

# Extended Forest Type Stand and Stock Reports

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# 10

The Extended Forest Type Stand and Stock Tables report average height, gross volume, and net volume by DBH class.

Each table is reported at the Timber Type level and contains a single Species. Hence, if there were 5 species in a Type, then 5 separate tables would be produced.

If a percent reduction is being compiled, report each table at the Treatment Unit level. Refer to chapter 5 for an explanation of reductions based on Treatment Units.

Where damaged species exist in a Type, produce reports for that Species for each damage code. Include a page that reports all non-damaged trees for the Species, as well as a page for each damage code. Do not produce a report for a damage code that does not occur for the Species in the Type. Refer to Chapter 4 for a sample damage report listing.

## **10.1 Header Information**

Include the following header information on the extended stand and stock reports, including the damage reports. For damage reports, add the species and damage type, as shown in Chapter 4.

1. License from card type A.
2. Cutting Permit from card type A.
3. Timber Type number, species composition, age class, height class, and stocking class from card type C.
4. Species.
5. Number of live and dead trees (reduction applied if compiling a reduction):
  - Live Trees include tree classes 1, 2, 5, 6 and 8.
  - Dead Trees include tree classes 3, 4, 7 and 9.
6. Number of measured and count plots.
7. Silviculture Treatment Unit areas for the Timber Type.
8. Message indicating whether compilation is for appraisals or not.
9. Method of calculation (Average Line or Block).
10. Special compilation messages for:
  - a. Reduction compilation,
  - b. Stump cruise compilation,
  - c. Tree class combination - useless volumes are included or excluded, from column 15 of card type B (0 or blank - snags excluded, 1 - snags included),
  - d. Selective cut indicator - which trees to compile depends on column 12 of card type B (blank - include all trees, 'C' - include cut-indicated and non-indicated trees, 'L' - include leave-indicated trees),
  - e. Double sampling, if count plots are used.
11. Compiler program name and version.
12. Compile date and time.
13. Page number.
14. Damage code - for damage reports only.

## 10.2 Detail Information

### 10.2.1 Average Height

The average tree **height** is based on coded tree heights from measured plots.

$$\bar{H}_{s,d,i} = \frac{\sum_{t=1}^{t_{s,d,i}} H_t}{t_{s,d,i}}$$

Report to 1 decimal place.

#### *Example 10.1*

3 Lodgepole pine were tallied in measured plots in Type 1. The measured heights are 36.6 m, 26.5 m, and 32.2 m.

$$\bar{H}_{s,d,i} = \frac{(36.6 + 26.5 + 32.2)}{3} = 31.8$$

### 10.2.2 Gross Merchantable Volume per Tree

Report gross merchantable volume per tree. Divide the gross volume by the number of stems in the Type.

$$VG_{s,d,i} = \frac{\sum_{t=1}^{t_{s,d,i}} VG_t}{t_{s,d,i}}$$

Report to 3 decimal places.

### 10.2.3 Net Merchantable Volume per Tree

Report net merchantable volume per tree (i.e., gross less decay, waste, breakage). Refer to Section 8.1.3.6 for an explanation of applying loss factors.

$$V_{s,d,i} = \frac{\sum_{t=1}^{t_{s,d,i}} V_t}{t_{s,d,i}}$$

Report to 3 decimal places.

### 10.2.4 Stems per Hectare by Risk Group

Include only tree class 1, 2, 5 and 8 trees. Refer to Section 3.3.1 Step #3 for the method of determining the Risk Group for a tree. Only use trees for species *s*, diameter class *d*, risk group *r* and type *i*.

$$S_{s,d,i,r} = \frac{\sum_{p=1}^{m_i} S_{p,s,d,i,r}}{m_i}$$

Report to 2 decimal places.

### 10.2.5 Total Stems per Hectare

Sum the 4 Risk Group Stems per hectare. If the Tree Class Combination from card type B is 1, then include the live and dead useless stems per hectare.

$$S_{s,d,i} = \sum_{r=0}^3 S_{s,d,i,r}$$

Report to 2 decimal places.

**10.2.6 Live Veterans per Hectare**

Use the same method as above for risk group stems per hectare. Include only tree class 5 trees for all risk groups.

Report to 2 decimal places.

**10.2.7 Dead Useless Snags per Hectare**

Use the same method as above for risk group stems per hectare. Include only tree class 4 trees for all risk groups.

Report to 2 decimal places.

**10.2.8 Live Useless Snags per Hectare**

Use the same method as above for risk group stems per hectare. Include only tree class 6 trees for all risk groups.

Report to 2 decimal places.

**10.2.9 Total of Averages**

Report the stems per hectare estimate for the Species and Type. Sum the Stems/Snags per hectare for all DBH classes. Do not sum the average height or volume per hectare parameters.

$$S_{s,i} = \sum_{d=1}^{34} S_{s,i,r}$$

**10.2.10 Percent by Risk Group**

Calculate the percent that each risk group contributes to the total stems per hectare estimate for the Species and Type.

$$RG_{s,i,r}\% = 100 * \frac{S_{s,i,r}}{S_{s,i}}$$

If the Tree class combination from card type B = 1, then add the Live and Dead Useless stems per hectare to the total stems per hectare in the above calculation.

Where:

- $t_{s,d,i}$  = Number of measured trees for Species  $s$  and Diameter Class  $d$  in Type  $i$ .
- $S_{s,d,i,r}$  = Number of stems/ha for Species  $s$ , Diam. Class  $d$ , Type  $i$  and Risk Group  $r$ .
- $S_{s,i,r}$  = Number of stems/ha for Species  $s$ , Type  $i$  and Risk Group  $r$ .
- $S_{s,d,i}$  = Number of stems/ha for Species  $s$ , Diameter Class  $d$  and Type  $i$ .
- $S_{s,i}$  = Number of stems/ha for Species  $s$  and Type  $i$ .
- $S_p$  = Stems/ha estimate from Plot  $p$ .
- $VG_{s,d,i}$  = Gross volume/tree for Species  $s$ , Diameter Class  $d$  and Type  $i$ .
- $VG_t$  = Gross volume for tree  $t$ .
- $V_t$  = Net volume for tree  $t$ .
- $V_{s,d,i}$  = Net volume/tree for Species  $s$ , Diameter Class  $d$  and Type  $i$ .
- $V_{s,d,i,r}$  = Net volume/tree for Species  $s$ , Diam. Class  $d$ , Type  $i$  and Risk Group  $r$ .
- $H_t$  = Height of tree  $t$ .
- $\bar{H}_{s,d,i}$  = Average height for Species  $s$ , Diameter Class  $d$  and Type  $i$ .
- $R_t$  = Post-reduction percent of tree  $t$ .
- $DSR_{s,i}$  = Double sampling ratio for species  $s$  in Type  $i$ .
- $m_i$  = Number of measured plots in Type  $i$ .
- $RG_{s,i,r}\%$  = Percent of stems per hectare for Risk Group  $r$  for Species  $s$  in Type  $i$ .
- $r$  = Risk Group.

### 10.2.11 Average DBH at Five Levels

The average DBH is also reported for five diameter levels:

1. DBH greater than 12.4 cm
2. DBH greater than 17.4 cm
3. DBH greater than 22.4 cm
4. DBH greater than 27.4 cm
5. DBH greater than 32.4 cm

$$\bar{D}_{s,l,i} = 2 * \sqrt{\frac{BA_{s,l,i}}{\pi * S_{s,l,i}}}$$

Where:

$\bar{D}_{s,l,i}$  = Average diameter of trees with DBH lower limit l for Species s and type i.

$BA_{s,l,i}$  = Average basal area per hectare estimate of trees with DBH lower limit l for Species s and Type i.

$S_{s,l,i}$  = Stems (or snags) per hectare estimate of trees with DBH lower limit l for Species s and Type i.

$\pi$  = 3.14159265.

Report to 2 decimal places.

