



United States Department of Agriculture
US Forest Service
Natural Resource Manager (NRM)



FSVeg Common Stand Exam User Guide Region 8 Appendices

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APPENDIX A: ADMINISTRATIVE AND PROCLAIMED FOREST CODES

Table 1: Region 8 codes

Admin Number	Administrative Forest Name	Proclaimed Number	Proclaimed Forest Name
01	National Forests in Alabama	03	William B. Bankhead
01	National Forests in Alabama	07	Conecuh
01	National Forests in Alabama	25	Talladega
01	National Forests in Alabama	26	Tuskegee
02	Daniel Boone	31	Daniel Boone
03	Chattahoochee – Oconee	05	Chattahoochee
03	Chattahoochee – Oconee	27	Oconee
04	Cherokee	06	Cherokee
05	National Forests in Florida	01	Apalachicola
05	National Forests in Florida	17	Ocala
05	National Forests in Florida	18	Osceola
06	Kisatchie	15	Kisatchie
07	National Forests in Mississippi	04	Bienville
07	National Forests in Mississippi	10	Delta
07	National Forests in Mississippi	11	De Soto
07	National Forests in Mississippi	13	Holly Springs
07	National Forests in Mississippi	14	Homochita
07	National Forests in Mississippi	28	Tombigbee
08	George Washington–Jefferson	32	George Washington
08	George Washington–Jefferson	33	Jefferson
09	Ouachita	19	Ouachita
10	Ozark – St. Francis	20	Ozark

Admin Number	Administrative Forest Name	Proclaimed Number	Proclaimed Forest Name
10	Ozark – St. Francis	29	St. Francis
11	National Forests in North Carolina	08	Croatan
11	National Forests in North Carolina	16	Nantahala
11	National Forests in North Carolina	21	Pisgah
11	National Forests in North Carolina	30	Uwahrrie
12	Francis Marion – Sumter	12	Francis Marion
12	Francis Marion – Sumter	24	Sumter
13	National Forests in Texas	02	Angelina
13	National Forests in Texas	09	Davy Crockett
13	National Forests in Texas	22	Sabine
13	National Forests in Texas	23	Sam Houston
16	El Yunque	34	El Yunque
36	Savannah River	36	Savannah River
60	Land Between the Lakes	35	Land Between the Lakes

APPENDIX B: DISTRICT CODES

Table 2: Region 8 codes

Forest	Code	District
Alabama	1	Bankhead
Alabama	3	Conecuh
Alabama	4	Oakmulgee
Alabama	5	Shoal Creek

Forest	Code	District
Alabama	6	Talledega
Alabama	7	Tuskegee
Chatahoochee/Oconee	1	Armuchee
Chatahoochee/Oconee	2	Toccoa
Chatahoochee/Oconee	4	Brasstown
Chatahoochee/Oconee	5	Talluah
Chatahoochee/Oconee	6	Chattooga
Chatahoochee/Oconee	7	Cohutta
Chatahoochee/Oconee	8	Oconee
Cherokee	1	Ocoee/Hiwassee
Cherokee	2	Nolichucky/Unaka
Cherokee	3	Tellico
Cherokee	4	Watauga
Daniel Boone	11	Morehead
Daniel Boone	12	Stanton
Daniel Boone	13	Berea
Daniel Boone	14	London
Daniel Boone	15	Somerset
Daniel Boone	16	Stearns
Daniel Boone	17	Redbird
Florida	1	Apalachicola
Florida	2	Lake George
Florida	4	Osceola
Florida	5	Seminole
Florida	6	Wakulla

Forest	Code	District
Francis Marion & Sumter	1	Enoree/Tyger
Francis Marion & Sumter	2	Andrew Pickens
Francis Marion & Sumter	3	Long Cane
Francis Marion & Sumter	5	Wambaw/Witherbee
George Washington Jefferson	1	Deerfield
George Washington Jefferson	2	Dry River
George Washington Jefferson	3	James River
George Washington Jefferson	4	Lee
George Washington Jefferson	5	Pedlar
George Washington Jefferson	6	Warm Springs
George Washington Jefferson	11	Blacksburg
George Washington Jefferson	12	Clinch
George Washington Jefferson	13	Glenwood
George Washington Jefferson	14	Mt. Rogers
George Washington Jefferson	15	New Castle
George Washington Jefferson	16	Wythe
Kisatchie	1	Catahoula
Kisatchie	2	Evangeline/Vernon
Kisatchie	3	Kisatchie

Forest	Code	District
Kisatchie	4	Winn
Kisatchie	5	Caney
Land Between the Lakes	1	Land Between the Lakes
Mississippi	1	Bienville
Mississippi	2	Desoto
Mississippi	4	Homochitto
Mississippi	5	Chickasawhay
Mississippi	6	Delta
Mississippi	7	Holly Springs
Mississippi	17	Tombigbee
North Carolina	2	Cheoah
North Carolina	3	Croatan
North Carolina	4	Appalachian
North Carolina	5	Grandfather
North Carolina	6	Highlands
North Carolina	7	Pisgah
North Carolina	9	Tusquitee
North Carolina	10	Uwharrie
North Carolina	11	Wayah
Ouchita	2	Caddo
Ouchita	3	Cold Springs
Ouchita	4	Foursche
Ouchita	5	Jessieville
Ouchita	6	Oklahoma
Ouchita	7	Mena

Forest	Code	District
Ouchita	8	Oden
Ouchita	9	Poteau
Ouchita	10	Womble
Ozark St. Francis	1	Sylamore
Ozark St. Francis	3	Big Piney
Ozark St. Francis	4	Pleasant Hill
Ozark St. Francis	5	Boston Mountain
Ozark St. Francis	6	Magazine
Ozark St. Francis	7	St. Francis
Savannah River	1	Savannah River
Texas	1	Angelina
Texas	3	Davy Crockett
Texas	4	Sam Houston
Texas	7	Sabine
Texas	8	Caddo/LBJ

APPENDIX C: STATE CODES

Table 3: Region 8 codes

Code	State
AL	Alabama
AR	Arkansas
FL	Florida
GA	Georgia
KY	Kentucky
LA	Louisiana

Code	State
MS	Mississippi
NC	North Carolina
OK	Oklahoma
PR	Puerto Rico and Virgin Islands
SC	South Carolina
TN	Tennessee
TX	Texas
VA	Virginia
WV	West Virginia

APPENDIX D: COUNTY CODES

Table 4: Alabama County codes

Code	County
7	Bibb
15	Calhoun
21	Chilton
27	Clay
29	Cleburne
39	Covington
47	Dallas
53	Escambia
59	Franklin
79	Lawrence
87	Macon
65	Rale

Code	County
105	Perry
121	Talledega
125	Tuscaloosa
133	Winston

Table 5: Arkansas county codes

Code	County
5	Baxter
7	Benton
29	Conway
33	Crawford
47	Franklin
51	Garland
59	Hot Spring
61	Howard
71	Johnson
77	Lee
83	Logan
87	Madison
89	Marion
97	Montgomery
101	Newton
105	Perry
107	Phillips
109	Pike
113	Polk

Code	County
115	Pope
125	Saline
127	Scott
129	Searcy
131	Sebastian
137	Stone
141	Van Buren
143	Washington
149	Yell

Table 6: Florida county codes

Code	County
3	Baker
23	Columbia
37	Franklin
69	Lake
73	Leon
77	Liberty
83	Marlon
107	Putnam
129	Wakulla

Table 7: Georgia county codes

Code	County
11	Banks
47	Catoosa

Code	County
55	Chattooga
85	Dawson
111	Fannin
115	Floyd
123	Gilmer
129	Gordon
133	Greene
137	Habersham
159	Jasper
169	Jones
211	Morgan
213	Murrey
219	Oconee
237	Putnam
241	Rabun
257	Stephens
281	Towns
285	Walker
291	Union
311	White
313	Whitfield

Table 8: Kentucky county codes

Code	County
11	Bath
13	Bell

Code	County
51	Clay
65	Estill
95	Harlan
109	Jackson
125	Laurel
129	Lee
131	Leslie
133	Letcher
143	Lyon
147	McCreary
151	Madison
165	Menifee
175	Morgan
189	Owsley
195	Pike
197	Powell
199	Pulaski
203	Rockcastle
205	Rowan
221	Trigg
213	Wayne
235	Whitley
237	Wolfe

Table 9: Louisiana county codes

Code	County
27	Claiborne
43	Grant
69	Natchitoches
79	Rapids
115	Vernon
119	Webster
127	Winn

Table 10: Mississippi county codes

Code	County
1	Adams
5	Amite
9	Benton
17	Chickasaw
19	Choctaw
27	Claiborne
29	Copiah
35	Forrest
37	Franklin
39	George
41	Greene
47	Harrison
55	Issaquena
59	Jackson

Code	County
61	Jasper
63	Jefferson
67	Jones
71	Lafayette
85	Lincoln
91	Marlon
93	Marshall
101	Newton
105	Oktibbeha
109	Pearl River
111	Perry
115	Pontotoe
123	Scott
125	Sharkey
129	Smith
131	Stone
139	Tippah
145	Union
149	Warren
153	Wayne
157	Wilkinson
159	Winston
161	Yalobusha

Table 11: North Carolina county codes

Code	County
11	Avery
21	Buncombe
23	Burke
27	Caldwell
31	Carteret
39	Cherokee
43	Clay
49	Craven
57	Davidson
75	Graham
87	Haywood
89	Henderson
99	Jackson
103	Jones
111	McDowell
113	Macon
115	Madison
121	Mitchell
123	Montgomery
151	Randolph
173	Swain
175	Transylvania
189	Watuaga
193	Wilkes

Code	County
199	Yancey

Table 12: Oklahoma county codes

Code	County
25	Cimarron
79	LeFlore
89	McCurtain
129	Roger Mills

Table 13: South Carolina county codes

Code	County
1	Aberville
3	Aiken
11	Barnwell
15	Berkeley
19	Charleston
23	Chester
37	Edgefield
39	Fairfield
47	Greenwood
59	Laurens
65	McCormick
71	Newberry
73	Oconee
81	Saluda
87	Union

Table 14: Tennessee county codes

Code	County
19	Carter
29	Cocke
59	Greene
91	Johnson
107	McMinn
123	Monroe
139	Polk
161	Stewart
163	Sullivan
171	Unicoi
179	Washington

Table 15: Texas county codes

Code	County
5	Angelina
111	Dallam
179	Gray
211	Hemphill
225	Houston
241	Jasper
339	Montgomery
347	Nacogdoches
403	Sabine
405	San Augustine
407	San Jacinto
419	Shelby
455	Trinity

Table 16: Virginia county codes

Code	County
5	Alleghany
9	Amherst
15	Augusta
17	Bath
19	Bedford
21	Bland
23	Botetourt
27	Buchanan
35	Carroll
45	Craig
51	Dickenson
69	Frederick
71	Giles
77	Grayson
91	Highland
105	Lee
121	Montgomery
125	Nelson
139	Page
155	Pulaski
161	Roanoke
163	Rockbridge
165	Rockingham
167	Russell

Code	County
169	Scott
171	Schenandoah
173	Smyth
185	Tazewell
187	Warren
191	Washington
195	Wise

Table 17: West Virginia county codes

Code	County
1	Barbour
23	Grant
25	Greenbrier
27	Hampshire
31	Hardy
63	Monroe
67	Nicholas
71	Pendleton
75	Pocahontas
77	Preston
83	Randolph
93	Tucker
101	Webster

APPENDIX E: EXISTING VEGETATION REFERENCES & CODES

Table 18: Existing Vegetation References

Code	Name	Author
FSHRB	Forest Service Handbook. Atlanta, GA, R8 FSH2409.26d. Silvicultural Examination and Prescription Handbook. R8 Amendment No. 2409.26d-93-1.	USDA Forest Service

Table 19: Existing FSHR8 Vegetation codes

Code	Description	Management Type?
2	Red pine	Yes
3	White pine	Yes
4	White pine – hemlock	No
5	Hemlock	No
6	Fraser fir	No
7	Red spruce – frasier fir	Yes
8	Hemlock – hardwood	Yes
9	White pine – cove hardwood	Yes
10	White pine – upland hardwood	Yes
11	Easter red cedar – hardwood	No
12	Shortleaf pine – oak	Yes
13	Loblolly pine – hardwood	Yes
14	Slash pine – hardwood	Yes
15	Pitch pine – oak	Yes
16	Virginia pine – oak	Yes
17	Red spruce – northern hardwood	No
18	Pond pine – hardwood	No
19	Sand pine – hardwood	No

Code	Description	Management Type?
20	Table Mountain pine – hardwood	Yes
21	Longleaf pine	Yes
22	Slash pine	Yes
23	Pondcypress	Yes
24	Baldcypress	Yes
25	Yellow pine	Yes
26	Longleaf pine – hardwood	Yes
27	Longleaf pine – slash pine	No
28	Shortleaf pine – loblolly pine	No
29	Loblolly pine – longleaf pine	No
30	Longleaf pine – shortleaf pine	No
31	Loblolly pine	Yes
32	Shortleaf pine	Yes
34	Sand pine	Yes
35	Eastern red cedar	Yes
36	Pond pine	Yes
37	Spruce pine	No
38	Pitch pine	Yes
39	Table Mountain pine	Yes
40	Hardwood – pond pine	No
41	Cove hardwood – white pine – hemlock	Yes
42	Upland hardwoods – white pine	Yes
43	Oak – Eastern red cedar	No
44	Southern red oak – yellow pine	Yes
45	Chestnut oak – scarlet oak – yellow pine	Yes

Code	Description	Management Type?
46	Bottomland hardwood – yellow pine	Yes
47	White oak – black oak – yellow pine	Yes
48	Northern red oak – hickory – yellow pine	Yes
49	Bear oak – southern scrub oak – yellow pine	Yes
50	Yellow poplar	Yes
51	Post oak – black oak	Yes
52	Chestnut oak	Yes
53	White oak – northern red oak – hickory	Yes
54	White oak	Yes
55	Northern red oak	Yes
56	Yellow poplar – white oak – northern red oak	Yes
57	Scrub oak	Yes
58	Sweetgum – yellow poplar	Yes
59	Scarlet oak	Yes
60	Chestnut oak – scarlet oak	Yes
61	Swamp chestnut oak – cherrybark oak	Yes
62	Sweetgum – oak	Yes
63	Sugarberry – American elm – green ash	Yes
64	Laurel oak – willow oak	Yes
65	Overcup oak – water hickory	No
66	Atlantic white cedar	No
67	Baldcypress – water tupelo	Yes
68	Sweetbay – swamp tupelo – red maple	Yes
69	Beech – magnolia	Yes
70	Black cherry	Yes

Code	Description	Management Type?
71	Black ash – American elm – red maple	No
72	River birch – sycamore	Yes
73	Cottonwood	No
74	Willow	No
75	Sycamore – pecan – American elm	Yes
76	Silver maple – American elm	No
77	Oak hammock	Yes
78	American chestnut	No
79	Slash pine – cypress	No
80	Upland oak	No
81	Sugar maple – beech – yellow birch	Yes
82	Black walnut	No
83	Black birch	No
84	Chestnut oak – white oak – scarlet oak	No
85	White oak – black oak – hickory	No
87	Red maple	No
88	Black locust	No
90	Non-forest	No
97	Live oak	Yes
98	Undrained flatwoods	No
99	Brush species	No
800	Novaculite Glade (includes talus)	No
801	Cliff and Talus (sandstone, shale)	No
802	Glade and Barrens (sandstone, shale)	No
803	Calcareous Prairie	No

Code	Description	Management Type?
804	Seep/Spring	No
805	Montane Oak	No
806	Ozark Clacareous Glade and Barren (Ozark)	No
807	Sinkhole and Depression Pond (Ozark)	No
808	Clacareous Cliff and Talus (Ozark)	No
809	Prairie and Woodland (Ozark)	No

The Existing Vegetation type code is a classification of the forest overstory cover type currently existing on the stand. These codes are also used to identify management type. Existing Vegetation type is based on one or more species of trees that comprise the main crown canopy (i.e., the dominants and co-dominants). These codes generally conform to definitions in "Forest Cover Types of the United States and Canada," Society of American Foresters (1980) with some notable exceptions. They are divided into four broad groups as follows:

- **Pine Types:** Stands in which 70 percent or more of the basal area of trees with dominant and co-dominant crowns are softwoods, the specific name represents the species comprising the plurality.
- **Pine-Hardwood Types:** Stands in which 51-69 percent of the basal area of trees with dominant and co-dominant crowns are softwood species. Use the type name associated with the softwood species comprising the plurality.
- **Hardwood-Pine Types:** Stands in which 51-69 percent of the basal area of trees with dominant and co-dominant crowns are hardwoods. Use the type name associated with the hardwood species comprising the plurality.
- **Hardwood Types:** Stands in which 70 percent or more of the basal area of trees with dominant and co-dominant crowns are hardwoods. Use the type name associated with the hardwood species comprising the plurality.

The SAF cover type classification requires a stand to exceed 80 percent in one species to be considered pure as opposed to the 70 percent threshold used in the Region 8 classification. The SAF cover type classification considers all mixtures of pine and hardwood that have less than 80 percent stocking of one species group as pine hardwood types. The Region 8 approach divides the groups into Pine-Hardwood and Hardwood-Pine.

The percentage of softwood and hardwood in the Region 8 classification applies to the particular mixture of trees at any single sample point. This is not the same as, and should not be confused with intermingling of less-than-stand-size areas of pine type in a hardwood stand or of a hardwood type in a pine stand. These less-than-stand-size areas should be treated as pine inclusions in hardwood stands or hardwood inclusions in pine stands. In heterogeneous areas with neither type being of stand size, forest type should be assigned on the basis of the type occupying the plurality of the area. Such situations should not be assigned a pine-hardwood or hardwood-pine forest type unless individual plot classifications for a plurality of the area are a mixed type.

- **Management Types:** Existing Vegetation codes are used to identify management type. The management type classification reflects the vegetation type that should be

produced on the site to best meet the goals and objectives of the Forest Plan. For areas classified as suitable for timber production and allocated to management prescriptions with timber production management emphasis, the management type is the vegetation type that optimizes the productive capability of the site to produce high quality material. These same criteria also apply to all other areas unless the Forest Plan requires occupying the site with another, less productive vegetation type, to meet some other resource goal or objective.

Assigning a Management Type code to a stand implies that you expect the Existing Vegetation type to be this code after the next regeneration. For example, 74 Willow is not an acceptable Management Type because we would not regenerate a stand and expect to see Willow as the resulting Existing Vegetation Type.

Note: CISC used four levels of Management Type. Those levels have been removed from use as of the transition to FSveg. If this causes a problem for you, please let me know.

-David Belcher

APPENDIX F: POTENTIAL VEGETATION REFERENCES

Region 8 does not support Potential Vegetation References.

APPENDIX G: POTENTIAL VEGETATION CODES

Region 8 does not support Potential Vegetation Codes.

APPENDIX H: FUEL PHOTO REFERENCES & CODES

Table 20: Fuel Photo References

Code	Reference
19	Ottmar, Roger D. and R.E. Vihnanek. 2000. Stereo Photo Series for Quantifying Natural Fuels. Volume VI: Longleaf Pine, Pocosin, and Marshgrass Types in the Southeast United States. PMS 835. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center. 56 p.
24	Christine M. Lynch and L.J. Horton. 1983. Photo Series for Quantifying Forest Residues in Loblolly Pine, Eastern White Pine, Pitch Pine and Virginia Pine. USDA Forest Service, NA-FR-25.
26	Eric R. Scholl and Thomas A. Waldrop. 1999. Photos for Estimating Fuel Loadings Before and After Prescribed Burning in the Upper Coastal Plain of the Southeast. USDA Forest Service, SRS-26.

Code	Reference
29	Bradford M. Sanders and David H. Van Lear. 1988. Photos for Estimating Residue Loadings Before and After Burning in Southern Appalachian Mixed Pine – Hardwood Clearcuts. USDA Forest Service GTR SE-49.
30	Wade et. al. 1993. Photo Series for Estimating Post-Hurricane Residues and Fire Behavior in Southern Pine. 1993. USDA Forest Service GTR SE-82.

FUEL PHOTO CODES

Table 21: Fuel Photo Codes for Reference 19

Code
LLP01
LLP02
LLP03
LLP04
LLP05
LLP06
LLP07
LLP08
MG01
MG02
MG03
MG04
MG05
MG06
MG07
MG08
MG09

Code
PS01
PS02
PS03
PS04
PS05
PS06
PW01
PW02

Table 22: Fuel Photo Codes for Reference 24

Code
1-LL-2-N
2-LL-2-H
3-LL-3-N
4-LL-2-H
5-LL-1-P
6-LL-3-H
7-LL-3-H
8-LL-3-N
9-LL-3-H
1-WP-3-N
2-WP-2-P
3-WP-3-N
4-WP-3-H
5-WP-3-H
6-WP-2-H

Code
7-WP-3-N
1-PP-1-N
2-PP-2-N
3-PP-1-N
4-PP-1-N
5-PP-2-N
6-PP-2-N
7-PP-3-H
1-VP-2-N
2-VP-2-N
3-VP-3-N
4-VP-2-N

Table 23: Fuel Photo Codes for Reference 26

Code
FC1-PRE
FC1-POST
FC2-PRE
FC2-POST
FC3-PRE
FC3-POST
FC4-PRE
FC4-POST
FC5-PRE
FC5-POST
FC6-PRE

Code
FC6-POST
FC7-PRE
FC7-POST
FC8-PRE
FC8-POST

Table 24: Fuel Photo Codes for Reference 29

Code
6A
6B
8A
8B
10A
10B
12A
12B
14A
14B
16A
16B
18A
18B
20A
20B

Table 25: Fuel Photo Codes for Reference 30

Code
1A
1C
1D
2A
2C
2D
3B
3D

REGION 8 LAND CLASS CODES

Land Class	Name	Suitable	Description
000	Un-Inventoried	No	Land in Forest Service Ownership that has not been classified. Usually for new acquisitions or other lands for which no information is available
100	Water Area	No	Areas that are covered by water and not included in the more specific codes below
110	Natural Lake	No	A naturally occurring area of water of more than one are in size
120	Reservoir	No	A constructed area of water of more than one acre in size
125	Pond	No	A natural or construncted area of water of less than one acre in size
130	Estuary	No	An area where fresh water from a river mixes with salt water from the sea
140	River	No	A flowing body of water in a well defined bed or channel. Wider than a stream

Land Class	Name	Suitable	Description
150	Stream	No	A flowing body of water in a well defined bed or channel. Narrower than a river. Most of the streams that we are used to seeing are components of stands and do not get mapped out separately with stand numbers of their own and thus would not be covered by this code. Use this code when a stream is large enough or important enough to be mapped separately as a stand by itself.
160	Wetlands	No	Areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. These areas are also referred to as swamps, marshes, bogs, and bays.
200	Non-Forest Land	No	Lands developed for non-forest use include areas for crops, improved pasture, residential, or administrative areas, improved roads of any width, and adjoining road clearing and power line/pipeline clearing of any width. (Forest land is defined as land at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use). 219.3. Use this code for non-forest land not covered by more specific codes below.
210	Public Park, Cemetery	No	Land containing an officially designated public park or a cemetery
220	Utility R-O-W	No	Land containing easements or Right-of-way for utility lines
230	Road and Railroad R-O-W	No	Land occupied by road and/or railroad right-of-way
240	Special Use	No	Lands that are under a special user permit
250	Wildlife Opening	No	Non-forest land used for wildlife purposes
251	Balds	No	High elevation heaths or grassy areas
260	Nursery	No	Nursery

Land Class	Name	Suitable	Description
265	Seed Orchard	No	Seed Orchard
270	Non Forest service	No	Lands within Forest Service boundary that do not belong to Forest Service. May be forested or non-forested.
280	Mine	No	Strip Mines, well sites, quarries, etc.
290	Military Use	No	Lands used by or formerly used by military. May contain unexploded ordinance at or near ground surface. May contain shrapnel in trees.
300	Reserved - Withdrawn	No	Withdrawn from timber production by an act of Congress, the Secretary of Agriculture, or the Chief of the Forest Service
310	Scenic Area	No	Officially designated scenic area
320	Historic Area	No	Officially designated historic area
330	Natural Area	No	Officially designated natural area. Includes research natural areas, RNAs
340	Geological/Archeological Area	No	Officially designated geological/archeological area
350	Wilderness Area	No	Officially designated wilderness area
351	RCW in Wilderness – Active	No	Officially designated wilderness area with RCW currently active
352	RCW in Wilderness – in active	No	Officially designated wilderness area with RCW previously active
360	Wild and Scenic River	No	Officially designated wild and scenic river. Includes river corridor
370	Roadless Area	No	Officially designated roadless area

Land Class	Name	Suitable	Description
400	Deferred - Withdrawn	No	Deferred – withdrawn from timber production pending final action at which time it may be re-classified into the 300 series or some other land class
410	Scenic Area	No	Scenic area. Pending
420	Historic Area	No	Historic area. Pending
430	Natural Area	No	Natural area. Pending
440	Geological/Archeological Area	No	Geological/Archeological area. Pending
450	Wilderness Area	No	Wilderness area. Pending
460	Wild and Scenic River	No	Wild and Scenic River. Includes river corridor. Pending
470	Roadless Area	No	Roadless area. Pending
500	Standard Forest Land	Yes	Standard – timber production emphasis
510	Key Area for Wildlife, Fish, Rare Plants	Yes	A stand lying within an area having a timber production emphasis where wildlife, fish, and rare plants resources are a major management consideration
511	Contains key area for wildlife, Fish, rare Plants	Yes	Area of standard forest land which contains an inclusion where wildlife, fish, and rare plants resources are a major management consideration.
512	Contains Threatened & endangered Species-Plants	Yes	Area of standard forest land which contains an inclusion where threatened & endangered plants resources are a major management consideration.
513	Contains Threatened & endangered Species-Animals	Yes	Area of standard forest land which contains an inclusion where threatened & endangered animals resources are a major management consideration.

Land Class	Name	Suitable	Description
520	Open woodland	Yes	Stocking levels are maintained below regional guidelines for fully stocked stands. Stands are open, park-like with emphasis on maintaining a strong herbaceous component. Percent crown closure from all woody vegetation is between 10% and 60%
530	Low Site Productivity	Yes	n/a
540	Steep Slopes	Yes	Steep slopes
545	Sensitive Soils	Yes	Sensitive soils
550	Needs R-O-W	Yes	Lands needing road access for implementation of management prescriptions
560	Needs Road	Yes	Lands needing road construction for implementation of management prescriptions
580	Military Use	No	Lands used or formerly used by military. May contain unexploded ordinance at or near ground surface. May contain shrapnel in trees.
590	RCW Forage for Active Cluster	Yes	Stand designated as foraging habitat for active RCW cluster
591	RCW Foraging Stand for Recruitment Cluster	Yes	Stand designated as foraging habitat for RCW recruitment cluster. Note: recruitment clusters are provisioned with artificial cavities.
592	RCW Foraging Stand for Recruitment Stand	Yes	Stand designated as foraging habitat for RCW recruitment stand. Note: recruitment stands are not provisioned with artificial cavities.
593	RCW Foraging Stand for Inactive Cluster	Yes	Stand designated as foraging habitat for inactive RCW cluster
594	RCW Potential Recruitment	Yes	Stand that may be used for recruitment in the future
600	Special	Yes	Special – Timber production secondary to other resources

Land Class	Name	Suitable	Description
620	Sensitive Plants	Yes	Sensitive plants
630	Recreation Emphasis	Yes	Recreation emphasis
640	Visual Emphasis	Yes	Visual emphasis
650	Wildlife Emphasis	Yes	Wildlife emphasis
660	Water Emphasis	Yes	Water emphasis
665	Cultural Resource Emphasis	Yes	Cultural resource emphasis
667	Wildlife Preserve	Yes	Wildlife preserve
670	Special Study Area	Yes	Special study area
671	Growth and Yield Research Plot	Yes	Growth and yield research plot
680	Progeny Test Plantation	Yes	Progeny test plantation
690	Military Use	No	Lands used or formerly used by military. May contain unexploded ordinance at or near ground surface. May contain shrapnel in trees.
700	Lack of Technology	No	Technology is not available to ensure timber production from the land without irreversible resource damage to soils, productivity, or watershed conditions.
710	Restocking Not Assured	No	There is not reasonable assurance that the land can be adequately restocked as provided in 219.27©(3). Adequate restocking means that the cut area will contain the minimum number, size, distribution, and species composition of regeneration as specified in the regional silvicultural guides for each forest type 5 years after harvest.
720	Irreversible Damage	No	Timber production would cause irreversible resource damage to soils, productivity, or watershed conditions.

Land Class	Name	Suitable	Description
740	Response Info Lacking	No	It is not known if timber production can be ensured without irreversible resource damage to soils, productivity, or watershed conditions.
800	Not Appropriate	No	Land coded in the 800's series are designated as Not Appropriate for timber production by regional Forester's decision in approving forest plans
810	Experimental Forest, Range or Watershed	No	Lands used for research and special study
820	MIN Level	No	Lands that are unsuitable due to access or existing landscape features. Lands that are difficult and/or exceedingly costly to manage. Minimally productive. If a treatment is applied then a number of mitigating measures must be implemented to protect the resources. Use this code if, when classifying a stand, you think "I would not touch this area with a 10 foot pole", nothing but big trouble once disturbed, "Why would I want to?"
821	MIN Level - Steep Slopes	No	MIN level – steep slopes
822	MIN Level - Inadequate Markets	No	MIN level – inadequate markets
823	MIN Level - Inaccessible ROW needed	No	MIN level – In accessible – ROW needed
824	MIN Level - Sensitive Soils	No	MIN level – sensitive soils
825	MIN Level - Low Level Management	No	MIN level – low level management
826	MIN Level – Physical Barriers	No	MIN level – physical barriers
827	MIN Level - Road Costs Exceed Values	No	MIN level – road costs exceeds values

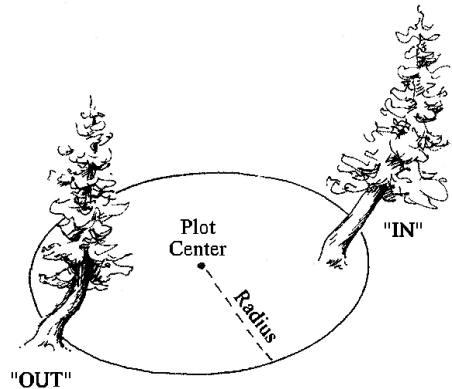
Land Class	Name	Suitable	Description
828	MIN Level – Riparian Area	No	MIN level – riparian area
830	Wildlife Emphasis	No	Wildlife emphasis
832	Threatened & Endangered Species – Plants	No	Unsuitable forest land with threatened & endangered plant resources
833	Threatened & Endangered Species – Animals	No	Unsuitable forest land with threatened & endangered animal resources
840	RCW Cluster Active	No	Area, at least 10 acres in size, containing the aggregate of cavity trees + a 200' buffer in an active cluster
841	RCW Cluster Inactive	No	Area, at least 10 acres in size, containing the aggregate of cavity trees + a 200' buffer in an inactive cluster
842	RCW Recruitment Stand	No	Area, at least 10 acres in size, designated for RCW recruitment that has not been provisioned with artificial cavities
843	RCW Replacement Stand	No	Area, at least 10 acres in size, designated to replace existing active RCW cluster. Sites should be adjacent to or within ¼ mile of active cluster it is replacing. Cavities are not present.
844	RCW Recruitment Cluster	No	Area, at least 10 acres in size, designated for RCW recruitment that has been provisioned with artificial cavities
846	Other Rare/Endangered Species	No	Area, at least 10 acres in size, designated for conservation of rare/endangered species other than RCW
848	Designated Critical habitat	No	Area, at least 10 acres in size, legally designated as critical habitat. For aquatic designated critical habitat, the adjacent riparian should also be coded as critical habitat.

Land Class	Name	Suitable	Description
850	Developed Recreation Site	No	Developed recreation site
851	Un-Developed Recreation Site	No	Un-developed recreation site
852	Appalachian Trail	No	Appalachian Trail corridor
853	Other National Recreation Trail	No	Other national Recreation Trail corridor
860	Administrative Site	No	Land occupied by Forest Service structures such as District offices, work centers, etc.
861	Undeveloped Administrative Site	No	Land potentially occupied by Forest Service structures such as District offices, work centers, etc.
862	Summer Home Site	No	Site contains a residential structure owned by Forest Service but rented or leased to public for residential or recreational purposes
870	Nursery	No	Lands dedicated to production of tree seedlings
871	Seed Orchards	No	Lands dedicated to the production and collection of tree seed
880	RARE II Lands under study	No	Lands removed from the suitable timber base pending evaluation with the roadless Area Review and Evaluation legislated program
890	Military Use	No	Lands used or formerly used by military. May contain unexploded ordinance at or near ground surface. May contain shrapnel in trees.
891	Contaminated	No	Lands containing hazardous materials (chemical, nuclear, etc.)
900	Unproductive	No	Forested land that is incapable of producing a minimum level of growth where the minimum level is set in the forest plan

APPENDIX I: FIXED RADIUS PLOT

A fixed radius plot is used to sample trees that are less than the specified breakpoint diameter. These sample trees are determined to be “in” or “out” at ground line. If the measured distance from plot center to the central axis of the tree at ground line is equal to or less than the fixed plot radius the tree is tallied as a sample tree. If this distance is greater than the fixed plot radius, the tree is not tallied.

Figure 1: Trees “in” and “out” of fixed radius plot



On level ground, the fixed plot radius is determined by holding the measuring tape or pole in a horizontal position from plot center to the central axis of the sample tree. On slopes greater than 9 percent, if a measuring tape or pole cannot be horizontally from plot center to the central axis of the sample tree, the fixed plot radius is corrected for the slope percent by using one of the following methods.

METHOD 1

Correct the fixed plot radius for slope percent using the “Circular Plot Radii Corrected for Slope” table and then measuring distances parallel to the ground line. This method always results in a circular plot on the slope. Example – 1/300 acre fixed plot on 50 percent slope. Corrected fixed plot radius is 7.2 feet.

Figure 2: Correcting the fixed plot radius for slope percent

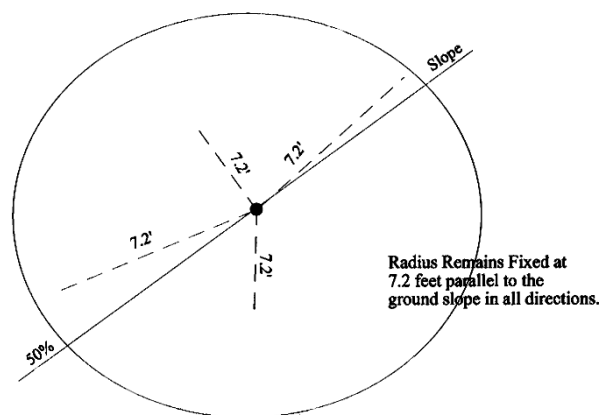


Table 26: Circular Plot Radii Corrected for Slope; plot size in acres

Slope %	1 / 300	1 / 100	1 / 50	1 / 20	1 / 10	1 / 5
0-9	6.8	11.8	16.7	26.3	37.2	52.7
10-17	6.8	11.8	16.7	26.5	37.4	52.9
18-22	6.9	11.9	16.8	26.6	37.6	53.2
23-26	6.9	12.0	16.9	26.7	37.8	53.4
27-30	6.9	12.0	17.0	26.9	38.0	53.7
31-33	7.0	12.1	17.1	27.0	38.2	54.0
34-36	7.0	12.1	17.1	27.1	38.3	54.2
37-39	7.0	12.2	17.2	27.2	38.5	54.5
40-42	7.1	12.2	17.3	27.4	38.7	54.7
43-44	7.1	12.3	17.4	27.5	38.9	55.0
45-47	7.1	12.3	17.5	27.6	39.1	55.2
48-49	7.2	12.4	17.5	27.7	39.2	55.5
50-51	7.2	12.5	17.6	27.9	39.4	55.7
52-53	7.2	12.5	17.7	28.0	39.6	56.0
54-55	7.3	12.6	17.8	28.1	39.8	56.2
56-57	7.3	12.6	17.9	28.2	39.9	56.5
58-59	7.3	12.7	17.9	28.4	40.1	56.7
60-61	7.4	12.7	18.0	28.5	40.3	57.0
62-63	7.4	12.8	18.1	28.6	40.4	57.2
64-65	7.4	12.8	18.2	28.7	40.6	57.4
66-67	7.4	12.9	18.2	28.8	40.8	57.7
68-69	7.5	13.0	18.3	29.0	41.0	57.9
70	7.5	13.0	18.4	29.1	41.1	58.2
71-72	7.5	13.1	18.5	29.2	41.3	58.4

Slope %	1 / 300	1 / 100	1 / 50	1 / 20	1 / 10	1 / 5
73-74	7.6	13.1	18.5	29.3	41.5	58.6
75	7.6	13.2	18.6	29.4	41.6	58.7
76-77	7.6	13.2	18.7	29.6	41.8	59.1
78-79	7.7	13.3	18.8	29.7	42.0	59.3
80	7.7	13.3	18.8	29.8	42.1	59.6
81-82	7.7	13.4	18.9	29.9	42.3	59.8
83	7.8	13.4	19.0	30.0	42.5	60.0
84-85	7.8	13.5	19.1	30.1	42.6	60.3
86	7.8	13.5	19.1	30.3	42.8	60.5
87-88	7.8	13.6	19.2	30.4	42.9	60.7
89	7.9	13.6	19.3	30.5	43.1	61.0
90-91	7.9	13.7	19.3	30.6	43.3	61.2
92	7.9	13.7	19.4	30.7	43.4	61.4
93-94	8.0	13.8	19.5	30.8	43.6	61.6
95	8.0	13.8	19.6	30.9	43.7	61.9
96-97	8.0	13.9	19.6	31.0	43.9	62.1
98	8.0	13.9	19.7	31.2	44.1	62.3
99-100	8.1	14.0	19.8	31.3	44.2	62.5
101	8.1	14.0	19.8	31.4	44.4	62.8
102	8.1	14.1	19.9	31.5	44.5	63.0
103-104	8.2	14.1	20.0	31.6	44.7	63.2
105	8.2	14.2	20.1	31.7	44.8	63.4
106-107	8.2	14.2	20.1	31.8	45.0	63.6
108	8.2	14.3	20.2	31.9	45.1	63.8
109	8.3	14.3	20.3	32.0	45.3	64.1

Slope %	1 / 300	1 / 100	1 / 50	1 / 20	1 / 10	1 / 5
110-111	8.3	14.4	20.3	32.1	45.5	64.3
112	8.3	14.4	20.4	32.2	45.6	64.5
113	8.4	14.5	20.5	32.4	45.8	64.7
114-115	8.4	14.5	20.5	32.5	45.9	64.9
116	8.4	14.6	20.6	32.6	46.1	65.1
117	8.4	14.6	20.7	32.7	46.2	65.3
118-119	8.5	14.7	20.7	32.8	46.4	65.6
120	8.5	14.7	20.8	32.9	46.5	65.8
121	8.5	14.8	20.9	33.0	46.7	66.0
122	8.5	14.8	20.9	33.1	46.8	66.2
123-124	8.6	14.8	21.0	33.2	47.0	66.4
125	8.6	14.9	21.1	33.3	47.1	66.6
130	8.7	15.1	21.3	33.7	47.7	67.4
135	8.8	15.3	21.6	34.1	48.3	68.3
140	8.9	15.4	21.8	34.5	48.8	69.1
145	9.0	15.6	22.1	34.9	49.4	69.9
150	9.1	15.8	22.3	35.3	50.0	70.0

METHOD 2

Determine the slope limiting distance to borderline trees by using the “Slope Correction Table” (the slope being corrected is the slope from plot center to the tree, not the overall plot slope). Measure the distance parallel to the ground line to the borderline tree. This method always results in an oval on the slope. Following is a list of fixed plot sizes and the specific radius for each.

Table 27: Method 2 plot size/radius slope

Plot Size	Plot Radius
1/1000	3.7 feet

Plot Size	Plot Radius
1/500	5.3 feet
1/400	5.9 feet
1/300	6.8 feet
1/250	7.4 feet
1/200	8.3 feet
1/150	9.6 feet
1/100	11.8 feet
1/50	16.7 feet
1/20	26.3 feet
1/10	37.2 feet
1/5	52.7 feet
1/4	58.9 feet
1/3	68.0 feet
1/2	83.3 feet
1	117.8 feet

To determine the slope limiting distance, multiply the plot radius for the appropriate plot size by the appropriate slope correction factor.

Example 1

1/300 acre fixed plot with a borderline tree on a 45 percent slope. A 1/300-acre plot equals a 6.8-foot radius and the slope correction factor for a 45 percent slope is 1.10. $6.8 \times 1.10 = 7.48$; thus, a tree on a 1/300 acre fixed plot at a 45 percent slope can be 7.5 feet from plot center.

Example 2

The same plot has another borderline tree on a 25 percent slope. The slope correction factor for a 25 percent slope is 1.03. $6.8 \times 1.03 = 7.0$; thus, a tree on a 1/300 acre fixed plot at a 25 percent slope can be 7.0 feet from plot center.

Figure 3: Plot size radius slope

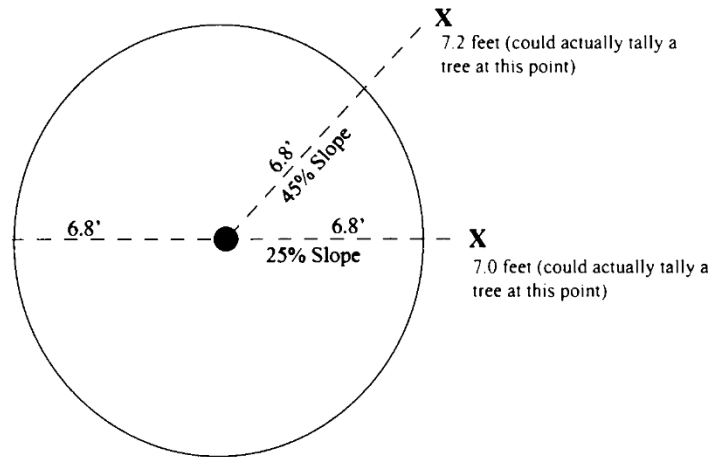


Table 28: Slope Correction Table

Percent of Slope	Degree of Slope	Correction Factor
0 to 9	0-6	1.00
10 to 17	7-10	1.01
18 to 22	11-12	1.02
23 to 26	13-14	1.03
27 to 30	15-17	1.04
31 to 33	18	1.05
34 to 36	19-20	1.06
37 to 39	21	1.07
40 to 42	22	1.08
43 to 44	23	1.09
45 to 47	24	1.10
48 to 49	25-26	1.11
50 to 51	27	1.12
52 to 53	28	1.13
54 to 55	29	1.14

Percent of Slope	Degree of Slope	Correction Factor
56 to 57	29	1.15
58 to 59	30	1.16
60 to 61	31	1.17
62 to 63	32	1.18
64 to 65	33	1.19
66 to 67	34	1.20
68 to 69	34	1.21
70	35	1.22
71 to 72	36	1.23
73 to 74	37	1.24
75	37	1.25
76 to 77	38	1.26
78 to 79	38	1.27
80	39	1.28
81 to 82	39	1.29
83	40	1.30
84 to 85	40	1.31
86	41	1.32
87 to 88	41	1.33
89	42	1.34
90 to 91	42	1.35
92	43	1.36
93 to 94	43	1.37
95	44	1.38
96 to 97	44	1.39

Percent of Slope	Degree of Slope	Correction Factor
98	44	1.40
99 to 100	45	1.41
101	45	1.42
102	46	1.43
103 to 104	46	1.44
105	46	1.45
106 to 107	47	1.46
108	47	1.47
109	47	1.48
110 to 111	48	1.49
112	48	1.50
113	48	1.51
114 to 115	49	1.52
116	49	1.53
117	49	1.54
118 to 119	50	1.55
120	50	1.56
121	50	1.57
122	51	1.58
123 to 124	51	1.59
125	51	1.60
126	52	1.61
127 to 128	52	1.62
129	52	1.63
130	52	1.64

Percent of Slope	Degree of Slope	Correction Factor
131	53	1.65
132 to 133	53	1.66
134	53	1.67
135	53	1.68
136	54	1.69
137 to 138	54	1.70
139	54	1.71
140	54	1.72
141	55	1.73
142 to 143	55	1.74
144	55	1.75
145	55	1.76
146	56	1.77
147	56	1.78
148 to 149	56	1.79
150	56	1.80

APPENDIX J: VARIABLE RADIUS PLOT

INTRODUCTION

In our determination is made at the DBH or DRC of each tree. For information on the theory and mathematics of variable plot cruising, and formulas for determining the plot radius factor for any given BAF, the reader is referred to **Log Scaling and Timber Cruising**, 1973, J.R. Dilworth. OSU Book Stores, Inc., Corvallis, Oregon.

The experienced field person using a wedge prism, angle gauge, or relaskop can quickly tell in which case trees are “in” or “out” on the variable plot. However, there are certain trees that are questionable (borderline) for tally because they are located at the outer limits of the variable plot radius. This narrative deals with the procedures needed to ascertain if these borderline trees should be tallied: the mechanics of using plot radius tables in the field, the associated measurements, and corrections of variable plot radii for slope.

MEASUREMENT OF BORDERLINE TREES TO DETERMINE “IN OR OUT” STATUS

In variable plot sampling, the plot radius varies according to the DBH or DRC of each tree. To determine whether a tree is to be sampled requires measurement of its DBH or DRC and its distance from plot center. [Table 29](#), [Table 30](#), [Table 31](#), [Table 32](#), [Table 33](#), [Table 34](#), and [Table 35](#) display limiting distances (the maximum horizontal distance from plot center to the face of the tree at breast height for a tree to be considered “in”) for various tree diameters and commonly used basal area factors (BAF).

Once the DBH or DRC of the borderline tree is taken, the limiting distance is found by entering the table appropriate for the specified BAF. This limiting distance is then compared to the horizontal distance between plot center and the nearest **face of the tree** at breast height. If the measured horizontal distance from plot center is *less than or equal to* the limiting distance from the table, the tree in question is “in” and is tallied as a sample tree. However, if measured horizontal distance from plot center is greater than the limiting distance, then the tree in question is “out” and is not tallied.

1. Measure the diameter to the nearest tenth of an inch
2. Measure the percent slope from the face of the tree at DBH or DRC to plot center

If the slope is less than ten percent look up limiting distance in Tables 1 through 5 or use the BAF correction factors listed in Table 35 below.

Table 29: BAF correction factors

Type	Correction Factors								
BAF	10	15	20	25	30	35	40	50	60
Plot Radius Factor*	27.08	2.203	1.902	1.697	1.546	1.428	1.333	1.188	1.081

** This is a corrected plot radius factor, corrected for determining the limiting distance to the face of the tree. A standard plot radius factor was used to determine limiting distance to the center of a tree, and is computed by $8.696/\text{SQR}(\text{BAF})$. A corrected PRF subtracts $1/24$ (0.041666) from the standard plot radius factor.*

Example:

BAF = 40; DBH = 20.9 inches; Slope = 5%

Limiting Distance = Plot Radius Factor * DBH, $1.333 * 20.9 = 27.9$ feet

3. **If the slope is greater than ten percent**, first determine the slope correction factor. The slope correction factor and the slope corrected plot radius factor can be obtained by using the formula below or by referring to [Table 34](#). Then, multiply the slope correction factor by the plot radius factor identified in step #3 above to obtain the slope corrected plot radius factor. Finally, multiply the slope corrected plot radius factor by the diameter to obtain the limiting distance.

Example:

BAF = 40; DBH = 20.9 inches; Slope = 20%

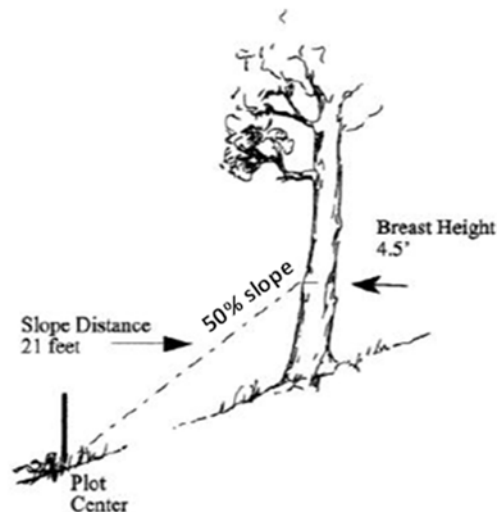
Slope Correction Factor = $\text{SQR}(1 + (\text{slope}/100)^2) = \text{SQR}(1 + (20/100)^2) = 1.0198$

Slope Corrected Plot Radius Factor = Slope Correction Factor * Plot Radius Factor =
 $1.0198 * 1.333 = 1.359$

Limiting Distance = Slope Corrected Plot Radius Factor * DBH = $1.359 * 20.9 = 28.4$ feet

4. Measure the distance from plot center to the face of the tree, nearest plot center, at DBH or DRC. Both the slope measurement and distance measurement must be taken at plot center. If the measured distance is less than the limiting distance, the tree is "in."

Figure 4: Determining limiting distance on a slope



Example:

BAF = 40; DBH = 15.0; Slope = 50%; Slope Distance = 21.0 feet

Referring to [Table 34](#), the Combined Factor for a slope of 50% with a 4- BAF is 1.490.

Limiting Distance = DBH * Combined Factor = $15.0 * 1.490 = 22.35$

Since 21.0 is less than or equal to the limiting distance of 22.35 feet, the tree is "in" and is tallied as a sample tree.

Measuring "In" or "Out" Down Trees

Down trees are "in" or "out" of the variable plot radius based on where the DBH or DRC now lies, not on where the tree once stood. The distance measurement is taken from plot center to the nearest face of the tree at breast height.

Table 30: BAF 10 Plot Radii in Feet and Tenths of Feet from Plot Center to Face of Tree at DBH for 0% Slope

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	13.5	13.8	14.1	14.4	14.6	14.9	15.2	15.4	15.7	16.0
6	16.2	16.5	16.8	17.1	17.3	17.6	17.9	18.1	18.4	18.7
7	19.0	19.2	19.5	19.8	20.0	20.3	20.6	20.9	21.1	21.4
8	21.7	21.9	22.2	22.5	22.7	23.0	23.3	23.6	23.8	24.1
9	24.4	24.6	24.9	25.2	25.5	25.7	26.0	26.3	26.5	26.8
10	27.1	27.4	27.6	27.9	28.2	28.4	28.7	29.0	29.2	29.5
11	29.8	30.1	30.3	30.6	30.9	31.1	31.4	31.7	32.0	32.2
12	32.5	32.8	38.5	38.7	39.0	39.3	39.5	39.8	40.1	40.3
13	35.2	35.5	35.7	36.0	36.3	36.6	36.8	37.1	37.4	37.6
14	37.9	38.2	38.5	38.7	39.0	39.3	39.5	39.8	40.1	40.3
15	40.6	40.9	41.2	41.4	41.7	42.0	42.2	42.5	42.8	43.1
16	43.3	43.6	43.9	44.1	44.4	44.7	45.0	45.2	45.5	45.8
17	46.0	46.3	46.6	46.8	47.1	47.4	47.7	47.9	48.2	48.5
18	48.7	49.0	49.3	49.6	49.8	50.1	50.4	50.6	50.9	51.2
19	51.5	51.7	52.0	52.3	52.5	52.8	53.1	53.3	53.6	53.9
20	54.2	54.4	54.7	55.0	55.2	55.5	55.8	56.1	56.3	56.6
21	56.9	57.1	57.4	57.7	58.0	58.2	58.5	58.8	59.0	59.3
22	59.6	57.1	57.4	57.7	58.0	58.2	58.5	58.8	59.0	59.3
23	62.3	62.6	62.8	63.1	63.4	63.6	63.9	64.2	64.5	64.7
24	65.0	65.3	65.5	65.8	66.1	66.3	66.6	66.9	67.2	67.4
25	67.7	68.0	68.2	63.1	63.4	63.6	63.9	64.2	64.5	64.7
26	70.4	70.7	70.9	71.2	71.5	71.8	72.0	72.3	72.6	72.8
27	73.1	73.4	73.7	73.9	74.2	74.5	74.7	75.0	75.3	75.6
28	75.8	76.1	76.4	76.6	76.9	77.2	77.4	77.7	78.00	78.3

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
29	78.5	78.8	79.1	79.3	79.6	79.9	80.2	80.4	80.7	81.0
30	81.2	81.5	81.8	82.1	82.3	82.6	82.9	83.1	83.4	83.7
31	83.9	84.2	84.5	84.8	85.0	85.3	85.6	85.8	86.1	86.4
32	86.7	86.9	87.2	87.5	87.7	88.0	88.3	88.6	88.8	89.1
33	89.4	89.6	89.9	90.2	90.4	90.7	91.0	91.3	91.5	91.8
34	92.1	92.3	92.6	92.9	93.2	93.4	93.7	94.0	94.2	94.5
35	94.8	95.1	95.3	95.6	95.9	96.1	96.4	96.7	96.9	97.2
36	97.5	97.8	98.0	98.3	98.6	98.8	99.1	99.4	99.7	99.9
37	100.2	100.5	100.7	101.0	101.3	101.6	101.8	102.1	102.4	102.6
38	102.9	103.2	103.4	103.7	104.0	104.3	104.5	104.8	105.1	105.3
39	105.6	105.9	106.2	106.4	106.7	107.0	107.2	107.5	107.8	108.0
40	108.3	108.6	108.9	109.1	109.4	109.7	109.9	110.2	110.5	110.8
41	111.0	111.3	111.6	111.8	112.1	112.4	112.7	112.9	113.2	113.5
42	113.7	114.0	114.3	114.5	114.8	115.1	115.4	115.6	115.9	116.2
43	116.4	116.7	117.0	117.3	117.5	117.8	118.1	118.3	118.6	118.9
44	119.2	119.4	119.7	120.0	120.2	120.5	120.8	121.0	121.3	121.6
45	121.9	122.1	122.4	122.7	122.9	120.2	123.5	123.8	124.0	124.3
46	124.6	124.8	125.1	125.4	125.7	125.9	126.2	126.5	126.7	127.0
47	127.3	127.5	127.8	128.1	128.4	128.6	128.9	129.2	129.4	129.7
48	130.0	130.3	130.5	130.8	131.1	131.3	131.6	131.9	132.2	132.4
49	132.7	133.0	133.2	133.5	133.8	134.0	134.3	134.6	134.9	135.1
50	135.4	135.7	135.9	136.2	136.5	136.8	137.0	137.3	137.6	137.8

Prepared by multiplying the BAF 10 Plot Radius Factor 2.708 * DBH. For example, if DBH = 14.3 inches, then $14.3 * 2.708 = 38$.

Table 31: BAF 20 Plot Radii in Feet and Tenths of Feet from Plot Center to Face of Tree at DBH for 0% Slope

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	9.5	9.7	9.9	10.1	10.3	10.5	10.7	10.8	11.0	11.2
6	11.4	11.6	11.8	12.0	12.2	12.4	12.6	12.8	12.9	13.1
7	13.3	13.5	13.7	13.9	14.1	14.3	14.5	14.7	14.8	15.0
8	15.2	15.4	15.6	15.8	16.0	16.2	16.4	16.6	16.8	16.9
9	17.1	17.3	17.5	17.7	17.9	18.1	18.3	18.5	18.6	18.8
10	19.0	19.2	19.4	19.6	19.8	20.0	20.2	20.4	20.6	20.7
11	20.9	21.1	21.3	21.5	21.7	21.9	22.1	22.3	22.5	22.6
12	22.8	23.0	23.2	23.4	23.6	23.8	24.0	24.2	24.4	24.5
13	24.7	24.9	25.1	25.3	25.5	25.7	25.9	26.1	26.3	26.5
14	26.6	26.8	27.0	27.2	27.4	27.6	27.8	28.0	28.2	28.4
15	28.5	28.7	28.9	29.1	29.3	29.5	29.7	29.9	30.1	30.3
16	30.4	30.6	30.8	31.0	31.2	31.4	31.6	31.8	32.0	32.2
17	32.4	32.5	32.7	32.9	33.1	33.3	33.5	33.7	33.9	34.1
18	34.3	34.4	34.6	34.8	35.0	35.2	35.4	35.6	35.8	36.0
19	36.2	36.3	36.5	36.7	36.9	37.1	37.3	37.5	37.7	37.9
20	38.1	38.3	38.4	38.6	38.8	39.0	39.2	39.4	39.6	39.8
21	40.0	40.2	40.3	40.5	40.7	40.9	41.1	41.3	41.5	41.7
22	41.9	42.1	42.2	42.4	42.6	42.8	43.0	43.2	43.4	43.6
23	43.8	44.0	44.1	44.3	44.5	44.7	44.9	45.1	45.3	45.5
24	45.7	45.9	46.1	46.2	46.4	46.6	46.8	47.0	47.2	47.4
25	47.6	47.8	48.0	48.1	48.3	48.5	48.7	48.9	49.1	49.3
26	49.5	49.7	49.9	50.0	50.2	50.4	50.6	50.8	51.0	51.2
27	51.4	51.6	51.8	52.0	52.1	52.3	52.5	52.7	52.9	53.1
28	53.3	53.5	53.7	53.9	54.0	54.2	54.4	54.6	54.8	55.0

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
29	55.2	55.4	55.6	55.8	55.9	56.1	56.3	56.5	56.7	56.9
30	57.1	57.3	57.5	57.7	57.9	58.0	58.2	58.4	58.6	58.8
31	59.0	59.2	59.4	59.6	59.8	59.9	60.1	60.3	60.5	60.7
32	60.9	61.1	61.3	61.5	61.7	61.8	62.0	62.2	62.4	62.6
33	62.8	63.0	63.2	63.4	63.6	63.8	63.9	64.1	64.3	64.5
34	64.7	64.9	65.1	65.3	65.5	65.7	65.8	6.0	66.2	66.4
35	66.6	66.8	67.0	67.2	67.4	67.6	67.7	67.9	68.1	68.3
36	68.5	68.7	68.9	69.1	69.3	69.5	69.6	69.8	70.0	70.2
37	70.4	70.6	70.8	71.0	71.2	71.4	71.6	71.7	71.9	72.1
38	72.3	72.5	72.7	72.9	73.1	73.3	73.5	73.6	73.8	74.0
39	74.2	74.4	74.6	74.8	75.0	75.2	75.4	75.5	75.7	75.9
40	76.1	76.3	76.5	76.7	76.9	77.1	77.3	77.5	77.6	77.8
41	78.0	78.2	78.4	78.6	78.8	79.0	79.2	79.4	79.5	79.7
42	79.9	80.1	80.3	80.5	80.7	80.9	81.1	81.3	81.4	81.6
43	81.8	82.0	82.2	82.4	82.6	82.8	83.0	83.2	83.4	83.5
44	83.7	83.9	84.1	84.3	84.5	84.7	84.9	85.1	85.3	85.4
45	85.6	85.8	86.0	86.2	86.4	86.6	86.8	87.0	87.2	87.3
46	87.5	87.7	87.9	88.1	88.3	88.5	88.7	88.9	89.1	89.3
47	89.4	89.6	89.8	90.0	90.2	90.4	90.6	90.8	91.0	91.2
48	91.3	91.5	91.7	91.9	92.1	92.3	92.5	92.7	92.9	93.1
49	93.2	93.4	93.6	93.8	94.0	94.2	94.4	94.6	94.8	95.0
50	95.2	95.3	95.5	95.7	95.9	96.1	96.3	96.5	96.7	96.9

Prepared by multiplying the BAF 20 Plot Radius Factor 1.902 * DBH. For example, if DBH = 14.3 inches, then $14.3 * 1.903 = 27$.

Table 32: BAF 30 Plot Radii in Feet and Tenths of Feet from Plot Center to Face of Tree at DBH for 0% Slope

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	7.7	7.9	8.0	8.2	8.3	8.5	8.7	8.8	9.0	9.1
6	9.3	9.4	9.6	9.7	9.9	10.0	10.2	10.4	10.5	10.7
7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	12.1	12.2
8	12.4	12.5	12.7	12.8	13.0	13.1	13.3	13.5	13.6	13.8
9	13.9	14.1	14.2	14.4	14.5	14.7	14.8	15.0	15.2	15.3
10	15.5	15.6	15.8	15.9	16.1	16.2	16.4	16.5	16.7	16.9
11	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4
12	18.6	18.7	18.9	19.0	19.2	19.3	19.5	19.6	19.8	19.9
13	20.1	20.3	20.4	20.6	20.7	20.9	21.0	21.2	21.3	21.5
14	21.6	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	23.0
15	23.2	23.3	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6
16	24.7	24.9	25.0	25.2	25.4	25.5	25.7	25.8	26.0	26.1
17	26.3	26.4	26.6	26.7	26.9	27.1	27.2	27.4	27.5	27.7
18	27.8	28.0	28.1	28.3	28.4	28.6	28.8	28.9	29.1	29.2
19	29.4	29.5	29.7	29.8	30.0	30.1	30.3	30.5	30.6	30.8
20	30.9	31.1	31.2	31.4	31.5	31.7	31.8	32.0	32.2	32.3
21	32.5	32.6	32.8	32.9	33.1	33.2	33.4	33.5	33.7	33.9
22	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4
23	35.6	35.7	35.9	36.0	36.2	36.3	36.5	36.6	36.8	36.9
24	37.1	37.3	37.4	37.6	37.7	37.9	38.0	38.2	38.3	38.5
25	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	40.00
26	40.2	40.4	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6
27	41.7	41.9	42.1	42.2	42.4	42.5	42.7	42.8	43.0	43.1
28	43.3	43.4	43.6	43.8	43.9	44.1	44.2	44.4	44.5	44.7

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
29	44.8	45.0	45.1	45.3	45.5	45.6	45.8	45.9	46.1	46.2
30	46.4	46.5	46.7	46.8	47.0	47.2	47.3	47.5	47.6	47.8
31	47.9	48.1	48.2	48.4	48.5	48.7	48.9	49.0	49.2	49.3
32	49.5	49.6	49.8	49.9	50.1	50.2	50.4	50.6	50.7	50.9
33	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.3	52.4
34	52.6	52.7	52.9	53.0	53.2	53.3	53.5	53.6	53.8	54.0
35	54.1	54.3	54.4	54.6	54.7	54.9	55.0	55.2	55.3	55.5
36	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	57.0
37	57.2	57.4	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6
38	58.7	58.9	59.1	59.2	59.4	59.5	59.7	59.8	60.0	60.1
39	60.3	60.4	60.6	60.8	60.9	61.1	61.2	61.4	61.5	61.7
40	61.8	62.0	62.1	62.3	62.5	62.6	62.8	62.9	63.1	63.2
41	63.4	63.5	63.7	63.8	64.0	64.2	64.3	64.5	64.3	64.8
42	64.9	65.1	65.2	65.4	65.6	65.7	65.9	66.0	66.2	66.3
43	66.5	66.6	66.8	66.9	67.1	67.3	67.4	67.6	67.7	67.9
44	68.0	68.2	68.3	68.5	68.6	68.8	69.0	69.1	69.3	69.4
45	69.6	69.7	69.9	70.0	70.2	70.3	70.5	70.7	70.8	71.0
46	71.1	71.3	71.4	71.6	71.7	71.9	72.0	72.2	72.4	72.5
47	72.7	72.8	73.0	73.1	73.3	73.4	73.6	73.7	73.9	74.1
48	74.2	74.4	74.5	74.7	74.8	75.0	75.1	75.3	75.4	75.6
49	75.8	75.9	76.1	76.2	76.4	76.5	76.7	76.8	77.0	77.1
50	77.3	77.5	77.6	77.8	77.9	78.1	78.2	78.4	78.5	78.7

Prepared by multiplying the BAF 30 Plot Radius Factor 1.546 * DBH. For example, if DBH = 14.3 inches, then $14.3 * 1.546 = 22$.

Table 33: BAF 40 Plot Radii in Feet and Tenths of Feet from Plot Center to Face of Tree at DBH for 0% Slope

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	6.7	6.8	6.9	7.1	7.2	7.3	7.5	7.6	7.7	7.9
6	8.0	8.1	8.3	8.4	8.5	8.7	8.8	8.9	9.1	9.2
7	9.3	9.5	9.6	9.7	9.9	10.0	10.1	10.3	10.4	10.5
8	10.7	10.8	10.9	11.1	11.2	11.3	11.5	11.6	11.7	11.9
9	12.0	12.1	12.3	12.4	12.5	12.7	12.8	12.9	13.1	13.2
10	13.3	13.5	13.6	13.7	13.9	14.0	14.1	14.3	14.4	14.5
11	14.7	14.8	14.9	15.1	15.2	15.3	15.5	15.6	15.7	15.9
12	16.0	16.1	16.3	16.4	16.5	16.7	16.8	16.9	17.1	17.2
13	17.3	17.5	17.6	17.7	17.9	18.0	18.1	18.3	18.4	18.5
14	18.7	18.8	18.9	19.1	19.2	19.3	19.5	19.6	19.7	19.9
15	20.0	20.1	20.3	20.4	20.5	20.7	20.8	20.9	21.1	21.2
16	21.3	21.5	21.6	21.7	21.9	22.0	22.1	22.3	22.4	22.5
17	22.7	22.8	22.9	23.1	23.2	23.3	23.5	23.6	23.7	23.9
18	24.0	24.1	24.3	24.4	24.5	24.7	24.8	24.9	25.1	25.2
19	25.3	25.5	25.6	25.7	25.9	26.0	26.1	26.3	26.4	26.5
20	26.7	26.8	26.9	27.1	27.2	27.3	27.5	27.6	27.7	27.9
21	28.0	28.1	28.3	28.4	28.5	28.7	28.8	28.9	29.1	29.2
22	29.3	29.5	29.6	29.7	29.9	30.0	30.1	30.3	30.4	30.5
23	30.7	30.8	30.9	31.1	31.2	31.3	31.5	31.6	31.7	31.9
24	32.0	32.1	32.3	32.4	32.5	32.7	32.8	32.9	33.1	33.2
25	33.3	33.5	33.6	33.7	33.9	34.0	34.1	34.3	34.4	34.5
26	34.7	34.8	34.9	35.1	35.2	35.3	35.5	35.6	35.7	35.9
27	36.0	36.1	36.3	36.4	36.5	36.7	36.8	36.9	37.1	37.2
28	37.3	37.5	37.6	37.7	37.9	38.0	38.1	38.3	38.4	38.5

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
29	38.7	34.8	34.9	35.1	35.2	35.3	35.5	35.6	35.7	35.9
30	40.0	40.1	40.3	40.4	40.5	40.7	40.8	40.9	41.1	41.2
31	41.3	41.5	41.6	41.7	41.9	42.0	42.1	42.3	42.4	42.5
32	42.7	42.8	42.9	43.1	43.2	43.3	43.5	43.6	43.7	43.9
33	44.0	44.1	44.3	44.4	44.5	44.7	44.8	44.9	45.1	45.2
34	45.3	45.5	45.6	45.7	45.9	46.0	46.1	46.3	46.4	46.5
35	46.7	46.8	46.9	47.1	47.2	47.3	47.5	47.6	47.7	47.9
36	48.0	48.1	48.2	48.4	48.5	48.7	48.	48.9	49.1	49.2
37	49.3	49.5	49.6	49.7	49.9	50.0	50.1	50.3	50.4	50.5
38	50.7	50.8	50.9	51.1	51.2	51.3	51.5	51.6	51.7	51.9
39	52.0	52.1	52.2	52.4	52.5	52.7	52.8	52.9	53.1	53.2
40	53.3	53.5	53.6	53.7	53.9	54.0	54.1	54.3	54.4	54.5
41	54.7	54.8	54.9	55.1	55.2	55.3	55.5	55.6	55.7	55.9
42	56.0	56.1	56.2	56.4	56.5	56.7	56.8	56.9	57.1	57.2
43	57.3	57.5	57.6	57.7	57.9	58.0	58.1	58.3	58.4	58.5
44	58.7	58.8	58.9	59.1	59.2	59.3	59.5	59.6	59.7	59.9
45	60.0	60.1	60.2	60.4	60.5	60.7	60.8	60.9	61.1	61.2
46	61.3	61.5	61.6	61.7	61.9	62.0	62.1	62.3	62.4	62.5
47	62.7	62.8	62.9	63.1	63.2	63.3	63.5	63.6	63.7	63.9
48	64.0	64.1	64.2	64.4	64.5	64.7	64.8	64.9	65.1	65.2
49	65.3	65.5	65.6	65.7	65.9	66.0	66.1	66.3	66.4	66.5
50	66.7	66.8	66.9	67.0	67.2	67.3	67.4	67.6	67.7	67.8

Prepared by multiplying the BAF 40 Plot Radius Factor 1.333 * DBH. For example, if DBH = 14.3 inches, then $14.3 * 1.333 = 19.1$ feet.

Table 34: BAF 60 Plot Radii in Feet and Tenths of Feet from Plot Center to Face of Tree at DBH for 0% Slope

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	5.4	5.5	5.6	5.7	5.8	5.9	6.1	6.2	6.3	6.4
6	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.4	7.5
7	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5
8	8.6	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6
9	9.7	9.8	9.9	10.1	10.2	10.3	10.4	10.5	10.6	10.7
10	10.8	10.9	11.0	11.1	11.2	11.4	11.5	11.6	11.7	11.8
11	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.8	12.9
12	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9
13	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	15.0
14	15.1	15.2	15.4	15.5	15.6	15.7	15.8	15.9	16.0	16.1
15	16.2	16.3	16.4	16.5	16.6	16.7	16.9	17.0	17.1	17.2
16	17.3	17.4	17.5	17.6	17.7	17.8	17.9	18.1	18.2	18.3
17	18.4	18.5	18.6	18.7	18.8	18.9	19.0	19.1	19.2	19.3
18	19.5	19.6	19.7	19.8	19.9	20.0	20.1	20.2	20.3	20.4
19	20.5	20.6	20.8	20.9	21.0	21.1	21.2	21.3	21.4	21.5
20	21.6	21.7	21.8	21.9	22.1	22.2	22.3	22.4	22.5	22.6
21	22.7	22.8	22.9	23.0	23.1	23.2	23.3	23.5	23.6	23.7
22	23.8	23.9	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.8
23	24.9	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8
24	25.9	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9
25	27.0	27.1	27.2	27.3	27.5	27.6	27.7	27.8	27.9	28.0
26	28.1	28.2	28.3	28.4	28.5	28.6	28.8	28.9	29.0	29.1
27	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	30.1	30.2
28	30.3	30.4	30.5	30.6	30.7	30.8	30.9	31.0	31.1	31.2

Inches	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
29	31.3	31.5	31.6	31.7	31.8	31.9	32.0	32.1	32.2	32.3
30	32.4	32.5	32.6	32.8	32.9	33.0	33.1	33.2	33.3	33.4
31	33.5	33.6	33.7	33.8	33.9	34.1	34.2	34.3	34.4	34.5
32	35.7	35.8	35.9	36.0	36.1	36.2	36.3	36.4	36.5	36.6
33	35.7	35.8	35.9	36.0	36.1	36.2	36.3	36.4	36.5	36.6
34	36.8	36.9	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7
35	37.8	37.9	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8
36	38.9	39.0	39.1	39.2	39.3	39.5	39.6	39.7	39.8	39.9
37	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.8	40.9	41.0
38	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	42.1
39	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	43.0	43.1
40	43.2	43.3	43.5	43.6	43.7	43.8	43.9	44.0	44.1	44.2
41	44.3	44.4	44.5	44.6	44.8	44.9	45.0	45.1	45.2	45.3
42	45.4	45.5	45.6	45.7	45.8	45.9	46.1	46.2	46.3	46.4
43	46.5	46.6	46.7	46.8	46.9	47.0	47.1	47.2	47.3	47.5
44	47.6	47.7	47.8	47.9	48.0	48.1	48.2	48.3	48.4	48.5
45	48.6	48.8	48.9	49.0	49.1	49.2	49.3	49.4	49.5	49.6
46	49.7	49.8	49.9	50.1	50.2	50.3	50.4	50.5	50.6	50.7
47	50.8	50.9	51.0	51.1	51.2	51.3	51.5	51.6	51.7	51.8
48	51.9	52.0	52.1	52.2	52.3	52.4	52.5	52.6	52.8	52.9
49	53.0	53.1	53.2	53.3	53.4	53.5	53.6	53.7	53.8	53.9
50	54.1	54.2	54.3	54.4	54.5	54.6	54.7	54.8	54.9	55.0

Prepared by multiplying the BAF 60 Plot Radius Factor 1.081 * DBH. For example, if DBH = 14.3 inches, then $14.3 * 10.81 = 15.5$ feet.

Table 35: Limiting Distances to Face of Tree and Slope Correction Factors for Various Basal Area Factors

This table provides an expanded list of slope correction factors to the face of the tree for use with various basal area factors. To use the table, measure the slope and distance from plot-center to the face of the tree at DBH. To obtain the corrected limiting distance to a tree, multiply the tree's DBH by the "combined factor" shown under the appropriate BAF heading.

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
1	1.00000	3.847	2.708	2.203	1.902	1.546	1.333
2	1.00020	3.848	2.709	2.203	1.902	1.546	1.333
3	1.00045	3.489	2.709	2.204	1.903	1.547	1.334
4	1.00080	3.850	2.710	2.205	1.904	1.547	1.334
5	1.00125	3.852	2.711	2.206	1.904	1.548	1.335
6	1.00180	3.854	2.713	2.207	1.905	1.549	1.335
7	1.00245	2.856	2.715	2.208	1.907	1.550	1.336
8	1.00319	3.859	2.717	2.210	1.908	1.551	1.337
9	1.00404	3.863	2.719	2.212	1.910	1.552	1.338
10	1.00499	3.866	2.722	2.214	1.911	1.554	1.340
11	1.00603	3.870	2.724	2.216	1.912	1.555	1.341
12	1.00717	3.875	2.727	2.219	1.916	1.557	1.341
13	1.00841	3.879	2.731	2.222	1.918	1.559	1.344
14	1.00975	3.884	2.734	2.224	1.921	1.567	1.346
15	1.01119	3.890	2.738	2.228	1.923	1.563	1/348
16	1.01272	3.896	2.742	2.231	1.926	1.566	1.350
17	1.01435	3.902	2.747	2.235	1.921	1.568	1.352
18	1.01607	3.909	2.752	2.238	1.933	1.571	1.354
19	1.01789	3.916	2.756	2.245	1.936	1.574	1.357
20	1.01980	3.923	2.762	2.245	1.940	1.577	1.359
21	1.02181	3.931	2.767	2.251	1.943	1.580	1.362

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
22	1.02391	3.939	2.773	2.256	1.947	1.583	1.365
23	1.02611	3.947	2.779	2.261	1.952	1.586	1.368
24	1.02840	3.956	2.785	2.266	1.956	1.590	1.371
25	1.03078	3.965	2.791	2.271	1.967	1.594	1.374
26	1.03325	3.975	2.798	2.276	1.965	1.597	1.377
27	1.03581	3.985	2.805	2.282	1.970	1.601	1.381
28	1.03846	3.995	2.812	2.288	1.975	1.605	1.384
29	1.04120	4.005	2.820	2.294	1.980	1.610	1.388
30	1.04403	4.016	2.827	2.300	1.986	1.614	1.392
31	1.04695	4.028	2.835	2.306	1.991	1.619	1.396
32	1.04995	4.039	2.843	2.313	1.997	1.623	1.400
33	1.05304	4.051	2.852	2.320	2.003	1.628	1.404
34	1.05622	4.063	2.960	2.327	2.009	1.633	1.408
35	1.05948	4.076	2.869	2.334	2.015	1.638	1.412
36	1.06283	4.089	2.878	2.341	2.022	1.643	1.417
37	1.06626	4.102	2.887	2.349	2.028	1.648	4.421
38	1.06977	4.115	2.897	2.357	2.035	1.654	1.426
39	1.07336	4.129	2.907	2.365	2.042	1.659	1.431
40	1.07703	4.143	2.917	2.373	2.049	1.665	1.436
41	1.08079	4.158	2.927	2.381	2.056	1.671	1.441
42	1.08462	4.173	2.937	2.389	2.063	1.677	1.446
43	1.08853	4.188	2.948	2.398	2.070	1.683	1.451
44	1.09252	4.203	2.959	2.407	2.078	1.689	1.456
45	1.09659	4.219	2.970	2.416	2.086	1.695	1.462
46	1.10073	4.235	2.981	2.425	2.094	1.702	1.467

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
47	1.10494	4.251	2.992	2.434	2.102	1.708	1.473
48	1.10923	4.267	3.004	2.444	2.110	1.715	1.479
49	1.11360	4.284	3.016	2.453	2.118	1.723	1.484
50	1.11803	4.301	3.028	2.463	2.126	1.728	1.490
51	1.12254	4.318	3.040	2.473	2.135	1.735	1.496
52	1.12712	4.336	3.052	2.483	2.144	1.743	1.502
53	1.13177	4.354	3.065	2.493	2.153	1.750	1.509
54	1.13649	4.372	3.078	2.504	2.162	1.757	1.515
55	1.14127	4.390	3.091	2.514	2.171	1.764	1.521
56	1.14612	4.409	3.104	2.525	2.180	1.772	1.528
57	1.15104	4.428	3.117	2.536	2.189	1.780	1.534
58	1.15603	4.447	3.131	2.547	2.199	1.788	1.541
59	1.16108	4.467	3.144	2.558	2.208	1.795	1.548
60	1.16619	4.486	3.158	2.569	2.218	1.803	1.555
61	1.17137	4.506	3.172	2.581	2.228	1.811	1.561
62	1.17661	4.526	3.186	2.592	2.238	1.819	1.568
63	1.18191	4.547	3.201	2.604	2.248	1.827	1.575
64	1.18727	4.567	3.215	2.616	2.258	1.836	1.583
65	1.19269	4.588	3.230	2.627	2.268	1.844	1.590
66	1.19817	4.609	3.245	2.640	2.279	1.852	1.597
67	1.20370	4.631	3.260	2.652	2.289	1.861	1.605
68	1.20930	4.652	3.275	2.664	2.300	1.870	1.612
69	1.21499	4.691	3.302	2.687	2.319	1.885	1.626
70	1.22066	4.696	3.306	2.689	2.322	1.887	1.627
71	1.22642	4.718	3.321	2.702	2.333	1.896	1.635

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
72	1.23223	4.740	3.337	2.715	2.344	1.905	1.643
73	1.23810	4.763	3.353	2.728	2.355	1.914	1.650
74	1.24403	4.786	3.369	2.741	2.366	1.923	1.658
75	1.25000	4.809	3.385	2.754	2.378	1.933	1.666
76	1.25603	4.832	3.401	2.767	2.389	1.942	1.674
77	1.26210	4.855	3.418	2.780	2.401	1.951	1.682
78	1.26823	4.879	3.434	2.794	2.412	1.961	1.691
79	1.27440	4.903	3.451	2.808	2.424	1.970	1.699
80	1.28062	4.927	3.468	2.821	2.436	1.980	1.707
81	1.28690	4.951	3.485	2.835	2.448	1.990	1.715
82	1.29321	4.975	3.502	2.849	2.460	1.999	1.724
83	1.29958	4.999	3.519	2.863	2.472	2.009	1.732
84	1.30599	5.024	3.537	2.877	2.484	2.019	1.741
85	1.31244	5.049	3.554	2.891	2.496	2.029	1.749
86	1.31894	5.074	3.572	2.906	2.509	2.039	1.758
87	1.32548	5.099	3.589	2.920	2.521	2.049	1.767
88	1.33207	5.124	3.607	2.935	2.534	2.059	1.776
89	1.33870	5.150	3.625	2.949	2.546	2.070	1.784
90	1.34536	5.176	3.643	2.964	2.559	2.080	1.793
91	1.35207	5.201	3.661	2.979	2.572	2.090	1.802
92	1.35882	5.227	3.680	2.993	2.584	2.101	1.811
93	1.36561	5.254	3.698	3.008	2.597	2.111	1.820
94	1.37244	5.280	3.717	3.023	2.610	2.122	1.829
95	1.37931	5.306	3.735	3.039	2.623	2.132	1.839
96	1.38622	5.333	3.754	3.054	2.637	2.143	1.848

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
97	1.39316	5.359	3.773	3.069	2.650	2.154	1.875
98	1.40014	5.386	3.792	3.085	2.663	2.165	1.866
99	1.40716	5.413	3.811	3.100	2.676	2.175	1.876
100	1.41421	5.440	3.830	3.116	2.690	2.186	1.885
102	1.42843	5.495	3.868	3.147	2.717	2.208	1.904
103	1.43558	5.523	3.888	3.163	5.730	2.219	1.914
104	1.44278	5.550	3.907	3.178	2.744	2.231	1.923
105	1.45000	5.578	3.927	3.194	2.758	2.242	1.933
106	1.45726	5.606	3.946	3.210	2.772	2.253	1.943
107	1.46455	5.634	3.966	3.226	2.876	2.264	1.952
108	1.47187	5.662	3.986	3.243	2.799	2.276	1.962
109	1.47922	5.691	4.006	3.259	2.813	2.287	1.972
110	1.48661	5.719	4.026	3.275	2.828	2.298	1.982
111	1.49402	5.747	4.046	3.291	2.842	2.310	1.992
112	1.50147	5.776	4.066	3.308	2.856	2.321	2.001
113	1.50894	5.805	4.086	3.324	2.870	2.333	2.011
114	1.51644	5.834	4.107	3.341	2.884	2.344	2.021
115	1.52498	5.863	4.127	3.357	2.899	2.356	2.031
116	1.53154	5.892	4.147	3.374	2.913	2.368	2.042
117	1.53912	5.921	4.168	3.391	2.927	2.379	2.052
118	1.54674	5.950	4.189	3.407	2.942	2.391	2.062
119	1.55438	5.980	4.209	3.424	2.956	2.403	2.072
120	1.56205	6.000	4.230	3.441	2.971	2.415	2.082
121	1.56975	6.039	4.251	3.458	2.985	2.427	2.092
122	1.57747	6.069	4.272	3.475	3.000	2.439	2.103

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
123	1.58521	6.098	4.293	3.492	3.015	2.451	2.113
124	1.59298	6.128	4.314	3.509	3.030	2.463	2.123
125	1.60078	6.158	4.335	3.527	3.045	2.475	2.134
126	1.60860	6.188	4.356	3.544	3.060	2.487	2.144
127	1.61645	6.218	4.377	3.561	3.074	2.499	2.155
128	1.62432	6.249	4.399	3.578	3.089	2.511	2.165
129	1.63221	6.279	4.420	3.595	3.104	2.523	2.176
130	1.64012	6.310	4.441	3.613	3.120	2.536	2/186
131	1.64806	6.340	4.463	3.631	3.135	2.546	2.197
132	1.65602	6.370	4.485	3.648	3.150	2.560	2.207
133	1.66400	6.401	4.506	3.666	3.165	2.573	2.218
134	1.67200	6.432	4.528	3.683	3.180	2.585	2.229
135	1.68003	6.463	4.550	3.701	3.195	2.597	2.239
136	1.68808	6.494	4.571	3.719	3.211	2.261	2.250
137	1.69614	6.525	4.593	3.737	3.226	2.622	2.261
138	1.70423	6.556	4.615	3.754	3.241	2.635	2.272
139	1.71234	6.587	4.637	3.772	3.257	2.647	2.283
140	1.72047	6.619	4.659	3.790	3.272	2.660	2.293
141	1.72861	6.650	4.681	3.808	3.288	2.672	2.304
142	1.73678	6.681	4.703	3.826	3.303	2.685	2.315
143	1.74497	6.713	4.725	3.844	3.319	2.698	2.326
144	1.75317	6.744	4.748	3.862	3.335	2.710	2.337
145	1.76139	6.776	4.770	3.880	3.350	2.723	2.348
146	1.76963	6.808	4.792	3.898	3.366	2.736	2.359
147	1.77789	6.840	4.815	3.917	3.382	2.749	2.370

Slope	Factor	5 BAF	10 BAF	15 BAF	20 BAF	30 BF	40 BAF
148	1.78617	6.871	4.837	3.935	3.397	2.761	2.381
149	1.79446	6.903	4.859	3.953	3.413	2.774	2.392

APPENDIX K: DAMAGE CATEGORIES, AGENTS, SEVERITY RATINGS, AND TREE PARTS

DAMAGE CATEGORIES

Detailed descriptions and examples of the content in these tables is available using the Insect & Disease Codes links on the [FSVeg Documentation web page](#).

Table 36: Damage category codes

Code	Description
10	General Insects
11	Bark Beetles
12	Defoliators
13	Chewing Insects
14	Sucking Insects
15	Boring Insects
16	Seed/Cone/Flower/Fruit Insects
17	Gallmaker Insects
18	Insect Predators
19	General Diseases
20	Biotic Damage
21	Root/Butt Diseases
22	Stem Decays/Cankers
23	Parasitic/Epiphytic Plants
24	Decline Complexes/Dieback/Wilts

Code	Description
25	Foliage Diseases
26	Stem Rusts
27	Broom Rusts
30	Fire
40	Animal Damage, Source Unknown
41	Wild Animals
42	Domestic Animals
50	Abiotic Damage
60	Competition
70	Human Activities
71	Harvest
80	Multi-Damage (Insect-Disease)
90	Unknown
99	Physical Effects

DAMAGE AGENTS

Detailed descriptions and examples of the content in these tables is available using the Insect & Disease Codes links on the [FSVeg Documentation web page](#).

Table 37: Damage agent codes

Category	Agent	Common Name	Scientific Name
10	000	General insects	n / a
10	001	Thrips	<i>n/a</i>
10	002	Tip moth	<i>n/a</i>
10	003	Wasp	<i>n/a</i>
10	007	Clerid beetle	<i>Cleridae</i>
10	008	Weevil	<i>Curculionidae</i>

Category	Agent	Common Name	Scientific Name
10	011	Ant	<i>Formicidae</i>
10	017	Bagworm moth	<i>Psychidae</i>
10	019	Scarab	<i>Scarabaeidae</i>
10	023	Wood wasps	<i>Siricidae spp.</i>
11	000	Bark beetles	n / a
11	001	Roundheaded pine beetle	<i>Dendroctonus adjunctus</i>
11	002	Western pine beetle	<i>Dendroctonus brevicomis</i>
11	004	Jeffrey pine beetle	<i>Dendroctonus jeffreyi</i>
11	005	Lodgepole pine beetle	<i>Dendroctonus murrayanae</i>
11	006	Mountain pine beetle	<i>Dendroctonus ponderosae</i>
11	007	Douglas-fir beetle	<i>Dendroctonus pseudotsugae</i>
11	009	Spruce beetle	<i>Dendroctonus rufipennis</i>
11	012	Red turpentine beetle	<i>Dendroctonus valens</i>
11	015	Western balsam bark beetle	<i>Dryocoetes confuses</i>
11	016	Unknown	<i>Dryocoetes sechelti</i>
11	019	Pinon ips	<i>Ips confuses</i>
11	021	Sixspined ips	<i>Ips calligraphus</i>
11	022	Emarginated ips	<i>Ips emarginatus</i>
11	025	Arizona five-spined ips	<i>Ips lecontei</i>
11	029	Pine engraver	<i>Ips pini</i>
11	030	Ips engraver beetles	<i>Ips spp/</i>
11	031	Unknown	<i>Ips tridens</i>
11	032	Western ash bark beetle	<i>Leperisinus californicus</i>
11	035	Cedar bark beetle	<i>Phloeosinus spp.</i>
11	036	Western cedar bark beetle	<i>Phloeosinus punctatus</i>

Category	Agent	Common Name	Scientific Name
11	037	Tip beetles	<i>Pityogenes spp.</i>
11	038	Douglas-fir twig beetle	<i>Pityophthorus pseudotsugae</i>
11	039	Twig beetles	<i>Pityophthorus spp.</i>
11	040	Four-eyed spruce beetle	<i>Polygraphus rufipennis</i>
11	041	Fir root bark beetle	<i>Pseudohylesinus granulates</i>
11	043	Douglas-fir pole beetle	<i>Pseudohylesinus nebulosus</i>
11	045	Small European elm bark beetle	<i>Scolytus multistriatus</i>
11	046	Spruce engraver	<i>Scolytus piceae</i>
11	048	True fir bark beetle	<i>Scolytus spp.</i>
11	049	Douglas-fir engraver	<i>Scolytus unispinosus</i>
11	050	Fir engraver	<i>Scolytus ventralis</i>
11	055	Spruce ips	<i>Ips pilifrons</i>
11	056	Mexican pine beetle	<i>Dendroctonus mexicanus</i>
12	000	Defoliators	n / a
12	001	Casebearer	<i>n/a</i>
12	002	Leaftier	<i>n/a</i>
12	003	Looper	<i>n/a</i>
12	004	Needleminer	<i>n/a</i>
12	005	Sawfly	<i>n/a</i>
12	006	Skeletonizer	<i>n/a</i>
12	009	Webworm	<i>n/a</i>
12	011	Western blackheaded budworm	<i>Acleris gloverana</i>
12	013	Whitefly	<i>Aleyrodoidae</i>
12	014	Fall cankerworm	<i>Alsophila pometaria</i>
12	016	Mountain mahogany looper	<i>Anacamptodes clivinaria profanata</i>

Category	Agent	Common Name	Scientific Name
12	020	Western larch sawfly	<i>Anoplonyx occidentis</i>
12	023	Boxelder defoliator	<i>Archips negundanus</i>
12	024	Oak leafroller	<i>Archips semiferana</i>
12	025	Birch sawfly	<i>Arge pectoralis</i>
12	033	Boxelder leafroller	<i>Caloptilia negundella</i>
12	037	Large aspen tortrix	<i>Choristoneura conflictana</i>
12	039	Sugar pine tortrix	<i>Choristoneura lambertiana</i>
12	040	Western spruce budworm	<i>Choristoneura occidentalis</i>
12	043	Aspen leaf beetle	<i>Chrysomela crotchii</i>
12	044	Cottonwood leaf beetle	<i>Chrysomela scripta</i>
12	045	Leafhopper	<i>Cicadellidae</i>
12	047	Larch casebearer	<i>Coleophora laricella</i>
12	049	Lodgepole needleminer	<i>Coleotechnites milleri</i>
12	050	Ponderosa needleminer	<i>Coleotechnites spp.</i>
12	052	Pandora moth	<i>Coloradia Pandora</i>
12	056	Dusky birch sawfly	<i>Croesus latitarus</i>
12	060	Spruce coneworm	<i>Dioryctria reniculelloides</i>
12	066	White fir needleminer	<i>Epinotia meritana</i>
12	069	Pine needleminer	<i>Exoteleia pinifoliella</i>
12	072	Geometrid moth	<i>Geometridae</i>
12	073	Leafblotch miner	<i>Gracillariidae</i>
12	074	Spotted tussock moth	<i>Halisidota maculate</i>
12	077	Brown day moth	<i>Hemileuca eglanderina</i>
12	082	Fall webworm	<i>Hyphantria cunea</i>
12	084	Unknown	<i>Lambdina punctate</i>

Category	Agent	Common Name	Scientific Name
12	087	Willow leafblotch miner	<i>Lithocolletis spp.</i>
12	089	Gypsy moth	<i>Lymantria dispar</i>
12	094	Western tent caterpillar	<i>Malacosoma californicum</i>
12	096	Forest tent caterpillar	<i>Malacosoma disstria</i>
12	099	Blister beetle	<i>Meloidae</i>
12	116	Pine butterfly	<i>Neophasia menapia</i>
12	121	Rusty tussock moth	<i>Orgyia antiqua</i>
12	123	Douglas-fir tussock moth	<i>Orgyia pseudotsugata</i>
12	124	Western tussock moth	<i>Orgyia vetusta</i>
12	125	Spring cankerworm	<i>Paleacrita vernata</i>
12	128	Pine tussock moth	<i>Parorygia griseofacta</i>
12	135	Aspen leafminer	<i>Phyllocnistis populiella</i>
12	139	Larch sawfly	<i>Pristiphora erichsonii</i>
12	140	Mountain-ash sawfly	<i>Pristiphora geniculate</i>
12	141	Elm leaf beetle	<i>Prrhalta luetola</i>
12	143	Giant silkworm moth	<i>Saturniidae</i>
12	144	Redhumped caterpillar	<i>Schizura concinna</i>
12	150	Spruce needleminer (west)	<i>Taniva albolineana</i>
12	155	Leafroller/seed moth	<i>Tortricidae</i>
12	156	Willow defoliation	<i>Tortricidae</i>
12	160	Pine needle sheathminer	<i>Zelleria haimbachi</i>
12	178	Western oak looper	<i>Lambdina discellaria somniaria</i>
12	181	Tent Caterpillar	<i>Malacosoma spp.</i>
12	190	Hickory tussock moth	<i>Halisidota caryae</i>
12	191	Pin oak sawfly	<i>Caliroa lineata</i>

Category	Agent	Common Name	Scientific Name
12	192	Palmerworm	<i>Dichomeris ligulella</i>
12	193	Pitch pine looper	<i>Lambdina athasaria pellucidaria</i>
12	194	Red pine sawfly	<i>Neodiprion annulus annulus</i>
12	195	Pine tip moth	<i>Argyrotaenia pinatubana</i>
12	196	Baldcypress leafroller	<i>Archips goyerana</i>
12	197	Winter moth	<i>Operophtera</i>
12	198	Basswood thrip	<i>Neohydatothrips</i>
12	199	Noctuid moth	<i>Xylomyges simplex (walker)</i>
12	200	Pyralid moth	<i>Palpita magniferalis</i>
13	000	Chewing insects	n / a
13	001	Grasshopper	<i>n/a</i>
13	006	Cicadas	<i>Cicadidae</i>
13	008	Cutworms	<i>Euxoa excellens</i>
13	021	Ponderosa pine tip moth	<i>Rhyacionia zozana</i>
13	022	Pine needle weevil	<i>Scythropus spp.</i>
13	030	Adana tip moth	<i>Rhyacionia adana</i>
14	000	Sucking insects	n / a
14	001	Scale insect	<i>n/a</i>
14	002	Western larch wooly aphid	<i>Adelges oregonensis</i>
14	003	Balsam woolly adelgid	<i>Adelges piceae</i>
14	006	Aphid	<i>Aphididae</i>
14	008	Western pine spittlebug	<i>Aphrophora permutata</i>
14	012	Pine needle scale	<i>Chionaspis pinifoliae</i>
14	014	Giant conifer aphid	<i>Cinara spp.</i>
14	017	Spruce aphid	<i>Elatobium anatinum</i>

Category	Agent	Common Name	Scientific Name
14	018	Woolly apple aphid	<i>Eriosoma lanigerum</i>
14	024	Honeysuckle aphid	<i>Hyadaphis tataricae</i>
14	026	Lecanium scale	<i>Lecanium spp.</i>
14	028	Oystershell scale	<i>Lepidosaphes ulmi</i>
14	029	Pinyon needle scale	<i>Matsucoccus acalyptus</i>
14	035	Treehoppers	<i>Membracidae</i>
14	039	Black pineleaf scale	<i>Nuculaspis California</i>
14	040	Spruce spider mite	<i>Oligonychus ununquis</i>
14	043	Maple aphid	<i>Periphyllus spp.</i>
14	050	Mealybug	<i>Pseudococcidae</i>
14	054	Spruce mealybug	<i>Puto sandini</i>
14	069	Elm scurfy scale	<i>Chionaspis Americana</i>
15	000	Boring insects	n / a
15	001	Shoot borer	<i>n/a</i>
15	002	Termite	<i>n/a</i>
15	003	Ponderosa pine bark borer	<i>Acanthocinus princeps</i>
15	004	Bronze birch borer	<i>Agrilus anxius</i>
15	006	Bronze poplar borer	<i>Agrilus liragus</i>
15	007	Carpenter bees	<i>Apidae</i>
15	008	Flatheaded borer	<i>Buprestidae</i>
15	009	Golden buprestid	<i>Buprestis aurulenta</i>
15	010	Carpenter ants	<i>Camponotus spp.</i>
15	011	Gouty pitch midge	<i>Cecidomyia piniinopis</i>
15	013	Roundheaded borer	<i>Cermbycidae</i>
15	018	Carpenterworm moth	<i>Cossidae</i>

Category	Agent	Common Name	Scientific Name
15	019	Poplar and willow borer	<i>Cryptorhynchus lapathi</i>
15	021	Douglas-fir twig weevil	<i>Cylindrocopturus furnissi</i>
15	027	Ponderous borer	<i>Ergates spiculatus</i>
15	029	Western pine shoot borer	<i>Eucosma sonomana</i>
15	030	Eucosma species	<i>Eucosma spp.</i>
15	035	Powderpost beetle	<i>Lyctidae</i>
15	039	Locust borer	<i>Megacyclene robiniae</i>
15	041	Flatheaded fir borer	<i>Melanophila drummondi</i>
15	042	Whitespotted sawyer	<i>Monochamus scutellatus</i>
15	044	Western ash borer	<i>Neoclytus conjunctus</i>
15	050	White pine weevil	<i>Pissodes radiatae</i>
15	051	Lodgepole terminal weevil	<i>Pissodes terminalis</i>
15	052	Ambrosia beetles	<i>Platypus spp.</i>
15	057	Lilac borer	<i>Podosesia syringae</i>
15	060	Western subterranean termite	<i>Reticulitermes Hesperus</i>
15	064	Western pine tip moth	<i>Rhyacionia bushnelli</i>
15	068	Poplar borer	<i>Saperda calcarata</i>
15	070	Saperda shoot borer	<i>Saperda spp.</i>
15	071	Clearwing moths	<i>Sesiidae</i>
15	073	Roundheaded fir borer	<i>Tetropium abietis</i>
15	076	Douglas-fir pitch moth	<i>Vespamima novaroensis</i>
15	077	Sequoia pitch moth	<i>Vespamima sequoia</i>
15	087	Emerald ash borer	<i>Agrilus planipennis</i>
16	000	Seed / Cone / Flower / Fruit Insects	n / a
16	001	Douglas-fir cone moth	<i>Barbara colfaxiana</i>

Category	Agent	Common Name	Scientific Name
16	002	Lodgepole cone beetle	<i>Conophthorus contortae</i>
16	003	Limber pine cone beetle	<i>Conophthorus flexilis</i>
16	004	Mountain pine cone beetle	<i>Conophthorus monticolae</i>
16	005	Ponderosa pine cone beetle	<i>Conophthorus ponderosae</i>
16	010	Douglas-fir cone midge	<i>Contarinia oregonesis</i>
16	015	Fir coneworm	<i>Dioryctria abietivorella</i>
16	017	Pine cone worm	<i>Dioryctria merkeli</i>
16	019	Ponderosa twig moth	<i>Dioryctria ponderosae</i>
16	020	Unknown	<i>Dioryctria pseudotsugella</i>
16	021	Dioryctria moths	<i>Dioryctria spp.</i>
16	022	Lodgepole cone moth	<i>Eucosma rescissoriana</i>
16	023	Seed chalcid	<i>Eurytomidae</i>
16	025	Cone maggot	<i>Hylemya anthracina</i>
16	027	Ponderosa pine seed worm/moth	<i>Laspeyresia piperana</i>
16	028	Spruce seed moth	<i>Laspeyresia youngana</i>
16	029	Boxelder bug	<i>Leptocoris trivittatus</i>
16	031	Western conifer seed bug	<i>Leptoglossus occidentalis</i>
16	034	Spruce seed chalcid	<i>Magastigmus piceae</i>
16	035	Ponderosa pine seed chalcid	<i>Megastigmus albifrons</i>
16	036	Fir seed chalcid	<i>Megastigmus pinus</i>
16	037	Douglas-fir seed chalcid	<i>Megastigmus spermotrophs</i>
16	042	Coneworm	<i>Phycitidae</i>
16	043	Harvester ants	<i>Pogonomyrmex spp.</i>
16	049	Prairie tent caterpillar	<i>Malacosoma lutescens</i>
16	050	Jack pine tip beetle	<i>Conophthorus banksianae</i>

Category	Agent	Common Name	Scientific Name
17	000	Gallmarker insects	n / a
17	003	Cooley spruce gall adelgid	<i>Adelges cooleyi</i>
17	007	Douglas-fir needle gall midge	<i>Contarinia pseudotsugae</i>
17	010	Hackberry nipplegall maker	<i>Pachypsylla celtidismamma</i>
17	013	Gall aphid	<i>Phylloxera</i>
17	018	Gouty pitch midge	<i>Cecidomyia piniinopsis</i>
17	019	Spider mites	<i>Oligonychus spp.</i>
18	000	Insect predators	n / a
18	001	Lacewing	<i>n/a</i>
18	002	Blackbellied clerid	<i>Enoclerus lecontei</i>
18	003	Redbellied clerid	<i>Enoclerus sphegeus</i>
18	004	Unknown	<i>Formica rufa</i>
18	005	Western yellowjacket	<i>Vespula pennsylvanica</i>
19	000	General diseases	n / a
20	000	Biotic damage	n / a
20	001	Damping off	<i>n/a</i>
20	002	Gray mold	<i>Botrytis cinerea</i>
21	000	Root / butt diseases	n / a
21	001	Armillaria root disease	<i>Armillaria spp.</i>
21	004	Brown crumbly rot	<i>Fomitopsis pinicola</i>
21	007	White mottled rot	<i>Ganoderma applanatum</i>
21	008	Ganoderma rot of hardwoods	<i>Ganoderma lucidum</i>
21	009	Ganoderma rot of conifers	<i>Ganoderma tsugae</i>
21	010	Annosus root disease	<i>Heterobasidion annosum</i>
21	012	Tomentosus root disease	<i>Inonotus tomentosus</i>

Category	Agent	Common Name	Scientific Name
21	013	Charcoal root rot	<i>Macrophomina phaseolina</i>
21	014	Black stain root disease	<i>Ophiostoma wagneri</i>
21	015	Schweinitzii butt rot	<i>Phaeolus schweinitzii</i>
21	018	Phytophthora root rot	<i>Phytophthora cinnamomi</i>
21	022	Pythium root rot	<i>Pythium spp.</i>
21	024	Crown gall	<i>Agrobacterium tumefaciens</i>
21	027	Brown cubical rot	<i>Laetiporus sulphureus</i>
22	000	Stem decays/cankers	n/a
22	006	Black knot of cherry	<i>Apiosporina morbosa</i>
22	007	Atropellis canker	<i>Atropellis piniphila</i>
22	012	Black canker of aspen	<i>Ceratocystis fimbriata</i>
22	025	Cryptosphaeria canker of aspen	<i>Cryptosphaeria populina</i>
22	026	Cytospora canker of fir	<i>Cytospora abietis</i>
22	028	Rust-red stringy rot	<i>Echinodontium tinctorium</i>
22	029	Sooty-bark canker	<i>Encoelia pruinosa</i>
22	034	Scleroderris canker	<i>Gremmeniella abietina</i>
22	035	Amelanchier rust	<i>Gymnosporangium harknessianum</i>
22	036	Cedar apple rust	<i>Gymnosporangium juniper-virginianae</i>
22	038	Hypoxylon canker of aspen	<i>Hypoxylon mammatum</i>
22	047	Red ring rot	<i>Phellinus pini</i>
22	048	Aspen trunk rot	<i>Phellinus tremulae</i>
22	057	Cytospora canker of aspen	<i>Cytospora chrysosperma</i>
22	058	Dothichiza canker	<i>Dothichiza populae</i>
22	059	Red belt fungus	<i>Fomitopsis pinicola</i>

Category	Agent	Common Name	Scientific Name
22	060	Leucocytospora canker of spruce	<i>Leucocytospora kunzei</i>
22	061	Sooty bark canker	<i>Phialis singular</i>
22	064	Tinder fungus	<i>Fomes formntarius</i>
22	066	Pinyon black stain	<i>Leptographium wagnerii</i>
22	068	False tinder fungus	<i>Phellinus igniarius</i>
22	071	Oyster mushroom	<i>Pleurotus ostreatus</i>
22	074	Cedar brown pocket rot	<i>Poria serceomollis</i>
22	075	Lachnellula canker	<i>Lachnellula flavovirens</i>
22	076	Strumella canker	<i>Strumella coryneoidea</i>
22	077	Phomopsis blight	<i>Phomopsis juniperovora</i>
22	078	Fusarium canker of yellow poplar	<i>Fusarium solani</i>
22	079	Sterile conk of maple and beech	<i>Inonotus glomeratus</i>
22	080	Canker of spruce	<i>Aleurodiscus spp.</i>
22	081	Birch conk	<i>Piptoporus betulinusai</i>
22	082	Canker	<i>Discocainia treleasei</i>
23	000	Parasitic	Epiphytic plants
23	005	White fir dwarf mistletoe	<i>Arceuthobium abietinum f. sp. Concoloris</i>
23	006	Lodgepole pine dwarf mistletoe	<i>Arceuthobium americanum</i>
23	008	Western dwarf mistletoe	<i>Arceuthobium compylopodum</i>
23	009	Limber pine dwarf mistletoe	<i>Arceuthobium cyanocarpum</i>
23	010	Pinyon dwarf mistletoe	<i>Arceuthobium divaricatum</i>
23	011	Douglas-fir dwarf mistletoe	<i>Arceuthobium douglasii</i>
23	013	Larch dwarf mistletoe	<i>Arceuthobium laricis</i>
23	017	Southwestern dwarf mistletoe	<i>Arceuthobium vaginatum subsp. Cryptopodum</i>

Category	Agent	Common Name	Scientific Name
23	021	Red fir dwarf mistletoe	<i>Arceuthobium abietinum f. sp. Pauciflorum</i>
23	022	Juniper true mistletoe	<i>Phoradendron junipeum</i>
24	000	Decline complexes / dieback / wilts	n / a
24	004	Ash decline/yellows	<i>n/a</i>
24	011	Larch decline	<i>n/a</i>
24	017	True fir pest complex	<i>n/a</i>
24	018	Western X disease	<i>n/a</i>
24	019	Pinewood nematode	<i>Bursaphelenchus xylophilus</i>
24	030	Elm phloem necrosis	<i>Mycoplasma</i>
25	000	Foliage diseases	n / a
25	009	True fir needlecast	<i>n/a</i>
25	011	Cercospora blight of juniper	<i>Cercospora sequoia</i>
25	014	Ink spot of aspen	<i>Ciborinia whetzellii</i>
25	015	Pine needle rust	<i>Coleosporium spp.</i>
25	022	Elytroderma disease	<i>Elytroderma deformans</i>
25	027	Brown felt blight	<i>Herpotrichia juniper</i>
25	029	Hardwood anthracnose	<i>Kabatiella apocrypta</i>
25	031	Spruce needle cast	<i>Lirula macrospora</i>
25	033	White pine needle cast	<i>Lophodermella arcuata</i>
25	034	Lophodermella needle cast	<i>Lophodermella spp.</i>
25	035	Lophodermium needle cast	<i>Lophodermium spp.</i>
25	036	Marssonina blight	<i>Marssonina populi</i>
25	037	Melampsora rusts	<i>Melampsora medusa</i>
25	039	Larch needle cast	<i>Meria laricis</i>

Category	Agent	Common Name	Scientific Name
25	040	Dothistroma needle blight	<i>Mycosphaerella pini</i>
25	041	Brown felt blight of pines	<i>Neopeckia coulteri</i>
25	042	Snow blight	<i>Phacidum abietis</i>
25	050	Douglas-fir needle cast	<i>Rhabdocline spp.</i>
25	055	Septoria leaf spot	<i>Septoria alnifolia</i>
25	056	Septoria leaf spot and canker	<i>Septoria musiva</i>
25	057	Sirococcus tip blight	<i>Sirococcus conigenus</i>
25	058	Diplodia blight	<i>Sphaeropsis sapinea</i>
25	059	Leaf blister of oak	<i>Taphrina caerulescens</i>
25	060	Venturia leaf blight of maple	<i>Venturia acerina</i>
25	061	Shepherd's crook	<i>Venturia tremulae</i>
25	062	Dothistroma needle blight	<i>Dothistroma septospora</i>
25	064	Broom rust	<i>Chrysomyxa arctostaphyli</i>
25	065	Spruce needle rust	<i>Lophodermium picea</i>
25	067	Spruce needle cast	<i>Lophodermium picea</i>
25	068	Hardwood leaf rust	<i>Rhizosphaera pini</i>
25	071	Spruce needle cast	<i>Rhizosphaera pini</i>
25	073	Shepards crook	<i>Ventirua populina</i>
25	074	Delphinella shoot blight	<i>Delphinella abietis</i>
25	075	Tar spot	<i>Rhytisma acerinum</i>
26	000	Stem rusts	n/a
26	001	White pine blister rust	<i>Cronartium ribicola</i>
26	002	Western gall rust	<i>Peridermium harknessii</i>
26	003	Stalactiform blister rust	<i>Cronartium coleosporioides</i>
26	004	Comandra blister rust	<i>Cronartium comandrae</i>

Category	Agent	Common Name	Scientific Name
26	005	Pinyon blister rust	<i>Cronartium occidentale</i>
26	011	Bethuli rust	<i>Peridermium bethuli</i>
26	012	Limb rust	<i>Peridermium filamentosum</i>
26	013	Southern cone rust	<i>Cronartium strobilinum</i>
27	000	Broom rusts	n / a
27	001	Spruce broom rust	<i>Chrysomyxa arctostaphyll</i>
27	002	Incense cedar broom rust	<i>Gymnosporangium libocedri</i>
27	003	Juniper broom rust	<i>Gymnosporangium nidus-avis</i>
27	004	Fir broom rust	<i>Melampsorella caryophyllacearum</i>
30	000	Fire	n / a
30	031	Wild-fire	<i>n/a</i>
30	032	Human caused fire	<i>n/a</i>
30	033	Crown fire damage	<i>n/a</i>
30	034	Ground fire damage	<i>n/a</i>
40	000	Animal damage, source unknown	n / a
41	000	Wild animals	n / a
41	001	Bear	<i>n/a</i>
41	002	Beaver	<i>n/a</i>
41	003	Big game (deer)	<i>n/a</i>
41	004	Mice or voles	<i>n/a</i>
41	005	Pocket gophers	<i>n/a</i>
41	006	Porcupines	<i>n/a</i>
41	007	Rabbits or hares	<i>n/a</i>
41	008	Sapsucker	<i>n/a</i>

Category	Agent	Common Name	Scientific Name
41	009	Squirrels	<i>n/a</i>
41	010	Woodpeckers	<i>n/a</i>
41	011	Moose	<i>n/a</i>
41	012	Elk	<i>n/a</i>
41	013	Deer	<i>n/a</i>
41	014	Feral pigs	<i>n/a</i>
41	015	Mountain beaver	<i>n/a</i>
41	016	Deer or elk	<i>n/a</i>
41	017	Earthworm	<i>Lumbricidae</i>
42	000	Domestic animals	n / a
42	001	Cattle	<i>n/a</i>
42	002	Goats	<i>n/a</i>
42	003	Horses	<i>n/a</i>
42	004	Sheep	<i>n/a</i>
50	000	Abiotic damage	n / a
50	001	Air pollutants	<i>n/a</i>
50	002	Chemical	<i>n/a</i>
50	003	Drought	<i>n/a</i>
50	004	Flooding/high water	<i>n/a</i>
50	005	Frost	<i>n/a</i>
50	006	Hail	<i>n/a</i>
50	007	Heat	<i>n/a</i>
50	008	Lightning	<i>n/a</i>
50	009	Nutrient imbalances	<i>n/a</i>
50	010	Radiation	<i>n/a</i>

Category	Agent	Common Name	Scientific Name
50	011	Snow/ice	<i>n/a</i>
50	013	Wind-tornado	<i>n/a</i>
50	014	Winter injury	<i>n/a</i>
50	015	Avalanche	<i>n/a</i>
50	016	Mud-land slide	<i>n/a</i>
50	017	Volcano	<i>n/a</i>
50	018	Other geologic events	<i>n/a</i>
50	019	Mechanical (non-human caused)	<i>n/a</i>
60	000	Competition	n / a
70	000	Human activities	n / a
70	001	Herbicides	<i>n/a</i>
70	003	Imbedded objects	<i>n/a</i>
70	004	Improper planting technique	<i>n/a</i>
70	005	Land clearing	<i>n/a</i>
70	006	Land use conversion	<i>n/a</i>
70	007	Logging damage	<i>n/a</i>
70	008	Mechanical	<i>n/a</i>
70	009	Pesticides	<i>n/a</i>
70	010	Roads	<i>n/a</i>
70	011	Soil compaction	<i>n/a</i>
70	012	Suppression	<i>n/a</i>
70	013	Vehicle damage	<i>n/a</i>
70	014	Road salt	<i>n/a</i>
71	000	Harvest	n / a
80	000	Multi-damage (insect / disease)	n / a

Category	Agent	Common Name	Scientific Name
80	001	Aspen defoliation	<i>n/a</i>
80	002	Subalpine fir mortality	<i>n/a</i>
80	004	Pinion pine decline	<i>n/a</i>
90	000	Unknown	n / a
99	000	Physical effects	n / a
99	001	Broken or top missing	<i>n/a</i>
99	002	Dead top	<i>n/a</i>
99	003	Limby (large limbs top to ground)	<i>n/a</i>
99	004	Forked top	<i>n/a</i>
99	005	Forked below merch top	<i>n/a</i>
99	006	Crook or sweep	<i>n/a</i>
99	007	Checks, bole cracks	<i>n/a</i>
99	008	Foliage discoloration	<i>n/a</i>
99	009	Mortality (for plantation surveys only)	<i>n/a</i>
99	010	Lack of seed source or dieback (for plantation surveys only)	<i>n/a</i>
99	011	Poor planting stock (for plantation surveys only)	<i>n/a</i>
99	012	Poor growth/fading/foliage is yellowing and loss of needles is occurring	<i>n/a</i>
99	013	Total board foot volume loss	<i>n/a</i>
99	014	Total cubic foot volume loss	<i>n/a</i>
99	015	Bark removal	<i>n/a</i>
99	016	Foliage loss	<i>n/a</i>
99	017	Sunscauld	<i>n/a</i>
99	018	Uproot	<i>n/a</i>

Category	Agent	Common Name	Scientific Name
99	019	Scorched foliage	<i>n/a</i>
99	020	Scorched bark	<i>n/a</i>
99	021	Dieback (for plantation surveys only)	<i>n/a</i>
99	022	Poor crown form	<i>n/a</i>
99	023	Severe forking	<i>n/a</i>
99	026	Open wound	<i>n/a</i>
99	031	Broken or dead branches	<i>n/a</i>
99	033	Damaged shoots, buds, or foliage (for plantation surveys only)	<i>n/a</i>
99	034	Excessively deformed sapling	<i>n/a</i>
99	036	Fire scar	<i>n/a</i>
99	037	Leaning tree	<i>>15% and self-supporting</i>
99	038	Charred bark	<i>Not recorded unless cambium is killed from heating</i>

DAMAGE SEVERITY RATINGS

Table 38: Damage severity rating codes

Category	Severity	Description
10	n / a	General insects
10	1	Minor: bottlebrush or shortened leaders, 0-2 forks on stem, OR <20% of branches affected, OR <50% of bole with visible larval galleries
10	2	Severe: 3 or more forks on bole, OR 20% or more branches affected, OR terminal leader dead, OR 50% or more of bole with visible larval galleries
11	n / a	Bark beetles

Category	Severity	Description
11	1	Unsuccessful bole attack: pitchout and beetle brood absent
11	2	Strip attacks: galleries and brood present
11	3	Successful current bole attack
11	4	Topkill
11	5	Successful attack last year
11	6	Older dead
12	n / a	Defoliators
12	1	Light defoliation (1-25%), no topkill
12	2	Light defoliation (1-25%), topkill $\leq 10\%$
12	3	Light defoliation (1-25%), topkill $> 10\%$
12	4	Moderate defoliation (26-75%), no topkill
12	5	Moderate defoliation (26-75%), topkill $\leq 10\%$
12	6	Moderate defoliation (26-75%), topkill $> 10\%$
12	7	Heavy defoliation (76-100%), no topkill
12	8	Heavy defoliation (76-100%), topkill $\leq 10\%$
12	9	Heavy defoliation (76-100%), topkill $> 10\%$
13	n / a	Chewing insects
13	1	Minor: bottlebrush or shortened leaders, 0-2 forks on stem, OR $< 20\%$ of branches affected
13	2	Severe: 3 or more forks on bole, OR 20% or more branches affected, OR terminal leader dead
14	n / a	Sucking insects
14	1	Minor: bottlebrush or shortened leaders, 0-2 forks on stem, OR $< 20\%$ of branches affected
14	2	Severe: 3 or more forks on bole, OR 20% or more branches affected, OR terminal leader dead

Category	Severity	Description
15	n / a	Boring insects
15	1	Minor: bottlebrush or shortened leaders, 0-2 forks on stem, OR <20% of branches affected
15	2	Severe: 3 or more forks on bole, OR 20% or more branches affected, OR terminal leader dead
16	n / a	Seed / cone / flower / fruit insects
16	1	Minor
16	2	Severe
17	n / a	Gallmaker insects
17	1	Minor
17	2	Severe
18	n / a	Insect predators
18	1	Minor
18	2	Severe
19	n / a	General diseases
19	1	Minor
19	2	Severe
20	n / a	Biotic damage
20	1	Minor
20	2	Severe
21	n / a	Root / butt diseases
21	1	(for individual trees) Tree within 30 feet of tree with deteriorating crown, tree with diagnostic symptoms or signs, or tree killed by root disease
21	2	(for individual trees) Pathogen (sign) or diagnostic symptom detected – no crown deterioration

Category	Severity	Description
21	3	(for individual trees) Crown deterioration detected – no diagnostic symptom or signs
21	4	(for individual trees) Both crown deterioration and diagnostic signs symptoms detected
21	5	(for individual trees) Bleeding present on bole
21	6	(for individual trees) Bleeding present on bole and adjacent mortality present
21	7	(for individual trees) Laboratory confirmed Sudden Oak Death
21	G2	(for setting level) Minor evidence of RDS on plot
21	G3	(for setting level) RDS present, canopy reduction less than 20%
21	G4	(for setting level) RDS present, canopy reduction 20-30%
21	G5	(for setting level) RDS present, canopy reduction 30-50%
21	G6	(for setting level) RDS present, canopy reduction 50-75%, most ground area infested
21	G7	(for setting level) RDS present, 76+ % canopy reduction
21	G8	(for setting level) Entire area infested with RDS, one or very few susceptible overstory trees
21	G9	(for setting level) Entire area infested with RDA, no susceptible overstory trees present
22	n / a	Stem decay/canker
22	0	0-4% rotten
22	1	5-15% rotten
22	2	16-25% rotten
22	3	26-35% rotten
22	4	36-45% rotten
22	5	46-55% rotten

Category	Severity	Description
22	6	56-65% rotten
22	7	66-75% rotten
22	8	76-85% rotten
22	9	86-100% rotten
23	n / a	Parasitic / epiphytic plants
23	1	Hawksworth tree DMR rating = 1; light infection
23	2	Hawksworth tree DMR rating = 2; light infection
23	3	Hawksworth tree DMR rating = 3; medium infection
23	4	Hawksworth tree DMR rating = 4; medium infection
23	5	Hawksworth tree DMR rating = 5; heavy infection
23	6	Hawksworth tree DMR rating = 6; heavy infection
23	7	Vine damage: less than 50% of crown involved
23	8	Vine damage: 50% or more of crown involved
24	n / a	Decline complexes / diebacks / wilts
24	1	Minor: minor crown symptoms
24	2	Severe: severe crown symptoms
25	n / a	Foliage diseases
25	1	Minor: <20% of foliage affected or <20% of crown in brooms
25	2	Severe: >20% of foliage affected or >20% of crown in brooms
26	n / a	Rust Stems
26	1	Branch infections located greater than 2 feet from tree bole

Category	Severity	Description
26	2	Branch infections located between 6 inches and 2 feet from tree bole
26	3	Bole infections or branch infections located within 6 inches of bole
26	4	Topkill
27	n / a	Broom rusts
27	1	Minor: <20% of crown in brooms
27	2	Severe: >20% of crown in brooms
30	n / a	Fire
30	1	Minor: <20% of crown affected
30	2	Severe: >20% of crown affected or any damage to the bole
40	n / a	Animal damage, source unknown
40	1	Minor
40	2	Severe
41	n / a	Wild animals
41	1	Minor: <20% of crown affected, bole damage is <50% circumference
41	2	Severe: >20% of crown affected, bole damage is >50% circumference, upper 1/3 of crown is killed
41	5	Earthworms are present
41	6	Earthworms are absent
50	n / a	Abiotic damage
50	1	Minor: <20% of crown affected, bole damage is <50% circumference
50	2	Severe: >20% of crown affected, bole damage is >50% circumference, upper 1/3 of crown is killed

Category	Severity	Description
60	n / a	Competition
60	1	Minor: tree slightly deformed and has some lie, terminal growth
60	2	Severe: tree extremely deformed or has no live terminal, growth severely reduced relative to neighbors
70	n / a	Human activities
70	1	Minor
70	2	Severe
71	n / a	Harvest
71	1	Minor
71	2	Severe
80	n / a	Multi-damage (insect / disease)
80	1	Minor
80	2	Severe
90	n / a	Unknown
90	0	0 – 9% affected
90	1	10 – 19% affected
90	2	20 – 29% affected
90	3	30 – 39% affected
90	4	40 – 49% affected
90	5	50 – 59% affected
90	6	60 – 69% affected
90	7	70 – 79% affected
90	8	80 – 89% affected
90	9	90 – 100% affected

Category	Severity	Description
99	n / a	Physical effects
99	001	Broken top
99	002	Dead top

Table 39: Category 99 damage severity rating codes

Category	Severity	Description	Actual percent of tree affected
99	n / a	Physical effects	n / a
99	001	Broken top	% of original height that is missing; for example, if a tree was originally 100 feet high, but 15 feet of the top is broken or missing; enter "15" in the severity code
99	002	Dead top	% of total tree height that is dead
99	003	Limby (large limbs top to bottom)	% of total tree height with many limbs/knots
99	004	Forked top	% of total tree height above fork
99	005	Forked below merch top	% of the total length of the bole affected
99	006	Crook or sweep	% of total tree height, which contains the crook or sweep
99	007	Checks, bole cracks	% of total tree height, which contains a crack or check
99	008	Foliage discoloration	% of foliage discolored
99	009	Mortality	1 = dead tree
99	010	Lack of seed source	If present, 100%
99	011	Poor planting stock source	If present, 100%
99	012	Poor growth	1 = minor (reduced growth); 2 = severe (affecting survival)
99	013	Total board foot volume loss	%of total board foot volume loss

Category	Severity	Description	Actual percent of tree affected
99	014	Total cubic foot volume loss	% of total cubic foot volume loss
99	015	Bark removal	% of tree circumference missing bark
99	016	Foliage loss	1 = minor; 2 = severe
99	017	Sunscald	1 = minor; 2 = severe
99	018	Uproot	1 = uprooted
99	019	Scorched foliage	% of foliage scorched
99	020	Scorched bark	% of bark scorched
99	021	Dieback source	1 = minor; 2 = severe
99	022	Poor crown form	1 = minor; 2 = severe
99	023	Severe forking	% of bole with forks
99	026	Open wound	% of bole or trunk affected using the height and width of the wound; for example, if a tree is 100 feet tall and the wound covers 15 feet of the bole, enter a value of "15"
99	031	Broken or dead branches	% of branches broken or dead
99	033	Damage shoots, buds, or foliage source	1 = minor; 2 = severe
99	034	Excessively deformed sapling	% of sapling deformed
99	036	Fire scar	% of bole covered by fire scar
99	037	Leaning tree	% lean from vertical
99	038	Charred bark	Not recorded unless cambium is killed from heating

TREE PARTS

Table 40: Tree part codes

Code	Description
UN	Unspecified
TO	Top
FO	Foliar (crown)
LI	Limb
BO	Bole, other than Top or Base
BA	Base
RO	Roots
WT	Whole tree
TT	Top third of crown
MT	Middle third of crown
BT	Bottom third of crown

APPENDIX L: ACCURACY STANDARDS

Table 41: Settings Measurements

Field	Tolerance
Project Name	No errors
Region	No errors
Proclaimed Forest	No errors
District	No errors
Location	No errors
Stand Number	No errors
Ownership	No errors

Field	Tolerance
State	No errors
County	No errors
Administrative Forest	No errors
Date	No errors
Photo ID	No errors
Exam Level	No errors
Exam Purpose	No errors
Stratum	No errors
Existing Vegetation Composition Type	No errors
Potential Vegetation Reference	No errors
Potential Vegetation	No errors
Structure	No errors
Capable Growing Area	± 10 percent
Fuel Model	No errors
Elevation	± 2 contour intervals
Aspect	± 45 degrees
Slope	± 10 percent
Slope Position	± 1 class
Acres	No errors
Radial Growth Interval	No errors
Radial Growth Interval #2	No errors
Height Growth Interval	No errors
Fuel Photo Reference	No errors
Precision Protocol	No errors
Examiner	No errors

Field	Tolerance
Stand Remarks	No errors
Damage Category	No errors
Damage Agent	No errors
Damage Severity	No errors
Species of Management Interest	No errors
Sketch Map and Traverse Notes	n/a

Table 42: Sample Design Criteria

Field	Tolerance
Form Type	n/a
Selection Method Type	No errors
Sample Expansion Factor	No errors
Plots Installed	No errors
Sub-population Filter	No errors
Starting Azimuth	No errors
Sample Design Remarks	No errors
Selection Criteria Number	No errors
Sub-pop Variable	No errors
Sub-pop Minimum Value	No errors
Sub-pop Maximum Value	No errors

Table 43: Plot Data

Field	Tolerance
Plot Number	No errors
Plot Latitude	No errors
Plot Longitude	No errors

Field	Tolerance
Capable Grow Area	± 10 percent
Plot Aspect	± 45
Plot Scope	± 10 percent
Slope Position	± 1 class
Slope Horizontal Shape	± 1 class
Slope Vertical Shape	± 1 class
Plot Elevation	± 2 contour intervals
Existing Vegetation	No errors
Potential Vegetation	Accurate to series understory union and phases
Plot History	No errors
Plot History Date	Year required in field 12 is other than code 10 or blank
Fuel Model	No errors
Residual Descriptive Code	No errors
Distance to Seed Wall	± 100 feet
Plot Remarks	n/a

Table 44: Tree Data

Field	Tolerance
Plot Number	No errors
Tag ID Number	No errors
Tree Status	No errors allowed in recognizing and coding down trees
Site/Growth Trees	No errors
Tree Species	No errors
Tree Count	See specifics in Table 45

Field	Tolerance
Number Stems	No errors
DBH/DRC Intensive Exam	See specifics in Table 46
DBH/DRC Extensive Exam	See specifics in Table 47
DBH/DRC Quick Exam	See specifics in Table 48
Height	10 percent
Height to Crown	10 percent
Radial Growth	1/20 th inch
Radial Growth #2	1/20 th inch
Height Growth	See specifics in Table 49
Tree Age	10 percent (based on actual tree ring count at breast height for trees ≥ 3.0 " DBH otherwise based on total age recorded)
Crown Ratio	10 percent
Crown Class	No errors
Crown Width	No errors
Wildlife Use	No errors
Log/Snag Decay	No errors
Cone Serenity	No errors
Damage Category	No errors, specifics listed in Table 50
Damage Agent	No errors
Damage Part	No errors
Damage Severity	No errors
Tree Remarks	n/a

Table 45: Tree Data, Tree Count

Height Range	Diameter Range	Trees on Point	Tolerance
*All	All	0	0 trees
≤ 0.5 feet	All	1-5	± 2 trees
≤ 0.5 feet	All	6+	± 50 percent
> 0.5 feet	< 0.5 in.	1-5	± 1 tree
> 0.5 feet	< 0.5 in.	6+	± 20 percent
All	.5" – breakpoint DBH	1-5	± 1 tree
All	.5" – breakpoint DBH	6+	± 10 percent
All	Breakpoint DBH +	1+	0 trees

* There is no tolerance for recording a tree when none are actually present in any of the above size classes. The recording of a fixed plot tree when none are present will result in a single discrepancy. The recording of a variable plot tree when none are present will result in an unacceptable unit.

Group criteria are standardized to facilitate stand exam contract inspection and payment. However, distinguishing characteristics other than tree class, species, and size class may warrant individual tree recording or more refined grouping criteria. Such characteristics include: age, crown ratio, crown class, or incident of damage.

Table 46: Tree Data, DBH/DRC Intensive Exam

Tolerance	Diameter
No errors	<.5 inch
± .1 inch	.5 inch – 13.9 inches
± .2 inch	14.0 inches – 23.9 inches
± .3 inch	24.0 inches – 34.9 inches
± .5 inch	35.0 inches +
± .1 inch	Borderline variable plot trees
± .1 inch	Estimated DRC

Table 47: Tree Data, DBH/DRC Extensive Exam

Tolerance	Diameter
± 1 inch	≤ 20 inches
± 5% of diameter	> 20 inches

Table 48: Tree Data, DBH/DRC Quick Exam

Tolerance	Diameter
± 2 inches	≤ 20 inches
± 10% of diameter	> 20 inches

Table 49: Tree Data, Height Growth

Tolerance	Diameter
± 1 foot	Trees > 6 feet
± 0.1 foot	Trees ≤ 6 feet

Table 50: Tree Data, Damage Category

Damage Category	Damage Category Description	Tolerance
11	Bark Beetles	No misses on live trees with a severity of 2 or greater
12	Defoliators	No misses on live trees with a severity of 3 or greater
13-17	Other Insects	No misses of shoot moths or weevils on live trees
21	Root/Butt Diseases	No misses on live trees with a severity of 2 or greater
22	Stem Decays/Cankers	No misses on live trees with a severity of 3 or greater
25	Foliage Diseases	No misses on Elytroderma on live trees

Damage Category	Damage Category Description	Tolerance
41-42	Animal Damage	No misses on live trees with terminal leader damage or with greater than $\frac{1}{4}$ of bole circumference affected
50	Abiotic Damage	No misses on wind, snow, or ice bending, breakage, or bole cracks and frost damage to shoots on trees less than 1-inch diameter and lightning
70	Human Damage	No misses on live trees for logging damage or fire if the damage affects greater than $\frac{1}{4}$ of the bole circumference or if an open wound is in contact with the ground

Table 51: Ground Surface Cover

Field	Tolerance
Plot Number	No errors
Cover Type	No errors
Cover Percent	± 10 percent

Table 52: Vegetation Composition

Field	Tolerance
Plot Number	No errors
Live/Dead	No errors
Layer	No errors
Life form	No errors
Species	No error in species-level identification for dominant, common, or community type indicator plants; no plant name can be repeated within a layer
Minimum Height	± 10 percent of height

Field	Tolerance
Average Height	± 10 percent of height
Maximum Height	± 10 percent of height
Canopy Cover	± 10 percent
Average Diameter	No errors
Maturity	No errors
Cover Remarks	n/a
User Field	n/a

Table 53: Down Woody

Field	Tolerance
Plot Number	No errors
First Duff	± ½ inch
Second Duff	± ½ inch
Fuel Depth	No errors
Twigs 0 – .24	± 40 percent
Twigs .25 - .99	± 30 percent
Twigs 1.0 – 2.99	± 20 percent
Volume 1	n/a
Weight 1	n/a
Volume 2	n/a
Weight 2	n/a
Volume 3	n/a
Weight 3	n/a
Volume 4	n/a
Weight 4	n/a
Piece Count	No missed pieces

Field	Tolerance
Decay Class	No errors
Diameter	± 1 inch on measurements
Piece Length	No errors

APPENDIX M: GLOSSARY OF TERMS

Table 54: Glossary

Term	Definition
Aspect	A position facing or commanding a given direction; exposure. Aspect is the compass direction of the prevailing slope with respect to true north.
Azimuth	A horizontal angular measure from true north to an object of interest.
Basal Area	The cross-sectional area of the stem or stems of a plant or of all plants in a stand; generally expressed as square units per unit area. For trees, measured at 4.5 feet above ground; forbs and grasses are measure at the root crown
Bole Length	The straight-line distance measured parallel to the main bole of a tree, from its base to its tip.
Breast Height	A point located on the uphill side of the main stem, by measuring 4.5 feet along the uphill side of the bole from ground level or the predominant root collar. Preclude slight, non-compacted litter accumulations when establishing breast height.
CALVEG	Classification and Assessment with LANDSAT of Visible Ecological Groupings. It is a California-wide system for classifying vegetative and non-vegetative cover types. The primary cover type relates to life form and uses a 3-character alpha code.
Canopy Cover	The percent of a fixed area covered by the crown of an individual plant species or delimited by the vertical projection of its outermost perimeter; small openings in the crown are included.

Term	Definition
Compacted Live Crown Ratio	The percent of the total height of the tree that supports a full, live crown. For trees that have uneven length crowns, occularly transfer lower branches to fill holes in the upper portions of the crown, until a full, even crown is created.
Compartment	A land area, usually between 3,000 and 8,000 acres, easily identified on the ground by physical features. A compartment tis comparable in size to a sub-watershed, or landscape management unit. It is used as a convenience for maintaining stand records and planning vegetation management projects.
Crown Class	The relative position of the tree or shrub crown with respect to the competing vegetation around it. Crown class for each tree or shrub is judged in the context of its immediate environment, that is those trees or shrubs which are competing for sunlight with the subject tree or shrub.
Crown Length	The vertical distance from the top of the leader to the base of the crown, measured to the lowest live branch-whorl with live branches in at least three quadrants, and continuous with the main crown.
Crown Ratio	The ratio of compacted live crown length to bole length. Lengths are measured parallel to the bole from the base of the tree to the tip.
DEM	Digital Elevation Model. USGS geographic elevation data distributed in raster form. Digital representation of the shape of the earth's surface. Typically, digital elevation data consists of arrays of values that represent topographic elevations measured at equal intervals on the Earth's surface.
Diameter	The length of a straight-line segment passing through the center of an item and terminating at its periphery.
Diameter at Breast Height (DBH)	A measure at breast height (4.5 feet), outside bark, of the tree bole, perpendicular to the tree bole.
Diameter at Root Collar (DRC)	The straight line passing through the center of a cross section of a bole measured at the root collar of a shrub or tree.
Down Log	Stem material (conifer or hardwood) that is lying on the ground. If a stem material is leaning more than 45 degrees from vertical, is not self-supporting, and/or in contact with the ground, it is considered a down log.

Term	Definition
Down Woody Material	Woody pieces of trees and shrubs that have been uprooted (no longer supporting growth) or severed from their root system, not self-supporting, and are lying on the ground.
Duff Layer	Duff is the fermentation and humus layer of the forest floor. It does not include the freshly cast material in the litter layer. The top of the duff is where needles, leaves, and other cast-off vegetative material have noticeably begun to decompose. Individual particles usually will be bound by fungi mycelium. When moss is present, the top of the duff is just below the green portion of the moss. The bottom of the duff is the start of the soil ("A" horizon).
Elevation	Vertical distance from a datum, usually mean sea level, to a point or object on the earth's surface. Not to be confused with altitude, this refers to points above the earth's surface.
Fuel Bed	The fuel bed is accumulation of dead, woody residue on the forest floor. It begins at the top of the duff layer and above. It includes litter, dead limb wood, and bole wood from tree species, as well as dead material from shrub, herbaceous, and grass species.
Fuel Model	Mathematical descriptions of fuel properties (e.g., fuel load and fuel depth) that are used as inputs to calculations of fire danger indices and fire behavior potential.
GPS	Global Positioning System. A network of radio-emitting satellites deployed by the U.S. Department of Defense. Ground-based GPS receivers can automatically derive accurate surface coordinates for all kinds of GIS, mapping, and surveying data collection.
Ground Level	The forest floor, made up by soil and duff layer. It does not include unincorporated woody debris that may rise above the ground line. In reference to a point of measure, it is the highest point of the ground touching the base of the object being referenced.
Group Tally	A count of one or more items of the same type or species and recorded as a single line entry.
Growth	A measure of the increase in growth layers for a specified time frame.
Height Growth	The increase in height over a set period of time.

Term	Definition
Intersect Diameter	Measurement of diameter at a point where the sampling plane intersects the geometric center of the object being tallied. No adjustment is made for stem irregularities at the point of intersection.
Lean (Tree)	The deflection from vertical, > 15 degrees of a straight line passing through the geometric center of the base and top of the main stem.
Length	The measurement of the extent of something along its greatest dimension.
Life Form	Species and individuals that are grouped into classes on the basis of their similarities in structure and function. A growth form that displays an obvious relationship to important environmental factors.
Limiting Distance	A comparative measurement between the subplot radius and the distance from the subplot center to the center of the object. The comparison is used to determine whether the object is in or out of the fixed area subplot. The object is "IN" if the measured distance is equal to or less than the subplot radius. The object is "OUT" if the measured distance is greater than the subplot radius.
Live Crown Length	The straight-line distance measured parallel to the main bole of a tree, from the top of the live crown to the base of the live crown.
Ownership	The identification of the legal owner/administrator on both the surface and subsurface estates.
Plant Species	The major subdivision of a genus or subgenus of a plant being described or measured.
Plot Configuration	The size and shape of the sampling unit (plot) and the spatial arrangement of subplots within that unit.
Plot	A sub-sample of a plot or stand exam. This is the unit on which data are recorded to individual trees, snags, logs, understory vegetation, and fuels. Data can be collected on either a fixed area or variable radius area.
Proclaimed Forest	Units of the National Forest System as originally proclaimed or designated by Congress.
Quadratic Mean Diameter	The diameter of the tree of average basal area.

Term	Definition
Radial Growth Increment	The increase in tree radius over a period of time at breast height, or occasionally at the base.
Random Sample	Any method of sample selection based on the theory of probability (degree of certainty). At any stage of the operation of selection, the probability of any set of units being selected must be known. It is the only method that can provide a measure of precision of the estimate.
Reconciliation Code	A code used to reflect the status of an individually tallied item with regards to previous surveys.
Slope	A deviation from the horizontal.
Species	A code that represents a fundamental category of taxonomic classification of an organism.
Stand	A spatially continuous group of trees and associated vegetation having similar structures and growing under similar soil and climatic conditions.
Stand Exam Grid	Basic data collection method for stand exams. It consists of a set of plots, separated by equal distances on a grid pattern. The lines of the grid (transects) are oriented in cardinal directions. There is a predetermined distance between plots. The number of transects and grid plots will vary depending upon the size and shape of the stand.
Stratified Sample	A method of sampling forest resources where stands or polygons of similar properties are lumped into strata. This improves the efficiency of an inventory by reducing the variability within a given population. The less variability there is within a strata, the fewer samples will need to be taken to achieve a statistically valid result.
Stratum	A group of stands within a condition class; similar characteristics such as forest type, tree size class, and canopy density.
Stump	The woody base of a tree remaining in contact with the soil after the trunk or main stem has been severed at a point less than 4.5 feet above ground height (measured on the uphill side).
Tree	A woody perennial plant, typically large, with a single well-defined stem carrying a more or less definite crown.

Term	Definition
Tree Age	Total age of the above-ground stem of a tree (not age of the root stock or the total age from seed). Total age is usually the annual ring count to the pith of the tree at breast height plus an estimate of the number of years it took the tree to reach breast height.

APPENDIX N: FUEL MODELS

The original 13 fuel models are from “Aids to Determining Fuel Models for Estimating Fire Behavior,” Hal E. Anderson, INT-122, 1982. The remaining fuel models are from “Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model” by Joe H. Scott and Robert E. Burgan. RMRS – GTR-153. June 2005.

Table 55: Fuel Models

Fuel Model	Fuel Model Code	Fuel Model Name	Fuel Type	Model Set	Fuel 1-hr	Fuel 10-hr	Fuel 100-hr	Fuel Bed Depth
1	n/a	Short grass (1 foot)	Grass and grass-dominated	Original 13	0.74	0	0	1
2	n/a	Timber (grass and understory)	Grass and grass-dominated	Original 13	2	1	0.500	1
3	n/a	Tall grass (2.5 feet)	Grass and grass-dominated	Original 13	3.01	0	0	2.50
4	n/a	Chaparral (6 feet)	Chaparral and shrub fields	Original 13	5.01	4.010	2	6
5	n/a	Brush (2 feet)	Chaparral and shrub fields	Original 13	1	0.500	0	2
6	n/a	Dormant brush, hardwood slash	Chaparral and shrub fields	Original 13	1.50	2.500	2	2.50
7	n/a	Southern rough	Chaparral and shrub fields	Original 13	1.13	1.870	1.500	2.50

Fuel Model	Fuel Model Code	Fuel Model Name	Fuel Type	Model Set	Fuel 1-hr	Fuel 10-hr	Fuel 100-hr	Fuel Bed Depth
8	n/a	Closed timber litter	Timber litter	Original 13	1.50	1	2.500	0.20
9	n/a	Hardwood litter	Timber litter	Original 13	2.92	0.410	0.150	0.20
10	n/a	Timber (litter and understory)	Timber litter	Original 13	3.01	2	5.010	1
11	n/a	Light logging slash	Slash	Original 13	1.50	4.51	5.510	1
12	n/a	Medium logging slash	Slash	Original 13	4.01	14.03	16.53	2.30
13	n/a	Heavy logging slash	Slash	Original 13	7.01	23.04	28.05	3
91	NB1	Urban/ Developed	Non-burnable	Scott and Burgan	0	0	0	0
92	NB2	Snow/Ice	Non-burnable	Scott and Burgan	0	0	0	0
93	NB3	Agricultural	Non-burnable	Scott and Burgan	0	0	0	0
98	NB4	Open Water	Non-burnable	Scott and Burgan	0	0	0	0
99	NB5	Bare Ground	Non-burnable	Scott and Burgan	0	0	0	0
101	GR1	Short, Sparse Dry Climate Grass (Dynamic)	Grass	Scott and Burgan	0.10	0	0	0.40
102	GR2	Low Load, Dry Climate (Dynamic)	Grass	Scott and Burgan	0.10	0	0	1

Fuel Model	Fuel Model Code	Fuel Model Name	Fuel Type	Model Set	Fuel 1-hr	Fuel 10-hr	Fuel 100-hr	Fuel Bed Depth
103	GR3	Low Load, Very Coarse, Humid Climate Grass (Dynamic)	Grass	Scott and Burgan	0.10	0.40	0	2
104	GR4	Moderate Load, Dry Climate Grass (Dynamic)	Grass	Scott and Burgan	0.25	0	0	2
105	GR5	Low Load, Humid Climate Grass (Dynamic)	Grass	Scott and Burgan	0.40	0	0	1.50
106	GR6	Moderate Load, Humid Climate Grass (Dynamic)	Grass	Scott and Burgan	0.10	0	0	1.50
107	GR7	High Load, Dry Climate Grass (Dynamic)	Grass	Scott and Burgan	1	0	0	3
108	GR8	High Load, Very Coarse, Humid Climate Grass (Dynamic)	Grass	Scott and Burgan	0.50	1	0	4
109	GR9	Very High Load, Humid Climate Grass (Dynamic)	Grass	Scott and Burgan	1	1	0	5
121	GS1	Low Load, Dry Climate Grass-Shrub (Dynamic)	Grass-Shrub	Scott and Burgan	0.20	0	0	0.90
122	GS2	Moderate load, Dry Climate Grass-Shrub (Dynamic)	Grass-Shrub	Scott and Burgan	0.50	0.500	0	1.50
123	GS3	Moderate Load, Humid Climate Grass-Shrub (Dynamic)	Grass-Shrub	Scott and Burgan	0.30	0.250	0	1.80

Fuel Model	Fuel Model Code	Fuel Model Name	Fuel Type	Model Set	Fuel 1-hr	Fuel 10-hr	Fuel 100-hr	Fuel Bed Depth
124	GS4	High Load, Humid Climate Grass-Shrub (Dynamic)	Grass-Shrub	Scott and Burgan	1.90	0.300	0.100	2.10
141	SH1	Low Load, Dry Climate Shrub (Dynamic)	Shrub	Scott and Burgan	0.25	0.250	0	1
142	SH2	Moderate Load, Dry Climate Shrub	Shrub	Scott and Burgan	1.35	2.400	0.750	1
143	SH3	Moderate Load, Humid Climate Shrub	Shrub	Scott and Burgan	0.45	3	0	2.40
144	SH4	Low Load, Humid Climate Timber-Shrub	Shrub	Scott and Burgan	0.85	1.150	0.200	3
145	SH5	High Load, Dry Climate Shrub	Shrub	Scott and Burgan	3.60	2.100	0	6
146	SH6	Low Load, Humid Climate Shrub	Shrub	Scott and Burgan	2.90	1.450	0	2
147	SH7	Very High Load, Dry Climate Shrub	Shrub	Scott and Burgan	3.5	5.300	2.200	6
148	SH8	High Load, Humid Climate Shrub	Shrub	Scott and Burgan	2.05	3.400	0.850	3
149	SH9	Very High Load, Humid Climate Shrub (Dynamic)	Shrub	Scott and Burgan	4.50	2.450	0	4.40
161	TU1	Low Load, Dry Climate Timber-Grass-Shrub (Dynamic)	Timber - Understory	Scott and Burgan	0.20	0.900	1.500	0.60

Fuel Model	Fuel Model Code	Fuel Model Name	Fuel Type	Model Set	Fuel 1-hr	Fuel 10-hr	Fuel 100-hr	Fuel Bed Depth
162	TU2	Moderate Load, Humid Climate Timber-Grass-Shrub (Dynamic)	Timber - Understory	Scott and Burgan	0.95	1.800	1.250	1
163	TU3	Moderate Load, Humid Climate Timber-Grass-Shrub (Dynamic)	Timber – Understory	Scott and Burgan	1.10	0.150	0.250	1.30
164	TU4	Dwarf Conifer with Understory	Timber – Understory	Scott and Burgan	4.50	0	0	0.50
165	TU5	Very High Load, Dry Climate Timber-Shrub	Timber – Understory	Scott and Burgan	4	4	3	1
181	TL1	Low Load Compact Conifer Litter	Timber Litter	Scott and Burgan	1	2.200	3.600	0.20
182	TL2	Low Load Broadleaf Litter	Timber Litter	Scott and Burgan	1.40	2.300	2.200	0.200
183	TL3	Moderate Load Conifer Litter	Timber Litter	Scott and Burgan	0.50	2.200	2.800	0.30
184	TL4	Small Downed Logs	Timber Litter	Scott and Burgan	0.50	1.500	4.200	0.40
185	TL5	High Load Conifer Litter	Timber Litter	Scott and Burgan	1.15	2.500	4.400	0.60
186	TL6	Moderate Load Broadleaf Litter	Timber Litter	Scott and Burgan	2.40	1.200	1.200	0.30
187	TL7	Large Downed Logs	Timber Litter	Scott and Burgan	0.30	1.400	8.100	0.40

Fuel Model	Fuel Model Code	Fuel Model Name	Fuel Type	Model Set	Fuel 1-hr	Fuel 10-hr	Fuel 100-hr	Fuel Bed Depth
188	TL8	Long-Needle Litter	Timber Litter	Scott and Burgan	5.80	1.400	1.100	0.30
189	TL9	Very High Load Broadleaf Litter	Timber Litter	Scott and Burgan	6.65	3.300	4.150	0.60
201	SB1	Low Load Activity Fuel	Slash-Blowdown	Scott and Burgan	1.50	3	11	1
202	SB2	High Load Activity Fuel or Moderate Load Blowdown	Slash-Blowdown	Scott and Burgan	4.50	4.250	4	1
203	SB3	High Load Activity Fuel or Moderate Load Blowdown	Slash-Blowdown	Scott and Burgan	5.50	2.750	3	1.20
204	SB4	High Load Blowdown	Slash-Blowdown	Scott and Burgan	5.25	3.500	5.250	2.70

Table 56: Detailed Descriptions of the Fuel Models

Code	Detailed Description
1	Contains fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Generally less than one-third of the area contains shrubs or timber. Grasslands and savanna are represented along with stubble, grass-tundra, and grass-shrub combinations. Annual and perennial grasses are included in this fuel model.
2	Herbaceous material with litter and dead-down stem wood from the open shrub or timber overstory. Open shrub lands and pine stands or scrub oak stands that cover one-third to two-thirds of the area. Stand many include clumps and may include pinyon-juniper.
3	Stands are tall, averaging about three feet, but considerable variation may occur. Approximately one-third or more of the stand is considered dead and cured. May include cultivated grains that have not been harvested, tall prairie, and marshland grasses.

Code	Detailed Description
4	Stands of mature shrubs, 6 feet or more tall such as California mixed chaparral, the high pocosin along the east coast, the pine barrens of New Jersey, or the closed jack pine stands of the north-central states. Besides flammable foliage, stand may contain dead woody material. May contains a deep litter layer.
5	Shrubs are young with little dead material, and the foliage contains little volatile material. Usually shrubs are short and almost totally cover the area. Young, green stands with no dead wood qualify: laurel, vine maple, alder, or even chaparral, manzanita, or chamise.
6	The shrubs are older, but not as tall as model 4, nor do they contain as much fuel as model 4. This model covers a broad range of shrub conditions: intermediate stands of chamise, chaparral, oak brush, low pocosin, Alaskan spruce taiga, and shrub tundra. May include hardwood slash that has been cured. Pinyon-juniper shrub lands may be represented.
7	Stands of shrubs are generally between 2 and 6 feet high. Palmetto-galliberry understory, with a pine overstory are typical. Low pocosin may be represented. Black spruce shrub combinations in Alaska may also be represented.
8	Contains closed canopy stands of short needle conifers or hardwoods that have leafed out. The compact litter layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present. Representative conifer types are white pine, lodgepole pine, spruce, fir, and larch.
9	Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Closed stands of long-needled pine like ponderosa, Jeffrey, red pines, or southern pine plantations are grouped in this model. May contain concentrations of dead-down woody material.
10	Dead-down fuels include quantities of 3-inch or larger limb wood resulting from over maturity or natural events that create a large load of dead material on the forest floor. Any forest type may be considered if heavy down material is present; examples are insect- or disease-ridden stands, wind thrown stands, over-mature situations with deadfall, and aged light thinning or partial cut slash.
11	Contains slash and herbaceous material intermixed with slash. Light partial cuts or thinning operations in mixed conifer stands, hardwood stands, and southern pine harvests are considered. Clearcuts generally produce more slash than represented here. The less than 3-inch material load is less than 12 tons per acre. The greater than 3 inch is represented by not more than 10 pieces, 4 inches in diameter, along a 60 foot transect.
12	The visual impression is dominated by slash and much of it is less than 3 inches in diameter. The fuels are well distributed. Heavily thinned conifer stands, clearcuts, and medium or heavy partial cuts are represented. The material larger than 3 inches is represented by encountering 11 pieces, 6 inches in diameter along a 50 foot transect.

Code	Detailed Description
13	There is a continuous layer of slash. Large quantities of material larger than 3 inches are present. Clearcuts and heavy partial cuts in mature and over-mature stands are depicted where the slash load is dominated by the greater than 3 inch diameter material. Fuels less than 3 inches are generally only 10 percent of the total load. May include situations where the slash still has “red” needles attached.
91	Land covered by urban and suburban development. The area must not support wildland fire spread. In some cases the area may experience structural fire losses during a wildland fire incident; however, structure ignition in those cases is either house-to-house or by firebrands, neither of which is directly modeled using fire behavior fuel models. If sufficient vegetation surrounds structures such that wildland fire spread is possible, then choose a fuel model appropriate for the wildland vegetation.
92	Land covered by permanent snow and ice. Areas covered by seasonal snow and ice can be mapped to two different fuel models.
93	Agricultural land maintained in a non-burnable condition, examples include irrigated annual crops, mowed or tilled orchards, and so forth. However, there are many agricultural areas that are not kept in a non-burnable condition. For example, grass is often allowed to grow beneath vines or orchard trees, and wheat and similar crops are allowed to cure before harvest; in those cases use a different fuel model.
98	Land covered by open bodies of water such as lakes, rivers, and oceans.
99	Land devoid of enough fuel to support wildland fire spread. Such areas include: gravel pits, arid deserts with little vegetation, sand dunes, rock outcroppings, beaches, and so forth.
101	The primary carrier of fire in sparse grass, though small amounts of fine fuel may be present. The grass is generally short, either naturally or by grazing, and may be sparse or discontinuous. The moisture extraction is indicative of a dry climate fuelbed, but may also be applied in high-extinction moisture fuelbeds because in both cases predicted spread rate and flame length are low compared to other grass models.
102	The primary carrier of fire is grass, though small amounts of fine dead fuel may be present. Load is greater than 101, and fuelbed may be more continuous. Shrubs, if present, do not affect fire behavior.
103	The primary carrier of fire is continuous, coarse, humid-climate grass. Grass and herb fuel load is relatively light; fuelbed depth is about 2 feet. Shrubs are not present in significant quantity to affect fire behavior.
104	The primary carrier of fire is continuous, dry-climate grass. Load and depth are greater than 102; fuelbed depth is about 2 feet.
105	The primary carrier of fire is humid-climate grass. Load is greater than 103 but depth is lower, about 1-2 feet.

Code	Detailed Description
106	The primary carrier of fire is continuous humid-climate grass. Load is greater than 105 but depth is about the same. Grass is less coarse than 105.
107	The primary carrier of fire is continuous dry-climate grass. Load and depth are greater than 104. Grass is about 3 feet tall.
108	The primary carrier of fire is continuous, very coarse, humid-climate grass. Load and depth are greater than 106. Spread rate and flame length can be extreme if grass is fully cured.
109	The primary carrier of fire is dense, tall, humid-climate grass. Load and depth are greater than 108, about 6 feet tall. Spread rate and flame length can be extreme if grass is fully more mostly cured.
121	The primary carrier of fire is grass and shrubs combined. Shrubs are about 1 foot height, grass load is low. Spread rate is moderate; flame length is low. Moisture of extinction is low.
122	The primary carrier of fire is grass and shrubs combined. Shrubs are 1 to 3 feet high, grass load is moderate. Spread rate is high; flame length moderate. Moisture of extinction is low.
123	The primary carrier of fire is grass and shrubs combined. Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate is high; flame length moderate. Moisture of extinction is high.
124	The primary carrier of fire is grass and shrubs combined. Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high. Moisture of extinction is high.
141	The primary carrier of fire is woody shrubs and shrub litter. Low shrub fuel load, fuelbed about 1 foot; some grass may be present. Spread rate is very low; flame length very low.
142	The primary carrier of fire is woody shrubs and shrub litter. Moderate shrub fuel load (higher than 141), depth about 1 foot, no grass fuel present. Spread rate is very low; flame length low.
143	The primary carrier of fire is woody shrubs and shrub litter. Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate is low; flame length low.
144	The primary carrier of fire is woody shrubs and shrub litter. Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate is high; flame length moderate.
145	The primary carrier of fire is woody shrubs and shrub litter. Heavy shrub load, depth 4-6 feet. Spread rate is very high; flame length very high. Moisture of extinction is high.

Code	Detailed Description
146	The primary carrier of fire is woody shrubs and shrub litter. Dense shrubs, little or no herbaceous fuel, fuelbed depth about 2 feet. Spread rate is high; flame length high.
147	The primary carrier of fire is woody shrubs and shrub litter. Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than 146, but flame length similar. Spread rate is high, flame length is very high.
148	The primary carrier of fire is woody shrubs and shrub litter. Dense shrubs, little or no herbaceous fuel, fuelbed depth about 3 feet. Spread rate is high; flame length high.
149	The primary carrier of fire is woody shrubs and shrub litter. Dense, finely branched shrubs with significant fine dead fuel, about 4 to 6 feet tall; some herbaceous fuel may be present. Spread rate is high; flame length is very high.
161	The primary carrier of fire is low load of grass and/or shrub with litter. Spread rate is low; flame length is low.
162	The primary carrier of fire is moderate litter load with shrub component. High extinction moisture. Spread rate is moderate; flame length is low.
163	The primary carrier of fire is moderate forest litter. High extinction moisture. Spread rate is high; flame length is moderate.
164	The primary carrier of fire is short conifer trees with grass or moss understory. Spread rate is moderate; flame length is moderate.
165	The primary carrier of fire is heavy forest litter with a shrub or small tree understory. Spread rate is moderate; flame length is moderate.
181	The primary carrier of fire is compact forest litter. Light to moderate loads, fuels 1 to 2 inches deep. May be used to represent a recently burned forest. Spread rate is very low; flame length is very low.
182	The primary carrier of fire is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length is very low.
183	The primary carrier of fire is moderate load conifer litter, light load of coarse fuels. Spread rate is very low; flame length low.
184	The primary carrier of fire is moderate load of fine litter and coarse fuels. Includes small diameter downed logs. Spread rate is low; flame length low.
185	The primary carrier of fire is high load of fine litter; light slash or mortality fuel. Spread rate is low; flame length low.
186	The primary carrier of fire is moderate load broadleaf litter, less compact than 182. Spread rate is very moderate; flame length is low.

Code	Detailed Description
187	The primary carrier of fire is heavy load of forest litter, includes large diameter downed logs. Spread rate is low; flame length low.
188	The primary carrier of fire is moderate load long-needle pine litter, may include small amount of herbaceous load. Spread rate is moderate; flame length low.
189	The primary carrier of fire is very high load, fluffy broadleaf litter. This can also be used to represent heavy needle-drape. Spread rate is very moderate; flame length moderate.
201	The primary carrier of fire is light dead and down activity fuel. Fine fuel load is 10 to 20 t/ac weighted towards fuels 1 to 3 inch diameter class; depth is less than 1 foot. Spread rate is moderate; flame length moderate.
202	The primary carrier of fire is moderate dead and downed activity fuel or light blowdown. Fine fuel load is 7 to 12 t/ac, evenly distributed across 0 to 0.25, 0.25 to 1, and 1 to 3 inch diameter classes, depth is about 1 foot. Blowdown is scattered, with many trees still standing. Spread rate is moderate; flame length moderate.
203	The primary carrier of fire is heavy dead and down activity fuel or moderate blowdown. Fine fuel load is 7 to 12 t/ac, weighted toward 0 to 0.25 inch diameter class, depth is more than 1 foot. Blowdown is moderate; trees compacted to near the ground. Spread rate is high; flame length high.
204	The primary carrier of fire is heavy blowdown fuel. Blowdown is total, fuelbed is not compacted, most foliage and fine fuel still attached to blowdown. Spread rate is very high; flame length very high.