



EIGHTPINE COMMON STAND EXAM PROTOCOLS (INTENSIVE LEVEL WITH GROWTH SAMPLE TREES)

Contents

Eightpine Common Stand Exam Protocols..... 2

Number of Plots: 2

Section 2: Setting Form, Intensive Plot Exam Level 2

Section 3: Sample Design Form: 4

Section 4: Plot Form: 6

Section 5: Tree Data Form –Intensive Exam Level..... 6

5.5 Growth Sample Trees (GST) Required 7

5.7 Tree Count..... 8

5.15 Age Required for all GST trees 8

5.20 Snag Decay Class *Required for dead trees*..... 9

Literature Cited 9

Eightpine Common Stand Exam Protocols

These stand exam protocols are a modified *CSE Intensive Exam* as defined in the *Region 1 Common Stand Exam and Inventory and Monitoring Field Guide*. If an item is not discussed in this document, record it exactly as specified for an intensive exam in the R1 CSE/IM Field Guide if it is required. Attribute tolerances are found in Appendix T in the R1 CSE/IM Field Guide under the Intensive Exam Level specifications for intensive plot attributes. A R1 CSE Template will be provided for this project.

Number of Plots:

Each stand will have a predetermined number of plots. Maps, shapefiles, and a list of plot locations are provided in task order attachments.

Section 2: Setting Form, Intensive Plot Exam Level

Record all required attributes for a R1 Intensive Common Stand Exam as per R1 CSE Protocols.

Table 2.1: Setting Data Form required attributes

* indicate defaults to be set in Exams Template file.

CSE Attribute #	Attribute Name	Value	Comments
2.1	Project Name	Eightpine CSE	
2.2	Proclaimed Region	01	Default in Exams software template file
2.3*	Proclaimed National Forest	14	Kootenai National Forest
2.4*	District	07	Cabinet Ranger District
2.5*	Location		See Attached Location Excel Table
2.6*	Stand Number		See Attached Location Excel Table
2.7	Owner	USFS	Default in Exams software template file
2.8*	State	Montana	Default in Exams software template file
2.9*	County	Sanders	Default in Exams software template file
2.10*	Administrative Forest	14	Default in Exams software template file.
2.11	Date	Exams software automatically fills in this field	

CSE Attribute #	Attribute Name	Value	Comments
2.13 *	Exam Level	3000	Default in Exams template file. <ul style="list-style-type: none"> • Tree Form = 3, intensive exam. • Veg Comp Form = 0, not collected • DWM Form = 0, Not collected • Surface Cover Form = 0, not collected
2.14	Exam Purpose	SE	Note the requirements to meet the SE exam purpose, as explained in section 2.14 of the <i>R1 CSE/IM Field Guide</i> . Default in Exams software template file.
2.15	Stratum	Not used.	
2.16	Existing Veg Reference	Not used.	
2.17	Existing Veg Composition Type.	Not used.	
2.18*	Potential Vegetation Reference	101 (Forest Habitat Types of Montana)	Default in Exams software template file.
2.19	Potential Vegetation	Required	Record most prevalent habitat type for the stand to <i>phase</i> . Populate after exam has been completed.
2.20	Structure	Not used.	
2.21	Setting Capable Growing Area	Required	See CSE Field Guide.
2.22	Setting Fuel Model	Not used.	
2.23	Setting Elevation	Required.	See CSE Field Guide.
2.24	Setting Aspect	Required.	See CSE Field Guide.
2.25	Setting Slope	Required.	See CSE Field Guide.
2.26	Setting Slope Position	Not used.	
2.27	Acres	Required.	See CSE Field Guide.
2.28	Examiner	Required.	See CSE Field Guide.
2.29	Precision Protocol	CSE_Q	Required. Default in Exams software template file.

CSE Attribute #	Attribute Name	Value	Comments
2.30	Radial Growth Interval	10	
2.31	Radial Growth Interval	Not used.	
2.32	Height Growth Interval	5	
2.33	Fuel Photo Reference	Not used.	
2.34	Setting User Code	Not used.	
2.35*	Setting Lat Long Reference Datum	NAD 83	Required for old growth exams. Default in Exams software template file.
2.36	Declination	Not used.	Not needed for stand exams because azimuth of the trees is NOT being recorded. Only used for IM protocols.
2.37	Measurement Number	Not used.	
2.38	Setting Remarks		Record Remarks about setting conditions including stand health, disturbances, wildlife, and regeneration.
2.39	Setting Damage Category		Record damage seen within the plot that was not recorded on the tree damages.
2.40	Setting Damage Agent		Record corresponding damage agent.
2.41	Setting Damage Severity	Not used.	
2.42	Species of Management Interest	Not used.	

Section 3: Sample Design Form:

The sample designs for this project will be provided as the default sample design in the CSE template file. Figure 3.1 shows the sample design.

When collecting exams, in every stand, choose a basal area factor appropriate to get a minimum of 7 live trees on each plot. (20, 25, 28, 30, or 40 BAF are generally appropriate to get a minimum of 7 trees on the Kootenai National Forest.

After selecting the appropriate BAF factor for the stand, go into the Setting Data/Sample Design Form and change the BAF factor if the default sample design for the Tree Form does not reflect the BAF that is used to sample the stand.

Figure 3.1 Tree Form Sample Design Format examples:

The following sample design for the Tree Form indicates:

- A BAF of 20, 25, 28, 30, or 40 will be used for variable-radius plot for all trees 5" + DBH
 - Trees ≥ 5.0" DBH are tallied individually
- 1/300-acre fixed plot for trees less than 5" DBH
 - Live trees less than 0.5' height and dead trees less than 3.0" DBH are *not* tallied
 - All other trees (live and dead) are tallied
 - A height measurement is required for all tree groups less than 4.5' tall.
 - A height measurement is required for all GST Trees
 - A height measurement is required for all trees with broken or missing tops.
 - Once GST tree requirements are met, live and dead trees less than 5.0" DBH are grouped as described under section 5.7 of the Tree Data Form.

Tree	Veg. Composition	Ground Surface Cover		Brown's Survey	Photo Series	Piece Count		Remarks
Meth	ExpFac	Azm	Cond.	SubFiltr	Var	MinV	MaxV	
BAF	40.0000		---	ALL	DBH	5.00	999.99	
FRQ	300.0000		---	ALL	DBH	3.00	4.99	
			OR	LIVE	HGT	0.50	4.49	
			OR	LIVE	DBH	0.10	3.00	

Figure 3.1: Note: This example uses a BAF of 40. Other BAFs may be appropriate for different stand densities.

*** BAF used must stay the same for all plots in a stand (setting).

Figure 3.4: Diameter and Height Classes for GST Selection

Diameter and Height Classes for GST Selection:

	Min. DBH (in)	Max. DBH (in)	Min. Hgt (ft)	Max. Hgt (ft)	Attributes to Measure
▶	N/A	N/A	1.0	4.5	5-year height growth
	0.1	2.9	4.5	12.9	5-year height growth
	0.1	2.9	13.0	999.9	5-year height growth (if feasible)
	3.0	4.9	N/A	N/A	5-year height growth (if feasible) 10-year radial growth
	5.0	8.9	N/A	N/A	10-year radial growth
	9.0	14.9	N/A	N/A	10-year radial growth
	15.0	999.9	N/A	N/A	10-year radial growth

Section 4: Plot Form:

Table 4.1 lists the required attributes to collect in the Plot Form. Other attributes may be collected to meet information needs.

Table 4.1: Plot Data Form

CSE Attribute #	Attribute name	Comments
4.1	Plot Number	Use the pre-assigned plot number. If the plot number needs to be edited within Exams software, use the Option button on the Plot Data Form to edit the default plot number.
4.2.1	Plot Latitude	Enter the plot latitude from plot center
4.2.2	Plot Longitude	Enter the plot longitude from plot center
4.3	Plot Capable Growing Area	Required
4.4	Plot Aspect	Required
4.5	Plot Slope	Required
4.11	Plot Potential Veg.	Required

Section 5: Tree Data Form –Intensive Exam Level

Record all required fields according to the R1 CSE Field Guide for the Tree Form, Intensive Exam Level. (Section 5).

Table 5.1 Tree form additional attributes/information

CSE Attribute #	Attribute Name	Comments
5.3	Tree Status	Required. Dead require a Snag Decay Class.
5.5	Growth Sample Tree	Required. See additional information below.
5.6	Tree Species	Required
5.7	Tree Count	Trees < 5.0" DBH are grouped by height class.
5.9	DBH	Required for all trees and tree groups $\geq 4.5'$ tall. See additional information below
5.10	Tree Height	Required for all GST trees, trees < 4.5' tall, tree height class groups, and trees with broken/missing tops.
5.12	Radial Growth	Required for GST Trees $\geq 3.0''$ DBH.
5.14	Height Growth	Required for GST trees < 3.0" DBH

CSE Attribute #	Attribute Name	Comments
5.15	Tree Age	Required for all GST trees. See additional information below.
5.16	Crown Ratio	Record for all trees. Record average for grouped trees < 3.0" DBH
5.17	Crown Class	Required.
5.20	Snag Decay Class	Required. Follow instructions in field Guide Section 5.20.
5.22 5.23 5.25	Damage Category Damage Agent Damage Severity	Category, Agent, Severity Required for <ul style="list-style-type: none"> • Bark Beetles, Damage Category 11 • Stem Decay, Damage Category 22 • Broken and Missing Tops, Damage Category 99, Agent 1 and 2
5.26	Tree Remarks	Required if age is estimated. <ul style="list-style-type: none"> • record "AE1" • record the length, in inches, of the core for which rings were counted and the actual ring count in that core.

5.5 Growth Sample Trees (GST) Required

Record code "G" for GST trees. A GST tree is the first live standing sample tree of each species encountered on each plot in each of the following diameter classes, moving clockwise from 0 degrees azimuth. In addition, if not already tallied, the largest tree of each species on each plot is also a GST tree. The following R1 Standard Exam GST diameter classes will be used for each species on each plot.

DBH range	Height Class Range
<3.0 inches ^(a)	1 – 4 feet
	5 – 12 feet
	≥ 13 feet
3.0 – 4.9 inches	
5.0 – 8.9 inches	
9.0 – 14.9 inches	
First tree ≥ 15.0 inches ^(b)	
Largest tree ≥ 15.0 inches ^(b)	

If the side of the tree that would normally be selected for increment boring would involve drilling into extensive rot if bored, it is permissible to move around the bole of the tree to obtain a breast height core that avoids the worst of the rot, and thus provides a more accurate age.

If the first GST tree of a given species in a given diameter class obviously has very extensive rot, and there is another relatively sound tree of that species and diameter class, that is also within +/- 2" diameter of the rotten GST tree, and appears from its overall form to be of the same age class, it may be substituted as the GST tree to get a better age estimate. (However, field crews must be extremely cautious to avoid any bias in their GST sample. Be aware that sometimes the cause of the rot may be a disturbance, and that the trees with rot may be an older age class. If you suspect this is the case, do not select an alternate GST Tree, but do the best you can with the first GST tree, and estimate total age if necessary – as outlined in Appendix O of the Handbook.)

5.7 Tree Count

All trees ≥ 5.0 " DBH (both live and dead) are recorded individually.

Grouping trees < 5.0" DBH:

- For live trees < 5.0" diameter
 - Do not tally any dead trees less than 5.0" DBH.
 - Group by species and height classes defined below (these are simplified from the Field Guide). **Do not include trees < 0.5' in height.**
 - For all other fields recorded for the sample tree group (DBH, Height, Crown Ratio, etc.) record the average for the group.
 - If all of the trees of a species cluster closely around a particular height break and are within 1 or 2 feet of that height break it is permissible to consider these as one group and assign an average height for that group (e.g. – most trees are between 12' and 14' tall; rather than split into 2 groups, this can be counted as one group, and assign the average diameter and height that fits best).

Height Classes for Grouping Trees less than 5" DBH:

Height Class Range (for sample tree groups)
1.0 – 4.0 feet
5.0 – 12.0 feet
13.0 – 19.0 feet
≥ 20.0 feet

5.15 Age Required for all GST trees

Always include age for the largest tree of each species on each plot. Recorded ages are actual ring count at breast height.

- **Trees with a diameter \geq 3.0 inches** – Determine TREE AGE from an increment bore taken directly below the point of diameter measurement (DBH) and at a right angle to the bole. To reduce bias, bore on the side of the tree facing plot center (when possible). Count annual rings to the pith of the tree.
- **Trees with a diameter $<$ 3.0 inches** – Determine total age by counting branch whorls that represent annual height increments, or by severing the tree at the root collar and counting annual rings on the stump, or by taking an increment boring at the root collar. The most efficient and accurate method to use depends largely on the species and size of the sample tree.

Estimate age for trees with heart-rot or hollow centers. If estimating age due to rot or hollow center, record “AE1” in Field 10.26, Tree Remarks. Follow the AE1 code with the length in inches of the core for which rings were counted and the actual ring count in that core. To estimate the breast height age, use the method for age estimates in Appendix O of the Region 1 CSE Field Guide.

Age estimates are only to be used for rotten or hollow trees, make sure that you have appropriately sized borers for the trees that need to be bored. Age estimates are not acceptable due to improper maintenance of increment borers.

5.20 Snag Decay Class *Required for dead trees*

Follow instructions in field Guide Section 5.20. The description table of snag decay classes is simply to create understanding of what characteristics are relevant. Classification is based on the *predominance of characteristics*, since few snags will perfectly match all characteristics in a single class. Do NOT spend a large amount of time on this call. Decay class is generally *determined from a quick visual inspection* and comparison with the pictures in Section 5.20.

Literature Cited

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