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February 27, 2007

BY EMAIL

To: Jim Gowriluk
Regional Executive Director
Coast Forest Region

Re: Timber Cruising Guideline for Wind Damaged Stands

The purpose of this memo is to provide direction for the cruising of stands of timber that have been heavily damaged by wind events during the storms in late 2006.

Please refer to the attached guideline that will assist you and your staff.

The *Cruising Manual* provides flexibility to the regions and districts to work with the licensees to find solutions to cruising damaged stands. The relevant sections are:

- Chapter 1
- Section 2.1.2.3
- Section A.6.4

If you have any questions regarding this guideline or other potential options for cruising wind damaged timber, please call Keith Tudor, Cruising Policy Forester, Revenue Branch at 250-387-8357.



Bill Howard
Director
Revenue Branch

Attachment





**BRITISH
COLUMBIA**

Ministry of Forests
and Range

CRUISING GUIDELINE

Cruising Wind Damaged Stands



February 27, 2007



Revenue
Branch

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1. INTRODUCTION

The *Cruising Manual* allows for sufficient flexibility for the regions and districts to accommodate re-cruising due to catastrophic damage events. The relevant sections of the *Cruising Manual* are:

- Chapter 1
- Section 2.1.2.3
- Section A.6.4

The link to the *Cruising Manual* is: <http://www.for.gov.bc.ca/hva/manuals/cruising/>

Please see the *Coast Appraisal Manual* for the changed circumstances requirements. If the cutting permit meets the changed circumstance requirements in the *Coast Appraisal Manual*, then all of the cruise information must be updated to reflect the new circumstances.

The link to the *Coast Appraisal Manual* is: <http://www.for.gov.bc.ca/hva/manuals/coast/>

2. PRINCIPLES

The following principles apply to these guidelines.

1. As is possible, attempts should be made to access the stand and assess the damaged plots; however, **no one should enter the stand if they feel it is unsafe.**
2. A new cruise plan is required in all circumstances where stands were damaged and are being reassessed for reappraisal. The new cruise plan must clearly delineate the portion(s) of the block affected by the wind event and outline a sampling process to evaluate the impact of the wind throw event.
3. Use the original cruise sampling error if any of the plots in an original cruise are unsafe to cruise or if there is not any new area added to the original cruise.
4. The assessment of wind damage can have a profound impact on the appraisal and as such, due care must be made by both the licensee and the ministry to ensure the data collected best reflects the true condition of the damaged timber.
5. The method of net volume adjustment must be agreed to by the licensee and district prior to the commencement of the data collection phase.
6. The guidelines can be modified on a case by case basis, however, in all cases the licensee and ministry representative must agree on the process to evaluate the stand and agree on the final application within the appraisal. The documentation used to determine the damage condition must be attached to the ECAS submission.

3. TYPES OF VOLUME ADJUSTMENTS

3.1 Net Cruise Volume Adjustment – Shatter Estimates

Determine the average percent volume loss per tree for the trees with shatter and multiply that value by the percentage of stems with shatter (determined by either ground review or aerial review) to determine the percent volume loss for the area unsafe to cruise. Adjust the net cruise volume for the area unsafe to cruise using the percent volume loss due to shatter. The adjusted cruise volume must be signed off by a forest professional and submitted with the backup data used to make the adjustment.

3.2 Net Cruise Volume Adjustment – Adding Damage Codes

The percentage of trees that have a new damage code assigned from a post blow down field assessment are used to adjust the original cruise data for areas unsafe to re-cruise.

By ground review or photographs taken from the air:

- Determine the percentage of trees that are blown down and not obviously shattered in the merchantable portion of the stem. These will be the damage code E trees.
- Determine the percentage of trees that are blown down and obviously shattered in the merchantable portion of the stem. These will be the damage code G trees.
- Calculate the average percent of damage code E and G trees in the unsafe area and round each one to the nearest ten percent.

4. APPLYING THE DAMAGE CODE ESTIMATES

4.1 Previously Cruised Area

Identify the plots that are in the area that is unsafe to re-cruise. Apply the damage codes E and G in sequence down through the data set using the damage code percent by timber type to assign the damage codes to the trees.

4.2 Area Not Cruised

Cruise the area that is safe and determine the percent of stems with a damage code. Multiply that percentage by the percent of the total area that is unsafe to cruise to determine the percentage of overall stems that require a damage code.

Starting with the first plot, systematically apply the damage code to the trees on all of the plots in the area safe to cruise.

5. PROCEDURES – LISTED IN ORDER OF PRECEDENCE

5.1 Re-cruise

If there is additional area that will be included then a full cruise of the new area is required.

Re-cruise all of the existing plots and recompile the cruise.

5.2 Perimeter Plots

Estimate perimeter cruise plots around the unsafe to cruise area(s).

Example 1:

Five hectares of timber type 1 is damaged by the wind event.

The timber type is fir and hemlock, and the original cruise is 5,000 cubic metres of fir and 5,000 cubic metres of hemlock in ten hectares.

A field review using one full measure plot for every 200 metres of boundary yields five perimeter plots placed 20 metres into the wind throw area and 90 degrees to the boundary. The average volume loss for the five plots due to shatter is ten percent for fir and 20 percent for hemlock resulting in adjusted net volumes of 2,250 cubic metres for fir (2,500 X 90 percent) and 2,000 cubic metres for hemlock (2,500 X 80 percent) on the area unsafe to re-cruise.

The total net volume for timber type 1 is then:

$$\text{Fir} = 2,250 \text{ m}^3 + 2,500 \text{ m}^3 * = \underline{4,750 \text{ m}^3} \text{ and Hemlock} = 2,000 \text{ m}^3 + 2,500 \text{ m}^3 * = \underline{4,500 \text{ m}^3}$$

$$\text{Updated Total Net Cruise Volume} = 9,250 \text{ m}^3$$

* Volume for half of the area not affected by the wind shear/blow down event.

5.3 Photo Estimate

Example 2:

Previously Cruised Area: Twenty plots in one timber type are affected and the new damage codes for the affected timber type based on photographs taken over the unsafe to cruise area. All of the stems are counted in each photograph and the proportion of code E and G trees are recorded and an average calculated for the timber type.

Code E = 40% of the trees and Code G = 30% of the trees

Starting with the first unsafe plot in the timber type and working down through the unsafe plots in the data set, the first four trees receive damage code E and the next three trees receive damage code G. The next three trees ($10 - 4 - 3 = 3$) do not receive a damage code. Repeat the process through all of the unsafe plots in the whole timber type.

If the new code tree already has a damage code E, then the new code will over-ride it if the new code is G. If an original code is present in a non-coded tree then it remains in the new data set.

Recompile the cruise with the new damage codes.

Area Not Cruised: The block is ten hectares with four hectares unsafe to cruise. On the unsafe area, 40 percent of the stems qualify for a damage code E and 40 percent of the stems qualify for a damage code G.

$40\% \times 40\% = 16\%$ which is rounded to 20%.

Therefore, two out of every ten stems receive a damage code E and two out of every ten stems receive a code G. Starting with the first plot, the first two trees receive a code E, the next two trees receive a code G and the next 6 trees do not receive a damage code.

If a tree already has a damage code E, then it will only change if it is one of the trees to receive a code G. If a damage code is already present in a tree that will not receive a new damage code it remains in the new data set.

5.4 Comparative Cruise

Use the standards outlined in Section 2.1.2.3 of the *Cruising Manual*. The comparative cruise checklist will be used to evaluate the similarity between the borrowed cruise data and the wind throw cruise area.

6. TREE CODING STANDARDS

All trees shall be coded for damage as per the *Cruising Manual*. Trees are coded as they appear at the time of the cruise and not at the anticipated time of harvesting.

Damage Code Column 63	Description and Cruising Concerns
“E”	The tree may have one clean break in the merchantable portion of the stem. Assign the tree class and record the pathological indicators as normal. The damage code will not change the risk group.
“G”	The tree must have more than one clean break or one or more shattered breaks in the merchantable portion of the stem. Assign the tree class and record the pathological indicators as normal. The damage code will move the tree into the highest risk group.

7. DEFINITIONS

Term	Definition
Merchantable Section	The section of the stem between the 30 centimetre stump and the ten centimetre top diameter.
Clean Break	Is a break that can be bucked out in a length equivalent to the diameter of the stem at the break.
Shattered Break	Is a break more severe than a clean break.
Break Below Stump Height	A break not in the merchantable portion of the stem will be coded as an uprooted tree.
Blow Down or Down Tree	A tree that is broken or shattered in the lower or middle third of the tree or a tree that is not self supporting.