

GFFP Monitoring Protocols

Modified from: USFS Region 3 Common Stand Exam Field Guide; Version 1.7 USFS 2005
(Revised 9-4-09)

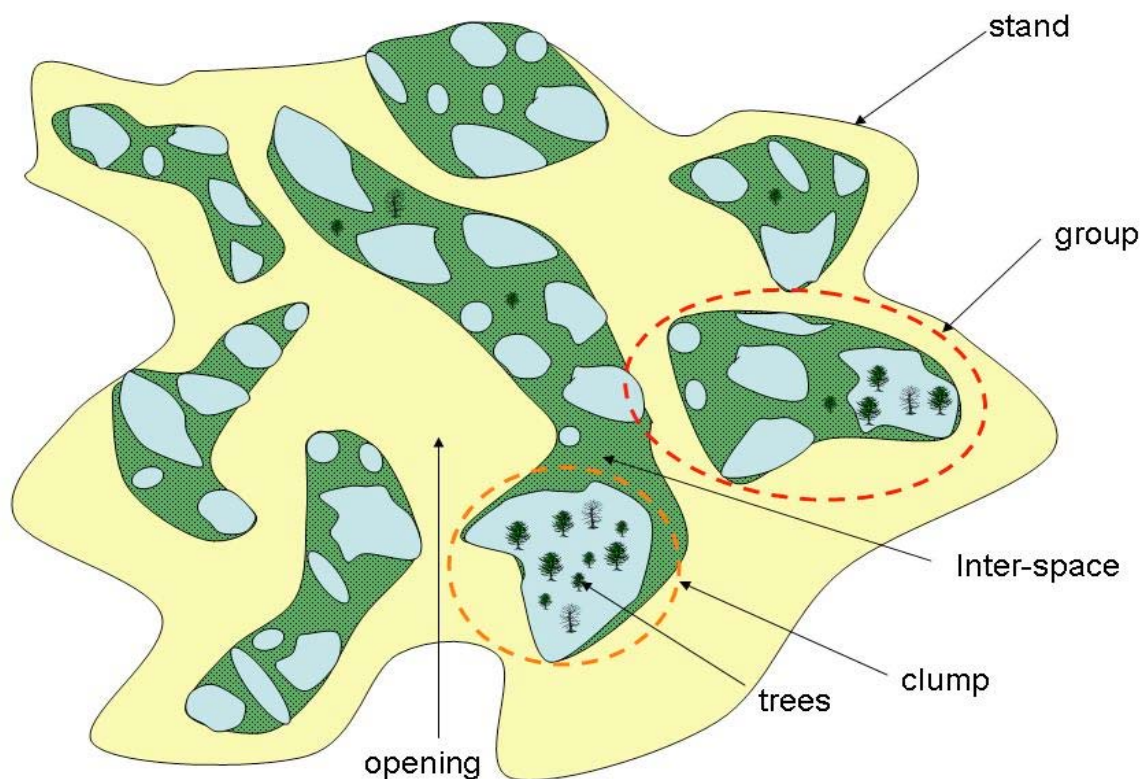
Step 1: Basic Plot Information

Plot Data Form

1. Crew: Record crew initials
2. Project Name: Record project name
3. Treatment: GFFP abbreviation for treatment (ex. Thin BA)
4. Date: Date data collected
5. Region: Forest Service Region (Two digits: 03).
6. Proc. Forest: Forest data collected on (Two digits: 07).
7. District: District data collected on (Two digits: 01=Mormon Lake RD, 02=Peaks RD).
8. Strata: Record strata type (**I = Interspace**, **O = Opening**, **C = Clump**)

Refer to the Appendix for written descriptions to clarify any ambiguities

**** You will not have any "group" strata types**



9. Plot: Record plot number
10. UTM East & North: Recorded at plot center in Map Datum NAD 27 CONNUS
11. Capable grow area: Percent of plot capable of growing trees (0=cannot support a tree, 100=can support trees) If there is a significant unusual feature like a road or rock face estimate percent and subtract from 100.
12. Aspect: Record the bearing that the plot faces in degrees, **Shoot the azimuth to the steepest aspect from plot center. Check your compass to ensure that the correct declination is set (11deg 19 min E currently)**
13. Slope: Use the same azimuth from the aspect from plot center and record the **slope in percent.**
14. Elevation: In **feet**, derived from GPS unit.
15. Fuel Model (Anderson): *Aid to Determining Fuels Models for Estimating Fire Behavior*, GTR INT-122, 1982. Models are numbered 1-13, ranging from grass, shrub, timber, and slash fuel loadings.
16. Plot Remarks: Pertinent comments to plot area.

Additional Plot Data:

17. C1-C4: Canopy cover estimate from spherical densiometer reading taken at each of the four cardinal points from plot center. **(Record all OPEN points). Do not record an average.**
18. BA (Basal area): Estimate of basal area taken with a BAF=20 prism at plot center.
Note: include only PIPO in your BA measurements
19. TPA (Trees per acre): Number of live trees measured in the plot, taken from the tree data form(s).
20. S & B Fuel: *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*, GTR RMRS-GTR-153.
21. Percent interspace: Percent of 0.1 ac plot occupied by interspace. See diagram above for clarification of interspace.
22. **Witness trees:** Witness trees should be large trees that are likely to be retained during treatment; old yellow pines are appropriate where available. These trees do not need to be within the 1/10th acre fixed plot area.
Record species, DBH (inches), and distance and azimuth from plot center to front of tree.
Tag tree at the base facing plot center using an aluminum nail; record plot #, distance and azimuth TO plot center on tag.

Step 2: Fuels transects and ground cover

Downed Woody Debris Data Form:

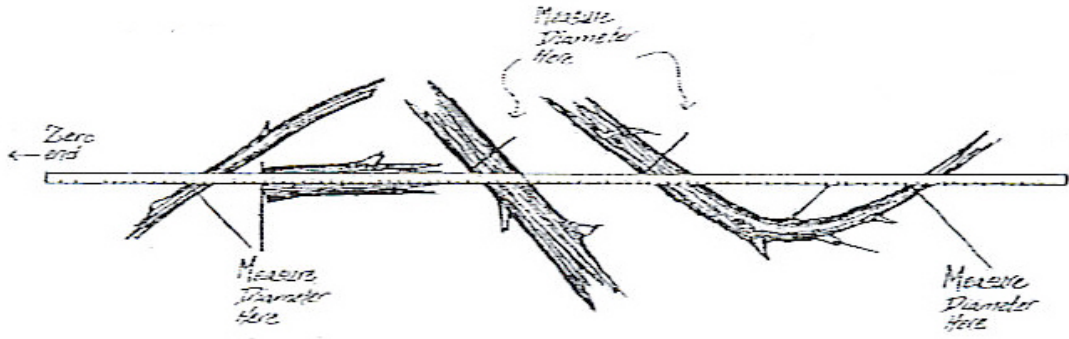
Three transects in randomly chosen azimuths starting at plot center. Transect is **50'** in length in conditions of natural fuels, but may be reduced to **35'** in slash fuels. Pick **one side** of the tape to work from for all measurements for consistency.

1. Strata and Plot#: Corresponds to plot number and strata type on Plot Data Form.
2. Duff Depth: Taken at 6' and 10' along transect. **Recorded to the nearest 0.1 inch**

3. Litter Depth: Three litter measurements, taken at 15', 30' and 45' along transect. Measurement is to highest point of litter, even if suspended aboveground. **Recorded to the nearest 0.1 inch.** Do not record average.
4. TWIG 1: 0-.24'' (1-hour fuel): Tally all woody material this diameter that intersects the transect between the 0-6 foot marks.
5. TWIG 2: 0.25-.99'' (10-hour fuel): Tally all woody material this diameter that intersects the transect between the 0-6 foot marks.
6. TWIG 3: 1.0-2.99'' (100-hour fuel): Tally all woody material this diameter that intersects the transect between the 0-10 foot marks.

***TWIG 1, 2 and 3: DO NOT INCLUDE PINE NEEDLES OR PINE CONES. COUNT ONLY WOODY PIECES ON THE SURFACE OF THE FOREST FLOOR, or what is visible from the surface; do not disturb litter or duff.**

*** Note: the curved piece is measured twice and counted twice (see diagram).**



7. Log/Piece Count: Individually record every log over 3'' in diameter that intersects the plane of the transect over the entire 50 foot transect.

The following data is recorded for each log:

-Decay class: A numeric ranking, class 1-5 (see table below).

*** Note: use only Codes 3-5**

Log Decay

Code	Bark	Twigs	Texture	Shape	Wood Color	Portion of log on ground
1*	Intact	Present	Intact	Round	Original	None, elevated on supporting points
2	Intact	Absent	Intact to soft	Round	Original	Parts touch, still elevated, sagging slightly
3**	Trace	Absent	Hard large pieces	Round	Original to faded	Bole on ground
4**	Absent	Absent	Soft blocky pieces	Round to oval	Light brown to faded brown	Partially below ground
5**	Absent	Absent	Soft, powdery	Oval	Faded light yellow or gray	Mostly below ground

-Diameter: Estimated diameter of log (to nearest inch) where it crosses the transect.

8. Length Est.: Estimated entire length of log (to nearest 0.1 ft).

***Note: keep the 50' transect tape in place for ground cover measurements once fuels have been completed.**

9. Ground cover: Percent of plot covered by bare ground, litter, grasses, forbs and shrubs as a percentage, recorded from a 0.5m X 2.0m quadrat placed with the bottom aligned with the 20 ft mark (so perpendicular to the transect line) on the same side fuels were measured on the Brown's transect tape.

Step 3: Live Trees and Snags

Live Tree and Snag Data Form:

1/10th acre plot (37.2' radius)

*** Note: measure all live trees and snags ≥ 5 inches DBH (diameter at breast height) or DRC (diameter at root collar) within this plot.**

**** After measuring live trees and snags move onto the Exotic Species form using the same plot boundary.**

Live Trees:

All live trees are recorded and measured individually. Some categories of the data form are used only for snags, so you may have blank fields (ie, decay class).

1. Strata/Plot#: Corresponds to plot number and strata type on Plot Data Form.
2. Tree #: Record number of tree on plot starting from north. (For example, the first tree encountered to the east of north would be recorded as tree #1)
3. Tree Status: Record as Live (L) or Dead (D).
4. SPP (Species): Record species of every sampled tree (Examples: PIP0= Ponderosa Pine: QUGA=Gambel oak, JUDE2=Alligator juniper: JUSC2=Rocky Mountain juniper)
5. DRC # Stems: Required for non-timber species. Number of stems per woodland species individual (Examples: Oaks, Junipers, Pinyons). Used to calculate Basal Area.
6. DBH/DRC: Record diameter at breast height (4.5' from ground level, uphill side of tree) for tree species. Record diameter at root crown for woodland species (measured at root collar, see Appendix M, CSE Field Guide). Record to the nearest 0.1''.
7. Tree Height: Record height from ground to top of tree to the nearest foot.
8. Crown Height: Measure height from ground level to lowest live branch. Record to nearest foot.
9. Crown Ratio: Estimated percent of the total tree height that is occupied by live crown.
10. Crown Class: A tree's relative position in the canopy. Recorded as a two-letter code. Use **DO=Dominant**, **CO=Co-dominant**, **IN=Intermediate**, and **OV=overtopped** (see table below).

Crown Class

Code	Name	Description
OP	Open-grown or Isolated	Tree crowns receive full light from above and from all sides. In even-aged stands, these trees have their crowns well above the general canopy.
DO	Dominant	Tree crowns receive full light from above and partly from the sides. Crowns extend above the general level of the crown cover of others of the same stratum and are not physically restricted from above, although possibly somewhat crowded by other trees on the sides. In even-aged stands, dominant trees rise somewhat above the general canopy.
CO	Codominant	Tree crowns receive full light from above, but comparatively little from the sides. Crowns form a general level of crown stratum, are not physically restricted from above and are crowded by other trees from the sides. In even-aged stands, codominants form the general canopy level.
IN	Intermediate	Tree crowns occupy a definitely subordinate position and are subject to strong lateral competition from crowns of dominants and codominants. They receive little direct light from above through small holes in the canopy, but no light from the sides.
OV	Overtopped	Tree crowns receive no direct light from above or from the sides and are entirely below the general level of dominant and codominant trees.
RE	Remnant	Trees that remain from a previous management activity or catastrophic event. The tree is significantly older than the surrounding vegetation. Remnant trees do not form a canopy layer and are usually isolated individuals or small clumps. This definition is from the Region 6 Inventory and Monitoring System field procedures for the Current Vegetation Survey.

11. Damage Category. If any tree damage exists. Appendix L of CSE Field Guide or App.R of CSE User Guide.
12. Damage Agent. If any damage exists. Appendix L of CSE Field Guide or App.R of CSE User Guide.
13. Damage Severity. If any damage exists. Appendix L of CSE Field Guide or App.R of CSE User Guide.
14. Tree Remarks. Comments relevant to the tree (ex. squirrel nest).

Snags:

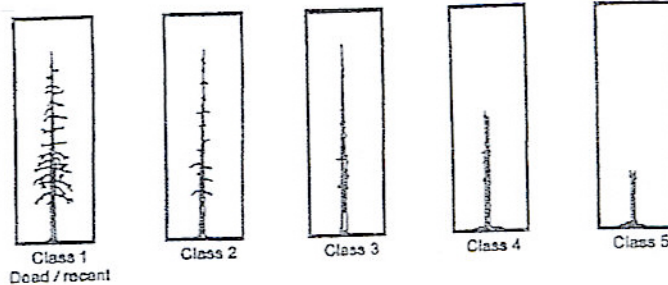
The following information is required for dead trees:

1. Strata/Plot#: Corresponds to plot number and strata type on Plot Data Form.
2. Tree #: Record number of tree on plot starting from north. (For example, the first tree encountered to the east of north would be recorded as tree #1)
3. Tree Status: Record as Live (L) or Dead (D).
4. DRC # Stems: Required for non-timber species. Number of stems per woodland species
5. individual (Examples: Oaks, Junipers, Pinyons).
6. DBH/DRC: Record diameter at breast height (4.5' from ground level, uphill side of tree)
7. for tree species. Record diameter at root crown for woodland species. Record to the nearest 0.1".
8. Tree Height: Record height from ground to top of tree to the nearest foot.
9. Decay Class: Record class number 1 – 5 (see table/diagram below).

Snag Decay Classes

Code	Bark	Heartwood Decay	Sapwood Decay	Limbs	Top Breakage	Bole Form	Time Since Death
1*	Tight, intact	Minor	None to incipient	Mostly Present	May be present	Intact	≤5 years
2	50% loose or missing	None to advanced	None to incipient	Small limbs missing	May be present	Intact	>5 years
3	75% missing	Incipient to advanced	None to 25%	Few remain	Approx. 1/3	Mostly intact	>5 years
4	75% missing	Incipient to advanced	25%+	Few remain	Approx. 1/3 to 1/2	Losing form, soft	>5 years
5	75%+ missing	Advanced to crumbly	50%+ advanced	Absent	Approx. 1/2+	Form mostly lost	>5 years

*Implies recent mortality, within the last 5 years.



Step 4: Exotic Species

Exotic Species Form:

1. Rate the percent of ground within the 0.1 ac plot covered by each exotic species using the Duabemire scale where species is present (see below). This is entered into the primary
 - a. T = < 1%
 - b. 1 = 1-5%
 - c. 2 = 5-25%
 - d. 3 = 25-50%
 - e. 4 = 50-75%
 - f. 5 = 75-95%
 - g. 6 = > 95

2. Exotic Richness: Number of exotic species found in the plot, entered into box above richness data.

Step 5: Regeneration

Regeneration Form:

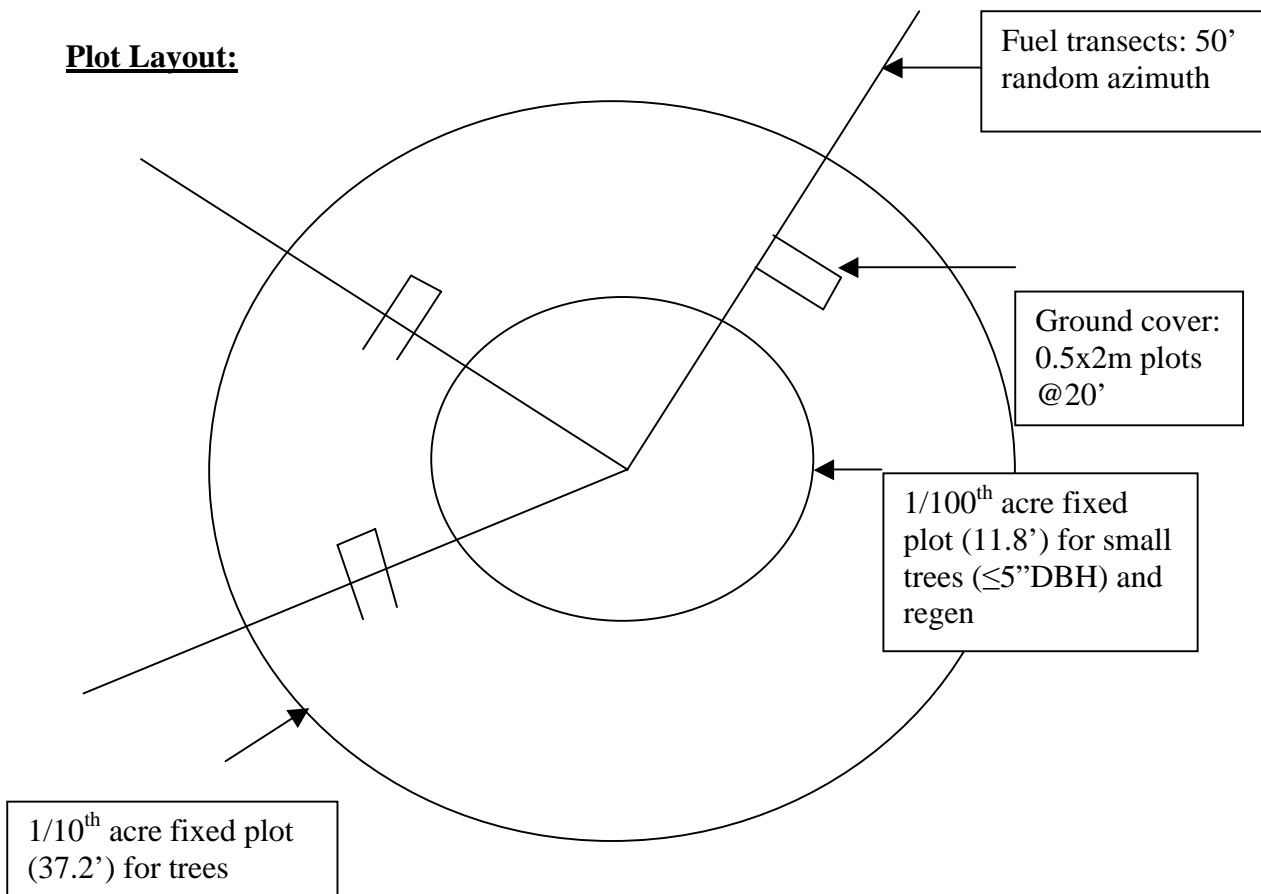
Collected on **1/100th acre (11.8' radius) nested plot.**

1. Tree less than 4.5' in height will be measured for total height and tallied into the height classes in the table below.

Trees >4.5' in height and <5.0" DBH or DRC are recorded on individual lines. Record species in the box next to the word 'Species'.

Tree height classes for trees < 4.5' in height
0-0.99'
1.00'-1.99'
2.00'-2.99'
3.00'-3.99'
4.00'-4.99'

Plot Layout:



MISCELLANEOUS:

Permanent plot photos: Digital photos are taken from plot center in the four cardinal directions. A laminated sign is placed within each photograph with identifying information (Project Name, Location, Stand, Plot#, Direction of photo). The photos encompass the general landscape and not just the plot boundaries.

Literature Cited:

- Anderson, H. E. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. USDA Forest Service General Technical Report INT-122, 22p. Intermountain Forest and Range Experiment Station, Ogden, UT.
- Scott, J. H. and R. E. Burgan. 2005. Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. USDA Forest Service General Technical Report RMRS-GTR-153. 72 pp. Rocky Mountain Research Station, Fort Collins, CO.
- USFS. 1997. Plant Associations of Arizona and New Mexico, Edition 3, Vol. 1: Forests. USDA Forest Service Southwestern Region Habitat Typing Guides, 291 pp.
- USFS. 2005. Common Field Exam Field guide Region 3, Version 1.7. USDA Forest Service Natural Resource Information System: Field Sampled Vegetation. 166 pp.