a stand expressed as a percentage of the total number, basal area or volume of all tree species in the stand.

***Stand conversion:*** changing the species composition of a stand to more desirable tree species which are less susceptible to damage or mortality from certain insects or diseases.

***Stand density:*** a relative measure of the amount of stocking on a forest area. Often described in terms of stems per hectare.

***Stand development:*** the part of stand dynamics concerned with changes in stand structure over time.

***Stand dynamics:*** the study of changes in forest stand structure over time, including stand behaviour during and after disturbances.

***Stand level:*** the level of forest management at which a relatively homogeneous land unit can be managed under a single prescription, or set of treatments, to meet well-defined objectives.

***Stand model:*** a computer model that forecasts the development of a forest stand, usually in terms of stand attributes such as mean diameter or height.

***Stand strategy:*** a documented plan of stand treatments to achieve management objectives during the life of a particular stand.

***Stand structure:*** the distribution of trees in a stand, which can be described by species, vertical or horizontal spatial patterns, size of trees or tree parts, age, or a combination of these.

***Stand table:*** a summary table showing the number of trees per unit area by species and diameter class, for a stand or type. The data may also be presented in the form of a frequency distribution of diameter classes.

***Stand tending:*** a variety of forest management treatments, including spacing, fertilization, pruning, and commercial thinning, carried out at different stages during a stand's development.

***Stand types:*** see Stand, Stand structure.

***Standard:*** the required level or measure of practice established by authority of the Forest Practices Code and referenced in legislation.

***Standard II (Source CSA):*** a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or specifications for activities or their results, aimed at the achievement of the optimum degree of consistency in a given context. Note: Standards should be based on the consolidated findings of science, technology, and experience and should be aimed at the promotion of optimum community benefits.

***Standing:*** status held by a person or group which allows the person or group to challenge or appeal a particular decision.

***Statutory framework:*** where forest practices are primarily regulated by legislation.

***Stewardship:*** caring for land and associated resources and passing healthy ecosystems to future generations.

***Stocking:*** a measure of the area occupied by trees, usually measured in terms of well- spaced trees per hectare, or basal area per hectare, relative to an optimum or desired level.

***Stocking class:*** a numeric code representing a range of stems per hectare, sometimes estimated by crown closure on aerial photographs, e.g. stocking class 1 is mature with 76+ stems/ha of > 27.5 cm DBH; class 2 is mature with < 76 stems/ha; class 0 is immature.

***Stocking plan:*** a plan that provides objectives and strategies for land allocation and/or resource management, including regional plans, subregional plans, and local resource plans.

***Stocking standard:*** the required range of healthy, well-spaced, acceptable trees.

***Stocking survey:*** the determination of the stocking of an area of both well-spaced and total trees; also used to generate an inventory label.

***Strategic plan:*** a plan that provides objectives and strategies for land allocation and/or resource management, including regional plans, subregional plans, and local resource plans.

***Strategy:*** a broad non-specific statement of an approach to accomplishing desired goals and objectives.

***Strategy II (Source CSA):*** a coordinated action set designed to meet established targets.

***Stream:*** a watercourse, having an alluvial sediment bed, formed when water flows on a perennial or intermittent basis between continuous definable banks.

***Stream bank:*** the rising ground bordering a stream channel.

***Stream channel:*** the streambed and banks formed by fluvial processes, including deposited organic debris.

***Stream class:*** the British Columbia Coastal Fisheries/Forestry Guidelines defines three stream classes:

- Stream Class A includes streams or portions of streams that are frequented by anadromous salmonids and/or resident sport fish or regionally significant fish species; or streams identified for fishery enhancement in an approved fishery management plan; stream gradient is usually less than 12 percent.
- Stream Class B includes streams or portions of streams populated by resident fish not currently designated as sport fish or regionally significant fish; stream gradient is usually 8-20 percent.
- Stream Class C includes streams or portions of streams not frequented by fish; stream gradient is usually greater than 20 percent.

***Stream culvert:*** a culvert used to carry stream flow in an ephemeral or perennial stream channel from one side of the road to the other.

***Stream gradient:*** the general slope, or rate of vertical drop per unit of length of a flowing stream.

***Streambed:*** the bottom of the stream below the usual water surface.

***Streamside Management Zone (SMZ):*** the land, together with the vegetation that supports it, immediately in contact with the stream and sufficiently close to have a major influence on the total ecological character and functional processes of the stream. (see also Riparian Management Area)

***Stumpage:*** is the fee that individuals and firms are required to pay to the government when they harvest Crown timber in British Columbia. Stumpage is determined through a complex appraisal of each stand or area of trees that will be harvested for a given timber mark. A stumpage rate ($ per m3) is determined and applied to the volume of timber that is cut (m3). Invoices are then sent to individuals or firms

***Subgrade:*** the material movement necessary to construct the roadway, excluding surfacing.

***Substructure:*** the part of a bridge that supports the superstructure and carries all the applied lateral and vertical loads; includes caps, sills, piles, and posts, each comprising elements known as abutments and piers.

***Subsurface drainage:*** water flow through permeable soil or rock beneath the surface of the land.

***Sub-unit plan:*** the fourth level of planning in the Ministry of Forests hierarchical planning system. The aggregation of a number of courses of action in map and written form designed to achieve sub-unit objectives. Normally centered on watersheds.

***Succession:*** the gradual supplanting of one community of plants by another, the sequence of communities being termed a sere and each stage seral.

***Suitability mapping:*** a habitat interpretation that describes the current potential of a habitat to support a species. Habitat potential is reflected by the present habitat condition or successional stage.

***Superstructure:*** the part of a bridge found above or supported by the caps or sills, including the deck, girders, stringers, and curbs.

***Supply block:*** an area of Crown land that is relatively homogeneous with respect to forest characteristics, access development and management concerns. Supply blocks are the next smaller timber management unit within a Timber Supply Area.

***Surface soil erosion:*** means for an area where a forest practice has been carried out, the movement of soil particles from the area by wind, gravity or water at a rate that is greater than that which would have occurred had the forest practice not been carried out.

***Surplus forest:*** a forest in which existing stands can provide more harvest volume than is needed to maintain the harvest at the level of long run sustained yield until the stands created when the existing stands are cut become available for harvest. See also deficit forest.

***Sustainability:*** the concept of producing a biological resource under management practices that ensure replacement of the part harvested, by regrowth or reproduction, before another harvest occurs.

***Sustainable development:*** preservation and protection of diverse ecosystems-the soil, plants, animals, insects and fungi while maintaining the forest's productivity.

***Sustainable forest management:*** management regimes applied to forest land which maintain the productive and renewal capacities as well as the genetic, species and ecological diversity of forest ecosystems.

***Sustainable forest management (SFM) (Source CSA):*** management "to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social, and cultural opportunities for the benefit of present and future generations" *(The State of Canada's Forests 2001/2002*).

***Sustained yield:*** a method of forest management that calls for an approximate balance between net growth and amount harvested.

***Switchback:*** a horizontal road curve used for surmounting the grade of a step hill, usually with a small radius (15-10 m) and curving 180 degrees.

***System road:*** a permanent road required for long-term management of the forest.

# T

***Tactical plan:*** non-legal operating plans that highlight short term development proposals.

***Target (Source CSA):*** a specific statement describing a desired future state or condition of an indicator. Targets should be clearly defined, time-limited, and quantified, if possible.

***Target stocking standards:*** the number of well-spaced acceptable trees per hectare that will, in normal circumstances, produce an optimum
free-growing crop; the standards at which silviculture treatments are aimed.

***Temporary access structure:*** a structure that would be a permanent access structure except that it is not shown on a forest development plan, access management plan, logging plan, road permit or silviculture prescription as remaining operational after the completion of timber harvesting activities.

***Temporary bridge:*** a bridge having most of its major components constructed of untreated wood.

***Temporary tenures:*** non-alienated lands on which the timber is alienated to private interests, but where the Crown retains ownership of the
lands. These lands include timber licences, timber leases and timber berths as well as pulp licences and pulp berths, including those now in tree farm licences under Schedule "A."

***Tending:*** any operation carried out for the benefit of a forest crop or an individual thereof, at any stage of its life. It includes operations both on the crop itself and on competing vegetation but not site preparation or regeneration cuttings.

***Tenure:*** the holding, particularly as to manner or term (i.e., period of time), of a property. Land tenure may be broadly categorized into private lands, federal lands, and provincial Crown lands. The Forest Act defines a number of forestry tenures by which the cutting of timber and other user rights to provincial Crown land are assigned.

***Tenure (Source CSA):*** the terms under which a forest manager or owner possesses the rights, and assumes the responsibilities, to use, harvest, or manage one or more forest resources in a specified forest area for a specified period of time. **Note:** Private ownership of forestland is the strongest form of tenure, as the rights and obligations rest solely with the forest owner. Forest tenures of public land in Canada fall into two main categories: area-based and volume-based. Area-based tenures not only confer timber-harvest rights but also usually oblige the tenure holder to assume forest management responsibilities. Volume-based tenures normally give the holder the right to harvest specific volumes of timber in areas specified by the landowner or manager, but can also oblige holders to assume forest management responsibilities.

***Tenure holder:*** an individual, group, or company that holds a licence agreement as defined in Section 10 of the Forest Act or Section 3 of the Range Act.

***Tenure management plan:*** a plan that relates to the management, development and use, by the holder of a licence or permit granted under the Range Act, of t he Crown range to which t he licence or permit applies, including the man agreement and use, affecting Crown range, of the following land: to which a licence or permit is made appurtenant, land which is subject to an agreement under section 17 of the Range Act, and unfenced land used for grazing purposes in common with Crown range to which a licence or permit applies.

***Terrain:*** the physical features of a tract of land.

***Terrain hazard assessment:*** an assessment or characterization of unstable or potentially unstable slopes on forested lands. A determination of the relative potential of landslide initiation and the type of landslide that may occur on different types of terrain, based on the data obtained from a review of available maps, photos, site data, and field observations.

***Terrain stability risk:*** a combined assessment of both the likelihood of landslide initiation and an order of magnitude estimate of the amount of landslide debris that might enter a stream or of the potential lengths of scour of a stream by a landslide.

***Thinning:*** a cutting made in an immature crop or stand primarily to accelerate diameter increment but also, by suitable selection, to improve the average form of the trees that remain.

***Threatened or endangered habitats:*** ecosystems that are:

- restricted in their distribution over a natural landscape (e.g., freshwater wetlands within certain biogeoclimatic) or are restricted to a specific geographic area or a particular type of local environment; or
- ecosystems that were previously widespread or common but now occur over a much smaller area due to extensive disturbance or complete destruction by such practices as intensive harvesting or grazing by introduced species, hydro projects, dyking, and agricultural conversion.

***Threatened or endangered species:*** species identified as red listed by the Ministry of Environment; these are indigenous species that are either threatened or endangered.

***Timber:*** trees, whether standing, fallen, living, dead, limbed, bucked or peeled.

***Timber cruising:*** the collection of field data on forests commonly by the measurement and recording of information in sample plots. Includes the measurement and estimation of volumes of standing trees.

***Timber harvesting land base (THLB):*** This is the area within each management unit that is available for commercial timber production, and it is based on economic, environmental, social and cultural considerations. This is the Crown forested land base that contributes to the AAC, as defined in the Timber Supply Review, for a Timber Supply Area (TSA) or Tree Farm License (TFL)
*The timber harvesting land base does not include protected lands or areas such as riparian reserves or lands that support important wildlife habitat, recreational activities or cultural features. It also does not include stands of trees with little economic value if, for example, there is no market for the predominant species or the area is too remote or difficult to access because of the rugged, mountainous terrain.*

***Timber licence:*** area-based tenures which revert to the government when merchantable timber on the area has been harvested and the land reforested. Many of these licences have been incorporated into tree farm licences.

***Timber management prescriptions:*** recommended forest management practices, usually pertaining to the sub-unit and operational levels of planning.

***Timber mark:*** a hammer indentation made on cut timber for identification purposes.

***Timber operability (see also Operable timber):*** in a planning context, the term refers to the economic suitability of timber for harvesting. Parameters to consider in assessing operability include: terrain, timber quality, timber size, operating season, labour costs, development costs, and transportation costs. In the Environmental Protection Area program, operability refers to freedom from harvesting constraints which include environmental protection and other forest uses.

***Timber sale licence:*** an agreement entered into under Part 3, Division (3) of the Forest Act. A timber sale licence usually defines a specific volume of timber to be harvested from a specific area. In special circumstances, an allowable annual cut (AAC) is specified. Allows the orderly harvest of relatively small volumes of timber by:

- operators with small cuts;
- operators registered under the Small Business Forest Enterprise Program or others with temporary cutting rights; and
- holders of pulpwood agreements.

***Timber supply:*** the available timber categorized by species, end-use, and relative value.

***Timber supply analysis:*** an assessment of future timber supplies over long planning horizons (more than 200 years) by using timber supply models for different scenarios identified in the planning process.

***Timber Supply Area (TSA):*** an area defined by an established pattern of wood flow from management units to the primary timber-using industries.

***Timber Supply Block (TSB):*** a division of a timber supply area.

***Timber supply model:*** an analytical model (usually computer-based) that simulates the harvest and growth of collections of forest stands over several decades according to specific data and management assumptions.

***Timber utilization:*** the dimensions and quality of timber that is actually cut and removed from an area.

***Tolerance:*** the ability of an organism or biological process to subsist under a given set of environmental conditions. The range of these under which it can subsist, representing its limits of tolerance, is termed its ecological amplitude. For trees, the tolerance of most practical importance is their ability to grow satisfactorily in the shade of and in competition with other trees.

***Top height:*** the average height of the hundred trees of largest diameter per hectare.

***Top management (Source CSA):*** persons with decision-making authority regarding SFM policy, resource allocation, and planning in the DFA.

***Topographic break:*** a distinct change in the slope of the land.

***Topography:*** the physical features of a geographic area, such as those represented on a map, taken collectively; especially, the relief and contours of the land.

***Total chance planning:*** early planning over an entire development area for the best overall realization of all objectives identified by broader planning.

***Total resource plan:*** a plan for long-term forest management over an entire area, such as a watershed. The plan identifies known resource values, capabilities and sensitivities; confirms or refines management objectives for those values; and establishes detailed management guidelines by which to achieve those objectives on the ground.

***Trade-off:*** a management decision whereby there is a reduction of one forest use in favour of another, such as a reduced timber yield in favour of improved wildlife habitat. In some cases, a management decision favouring one use in one location, is offset by a reverse decision favouring another use in another location.

***Treatment prescription:*** operational details required for carrying out individual silviculture activities such as site preparation and planting.

***Treatment season:*** the season or year the planned treatment activity will be carried out.

***Treatment unit:*** the geographic unit of productive forest land area designated in a prescription for a specific silviculture activity or series of treatments.

***Tree Farm Licence (TFL):*** TFLs are privately managed Sustained Yield Units. TFLs are designed to enable owners of Crown-granted forest lands and old temporary tenures or the timber licences which replace them, to combine these with enough unencumbered Crown land to form self-contained sustained yield management units. These licences commit the licensee to manage the entire area under the general supervision of the Forest Service. Cutting from all lands requires Forest Service approval through the issuance of cutting permits. TFLs should not be confused with Certified Tree Farms under the Taxation Act, though some Certified Tree Farm land (Crown-granted) may comprise a part of the TFL. A TFL has a term of 25 years.

***Tree Length*****:** The average height of co-dominant tree within a stand. *From March 8, 2005 Glossary Amendment*

***Tree-length harvesting system:*** a method of harvesting that includes felling a tree, cutting of the top and delimbing it before transport to a mill.

***TSA plan:*** the overall forest management plan developed for a TSA. The TSA Plan establishes the overall direction for the management of the timber, range and recreation resources under Forest Service jurisdiction in the TSA.

***Turnout:*** a widening in the roadway where a vehicle may pull or park to allow other vehicles to pass safely.

# U

***Underplanting:*** planting young trees under the canopy of an existing stand.

***Understorey:*** any plants growing under the canopy formed by other plants, particularly herbaceous and shrub vegetation under a tree canopy.

***Uneven-aged silvicultural system:*** a silvicultural system designed to create or maintain and regenerate an uneven-aged stand structure. Single-tree and group selection are uneven-aged silvicultural systems.

***Uneven-aged stand:*** a stand of trees containing three or more age classes. In a balanced uneven-aged stand, each age class is represented
by approximately equal areas, providing a balanced distribution of diameter classes.

***Unmanaged forest land:*** forest land that is not subject to management under a forest management plan.

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

***Unrecovered timber:*** timber as described in the Provincial Logging Residue and Waste Management Procedures Manual.

***Unrecovered volume:*** timber that is within the cutting specifications of the minimum utilization standards of the cutting authority and not removed from the area.

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

***Unstable or potentially unstable terrain:*** an area where there is a moderate to high likelihood of landslides.

***Uplands:*** terrain not affected by water table or surface water or else affected only for short periods so that riparian (hydrophilic) vegetation or aquatic processes do not persist.

***Urban forestry:*** the cultivation and management of trees and forests for their present and potential contributions to the physiological, sociological and economic well-being of urban society.

***Utilization (of forage and browse):*** the level of forage and browse use on a site. For herbaceous species, it is measured as a percentage of the current year's growth removed; for browse species, it is measured as a percentage of stem ends removed.

***Utilization standards:*** the dimensions (stump height, top diameter, base diameter, and length) and quality of trees that must be cut and removed from Crown land during harvesting operations.

# V

***Value***: Standards or principles considered valuable or important in life – ecological, economic and social – in the SFM Framework (Oxford Dictionary 1994).

***Value II (Source CSA):*** a DFA characteristic, component, or quality considered by an interested party to be important in relation to a CSA SFM element or other locally identified element.

***Values-at-risk:*** the specific or collective set of natural resources and man-made improvements/developments that have measurable or intrinsic worth and that could or may be destroyed or otherwise altered by fire in any given area.

***Variable area plot sampling method:*** a method of timber cruising commonly used for industrial timber cruising in which sampling area (plot size) varies with tree diameter.

***Variable retention (dispersed, aggregate):*** a relatively new silvicultural system that follows nature's model by always retaining part of the forest after harvesting. Standing trees are left in a dispersed or aggregated form to meet objectives such as retaining old growth structure, habitat protection and visual quality. Variable retention retains structural features (snags, large woody debris, live trees of varying sizes and canopy levels) as habitat for a host of forest organisms. There are two types of variable retention:

- Dispersed retention - retains individual trees scattered throughout a cutblock,
- Aggregate (group) retention - retains trees in clumps or clusters.

The main objectives of variable retention are to retain the natural range of stand and forest structure and forest functions. With retention systems, forest areas to be retained are determined before deciding which areas will be cut. This system offers a range of retention levels. The system also provides for permanent retention of trees and other structures after

regeneration is established. Variable retention can be implemented with a range of harvesting systems and can be combined with traditional silvicultural systems such as shelterwood or selection.

***Vegetative lot:*** a quantity of vegetative material or vegetative propagules having the same species, source and year of collection.

***Vegetative material:*** plant parts or tissues used to produce vegetative propagules through asexual means.

***Vegetative propagules:*** plants produced through asexual means.

***Vehicle side-tracking:*** the lateral displacement of vehicles on a curve caused by the length of the vehicle manoeuvring through the turn; the wider path that the rear of a vehicle takes when negotiating a curve.

***Ventilation Index (VI):*** a term commonly used in air pollution meteorology. The VI is a numerical value relating to the potential of the atmosphere to disperse airborne pollutants from a stationary source (such as smoke from a prescribed fire). It is calculated by multiplying the mixing height by the average wind speed in the mixed layer.

***Very unstable terrain:*** terrain units classified as being in Terrain Class V in the coastal terrain stability classification, or as having a very high mass wasting hazard according to the Mass Wasting Hazard Assessment Key for interior sites. For these areas there is a high likelihood that slope failures will follow harvesting or conventional road building.

***Veteran:*** in growth and yield, a tree that is at least 30 years older than the age of the main stand. In multi-layered or complex-layered stands, a tree that is at least 100 years older than the oldest sample tree of the main stand.

***Viewshed:*** a physiographic area composed of land, water, biotic, and cultural elements which may be viewed and mapped from one or more viewpoints and which has inherent scenic qualities and/or aesthetic values as determined by those who view it.

***Visual Absorption Capability (VAC):*** the relative capacity of a landscape to absorb land-use alterations and still maintain its visual integrity.

***Visual green-up:*** see Green-up.

***Visual impact assessment:*** an evaluation of the visual impact of resource development proposals on forest landscape.

***Visual landscape analysis:*** the process of recommending visual quality objectives based on the visual landscape inventory and social factors.

***Visual landscape inventory:*** the identification, classification, and recording of the location and quality of visual resources and values.

***Visual landscape management:*** the identification, assessment, design, and manipulation of the visual features or values of a landscape, and the consideration of these values in the integrated management of provincial forest and range lands.

***Visual quality:*** the character, condition, and quality of a scenic landscape or other visual resource and how it is perceived, preferred, or otherwise valued by the public.

***Visual Quality Objective (VQO):*** an approved resource management objective that reflects a desired level of visual quality based on the physical and sociological characteristics of the area; refers to the degree of acceptable human alteration to the characteristic landscape.

***Visual sensitivity:*** a component of the visual landscape inventory that estimates the sensitivity of the landscape based on the visual prominence or importance of features, conditions that affect visual perception, and social factors that contribute to viewer perceptions.

***Visually sensitive areas:*** viewsheds that are visible from communities, public use areas, and travel corridors, including roadways and waterways, and any other viewpoint so identified through referral or planning processes.

***Volume table:*** a table showing the estimated average tree or stand volume based on given tree measurements, usually diameter and height.

***Vulnerable species:*** see Sensitive/vulnerable species.

# W

***Waste:*** the volume of timber left on the harvested area that should have been removed in accordance with the minimum utilization standards in the cutting authority. It forms part of the allowable annual cut for cut-control purposes.

***Waste area:*** a pre-approved site for disposal of excavations.

***Waterbar:*** a shallow ditch dug across a road at an angle to prevent excessive flow down the road surface and erosion of road surface materials. A small excavation across a road to collect and divert roadway surface water flow.

***Water management:*** the planned development, distribution and use of water resources.

***Water quality:*** the physical, chemical and biological properties of water.

***Water resources:*** the supply of water in a given area or basin interpreted in terms of availability of surface and underground water.

***Watercourse:*** a natural stream or source or supply of water, whether usually containing water or not, such as a lake, river, creek, spring, ravine swamp, and gulch.

***Watershed:*** an area of land that collects and discharges water into a single main stream through a series of smaller tributaries.

***Watershed assessment:*** evaluates the present state of watersheds and the cumulative impact of proposed development on peak flows, suspended sediment, bedload, and stream channel stability within the watershed.

***Watershed integrity:*** refers to a stable overall physical condition of the watershed (bedrock, landforms, soils, drainage ways) within which transfers of energy, matter and, especially of water occur. It is prerequisite for the security of forest and stream ecosystems.

***Watershed management:*** the planned use of drainage basins in accordance with predetermined objectives.

***Weeding:*** a release treatment in stands during the seedling stage that eliminates of suppresses undesirable vegetation regardless of crown position.

***Wetland:*** a swamp, marsh or other similar area that supports natural vegetation that is distinct from adjacent upland areas.

***Wilderness:*** an area of land generally greater than 1000 ha that predominantly retains its natural character and on which the impact of man is transitory and, in the long run, substantially unnoticeable.

***Wilderness area:*** a part of the provincial forest designated by order in council as a wilderness area.

***Wildfire:*** an unplanned or unwanted natural or human-caused fire, or a prescribed fire that threatens to escape its bounds.

***Wildland urban interface:*** a popular term used to describe an area where various structures (most notably private homes) and other human developments meet or are intermingled with forest and other vegetative fuel types.

***Wildlife:*** raptors, threatened species, endangered species, game, and other species of vertebrates prescribed as wildlife by regulation.

***Wildlife habitat areas:*** units of habitat recommended for the maintenance, enhancement, or restoration of red-listed wildlife, threatened, and endangered habitats, and those species identified as being regionally important.

***Wildlife management:*** the application of scientific and technical principles to wildlife populations and habitats to maintain such populations
(particularly mammals, birds and fish) essentially for recreational and/or scientific purposes.

***Wildlife trees:*** dead, decaying, deteriorating, or other designated trees that provide present or future habitat for the maintenance or enhancement of wildlife.

***Wildling:*** a seedling naturally reproduced outside of a nursery, used in reforestation.

***Windrow:*** an accumulation of slash, branchwood and debris on a harvested cutblock created to clear the ground for regeneration. Also refers to an accumulation of fill or surfacing material left on the road shoulder as a result of grading operations.

***Windthrow:*** see Blowdown.

***Winter range:*** a range, usually at lower elevation, used by migratory deer, elk, caribou, moose, etc., during the winter months and typically better defined and smaller than summer range.

***Wolf tree:*** a dominant tree, which is often a remnant from a previous stand, having a broad crown and many limbs.

***Woodlot:*** the wooded portion of a private property upon which small-scale forestry operations are carried out.

***Woodlot licence:*** an agreement entered into under Part 3, Division 8 of the Forest Act. It is similar to a Tree Farm Licence but on a smaller scale, and allows for small-scale forestry to be practiced in a described area (Crown and private) on a sustained or perpetual yield basis.

***Working plan:*** See Management and Working Plans.

# X

No definitions to-date

# Y

***Yarding (yarding systems):*** in logging, the hauling of felled timber to the landing or temporary storage site from where trucks (usually) transport it to the mill site. Yarding methods include cable yarding, ground skidding, and aerial methods such as helicopter and balloon yarding.

***Yield Analysis:*** the study of forest yield over time using mathematical models and inventory data.

***Yield curve:*** a representation of stand volume, usually as a function of stand age, in graphical or tabular form.

***Young Forest***: means forested areas which are between 0 and 20 years old. *From "Order Establishing Landscape Biodiversity Objectives for the Prince George Timber Supply Area – October 20, 2004" Jan 28 2005 Glossary Amendment*

# Z

No definitions to-date

## Abbreviations

The following abbreviations are used in this document:

**AAC** – Annual Allowable Cut

**AT** – Alpine Tundra

**BEC** – Biogeoclimatic Ecosystem Classification

**BC** – British Columbia

**BCTS** – BC Timber Sales

**BWBS** – Boreal White and Black

**FRPA** – BC Forest Range and Practices Act

**FSP** – Forest Stewardship Plan

**ISO** – International Standards Organization

**LRMP** – Land and Resource Management Plan

Spruce

**Canfor** – Canadian Forest Products Ltd.

**CCFM** – Canadian Council of Forest Ministers

**CSA** – Canadian Standards Association

**DFA** – Defined Forest Area

**EMS** – Environmental Management System

**ESSF** – Engelmann Spruce - Subalpine Fir

**FDP** – Forest Development Plan

**FPC** – BC Forest Practices Code

**MCA** – Multi-Criteria Analysis

**MoFR** –Ministry of Forests and Range

**MOU** – Memorandum of Understanding

**PAG** – Public Advisory Group

**SBS** – Sub-Boreal Spruce

**SFM** – Sustainable Forest Management

**SFMP** – Sustainable Forest Management Plan

**SWB** – Spruce Willow Birch

**TOR** – Terms of Reference

**TSA** – Timber Supply Area

# Sources of Definitions

***Definitions given here are a compilation of general terms used in Ministry of Forests reports, Brochures and correspondence.***
***They are intended for staff, students, general public and interest groups. Definitions provided in an official document, such as an Act or Regulation, shall apply in those instances.***

http://www.for.gov.bc.ca/hfd/library/documents/glossary/

***Definitions have been based on a variety of resource material documented in the bibliography at the end of this document.***

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