

**Field Data Collection Protocol Manual  
Robson Valley Enhanced Forest Management Pilot Project  
Coarse Woody Debris Survey 2001**

Adapted from the Northern Interior Wetbelt Silviculture Systems Project 2001 (refer to working plan)

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## **Introduction**

### **Coarse Woody Debris**

Through a series of decay stages, wildlife trees eventually become non self supporting, and fall to the ground, subsequently becoming CWD. Trees and stumps that are still intact and in the ground are still considered self-supporting, and are thus not considered CWD (RIC Ground Sampling Procedures 1996, adapted from Buckland *et al.* 1998).

CWD provides potential habitat by creating, nest sites, dens, and security cover for small mammals and birds. It provides ground level and elevated runways across streams, along the forest floor and up into the canopy. It is also an important source of moist microsites for amphibians, insects, plants and ectomycorrhizal fungi (Oneil *et al.* 1997, cited from Buckland *et al.* 1998). Hollow logs, created by either heartwood fungi when the tree was standing or by subsequent decay processes, are important as cover or denning sites for a variety of large mammals, including snowshoe hares, bushy tailed woodrats, weasels, skunks and black bears (Akenson and Henjum 1994, Master *et al.* 1979, cited from Jull *et al.* 1998). Some animals such as red squirrels, cache winter food supplies in hollow logs (Master *et al.* 1979, cited from Jull *et al.* 1998). The root wad of uprooted trees is an important habitat feature that is used by flycatchers for perching, by grouse for dusting, by juncos for nesting and by winter wrens for both foraging and nesting (Campbell *et al.* 1997, cited from Jull *et al.* 1998). However, other factors, such as size, decay stage, orientation and quantity of CWD have a greater influence than mode of death on how the fallen trees are used by wild life (Caza 1993, cited from Jull *et al.* 1998).

## Coarse Woody Debris -- General

Include all pieces of CWD greater than 7.5 cm where the centerline is crossed by the vertically projected transect line. This includes:

- ❑ fallen trees, including ones with green foliage, and their roots
- ❑ trees suspended on other trees if they are not self-supporting
- ❑ fallen limbs or dead tops if they meet the size criterion
- ❑ uprooted stumps
- ❑ recently cut logs

It does not include:

- ❑ rooted trees or stumps that are self-supporting, or their roots
- ❑ CWD that is below the soil (entirely buried below forest floor or mineral soil)
- ❑ “ghosts”

**Ghost CWD** is CWD that is older than Class 5. Some of the distinguishing characteristics are:

- ❑ the wood is soft throughout, easily crushed in the hand, and decomposed enough to be considered forest floor humus
- ❑ the piece is well sunken and covered by moss and litter, just above the general level of the forest floor (Be careful to check this. On some slopes forest floor debris can build up around the edges of a piece, giving the impression that it has become part of the ground)
- ❑ the shape of the piece (or the overlying carpet of moss and forest floor) is a continuous, gradually sloped ridge without vertical edges

For transects that will be reassessed, mark each piece of CWD with paint where it is intersected by the transect line.

Normally, each piece of CWD intersected by the line transect is sampled. Subsampling procedures may be used where heavy accumulations are encountered (pp. 3-4 of RIC manual).

If the transect line crosses the same piece of CWD twice, record it twice.

Reference: *Field Manual for Describing Terrestrial Ecosystems*, pp 4-7

## Coarse Woody Debris – Coding Instructions

### Treatment

Allowable Codes:    **TU**    Treatment Unit (harvested clearcut plot)  
                              **UN**    Uncut control (un-harvested control plot)

**Transect slope, and Segments with slash** apply only to the transects in the harvested (TU) plots.

**Transect slope** Record the slope of the transect in percent.

**Segments with slash** Record the beginning and end distances to the nearest 0.1 m (slope distance) of each segment of the transect in which slash cover is great enough to obscure the ground and make it difficult to detect ground-level CWD and identify its attributes.

### Plot

Allowable Codes:    **A 1- or 2-digit number.** Plot numbers will be unique within a study area treatment unit.

### Date

Allowable Codes:    **2-digit numbers for year/month/day**, e.g. 99/06/30

**Observers** Record the first initial and last name of each person collecting or recording data.

**Page** \_\_\_ of \_\_\_ Remember to record the total number of pages on each sheet when you finish the plot.

### Transect Number

Allowable Codes:    **A 1-digit number.** Transect numbers will be unique at a plot location.

### Azimuth

Allowable Codes:    **A 3-digit number**

### Transect Length

Allowable Codes:    **A 2-digit number**

**Piece Number** Assign each piece a number as it is encountered.

**Distance** Record the distance of each piece from the POC of the transect, at the point when the transect crosses the centerline of the piece.

## Tree Species

Allowable Codes:	<b>Se</b>	Engelmann spruce
	<b>Bl</b>	Subalpine fir
	<b>Hw</b>	Western hemlock
	<b>Sx</b>	Hybrid spruce
	<b>Cw</b>	Western red cedar
	<b>Fd</b>	Douglas fir
	<b>Act</b>	Cottonwood
	<b>At</b>	Trembling aspen
	<b>Ep</b>	paper birch
	<b>Pl</b>	lodgepole pine
	<b>U</b>	unknown

or other standard codes, e.g. from Field Manual for Describing Terrestrial Ecosystems.

**Diameter** Measure the diameter to the nearest 0.1 cm perpendicular to the point where the transect crosses the centreline of the CWD if the cross-section is circular. If the cross-section is oval rather than circular, estimate an equivalent diameter that will more accurately represent the cross-sectional area.

If the cross-section is too irregular to express as equivalent to a circle, use the procedure for odd-shaped pieces (see below). Leave the diameter and tilt angle columns blank and record the information in the shaded Horizontal length and Vertical depth columns.

Where part of the wood has decayed and become part of the soil, estimate an equivalent diameter for the remaining portion of the CWD.

**Tilt angle** Use a clinometer to measure the tilt angle of the piece to the nearest whole degree. This is the angle between the central axis of the CWD and a horizontal plane at the point where the transect line intercepts the CWD. Reference: Field Manual for Describing Terrestrial Ecosystems, p. 10.

**Horizontal length and vertical depth (for odd-shaped pieces)** Complete these columns only for odd-shaped pieces or heavy accumulations. Reference: RIC Manual, pp 12-13.

**Piece length** Measure or estimate the length of the piece to the nearest meter (not 0.1 m). Reference: Field Manual for Describing Terrestrial Ecosystems, pp. 10-13.

## Decay Class of the piece

Allowable Codes: **Numbers 1-5**

Record the decay class of the greatest portion of the piece, with emphasis on the wood texture, even if that is not the decay class where the transect intercepts the piece. Reference: Field Manual for Describing Terrestrial Ecosystems, p. 9.

**Origin** Record the origin of the piece, using the following allowable codes:

- 1** stem break, where the bole of the tree has snapped well above the ground
- 2** stock break, where the bole snaps at ground level
- 3** root break (a rotational fall), where the tree is uprooted by pivoting on roots directly beneath the bole
- 4** tree throw (a hinge fall), where the tree is uprooted by pivoting on the outer edge of a massive plate composed of soil and roots
- 5** felled
- 6** branch or other portion of a tree that has broken off the main stem (which may be standing or fallen)
- U** unknown

**DSH (diameter at stump height)** If possible, record the diameter of the tree immediately above the root flare, usually about 30-45 cm above the original ground level.

### **CWD Types**

Allowable Codes: Enter X in the column for each Type that occurs in piece.

Reference: *Types of Wildlife Trees and Coarse Woody Debris required by wildlife on north-central British Columbia. Summary Tables.*

### **Number of Types**

Allowable Codes: Numbers 0-6

Record the total number of Types that apply to the piece.

### **Comments**

If there is evidence of wildlife use of the CWD, enter the Sign Class and Type of Hatler (1991) and the species code. Examples at the back of the manual:

- SC-CD, M-UWEA cord-type scat of an unidentified member of the weasel family
- HS-BU-2, M a 6-10 cm wide burrow of an unidentified mammal
- FS-BO, B-UWOO woodpecker borings

If you can't figure out how to record the wildlife use, describe it.

*Reference:*

## Additions to Coarse Woody debris Protocol Descriptions

- **CWD:** Although residual needles of fresh windthrown Coarse Woody Debris may provide some temporary cover along the edges of the piece this does not constitute CWD 2 or 4. Although, if cover is sufficiently secure, this situation may support CWD.
- **CWD** – In order for a CWD 5 (runway) to exist, its unimpeded distance must be at least 4-5m long.
- **CWD** – In order for a CWD 6 to exist (arthropods), frass must be present e.g. the arthropods must presently have chambers in the piece, or the arthropods must be observed.
- **CWD:** Woodpecker or sapsucker feeding holes on downed trees are not relevant to CWD measurements unless there are larvae present (The feeding took place while the tree was still standing). There are some cases where birds such as Piliated Woodpeckers will feed on CWD that harbors e.g. carpenter ants, which usually takes place in sun exposed openings.
- **CWD** – In many cases, especially in older cedar stands, the large cedar blowdown results in many pieces of a shattered tree still in a linear orientation. If these shattered pieces are still connected to the main body of the tree they can be called “origin 6’s”. If these pieces are not connected but it is still evident that they originated from that tree, then they should be measured as a “fork” would.
- **CWD:** One way to distinguish between class 4 and 5 when they appear close, is to assess whether or not the fiber is crunchy ( crackles when squished). If it does, then the portion of the log that you got the sample from is probably a class 4. If not, it is a class5. However, care must be taken to observe the whole piece for predominant class, before recording an observation (*Craig DeLong, Regional Ecologist, Prince George MOF,2000*)

**CWD** – Where CWD 1 is concerned, the minimum entrance size for the opening is determined by whether two fists pressed together can fit comfortably into the cavity. This approximates the size of e.g. (grouse, hare fisher etc..).

## Commonly Used Wildlife Species Codes

### Amphibians

A-USAL unspecified salamander  
A-UFRO unspecified frog

### Mammals

M-UBAT unspecified bat  
M-LEAM snowshoe hare  
M-UMOU unspecified mouse  
M-UVOL unspecified vole  
M-TAHU red squirrel  
M-ERDO porcupine  
M-UWEA unspecified member of weasel family  
M-UBEA unspecified bear  
M-MAAM marten  
M-MAPE fisher  
M-USMA unspecified small mammal (mouse-sized)  
M-UMED unspecified medium-sized mammal (larger than a mouse; smaller than a porcupine)  
M-ULAR unspecified large mammal (porcupine size or larger)  
M-UMAM unspecified mammal

### Birds

B-UHAW unspecified hawk  
B-UGRU unspecified grouse  
B-UOWL unspecified owl  
B-UWOO unspecified woodpecker  
B-NOFL northern flicker  
B-TTWO three-toed woodpecker  
B-RBSA red-breasted sapsucker  
B-PIWO pileated woodpecker  
B-RBNU red-breasted nuthatch  
B-UCHI unspecified chickadee  
B-WIWR winter wren  
B-SMCN small cavity nester (nuthatches, chickadees, DOWO)  
B-MECN medium cavity nester (e.g. TTWO, BBWO, HAWO, RBSA)  
B-UBIR unspecified BIRD

If there is a siting or strong evidence of use by a particular species, identify the user species as precisely as possible, and place in comments section of the data form