

Call Grade Net Factor or Loss Factor:

THERE ARE TWO DISTINCTLY DIFFERENT METHODS OF CRUISING CURRENTLY in use in BC, Loss Factor (LF) and Call Grade Net Factor (CGNF). Both methods have been around for many years and can generate quite different cruise volume and value estimations. Loss factor cruising has been the method used by the Ministry of Forests and Range (MOFR) for over 40 years to determine cutting permit cruise volume and value. CGNF cruising has been around for almost as long in coastal BC and is used extensively in the US and other countries. Both methods estimate the volume and value of a stand. However, they can generate quite different answers. So what is the difference?

Both methods take the 'gross' volume of a tree and reduce the volume to account for rot and other factors to generate a 'net' volume. On the coast, log grades are applied to the net volume by log to get the net volume by log grade within the stand. In the Interior, the lumber recovery factor is calculated from the cruise data to predict the potential volume of lumber available. At the end of this process the numbers on the page are presented in exactly the same format but usually show very different results. CGNF cruising is most common on the coast however, is becoming more frequently used in the interior as it generally produces a better estimate of timber volume and value.

It is also important to note there are two methods of CGNF cruising. Four years ago industry and the MOFR developed a CGNF system for use on the coast that utilizes a set of principle based deductions derived from the Vegetation Resource Inventory (VRI) process. The other (more

traditional) method is a system where the cruiser estimates the decay and log grades based on experience, knowledge and scaling conventions. The MOFR system is somewhat regimented in its process and principles while the traditional method leaves the final determination up to the discretion of the cruiser.

Loss factor (LF) cruising uses a set of deductions defined by species, diameter class, Forest Inventory Zone (FIZ), Public Sustained Yield Unit (PSYU) (yes, cruising still uses this land classification) and decay indicators. These tables are summarized into 'risk groups' that are applied to each tree. In general, there are three risk groups for each species. The significant point here, is that the risk group reduction is applied to the entire tree as a whole regardless of where the decay indicators are located. The LF system was initially developed to be used in the inventory field and was later adapted for appraisal cruising. At the inventory level (we're talking TSA, TFL) LF cruising produces quite reliable estimates. The risk group reductions when averaged over large data sets accurately estimate the net volume for the inventory unit being sampled. Log grades used on the coast and lumber recovery factor used in the Interior are calculated on a tree basis. The log grades are determined within the compilation through a set of algorithms using other tree quality remarks recorded by the cruiser. In the Interior, the potential amount of lumber (lumber recovery factor) and other products is calculated within the compilation using a complicated set of criteria applied to the tree attributes within the compilation.



What's the difference?

MOFR's CGNF cruising uses a set of mathematical deductions similar to scaling deductions combined with tree taper to derive the net volume of each log within a tree. Loss indicators (scars, conks etc) are identified and the loss associated to that indicator is applied to that log. The volume of each log is then summarized to calculate the net volume of the whole tree. These deduction rules are based on well established and tested vegetation resources inventory (VRI) and scaling conventions. Another deduction for net volume adjustment factor (NVAF) is then applied at the compilation level to adjust the volume for taper differences, hidden decay and missing wood. The net volume adjustment factor data is generated from vegetation resources inventory sampling through a very rigorous and statistically proven procedure. During the CGNF process, the cruiser also grades the tree based on scaling rules adapted for cruising. The end result is an estimate of the net volume and value of the tree on a log by log basis as seen by the cruiser.

The principle difference between the two systems is as follows:

The LF system uses a compiled estimate of volume and value based on tabled decay factors with broad averages designed for large inventory level sampling combined with log grade algorithms and complicated formulas to calculate the stand volume and value.

CGNF uses the cruisers visual estimations, knowledge and experience looking directly at each tree combined with scaling conventions to estimate volume and value on a log by log basis.

So how about accuracy?

First, it is important to point out that all results are just an estimate and must be viewed in that perspective. Many factors affect the final net volume of a stand that are beyond the cruisers control. Just to name a few: sampling error, number of plots, taper factors, hidden decay, local conditions, bucking and utilization policies all contribute to differences in volume. Many users take the cruise summary and consider them to be the definitive cruise volume without taking into consideration the above factors. Given the impacts of mountain pine beetle, it is also important to point out that LF cruise volumes are based on normal live forests. They were not designed for cruising catastrophic events such as the mountain pine beetle.

In a general sense, the CGNF cruise will produce a more realistic estimate of cruise volume and value. While considering the factors above, the volume and value are based on visual estimations made by the cruiser. The LF system relies heavily on broad averages compiled inside a computer. There is very little continuity between the cruise data and the results. By comparison, the results from a CGNF cruise can usually be directly compared to the cruise data and the visual estimations made by the cruiser. 🐼

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