



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



FSVeg Common Stand Exam User Guide Region 9 Appendices

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APPENDIX A: ADMINISTRATIVE AND PROCLAIMED FOREST CODES

Table 1: Region 9 codes

Admin Number	Administrative Forest Name	Proclaimed Number	Proclaimed Forest Name
03	Chippewa	03	Chippewa
04	Huron – Manistee	04	Huron
04	Huron – Manistee	24	Manistee
05	Mark Twain	05	Mark Twain
07	Ottawa	07	Ottawa
08	Shawnee	08	Shawnee
09	Superior	09	Superior
10	Hiawatha	10	Hiawatha
12	Hoosier	12	Hoosier
13	Chequamegon/Nicolet	02	Chequamegon
13	Chequamegon/Nicolet	06	Nicolet
14	Wayne	14	Wayne
15	Midewin National Tallgrass Prairie	15	Midewin National Tallgrass Prairie
19	Allegheny	19	Allegheny
20	Green Mountain–Finger Lakes	20	Green Mountain
20	Green Mountain-Finger Lakes	30	Finger Lakes
21	Monongahela	21	Monomgahela
22	White Mountain	22	White Mountain

APPENDIX B: DISTRICT CODES

Table 2: Region 8 codes

Forest	Code	District
Allegheny	2	Marienville
Allegheny	3	Bradford
Chequamegon – Nicolet	1	Medford-Park Falls
Chequamegon – Nicolet	2	Great Divide
Chequamegon – Nicolet	3	Eagle River – Florence
Chequamegon – Nicolet	4	Lakewood – Laona
Chequamegon – Nicolet	5	Washburn
Chippewa	1	Blackduck
Chippewa	3	Deer River
Chippewa	5	Walker
Green Mountain	1	Middlebury
Green Mountain	2	Manchester
Green Mountain	3	Hector
Green Mountain	5	Rochester
Hiawatha	1	Rapid River
Hiawatha	2	Manistique
Hiawatha	3	Munising
Hiawatha	4	Sault Ste. Marie
Hiawatha	5	St. Ignace
Hoosier	2	Brownstown
Hoosier	4	Tell City
Huron – Manistee	1	Baldwin – WC
Huron – Manistee	3	Manistee – Cadillac

Forest	Code	District
Huron – Manistee	5	Mio
Huron – Manistee	6	Huron Shores
Mark Twain	3	Houston
Mark Twain	4	Poplar Bluff
Mark Twain	5	Potosi-Fredricktown
Mark Twain	7	Salem
Mark Twain	8	Cedar Creek
Mark Twain	21	Ava – Cassville
Mark Twain	23	Eleven Point
Monongahela	1	Chest
Monongahela	2	Gauley
Monongahela	3	Greenbrier
Monongahela	4	Marlinton-White Sulphur
Monongahela	5	Potomac
Ottawa	1	Bergland
Ottawa	2	Bessemer
Ottawa	3	Iron River
Ottawa	4	Kenton
Ottawa	5	Ontonagon
Ottawa	6	Watersmeet
Shawnee	2	Mississippi Bluffs
Shawnee	4	Hidden Springs
Superior	1	Laurentian
Superior	2	Gunflint
Superior	5	Kawishiwi

Forest	Code	District
Superior	6	Lacroix
Superior	7	Tofte
Wayne	1	Athens
Wayne	3	Ironton
White Mountain	1	Ammonoosuc
White Mountain	2	Androscoggin
White Mountain	3	Evans Notch
White Mountain	4	Pemigewasset
White Mountain	5	Saco
White Mountain	6	Massabesic Exp. Forest

APPENDIX C: STATE CODES

Table 3: Region 9 codes

Code	State
IL	Illinois
IN	Indiana
ME	Maine
MI	Michigan
MN	Minnesota
MO	Missouri
NH	New Hampshire
NY	New York
OH	Ohio
PA	Pennsylvania
VT	Vermont

Code	State
WV	West Virginia
WI	Wisconsin

APPENDIX D: COUNTY CODES

Table 4: Illinois County codes

Code	County
3	Alexander
59	Gallatin
69	Hardin
77	Jackson
87	Johnson
127	Massac
151	Pope
165	Saline
181	Union
199	Williamson

Table 5: Indiana county codes

Code	County
5	Bartholomew
13	Brown
25	Crawford
37	Dubois
71	Jackson
81	Johnson

Code	County
93	Lawrence
101	Martin
105	Monroe
117	Orange
123	Perry

Table 6: Maine county codes

Code	County
17	Oxford

Table 7: Michigan county codes

Code	County
1	Alcona
3	Alger
13	Baraga
33	Chippewa
39	Crawford
41	Delta
53	Gogebic
61	Houghton
69	Iosco
71	Iron
85	Lake
97	Mackinac
101	Manistee
102	Marquette

Code	County
103	Mason
107	Mecosta
117	Montcalm
121	Muskegon
123	Newaygo
127	Oceana
129	Ogemaw
131	Ontonagon
135	Oscoda
153	Schoolcraft
165	Wexford

Table 8: Minnesota county codes

Code	County
7	Beltrami
21	Cass
31	Cook
61	Itasca
75	Lake
137	St. Louis

Table 9: Missouri county codes

Code	County
9	Barry
17	Bollinger
19	Boone

Code	County
23	Butler
27	Callaway
35	Carter
43	Christian
55	Crawford
65	Dent
67	Douglas
91	Howell
93	Iron
105	Leclede
123	Madison
149	Oregon
153	Ozark
157	Perry
161	Phelps
169	Pulaski
179	Reynolds
181	Ripley
186	St. Genevieve
187	St. Francois
203	Shannon
209	Stone
213	Taney
215	Texas
221	Washington

Code	County
223	Wayne
229	Wright

Table 10: New Hampshire county codes

Code	County
3	Carroll
7	Coos
9	Grafton

Table 11: New York county codes

Code	County
97	Schuyler
99	Seneca

Table 12: Ohio county codes

Code	County
9	Athens
53	Gallia
75	Hocking
79	Jackson
87	Lawrence
111	Monroe
115	Morgan
121	Noble
127	Perry
131	Pike

Code	County
141	Ross
145	Scioto
163	Vinton
167	Washington

Table 13: Pennsylvania county codes

Code	County
47	Elk
53	Forest
83	McKean
123	Warren

Table 14: Vermont county codes

Code	County
1	Addison
3	Bennington
21	Rutland
23	Washington
25	Windham
27	Windsor

Table 15: West Virginia county codes

Code	County
1	Barbour
23	Grant
25	Greenbrier

Code	County
27	Hampshire
31	Hardy
63	Monroe
67	Nicholas
71	Pendleton
75	Pocahontas
77	Preston
83	Randolph
93	Tucker
101	Webster

Table 16: Wisconsin county codes

Code	County
3	Ashland
7	Bayfield
37	Florence
41	Forest
67	Langlade
83	Oconto
85	Oneida
99	Price
113	Sawyer
119	Taylor
125	Vilas

APPENDIX E: EXISTING VEGETATION REFERENCES & CODES

Table 17: Existing Vegetation References

Code	Name	Author
FSHR9	Forest Service Handbook. Milwaukee, WI. FSH2409.21d-R9. Compartment Prescription Handbook, FSH 6/84. Amendment 20, April 1974. pp. 260.2-2.	USDA Forest Service
FIAD8	The Forest Inventory and Analysis Database: Database Description and Users Manual. Version 1.0 Gen. Tech. Rep NC-218, St. Paul, MN: U.S.D.A., Forest Service, North Central Research Station, 130pp.	U.S. Dept. of Agriculture

Table 18: Existing FSHR9 Vegetation codes

Code	Description
1	Jack pine
2	Red pine
3	Eastern white pine
4	Eastern white pine – hemlock
5	Hemlock
6	Scotch pine
7	Norway spruce
8	White spruce
9	Conifers (Allegheny)
10	Spruce
11	Balsam fir – aspen/paper birch
12	Black spruce
14	Red spruce – balsam fir
15	Tamarack
16	White spruce – balsam fir
17	Upland black spruce

Code	Description
18	Mixed swamp conifers
19	Northern white cedar – aspen/paper birch
20	Northern hardwoods – hemlock
21	Mixed northern hardwoods
22	Upland northern white cedar
23	White spruce – balsam fir – aspen
24	Balsam fir
30	Mixed pines
31	Loblolly pine
32	Shortleaf pine
33	Virginia pine
35	Eastern red cedar
38	Pitch pine
41	Eastern white pine – northern red oak/white ash
42	Eastern red cedar – hardwood
43	Oak – eastern white pine
44	Shortleaf pine – oak
45	Virginia pine – hardwoods
46	Oak – shortleaf pine
47	Oak – aspen
48	Jack pine – oak
49	Red pine – oak
50	Pin oak
51	Post oak/blackjack oak
52	Chestnut oak

Code	Description
53	Black oak/scarlet oak/hickory
54	White oak
55	Northern red oak
56	Yellow poplar/white oak/northern red oak
57	Scarlet oak (Mark Twain)
58	Sweetgum – yellow poplar
59	Mixed oaks
60	Oak – hardwoods
61	Swamp chestnut oak/cherrybark oak/pin oak
62	Sweetgum – Nuttall oak/willow oak
63	Northern pin oak
67	Baldcypress/water tupelo
70	Sugar maple – black cherry
71	Black ash – American elm/red maple
72	River birch/sycamore
73	Cottonwood
74	White ash
75	Sycamore – pecan/American elm
76	Red maple (wet site)
77	Green ash
78	Black walnut
79	Mixed lowland hardwoods
80	Sugar maple – northern red oak
81	Sugar maple – beech/yellow birch
82	Sugar maple – basswood

Code	Description
83	Black cherry – white ash/yellow poplar
84	Red maple (dry site)
85	Sugar maple
86	Beech
87	Sugar maple – beech – yellow birch/red spruce
88	Black locust
89	Mixed upland hardwoods
90	Sugar maple – beech/basswood
91	Quaking aspen
92	Paper birch
93	Bigtooth aspen
94	Balsam poplar
95	Aspen – white spruce/balsam fir
96	Birch
97	Lowland shrubs
98	Upland shrubs
99	Open
100	Reserved for Midewin Tall Grass Prairie
101	Reserved for Midewin Tall Grass Prairie
102	Reserved for Midewin Tall Grass Prairie
103	Reserved for Midewin Tall Grass Prairie
104	Reserved for Midewin Tall Grass Prairie
105	Reserved for Midewin Tall Grass Prairie
106	Reserved for Midewin Tall Grass Prairie
107	Reserved for Midewin Tall Grass Prairie

Code	Description
108	Reserved for Midewin Tall Grass Prairie
109	Reserved for Midewin Tall Grass Prairie

Table 19: Existing FIADB Vegetation codes

Code	Description
100	White/Red/Jack Pine Group
101	Jack pine
102	Red pine
103	Eastern white pine
104	White pine/hemlock
105	Eastern hemlock
120	Spruce/Fir Group
121	Balsam fir
122	White spruce
123	Red spruce
124	Red spruce/balsam fir
125	Black spruce
126	Tamarack
127	Northern white-cedar
140	Longleaf/Slash Pine Group
141	Longleaf pine
142	Slash pine
160	Loblolly/Shortleaf Pine Group
161	Loblolly pine
162	Shortleaf pine
163	Virginia pine

Code	Description
164	Sand pine
165	Table-mountain pine
166	Pond pine
167	Pitch pine
168	Spruce pine
180	Pinyon/Juniper Group
181	Eastern redcedar
182	Rocky Mountain cedar
183	Western juniper
184	Juniper woodland
185	Pinyon juniper woodland
200	Douglas-fir Group
201	Douglas-fir
202	Port-Orchard-fir
220	Ponderosa Pine Group
221	Ponderosa pine
222	Incense cedar
223	Jeffrey pine/Coulter pine/Bigcone Douglas-fir
224	Sugar pine
225	Jeffrey pine
226	Coulter pine
240	Western White Pine Group
241	Western white pine
260	Fir/Spruce/Mountain Hemlock Group
261	White fir

Code	Description
262	Red fir
263	Noble fir
264	Pacific silver fir
265	Engelmann spruce
266	Engelmann spruce/subalpine fir
267	Grand fir
268	Subalpine fir
269	Blue spruce
270	Mountain hemlock
271	Alaska-yellow-cedar
280	Lodgepole Pine Group
281	Lodgepole pine
300	Hemlock/Sitka Spruce Group
301	Western hemlock
304	Western redcedar
305	Sitka spruce
320	Western Larch Group
321	Western larch
340	Redwood Group
341	Redwood
342	Giant sequoia
360	Other Western Softwoods Group
361	Knobcone pine
362	Southwest white pine
363	Bishop pine

Code	Description
364	Monterey pine
365	Foxtail pine/bristlecone pine
366	Limber pine
367	Whitebark pine
368	Misc. western softwoods
370	California Mixed Conifer Group
371	California mixed conifer
380	Exotic Softwoods Group
381	Scotch pine
382	Australian pine
383	Other exotic softwoods
384	Norway spruce
385	Introduced larch
390	Western cypress group
400	Oak/Pine group
401	White pine/red oak/white ash
402	Eastern redcedar/hardwood
403	Longleaf pine/oak
404	Shortleaf pine/oak
405	Virginia pine/southern red oak
406	Loblolly pine/hardwood
407	Slash pine/hardwood
409	Other pine/hardwood
500	Oak/Hickory Group
501	Post oak/blackjack oak

Code	Description
502	Chestnut oak
503	White oak/red oak/hickory
504	White oak
505	Northern red oak
506	Yellow-poplar/white oak/red oak
507	Sassafras/persimmon
508	Sweetgum/yellow-poplar
509	Bur oak
510	Scarlet oak
511	Yellow-poplar
512	Black walnut
513	Black locust
514	Southern scrub oak
515	Chestnut oak/black oak/scarlet oak
519	Red maple/oak
520	Mixed upland hardwoods
600	Oak/Gum/Cypress Group
601	Swamp chestnut oak/cherrybark oak
602	Sweetgum/Nuttall oak/willow oak
605	Overcup oak/water hickory
606	Atlantic white-cedar
607	Baldcypress/water tupelo
608	Sweetbay/swamp tupelo/red maple
700	Elm/Ash/Cottonwood Group
701	Black ash/American elm/red maple

Code	Description
702	River birch/sycamore
703	Cottonwood
704	Willow
705	Sycamore/pecan/American elm
706	Sugarberry/hackberry/elm/green ash
707	Silver maple/American elm
708	Red maple/lowland
709	Cottonwood/willow
722	Oregon ash
800	Maple/Beech/Birch Group
801	Sugar maple/beech/yellow-birch
802	Black cherry
803	Cherry/ash/yellow-poplar
805	Hard maple/basswood
807	Elm/ash/locust
809	Red maple/upland
900	Aspen/Birch Group
901	Aspen
902	Paper birch
904	Balsam poplar
910	Alder/Maple Group
911	Red alder
912	Bigleaf maple
920	Western Oak Group
921	Gray pine

Code	Description
922	California black oak
923	Oregon white oak
924	Blue oak
925	Deciduous oak woodland
926	Evergreen oak woodland
931	Coast live oak
932	Canyon live oak/interior live oak
940	Tanoak/Laurel Group
941	Tanoak
942	California laurel
943	Giant chinkapin
950	Other Western Hardwoods Group
951	Pacific madrone
952	Mesquite woodland
953	Cercocarpus woodland
954	Intermountain maple woodland
955	Misc. western hardwood woodlands
960	Western woody shrublands-chaparral
980	Tropical Hardwoods Group
981	Sable palm
982	Mangrove
989	Other tropical
990	Exotic Hardwoods Group
991	Paulownia
992	Melaluca

Code	Description
993	Eucalyptus
995	Other exotic hardwoods
999	Non stocked

APPENDIX F: POTENTIAL VEGETATION REFERENCES

Table 20: Potential Vegetation References

Code	Name	Author
901	Habitat Classification System Field Guide for Upper Peninsula of Michigan and Northeastern Wisconsin. CRPFS; School of Forestry and Wood Products, Michigan Technological University, Houghton, MI. 49931.	Michael S. Coffman, et. al. 1984
902	Field Guide to Ecological Classification and Inventory Systems of the Huron-Manistee National Forests. USDA Forest Service, Michigan State University, and the North Central Experiment Station.	USDA Forest Service
903	Wayne National Forest Ecological Classification Handbook. USDA Forest Service, Wayne National Forest.	Jeffery N. Percy, David M. Hix, and James R. McClenahan
904	Field Guide to the Native Plant Communities of Minnesota; the Lautentian Mixed Forest Province. 2003.	Minnesota Department of Natural Resources
905	A Field Guide to Forest Communities and Habitat Types of Northern Wisconsin. Department of Ecology and Management, University of Wisconsin-Madison. 2002.	Kotar, John, J.A. Kovach, and T.L. Burger
906	A Field Guide to Forest Communities and Habitat Types of Central and Southern Wisconsin. Department of Ecology and Management, University of Wisconsin-Madison. 1996.	Kotar, John, and Timothy L. Burger

APPENDIX G: POTENTIAL VEGETATION CODES

Table 21: Reference Code 901

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
AOC	Maple/sweetroot-cohosh	ACER/OSMOR-CAULO
AQVac	Maple-oak/blueberry	ACER-QUERC/VACCI
AQVib	Maple-oak/viburnum	ACER-QUERC/VIBUR
ATD	Maple-hemlock/woodfern	ACER-TSUGA/DRYOP
AVO	Maple/violet-sweetroot	ACER/VIOLA-OSMOR
FE	Ash/thoroughwort	FRAXI/EUPAT
FI	Ash/touch-me-not	FRAXI/IMPAT
FMC	Ash/mint/sedge	FRAXI/MENTH/CAREX
PCS	Spruce/leatherleaf/sphagnum	PICEA/CHAMA5/SPHAG2
PO	Spruce/osmunda	PICEA/OSMUN
PVC	Pine/blueberry/sedge	PINUS/VACCI/CAREX
PVD	Pine/blueberry/hairgrass	PINUS/VACCI/DESCH
QAE	Oak-maple/trailing arbutus	QUERC-ACER/EPIGA
TAM	Hemlock-maple/mitchella	TSUGA-ACER/MITCH
TM	Hemlock/mayflower	TSUGA/MAIAN
TMC	Hemlock/mayflower-goldthread	TSUGA/MAIAN-COPTI
TMV	Hemlock/mayflower-blueberry	TSUGA/MAIAN-VACCI
TTL	Hemlock-red cedar/honeysuckle	TSUGA-THUJA/LONIC

TTM	Hemlock-red cedar/miterwort	TSUGA-THUJA/MITEL
TTP	Hemlock-red cedar/butterbur	TSUGA-THUJA/PETAS
TTS	Hemlock-red cedar/sphagnum	TSUGA-THUJA/SPHAG2

Table 22: Reference Code 902

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
62	Mixed oak-red maple/vaccinium (poorly drained, acidic sands)	QUERC-ACRU/VACCI
63	Northern red oak-red maple-paper birch/mayflower	QURU-ACRU-BEPA/MAIAN
64	White ash-American basswood/violet	FRAM2-TIAM/VIOLA
72	Red maple-paper birch/wintergreen	ACRU-BEPA/PYROL
73	Red maple-paper birch/bunchberry dogwood	ACRU-BEPA/COCA13
74	Black ash-American basswood/violet	FRNI-TIAM/VIOLA
80	Sedge (cattails and open water)	CAREX
81	Acid organics (stagnant drainages)	n/a
82	Non-acid organics (floodplains)	n/a
DSH	Mixed oak-red maple/starflower (dry ice-contact and sand hills)	QUERC-ACRU/TRIEN
HPM	Sugar maple-beech/mayflower (herb poor moraines)	ACSA3-FAGUS/MAIAN
HPM42	Sugar maple/mayflower	ACSA3/MAIAN
HPM43	Sugar maple-northern red oak/mayflower	ACSA3-QURU/MAIAN
HRM	Sugar maple-white ash/sweetroot (herb rich moraines)	ACSA3-FRAM2/OSMOR

HRM47	Sugar maple-white ash/cohosh	ACSA3-FRAM2/CAULO
MSH	Northern red oak-red maple/viburnum (mesic ice-contact sand hills)	QURU-ACRU/VIBUR
MSH37	Northern red oak-red maple/ticktrefoil	QURU-ACRU/DESMO
OWP	Black oak-white oak/blueberry (outwash plains)	QUVE-QUAL/VACCI
OWP1	Northern pin oak-white oak/hairgrass	QUEL-QUAL/DESCH

Table 23: Reference Code 903

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
10	chestnut oak-white oak/upright carrionflower	QUPR2-QUAL/SMEC
11	tuliptree-sugar maple/woodland stonecrop-Canadian woodnettle	LITU-ACSA3/SETE3-LACA3
110	scarlet oak-chestnut oak/blueberry	QUCO2-QUPR2/VACCI
120	shagbark hickory-pignut hickory/smooth Solomon's seal-American pokeweed	CAOV2-CAGL8/POBI2-PHAM4
21	chestnut oak/wreath goldenrod-upright carrionflower	QUPR2/SOCA4-SMEC
211	chestnut oak-scarlet oak/smooth yellow false foxglove/poverty oatgrass	QUPR2-QUCO2/AUFL/DASP2
212	red maple-northern red oak-white oak/Canada lily/sedge	ACRU-QURU-QUAL/LICA3/CAREX
22	chestnut oak-white oak/nakedflower ticktrefoil-wreath goldenrod	QUPR2-QUAL/DENU4-SOCA4
221	scarlet oak-chestnut oak-white oak/whorled yellow loosestrife	QUCO2-QUPR2-QUAL/LYQU2
222	white oak-black cherry-red maple/early bluegrass-sedge	QUAL-PRSE2-ACRU/POCU4-CAREX

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
23	white oak/viburnum-blueberry	QUAL/VIBUR-VACCI
230	white oak-black oak-sugar maple-northern red oak/Indianpipe-Bosc's panicgrass	QUAL-QUVE-ACSA3-QURU/MOUN3-DIBO2
24	white oak/azure bluet-rue anemone	QUAL/HOCA4-THTH2
31	oak/Christmas fern	QUERC/POAC4
311	white oak-black oak-blackgum	QUAL-QUVE-NYSY
312	northern red oak-sugar maple-American beech/hairy Solomon's seal-lanceleaf wild licorice	QURU-ACSA3-FAGR/POPU4-GALA3
32	tuliptree-sugar maple/Canadian clearweed-Clayton's sweetroot	LITU-ACSA3/PIPU2-OSCL
321	white oak-black oak-hickory/nakedflower ticktrefoil-American alumroot	QUAL-QUVE-CARYA/DENU4-HEAM6
322	northern red oak-sugar maple-American beech/hairy skullcap-sedge	QURU-ACSA3-FAGR/SCEL-CAREX
33	mixed hardwoods/northern spicebush-bigleaf aster	2TD/LIBE3-EUMA27
330	white oak-northern red oak-ash/nakedflower ticktrefoil-white avens	QUAL-QURU-FRAXI/DENU4-GECA7
34	mixed hardwoods/bigleaf aster-Canadian honewort	2TD/EUMA27-CRCA9
411	white oak-tuliptree-American hornbeam-sugar maple/golden ragwort-upright carrionflower	QUAL-LITU-CACA18-ACSA3/PAAU3-SMEC
412	white oak-green ash-yellow buckeye-American beech-American basswood-American sycamore/basil beebalm-jumpseed	QUAL-FRPE-AEFL-FAGR-TIAM-PLOC/MOCL2-POVI2

Table 24: Reference Code 904

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
APN80	Northern Spruce Bog	n/a
APN80a1	Black Spruce Bog, Treed subtype	n/a
APN80a2	Black Spruce Bog, Semi-treed subtype	n/a
APN81	Northern Poor Conifer Swamp	n/a
APN81a	Poor Black Spruce Swamp	n/a
APN81b1	Poor Tamarack - Black Spruce Swamp, Black Spruce subtype	n/a
APN81b2	Poor Tamarack - Black Spruce Swamp, Tamarack subtype	n/a
APN90	Northern Open Bog	n/a
APN90a	Low Shrub Bog	n/a
APN90b1	Graminoid Bog, Typic subtype	n/a
APN90b2	Graminoid Bog, Schlenke subtype	n/a
APN91	Northern Poor Fen	n/a
APN91a	Low Shrub Poor Fen	n/a
APN91b	Graminoid Poor Fen	n/a
APN91c1	Graminoid Poor Fen (Water track), Featureless Water Track subtype	n/a
APN91c2	Graminoid Poor Fen (Water track), Flark subtype	n/a
CTN11	Northern Dry Cliff	n/a
CTN11a	Dry Mafic Cliff (Northern)	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
CTN11b	Dry Mafic Cliff (Northern)	n/a
CTN11c	Dry Thomson Cliff (Northern)	n/a
CTN11d	Dry Felsic Cliff (Northern)	n/a
CTN11e	Dry Sandstone Cliff (Northern)	n/a
CTN12	Northern Open Talus	n/a
CTN12a	Dry Open Talus (Northern)	n/a
CTN12b	Mesic Open Talus (Northern)	n/a
CTN24	Northern Scrub Talus	n/a
CTN24a	Dry Scrub Talus (Northern)	n/a
CTN24b	Mesic Scrub Talus (Northern)	n/a
CTN32	Northern Mesic Cliff	n/a
CTN32a	Masic Mafic Cliff (Northern)	n/a
CTN32b	Mesic Rove Cliff (Northern)	n/a
CTN32c	Mesic Thomson Cliff (Northern)	n/a
CTN32d	Mesic Felsic Cliff (Northern)	n/a
CTN32e	Mesic Sandstone Cliff (Northern)	n/a
CTN42	Northern wet Cliff	n/a
CTN42a	Wet Mafic Cliff (Northern)	n/a
CTN42b	Wet Rove Cliff (Northern)	n/a
CTN42c	Wet Felsic Cliff (Northern)	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
CTN42d	Wet Sandstone Cliff (Northern)	n/a
CTU22	Lake Superior Cliff	n/a
CTU22a	Exposed Mafic Cliff (Lake Superior)	n/a
CTU22b	Exposed Felsic Cliff (Lake Superior)	n/a
CTU22c	Sheltered Mafic Cliff (Lake Superior)	n/a
FDN12	Northern Dry-Sand Pine Woodland	n/a
FDN12a	Jack Pine Woodland (Sand)	n/a
FDN12b	Red Pine Woodland (Sand)	n/a
FDN22	Northern Dry-Bedrock Pine (oak) Woodland	n/a
FDN22a	JackPine Woodland (Bedrock)	n/a
FDN22b	Red Pine - White Pine Woodland (Northeastern Bedrock)	n/a
FDN22c	Pin Oak woodland (Bedrock)	n/a
FDN22d	Red Pine - White Pine Woodland (Eastcentral Bedrock)	n/a
FDN32	Northern Poor Dry-Mesic Mixed Woodland	n/a
FDN32a	Red Pine - White Pine Woodland (Canadian Shield)	n/a
FDN32b	Red Pine - white Pine Woodland (Minnesota Point)	n/a
FDN32c1	Black Spruce - Jack Pine Woodland, Jack Pine - Balsam Fir	n/a
FDN32c2	Black Spruce - Jack Pine Woodland, Black Spruce - Feathermoss subtype	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
FDN32c3	Black Spruce - Jack Pine Woodland, Jack Pine - Black Spruce - Aspen subtype	n/a
FDN32d	Jack Pine - Black Spruce Woodland (Sand)	n/a
FDN32e	Spruce - Fir woodland (North Shore)	n/a
FDN33	Northern Dry-Mesic Mixed Woodland	n/a
FDN33a1	Red Pine - White Pine Woodland, Balsam Fir subtype	n/a
FDN33a2	Red Pine - White Pine Woodland, Mountain Maple subtype	n/a
FDN33b	Aspen - Birch Woodland	n/a
FDN33c	Black Spruce Woodland	n/a
FDN43	Northern Mesic Mixed Forest	n/a
FDN43a	White Pine - Red Pine Forest	n/a
FDN43b1	Aspen - Birch Forest, Balsam Fir subtype	n/a
FDN43b2	Aspen - Birch Forest, Hardwood subtype	n/a
FDN43c	Upland white Cedar Forest	n/a
FDC12	Central Poor Dry Pine Woodland	n/a
FDC12a	Jack Pine - (Bearberry) woodland	n/a
FDC23	Central Dry Pine Woodland	n/a
FDC23a1	Jack Pine - (Yarrow) Woodland, Ericaceous Shrub subtype	n/a
FDC23a2	Jack Pine - (Yarrow) Woodland, Bur Oak - Aspen subtype	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
FDC24	Central Rich Dry Pine Woodland	n/a
FDC24a1	Jack Pine - (Bush Honeysuckle) Woodland, Bracken subtype	n/a
FDC24a2	Jack Pine - (Bush Honeysuckle) Woodland, Bur Oak - Aspen subtype	n/a
FDC25	Central Dry Oak-Aspen (Pine) Woodland	n/a
FDC25a	Jack Pine - Oak Woodland	n/a
FDC25b	Oak - Aspen Woodland	n/a
FDC34	Central Dry-Mesic Pine-Hardwood Forest	n/a
FDC34a	Red Pine - White Pine Forest	n/a
FDC34b	Oak - Aspen Forest	n/a
FFN57	Northern Terrace Forest	n/a
FFN57a	Black Ash - Silver Maple Terrace Forest	n/a
FFN67	Northern Floodplain Forest	n/a
FFN67a	Silver Maple - (Sensitive Fern) Floodplain Forest	n/a
FFS59	Southern Terrace Forest	n/a
FFS59a	Silver Maple - Green Ash - Cottonwood Terrace Forest	n/a
FFS59b	Swamp White Oak Terrace Forest	n/a
FFS59c	Elm - Ash - Basswood Terrace Forest	n/a
FPN62	Northern Rich Spruce Swamp (Basin)	n/a
FPN62a	Rich Black Spruce Swamp (Basin)	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
FPN63	Northern Cedar Swamp	n/a
FPN63a	White Cedar Swamp (Northeastern)	n/a
FPN63b	White Cedar Swamp (Northcentral)	n/a
FPN63c	White Cedar Swamp (Northwestern)	n/a
FPN71	Northern Rich Spruce Swamp (Water Track)	n/a
FPN71a	Rich Black Spruce Swamp (Water Track)	n/a
FPN72	Northern Rich Tamarack Swamp (Eastern Basin)	n/a
FPN72a	Rich Tamarack Swamp (Eastcentral)	n/a
FPN73	Northern Alder Swamp	n/a
FPN73a	Alder Swamp	n/a
FPN81	Northern Rich Tamarack Swamp (Water Track)	n/a
FPN81a	Rich Tamarack (Sundew - Pitcher Plant) Swamp	n/a
FPN82	Northern Rich Tamarack Swamp (western Basin)	n/a
FPN82a	Rich Tamarack - (Alder) Swamp	n/a
FPN82b	Extremely Rich Tamarack Swamp	n/a
FPS63	Southern Rich Conifer Swamp	n/a
FPS63a	Tamarck Swamp (Southern)	n/a
FPW63	Northwestern Rich Conifer Swamp	n/a
FPW63a	Tamarack - Black Spruce Swamp (Aspen Parkland)	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
FPW63b	Tamarack Seepage Swamp (Aspen Parkland)	n/a
LKI32	Inland Lake Sand/Gravel/Cobble Shore	n/a
LKI32a	Sand Beach (Inland Beach)	n/a
LKI32b	Gravel/Cobble Beach (Inland Lake)	n/a
LKI43	Inland Lake Rocky shore	n/a
LKI43a	Boulder Shore (Inland Lake)	n/a
LKI43b	Bedrock Shore (Inland Lake)	n/a
LKI54	Linland Lake Clay/Mud Shore	n/a
LKI54a	Clay/Mud Shore (Inland Lake)	n/a
LKI54b1	Mud Flat (Inland Lake), Saline subtype	n/a
LKI54b2	Mud Flat (Inland Lake), Non-Saline subtype	n/a
LKU32	Lake Superior Sand/Gravel/Cobbel Shore	n/a
LKU32a	Beachgrass Dune (Lake Superior)	n/a
LKU32b	Juniper Dune Shrubland (Lake Superior)	n/a
LKU32c	Sand Beach Shrubland (Lake Superior)	n/a
LKU32d	Beach Ridge Shrubland (Lake Superior)	n/a
LKU32e	Gravel/Cobble Beach (Lake Superior)	n/a
LKU43	Lake Superior Rocky Shore	n/a
LKU43a	Dry Bedrock Shore (Lake Superior)	n/a
LKU43b1	Wet Rocky Shore (Lake Superior), Cobble subtype	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
LKU43b2	Wet Rocky Shore (Lake Superior), Bedrock subtype	n/a
MHN35	Northern Mesic Hardwood Forest	n/a
MHN35a	Aspen - Birch - Basswood Forest	n/a
MHN35b	Red Oak - Sugar Maple - Basswood - (Bluebead Lily) Forest	n/a
MHN44	Northern wet-Mesic Boreal Hardwood-Conifer Forest	n/a
MHN44a	Aspen - Birch - Red Maple Forest	n/a
MHN44b	White Pine - White Spruce - Paper Birch Forest	n/a
MHN44c	Aspen - Fir Forest	n/a
MHN44d	Aspen - Birch - Fir Forest	n/a
MHN45	Northern Mesic Hardwood (Cedar) Forest	n/a
MHN45a	Paper Birch - Sugar Maple Forest (North Shore)	n/a
MHN45b	White Cedar - Yellow Birch Forest	n/a
MHN45c	Sugar Maple Forest (North Shore)	n/a
MHN46	Northern Wet-Mesic Hardwood Forest	n/a
MHN46a	Aspen - Ash Forest	n/a
MHN46b	Black Ash - Basswood Forest	n/a
MHN47	Northern Rich Mesic Hardwood Forest	n/a
MHN47a	Sugar Maple - Basswood - (Bluebead Lily) Forest	n/a
MHN47b	Sugar Maple - Basswood - (Horsetail) Forest	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
MHC26	Central Dry-Mesic-Oak-Aspen Forest	n/a
MHC26a	Oak - Aspen - Red Maple Forest	n/a
MHC26b	Red Oak - Sugar Maple - Basswood - (Large-Flowered Trillium) Forest	n/a
MHC36	Central Mesic Hardwood Forest (Eastern)	n/a
MHC36a	Red Oak - Basswood Forest (Noncalcareous Till)	n/a
MHC36b	Red Oak - Basswood Forest (Calcareous Till)	n/a
MHC37	Central Mesic Hardwood Forest (Western)	n/a
MHC37a	Aspen - (Sugar Maple -Basswood) Forest	n/a
MHC37b	Sugar Maple - Basswood - (Aspen) Forest	n/a
MHC47	Central Wet-Mesic Hardwood Forest	n/a
MHC47a	Basswood - Black Ash Forest	n/a
MRN83	Northern Mixed Cattail Marsh	n/a
MRN83a	Cattail - Sedge Marsh (Northern)	n/a
MRN83b	Cattail Marsh (Northern)	n/a
MRN93	Northern Bulrush-Spikerush Marsh	n/a
MRN93a	Bulrush Marsh (Northern)	n/a
MRN93b	Spikerush - Bur Reed Marsh (Northern)	n/a
MRU94	Lake Superior Coastal Marsh	n/a
MRU94a	Estuary Marsh (Lake Superior)	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
OPN81	Northern Shrub Shore Fen	n/a
OPN81a	Bog Birch - Alder Shore Fen	n/a
OPN81b	Bog Birch - Alder Shore Fen	n/a
OPN91	Northern Rich Fen (Water Track)	n/a
OPN91a	Shrub Rich Fen (water Track)	n/a
OPN91b1	Graminoid Rich Fen (Water Track), Featureless Water Track subtype	n/a
OPN91b2	Graminoid Rich Fen (Water Track), Flark subtype	n/a
OPN92	Northern Rich Fen (Basin)	n/a
OPN92a	Graminoid Rich Fen (Basin)	n/a
OPN92b	Graminoid - Sphagnum Rich Fen (Basin)	n/a
OPN93	Northern Extremely Rich Fen	n/a
OPN93a	Spring Fen	n/a
RON12	Northern Bedrock Outcrop	n/a
RON12a	Sandstone Outcrop (Northern)	n/a
RON12b	Crystalline Bedrock Outcrop (Northern)	n/a
RON23	Northern Bedrock Shrubland	n/a
RON23a	Bedrock Shrubland (Inland)	n/a
RON23b	Bedrock Shrubland (Lake Superior)	n/a
RVX32	Sand/Gravel/Cobble River Shore	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
RVX32a	Willow Sandbar Shrubland (River)	n/a
RVX32b1	Sand Beach/Sandbar (River), Intermittent Streambed subtype	n/a
RVX32b2	Sand Beach/Sandbar (River), Permanent Stream subtype	n/a
RVX32c1	Gravel/Cobble Beach (River), Intermittent Streambed subtype	n/a
RVX32c2	Gravel/Cobble Beach (River), Permanent Stream subtype	n/a
RVX43	Rocky River Shore	n/a
RVX43a1	Bedrock/Boulder Shore (River), Intermittent Streambed subtype	n/a
RVX43a2	Bedrock/Boulder Shore (River), Permanent Stream subtype	n/a
RVX54	Clay/Mud River Shore	n/a
RVX54a	Slumping Clay/Mud Slope (River)	n/a
RVX54b1	Clay/Mud Shore (River), Intermittent Streambed subtype	n/a
RVX54b2	Clay/Mud Shore (River), Permanent Stream subtype	n/a
WFN53	Northern Wet Cedar Forest	n/a
WFN53a	Lowland White Cedar Forest (North Shore)	n/a
WFN53b	Lowland White Cedar Forest (Northern)	n/a
WFN55	Northern Wet Ash Swamp	n/a
WFN55a	Black Ash - Aspen - Balsam Poplar Swamp (Northeastern)	n/a

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
WFN55b	Black Ash - Yellow Birch - Red Maple - Basswood Swamp (Eastcentral)	n/a
WFN55c	Black Ash - Mountain Maple Swamp (Northern)	n/a
WFN64	Northern Very Wet Ash Swamp	n/a
WFN64a	Black Ash - Conifer Swamp (Northeastern)	n/a
WFN64b	Black Ash - Yellow Birch - Red Maple - Alder Swamp (Eastcentral)	n/a
WFN64c	Black Ash - Alder Swamp (Northern)	n/a
WFS57	Southern Wet Ash Swamp	n/a
WFS57a	Black Ash - (Red Maple) Seepage Swamp	n/a
WFS57b	Black Ash - Sugar Maple - Basswood - (Blue Beech) Seepage Swamp	n/a
WFS57c	Black Ash - Basswood Seepage Swamp	n/a
WFW54	Northwestern Wet Aspen Forest	n/a
WFW54a	Lowland Black Ash - Aspen - Balsam Poplar Forest	n/a
WMN82	Northern Wet Meadow/Carr	n/a
WMN82a	Willow - Dogwood Shrub Swamp	n/a
WMN82b1	Sedge Meadow, Bluejoint subtype	n/a
WMN82b2	Sedge Meadow, Tussock Sedge subtype	n/a
WMN82b3	Sedge Meadow, Beaked Sedge subtype	n/a
WMN82b4	Sedge Meadow, Lake Sedge subtype	n/a

Table 25: Reference Code 905

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
AAs	Sugar maple/Jack in the pulpit	ACSA3/ARTRT3
AAt	Sugar maple/common ladyfern	ACSA3/ATFI
AAtRp	Sugar maple/common ladyfern-dwarf red blackberry	ACSA3/ATFI-RUPU
ACaCi	Sugar maple/blue cohosh-broadleaf enchanter's nightshade	ACSA3/CATH2-CILUC
ACal	Sugar maple/blue cohosh-jewelweed	ACSA3/CATH2-IMCA
ACI	Sugar maple/bluebead	ACSA3/CLBO3
AFAd	Sugar maple-American beech/northern maidenhair	ACSA3-FAGR/ADPE
AFAI	Sugar maple-American beech/wild leek	ACSA3-FAGR/ALTR3
AFTD	Sugarmaple-eastern henlock-American beech/spinulose woodfern	ACSA3-TSCA-FAGR/DRCA11
AFVb	Sugar maple-American beech/mapleleaf viburnum	ACSA3-FAGR/VIAC
AH	Sugar maple/Shawnee salad	ACSA3/HYVI
AHVb	Sugar maple/Shawnee salad-mapleleaf viburnum	ACSA3/HYVI-VIAC
AHi	Sugar maple/Shawnee salad-jewelweed	ACSA3/HYVI-IMCA
AOCa	Sugar maple/Clayron's sweetroot-bluecohosh	ACSA3/OSCL-CATH2
ASal	Sugar maple/bloodroot-jewelweed	ACSA3/SACA13-IMCA
ASnMi	Sugar maple/Maryland sanicle-partridgeberry	ACSA3/SAMA2-MIRE
ATAtOn	Sugar maple-eastern hemlock/common ladyfern-sensitive fern	ACSA3-TSCA/ATFI-ONSE

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
ATD	Sugar maple-eastern hemlock/spinulose woodfern	ACSA3-TSCA/DRCA11
ATDH	Sugar maple-eastern hemlock/spinulose woodfern-Shawnee salad	ACSA3-TSCA/DRCA11-HYVI
ATFPo	Sugar maple-eastern hemlock-American beech/hairy Solomon's seal	ACSA3-TSCA-FAGR/POPU4
ATFSt	Sugar maple-eastern hemlock-American beech/twistedstalk	ACSA3-TSCA-FAGR/STLAR
ATM	Sugar maple-eastern hemlock/Canada mayflower	ACSA3-TSCA/MACA4
AVCI	Sugar maple/lowbush blueberry/bluebead	ACSA3/VAAN/CLBO3
AVDe	Sugar maple/lowbush blueberry/pointedleaf ticktrefoil	ACSA3/VAAN/DEGL5
AVVb	Sugar maple/lowbush blueberry-mapleleaf viburnum	ACSA3/VAAN-VIAC
AVb	Sugar maple/mapleleaf viburnum	ACSA3/VIAC
ArAbCo	Red maple-balsam fir/bunchberry dogwood	ACRU-ABBA/COCA13
ArAbSn	Red maple-balsam fir/Maryland sanicle	ACRU-ABBA/SAMA2
ArAbVC	Red maple-balsam fir/lowbush blueberry-threelobed goldthread	ACRU-ABBA/VAAN-COTR2
ArAbVCo	Red maple-balsam fir/lowbush blueberry-bunchberry dogwood	ACRU-ABBA/VAAN-COCA13
ArVRp	Red maple/lowbush blueberry-dwarf red blackberry	ACRU/VAAN-RUPU
Avb-V	Sugar maple/mapleleaf viburnum-lowbush blueberry	ACSA3/VIAC-VAAN
PArV	White pine-red maple/lowbush blueberry	PIST-ACRU/VAAN

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
PArV-U	White pine-red maple/lowbush blueberry/sessileleaf bellwort	PIST-ACRU/VAAN/UVSE
PArVAa	White pine-redmaple/lowbush blueberry-wild sarsaparilla	PIST-ACRU/VAAN-ARNU2
PArVAa-Po	White pine-redmaple/lowbush blueberry-wild sarsaparilla/hairy Solomon's seal	PIST-ACRU/VAAN-ARNU2/POPU4
PArVAa-Vb	White pine-redmaple/lowbush blueberry-wild sarsaparilla/mapleleaf viburnum	PIST-ACRU/VAAN-ARNU2/VIAC
PArVAo	White pine-redmaple/lowbush blueberry-spreading dogbane	PIST-ACRU/VAAN-APAN2
PArVHa	White pine-red maple/lowbush blueberry-American witchhazel	PIST-ACRU/VAAN-HAVI4
PArVPo	White pine-red maple/lowbush blueberry/hairy Solomon's seal	PIST-ACRU/VAAN/POPU4
PArVRh	Eastern white pine-red maple/lowbush blueberry-bristly dewbwrry	PIST-ACRU/VAAN-RUHI
PQE	White pine-northern red oak/trailing arbutus	PIST-QURU/EPRE2
PQG	White pine-oak/eastern teaberry	PIST-QUERC/GAPR2
PQGce	White pine-oak/eastern teaberry-New Jersey tea	PIST-QUERC/GAPR2-CEAM
Par/Vam	White pine-red maple/lowbush blueberry-American hogpeanut	PIST-ACRU/VAAN-AMPR2
Qap	White oak-oak/leadplant	QUAL-QUERC/AMCA6
TFAa	Eastern hemlock-American beech/wild sarsaparilla	TSCA-FAGR/ARNU2
TMC	Eastern hemlock/Canada mayflower-threeleaf goldthread	TSCA/MACA4-COTR2

Table 26: Reference Code 906

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
AArL	Sugar maple-red maple/fourflower yellow loosestrife	ACSA3-ACRU/LYQU
AArVb	Sugar maple-red maple/mapleleaf viburnum	ACSA3-ACRU/VIAC
AFAs	Sugar maple-American beech/Jack in the pulpit	ACSA3-FAGR/ARISA
AFAs-O	Sugar maple-American beech/Jack in the pulpit-sweetroot	ACSA3-FAGR/ARISA-OSMOR
AFH	Sugar maple-American beech/waterleaf	ACSA3-FAGR/HYDRO4
AFTD	Sugar maple-American beech-hemlock/spinulose woodfern	ACSA3-FAGR-TSUGA/DRCA11
AFrDe	Sugar maple-white ash/pointedleaf ticktrefoil	ACSA3-FRAM2/DEGL5
AFrDe-O	Sugar maple-white ash/pointedleaf ticktrefoil-sweetroot	ACSA3-FRAM2/DEGL5-OSMOR
AFrDe-Vb	Sugar maple-white ash/ticktrefoil-viburnum	ACSA3-FRAM2/DESMO-VIBUR
AQVb-Gr	Sugar maple-oak/mapleleaf viburnum-spotted geranium	ACSA3-QUERC/VIAC-GEMA
ATDe	Sugar maple-basswood/ticktrefoil	ACSA3-TILIA/DESMO
ATDe-Pr	Sugarmaple-basswood/ticktrefoil-black cherry	ACSA3-TILIA/DESMO-PRSE2
ATiAs-De	Sugar maple-basswood/Jack in the pulpit-ticktrefoil	ACSA3-TILIA/ARISA-DESMO
ATiCa	Sugar maple-basswood/blue cohosh-laportea	ACSA3-TILIA/CATH2
ATiCa-Al	Sugar maple-basswood/blue cohosh-onion	ACSA3-TILIA/CATH2-ALLIU
ATiCa-La	Sugar maple-basswood/blue cohosh-laportea	ACSA3-TILIA/CATH2-LAPOR

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
ATiCr-As	Sugar maple-basswood/gray dogwood-Jack in the pulpit	ACSA3-TILIA/CORA6-ARISA
ATiCr-O	Sugar maple-basswood/gray dogwood-sweetroot	ACSA3-TILIA/CORA6-OSMOR
ATiDe-As	Sugar maple-basswood/ticktrefoil-Jack in the pulpit	ACSA3-TILIA/DESMO-ARISA
ATiDe-Ha	Sugar maple-basswood/ticktrefoil-witchhazel	ACSA3-TILIA/DESMO-HAMAM
ATiFrCa	Sugar maple-basswood-whiteash/blue cohosh	ACSA3-TILIA-FRAM2/CATH2
ATiFrCa-O	Sugar maple-basswood-white ash/blue cohosh-sweetroot	ACSA3-TILIA-FRAM2/CATH2-OSMOR
ATiFrCi	Sugar maple-basswood-white ash/broadleaf enchanter's nightshade	ACSA3-TILIA-FRAM2/CILUC
ATiFrVb	Sugar maple-basswood-white ash/viburnum	ACSA3-TILIA-FRAM2/VIBUR
ATiFrVb-Cr	Sugar maple-basswood-white ash/viburnum-gray dogwood	ACSA3-TILIA-FRAM2/VIBUR-CORA6
ATiH	Sugar maple-basswood/waterleaf	ACSA3-TILIA/HYDRO4
ATiSa	Sugar maple-basswood/bloodroot	ACSA3-TILIA/SACA13
ATiSa-De	Sugar maple-basswood/bloodroot-ticktrefoil	ACSA3-TILIA/SACA13-DESMO
ATiTr	Sugar maple-hemlock/starflower	ACSA3-TSUGA/TRIEN
ArCi	Red maple/enchanter's nightshade	ARCU/CIRCA
ArCi-Ph	Red maple/enchanter's nightshade-phrym	ARCU/CIRCA-PHYM
ArDe	Red maple/ticktrefoil	ACRU/DESMO
ArDe-V	Red maple/ticktrefoil-blueberry	ACRU/DESMO-VACCI

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
PEu	Eastern white pine/flowering spurge	PIST/EUCO10
PVCr	Eastern white pine/blueberry-gray dogwood	PIST/VACCI-CORA6
PVGy	Eastern white pine/blueberry-huckleberry	PIST/VACCI-GAYLU
PVHa	Eastern white pine/blueberry-witchhazel	PIST/VACCI-HAMAM
PVRh	Eastern white pine/blueberry-bristly dewberry	PIST/VACCI-RUHI
PVg	Eastern white pine/blueberry-snowberry	PIST/VACCU-GAULT

Table 27: Reference Code 907

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
PVDc	Eastern white pine/lowbush blueberry-wavy hairgrass	PIST/VAAN-DEFL
PVCx	Eastern white pine/lowbush blueberry-sedge	PIST/VAAN-CAREX
PQE	Eastern white pine-northern red oak/trailing arbutus	PIST-QURU/EPRE2
PArV	Eastern white pine-red maple/lowbush blueberry	PIST-ACRU/VAAN
PArVw	Eastern white pine-red maple/lowbush blueberry (Wisconsin variant)	PIST-ACRU/VAAN (Wisconsin variant)
PArVAa	Eastern white pine-red maple/lowbush blueberry-wild sarsaparilla	PIST-ACRU/VAAN-ARNU2
PArVAaw	Eastern white pine-red maple/lowbush blueberry-wild sarsaparilla (Wisconsin variant)	PIST-ACRU/VAAN-ARNU2 (Wisconsin variant)
PArV-Co	Eastern white pine-red maple/lowbush blueberry-bunchberry dogwood (bunchberry variant)	PIST-ACRU/VAAN-COCA13 (bunchberry variant)
AArAst	Sugar maple-red maple/bigleaf aster	ACSA3-ACRU/ASMA2

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
AARLy	Sugar maple-red maple/stiff clubmoss	ACSA3-ACRU/LYAN2
AVVb	Sugar maple/lowbush blueberry-mapleleaf viburnum	ACSA3/VAAN-VIAC
AVb	Sugar maple/mapleleaf viburnum	ACSA3/VIAC
TMC	Eastern hemlock/Canada mayflower-threeleaf goldthread	TSCA/MACA4-COGR13
ATM	Sugar maple-eastern hemlock/Canada mayflower	ACSA3-TSCA/MACA4
ATM-O	Sugar maple-eastern hemlock/Canada mayflower-Clayton's sweetroot	ACSA3-TSCA/MACA4-OSCL
ATM-Sm	Sugar maple-eastern hemlock/Canada mayflower-feathery false lily of the valley	ACSA3-TSCA/MACA4-SMRA
ATFAs	Sugar maple-eastern hemlock-American beech/Jack in the pulpit	ACSA3-TSCA-FAGR/ARAT5
ATD	Sugar maple-eastern hemlock/spinulose woodfern	ACSA3-TSCA/DRSP4
ATD-Hp	Sugar maple-eastern hemlock/spinulose woodfern-sharplobe hepatica	ACSA3-TSCA/DRSP4-HENOA
ATD-Ca	Sugar maple-eastern hemlock/spinulose woodfern-blue cohosh	ACSA3-TSCA/DRSP4-CATH2
AOCa	Sugar maple/Clayton's sweetroot-blue cohosh	ACSA3/OSCL-CATH2
PVE	Eastern white pine/lowbush blueberry-trailing arbutus	PIST/VAAN-EPRE2
PArV	Eastern white pine-red maple/lowbush blueberry	PIST-ACRU/VAAN
PArV-Ao	Eastern white pine-red maple/lowbush blueberry-spreading dogbane (variant)	PIST-ACRU/VAAN-APAN2 (variant)

PV_CODE	COMMON_NAME	SCIENTIFIC_NAME
ATFD	Sugar maple-eastern hemlock-American beech/spinulose woodfern	ACSA3-TSCA-FAGR/DRSP4
AFPo	Sugar maple-American beech/hairy Solomon's seal	ACSA3-FAGR/POPU4
AFOAs	Sugar maple-American beech/Clayton's sweetroot-Jack in the pulpit	ACSA3-FAGR/OSCL-ARAT5
PVCd	Eastern white pine/lowbush blueberry-graygreen reindeer lichen	PIST/VAAN-CLRA60
PARVHa	Eastern white pine-red maple/lowbush blueberry-American witchhazel	PIST-ACRU/VAAN-HAVI4
PARVVb	Eastern white pine-red maple/lowbush blueberry-mapleleaf viburnum	PIST-ACRU/VAAN-VIAC
AFO	Sugar maple-American beech/Clayton's sweetroot	ACSA3-FAGR/OSCL
AFOCa	Sugar maple-American beech/Clayton's sweetroot-blue cohosh	ACSA3-FAGR/OSCL-CATH2
PARVCo	Eastern white pine-red maple/lowbush blueberry-bunchberry dogwood	PIST-ACRU/VAAN-COCA13

APPENDIX H: FUEL PHOTO REFERENCES & CODES

Table 28: Fuel Photo References

Code	Reference
18	Ottmar, Roger D. and R.E. Vihnanek. 1999. Stereo Photo Series for Quantifying Natural Fuels. Volume V: Midwest Red and White Pine, Northern Tallgrass Prairie, and Mixed Oak Types in the Central Lake States. PMS 834. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center. 99 p. 1999. (includes Volume Va: Jack Pine in the Lake States)
25	Frederick Wilcox, John McCarty and Barry Bungard. 1982. Photo Series for Quantifying Residues in the: Northern Hardwood Type and Oak-Hickory Type. USDA Forest Service, NA-FR-22.

Code	Reference
31	Richard W. Blank. 1982. Stereo Photos for Evaluating Jack Pine Slash Fuels. Gen. Tech. Rep. NC-77, St. Paul, MN: U.S. Dept. of Ag., Forest Service, North Central Forest Experiment Station; 23 p.

FUEL PHOTO CODES

Table 29: Fuel Photo Codes for Reference 18

Code
JP01
JP02
JP03
JP04
JP05
JP06
JP07
JP08
JP09
JP10
JP11
JP12
JP13
JP14
JP15
JP16
JP17
JP18
JP19

Code
MO01
MO02
MO03
MO04
MO05
MO06
MO07
MO08
MO09
MO10
MO11
MP01
MP02
MP03
MP04
MP05
MP06
MP07
MP08
MP09
MP10
MP11
MP12
MP13
TP01

Code
TP02
TP03
TP04
TP05
TP06
TP07
TP08
TP09
TP10
TP11
TP12
TP13
TP14
TP15
TP16
TP17

Table 30: Fuel Photo Codes for Reference 25

Code
1-A21-N
2-A22-N
3-B21-N
4-A22-N
5-B12-N
6-A12-N
7-B22-N

Code
8-A22-N
9-A11-N
10-A22-CC
11-B22-CC
12-A22-CC
13-A22-CC
14-B23-CC

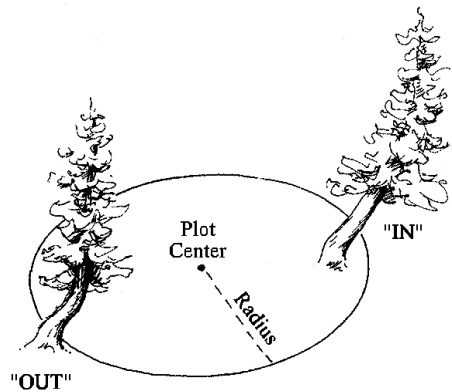
Table 31: Fuel Photo Codes for Reference 31

Code
1
2
3
4
5
6
7
8
9
10

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

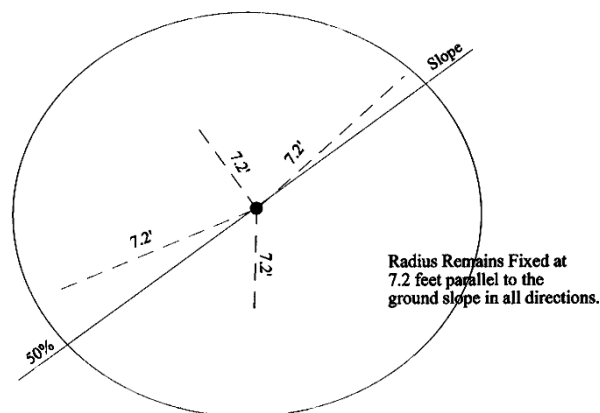


Table 32: Circular Plot Radii Corrected for Slope; plot size in acres

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

Slope %	1 / 300	1 / 100	1 / 50	1 / 20	1 / 10	1 / 5
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
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

Slope %	1 / 300	1 / 100	1 / 50	1 / 20	1 / 10	1 / 5
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
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

Slope %	1 / 300	1 / 100	1 / 50	1 / 20	1 / 10	1 / 5
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 33: Method 2 plot size/radius slope

Plot Size	Plot Radius
1/1000	3.7 feet
1/500	5.3 feet
1/400	5.9 feet
1/300	6.8 feet

Plot Size	Plot Radius
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

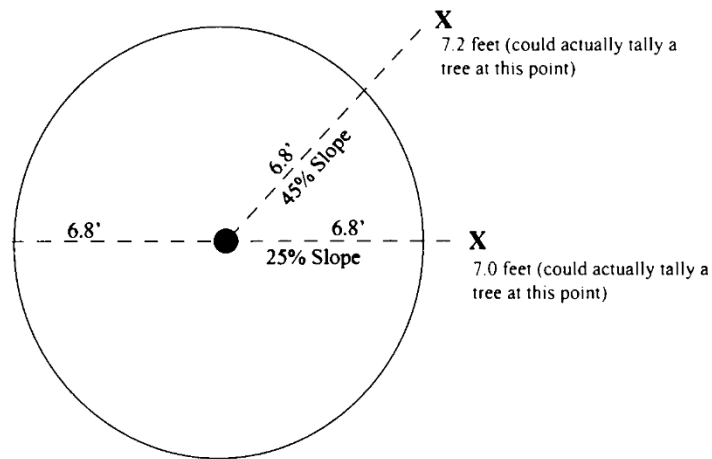


Table 34: Slope Correction Table

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 35](#), _____

[Table 36](#), [Table 37](#), [Table 38](#), [Table 39](#), [Table 40](#), and [Table 41](#) 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 41 below.

Table 35: 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 40](#). 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%

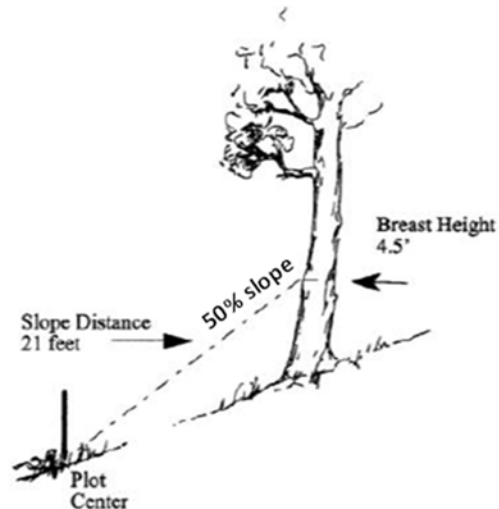
Slope Correction Factor = $\text{SQR}(1 + (\text{slope}/100)^2) = \text{SQR}(1 + (20/100)^2) = 1.0198$

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 40](#), 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 36: 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 37: 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 38: 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 39: 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 40: 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 41: 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 42: 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 43: 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 griseifecta</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 44: 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 45: 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 46: 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 47: 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 48: 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 49: 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 50: 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 51

Field	Tolerance
Number Stems	No errors
DBH/DRC Intensive Exam	See specifics in Table 52
DBH/DRC Extensive Exam	See specifics in Table 53
DBH/DRC Quick Exam	See specifics in Table 54
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 55
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 56
Damage Agent	No errors
Damage Part	No errors
Damage Severity	No errors
Tree Remarks	n/a

Table 51: 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 52: 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 53: Tree Data, DBH/DRC Extensive Exam

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

Table 54: Tree Data, DBH/DRC Quick Exam

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

Table 55: Tree Data, Height Growth

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

Table 56: 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 57: Ground Surface Cover

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

Table 58: 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 59: 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 60: 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 61: 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 62: 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.