General Bulletin

Number 42 **September 25, 2001**

Green-up

Introduction

The state of green-up in previously harvested cutblocks adjacent to proposed cutblocks has been a planning consideration for many years. When the Code was introduced in 1995, it was recognized that green-up needed to be part of the legislation as a planning provision. In 1998 the legislation on green-up was amended. Operational flexibility was increased and green-up was moved from a planning consideration to a harvesting practice.

In accordance with the Timber Harvesting Practices Regulation (THPR), a cutblock that is adjacent to a previously harvested cutblock may only be harvested if the adjacent cutblock is greened-up, unless the cutblock to be harvested satisfies other requirements as explained in this bulletin.

The purpose of the green-up provisions are to ensure that harvested cutblocks reach a level of recovery for wildlife, hydrologic, and scenic/recreational values, before harvesting occurs in bordering cutblocks. Changes made to regulations in 1998 addressed most green-up issues, and the intent is generally understood. However, there has been some confusion about green-up in relation to the following:

a) uniform distribution,
b) maximum cutblock size, and
c) the species and function of the residual stand.

The purpose of this bulletin is to clarify these issues and explain the operational flexibility of the THPR and the Operational Planning Regulation (OPR) associated with green-up.

Background

Part 10 of the OPR outlines the various parameters used to determine green-up. It helps to understand the background of these parameters, to make informed decisions.

a) Green-up height:
Green-up height is the average height of the tallest trees of a commercially valuable species or other species acceptable to the district manager (DM) in each $1/100^{th}$ ha plot in a representative sample.

Visuals: An effective green-up height for scenic areas is a measurement that has been arrived at through numerous studies. In 1994 a visually effective green-up (VEG) study relating green-up height to slope, was conducted for the province. The study found that 3 m was the approximate height that provided initial visual cover on flat ground. At this

height young trees block stumps, logging debris, and bare ground from view. As the slope increases, so does the height required to obscure signs of logging. For example, on 60% plus slope, the trees generally need to be 8.5 m. The VEG study produced a guide that may be applied to known scenic areas (Green-up Guidebook - page 9, Table 1).

In applying green-up heights to achieve visual requirements, there may be situations where the tree height in Table 1 is inadequate. For example, where there is poor stocking, dispersed stems, tree species with thin crowns and site disturbance. In such cases visually effective green-up should be determined by observing previously harvested cutblocks, rather than relying solely on the recommend heights from Table 1.

Visual green-up is achieved when the new forest cover generally blocks views of stumps, logging debris, bare ground and roads. Rock outcrops and bluffs may be acceptable if there is the perception that a new forest exists amongst a rocky landscape.

Wildlife: For wildlife, green-up conditions provide security, thermal cover and forage. Recovery height generally starts at 3 m. However, the regulation provides the opportunity to increase the height, as may be necessary for larger mammals in areas with deep snow packs, or for forage production. Visual and wildlife green-up studies generally use top height measurements of the tallest tree in each $1/100^{th}$ ha plot to gauge recovery.

Hydrologic: Hydrologic green-up is a function of crown closure, height, species, and stand density. Studies have indicated that recovery for buffering snow melt and snow on rain processes generally starts at 3 m. However, this basic green-up height requirement may not be adequate, and a watershed assessment may be necessary to determine the appropriate green-up height. This assessment helps a forest development planner recognize the hydrologic implications of forestry operations. See section 14 of the OPR, and Watershed Assessment Procedure Guidebook (April 1999) for further details on this analysis.

b) Adequately stocked
Adequate stocking for green-up on the coast means 800 or more trees per ha and in the interior 1,000 or more trees per ha - of commercially viable species, at least 1.3 m in height (stocking height), as per section 67 of the OPR.

Adequately stocked, stocking height, and green-up stocking - work together. For a normal plantation, the average height tends to be 80% of the top height. Consequently, the adequately stocked number (800 or 1,000) helps to ensure that given a stocking height of at least 1.3 m, many trees will be of a greater height, and this will provide initial recovery for visuals, wildlife and scenic values when combined with a green-up height of at least 3 m for the tallest trees for each $1/100^{th}$ ha plot. As recovery relates to height of trees and number of stems, the adequate stocking number is reduced (500 and 700 trees, coast and interior, respectively) when the green-up height of the tallest (100) trees is increased to at least 3.5 m.

Discussion - THPR

THPR 9(1) A person may only harvest a cutblock that is adjacent to a previously harvested cutblock if that previously harvested cutblock is greened-up.

(2) Despite subsection (1), a person may harvest a cutblock that is adjacent to a previously harvested cutblock that is not greened-up if any of the requirements of the following paragraphs are met:

(a) harvesting is related to a licence to cut,…
(b) a partial cut silvicultural system is used for the **cutblock to be harvested**, that retains a **uniform distribution** of trees, throughout the cutblock, and **40% or more** of the pre-harvest basal area. (In other words, the basal area to be retained cannot be concentrated in one or more portions of the cutblock to be harvested. It must be evenly distributed.)

What is uniform distribution?

Uniform distribution refers to a relatively even distribution of stems in such a manner as to provide the desired green-up effect for the visual, wildlife and hydrologic values for the cutblock and adjacent areas.

The uniform distribution requirement ensures that the 40% or more pre-harvest basal area is not achieved by a concentration of stems in one part of the block, with sparse coverage over the rest. Such a situation would not provide sufficient coverage for visual, wildlife or hydrological considerations.

There is no Code definition for “uniform distribution”. It means in the same form, manner or degree. This wording was inserted into the regulation to prevent extremes in basal area concentration from some forms of partial cutting. Such extremes do not serve green-up purposes for wildlife, visuals, recreation, or hydrology. “Uniform distribution”, was not meant to achieve absolute consistency over an area.

DM’s may wish to establish policy regarding their expectation for "uniform distribution". DM policy can be an effective tool to:

- Assist the DM to structure their thought processes leading to a statutory decision;
- Advise licensees of the guiding principles that will be used in forming a decision;
- Provide licensees with insight as to how they might be able to provide useful information to assist the DM’s decision.

The THPR provides flexibility in the harvesting practice relative to green-up adjacency. This flexibility includes: THPR 9(2)(c) – basal area retention, 9(2)(e) – visual quality objectives, 9(2)(f) – consistency with natural openings, and 9(2)(g) – the salvage of damaged timber. The intent of this flexibility is discussed as follows.

Lower basal area

Under THPR 9(2)(c), the district manager may authorize before the harvesting commences, retention of less than 40% of the preharvest basal area, if the retained trees

are to be uniformly distributed throughout the cutblock, or the cutblock is stocked with commercially valuable/acceptable trees, and the average height of the tallest tree in each representative plot (0.01ha) is 3 m or greater.

The intent of this provision is to allow for partial cutting systems that commonly retain less than 40% of the basal area and provide consideration for the mature trees and the advanced regeneration that is retained. For example, seed tree or shelterwood systems. Note, uniform distribution is not a requirement in the second part of the provision. In seeking DM authorization for a lower basal area retention, the proponent should explain how the residual stand structure will satisfy green-up objectives.

For Example:

A watershed assessment indicates that the equivalent clearcut area (ECA) for a major side drainage is low (15%). A 20 ha cutblock is planned, using a seed tree system. The basal area retention is 8%. An adjacent, previously harvested 30 ha cutblock - is not greened-up (the maximum cutblock size is 40 ha). The soils for this sub-basin are coarse, and not sensitive to erosion. The harvesting method will not contribute to surface erosion. No bladed skid trails are to be built and harvesting will proceed under frozen ground conditions.

The licensee is requesting that the DM authorize under THPR 9(2)(c), a basal area retention of 8%, for the following reasons:

a. the cutblock is not in a scenic area and is not visually sensitive,
b. wildlife green-up will not be adversely affected as the cutblock is not in a known ungulate winter range or wildlife habitat area, and
c. the proposed cutblock will only increase the ECA by less than 0.01 percent for the watershed, and increased siltation should not occur because of the proposed timing/method of harvest as well as the soil types.

Visuals

Under THPR 9(2)(e) a cutblock can be harvested next to an adjacent block that has not greened-up if it achieves established VQOs and it has been approved in an operational plan (FDP/SP) or authorized by the DM in writing.

The intent of this provision is to provide an opportunity to improve the visual aesthetics of a previously harvested cutblock. For example, the appearance of a large square block on a side hill may be improved if the boundaries follow a more natural pattern.

Total Area

Under THPR 9(2)(f) the total area of the cutblock to be harvested and the adjacent cutblock not greened-up cannot exceed the regional maximum (OPR 11), unless the combined opening has been approved by the DM on the grounds that it is consistent with natural openings for the area. (This is explained further under cutblock size and green-up.)

Salvage

Under THPR 9(2)(g) green-up restrictions may be waived for salvage harvesting operations. Where possible, the cutblock to be harvested should incorporate the structural elements of a natural disturbance.

Cutblock Size and Green-up

The maximum cutblock size provisions are outlined in section 11 of the OPR. Cutblock sizes may be larger than the specified maximums if provided for in a higher level plan, or if:

(A) harvesting is being carried out to recover damaged timber, and where possible the cutblock approximates a natural disturbance, or

(B) the proposed silvicultural system retains > 40% of the pre-harvest basal area, and is not a clearcut or seedtree system, or

(C) the DM, and for joint approval areas, the DM and the designated environment official are satisfied that the cutblock has the structural, spatial and temporal distribution of a natural opening.

Determinations made under points (A) and (B) pertain to salvage operations and partial cutting systems, and are generally more straight forward than (C). To evaluate (C), the structural characteristics, age class distribution over time and size distribution of natural openings should be examined for an entire Landscape Unit (LU) as a minimum, and preferably over a number of LU units. This ensures the proposed range of patch sizes are within the natural range of disturbance return intervals. This information helps to provide an insight and rationale on how to meet the temporal requirements. The period of assessment should be a minimum of a rotation and considered over a large area, i.e., a district, or timber supply area. Green-up considerations should not be factored into the equation, and only used in determining if the combined opening size is less than the maximum.

Under (C), one must consider if the cutblock resembles historic natural openings. The intent is to allow for more natural structural characteristics within the cutblock in order to develop biological diversity and wildlife habitat dependent upon larger openings and larger leaves. An ecological rationale for larger openings should include information on retention levels in naturally disturbed forests. Large natural openings generally have the following characteristics:

- greater stand level retention than is generally associated with wildlife trees,
- moderate to higher levels of coarse woody debris depending upon the natural disturbance,
- irregular edges, and
- retention of forested regeneration and understorey vegetation.

These elements left after natural disturbances should be present and cited in any request for approval or rationale for approving larger openings. A request for larger openings should also provide an analysis of existing younger seral openings, existing large older forest leaves, and whether the opening request is within the range of natural openings. The request should detail the natural disturbance type, the agents of disturbance (wildfire, wind, or pathological), the natural rate of large opening development, and the temporal and spatial relationship of the

proposed cutblock to the existing condition. It is important to provide information on the existing range of openings and whether the proposed larger block contributes to the natural range of block sizes. Proposed cutblocks that move the trend towards a more natural distribution are considered to have lower environmental impacts. The temporal aspects require long term landscape level assessments to indicate how the range of younger and older forests will be retained in the landscape over time. A rationale for approving larger openings should provide the environmental and economic benefits of a reduced road network, where these occur, and the structural retention provisions which make the larger harvest cutblocks emulate the stand structure, spatial and temporal patterns of a natural disturbance. Guidance on cutblock size and the range of natural openings is provided in Code Bulletin 20 and the Landscape Unit Planning Guide - section *3.3 Planning for Temporal and Spatial Distribution of Cutblocks* (patch size).

Cutblock size is a planning consideration. Green-up is a timber harvesting practice restriction. Except for unusual circumstances, the need for green-up adjacency can be eliminated by longer-term landscape level planning and partial cutting systems. (Refer to the *Planning* section at the end of this bulletin.) Planning rationale is presented in the forest development plan (FDP). For example, in the FDP Template a request for a larger cutblock size may be done under the Harvesting Variance Table. Requests and rationale to alter green-up restrictions based upon simulating natural openings may be made outside of the FDP, or within the FDP, depending upon the statutory decision makers preference. Further guidance on the presentation of this information is provided in the *Rationale* section of this bulletin.

Note, section 9(2)(d) of the THPR limits the total area of the cutblock to be harvested and the adjacent cutblock that has been harvested to – the maximum cutblock size or varied as described in OPR 11.

Species and Function of the Residual Stand

Section 39(3)(c) of the OPR states that the silviculture prescription (SP) must describe the silvicultural system to be used and the species and function of any trees that are left standing. Section 9(2)(b) of the THPR enables a cutblock to be harvested without green-up adjacency considerations, if the proposed cutblock is a partial cutting silvicultural system, with a basal area retention of greater than 40% in a uniform distribution over the cutblock.

There is no direct link between the two sections of the legislation. Commitments made under OPR 39(3)(c) do not guarantee that the THPR S9 requirements will be met. Green-up considerations and silviculture requirements for regenerating the next crop should be evaluated independently, based upon separate information and criteria.

Discussion — OPR - Part 10, S68 Green-up

The flexibility related to green-up as a harvesting practice has been discussed in the text above. The other aspects of flexibility in green-up are under the provisions of Part 10 of the OPR.

> **Note:** The DM may exercise the discretion under sections 68(3) or (5) to (8), for a cutblock, or for all or part of the forest district.

This discretion is discussed as follows:

Section 68

Area/Portion

(3)

i. Green-up requirements must be met on 75% of net area of the cutblock. The DM can increase or decrease this percentage.
ii. The DM can specify another portion of the cutblock to which the green-up requirements apply, adjacent to the proposed area to be harvested. However, it must be sufficient in size to adequately manage and conserve the resource.

Higher Level Plan

(4) —If a higher level plan specifies a requirement that is different than a requirement referred to in this section, the requirement specified in the higher level plan prevails.

For example:

The Kootenay Boundary Higher Level Plan (KBHLP) states.

(1) To contribute to the conservation of biodiversity through the emulation of natural disturbance patterns and to provide for more cost-effective timber harvesting based on the following:
   a) Pursuant to Section 68(4) of the OPR, establishing the green-up height as 2.5 metres for areas adequately stocked and 3.0 metres for areas not adequately stocked, based on the criteria in the regulations except in:
      i. community watersheds,
      ii. visually sensitive areas to be defined and determined by the DM, within known scenic areas as identified in Objective 9,
      iii. Enhanced Resource Development Zones - Timber as identified in Objective 7, and
      iv. the specified fire-maintained ecosystems identified in objective 8(d).

As the KBHLP is an approved higher level plan the modified requirements set forth supersede OPR 68(5) requirements for green-up height.

Stocking

(5)(b) —DM may approve green-up stocking of less than 500 or 700 trees per ha at a 3.5 m green-up height, if satisfied that the decreased stocking adequately manages and conserves the hydrologic, wildlife, recreational and scenic values of the area.

For example:

In an interior district, some areas were logged 30 plus years ago. The site histories for these areas are vague. The sites are dry open grown stands, classed as open range. Stocking is less than 200 stems per ha. No further work is planned. The average height of the tallest trees is 15 m. There is no higher level plan specifying management objectives for these areas.

Under subsection 68(5)(b), the licensee may submit a request to the DM to consider a lower stocking level. The average height of the tallest trees is well above 3.5 m. The proponent should provide the rationale so that the DM can be satisfied that lowering the stocking level manages and conserves the hydrologic, wildlife, recreation, and scenic values for the area.

Varying Species

Acceptable

(5)(a) and (b) —DM may accept species other than the standard commercially recognized species, in determining adequate stocking.

Not acceptable

(7)—DM may exclude deciduous species, or species that will be removed from the opening in a post harvest treatment.

For example:

a) Even though a deciduous species may be commercially viable, it may not satisfy visual requirements in the dormant season.
b) Deciduous may not be acceptable because of sanitation or knock-down treatments (aspen, cottonwood).

Varying Green-up Height

(8)(a)—DM may reduce the green-up height requirement of 3 m, if DM and designated environment official agree that the reduced height will adequately manage and conserve the forest resources. (Note: the DEO's concurrence and the broader test than 8(b).)

(8)(b) – DM may increase the green-up height, to be greater than the standard 3m if satisfied that the greater height is necessary to adequately manage and conserve hydrological, wildlife, recreational and scenic values.

For example:

A height increase may be necessary to provide a better visual effect on a steep slope, or for wildlife, to provide an adequate security cover or reduce the snow pack depth adjacent to a winter range, etc.

Number of Tallest Trees

68(6)—DM may specify the number of trees to be at least 3 m in height. This may be applied where a stand meets the standard green-up parameters, but does not meet known objectives for the area for wildlife, scenic or hydrologic values.

For example:

For an area of scenic importance, the standard green-up requirements may not be adequate to address scenic objectives. Therefore, the DM may specify a higher number of trees/ha than the standard 100 trees/ha that must be at least 3m tall.

Note: *When altering any of the green-up requirements discussed above, the DM must provide a written notice to the affected licensees.*

Rationale

A proponent should specify under which provision of the regulation they are seeking DM approval for varying from a default green-up standard. The request should also provide supporting information with regard to the site factors considering hydrologic, scenic, recreational and wildlife values to aid the DM in determining whether the variance manages and conserves these resources. Any other information that helps the DM in making his/her decision and drafting a rationale should be included in the requests.

A green-up variance request may be made within the FDP to provide an opportunity for public review and for administrative efficiencies. In the FDP template, this information is presented in the Harvesting Variance table (Section 5). The DM determines the information requirements and how a green-up variance is to be presented, either within or separate from the FDP.

The regulation provisions pertaining to green-up provide operational flexibility. In exercising that flexibility, statutory decision-makers should draft a rationale for green-up related decisions. If direction is provided by a higher level plan, the rationale may simply reflect that direction. However, where there is no higher level plan, the rationale should clearly outline the considerations for adjusting the green-up standard as allowed for in the regulations.

Planning

Longer-term landscape level planning with regard to patch sizes provides greater efficiencies in accessing timber and resource integration to sustain hydrologic, wildlife (species, habitat, connectivity), recreational and scenic values. Reliance on short-term cutblock by cutblock green-up standard variances is less efficient than longer-term landscape-level harvest planning that integrates non-timber values. Rugged terrain, unforeseen events, and the existing harvest pattern may limit flexibility in cutblock distribution. Partial cutting silvicultural systems provide flexibility in addressing present and future adjacency issues.

Surveys

The objective of the green-up survey is to determine if a cutblock is greened-up as defined by OPR S68. To make this assessment the surveyor must:

1. Determine the total density of the commercially valuable species that are at least 1.3 m in height, sampled by using 1/200ha plots.
2. Determine the green-up height of the tallest tree in each 1/100ha plot, of commercially valuable species, or other species acceptable to the DM.
3. Determine what portion of the net area meets density, species and green-up height requirements.

For further information on green-up surveys contact – Paul Rehsler, Silviculture Surveys Specialist, Forest Practices Branch at Paul.Rehsler@gems9.gov.bc.ca or 250 387-8908.

Green-up Guidebook

For further information on the green-up provisions of the Code, survey methodology and related information consult the Green-up Guidebook (January 1999).
http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/guidetoc.htm

AFOP and Code Bulletins

Administration of Forest Operational Plans and Forest Practices Code Bulletins directed at primarily statutory decisions makers, provide information related to the administration of the Code. These documents may be obtained from the following internal web-site.
http://wwwinternal.for.gov.bc.ca/enforce/bulletins/bulletins_index.html

Contacts

If there are any questions about this bulletin, please contact:

Name	Branch, Ministry	Phone	E-Mail
Sheldon Gagne	Forest Practices Branch, MOF	(250) 387-2081	Sheldon.Gagne@gems7.gov.bc.ca
John McClarnon	Forest Practices Branch, MOF	(250) 387-8903	John.McClarnon@gems1.gov.bc.ca
Mike Fenger	Ministry of Water, Land and Air Protection	(250) 387-9779	Mike.Fenger@gems3.gov.bc.ca