FIA Activity Standards Document

Information Gathering and Management Component, Resource Inventories Activity Area, Wildlife and Wildlife Habitat Activities, specifically Vegetation Measurements at Williamson's Sapsucker Nests and Territories.

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1. BACKGROUND

1.1   Eligible Activities

The following Forest Investment Account (FIA) Activity Standards apply to activities eligible under the Land Base Information Program, Information Gathering and Management Component, Resource Inventories Activity Area, Wildlife and Wildlife Habitat Activities, specifically, Vegetation Measurements at Williamson's Sapsucker Nests and Territories.

1.2   General Description of Standards

These standards have been adapted from the Birds and Burns Network (BiBN, see www.rmrs.nau.edu/lab/4251/birdsnburns/) vegetation protocol. The advantage of using this protocol is that it will be comparable to data collected for Williamson's Sapsucker in Oregon, Idaho, Washington, and Colorado. The data to be collected are consistent with British Columbia standards for Wildlife Trees and Coarse Woody Debris. These standards replace the Resources Information Standards Committee (RISC) standards for woodpecker inventory (BC MELP 1999), specifically the habitat data standards.

2. STANDARDS FOR VEGETATION MEASUREMENTS AT WILLIAMSON'S SAPSUCKER NESTS AND TERRITORIES

For the purposes of this standard, a Williamson's Sapsucker territory is defined as a 16-ha area, based on a 225-m radius around a Williamson's Sapsucker nest tree. Vegetation sampling plots will be placed at the nest tree and within the surrounding territory.

These standards involve the use of a plot design of 4 × 50-m transects in cardinal directions around known nest trees and single 50-m transects at stratified points within the surrounding territory. For each nest territory, one plot will be located around the nest tree and additional vegetation plots will be placed within the surrounding territory to quantify the remaining 15-ha of the territory. See Section 2.1.1 *Stratification of Vegetation Survey Plots within the Surrounding Territory*.

Vegetation data collected at both the nest site and within the surrounding territory will be used to model the suitability of trees as Nest Trees, Sap Trees, and/or Ant Trees/Logs, based on their DBH, species, and Wildlife Tree Class. Vegetation data will also be used to model territory productivity, based on nest productivity data collected. Vegetation plots at the nest tree and within the surrounding territory should be sampled only where productivity data has been collected for the nest. However, where no productivity data exists, it may still be useful to conduct vegetation sampling. This decision will be addressed by considering the specific circumstances of each project.

2.1   Sample Design

2.1.1   Vegetation Survey Plot Design

Around each nest tree, four 50-m transects are laid out. The transect and the area to be surveyed

adjacent to the transect is referred to as a "section." Transects are situated along N/S and E/W azimuths from the nest tree. N/S azimuths meet at the central point. E/W azimuths end 10 m from either side of nest tree, forming a "plus sign" (see Figure 1). Each 50-m section is given a unique number: **1** for northern azimuths, **2** for eastern azimuths, **3** for southern azimuths, and **4** for western azimuths.

Each 50-m transect (section) is divided into four subsegments of 12.5 m each. The first subsegment in each section (farthest from the nest tree) must be given an odd integer. The remaining numbers follow. For example, subsegments 1–4 are assigned to Section 1 (the northern azimuth), while subsegments 5–8 are assigned to Section 2 (eastern azimuth). Sections 3 and 4 are assigned subsegments 9–12 and 13–16, respectively. To ensure consistent numbering of subsegments within each section, start numbering from the subsegment farthest from the nest tree. For Section 1, subsegment 1 would be the farthest north. To ensure accurate record-keeping of subsegment numbers, always stop before starting to sample each new subsegment and record its number.

For the randomly placed 50-m transects that are not around the nest tree, transects are assigned unique numbers by project before field work begins. These transects are not in a "plus-sign" array and the 12.5-m subsegments are not used for random transects (see Section 2.1.1 *Stratification of Vegetation Survey Plots within the Surrounding Territory*).
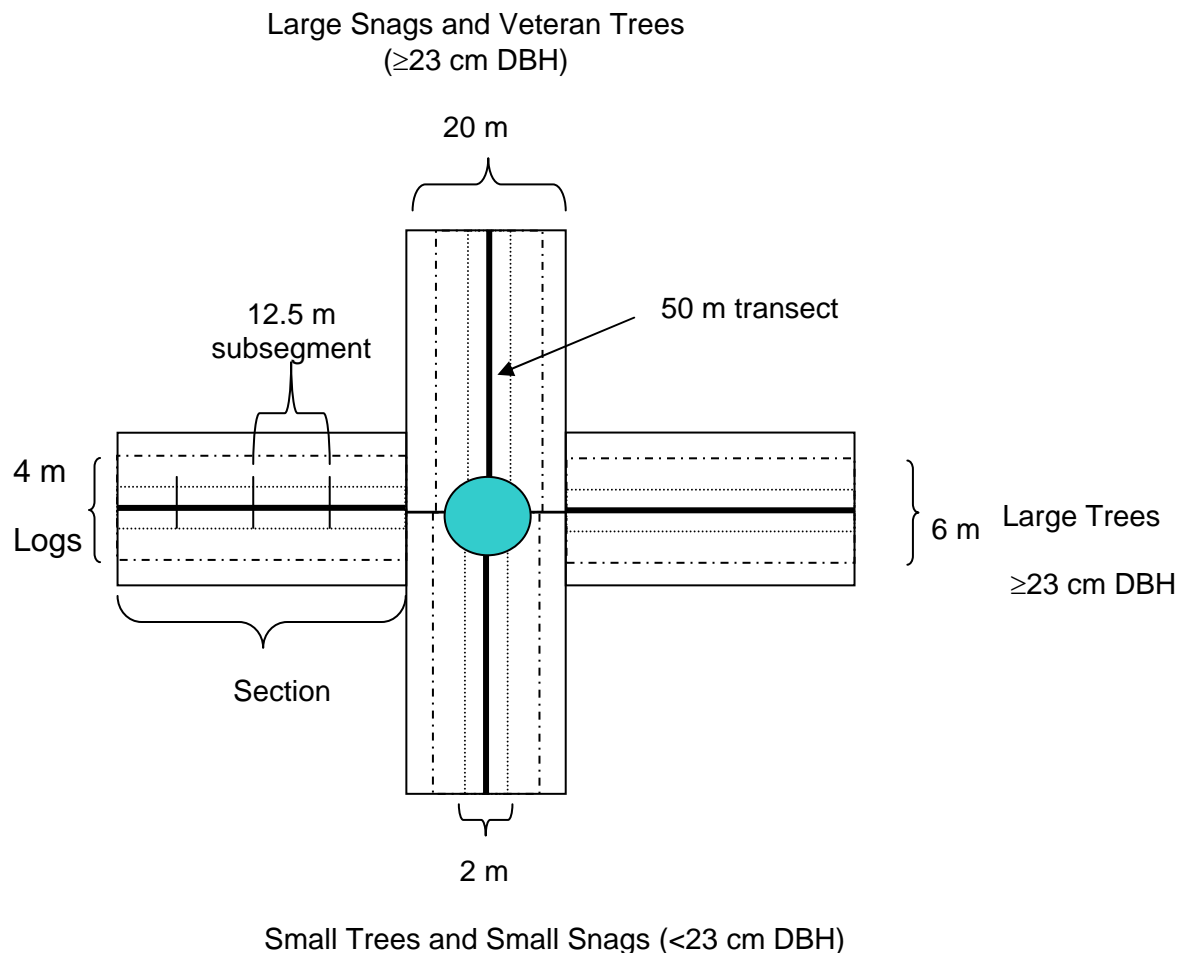

Figure 1. "Plus-sign" sample design surrounding a nest tree.

2.1.2 Stratification of Vegetation Survey Plots within the Surrounding Territory

In addition to the plot at the nest tree, single 50-m transect plots will be randomly placed within the surrounding 16-ha (225-m radius) territory by strata; each forest cover polygon >1 ha within the territory will be considered a strata. Where forest cover polygons in the 225-m radius area around a nest tree are smaller than 1 ha, they will be dissolved into the adjacent polygon that is most similar in stand structure for sampling purposes. The number of random plots per strata will be equal to the number of hectares of the polygon, rounded to the nearest hectare. As a general rule, 14 to 15 plots in addition to the nest tree plot should be located within the territory, and none of these plots may overlap with the nest-tree sampling plot (the "plus-sign" plot). Fewer than 14 other plots may be completed if habitats within the territory are non-treed types (e.g., open water or non-treed marshes).

Plots will be placed randomly in each strata before entering the field using forest cover polygons in a GIS layer. The Minnesota Department of Natural Resources has produced a freeware ArcView 3 extension that will randomly place a given number of transects of any length and width within selected polygons. The beginning point and azimuth of each 50-m transect will be loaded into a GPS unit for location of the plots in the field.

If WISA have been observed foraging outside the 225-m radius during the nesting season, then there should be at least one additional plot outside the 225-m radius in stand(s).

2.2 Definitions

In each section, vegetation data will be collected for Large Snags, Large Trees, Small Trees, Small Snags, Small Logs, and Large Logs. For the purposes of this standard, the following definitions apply:

LARGE SNAGS: For the purposes of this study, a Large Snag is defined as a standing dead tree ≥23 cm DBH and ≥1.4 m in height. If any green needles or leaves persist anywhere along the bole, treat it as a live tree instead of a snag. For leaning dead trees, if the angle between the dead tree and the ground is >45 degrees it is a snag; otherwise it is a log.

SMALL SNAGS: For the purposes of this study, a Small Snag is defined as a standing dead tree ≥7.5 cm and <23 cm DBH. If any green needles or leaves persist anywhere along the bole, treat it as a live tree instead of a snag. For leaning dead trees, if the angle between the dead tree and the ground is >45 degrees it is a snag; otherwise it is a log.

VETERAN TREES: For the purposes of this study, a Veteran Tree is defined as a standing live tree >60 cm DBH.

LARGE TREES: For the purposes of this study, a Large Tree is defined as a standing live tree ≥23 cm DBH and <60 cm DBH.

SMALL TREES: For the purposes of this study, a Small Tree is defined as a standing live tree ≥7.5 cm and <23 cm DBH.

VERY SMALL TREES: For the purposes of this study, a Very Small Tree is defined as a standing

live tree <7.6 cm DBH, but >0.5 m in height.

LARGE LOGS: For the purposes of this study, a Large Log is defined as any dead downed wood pieces ≥23 cm large-end diameter (LED) and ≥1 m in length (see Figure 3 for examples).

STUMPS: For the purposes of this study, a Stump is defined as being <1.4 m in height and >22.4 cm diameter at stump height (DSH) and meeting the definition of a stump as per class 9 of the BC Wildlife Tree Class. Two categories of Stumps are recognized: Natural Stumps and Cut Stumps. A Natural Stump is the result of a natural event, such as blowdown or a snag breaking off. A Cut Stump is the result of previous harvesting.

2.3 Measuring Snags, Trees, and Stumps

2.3.1 Measuring Large Snags, Veteran Trees, and Natural Stumps

Measure Large Snags (dead trees ≥23 cm DBH and ≥1.4 m in height), Veteran Trees (live trees >60 cm DBH) and Natural Stumps (naturally decaying stumps >22.4 cm DSH and <1.4 m high) in four 50 × 20-m sections about the central point. For each section, this represents the 50-m transect and 10 m on either side (perpendicular) of each 50-m transect (see Figure 1).

For leaning dead trees, if the angle between the dead tree and the ground is >45 degrees it is a snag; otherwise it is a log. Measure the DBH of the snag on the uphill side of the snag in steep terrain. For snags with irregular growth (i.e., one side is flattened), take the mean of the DBH from two sides.

If the central axis of a Large Snag or Veteran Tree is <10 m from the centre transect line, it should be measured. For trees directly on the line, measure the first such tree, disregard the second, and so on alternately. Use the central axis (rather than the edge) of each tree to determine whether a tree qualifies to be counted within the plot. For trees whose distances are marginal (can't visually tell how far away they are), use a tape to measure the <u>perpendicular</u> distance from the transect line to the side of the tree where the central axis is located.

Natural Stumps need be counted only if there is a significant amount of wood left (usually >30-cm height) that an ant colony could live in.

2.3.2 Measuring Large Trees and Cut Stumps

Measure Large Trees (live trees ≥23 cm DBH) and Cut Stumps (stumps resulting from harvesting >22.4 cm DSH and <1.4 m high) in four 50 × 6-m sections about the central point. For each section, this represents the 50-m transect and 3 m on either side (perpendicular) of the central transect (see Figure 1).

If the central axis of a tree is <3 m from the centre transect line, it should be measured. See Section 2.3.1 for a description of how to treat trees directly on the line.

Tallying Cut Stumps is acceptable for each size and species class, but only if there are no foraging signs that need to be recorded separately (e.g., contain ants).

2.3.3 Measuring Small Trees and Small Snags

Measure Small Trees (live trees ≥7.5 cm and <23 cm DBH) and Small Snags (standing dead tree ≥7.5 cm and <23 cm DBH), in four 50 × 2-m sections about the central point. For each section, this represents the 50-m transect and 1 m on either side (perpendicular) of the central transect (see Figure 1).

If the central axis of a Small Tree or Small Snag is <1 m from the centre transect line, it should be measured. See Section 2.3.1 for a description of how to treat trees directly on the line.

2.3.4 Measuring Very Small Trees

Measure Very Small Trees (live trees ≤7.5 cm DBH, but >0.5-m in height) in two 3.99-m radius plots at the end of the first (12.5-m point) and third (37.5-m point) subsegments only in any 50-m transect that falls in an area of clearcuts and seedtree cuts where most trees are <7.5-cm DBH, and thus are too small to be counted as Small Trees. Estimate the stocking of trees <7.5-cm DBH by species using the tallies of trees >50 cm in height.

2.3.5 Measuring Large Logs

Measure Large Logs (downed wood ≥23 cm DBH) in four 50 × 4-m sections about the central point. For each section, this represents the 50-m transect and 2 m on either side (perpendicular) of the central transect (see Figure 1).

To qualify as a Large Log, the axis of the log or stem must lie above the ground (above duff and mineral soil layer), and ≥0.1 m of the qualifying log must be contained within the plot. For a log broken into two pieces, treat the pieces as one log if the pieces are touching. Otherwise, treat them as separate logs. Dead stems attached to a live tree are not counted. Multiple branches attached to dead trees or shrubs are each tallied separately.

For leaning dead trees, if the angle between the dead tree and the ground is <45 degrees it is a log; if greater, it is a snag. If the central axis of a suspended log is <1.8 m above the ground where the transect passes, tally the log on the transect; otherwise, disregard it. Don't try and separate log lengths by subsegment, just count the log as "in" the subsegment where most of it is.

2.4 Recording Data for Snags, Trees, and Stumps

Record data outlined below on the data forms provided in Appendix 1 through 6.

If you cross a road or landing while collecting data, indicate this on the appropriate data form.

Note: Enter "9999" as a placeholder whenever there is nothing to be counted in a transect or subsegment.

2.4.1 General Data to be Recorded for all Trees, Logs, and Stumps

STUDY LOCATION: Unique 4-letter code [e.g., MEBC: the first 2 letters=*location* (e.g., Merritt, OK, BO, EK) and the second 2 letters=*state* (BC)].

DATE: Numeric, **dd/mm/yyyy**.

POINT TYPE: N=Nest, **T=**Territory (within 225-m radius), or L= Large territory plot for plots placed outside the 225-m radius, based on observing nesting Williamson's Sapsucker foraging in particular areas outside the 225-m radius.

TERRITORY PLOT LOCATION: For territory or large territory plots that have not been previously assigned using GIS random locations, take a GPS location (UTM, NAD 83, <10-m accuracy) of the Point of Commencement (POC) of the territory transect.

NEST ID#: Alpha-numeric number assigned to each nest tree (e.g., **WNM001**).

FC Poly ID#: Number assigned to each stratum, i.e., forest cover polygon, in which sampling is taking place (e.g., **2336**). This number will be the number of the forest cover polygon from the VRI or Forest Cover mapping used to derive the sampling scheme. For nest tree plots, this number will be Zero (0).

Trans ID#: Unique number assigned to each randomly placed transect within a project (e.g., **123**). Together the Nest ID, FCPoly ID, and Trans ID fields form a unique identifier for each transect.

FULL IDENTIFIER: This is added later electronically by concatenating the Nest ID, the FC Polygon ID, the Transect ID, and the Subsegment ID (e.g., **WNM001-2336-123-1**).

BIRD SPECIES: Four-letter acronym (e.g., **WISA**).

RECORDER(S): Initials of person(s) collecting data, 2-letter code (e.g., **LG**=Les Gyug). Place initials in alphabetical order when working with another person (e.g., **JD, VS**).

AZIMUTH (Az): Compass bearing of the transect being surveyed – **N, E, S, or W,** or bearing from the Point of Commencement (POC) (e.g., **060**) if a randomly placed transect.

SECTION_NO.: Only used for "plus-sign" plots around the nest trees. Use N for North, E for East, S for South, and W for West.

SUBSEGMENT (Subseg): A 12.5-m transect length nested within a section (0–12.5 m, 12.6–25 m, 25.1–37.5 m, 37.6–50 m). There are four subsegments per section about the central point. Each subsegment is assigned a number; always start numbering at the subsegment the farthest from the central point. To ensure accurate record keeping of subsegment numbers, stop at the start of each new subsegment and record its number before starting to sample. For randomly placed 50-m transects, ignore subsegments.

2.4.2 Specific Data to be Recorded for Large Snags, Large Trees, Veteran Trees, Small

Trees, and Small Snags.

SPECIES (Spp): Enter the corresponding two-letter code of the tree species using the BC MOF standards (e.g., Py, Fd, Lw, At, etc.).

CLASS (Cl): Enter the numeric value for the appropriate structural class of the tree followed by a set of letters identifying the type of decay.

> **1** = Sound (no additional letter code).
> **2** = Live but with wildlife use or as otherwise defined below using letter codes.
> **3–9** as per B.C. Wildlife Tree Classes, with letter codes (if applicable).
>
> Type of Decay:
> B = Broomed Trees
> H = Hollow
> SP = Snow Press
> LS = Lightning Scar
> CR = Crooked, for bent or twisted trees (where often the original leader died)
> D = Some general Decay Evidence (e.g., broken top/branch, fungi, fire scars, insect evidence, woodpecker foraging). May use two or three letter codes instead of just a "D" to better define type of decay evidence:
> > DT: Dead Top
> > INJ: Open Scar from logging or rubbing from another tree
> > BT: Broken Top
> > CF: Cake Fork, candelabra, or doubled top
> > BS: Basal Scars
> > FS: Basal Scars with clear evidence of previous charring
> > HR: Evidence of heart rots such as woodpecker holes, conks, etc.
> > UN: Unhealthy tree with declining crown due to some factor not covered above
> > > (e.g., from insect infestation or other unknown causes)
> > RR: Root Rots
> > Or make up other codes as necessary, and record what they mean at the bottom of the field page.

DBH:

For Large Snags, Large Trees, and Veteran Trees:

Enter the diameter at breast height (1.3 m) of the tree measured using calipers, a DBH stick, or diameter tape, to the nearest cm for trees >47.4 cm DBH. For trees and snags smaller than 47.4 cm DBH, use the nearest 5-cm class centre point, as follows:

> **25** = 22.5–27.4 cm DBH
> **30** = 27.5–32.4 cm DBH
> **35** = 32.5–37.4 cm DBH
> **40** = 37.5–42.4 cm DBH
> **45** = 42.5–47.4 cm DBH

For Small Trees and Small Snags:

Record only those trees in the following 3 DBH classes:

10 = 7.5 to 12.4 cm: Total the number of live trees (n) within 1 m of the centre line with a DBH of **8 to <13 cm** within each subsegment. Enter "0" if there are none.

15 = 12.5 to 17.4 cm: Total the number of live trees (n) within 1 m of the centre line with a DBH of **13 to <15 cm** within each subsegment. Enter "0" if there are none.

20 = 17.5 to 22.4 cm: Total the number of live trees (n) within 1 m of the centre line with a DBH of **15 to <23 cm** within each subsegment. Enter "0" if there are none.

HEIGHT (Ht): Enter the height class of the tree as A1, A2, A3, as defined in Land Management Handbook 25 (BC MOF 1998). Enter estimated or measured height to the nearest metre for broken snags or trees (see Figure 2).

The *tree layer* (A) includes all woody plants taller than 10 m. Three sub-layers are recognized:

A1. Dominant trees: includes the dominant (tallest) trees of the main canopy, which may be veterans of one or more fires (previously classed as A0), or the tallest trees of the same age class as the main canopy; usually a minor portion of the stand composition.

A2. Main tree canopy (codominant trees): the main layer of tree cover, composed of trees whose crowns form the upper layer of foliage; typically the major portion of the stand composition.

A3. Sub-canopy trees: includes trees >10 m high that do not reach the main canopy; may form a distinct secondary canopy; often a mixture of trees of various heights younger than those in the main canopy or may be suppressed trees of the same age; includes "intermediate" and "overtopped" trees (terminology of MOF Resources Inventory Branch).
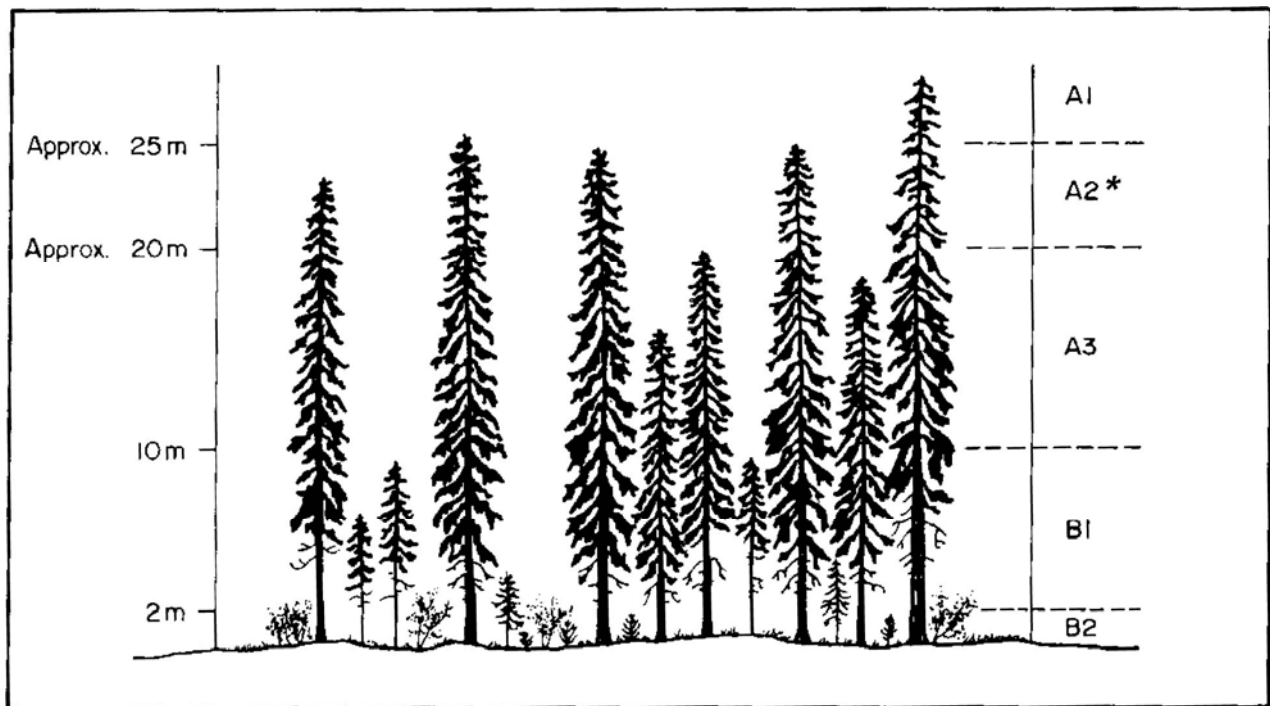
some exceptions for very low growing stands

Figure 2. Example tree layers (A, tree layers; B, shrub layer).

CAVITY (Cav): Enter the appropriate letter code to **indicate nesting use** of the tree under consideration.

> **"Blank" or "-----"** (strikeout) = No cavities found
> **N** = New cavity(ies)
> **O** = Old cavity(ies)
> **N+O** = Both old and new cavities
> **U** = Unknown, it is not possible to determine whether any cavities are present
> And record any other notes considered appropriate, e.g., species (if known) or number of cavities.

FORAGING (For): Enter the appropriate code(s) to indicate that **NEW** woodpecker foraging signs are present in the lower 2 m of the bole of the tree. New foraging signs often are reddish or light in colour, whereas old foraging signs are gray. **Record sap wells at any height and of any age if they are noticed. Also use this section for recording ant sign on tree, snag, or log.**

> **"Blank" or "----"** (strikeout) = **None**
> **F** = Flake. Indicate type of insect, if known, e.g., MPB = Mountain Pine Beetle, or WBB = Wood-boring Beetle (e.g., F-MPB)
> **D** = Drill. Indicate type of insect, if known (e.g., D-WBB)

P = PIWO

Saps = Sapsucker Wells

B = Bear

YJ = Yellow Jacket

U = Unknown type of sign

C = Carpenter ants seen or sign consisting of sawdust, galleries, or colony with workers and pupae. Species, if known. The following should be used to better define carpenter ants:

> **"C"** for unknown carpenter ants — minor workers may be small, but you should see some major workers (>8 mm) as well
>
> **"C-shiny"** for carpenter ants with shiny black thorax and head — *C. laevigatus*
>
> **"C-dull"** for carpenter ants with dull black thorax and head — *C. modoc*
>
> **"C-red-thorax"** for carpenter ants with reddish thorax but dark abdomen and head — probably *C. vicinus*

A = Ants other than carpenter ants with colony in log or tree, i.e., not just seen on log or tree. Species, if known. The following should be used to better define ants:

> **"A-tiny"** for very small (2.5–3 mm ants)
>
> **"A"** for all other 3–8 mm ants not counted above or below
>
> **"A-F.aserva"** for aggressive, slave-making (so you may see other ants there too) stump ants, *Formica aserva*, that has black abdomen and red thorax and head (these will usually swarm when you cut into the piece of wood).

Note: Do not count the ants that may be living under a log — only those within the log or between the log and the bark. Only count ant nests, not the odd wandering ant — but if you see 1 or 2 carpenter ants, you may be close to a nest and just have to cut deeper.

"Old" should be put in front of any of the above if the sign is not fresh; e.g., often, the carpenter ants have been and gone, leaving galleries that are visible through PIWO excavations. This would be coded as "Old P, Old C".

NEST TREE (Nt): Enter the appropriate letter to indicate whether the tree under examination was the central nest tree or not.

> **Y** = Yes; **N** = No

2.4.3   Specific Data to be Recorded for Large Logs

For all Large Logs within 2 m of the centre line (i.e., a 4-m wide plot), record the following:

SPECIES (Spp): Enter the corresponding two-letter code of the tree species using the BC MOF standards (e.g., **Py, Fd, Lw, At,** etc.). Enter **Un** for Unknown.

LED: Measure to the nearest centimetre the large-end diameter (LED) of the log (which may be outside the actual plot). If no logs are encountered along the subsegment (12.5 m), enter the code 9999 in the LED column.

ENDPOINT: Enter "**1**" for each log ≥23 cm LED, whose LED endpoint falls within the plot

boundaries (2 m of centre line). Otherwise, enter "**0**." Use the central axis of the log to determine whether the endpoint of the log is "in" or "out".

LARGE: Only for those logs whose LED ≥23 cm, enter the diameter of the log at its **large end within** the subsegment boundaries.

SMALL: Only for those logs whose LED ≥23 cm, enter the diameter of the log at its **small end within** the subsegment boundaries.

LENGTH: Only for those logs whose LED ≥23 cm, enter the total length of the log if the **entire log is within** the subsegment boundaries and within the 4-m width plot (2-m each side of centreline). If the log extends beyond the plot, enter only that portion within the boundary. If logs traverse subsegments, enter the **portion** of the length within the subsegment. The remaining portion would be recorded in the next subsegment. **Include only qualifying logs >0.1 m of their length contained within the plot.**

DECAY: Enter the numeric value for the appropriate decay class (1 to 5) of the log using Table 7.1 of Land Management Handbook 25 (1998) (see Figure 3):

Add Class 6 for Burnt log; almost the entire outer shell is case-hardened by fire; looks like charcoal.

	Class 1	Class 2	Class 3	Class 4	Class 5
Wood Texture	Intact, hard	Intact, hard to partly decaying	Hard, large pieces, partly decaying	Small, blocky pieces	Many small pieces, soft portions
Portion on Ground	Elevated on support points	Elevated but sagging slightly	Sagging near ground, or broken	All of log on ground, sinking	All of log on ground, partly sunken
Twigs < 3 cm (if originally present)	Present	Absent	Absent	Absent	Absent
Bark	Intact	Intact or partly missing	Trace	Absent	Absent
Shape	Round	Round	Round	Round to oval	Oval
Invading Roots	None	None	In sapwood	In heartwood	In heartwood

Figure 3. Example decay classes .

FORAGING: Enter the appropriate letter(s) to indicate **NEW** foraging signs are present along the log. New foraging signs often are reddish or light in colour, whereas old foraging signs are gray.

> **"Blank" or "----"** (strikeout) = **None**
> **F** = Flake. Indicate type of insect, if known, e.g., MPB for Mountain Pine Beetle, or WBB for Wood-Boring Beetle (e.g., F-MPB)
> **D** = Drill. Indicate type of insect, if known (e.g., D-WBB)
> **P** = PIWO
> **Saps** = Sapsucker Wells
> **B** = Bear
> **YJ** = Yellow Jacket
> **U** = Unknown type of sign
> **C** = Carpenter Ants seen or sign consisting of sawdust, galleries or colony with workers and pupae. Species, if known. The following should be used to better define Carpenter Ants:
>> **"C"** for unknown carpenter ants — minor workers may be small, but you should see some major workers (>8 mm) as well
>> **"C-shiny"** for carpenter ants with shiny black thorax and head — *C. laevigatus*
>> **"C-dull"** for carpenter ants with dull black thorax and head — *C. modoc*
>> **"C-red-thorax"** for carpenter ants with reddish thorax but dark abdomen and head —probably *C. vicinus.*
>
> **A** = Ants other than carpenter ants with colony in log or tree, i.e., not just seen on log or tree. Species, if known. The following should be used to better define ants:
>> **"A-tiny"** for very small (2.5–3 mm ants)
>> **"A"** for all other 3–8 mm ants not counted above or below
>> **"A-F.aserva"** for aggressive, slave-making (so you may see other ants there too) stump ants, *Formica aserva*, that has black abdomen and red thorax and head (these will usually swarm when you cut into the piece of wood).

Note: Do not count the ants that may be living under a log — only those within the log or between the log and the bark. Only count ant nests, not the odd wandering ant — but if you see 1 or 2 carpenter ants, you may be close to a nest and just have to cut deeper.

To locate ants you must cut into the stump or log in at least 2 places. First look under the bark, then cut into it. If it is too fresh and hard, then you will only be able to look under the bark. Virtually all old stumps and logs will have had ants in it at some time, the question is whether they have any right now. Carpenter ant evidence in live trees is difficult to find — sometimes you may see exit holes and sawdust, but this is not definitive.
Bears and PIWO will excavate for ants of any size, so carpenter ants cannot be detected by indirect sign alone.

"Old" should be put in front of any of the above if the sign is not fresh; e.g., often the carpenter ants have been and gone, leaving galleries that are visible through PIWO excavations. This would be coded as "Old P, Old C".

2.4.4   Specific Data to be Recorded for Natural Stumps and Cut Stumps

SPECIES (Spp): Enter the corresponding 2-letter code of the tree species using the BC Ministry of Forests standards (e.g., **Py, Fd, Lw, At,** etc.). Enter **Un** for Unknown.

CLASS (Cl): For all stumps, the Class is 9. For Natural Stumps, enter 9N and for CUT Stumps enter 9C.

DIAMETER AT STUMP-HEIGHT (DSH): Enter the DSH for all stumps. For decaying stumps estimate what the DSH would have been.

FORAGING: Enter the appropriate letter(s) to indicate **NEW** foraging signs are present along the log. New foraging signs often are reddish or light in colour, whereas old foraging signs are gray.

> **"Blank" or "----"** (strikeout) = **None**
> **F** = Flake. Indicate type of insect, if known, e.g., MPB = Mountain Pine Beetle, or WBB = Wood-Boring Beetle (e.g., F-MPB)
> **D** = Drill. Indicate type of insect, if known (e.g., D-WBB)
> **P** = PIWO
> **Saps** = Sapsucker Wells
> **B** = Bear
> **YJ** = Yellow Jacket
> **U** = Unknown type of sign
> **C** = carpenter ants seen or sign consisting of sawdust, galleries or colony with workers and pupae. Species, if known. The following should be used to better define Carpenter Ants:
>> **"C"** for unknown carpenter ants — minor workers may be small, but you should see some major workers (>8 mm) as well
>> **"C-shiny"** for carpenter ants with shiny black thorax and head — *C. laevigatus*
>> **"C-dull"** for carpenter ants with dull black thorax and head — *C. modoc*
>> **"C-red-thorax"** for carpenter ants with reddish thorax but dark abdomen and head — probably *C. vicinus*
> **A** = Ants other than carpenter ants with colony in log or tree, i.e., not just seen on log or tree. Species, if known. The following should be used to better define ants:
>> **"A-tiny"** for very small (2.5–3 mm ants)
>> **"A"** for all other 3–8 mm ants not counted above or below
>> **"A-F.aserva"** for aggressive, slave-making (so you may see other ants there too) stump ants, *Formica aserva*, that has black abdomen and red thorax and head (these will usually swarm when you cut into the piece of wood).

> *Note: Do not count the ants that may be living under a log — only those within the log or between the log and the bark. Only count ant nests, not the odd wandering ant — but if you see 1 or 2 carpenter ants, you may be close to a nest and just have to cut deeper.*

> *To locate ants you must cut into the stump or log in at least 2 places. First look under the bark, then cut into it. If it is too fresh and hard, then you will only be able to look under the bark. Virtually all old stumps and logs will have had ants in it at some time, the question is whether they have any right now. Carpenter ant evidence in live trees is difficult to find — sometimes you may see exit holes and sawdust, but this is not definitive.*
> *Bears and PIWO will excavate for ants of any size, so carpenter ants cannot be detected by indirect sign alone.*

"Old" should be put in front of any of the above if the sign is not fresh; e.g., often, the carpenter ants have been and gone, leaving galleries that are visible through PIWO excavations. This would be coded as "Old P, Old C".

Tallying cut stumps is acceptable for each size and species class, but only if there are no foraging signs that need to be recorded separately (e.g., contain ants).

REFERENCES

British Columbia Ministry of Environment, Lands and Parks. 1999. Inventory Methods for Woodpeckers, Standards for Components of British Columbia's Biodiversity No. 19. The Resource Information Committee, Victoria, BC.

British Columbia Ministry of Forest. 1998. Field manual for describing terrestrial ecosystems, Land Management Handbook 25. B.C. Ministry of Forests and B.C. Ministry of Environment, Lands and Parks, Victoria, BC.

Appendix 1. Data Form for Large Snags, Veteran Trees, and Natural Stumps

HEADER DATA Large Snags and Veteran Trees														50 m	12.5 m	Large snags and Vets within 10 m (≥22.6 cm DBH)							STUMPS <1.4 m ht;>22.4 cm top		
Location	Date dd/mm/yyyy	Point_type	Datum	Zone	UTM_E	UTM_N	Nest ID#	FC Poly ID#	Trans ID#	Full Identifier	Bird spp	Recorder	PLOT WIDTH	Azimuth	Section	Subsegment	Species	WTC DECAY Class	DBH (cm)	HEIGHT (M)/Layer	CAVITY	FORAGING	NEST SNAG	Natural	Cut	Stump Char

Appendix 2. Data Form for Large Trees

														50 m	12.5 m	Large trees within 3 m (>22.6 cm DBH)						
Location	Date dd/mm/yyyy	Point_type	Datum	Zone	UTM_E	UTM_N	Nest ID#	FC Poly ID#	Trans ID#	Full Identifier	Bird spp	Recorder	PLOT WIDTH	Azimuth	Section	Subsegment	Species	WTC DECAY Class	DBH (cm)	HEIGHT (M)/Layer	CAVITY	FORAGING	NEST TREE

The span "HEADER DATA Large Snags and Veteran Trees" covers columns Location through PLOT WIDTH.

Appendix 3. Data Form for Small Trees and Snags

HEADER DATA Small Trees and Snags (7.5–22.4 cm DBH and >1.39-m height)														50 m	12.5 m		Small trees and snags within 2 m				
Location	Date dd/mm/yyyy	Point_type	Datum	Zone	UTM_E	UTM_N	Nest ID#	FC Poly ID#	Trans ID#	Full Identifier	Bird spp	Recorder	PLOT WIDTH	Azimuth	Section	Subsegment	Species	WTC DECAY Class	Tally 7.6-12.5	Tally 12.6-17.5	Tally 17.6-22.5

Appendix 4. Data Form for Very Small Trees

															50 m	at end of 12.5 m	Small trees	
HEADER DATA Very Small Live Trees (0-7.4 cm DBH and >0.5-m height) within 3.99-m radius and only in clearcuts and seedtree cuts																		
Location	Date dd/mm/yyyy	Point_type	Datum	Zone	UTM_E	UTM_N	Nest ID#	FC Poly ID#	Trans ID#	Full Identifier	Bird spp	Recorder	PLOT WIDTH	Azimuth	SECTION	SUB-SEGMENT	Species	Tally

Appendix 5. Data Form for Large Logs

HEADER DATA Large Logs														50 m	12.5 m	Large logs within 2 m (≥22.6 cm **LED**)							
Location	Date dd/mm/yyyy	Point_type	Datum	Zone	UTM_E	UTM_N	Nest ID#	FC Poly ID#	Trans ID#	Full Identifier	Bird spp	Recorder	PLOT WIDTH	Azimuth	Section	Subsegment	Species	LED (cm)	Endpoint	Large (cm)	Small (cm)	Length (m)	Decay	Foraging

Appendix 6. Data Form for Cut Stumps

																	Cut Stumps within 3 m (≥22.4 cm DBH and < 1.4 m in height)				Tally
HEADER DATA Large Snags and Veteran Trees														50 m	12.5m						
Location	Date dd/mm/yyyy	Point_type	Datum	Zone	UTM_E	UTM_N	Nest ID#	FC Poly ID#	Trans ID#	Full Identifier	Bird spp	Recorder	PLOT WIDTH	Azimuth	Section	Subsegment	Species	WTC DECAY Class	DSH (cm)	FORAGING	Cut