

Introduction and Overview of Call

Grading/Net Factoring

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The standards in this manual are developed to assess the use of net factoring and call grading (CGNF) procedures for the coastal appraisal system. This manual contains the standards and procedures used to call grade and net factor timber for appraisal cruising in coastal B.C. They replace the use of the 1976 loss factors and computer grades. See the current *Cruising Manual* for other procedures and standards.

They are a combination of standards and procedures commonly used by the forest industry and the Ministry of Forests and Range, Forest Analysis and Inventory Branch.

CGNF uses cruiser estimates of decay, waste and value for individual logs in a tree. The loss factors use computer based decay, waste and breakage factors that are applied to all logs in a tree equally and log grade algorithms that are linked to pathological indicators and historic scale. CGNF provides better tree and site specific volumes and value than the loss factor system.

The system is designed to be consistent and auditable. The net volume principles, procedures and standards will be fine tuned through an unbiased net volume adjustment process that will be applied as post-cruise compilation factors known as species net volume adjustment factors (NVAF).

It is important that cruisers use a common set of principles, procedures and standards, so that logs are net factored and graded in a similar manner.

Net factors are localized to specific logs. Each loss indicator has a procedure for determining the amount of sound wood deduction for rot and missing wood in each log. The grade is the descriptor for each net factored log and the grades are grouped into end-use sorts for determining the selling prices. The system is based on the principle that the cruiser will always attempt to use the longest standard length within the highest sort.

Following is an example of the CGNF process:

1. Identify potential diameter limits, major form and surface characteristics.

2. Determine the sort lengths (13, 11, 8 metres) and sort length combinations that will provide the best sort per top diameter limits.
3. Inspect for any sound wood losses and use of non-standard log lengths. Calculate the net factors for the log lengths using the conventions illustrated in this manual.
4. Using the standards in this manual, assign the appropriate grade to the log.

1.1 Call Grading and Net Factoring

Call grading and net factoring are processes used to assess timber quality and net tree volume. The processes do not attempt to predict grade based on falling breakage or manufacturing process, or to predict volume loss without direct evidence.

1.1.1 Call Grading

Call Grading is a procedure that assigns a descriptor grade to a standard log length on a tree. As call grading assigns a length to a log. A net factor or percentage of sound wood remaining is also applied.

The process is hierarchical. The cruiser selects the highest "sort" that the tree will support. The standard sorts are lumber, peeler, sawlog, gang, shingle, utility, pulp and non-recoverable.

The cruiser then selects the first grade within that sort which will provide the longest standard log length. Standard log lengths are 13, 11 and 8 metres. For example the lumber sort has three grades (D, F, B). If the tree will support a 13 metre "F", but only an 8 metre "D" then the log will be a 13 metre "F".

The log lengths can be either "standard" or "variable". For the determination of standard lengths the cruiser attempts to assign the longest allowable standard length for a grade in the highest sort. Logs will normally not be longer or shorter than the standard lengths. Variable lengths are allowed for the occurrence of poor tree form and/or severe defect and/or unique grade considerations. See Table 1.

1.1.2 Net Factoring

Net Factoring is a procedure whereby the cruiser assigns a net factor (% sound) to the log that is being graded. The principle for the net factoring procedures is to measure any rot or missing wood directly and reduce the log volume percent sound-wood remaining. If the rot or missing wood cannot be directly measured, then a set of standard procedures for each defect is applied. No other deductions are made for local knowledge.

Deductions normally measured directly are:

- Butt rot (when visible),
- Missing wood (scars, burns, etc.),
- Sap rot.

Deductions normally determined by applying a procedure are:

- Conk,
- Blind conk,
- Rotten branches,
- Root rot,
- Rot in forks,
- Crooks,
- Broken tops,
- Frost cracks, and
- Soundings

The net factors that are used to assign the net merchantable volume will be further adjusted by a series of net volume adjustment factors (NVAF) in the compilation program.

Table 1: Summary of Sorts, Grades, Standard Log Lengths and Application Notes

The following end use sorts, grades and standard lengths will be used:

SORT TYPE	GRADE	STANDARD LENGTHS (m)	NOTES
Lumber	D,F,B,G	13,11,8	Min length 5 m
Peeler	C	13,11,8	Min length 5 m
Sawlog	H,I	13,11,8	Min length 5 m
Gang	J	13,11,8	Min length 5 m
Shingle	K,L,M	13,11,8	Min length 4 m, 1 m multiple up to 13 m / attempt to use standard lengths.
Utility	U,X	13,11,8	Min length 5 m
Pulp	Y	13,11,8	Min length 3 m, 1 m multiples up to 13 m / attempt to use standard lengths.

Log lengths of 4 and 6 m are allowed for all sorts for helicopter logging only.

NON SORT	GRADE	STANDARD LENGTHS (m)	NOTES
Breakage	Z Shatter and non-recoverable	1 m multiples	Z grade is not intended to meet the statutory definition of firmwood reject.
Missing Wood	N	1 m multiples	Net Factor = "00"

1.1.3 Tree Form

Irregular tree forms such as forks/crooks/pistol butts may necessitate the use of non-standard log lengths. Pencil bucking Y or Z-grade segments is acceptable if the tree form will affect the standard log length and/or sort. See Figure 1.1 where tree form affects the standard log lengths. Sweep in deciduous trees may not change the sort or the standard length provided that the effect of the sweep can be dealt with by assessing the logs in 2.5 m increments.

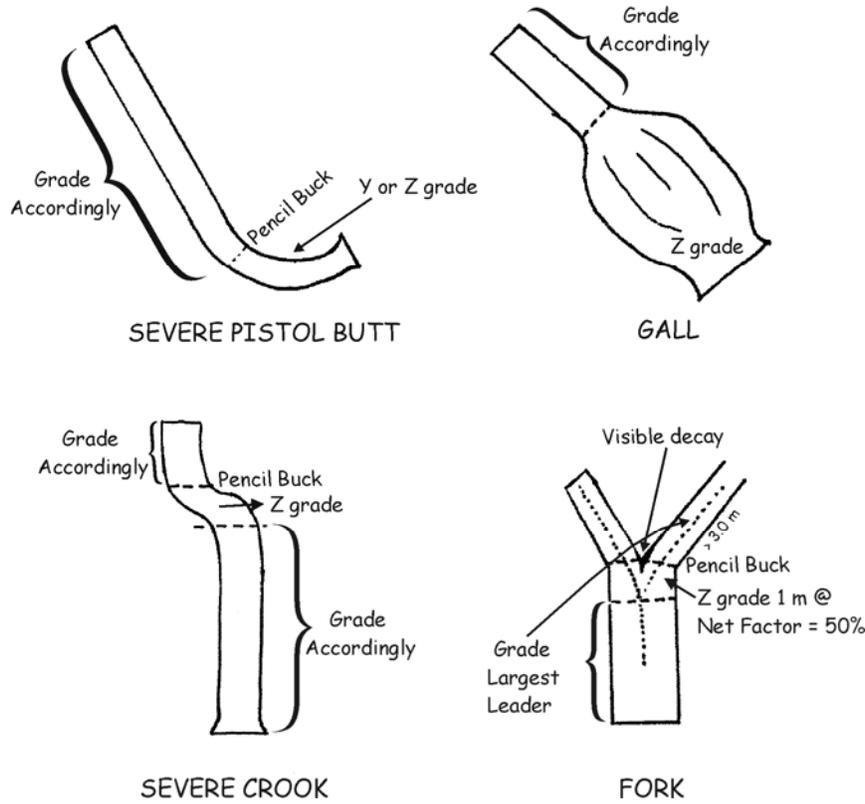


Figure 1.1 Irregular Tree Form.

Major defects may necessitate non-standard log lengths.

Shingle cedar can be 4 metres to 13 metres and 1 metre increments to accommodate excessive decay and bark seams.

Helicopter log lengths are per weight restrictions. The 4 and 6 metre lengths can only be used in pre-identified helicopter cutblocks.

Estimated Log Top DIB (centimetres)	Log Lengths				
	1 st Log	2 nd Log	3 rd Log	4 th Log	5 th Log
<75.0	13, 11, 8	13, 11, 8	13, 11, 8	13, 11, 8	13, 11, 8
75.0 – 100.0 cm	8	13, 11, 8	13, 11, 8	13, 11, 8	13, 11, 8
100.0 – 149.9 cm	6	8	13, 11, 8	13, 11, 8	13, 11, 8
150.0 – 200.0 cm	4	6	8	13, 11, 8	13, 11, 8
>200 cm	4	4	6	8	13, 11, 8

The last log in a tree will almost always have a non-standard length and so it is always coded as a "99". The computer calculates the last log length based on the taper equation and merchantable top diameter.

Fallen trees with roots attached will have a 1 metre Z grade for the first log if they are < 100 cm at DBH and a 2 metre Z grade if they are > or = 100 cm.

1.2 Objectives

To provide a procedure-based estimate of net tree volume and quality that is repeatable and auditable.

1.3 Conventions/Procedures

- a. A dead tree is tallied if it contains a butt log 8 metres or more in length and has a grade of U or better.
- b. The primary objective is to have logs in the correct end use sort. Grades within the sort are a secondary objective.
- c. The grades and the grading rules are modifications of the statutory log grading rules and are not intended to match statutory grading rules and logic.
- d. The standard lengths are 13, 11 and 8 metres.
- e. Specified helicopter operations have the additional options of 6 metres and 4 metres.
- f. Shingle lengths are a minimum of 4 metres increasing in 1 metre increments up to 13 metres.
- g. Grade Z is used for non-recoverable and shatter and grade "N" is used for nothing there (missing wood).
- h. The last log in a tree is described by "99" to indicate that the sort runs to the top of the tree.
- i. Ring shake is recognized for all species except Cedar and Cypress and can be considered on all trees with the following characteristics:
 - Large trees that have been sheltered throughout most of their growth but have a major broken top (40 cm) as a result of wind damage, or
 - Large trees without a broken top which have clearly been exposed to wind over an extended period of time (e.g., vets in an immature stand).
- j. Butt logs with ring shake cannot be in peeler or lumber sorts. In general, ring shake should be isolated by using an 8 metre butt log.
- k. Windfall trees (with their roots attached) up to 100 cm DBH will have a 1 meter "Z" grade in the butt log.
- l. Windfall trees (with their roots attached) over 100 cm DBH will have a 2 metre "Z" grade in the butt log.
- m. Standard procedure-based deductions will be used to determine the extent of the defect and the net factor calculation (% sound wood).
- n. Pencil bucking is used to section the tree into maximum standard log lengths by sort. A grade is assigned and the log is net factored.

- o. Net factoring is only used for sound wood loss only caused by decay or missing wood.
- p. If it is necessary to calculate log volumes the convention will be to use DBH for the butt log diameter and the estimated mid-point diameter for logs above the butt log.
- q. Sounding will be used to assess the presence of hidden butt rot. If a hollow sound is detected then a 0.8 m length deduction is removed from the butt log. Sounding cannot be applied if there is any visible rot or net factor procedure that affects the tree below 2.4 m.

It is recommended that an "S" is painted on the tree where the sounding is heard. If there are safety concerns for cruisers or licensees, then do not sound the tree(s).

- r. The species codes are required for mountain hemlock (Hm) and western hemlock (Hw or H) because they have separate NVAFs. A tree recorded as H will always default to the western hemlock NVAF.

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