Ministry of Forests **Prince George Region**	Prince George **REGION** **Forest Practices Note**	SUBJECT: **Douglas-fir Management Guidelines for the Prince George Forest Region**

SUBJECT:

Douglas-fir Management Guidelines for the Prince George Forest Region

PURPOSE

The purpose of these guidelines is to provide: a) guiding principles, and b) interim objectives, to ensure that the Interior Douglas-fir (*Pseudotsuga menziesii*) resource is adequately managed and conserved throughout its range in the Prince George Forest Region, until such time that Landscape Unit objectives for species composition are put into effect.

Where enabled and guided by district manager policy, these guidelines will provide direction for individuals, agencies, and licensees preparing or reviewing operational plans in the Prince George Forest Region. Landscape Unit Plans, when established, may replace some or all of the principles and objectives of these guidelines. Professionals preparing operational plans have site-specific discretion and flexibility in prescribing methods to achieve these and other specified resource objectives.

SCOPE

These guidelines are applicable to areas in the Prince George Forest Region where:

1. Douglas-fir is listed in the forest cover timber type label and exists within the area, or;
2. Based on existing information or field inspections, it is known that:
   a) Douglas-fir is present within the area, or;
   b) Although Douglas-fir may not necessarily be present in the area being considered under the operational plan, the area is considered by the prescribing forester to be ecologically suitable for establishment and productive growth of Douglas-fir.

GUIDING PRINCIPLES

1. In approving operational plans, the district manager must be satisfied that the plan or amendment will **adequately manage and conserve the forest resources** of the area to which it applies (Sect. 41(1) FPC Act).

2. As per the Biodiversity Guidebook, Douglas-fir is recognised as an **important element of biodiversity** (including structural and species diversity) in the Central Interior landscape. Other benefits of conserving Douglas-fir as an element of forest diversity are provision of distinctive timber products, heritage values, and aesthetics.

DATE: April, 2001	ORIGINATOR (TITLE) Forest Practices Team Leader

3. These **guidelines are neither additive nor incremental** to current biodiversity requirements. Retention of residual Douglas-fir leave-trees are included in current post-harvest wildlife tree/ wildlife patch requirements.

4. Natural stands with occurrence of Douglas-fir in the Prince George Forest Region are presumed to have a **wildfire-dominated natural disturbance regime** characteristic of Natural Disturbance Type 3, or **NDT3** (Biodiversity Guidebook, 1995), regardless of the subzone in which they occur.

5. Artificial **regeneration** (planting) is presumed to be the most widely-prescribed mode of regeneration of Douglas-fir and other coniferous species on harvested areas. Natural regeneration of Douglas-fir, where it occurs, is a desirable contribution to the species composition and stocking of some regenerating stands.

6. **Conservation of an adequate range and abundance** of different age and/or size classes of Douglas-fir in the landscape (including young, immature, thrifty mature, and older trees) is critical for management of ecologically-important large, old Douglas-fir trees in the landscape over time. A healthy population of younger trees allows steady replacement of mortality losses of older trees in the short- and long-term.

7. Consideration of **forest health factors** is an integral component of operational plans, as per the Operational Planning Regulations.

REGIONAL OBJECTIVES FOR DOUGLAS-FIR MANAGEMENT

The following objectives are recommended for use in the preparation and review of operational plans in the absence of approved Landscape Unit Plan (LUP) objectives. The district manager may modify, clarify, or prioritise these objectives.

Objective # 1: No Net Loss of Douglas-fir Forest Types

1a. No net reduction / loss of area of Douglas-fir-leading or Douglas-fir-major forest types in a landscape unit.

Recommended Best Practice for 1a:

I. Where harvesting occurs in Douglas-fir major or Douglas-fir leading stands, the harvest area or similar number of hectares of ecologically-suitable harvested areas in the landscape unit are to be successfully planted and regenerated to Douglas-fir-major and Douglas-fir-leading stands.

1b. No net reduction / loss of area of forest types in which Douglas-fir is a minor species in a landscape unit.

Recommended Best Practice for 1b:

I. Where harvesting occurs in stands containing a minor component of Douglas-fir, the harvest area or similar number of hectares of ecologically-suitable harvested areas in the landscape unit are to be successfully planted and regenerated to Douglas-fir-minor stands.

Objective # 2: Retain a Post-harvest Range of Douglas-fir Stand Structure and Age Classes representative of the range present in the Pre-harvest Condition

As per the guiding principles, the following objectives will consider and balance structural biodiversity and forest health objectives.

2a Reserve adequate levels of large old Douglas-fir trees, either individual-tree or group reserves.
The intent of this objective is to address mature-tree/veteran retention objectives or other objectives addressed in assessments or higher level plans. Tree selection and numbers for retention should be based on specified objectives. However, the stand structure and stand variability may be the guiding factors in the selection of appropriate retention trees.

2b Maintain adequate levels of a representative range of younger and older age-classes of residual Douglas-fir in a windfirm and undamaged condition within areas under the operational plan.

Recommended Best Practices for Achieving Objectives 2a and 2b

I. Silviculture Prescriptions (SP's) should indicate whether the management objective for the stand is to produce a Douglas-fir leading, Douglas-fir major, Douglas-fir minor, or non-Douglas-fir-containing stand (see objective # 1) and ensure that the plan and specified retention levels are consistent with that objective.

II. SPs which include partial-cut retention of reserved Douglas-fir leave trees within the plan area should specify measurable target levels of Douglas-fir retention and define measurable criteria for post-harvest acceptability of leave-trees and/or groups.

III. Acceptable leave-trees should be maintained in a windfirm condition, with acceptably low incidence of defined types of logging damage and pathogens. Where necessary, spatial distribution of Douglas-fir leave-trees within the area should be altered to reduce wind, harvesting, and forest health damage to the residual stand. Reserved Douglas-fir in an operational plan should be located in windfirm locations and stand conditions, through modification of cut and leave patterns, cutting intensity, and/or protected locations of reserves relative to topography or stand edges. Also, where dispersed or single-tree post-harvest Douglas-fir retention patterns are not considered likely to achieve objectives due to high windthrow risk, forest health, or other concerns, aggregated (grouped) cut and/or leave patterns are to be considered to achieve the desired objectives.

IV. Target post-harvest levels of Douglas-fir retention should consider expectations for post-harvest mortality of reserved leave-trees.

V. The minimum period for which reserved Douglas-fir leave trees are reserved from future cutting should be specified in the Silvicultural Prescription.

DISTRICT MANAGER POLICY

District managers may, at their discretion, develop and set district policy on the interpretation and implementation of these regional guidelines.

Ray L. Schultz, R.P.F.
Regional Manager
Prince George Forest Region

DATE: April, 2001	ORIGINATOR (TITLE) Forest Practices Team Leader

DEFINITIONS

The following definitions are provided for the purposes of these guidelines:

Douglas-fir-minor forest type	*A forest cover type in which Douglas-fir comprises greater than 1 % but less than 20% species composition.*
Douglas-fir-major forest type	*A forest cover type in which Douglas-fir comprises 20% or greater by species composition, but is not the leading species.*
Douglas-fir-leading forest type	*A forest cover type in which Douglas-fir ranks first in percentage species composition.*
Group reserves	*In the sense used in these guidelines, group reserves are distinguished from single-tree reserves in that, within the boundaries of a group reserve, the stand remains largely or totally uncut. The reserve is large enough that mutual support and shelter is provided by adjacent trees within the group reserve.*
Partial-cutting	*Refers generically to stand harvest entries, to cut selected trees and leave desirable trees, for various stand objectives. Partial-cutting includes harvest methods used for seed tree, shelterwood, selection, and clearcutting with reserves systems.*
Reserve(s)	*The retention of live or standing dead trees, pole size or large, on site following harvest for purposes other than regeneration. Reserves can be uniformly distributed or left in small groups, and they can be used with any silvicultural system.*
Species composition:	*The percentage of each recognised tree species comprising the forest type based upon the gross volume, the relative number of stems per hectare or basal area. For immature stands up to and including free-growing status, species composition is generally based on stems-per-hectare, while species composition of older or mature stands is generally based on volume or basal area.*

GUIDANCE PROVIDED BY THE BIODIVERSITY GUIDEBOOK, OPERATIONAL PLANNING REGULATIONS, AND PLANNING PROCESSES

This section provides clear direction for the management of Douglas fir for biodiversity and planning (Appendix 1).

DOUGLAS-FIR SITE AND STAND RATING SYSTEM (First Approximation)

The rating system is included in Appendix 2, and is included as a suggested tool for use in the rating and assessment of sites and stands for Douglas-fir regeneration potential and partial-retention potential.

The Douglas-fir site and stand suitability rating is a tool to aid management of biodiversity and prescription of silvicultural systems in forest types and standards units containing significant levels of Douglas-fir in the Prince George Forest Region. This rating system of site and stand characteristics allows preliminary identification and documentation of a number of specific factors favouring or hindering management of Douglas-fir within the area under consideration.

APPENDIX 1

GUIDANCE PROVIDED BY THE BIODIVERSITY GUIDEBOOK, OPERATIONAL PLANNING REGULATIONS, AND PLANNING PROCESSES

DATE:	ORIGINATOR (TITLE)
April, 2001	Forest Practices Team Leader

GUIDANCE PROVIDED BY THE BIODIVERSITY GUIDEBOOK, OPERATIONAL PLANNING REGULATIONS, AND PLANNING PROCESSES

The Biodiversity Guidebook characterises Natural Disturbance Type 3, or "NDT3" (*Ecosystems with frequent stand-initiating events*) as being historically influenced by frequent stand-initiating wildfire with an average return interval of 100 to 150 years. The guidebook (page 29) identifies Douglas-fir as the most fire-resistant tree species in this natural disturbance type, and that where present, it determines the number and size of mature remnant stands that survive extensive crown fires to provide structural diversity. For NDT3, the guidebook (page 37-38) states that, *"where present, large old Douglas-fir trees should be maintained during forestry operations because they provide structural diversity in this disturbance type. In addition, a component of older seral stages that did not burn historically should be reserved from cutting*" In this regard, this section provides the following recommendations for NDT3 areas:

- *Partial-cutting should be used in Douglas-fir stands.*
- *Some mature Douglas-fir should be retained in stands where they constitute a minor component of the stand.*
- *Where Douglas-fir is a component of a stand, it should also form a component of the regenerating stand.*

Part 5, Section 41 of the Operation Planning Regulation (Species Selection), states that:

"*When proposing the species composition for the purposes of section 39 (3) (o), a person must, unless otherwise specified in a higher-level plan, select a mix of species that is ecologically suited to the area, if a mix of species was present on the area before the timber was harvested*."

As per the *Operational Planning Regulations (Evaluation of Forest Health Factors, Forest Development Plans* and *Silvicultural Prescriptions*), forest health factors must be considered in Douglas-fir management objectives. Specifically this includes the recording and evaluation of the occurrence of detected forest health factors currently or potentially causing damage in the plan area. If sufficient risk to forest resources is detected, management strategies or treatments must be proposed that are consistent with forest resource objective, reduce future risks if possible, and must not result in new or intensified risks from other forest health factors.

As per the *Forest Practices Code of British Columbia Act* (Part 2, Strategic Planning, Objectives and Standards)

4.(3) "The district manager must establish objectives for a landscape unit, and may vary or cancel an objective."

As per Section 5.8.1 of the Higher Level Plans: Policy and Procedures guidebook (Chapter 5, December, 1996), (Introduction, Regional and District Co-ordination, pp. LU6-7):

"*Landscape objectives will be established based on the regional landscape unit planning strategy… Until then, when reviewing operational plans, district managers are encouraged to fully consider conserving biodiversity, pursuant to Section 41(1)(b) of the Forest Practices Code Act. …*

Until landscape unit objectives are established, district managers may consider existing information related to landscape level biodiversity management when approving operational plans. This information may be in the form of approved plans, timber harvesting guidelines, or agreements with other ministries."

In some cases, draft Land and Resource Management Plans (LRMP's) also identify Douglas-fir objectives and strategies at the Resource Management Zone (RMZ) level.

Content requirements of LPs and SPs relative to Douglas-fir management objectives are addressed in the Operation Planning Regulations. Part 4, Section 32(b)(i) (Logging Plan Map) of the Operational Planning Regulations requires that logging plans contain a map which

" *shows the approximate location of (i) mappable reserves including wildlife trees and wildlife tree patches"*.

Part 5, Division 1, Section 39(3)(c) (Content of Prescriptions) of the Operational Planning Regulations requires that a prescription does the following;

"describe the silvicultural system to be used, including the species and ***function*** *of any trees to be left standing"*

Part 5, Division 1, Section 39(3)(m) (Content of Prescriptions) of the Operational Planning Regulations requires that a prescription does the following ;

"describes

(ii) the site conditions that must exist, if any, after a harvest or site treatments to accommodate forest resources identified in the forest development plan, or in the absence of a forest development plan, in any higher level plan that applies to the area

(iii) the site conditions that must exist, if any, after harvest or site treatment to accommodate (A) known non-timber forest resources on or adjacent to the area under the prescription that were not referenced in subparagraph (ii), and (B) resource features identified in the forest development plan or silviculture prescription"

APPENDIX 2

DOUGLAS-FIR SITE AND STAND RATING SYSTEM FOR REGENERATION AND RETENTION POTENTIAL

First Approximation

DATE:	ORIGINATOR (TITLE)
April, 2001	Forest Practices Team Leader

USE OF THE DOUGLAS-FIR STAND AND SITE RATING SYSTEM

This rating system included as a suggested tool for use in the rating and assessment of sites and stands for Douglas-fir regeneration potential and partial-retention potential.

The Douglas-fir site and stand suitability rating is a tool to aid management of biodiversity and prescription of silvicultural systems in forest types and standards units containing significant levels of Douglas-fir in the Prince George Forest Region. This rating system of site and stand characteristics allows identification and documentation of specific factors favouring or hindering management of Douglas-fir within the area under consideration.

At this stage of its development, the rating system is intended as a qualitative, rather than quantitative tool in assessing opportunities for Douglas-fir management under a specific combination of assessed stand and site conditions.

⇑ Moderate to better site or stand rating
⇓ Average to poorer site or stand rating

Site Rating	Stand (Layer) Retention Rating	Recommended Best Practice
Site ⇑	**Stand ⇑**	May be likely to be a superior opportunity for regeneration of Douglas-fir and partial-cut retention of the layer(s) being considered. Depending on the overall stand structure available, a range of silvicultural systems and partial-cut harvesting patterns may be possible.
Site ⇑	**Stand ⇓**	May be likely to be a superior opportunity for regeneration of Douglas-fir but a restricted or inferior potential for uniform retention of the layer(s) under consideration. Artificial regeneration in conjunction with retention of veteran trees and group reserves may be considered.
Site ⇓	**Stand ⇑**	May be likely to be an inferior regeneration opportunity for Douglas-fir but a superior opportunity for retention of dispersed retention of Douglas-fir in the layer(s) under consideration. Existing Douglas-fir may be retained as single tree reserves or group reserves, but the stand may be regenerated predominantly or wholly to another species.
Site ⇓	**Stand ⇓**	May be likely to be inferior regeneration and partial-cut retention opportunities for Douglas-fir. Stand conversion to an alternate species may be appropriate.

DATE:	ORIGINATOR (TITLE)
April, 2001	Forest Practices Team Leader

Determination of Douglas-fir Site Potential Rating

	Site parameter	Characteristic	Point rating
SOILS and TOPOGRAPHY	**Coarse fragment content**	50 % or more	4
		20 to 49%	2
		Less than 20%	1
	Soil texture	Very coarse	4
		Coarse	3
		Medium	2
		Fine	0
	Site drainage characteristics	Very rapidly drained	4
		Well-drained	2
		Moderately well-drained	0
		Poorly-drained	-4
	Depth to root restricting layer	> 80 cm depth	4
		50 to 80 cm	2
		25 to 50 cm	0
		< 25 cm depth	-4
TOPOGRAPHY	**Slope and slope position**	Ridge crest > 30% slope	4
		Slope > 30%	3
		Slope > 10% frost shedding position	2
		5 to 10%	1
		Slope > 10% frost receiving position (e.g. base of long slope)	-2
		Flat or < 5 %	-2

Maximum points possible = 20
Minimum points possible = -9

Douglas-fir Site Potential

> 12	Very high
8-12	High
4-8	Moderate
< 4	Limited to Poor

DATE:	ORIGINATOR (TITLE)
April, 2001	Forest Practices Team Leader

Determination of Douglas-fir Stand Retention Potential Rating

	Stand parameter	Characteristic	Point rating
PRE-HARVEST STAND CHARACTERISTICS (by strata)	**Overstory layer** (Fd > mean stand dbh by sph):	> 50 % of stand is Fd by basal area or volume	4
		33 to 50 % of stand is Fd by basal area or volume	3
		10 to 33 % of stand is Fd by basal area or volume	2
		< 10 % of stand is Fd by basal area or volume	1
		Relatively open multi-layered forest canopy	4
		Relatively open single-layered forest canopy	3
		Dense multi-layered forest canopy (Fd dominant)	2
		Dense multi-layered forest canopy, Fd not dominant	0
		Dense single-layered canopy	0
		Average H/D ratios of dominant Fd less than 50	4
		Average H/D ratios of dominant Fd 50 to 65	3
		Average H/D ratios of dominant Fd 65 to 80	1
		Average H/D ratios of dominant Fd > 80	0
	Pole or Intermediate layer (Fd 3.0 m height to mean stand dbh by sph)	Greater than 500 sph Fd	3
		250 to 500 sph Fd	2
		100 to 249 sph Fd	1
		Less than 100 sph Fd	0
		Avg. Fd live crown % > 50%	4
		Avg. Fd live crown % 40 to 50%	2
		Avg. Fd live crown % 25 to 40%	1
		Avg. Fd live crown % < 25 %	0

DATE:	ORIGINATOR (TITLE)
April, 2001	Forest Practices Team Leader

	Understory layer (Fd < 3.0 m height)	Greater than 2000 sph Fd	4
		1000 to 2000 sph	2
		Less than 1000 sph	0
		Good vigour	4
		Moderate vigour	2
		Poor vigour	0

Douglas-fir Retention Potential

Douglas-fir Overstory Layer Potential

- 8 points or greater with minimum 2 points per category — High Potential
- 5 to 7 points with minimum 2 points per category — Moderate Potential
- 4 or less points — Limited to Low Potential

Douglas-fir Pole/Intermediate Layer Potential

- 5 points or greater with minimum 1 point per category — High Potential
- 3 to 4 points with minimum 1 point per category — Moderate Potential
- 2 or less points — Limited to Low Potential

Douglas-fir Understory Layer Potential

- 5 points or greater with minimum 1 point per category — High Potential
- 3 to 4 points with minimum 1 point per category — Moderate Potential
- 2 or less points — Limited to Low Potential