

# CLASSIFICATION OF HISTORICAL VEGETATION IN OREGON AND WASHINGTON, AS RECORDED BY GENERAL LAND OFFICE SURVEYORS

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This classification of historical vegetation map units is based on General Land Office (GLO) surveyors' descriptions of vegetation, independent of modern vegetation classification. Vegetation data in the survey notes include species encountered along the survey lines, distances from section or quarter corners to "witness" or bearing trees, diameters of witness trees, and general descriptions of vegetation along each line. The surveyors were usually consistent in differentiating stands with dissimilar structure or composition, and they routinely segregated forest ("timber"), savanna ("openings"), and woodland ("scattering timber") from prairie. Today, these structural classes are often segregated by percent canopy cover or stand density, but such data were not recorded in GLO notes and must be extrapolated from distances between survey corners and witness trees.

The classification consists of ten vegetation classes (herbaceous upland, upland forest, riparian and wetland forest, shrubland, composition unknown, woodland, prairie, savanna, water, and emergent wetlands excluding wet prairie), each of which is subdivided into several to many subclasses. Use of classes and subclasses as map units in GIS enables users to display data at both coarse and fine scales.

Text in quotes identifies descriptors used by surveyors when recording vegetation. Descriptors that do not identify species (e.g., "swale") are listed in a lookup table that keys them to the appropriate vegetation class. Discontinued codes, needed for tracking and updating changes in mapping units, are also listed in a lookup table. The classification is updated frequently.

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## Contents

Primary descriptive terms .....	2
Secondary descriptive terms .....	2
Disturbance modifiers .....	2
Key to vegetation classes described by GLO surveyors.....	3
Equivalent forest, woodland, and savanna subclasses.....	5
Classification of historical vegetation.....	7
E. Herbaceous uplands .....	7
F. Forest. ....	7
Upland forest .....	7
Riparian and wetland forest .....	17

H. Shrubland and "thickets." Many of these shrub types were probably seral stages following fire.....	19
N. Composition unknown.....	22
O. Woodland.....	22
P. Prairie.....	30
S. Savanna.....	32
U. Unvegetated.....	33
W. Water and wetlands (except for wet prairie [P] and shrub swamps [H]).....	34
Lookup table for vegetation units lacking species names.....	36
Discontinued codes and their equivalents (old code => new code).....	37

## **Primary descriptive terms**

In this classification, certain descriptions used by GLO surveyors usually take precedence over witness tree data or other variables that influence classification. These primary descriptors were more or less standard diagnostic terms, used repeatedly in GLO surveys across the United States.

Primary descriptors range from open features to closed features, and are hierarchical. If surveyors used more than one term to describe the same landscape feature, prairie has priority over savanna, savanna has priority over woodland, etc., independent of distances to witness trees.

- a) "Prairie" = Prairie (P)
- b) "Openings," "Open woods" = Savanna (S)
- c) "Scattering timber" = Woodland (O)
- d) "Timber" = Forest (F)

## **Secondary descriptive terms**

Distances to witness trees, as shown in the following keys, are secondary indicators in the classification and are "trumped" by the primary descriptors. The distances provide a quick index to vegetation classes.

- 0-100 links = Forest (F)
- 100-200 (400) links = Woodland (O)
- (100) 200-400 = Savanna (S)
- 200-800 (1750) = Prairie (P)

## **Disturbance modifiers**

Any map units in the following classification may have disturbance modifiers added as a suffix, as described by surveyors:

- Bu ..... Burned forest, often with "scattering" trees (> 100 links distant) surviving fire. Used when (1) "burn" or "fire" is mentioned specifically, (2) exiting "green timber," or (3) in dead timber ("deadening"), standing or fallen timber, or presence of dead "stubs." Older burns may have openings, brush, and "groves" or "thickets" of young trees (alder, fir) up to 12-14 inches in diameter.
- Fl ..... Flooded forest, usually dead.
- St ..... Storm-damaged forest ("sleetbreak" = broken limbs, bent trees, windfall etc.).

## Key to vegetation classes described by GLO surveyors

Note: there will be exceptions to the general patterns described in the survey notes, so ecological judgment should be used in applying these guidelines.

### Key to vegetation classes

- 1a. Stand described as "timber," "scattering timber," "scant," "sparsely timbered," or "openings" dominated by trees .....2
- 1b. Stand described as "prairie," "plains," fern or grass "openings," "brush," "thicket," "willow swamp," or unvegetated ..... 10
- 2a. Stand usually described as "timber," "scattering timber," rarely as "openings" or "open;" distance to witness trees mostly < 200 (400) links .....3
- 2b. Stand usually described as "openings," "scattering timber," or "timber;" distance to witness trees mostly (100) 200-800 (1750) links .....6
- 3a. Distance to witness trees mostly 100-200 (400) links .....4
- 3b. Distance to witness trees mostly < 100 links, typically < 50 links ..... 16
- 4a. Understory "dense," with hazel, "shrub oak," "young oak," "scrub oak," or oak "grubs;" distance to witness trees mostly 100-200 links ..... **Woodland (O)**
- 4b. Understory (or stand when understory not described) "open," or with "good grazing;" with grass, fern, hazel, "shrub oak;" distance to witness trees 100-400 links .....5
- 5a. Distance to witness trees mostly 100-200 links ..... **Woodland(O)**
- 5b. Distance to witness trees mostly (100) 200-400 links ..... **Savanna (S)**
- 6a. Stand described as "openings" or "timber"; distance to witness trees mostly 100-200 (400) links.....7
- 6b. Stand described as "scattering timber" or "timber"; distance to witness trees mostly 100-800 (1750) links .....8

7a. Stand described as "timber" or "openings;" understory "dense," with hazel, "shrub oak," "young oak," "scrub oak," or oak "grubs;" distance to witness trees mostly < 200 links..... **Woodland (O)**

7b. Stand described as "openings," or with "good grazing;" or not described; understory "open," with grass, fern, hazel, "shrub oak," or not described; distance to witness trees mostly 100-400 links..... **Savanna (S)**

8a. Distance to witness trees mostly 200-800 (1750) links; corners often lacking one or more witness trees; understory lacking shrubs, "open," or not described ..... **Prairie (P)**

8b. Distance to witness trees mostly 100-200 (400) links; corners usually with all witness trees present; understory with shrubs ..... 9

9a. Understory "dense," with hazel, "shrub oak," "young oak," "scrub oak," or oak "grubs;" distance to witness trees mostly 100-200 links ..... **Woodland (O)**

9b. Understory open, or with "good grazing," or not described; with grass, fern, hazel, "shrub oak;" distance to witness trees mostly (100) 200-400 links ..... **Savanna (S)**

10a. Stand with no reference to vegetation or stand structure; includes "gravel bar," "sand bar," and "rocky barren" ..... **Unvegetated (U)**

10b. Stand including reference to vegetation or stand structure ..... 11

11a. Stand with shrubs, including willows ..... 12

11b. Stand lacking shrubs..... 13

12a. Shrub species listed; stand described as "brush," "thicket," "swamp," or "rocky" or "stony" openings or "barrens" with low sagebrush..... **Shrubland (H)**

12b. Shrub species not listed; stand described only as "glade" or "alkali bottom," where species composition is unknown ..... **Composition unknown (N)**

13a. Stand described as "prairie," "plains," "open land," or "fern prairie," distance to witness trees mostly (100) 200-800 (1750) links, or witness trees absent ..... **Prairie (P)**

13b. Stand described otherwise, witness trees absent or < 100 links..... 14

14a. Stand described as "fern openings" in forest, woodland or savanna ..... **Herbaceous upland communities (E)**

14b. Stand described otherwise ..... 15

15a. Stand described as having water (river, pond, lake, slough, bayou), including seasonally-flooded sites, or with hydrophytic vegetation (tule, "swamp grass," "wire grass," pond lily, skunk cabbage, wapato); includes "marsh," "swamp," "wet meadow," or "slough" where species composition is unknown ..... **Water, emergent wetland or aquatic bed (W)**

15b. Stand described only as "glade" or "alkali bottom," where species composition is unknown ..... **Composition unknown (N)**

16a. Stand described as "openings," "open timber;" understory with "some grass," "good grazing, or not described" ..... **Savanna (S)**

- 16b. Stand described as "timber" or "scattering timber;" understory various..... 17
- 17a. Stand described as "scattering timber;" may have trees 6-15 inches in diameter within 100 links, but larger trees are further than 100 links; sometimes with "good grass" or "good grazing" ..... **Woodland (O)**
- 17b. Stand described as "timber" ..... 18
- 18a. All or most witness trees present, no mention of "good grass" or "good grazing" ..... **Forest (F)**
- 18b. More than half of witness trees absent, "good grass" or "good grazing" present ..... **Woodland (O)**

### Equivalent forest, woodland, and savanna subclasses

Ecoregions: CR = Coast Range, EC = East Cascades, KM = Klamath Mountains, PT = Puget Trough, WV = Willamette Valley.

Forest	Woodland	Savanna	Ecoregion
FA	--	SA	WV
FALW	--	--	WV
FAS	--	--	KM
FAT	--	--	KM
FAW	--	--	WV
FB	OB	SB	KM
FBF	OBF	SBF	KM
FCS	--	--	CR
FD	OD	--	EC
FE	--	--	CR
FED	OFED	--	CR, KM, WC, WV
FF	OFZ	SF	CR, WC, WV
FFA	--	--	WV
FFC	OFC	SFC	KM
FFCL	--	--	CR, WC, WV
FFDA	OFDA	SFDA	PT
FFDF	OFDF	--	KM
FFH	OFH	--	KM, WC
FFHA	--	--	CR
FFHB	OFHB	--	WC
FFHC	OFHC	SFHC	CR, WV
FFHE	OFHE	--	KM, WC
FFHO	OFHO	SFHO	CR, KM
FFHP	--	--	CR, WC

Forest	Woodland	Savanna	Ecoregion
FFHPP	--	--	WV
FFHPT	OFHPT	--	EC
FFPT	OFPT	--	EC
FFHV	OFHV	--	CR
FFHW	--	--	CR
FFM	--	--	CR
FFO	OFOZ	SOF	WV
FFOC	OPFOC	--	KM
FFOM	OFOM	SFOM	KM, WV
FFON	OFON	--	KM
FFP	OFFP	SFP	WV, EC
FFPE	--	--	EC
--	OFFPC	--	CR
FFPH	OFFPH	--	EC
FFPT	OFPT	--	EC, WC
FFR	--	--	CR
FFSP	--	--	KM
FFSPH	OFFSPH	--	KM
FFSY	--	--	CR
FFY	--	--	CR, WC, WV
FJ	OJ	SJ	BM, BR, CB
FL	--	--	CR, WV
FM	--	--	KM
FMFMP	OMPFC	--	KM
--	OMFP	SPF	KM

<b>Forest</b>	<b>Woodland</b>	<b>Savanna</b>	<b>Ecoregion</b>
FMFP	OFMFP	--	KM
FMPF	OFMPF	--	KM
FO	OOZ	SO	WV
FOA	--	SOA	WV
FOAM	OOAM	--	CR, KM
FOB	OOB	SOB	KM, WV
FOFP	OFOPZ	SOFP	WV
--	--	SOP	WV
FP	OP	--	EC
FPC	OPC	--	EC
FPD	OPD	--	EC
FPDF	OPDF	--	EC
FPDFL	OPDFL	--	EC
FPDS	--	--	EC
FPDSF	--	--	EC
FPF	OPF	--	EC
FPFC	OPFC	--	EC
FPFCS	OPFCS	--	EC
FPFE	--	--	EC
FPFH	OPFH	--	EC
--	OPFO	--	CR
FOPMO	OPMO	SPMO	KM
FPJ	OPJ	--	EC
FPO	OPO	SPO	EC
--	--	SPOC	KM
FPOF	OPOF	--	EC, WC
FPSF	--	--	EC
FPVF	--	--	KM
FPW	OPZ	SP	WV
FSH	OSH	SSH	CR
FSHL	--	--	CR
FSHY	--	--	CR
FSL	OFSL	--	CR
FSP	OSP	SSP	CR
FT	--	--	WV
FWFC	OWFC	--	KM

## Classification of historical vegetation

To help differentiate map units, those printed in *italics* are restricted to east of the Cascade Crest.

### E. Herbaceous uplands

EF ..... "Fern openings," "fern land," or "open fern hills," usually in forest, woodland or savanna. May contain hazel. Use only when openings have entry and exit points. NO TREES. If "fern prairie," or if scattering trees are present, use PB. If "fern openings" occur in woodland or with "scattering fir," use OFZ.

**F. Forest.** Distances to witness trees mostly < 100 links (66 ft); stands described as "*timber*," "*heavy*," "*dense*," "*thick*;" understory brushy or ferny.

### Upland forest

FB ..... Black oak forest. Southern Lane County and southward. NO WHITE OAK, PINE.

FBF ..... Black oak - Douglas fir forest. Understory may have vine maple, hazel, oak. Umpqua Valley and southward. NO WHITE OAK, PINE.

FD ..... *Lodgepole pine forest. Ponderosa pine occasional.*

FE ..... Alder "grove," "flat," "timber," "land," or "bottom" if no mention of water, "swamp," or "swale." Usually on mountain slopes, benches, and flats. May contain cherry. NO CONIFERS.

FED ..... Low to mid-elevation (to 2500 ft) complex of (a) dry Douglas fir –chinquapin - madrone ("laurel") forest on S to W slopes and ridgetops, and (b) more mesic Douglas fir - western red cedar - western hemlock forest (FFHC) on N slopes and bottoms. May include incense cedar ("redwood"), black and white oak, ponderosa pine, sugar pine, grand fir, yew, red alder, maple, dogwood. "Dense" understory may include salal, madrone, hazel, vine maple, viburnum, ocean spray, ceanothus, poison oak, manzanita. Consistent presence of madrone and use of madrone and chinquapin (but not oaks) as witness trees, and abundance of hazel is diagnostic. If oaks are dominant witness trees, or if hemlock is absent, use FFOM.

FEDBu ..... Burned FED, often with scattered trees surviving fire.

FF ..... Douglas fir forest, often with bigleaf maple, dogwood, red alder, ash, western red cedar, and grand fir. Brushy understory may include vine maple, hazel, salal, willow, cascara, briars, fern, viburnum, Oregon grape, rhododendron, yew, fern. Madrone, chinquapin or ceanothus may be present in dry sites, but are not used for witness trees. More mesic stands in Coast Range may include cherry, salmonberry, cascara. NO HEMLOCK, NO OAK.

FFBu ..... Burned FF, often with scattered trees surviving fire. May include alder or willow.

FFC ..... Low to mid-elevation dry Douglas fir forest with combinations of incense cedar, madrone ("laurel"), ponderosa pine, sugar pine, and bigleaf maple. Dense understory may include fir, hazel, canyon live oak, vine maple, yew, salal, madrone, arrowwood, ceanothus ("mountain balm"), briars, fern, huckleberry, dogwood, manzanita, chinquapin, grass. Madrone frequently used for witness trees. Umpqua Valley and southward. NO HEMLOCK, WHITE

- OAK, BLACK OAK. Similar to FED, but lacking mesic conifer component on N slopes. Intergrades with FFHE.
- FFCBu ..... Burned FFC, often with scattered trees surviving fire. May include alder or willow.
- FFDF ..... Low to mid-elevation dry Douglas fir forest with black oak and ponderosa pine as secondary species. Sugar pine occasional, little or no white oak. Mid- or late-successional stands where hardwood trees and pine are being replaced by Douglas fir. Understory may include "small fir," "fir thickets," live oak, poison oak, birchleaf mountain mahogany, and shade-tolerant grasses may be present. Differs from FFON by having more Douglas fir. Applegate and Rogue valleys.
- FFDFBu ..... Burned FFDF, often with scattered trees surviving fire. May contain manzanita, oak, fir.
- FFH..... Moist lower elevation fir - hemlock - cedar forest (assumed both incense cedar and western red cedar), often with "laurel" (madrone), chinquapin and big leaf maple. Sugar pine, yew, red alder, and black oak occasional. Understory primarily "laurel" (snowbrush), vine maple, hazel, Oregon grape, Douglas fir, and western hemlock. Salal, huckleberry, thimbleberry, arrowwood and lilac occasional. Differs from FFHC by absence of devils club, myrtle, or salmonberry, and occasional presence of ponderosa pine, sugar pine, and black oak. Almost always "very dense forest" with "dense undergrowth." Cascade foothills in South Umpqua area.
- FFHBu ..... Burned FFH, often with scattered trees surviving fire.
- FFHA..... As in FFHC, with silver or noble fir ("larch"). Understory mostly mesic deciduous species. Coast Range. NO SPRUCE. If spruce is present, use FSH.
- FFHB ..... Mid to upper montane (3500 ft to timberline) mixed fir (silver fir, noble fir ["larch"], alpine fir) - mountain hemlock forest with mostly broadleaved evergreen understory. With various combinations of lodgepole pine, Douglas fir, western and mountain hemlock, western red cedar, western white pine, and Engelmann spruce. Western larch occasional. Sparse to dense understory may include rhododendron, Oregon grape, vine maple, hazel, huckleberry, "white maple," "honey laurel", "soapbrush." Near timberline, frequent use of "hemlock" (= mountain hemlock) as witness trees. Stands "medium" to "scattering" near timberline = OFHB. West slope and summit of Cascade Range. Intergrades with FFHC and FFHE on W slope Cascades, and FPFH on E slope Cascades. NO OAK, BIGLEAF MAPLE, OR PONDEROSA PINE.
- FFHBBu..... Burned FFHB, often with scattered trees surviving fire.
- FFHC ..... Mesic Douglas fir - mixed conifer (or "fir, etc.") foothill forest (usually <2000 ft) with mostly deciduous understory. May include various combinations of western hemlock, red cedar, grand fir, with lesser amounts of bigleaf maple, dogwood, white oak, red alder, madrone ("laurel"). Myrtle sometimes present in southern Coast Range. Sparse to very dense understory may include vine maple, huckleberry, thimbleberry, rhododendron, gooseberry, blackberry, salmonberry, "whortleberry," cascara ("shittim," "chittim"), willow, yew, salal, hazel, ferns, Oregon grape, devils club ("devils walking stick," "walking stick," "devils walking cane"). From southern Lane County and southward, this type intergrades with FED, FFH, FFHB, FFHO. NO ASH, BLACK OAK, SILVER FIR, NOBLE FIR ("larch"), LARCH ("tamarack"), SPRUCE, OR PINE.
- FFHCBu..... Burned FFHC, often with scattered trees surviving fire. May include "peavine," grass, blackberries or raspberries.

- FFHCSt.....Storm-damaged FFHC ("sleet break" = broken limbs, bent trees, windfall etc.).
- FFHE .....Low to mid-montan (1500-4000 ft) Douglas fir - mixed conifer forest with mostly broadleaved evergreen understory. With various combinations of white fir, western hemlock, western red cedar, western white pine, sugar pine (southern Cascades only), lodgepole pine ("bull pine"), incense cedar, madrone ("laurel"), bigleaf maple, dogwood, red alder, and grand fir. Sparse to dense understory may include rhododendron, Oregon grape, yew, vine maple, chinquapin, live oak, madrone, ceanothus ("mountain balm," "balm," "greasewood," "chaparral," "buckbrush," "chamise," "slickleaf"), manzanita, salal, hazel, ocean spray, huckleberry, "tasselwood." Cherry and thimbleberry occasional. Sometimes with "bunchgrass" or "good grazing," but trees not described as "scattering" or "openings." Soils rocky. Consistent presence of rhododendron, ceanothus, chinquapin, manzanita, and madrone in understory is diagnostic, with only occasional use as witness trees. NO WHITE OAK, BLACK OAK, PONDEROSA PINE, SILVER FIR, NOBLE FIR ("larch"), OR LARCH ("tamarack").
- FFHEBu.....Burned FFHE, often with scattered trees surviving fire.
- FFHO.....Southern mixed dry conifer forest with mostly broadleaved evergreen understory. Various combinations of Douglas fir, western hemlock, Port Orford cedar ("white cedar"), grand fir ("ponderosa fir"), white fir, oak (species unspecified), white oak, live oak, tan oak, madrone, chinquapin, myrtle, bigleaf maple, red alder, cherry, redwood, pine (except shore pine). Sparse to very dense understory may include salal, huckleberry, Sargent oak, live oak, oak "brush," "young oak," madrone, rhododendron, yew, salal, ceanothus ("greasewood," "bluewood"), manzanita, elder, gooseberry, briars, poison oak, vine maple, dogwood, "oleander," hazel, fern, bracken, ceanothus ("wild lilac"), "barberry," or blackberry. Witness trees include fir, oak, madrone, chinquapin, myrtle. "Elk brush" or "elkwood" absent or only occasional. Sometimes with "bunchgrass" or "good grazing," but trees not described as "scattering" or "openings." May include willow, ash, cascara, cherry, whortleberry, elderberry, or salmonberry near water. Southern Coast Range. NO SPRUCE, SHORE PINE, RED CEDAR, SALMONBERRY.
- FFHOBu .....Burned FFHO, often with scattered trees surviving fire.
- FFHP .....As in FFHC, with white pine.
- FFHPP .....Mixed conifer forest with ponderosa pine. May include Douglas fir, red cedar, and western hemlock, with lesser amounts of bigleaf maple, white oak, red alder, ash and dogwood. Understory may include vine maple, hazel, viburnum, briars, yew. More dry than FFHC, more mesic than FFP. NO BLACK OAK.
- FFHPPBu....Burned FFHPP, often with scattered trees surviving fire.
- FFHPT.....*Mesic mixed conifer montane forest (2000 ft to timberline) with mixed deciduous-broadleaved evergreen understory. May include various combinations of larch ("tamarack"), noble fir ("larch"), grand fir ("white fir"), "black fir," Douglas fir, western hemlock, cedar (probably incense cedar), mountain hemlock, white pine, whitebark pine, "silver pine," Engelmann spruce, lodgepole pine ("black pine"), ponderosa pine, alder, aspen, cherry, dogwood, chinquapin ("bur willow", "mountain willow"). Light to dense undergrowth may include rhododendron, vine maple, serviceberry, huckleberry, Devils club, salal, thimbleberry, mountain ash, hazel, spiraea, ceanothus ("buckbrush," "slickleaf," "snowbrush," "chaparral", "sweet laurel"), manzanita, maple (species unspecified), willow,*

*blackberry, peavine, rose, bearberry, ferns, bunchgrass, pinegrass, and Oregon grape ("wild grape"). Oak rarely present at lower elevations. Stands "medium" to "scattering" near timberline = OFHPT. Frequent presence of larch ("tamarack") is diagnostic. Intergrades with FFHE, FFHB, and FFPT at lower elevations and with increasing incidence of Douglas fir, and with FPFH at higher elevations to south, with increasing incidence of lodgepole and ponderosa pine. NO SUGAR PINE. Eastern Columbia Gorge, East slope Cascades.*

*FFHPTBu ... Burned FFHPT, often with scattered trees surviving fire.*

*FFHPTY.....*

FFHU.....Moist low elevation fir forest with madrone ("laurel") and cedar (assume both incense and western red cedar), often with chinquapin and bigleaf maple. Fir presumably Douglas fir, but grand fir may be a minor component in very moist positions. Western hemlock consistently absent from canopy but present as regeneration in understory. Understory usually with vine maple, hazel, arrowwood, chinquapin, cedar, fir, madrone, bigleaf maple. Thimbleberry, huckleberry, willow, alder, snowbrush, elkbrush, high fern, rhododendron occasional. "Very dense" canopy at most locations, usually with "dense undergrowth." Cascade foothills in South Umpqua area.

FFHUBu .....Burned FFHU, described as "dense brush" or "dense undergrowth," sometimes with "laurel" (snowbrush), hazel, vine maple, arrowwood, thimbleberry, elkbrush, huckleberry, rhododendron, fir, cedar, chinquapin.

FFHV.....Complex of mostly northern mesic mixed conifer forest (FFHC) on north slopes, with elements of southern dry conifer forest on S to W slopes and ridgetops. Includes various combinations of Douglas fir, western hemlock, red cedar, Port Orford cedar ("white cedar"), grand fir, with lesser amounts of bigleaf maple, dogwood, red alder, madrone ("laurel"). Myrtle occasional. Dense to "impassable" understory of "elk brush" or "elkwood" is diagnostic, but may also include salmonberry, vine maple, salal, briars, ceanothus ("greasewood," "bluewood"), "whortleberry," huckleberry, cascara. Rhododendron occasional. Witness trees primarily fir, hemlock, cedar. Southern Coast Range. NO OAK, SPRUCE, OR PINE.

FFHVBu .....Burned FFHV, often with scattered trees surviving fire.

FFHW.....Montane (3500-5600 ft) mixed conifer forest with white oak. Oak associated with rocky openings or balds, probably shrubby but not described as such. With various combinations of Douglas fir, white fir, western hemlock, western red cedar, western white pine, incense cedar, incense cedar, madrone ("laurel"), chinquapin, and dogwood. Sparse to dense understory may include rhododendron, Oregon grape, yew, vine maple, chinquapin, ceanothus ("mountain balm," "balm," "greasewood," "chaparral," "buckbrush," "chamise," "slickleaf"), manzanita, salal, hazel, huckleberry, and willow. Cherry occasional. Soils rocky. Intergrades with FFHE. Presence of oak is diagnostic. Cascade Range. NO BIGLEAF MAPLE OR PONDEROSA PINE.

FFM.....Dry Douglas fir, chinquapin, and myrtle ("greenbay") forest. Cedar (Port Orford cedar?) and white fir occasional. Consistent use of chinquapin as witness trees is diagnostic. May include madrone, red alder, bigleaf maple. Understory may include "elk brush," ceanothus ("blue wood"), manzanita, gooseberry, salmonberry, vine maple, whortleberry, elderberry, salal, "hyssop," dogwood, yew. NO OAK, NO PINE. Southern Coast Range.

- FFO.....Douglas fir - white oak (or oak species unspecified) forest, often with bigleaf maple. Brushy understory of hazel, young oaks, oak brush, oak stump sprouts, young Douglas fir, bracken, briars, willow. May include red cedar, western hemlock, ash, alder, vine maple, yew, young ash, and ferns if uplands and bottomlands are not segregated by surveyor. May include madrone in southern Lane County and southward, but not used for witness trees. If distance to witness trees > 100 links, use OFOZ. NO BLACK OAK, PONDEROSA PINE, OR INCENSE CEDAR ("REDWOOD"). If "wet," use FFA.
- FFOBu ..... Burned FFO, often with scattered trees surviving fire.
- FFOC.....Moist Douglas fir forest at various elevations, usually with madrone ("laurel") except at colder high elevations. May include ponderosa pine, black oak, and occasionally bigleaf maple and Pacific yew. Incense cedar ("redwood"), sugar pine, and live oak present at west end of range. Understory may include chinquapin, dogwood, hazel, serviceberry, ceanothus ("chimesal," "lilac," "spice"), willow, vine maple, thimbleberry, buckbrush (*C. sanguineus*), fern, and rarely "bugwood" (*Cercocarpus betuloides*) or cherry. At the west edge of the range, may include salal, rhododendron, "spice," arrowwood (*Holodiscus*), elk-brake, chimesel, manzanita, chaparral, scrub oak, and snowbrush ("balm"). White fir sparse to codominant on very moist or cool higher-elevation sites, but rarely identified in GLO survey notes. May contain unmappable inclusions of woodland (OPFOC). Klamath and Siskiyou Mountains.
- FFOCBu..... Burned FFOC, often with scattered trees surviving fire.
- FFOCH ..... Middle-elevation Douglas fir ("red fir") - western hemlock - white fir - madrone forest on moist, cool sites. May include ponderosa pine, sugar pine, black oak, chinquapin, bigleaf maple, incense cedar, and yew. Madrone reduced in colder locations. Understory may include dogwood, arrowwood (*Holodiscus*), willow, vine maple, manzanita, and elk brake. Salal, rhododendron, and snowbrush are known from modern stands but were not documented in GLO notes. Umpqua Divide. Similar to FFHE but lacking documentation of evergreen understory.
- FFOM ..... Low to mid-elevation dry Douglas fir - black oak - white oak - madrone ("laurel") forest, often with ponderosa pine or sugar pine. Oak and madrone consistently used for witness trees. May also include bigleaf maple, myrtle, incense cedar ("redwood"), and red cedar. Dense or open understory may include hazel, poison oak, chinquapin, madrone, willow, oak brush, briars, ferns, ninebark, Oregon grape, salal, sometimes only madrone. Vine maple occasional. Differs from FED in consistent use of oaks as witness trees, and abundance of madrone. Southern Lane County and southward. NO HEMLOCK, LIVE OAK, TAN OAK.
- FFOMBu..... Burned FFOM, often with scattered trees surviving fire.
- FFON..... Low to mid-elevation dry mixed hardwood (black oak, white oak, madrone) - ponderosa pine forest with scattered Douglas fir. Sometimes with minor amounts of incense cedar. Understory unspecified or with "some" to "thick" manzanita, ceanothus ("greasewood," "lilac"), occasionally with "plum," willow, or cherry at higher elevation. May include "arrowwood" (*Holodiscus discolor*), "chimesal," hazel, and bigleaf maple. Some shade-tolerant grasses present. May contain 10-20% unmappable inclusions of OFON, 20-40% unmappable inclusions of OPMO, "openings," or prairie. Early to mid-seral, on droughty sites. Differs from FFDF by having less Douglas fir. Rogue Valley.

- FFP .....Mesic Douglas fir - ponderosa pine forest. Understory may include ash, madrone, red alder, hazel, Oregon grape, vine maple, fern, salal. Oak and hemlock occasional to scarce. Willamette Valley, Hood River Valley.
- FFPBu.....Burned FFP, often with scattered trees surviving fire.
- FFPE .....*Dry Douglas fir - ponderosa pine forest. May include grand fir ("white fir") or incense cedar. Understory may include pine, fir, manzanita, willow, ceanothus ("chaparral"). May have "scattering" oak or larch along creek bottoms, and vine maple at higher elevations. NO LODGEPOLE PINE, MADRONE, HEMLOCK. If more larch use FFPT. East slope Cascades.*
- FFPC.....Complex of dry Douglas fir - mixed hardwood (FFDF) and dry mixed hardwood - ponderosa pine forest (FFON). Usually 40-60 % of each type present. Lower montane topography, eastern Klamath Mountains.
- FFPH.....*Montane (4700-7500 ft) mixed fir (Douglas fir, grand fir) forest with lodgepole pine, ponderosa pine, and Engelmann spruce. May contain white pine, larch, mountain hemlock. Sugar pine occasional. Frequent use of fir and Engelmann spruce as witness trees. Understory may contain young pine, hemlock, spruce, fir, manzanita, ceanothus ("myrtle," "laurel"), chinquapin ("mountain willow"), bitterbrush ("greasewood"), "tasselwood." East slope Cascades.*
- FFPHBu .....*Burned FFPH, often with scattered trees surviving fire.*
- FFPO .....Douglas fir - ponderosa pine forest, sometimes with sugar pine and incense cedar. Understory brush or oak and chaparral, sometimes dense. Drier and warmer than FMFMP. May have significant unmappable inclusions of scattering black or white oak and ponderosa pine. Undergrowth described only with scrub oak, mahogany, and chaparral. Southern Cascades. NO WHITE FIR.
- FFPOC.....Complex of heavy white fir and Douglas fir timber, often on north slopes, with scattered ponderosa pine and black or white oak. Undergrowth greenleaf manzanita, snowbrush, serviceberry, oak, chaparral, serviceberry, lilac, buckbrush, cherry, mountain mahogany, and is thin or dense, depending on location. Southern Cascades.
- FFPT .....*Mid-montane ([1500] 3000-5000 ft) transitional Douglas fir ("red fir")-mixed conifer forest, with grand fir ("white fir"), ponderosa pine, larch ("tamarack"). At lower elevations, white oak increases and tamarack decreases. Ponderosa pine increases at lower elevation and at southern and eastern end of coverage. Usually dense undergrowth may include maple (species unspecified), "soft maple," vine maple, aspen, alder, "laurel" (ceanothus), willow, hazel, and regenerating fir, pine, and larch. Hemlock and cedar limited to upper elevations or canyons. NO SPRUCE, NOBLE FIR ("LARCH"), OR LODGEPOLE PINE. If less larch use FFPE. If more spruce, cedar, hemlock use FFHPT. If more ponderosa pine and oak use FPOF. East slope Cascades.*
- FFPTBu.....*Burned FFPT, often with scattered trees surviving fire.*
- FFR.....Redwood forest, with various combinations of Douglas fir, oak (species unspecified), white oak, madrone, myrtle, bigleaf maple. Understory may include young oak, salal, manzanita, hazel, whortleberry, fern. Extreme south coast.
- FFSP .....Low to mid-elevation dry mixed pine (sugar pine, ponderosa pine) - Douglas fir forest, usually with madrone ("laurel") and black oak. Most common on south aspects with pine as dominant, but may occur on north aspects with Douglas fir as dominant. Sugar pine may be

- common to sparse. Soils granitic, precipitation under 35 inches. South slopes may have more open canopy with grass or bunchgrass in understory. Rogue Valley.
- FFSPH..... White fir - Douglas fir forest, with ponderosa pine and often sugar pine, at cool middle-elevation sites on granitic soils. Sometimes described as "heavy timber." Pine may dominate on warm, droughty, or heavily disturbed sites. Black oak and "redwood" (incense cedar) occasional on warmer sites. "Hemlock" is probably *Taxus brevifolia*. Undergrowth often "dense," including chinquapin, arrowwood (*Holodiscus discolor*), "aroma balm" (*Ceanothus velutinus*), hazel, willow, and greenleaf manzanita. Dogwood, buckbrush, and willow occasional. Southern Cascades.
- FFSPHBu.... Burned FFSPH, often with scattered trees surviving fire.
- FFSt..... Storm-damaged Douglas fir forest.
- FFSY ..... Young Sitka spruce forest with various combinations of Douglas fir, grand fir, western hemlock, red cedar, red alder, bigleaf maple. "Dense" understory of vine maple, salmonberry, thimbleberry, huckleberry, salal, devils club, gooseberry, cascara, elderberry, dogwood, briars, "whortleberry," Oregon grape, cherry, fern. May rarely contain shore pine. Primarily loam soils, with wetland pockets on bottomlands. Higher elevations may include silver or noble fir ("larch"). May include myrtle and chinquapin along southern coast of Oregon.
- FFY..... Young fir forest, "fir brush," or "fir thicket," species unspecified, burned within last ca. 20 years. Diameters < 12-14 inches. May include cedar, hemlock, alder, maple, rhododendron, salal, ceanothus, hazel, madrone, "birch," and "brush."
- FGC..... Complex of dry mixed conifer (Douglas fir, Ponderosa pine, sugar pine) - mixed hardwood (black oak, white oak, madrone) forest (FFDF, FFON, FFSP), woodland (OFON), and prairie at low elevations. Soils sometimes granitic. Eastern Klamath Mountains.
- FJ ..... *Western juniper "timber," some "heavy" (not "scattering timber"), often with grass, bunchgrass, sagebrush (sometimes dense), and bitterbrush ("greasewood"). Lower elevation east slope Cascades, Columbia Basin, Blue Mountains, Northern Basin and Range. Intergrades with FPJ.*
- FM..... Madrone ("laurel") forest or "thicket." Douglas fir occasional.
- FMFMP ..... White fir, Douglas fir ("red fir"), and ponderosa pine, often "heavy" or "thick." Incense cedar and black or white oak may be present. Undergrowth hazel, serviceberry, snowbrush ("balm" or "laurel"), less often chaparral, buckbrush, lilac, and oak, which is often "thick," "dense," or "heavy." Southern Cascades. NO TAN OAK.
- FMFP..... Low to mid-elevation, very moist Douglas fir - sugar pine - ponderosa pine - black oak forest. May include chinquapin, madrone ("laurel"), incense cedar, and sometimes Port Orford cedar, with alder (presumably white alder) and bigleaf maple along streams and myrtle, cascara, and "tamarack" (probably grand fir) occasional. Understory brushy or dense in places, may include vine maple, hazel, lilac, yew, cascara, dogwood, live oak, tanoak, manzanita, whortleberry, arrowwood (*Holodiscus*), poison oak, thimbleberry, ferns, ceanothus ("greasewood"), and "eucalyptus" (myrtle). Canyon live oak more abundant at mid to upper elevations. May contain unmappable inclusions of woodland. Applegate and Illinois valleys. NO MAHOGANY.
- FMFPBu ..... Burned FMFP, often with scattered trees surviving fire.

- FMFW ..... White fir and Douglasfir forest with incense cedar, ponderosa pine and sometimes sugar pine. Undergrowth laurel (snowbrush), greenleaf manzanita, and sometimes lilac, tasselwood (*Holodiscus discolor*), willow, and "heath." Southern Cascades. NO OAK.
- FMFWBu .... Burned FMFW, often with scattered trees surviving fire.
- FMPF ..... Mixed pine - Douglas fir - black oak - madrone - incense cedar forest in moist, low interior valleys and south-facing slopes. Chinquapin, bigleaf maple, and Port Orford cedar may also be present. Understory open to "brushy in places," and may contain vine maple, yew, live oak, tanoak, hazel, and huckleberry. May contain unmappable inclusions of woodland (OFMPF) with "good grazing." Upper Illinois River basin of SW Oregon.
- FO ..... White oak forest, "oak brush," "scrub oak," "oak grubs," or "oak and hazel brush." May contain willow. Use HO for Southern Coast Range. NO BLACK OAK.
- FOB ..... White oak - black oak forest, often with madrone ("laurel") and ponderosa pine. Understory may include hazel, poison oak, bigleaf maple, willow, oak, fern, briars. Southern Lane County and southward. NO FIR.
- FOFP ..... White oak - Douglas fir - ponderosa pine forest. May include hazel, vine maple, salal, rose, and ferns. Willamette Valley and south. NO BLACK OAK OR MADRONE.
- FOFPBu ..... Burned FOFP, often with scattered trees surviving fire.
- FOPMO ..... Moist ponderosa pine - mixed oak (black oak, white oak) forest, with significant amounts of Douglas fir, incense cedar, ash, and bigleaf maple. Understory unspecified, thick, or dense. May include madrone ("laurel"), ceanothus ("greasewood"), oak, scrub oak, poison oak, Oregon grape, serviceberry, and manzanita. "Plum," "bugwood" (*Cercocarpus betuloides*), or grass occasional. May have 5-20% unmappable inclusions of prairie or "bald ridges" (PU), woodland, and savanna. With more Douglas fir than FFON. Sometimes called "level pine plains," "pine plains," or "rolling pine timber." On valley floor or hillslopes. Umpqua Divide.
- FP ..... Ponderosa pine forest, with bitterbrush ("greasewood") and manzanita. Lodgepole pine and pinegrass scant. East slope Cascades.*
- FPBu ..... Burned FP, often with scattered trees surviving fire.*
- FPC ..... Ponderosa pine - incense cedar forest. Understory may contain manzanita, ceanothus ("sweet laurel"), bitterbrush ("greasewood"), peavine, cherry, chinquapin. Bunchgrass and pinegrass sometimes abundant. East slope Cascades.*
- FPD ..... Ponderosa pine - lodgepole pine forest. Understory may contain bitterbrush ("greasewood"), manzanita, buckbrush, gooseberry, pinegrass, yew, aspen, and young pine. Sagebrush and mountain mahogany more common at lower and drier elevation. Juniper or Engelmann spruce occasional. NO SUGAR PINE. Intergrades with FPJ.*
- FPDBu ..... Burned FPD, often with scattered trees surviving fire.*
- FPDF ..... Montane (4400-6000 ft) ponderosa pine - lodgepole pine - mixed fir (Douglas fir, white fir) forest. Sugar pine, Engelmann spruce, incense cedar, juniper occasional. East slope Cascades.*
- FPDFBu ..... Burned FPDF, often with scattered trees surviving fire.*
- FPDFL ..... Ponderosa pine - fir (grand and Douglas fir) - larch - incense cedar forest. Lodgepole pine frequent. Engelmann spruce, sugar pine, mountain hemlock, and juniper occasional. Sugar pine and red cedar occasional at northern edge of area. East slope Cascades.*
- FPDFLbu ... Burned FPDFL, often with scattered trees surviving fire.*

- FPDS* ..... *Ponderosa pine - lodgepole pine - sugar pine forest. Understory may include manzanita, bitterbrush ("greasewood"), mountain mahogany, young pine, ceanothus ("sweet laurel"), peavine, cherry, chinquapin, serviceberry. Bunchgrass and pinegrass sometimes abundant. East slope Cascades.*
- FPDSB* ..... *Ponderosa pine - lodgepole pine forest. Understory primarily sagebrush, often dense. East slope Cascades.*
- FPDSF* ..... *As in FPDS, with Douglas fir or white fir codominant. May include young fir, wild cherry.*
- FPDY* ..... *Young ponderosa pine - lodgepole pine forest. Described as "young," "scrubby," "small timber," "thickets." East slope Cascades.*
- FPF* ..... *Ponderosa pine - Douglas fir (or white fir) forest. May include juniper, mountain mahogany, manzanita, bitterbrush ("greasewood"), buckbrush (*Ceanothus velutinus*) and deerbrush (*Ceanothus integerrimus*), low sagebrush, bunchgrass, pinegrass. East slope Cascades.*
- FPFC* ..... *Ponderosa pine - mixed fir (Douglas fir ("red fir"), grand, or white fir) - incense cedar ("red cedar") forest. May include juniper, chinquapin, Klamath plum, bunchgrass, pinegrass. Larch occasional. East slope Cascades: Deschutes, Klamath, and Lake Counties.*
- FPFCS* ..... *As in FPFC, with sugar pine. East slope Cascades.*
- FPFE* ..... *Ponderosa pine - Douglas fir or white fir - Engelmann spruce forest. NO JUNIPER.*
- FPFH* ..... *Montane (4700-7500 ft) lodgepole pine - ponderosa pine - mixed fir (Douglas fir, grand fir) - Engelmann spruce forest on well-drained pumice soils. May contain white pine, larch, mountain hemlock. Sugar pine occasional. Frequent use of Engelmann spruce as witness trees. Understory may contain young pine, hemlock, spruce, fir, manzanita, ceanothus ("myrtle," "laurel"), chinquapin ("mountain willow"), bitterbrush ("greasewood"), "tasselwood." Fallen trees ("deadfall") common. East slope Cascades. If cedar or larch are frequent use FFHPT. Intergrades with FFHB to west.*
- FPFHBu* ..... *Burned FPFH, often with scattered trees surviving fire.*
- FPJ* ..... *Ponderosa pine - juniper forest. Incense cedar occasional. Understory may contain bunchgrass, "good grass," sagebrush, bitterbrush ("greasewood"). Shrubs sometimes dense. Intergrades with FPD and OJ.*
- FPO* ..... *Ponderosa pine - white oak forest. Understory "scant," "scarce," or dense. May contain grass ("good grazing," good pasturage"), hazel, ceanothus ("chaparral"), oak, pine, willow, alder, cottonwood, rose, hawthorn, manzanita. NO FIR. Eastern Columbia River Gorge, east slope Cascades.*
- FPOF* ..... *Ponderosa pine - white oak - Douglas fir forest, mostly < 3000 ft. "Scant" to dense undergrowth of oak, fir, pine, hazel, aspen, alder, rose, "soft maple," chinquapinn ("bur willow"), "laurel," cherry, "arrowwood," thimbleberry, dogwood, vine maple, huckleberry, manzanita, gooseberry, ceanothus ("chaparral," "buckbrush," "snowbrush"). May contain larch ("tamarack"), hemlock, cedar, alder, and white pine near western edge of range, > 2500 ft, or in creek bottoms. Eastern Columbia Gorge, east slope Cascades. Intergrades with FFPT.*
- FPOFBu* ..... *Burned FPOF, often with scattered trees surviving fire.*
- FPSF* ..... *Ponderosa pine - sugar pine - Douglas fir (or white fir) forest. Understory with manzanita and young pine. NO LODGEPOLE PINE.*
- FPVF* ..... *Ponderosa pine - black oak - white oak - madrone forest, usually in "groves" on valley floor. Douglas fir, incense cedar, and hawthorn ("thorn") often present. Understory may contain*

ceanothus ("lilac," "greasewood"), and grass. On uplands, river terraces and large alluvial fans, some with groundwater but rarely flooded. May contain unmappable inclusions of SWO, with less pine and more white oak and grass. May contain 10-20% unmappable inclusions of FAT and PF in flood zones. Applegate and Rogue valleys.

- FPW.....Ponderosa pine forest in Willamette Valley. Understory unspecified.
- FR..... *Western larch ("tamarack") "thicket."* May contain ponderosa pine and grand fir. East slope Cascades.
- FS .....Ash "timber," if no mention of water, "muddy ground," "swale," or "bottom." May contain Douglas fir, cascara, vine maple. Differs from FF in having less fir.
- FSt.....Storm-damaged forest ("sleetbreak" = broken limbs, bent trees, windfall etc.), species unspecified.
- FSH .....Sitka spruce forest with various combinations of Douglas fir, grand fir, western hemlock, red cedar, red alder, bigleaf maple. "Dense" understory of vine maple, salmonberry, thimbleberry, huckleberry, salal, devils club, gooseberry, cascara, elderberry, dogwood, briars, "whortleberry," Oregon grape, cherry, fern. May rarely contain shore pine, hazel, "lilac." Primarily loam soils, with wetland pockets on bottomlands. Higher elevations may include silver or noble fir ("larch"). May contain myrtle and chinquapin along southern coast.
- FSHBu.....Burned FSH, often with scattered trees surviving fire. May include lots of alder with widely scattering conifers and dense understory of salmonberry and salal.
- FSHSt .....Storm-damaged Sitka spruce forest.
- FSHY.....Young Sitka spruce forest, burned within last 20 years. Diameters < 12 inches. May include cedar, hemlock, alder, maple, vine maple, salmonberry, thimbleberry, huckleberry, salal.
- FSJF.....Ponderosa pine - Douglas fir - incense cedar forest on ultramafic soils. "Ponderosa pine" of GLO presumably includes Jeffrey pine. Madrone ("laurel") and black oak occasional. Understory ceanothus ("greasewood") and manzanita, otherwise unspecified. Illinois Valley.
- FSJFO.....Ponderosa pine - Douglas fir forest on ultramafic soils, with madrone ("laurel") and black oak. Douglas fir sometimes dominant. Incense cedar occasional. "Ponderosa pine" of GLO presumably includes Jeffrey pine. Madrone ("laurel") and oak occasional. Understory may include hazel, ceanothus ("greasewood," "lilac"), manzanita, honeysuckle, sometimes "very little." With unmappable inclusions of woodland. Illinois Valley.
- FSP .....Shore pine forest on sandy soils, including "pine flats," "pine groves," or "pine timber." May include Douglas fir, Sitka spruce, western hemlock, and madrone. Port Orford cedar ("white cedar") and chinquapin sometimes present in SW Oregon (Coos and Curry counties). Understory may include manzanita, salal, evergreen huckleberry, rhododendron, chinquapin. Alder, willow, crabapple, and salmonberry may occur near water. Intermixed with PD on partly stabilized dunes.
- FSPBu.....Burned FSP, often with scattered trees surviving fire. May include understory of salal and evergreen huckleberry.
- FWF.....White fir timber on high-elevation north slopes, with Douglas fir, ponderosa pine, and incense cedar on warmer sites. Undergrowth usually listed as lilac and balm (snowbrush). Southern Cascades. NO OAK.
- FWFC .....High-elevation white fir, Douglas fir, ponderosa pine, and incense cedar timber, often dense. White fir may be sole dominant on colder high-elevation north slopes. Incense cedar and

sugar pine occasional. Undergrowth often dense, including "laurel" or "balm" (*Ceanothus velutinus*), serviceberry, greenleaf manzanita, dogwood, "hemlock" (presumably *Taxus brevifolia*), bush chinquapin, gooseberry, elder, cherry, willow, and whortleberry. Southern Cascades. NO OAK.

FWFCBu..... Burned FWFC, often with scattered trees surviving fire.

FWFO..... White fir timber on high-elevation north slopes, with Douglas fir, ponderosa pine, white or black oak, and incense cedar on warmer sites. Undergrowth willow or hazel. Southern Cascades.

### Riparian and wetland forest

FA..... Brushy ash "swamp," "swale," "bottom," or "ash land," sometimes with red alder, bigleaf maple, crabapple, quaking aspen, hardhack. May include grassy openings and briars. NO CONIFERS.

FABu ..... Burned FA, often with scattered trees surviving fire.

FALW ..... Ash - alder - willow swamp or "beaverdam marsh," sometimes with bigleaf maple. May include vine maple, crabapple, cascara, gooseberry, salmonberry, ninebark, hardhack, cattail, "coarse grass," and briars. Myrtle present in southwestern Oregon. Ground "very soft," "miry," "muddy," "wet." May contain standing water 6-36 inches deep. Often with beaver dams. May contain inclusions of FA, HU, HW, WG, or WMU. NO CONIFERS.

FALWBU .... Burned FALW, often with scattered trees surviving fire.

FAS..... Ash "swale" with willow and briars, sometimes "brushy" or "thick." Depressions associated with creeks. Rogue Valley.

FAT ..... Mixed hardwood riparian forest ("creek timber") with various combinations of ash, white alder, black cottonwood, white oak, black oak, willow, and less often bigleaf maple. Ponderosa pine, incense cedar, Douglas fir, grand fir, and cherry occasional. Understory may contain a dense mixture of grape vines, nettles, and "briars" with hazel and hawthorn occasional. Pacific yew sometimes present at higher elevations. May include unmappable inclusions of HUR. Eastern Klamath Mountains, Applegate and Rogue valleys.

FATK..... Brushy floodplain with black cottonwood and willows along creeks. Mid-elevation bottoms of Klamath River drainage. Southern Cascades.

FAW ..... Ash - willow swamp, "very thick," sometimes with ninebark and briars.

FCS..... Cedar swamp or "bottom," often "dense." May contain red alder, western hemlock, and fir.

FDR..... Low-elevation mixed riparian forest with lodgepole pine on droughty, sandy or pumice outwash floodplains. May contain cottonwood, Douglas fir, red cedar, western hemlock, ash, red alder, vine maple, hazel, cherry, and dogwood. SW Washington.

FFA..... Mixed riparian or seasonally wet forest, with various combinations of ash, bigleaf maple, black cottonwood, red alder, white alder, white oak, quaking aspen, dogwood and willow. Douglas fir, grand fir, ponderosa pine, and red cedar may be present in small quantities. Understory "brushy," with various combinations of willow, hazel, ninebark, rose, hardhack, elderberry, vine maple, crabapple, viburnum, gooseberry, blackberry, hawthorn, salal, and yew. Differs from FFCL by having fewer conifers, and from FT by minority of cottonwood. Differs from FOA in having more conifers and greater diversity of mesic deciduous taxa. May contain inclusions of FA, HR, HS, HW, and WMU. NO BLACK OAK.

FFABu ..... Burned FFA, often with scattered trees surviving fire.

- FFCL ..... Brushy red alder - bigleaf maple - mixed conifer riparian forest, with various combinations of red cedar, grand fir, Douglas fir, western hemlock, black cottonwood, and sometimes ash. Includes "maple bottom." Understory may include yew, dogwood, vine maple, elder, hazel, willow, salmonberry, thimbleberry, devils club, hardhack, briars, ninebark, nettles, crabapple. Sometimes swampy or subject to winter overflow or inundation of 1-10 feet. Differs from FFA by larger conifer component. May have unmappable inclusions of US along floodplains. NO OAK OR SPRUCE. Witness trees often ash, maple, or alder.
- FFCLBu ..... Burned FFCL, often with scattered trees surviving fire.
- FFDA ..... Low-elevation Douglas fir - lodgepole pine - ash - white oak forest. Wetter areas may include quaking aspen and cottonwood. Understory may include hazel, willow, vine maple, salal, ninebark, crabapple, hawthorn, spiraea, and briars. Oak, pine, and fir used as witness trees. Puget Trough.
- FL ..... Red alder "swamp" "bottom," "flat," or "swale," usually with salmonberry, sometimes willow, red cedar, and bigleaf maple. Wetter than FFCL, drier than FALW and lacking deep muck soils.
- FMA ..... Bigleaf maple swamp ("maple swamp"). Possibly vine maple swamp (HV) instead, but lacking additional descriptors.
- FOA ..... White oak - ash riparian or seasonally wet forest, with various combinations of cottonwood, quaking aspen, bigleaf maple, alder, and willow. Sometimes with ponderosa pine, Douglas fir, or red cedar. "Dense" understory may include vine maple, hazel, hardhack, and briars. Differs from FFA in having fewer conifers and fewer mesic deciduous taxa. NO BLACK OAK.
- FOAM ..... Southern mixed riparian forest with various combinations of oak, ash, bigleaf maple, myrtle, willow, alder, Douglas fir, grand fir ("ponderosa fir"), and white fir. "Dense" or "brushy" understory may include hazel, fern, ninebark, wild grape, poison oak, and briars, with salal or salmonberry near coast. May include ponderosa pine on gravelly soils. South coast and Umpqua Valley.
- FPVF ..... Ponderosa pine - black oak - white oak - madrone forest (pine or oak "groves") on floor of Rogue Valley. Douglas fir, incense cedar, and hawthorn ("thorn") often present. Understory may contain ceanothus ("lilac," "greasewood"), and grass. On uplands, river terraces and large alluvial fans, some with groundwater but rarely flooded. May contain unmappable inclusions of SWO, with less pine and more white oak and grass. May have 10-30% unmappable inclusions of FAT in flood zones.
- FPW ..... *Lodgepole pine - willow riparian forest. East slope Cascades.*
- FSHL ..... Sitka spruce riparian forest with various combinations of Douglas fir, grand fir, western hemlock, red cedar, red alder, cottonwood, bigleaf maple, ash. Myrtle present farther south. "Dense" understory may include salmonberry, salal, vine maple, willow, thimbleberry, "bearberry," elderberry, briars, and crabapple. If wet or tidal, use FSL. Subject to occasional overflow only at extreme high water.
- FSHLBu ..... Burned FSHL, often with scattered trees surviving fire.
- FSL ..... Sitka spruce swamp, including freshwater tidal forest. May contain various combinations of willow, red alder, cottonwood, red cedar, hemlock. Rarely with ash or bigleaf maple. Dense understory may include salmonberry, crabapple, rose, elderberry, gooseberry, briars, ferns, skunk cabbage, vine maple. Ground "very soft," "miry," or "muddy." Includes "rich bottom

- tide land," "tide bottom," "subject to inundation," "subject to overflow." Periodic tidal flooding implied, not just seasonal high water. NO FIR. If drier or nontidal, use FSHL.
- FSPFl.....Dead shore pine forest (FSP) on sandy soils, flooded and killed by beaver dams. May include alder, willow, crabapple, and salmonberry.
- FT .....Black cottonwood ("balm") riparian forest, often with ash, maple, willow, rose, briars, hazel, hawthorn, nettles, and crabapple. Cottonwood is dominant species, and used with willow as witness trees, but usually not ash. NO CONIFERS, NO OAK. Willamette Valley and Puget Trough.
- FTB.....*Black cottonwood riparian "timber," otherwise undescribed. Northern Basin and Range.*
- FTC .....Black cottonwood ("balm") riparian forest, with lesser amounts of ash, white alder, and willow. Sometimes with bigleaf maple, hawthorn, incense cedar, ponderosa pine. Undergrowth often unspecified but may include hazel, vine maple, salmonberry, ceanothus ("greasewood"), willow, briars, nettles. May have unmappable inclusions pine, black oak, white oak, or fir woodland "creek brush" (HUR). Applegate and Illinois valleys.
- FTCC.....Unmappable mixture of Black cottonwood - hardwood riparian forest (FTC) and "creek brush" (HUR). May include pine and oak forest, woodland, or savanna. Understory mostly unspecified but may include ceanothus ("greasewood"), briars, and nettles. Illinois Valley.

## H. Shrubland and "thickets." Many of these shrub types were probably seral stages following fire.

- HA.....Manzanita shrubland. May include scattered trees. South Cascades.
- HAC.....*Silver "sage flat." No other information given. Use when plat map identifies feature as "sage flat", and topographic map identifies it as a dry lakebed. If plat map identifies feature only as "dry lake bed," use UP. Northern Basin and Range.*
- HB .....Brush fields or thickets on slopes and ridges, with few or no witness trees. May be unspecified "brush," or include vine maple, red alder, salmonberry, thimbleberry, rhododendron, hazel, cherry, fern, salal, willow, young fir, "birch," ceanothus ("greasewood," "buckbrush"), chinquapin, garrya ("tassel") or madrone southward along coast.
- HBBu.....Burned HB, with few or no trees remaining.
- HC .....Crabapple "swamp," "thicket," "flat," "bottom," or "swale," sometimes with willow, ash, alder, grass, salmonberry, huckleberry, briars. May contain standing water (e.g., "lake covered with crabapple").
- HCH ..... "Chaparral" thicket or "thick growth" at low elevation (3000 ft), species unspecified. Probably a mixture of manzanita and ceanothus ("greasewood"), sometimes with "plum," white oak, and poison oak. Applegate and Rogue valleys.
- HCHO..... "Heavy" or "dense" chaparral brush at moderate to upper elevations (3000-4000 ft). Species unspecified but probably with buckbrush, serviceberry, plum, white oak, mountain mahogany, and bitterbrush. May contain unmappable inclusions of timber (pine, oak, fir) and prairie (PU). Applegate Valley and Southern Cascades.
- HD..... "Brushy swamp," "beaver dam swamp," "brushy wetland," "bush marsh," or "thicket" on bottoms or wet terraces, with a variety of shrubs but few or no trees. May include willow, vine maple, elderberry, crabapple, hardhack, rose, grass, salmonberry, thimbleberry, dogwood, salal, sedge. With occasional alder, ash, quaking aspen, or cherry, but trees scarce. Use when a mix of shrubs is indicated, instead of a stand dominated by a single

- species, or a stand with no species given (e.g., HW or HU). "Low" and wet or miry like HW. Differs from FALW in dominant cover of shrubs and minority of trees.
- HE ..... *Ceanothus* ("greasewood," "chaparral," "snowbrush," "balm," "laurel") shrubland, usually dense. May contain manzanita and willow (*Salix scouleriana*).
- HED..... Brush fields without overstory or with minor ponderosa pine, fir, incense cedar, oak. Undergrowth sometimes described as "thick" or as "almost impenetrable" and includes mixtures of snowbrush, greenleaf manzanita, mountain mahogany, serviceberry, scrub oak and sometimes cherry and buckbrush. Southern Cascades.
- HF..... Maple "thicket" or "flat," species unspecified.
- HFBu ..... Burned HF, with few or no trees remaining.
- HG..... Brush fields on dry coastal bluffs. Dense stands with combinations of salal, huckleberry, thimbleberry, garrya ("tassel"), twinberry, hazel, "lilac," crowberry, coyote bush. May contain scattered and scrubby shore pine, Sitka spruce, red alder.
- HGW..... *Sodic greasewood and saltgrass flat. May include lesser amounts of bunchgrass, basin wildrye, wiregrass (Juncus balticus), white sage, sagebrush, and tule. Usually "swampy," "overflowed in spring and early summer," or "unfit for cultivation." Shrubs may be "scattering." If no shrubs present, use WSG. If not sodic, use HTG. Northern Basin and Range.*
- HH..... Dense cherry "thickets" on burned slopes, with few or no trees. May include hazel, huckleberry, thimbleberry, small firs, vine maple, arrowwood (*Holodiscus discolor*), or willow. Western Cascades.
- HHCH..... Dense or "thick" stands of "chaparral" or "brush" at moderate to high elevation (> 4000 ft) on south slopes. May include manzanita (*Arctostaphylos patula* and *A. viscida*), ceanothus ("laurel," "mountain balm"), live oak, chinquapin, hazel, and madrone ("laurel"). Live oak more abundant at western edge of range, where it may be primary shrub. Scattering timber may include ponderosa pine, red fir, maple, madrone, Douglas fir, and white fir. Siskiyou Mountains.
- HHP..... Krummholz "thickets" at timberline. May include stunted mountain hemlock and whitebark pine. Cascade Range.
- HL ..... Alder "thickets" or "brush," species unspecified. Presumably *A. viridis* ssp. *sinuata*. On both sides of Cascades, ca. 4000 ft.
- HM ..... *Mountain mahogany shrubland (Cercocarpus ledifolius).*
- HMO..... Dense "mahogany brush," "plum-mahogany thickets" (Klamath plum and birchleaf mountain mahogany), sometimes with white oak. Usually on loamy soils and all aspects but particularly on south slopes. Called "chaparral" or "dense chaparral." May include a few scattering pines, white oak, or madrone. May contain unmappable inclusions of prairie (PU) and minor patches of conifers. Mid to upper elevations. Applegate Valley and Southern Cascades.
- HN..... *Ceanothus* ("greasewood") "brush" or "thickets" on plains or uplands. May contain occasional white oak or pine. Rogue Valley, Southern Cascades.
- HNM..... *Ceanothus* ("greasewood") "brush" or "thickets" on mounded plains or tableland. Differs from HN by being on plains with mound and swale topography. Rogue Valley.
- HO..... Oak "brush" or "oak grubs" with Sargent oak, madrone ("laurel"), chinquapin, myrtle, ceanothus ("greasewood"), manzanita, salal, rhododendron, hazel, whortleberry, willow,

"lilac." May contain huckleberry, red alder, poison oak, salmonberry, cascara, fern near water or in gullies. Sometimes with scattered fir or pine, but trees not used as witnesses. Southern Coast Range. Use FO for interior valleys and Columbia River Gorge.

- HOBu ..... Burned HO, with few or no trees remaining.
- HP ..... Quaking aspen "thicket."
- HR ..... Rose or briar thickets, "briar brush."
- HRS ..... Salmonberry "swamp."
- HS ..... Spiraea ("hardhack" or "hardbush") brush, "swamp," of "bottom." May contain rose, grass, and standing water (e.g., "pond with growth of hardhack").
- HSC ..... Dense serviceberry - cherry thickets or cherry brush, sometimes with oak (probably white or scrub oak). Sites on warmer slopes were mostly scrub oak or dense oak brush but probably included cherry and/or serviceberry. Southern Cascades.
- HSO ..... "Thick" or "dense" oak "brush" or "scrub oak," sometimes with "chaparral" or juniper. Usually at lower elevations than HSC. Undergrowth not listed but assumed to include serviceberry, plum, buckbrush, lilac and/or mountain mahogany. Southern Cascades.
- HSB ..... Sagebrush - bitterbrush ("greasewood") shrubland, sometimes with "grass" or bunchgrass. May contain scattered juniper. If stands have grass codominant and were described by surveyors as "prairie", use PU.*
- HSG ..... "Rocky" or "stony" low sagebrush/ bunchgrass shrubland in "rocky openings" or "rocky barrens." Sometimes with a few scattered ponderosa pine or juniper. Presumably with more shrub cover than PS.*
- HSP ..... "Dense" or "scrubby" shore pine. May include Sitka spruce, Douglas fir, red alder, salmonberry.
- HSR ..... Sagebrush bottomland ("sage land") with rye grass, bunch grass, Klamath plum, serviceberry. Soil dry and sandy. Klamath and Lake Counties.*
- HSS ..... Shrub swamp ("brushy swamp," "brushy swale," "brushy marsh," "wet brushy bottom," "marshy thicket," "swampy thicket"), composition unknown.
- HT ..... Sagebrush, usually with bunchgrass, "good grass," or "grass." Often dense or "brush." Sagebrush consistently present, greasewood and saltgrass occasional (vs. HTG). Where sagebrush is expected, some surveyors record only grass without sagebrush, while others record the opposite, though both are usually present. Northern Basin and Range.*
- HTG ..... Sagebrush and greasewood "brush," often dense. May contain "thorn" (probably *Atriplex confertifolia*). Greasewood consistently present (vs. HT), but not sodic like HGW. Northern Basin and Range.*
- HU ..... Brush, composition unknown. Includes "thicket" if no species or other descriptors are given. Can be wet or dry.
- HUR ..... "Creek brush," "brushy bottoms," "thick brush," or "thickets" in riparian areas. Sometimes with willow, grapevines, briars, or composition unknown. Probably included willow, alder, cherry, cottonwood, oak, and scant firs. Applegate, Illinois, and Rogue valleys.
- HV ..... Vine maple "swamp," "thicket," "swale," or "bottom," sometimes with "elk briar," hazel, and willow (wetland and upland), or alder.
- HW ..... Lower-elevation willow "swamp," "thicket," or "swale," sometimes "scattering" or "openings." May include unmappable inclusions of crabapple, cascara, ninebark, hardhack, briars, salmonberry, gooseberry, "swamp grass." Ground "very soft," "miry," "muddy," "wet." May contain standing water 6-36 inches deep. Often with beaver dams. Includes riparian stands

on gravel or sand bars, with cottonwood or driftwood. May contain small amounts of alder, ash, or bigleaf maple, but trees are mostly peripheral. NO CONIFERS. If dominated by crabapple use HC; if dominated by hardhack use HS; if dominated by ash or alder use FALW. If mid to upper montane swamps use HWA. West of Cascades.

- HWA ..... Middle to upper montane willow swamp or "swale," sometimes with huckleberry, cranberry, quaking aspen, and scattering lodgepole pine. Cascade Range and east.
- HWB ..... "*Heavy*" or "*dense*" riparian willow "*thickets*," sometimes with rose. East Cascades, Northern Basin and Range.
- HWS ..... Willow "swale" or narrow drainages, sometimes with ash, white alder, or cottonwood. Rogue Valley.
- HZ ..... Hazel brush or thicket, sometimes with vine maple.

## **N. Composition unknown**

- NA..... "*Alkali bottom*," composition unknown. "*Grass*" may be present (*saltgrass* or *Great Basin wild rye*).
- NG..... "*Glade*," "*opening*," "*open ground*," or "*open space*" in forest or shrubland, composition unknown. If grass is present, or if "*glade*" is in prairie, use P. Not to be confused with savanna "*openings*."

**O. Woodland.** Distances to witness trees mostly 100-200 (400) links [66-132 (265) ft; stands described as "*timber*," "*thinly timbered*," "*scattering*," "*scattering timber*," "*open*." Understory brushy in Willamette Valley but may be grassy elsewhere. Woodland also applies when (1) more than half of witness trees are absent, (2) there is no mention of burned timber, and (3) good grazing is present, despite spacing of remaining trees being <100 links. Many of these woodland types were probably seral stages following fire.

- OB ..... Black oak woodland. Southern Lane County and southward.
- OBF ..... Black oak - Douglas fir woodland, often with sugar pine or ponderosa pine. Understory may include hazel, oak, elk brake, manzanita, pine. Umpqua Valley and southward.
- OD ..... *Lodgepole pine woodland*.
- OFC ..... Low to mid-elevation dry Douglas fir - incense cedar woodland with combinations of ponderosa pine, sugar pine, bigleaf maple, and madrone ("*laurel*"). Umpqua Valley and southward. NO HEMLOCK, NO OAK. Similar to OFED, but lacking mesic conifer component on N slopes. Madrone frequently used as witness trees, as in FFC.
- OFDA ..... Low-elevation Douglas fir - lodgepole pine - ash - white oak woodland. Wetter areas may include quaking aspen and cottonwood. Understory may include hazel, willow, vine maple, salal, ninebark, crabapple, hawthorn, spiraea, and briars. Oak, pine, and fir used as witness trees. Puget Trough.
- OFDF ..... Low to mid-elevation dry Douglas fir - ponderosa pine - mixed hardwood woodland. Pine and hardwoods codominant or secondary. Mid- or late-successional stands where hardwood trees and pine are being replaced by Douglas fir. May contain unmappable inclusions of "*good grazing*" or "*good pasture land*" and savanna. Understory unspecified or may include chaparral, manzanita, and scrub oak. Applegate Valley.

- OFED .....Low to mid-elevation unmappable mixture of (1) dry Douglas fir – chinquapin - madrone ("laurel") woodland on S to W slopes and ridgetops, and (2) more mesic Douglas fir - western red cedar - western hemlock woodland (OFHC) or forest (FFHC) on N slopes and bottoms. May include incense cedar ("redwood"), black and white oak, ponderosa pine, grand fir, yew, red alder, maple, dogwood. "Dense" understory may include hazel, vine maple, viburnum, ocean spray, ceanothus, manzanita. Use of madrone and chinquapin (but not oaks) as witness trees, and abundance of hazel is diagnostic. If oaks are dominant witness trees, use OFOM.
- OFH.....Moist lower elevation fir - hemlock - cedar woodland (assumed both incense cedar and western red cedar), often with "laurel" (madrone), chinquapin and big leaf maple. Sugar pine, yew, red alder, and black oak occasional. Understory primarily "laurel" (snowbrush), vine maple, hazel, Oregon grape, Douglas fir, and western hemlock, with salal, huckleberry, thimbleberry, arrowwood and lilac occasional. Cascade foothills in South Umpqua area.
- OFHB .....Mid to upper montane (3500 ft to timberline) mixed fir (silver fir, noble fir ["larch"], alpine fir) - mountain hemlock forest with mostly broadleaved evergreen understory. Stands near timberline "medium" or "scattering." With various combinations of lodgepole pine, Douglas fir, western hemlock, western red cedar, western white pine, and Engelmann spruce. Larch occasional. Sparse to dense understory may include rhododendron, Oregon grape, vine maple, hazel, huckleberry, "white maple," "honey laurel," "soapbrush." West slope and summit Cascade Range. Intergrades with OFHC and OFHE on west slope Cascades. NO OAK, BIGLEAF MAPLE, OR PONDEROSA PINE.
- OFHC .....Mesic mixed conifer woodland, with various combinations of Douglas fir, red cedar, and western hemlock, with lesser amounts of bigleaf maple, white oak, ash, madrone, and red alder. Understory may include vine maple, dogwood, hazel, viburnum, fern, briars, yew, and rarely open with grass and fern, or "good grazing."
- OFHCBu.....Burned OFHC, often with scattered trees surviving fire.
- OFHE .....Mid-elevation (1500-4000 ft) mixed conifer woodland with mostly broadleaved evergreen understory. With various combinations of Douglas fir, white fir, western hemlock, western red cedar, western white pine, sugar pine, "bull pine," incense cedar, madrone ("laurel"), bigleaf maple, dogwood, red alder, and grand fir. Sparse to dense understory may include rhododendron, Oregon grape, yew, vine maple, chinquapin, live oak, madrone, ceanothus ("mountain balm," "balm," "greasewood," "chaparral," "buckbrush," "chamise"), manzanita, salal, hazel, ocean spray, huckleberry, "tasselwood. Sometimes with "bunchgrass" or "good grazing."
- OFHO .....Southern mixed dry conifer woodland with mostly broadleaved evergreen understory. Various combinations of Douglas fir, western hemlock, Port Orford cedar ("white cedar"), grand fir, oak, white oak, tan oak, live oak, madrone, chinquapin, myrtle, red alder. Dense understory may include Sargent oak, live oak, madrone, rhododendron, yew, salal, evergreen huckleberry, ceanothus ("greasewood," "bluewood"), manzanita, elder, gooseberry, briars, tall fern. Sometimes with "bunchgrass" or "good grazing." May include willow, ash, cascara, cherry, whortleberry, elderberry, or salmonberry near water. Southern Coast Range. NO SPRUCE.
- OFHOBu.....Burned OFHO, often with scattered trees surviving fire.

- OFHPT* ..... *Mesic mixed conifer montane woodland (2000 ft to timberline) with mixed deciduous-broadleaved evergreen understory. May include various combinations of larch ("tamarack"), noble fir, white fir, "black fir," Douglas fir, western hemlock, cedar, mountain hemlock, white pine, whitebark pine, "silver pine," Engelmann spruce, lodgepole pine ("black pine"), ponderosa pine, alder, dogwood, chinquapin ("bur willow"). Light to dense undergrowth may include rhododendron, vine maple, serviceberry, huckleberry, Devils club, salal, ceanothus ("buckbrush," "slickleaf," "snowbrush") manzanita, maple (species unspecified). Stands near timberline "medium" to "scattering," with dwarf juniper. Frequent presence of larch ("tamarack") diagnostic. Oak sometimes present at lower elevations. Intergrades with FFHE at lower elevations and with increasing incidence of Douglas fir. NO SUGAR PINE. Eastern Columbia Gorge, Eastern Cascades.*
- OFHPTBu*... *Burned OFHPT, often with scattered trees surviving fire.*
- OFHV* ..... Unmappable mixture of mostly northern mesic mixed conifer woodland (OFHC) or forest (FFHC) on north slopes, with elements of dry conifer woodland on S to W slopes and ridgetops. Includes various combinations of Douglas fir, western hemlock, red cedar, Port Orford cedar ("white cedar"), grand fir, with lesser amounts of bigleaf maple, dogwood, red alder, madrone ("laurel"). Myrtle occasional. Dense to "impassable" understory of "elk brush" or "elkwood" is diagnostic, but may also include salmonberry, vine maple, salal, briars, ceanothus ("greasewood," "bluewood"), "whortleberry," and cascara. "Good grass," rhododendron, or dead timber occasional. Witness trees primarily fir, hemlock, cedar. Southern Coast Range. NO OAK, SPRUCE, OR PINE.
- OFMFP* ..... Moist Douglas fir - black oak woodland, usually with madrone. Sugar pine and ponderosa pine are secondary. May include chinquapin, madrone ("laurel"), incense cedar, possibly Port Orford cedar, with alder and bigleaf maple along streams and myrtle, cascara, and "tamarack" occasional. Understory brushy or dense in places, may include vine maple, yew, hazel, lilac, dogwood, live oak, tanoak, manzanita, whortleberry, arrowwood, poison oak, thimbleberry, ferns, ceanothus ("greasewood"). Canyon live oak more abundant at mid to upper elevations. May contain unmappable inclusions of woodland. Low elevation to montane. Applegate and Illinois valleys. NO MAHOGANY.
- OFMPF* ..... Pine - Douglas fir - black oak - madrone - incense cedar woodland in moist, low interior valleys and south-facing slopes. Chinquapin, bigleaf maple, and Port Orford cedar may also be present. Understory often dense, and may contain vine maple, yew, live oak, tanoak, hazel, and huckleberry. Upper Illinois River basin of SW Oregon.
- OFOM* ..... Dry mixed Douglas fir - black oak - white oak - madrone woodland. May include ponderosa pine, bigleaf maple, incense cedar ("redwood"), and red cedar. Dense brushy understory may include hazel, poison oak, oak sprouts, madrone, willow, oak brush, bracken, sometimes only madrone. Vine maple occasional. Differs from OFED in consistent use of oaks as witness trees, and abundance of madrone. Southern Lane County and southward. NO HEMLOCK.
- OFON* ..... Low to mid-elevation dry mixed hardwood - ponderosa pine woodland with scattered Douglas fir. Black oak, white oak, and madrone ("laurel") usually present, sometimes with minor amounts of incense cedar. Understory may contain "good grass" or "good grazing," ceanothus ("lilac," "chaparral"), manzanita, oak, plum, scrub oak, poison oak, serviceberry, hazel, and madrone. May have 5-15% unmappable inclusions of prairie or "bald ridges"

- (PU), oak or oak - ponderosa pine savanna, and riparian vegetation. Soils droughty to poorly drained.
- OFOPZ ..... White oak - Douglas fir - ponderosa pine woodland. Brushy understory of hazel, young oak, oak sprouts, bracken, briars. May include "small openings," "part openings," or "some open." NO HEMLOCK OR CEDAR. More open than FFO. Differs from SOFP in having brushy undergrowth.
- OFOPZBu... Burned OFOPZ, often with scattered trees surviving fire.
- OFOZ..... Douglas fir - white oak woodland, often with bigleaf maple. Brushy understory of hazel, young oaks, oak brush, oak stump sprouts, young fir, bracken, and briars. Willow, chinquapin, or madrone sometimes present. NO BLACK OAK OR PINE. May also include red cedar, western hemlock, ash, alder, vine maple, yew, young ash, and ferns if uplands and bottomlands are not segregated by surveyor. More open than FFO. Differs from SOF in having brushy understory. If distance to witness trees < 100 links, use FFO.
- OFOZBu ..... Burned OFOZ, often with scattered trees surviving fire.
- OFPP ..... Douglas fir - ponderosa pine woodland. Often dense understory may include hazel, willow, alder, vine maple, salal. Columbia River Gorge. Oak or hemlock occasional to scarce.
- OFPC..... Southern dry Douglas fir - ponderosa pine woodland, understory unknown. Southern Coast Range. Adjacent to OFHO. NO HEMLOCK, CEDAR, SHORE PINE.
- OFPH ..... *Montane (4700-7500 ft) mixed fir (Douglas fir, grand fir) woodland, with lodgepole pine, ponderosa pine, and Engelmann spruce. May contain white pine, larch, mountain hemlock. Sugar pine occasional. East slope Cascades.*
- OFPT..... *Mid-montane ([1500] 3000-4000 ft) transitional woodland, with fir (species unspecified), ponderosa pine, larch ("tamarack"). White oak at lower elevations. Usually dense undergrowth may include maple (species unspecified), "soft maple," vine maple, aspen, alder, "laurel," willow, hazel, and regenerating fir, pine, and larch. May contain hemlock and cedar at upper elevations or in canyons. NO SPRUCE OR LODGPOLE PINE. East slope of Mount Hood, East Cascades.*
- OFSL ..... Sitka spruce swamp woodland with widely scattered trees and dense shrub understory. May include various combinations of willow, red alder, red cedar, hemlock. Rarely with ash or bigleaf maple. Dense understory may include salmonberry, crabapple, elderberry, gooseberry, briars, ferns, skunk cabbage, vine maple. Ground "very soft," "miry," or "muddy." Includes "rich bottom tide land," "subject to inundation," "subject to overflow." Regular or periodic overflow implied, not just extreme high water. NO FIR.
- OFSPH..... White fir - Douglas fir woodland, with ponderosa pine and often sugar pine, at cool middle to upper-elevation sites on granitic soils. Pine may dominate on warm, droughty, or heavily disturbed sites. Black oak and "redwood" (incense cedar) occasional on warmer sites. "Hemlock" is probably *Taxus brevifolia*. Undergrowth often "dense," including chinquapin, arrowwood (*Holodiscus discolor*), "aroma balm" (*Ceanothus velutinus*), hazel, willow, and greenleaf manzanita. Dogwood, buckbrush, and willow occasional. Southern Cascades.
- OFZ ..... Douglas fir woodland, often with bigleaf maple, alder or dogwood. Understory brushy or open, may include hazel, vine maple, young Douglas fir, bracken or "ferns." May include "small openings," "part openings," or "some open." "Fern openings" may be present, but these lack entrance and exit points, or the stand occurs as "open fern hills" or "fern openings" with "scattering firs." If "fern opening" has entrance and exit points and no trees, use EF.

Madrone, chinquapin or ceanothus may be present in dry sites, but are not used for witness trees. NO OTHER CONIFERS, NO OAK. More open than FFO. Differs from SF in having brushy or fern understory. Use with caution in burned-over areas, as surveyor may just be selecting widely scattered live trees among dead ones; in this case map as FF.

OFZBu..... Burned OFZ, often with scattered trees surviving fire.

OJ..... *"Scattering" western juniper woodland, often with "good grass," bunchgrass, or sagebrush. Sometimes on rocky scabland or rimrocks. East slope Cascades, Columbia Basin, Blue Mountains, Northern Basin and Range.*

OJBU..... *Burned OJ, often with scattered trees surviving fire. East slope Cascades, Columbia Basin, Blue Mountains, Northern Basin and Range.*

OMFP..... White fir - Douglas fir - ponderosa pine woodland, often with incense cedar. At middle elevations, with white fir dominating older stands and cooler sites. Undergrowth not described. With unmappable inclusions of forest density. Southern Cascades.

OMOPK..... *"Scattering" oak and ponderosa pine woodland at mid elevations, with white oak, black oak, incense cedar, and fir in places. Undergrowth not described but probably included chaparral, plum, lilac, serviceberry, mountain mahogany, bitterbrush, buckbrush and juniper. May have 5-10% unmappable inclusions of OFWF on moist or cool positions with loamy soils and 10-30% HU and PU. Southern Cascades.*

OMPFC..... Ponderosa pine - sugar pine woodland, usually with incense cedar, Douglas fir, white fir, and black oak. White oak and juniper sometimes present on poor soil, droughty sites. White fir probably minor or absent and black oak more common at driest sites, while white fir most abundant and black oak least abundant or absent in cooler moist sites. Undergrowth mostly undocumented but including buckbrush, chaparral, mahogany, and greenleaf manzanita. Southern Cascades. NO OAK.

OOAM..... Southern mixed riparian woodland with various combinations of oak, ash, bigleaf maple, myrtle, willow, alder, Douglas fir, grand fir ("ponderosa fir"), and white fir. "Dense" or "brushy" understory may include hazel, fern, ninebark, wild grape, poison oak, and briars, with salal or salmonberry near coast. May include ponderosa pine on gravelly soils. South coast and Umpqua Valley.

OOB..... White oak - black oak woodland, often with madrone ("laurel") and ponderosa pine. "Dense" understory may include hazel, poison oak, madrone, bigleaf maple, willow, oak, fern, briars. Southern Lane County and southward. NO FIR. If understory not described, use SOB.

OOP..... Mixed white oak - black oak woodland with ponderosa pine scattered or in pockets. Madrone ("laurel") frequent to minor. Understory "thick" or with "a few bunches" of ceanothus ("greasewood," "chaparral"), scrub oak, hazel, cherry, manzanita, and sometimes "bugwood" (*Cercocarpus betuloides*), "plum," "lilac," or "good grazing." Low to mid-elevation plains and foothills. Commonly with 5-15% unmappable inclusions of prairie or "bald ridges" (PU), and 10-40% unmappable inclusions of FPVF, OWM, or SWO. Applegate and Rogue valleys.

OOZ..... White oak woodland, with brushy understory of hazel, oak sprouts, bracken and other shrubs. NO FIR, NO BLACK OAK. More open than FFO. Differs from SO in having brushy understory.

- OP ..... *Ponderosa pine woodland. Understory sometimes dense with manzanita, bitterbrush ("greasewood"), mountain mahogany, buckbrush (Ceanothus velutinus), deerbrush (Ceanothus integerrimus), young pine, sagebrush, and bunchgrass.*
- OPB ..... *Ponderosa pine - white fir - Douglas fir - incense cedar woodland on cool mid-elevation sites, on gentle to flat slopes near the margins of meadow bottoms. Undergrowth not described. Some areas are probably only pine, especially where approaching the meadow fringe. Southern Cascades.*
- OPC ..... *Ponderosa pine and cedar (probably incense cedar) woodland. Understory unspecified.*
- OPD ..... *Ponderosa pine - lodgepole pine woodland. Understory with bitterbrush, manzanita, sagebrush, gooseberry, and young pine.*
- OPDF ..... *Montane (4400-6000 ft) ponderosa pine - lodgepole pine - mixed fir (Douglas fir, white fir) woodland. Sugar pine, Engelmann spruce, incense cedar, juniper occasional. East slope Cascades.*
- OPDFL ..... *Ponderosa pine - fir (grand and Douglas fir) - larch - incense cedar woodland. Lodgepole pine frequent. Engelmann spruce, sugar pine, mountain hemlock, and juniper occasional. Sugar pine and red cedar occasional at northern edge of area. East slope Cascades.*
- OPDSB ..... *Ponderosa pine - lodgepole pine woodland. Understory primarily sagebrush, often dense.*
- OPF ..... *Ponderosa pine - fir (Douglas fir, red or white fir) woodland. May include juniper, mountain mahogany, manzanita, bitterbrush ("greasewood"), buckbrush (Ceanothus velutinus), deerbrush (Ceanothus integerrimus), sagebrush, bunchgrass.*
- OPFC ..... *Ponderosa pine - fir (Douglas, red or white fir) - incense cedar woodland or "timber" if no witness trees are used. May include juniper, chinquapin, Klamath plum, bunchgrass, pinegrass. Deschutes, Klamath. Lake Counties.*
- OPFCS ..... *As in OPFC, with sugar pine.*
- OPFH ..... *Montane (4700-7500 ft) lodgepole pine - ponderosa pine - mixed fir (Douglas fir, grand fir) - Engelmann spruce woodland on well-drained pumice soils. Fallen trees ("deadfall") common. East slope Cascades.*
- OPFO ..... *Douglas fir - ponderosa pine woodland. May contain black oak, white oak, incense cedar, madrone, chinquapin. Understory along coast may contain young oak, rhododendron, huckleberry, salal, hazel, manzanita, or maple. Eastern Klamath Mountains with incense cedar, black oak, rarely live oak, but lacking rhododendron, huckleberry, and salal. South Coast to eastern Klamath Mountains. NO RED CEDAR, MYRTLE, HEMLOCK, GRAND FIR.*
- OPFOC ..... *Moist woodland with ponderosa pine, black oak, madrone ("laurel"), red fir, white fir, cedar (incense cedar), and sugar pine. Understory poorly documented but presumed to have had low to moderate shrub cover and some grass. With unmappable inclusions of prairie. Plateau surrounding Butte Falls, Southern Cascades foothills.*
- OPFOJ ..... *White fir - Douglas fir - ponderosa pine woodland, often with incense cedar, at middle-elevation warm southern slopes. May have 10-20% unmappable inclusions of scabland or rocky soils with mixed western juniper, oak, ponderosa pine, and incense cedar. Black oak and sugar pine occasional. Timber sometimes occurs in forest density. Undergrowth not well described but includes oak, balm (Ceanothus velutinus), lilac, greenleaf manzanita, tasslewood (Holodiscus discolor), plum and serviceberry. Southern Cascades.*

- OPFOK..... "Pine" (presumably ponderosa pine) - Douglas fir - "fir" (presumably white fir) woodland at middle elevations on dry, cool sites. May include "tamarack" (*Abies* spp.), black oak, and less often white oak. Sugar pine not mentioned but may occur in places with fir. With unmappable inclusions of savanna tree density ("open woods"). In places understory described as "fine grass," or "good grazing." May have 10-40% unmappable inclusions of upland prairie with patches of PUD. Woody undergrowth not listed. Southern Cascades.
- OPJ..... *Ponderosa pine - western juniper woodland, sometimes with extensive but unmappable inclusions of sagebrush and bunchgrass. May contain scattered bitterbrush, mountain mahogany, or deerbrush (Ceanothus integerrimus).*
- OPJS..... *Ponderosa pine - western juniper woodland, with dense mountain mahogany, manzanita, and bitterbrush. Low sagebrush and bunchgrass occasional.*
- OPMO ..... Ponderosa pine - mixed oak (black oak, white oak) woodland, usually with madrone ("laurel"). Douglas fir and incense cedar sometimes present in minor amounts. Understory unspecified, thick, or dense. May include ceanothus ("greasewood"), oak, scrub oak, poison oak, Oregon grape, serviceberry, and manzanita. "Plum," "bugwood" (*Cercocarpus betuloides*), or grass occasional. May have 5-20% unmappable inclusions of prairie or "bald ridges" (PU), savanna, and up to 50% forest. If Douglas fir present in forest inclusions, it contains more than FFON. Sometimes called "level pine plains," "pine plains," "rolling pine timber," "open pine timber." On valley floor or hillslopes. Applegate and Rogue valleys.
- OPO..... *White oak - ponderosa pine woodland. Understory "scant" or dense, may contain hazel, ceanothus ("chaparral"), oak, pine, willow, alder, cottonwood, rose, hawthorn, manzanita. Eastern Columbia River Gorge and east slope of Mount Hood.*
- OPOF ..... *Unmappable mix of open white oak - ponderosa pine - Douglas fir woodland on ridges and south slopes and denser white oak - ponderosa pine - Douglas fir forest on north slopes. Understory grassy ("good grazing," "good pasturage"), or with a dense shrub layer that may include oak, fir, pine, hazel, willow, "bur willow," "laurel," cherry, "arrowwood," thimbleberry, dogwood, vine maple, huckleberry, manzanita, gooseberry, ceanothus ("buckbrush," "chapparal," "snowbrush"). May contain hemlock, cedar, or larch ("tamarack") near western edge above 2500 ft, or in canyons. Eastern Columbia Gorge and east slope Cascades.*
- OPOFH..... White fir - Douglas fir - ponderosa pine - white oak or black oak woodland, often with incense cedar, in "high rolling land" in a cool to cold climatic zone. Oak probably more common in more open stands and on drier sites or on more clayey soils. Undergrowth not documented at most locations, with only few references to willow, hazel, or chaparral. Southern Cascades.
- OPOJ ..... Ponderosa pine - white oak or black oak woodland, sometimes with incense cedar or western juniper. Stocking "light," "scattering," or sometimes "good timber." Undergrowth mostly "grassy," "good grass," or "abundant," "rich," or "luxuriant" bunchgrass. Woody undergrowth absent or scant but may include patches with "much chaparral." Probably included small unidentified open scabland savanna or prairie with minor juniper and oak. Eastern and Southern Cascades. Occurrences to north could be dwarf juniper instead of western juniper.
- OPOM ..... Ponderosa pine - white oak woodland ("open pine timber") on mounded plains, with lesser amounts of black oak. Understory sometimes "thick," with *Ceanothus cuneatus*

("greasewood") and sometimes manzanita. Madrone absent or minor. On valley plains or tableland with "openings" interspersed throughout, often with vernal pools in treeless intermounds. Rogue Valley.

- OPPO.....Ponderosa pine - black oak - white oak woodland on bottomland or southerly slopes. Density may range to savanna. Douglas fir occasional. With unmappable inclusions of prairie (PA, PF), "creek brush," or "thick brushy bottoms" (HUR). Understory mostly unspecified but may include manzanita, hazel, poison oak, live oak, and *Ceanothus velutinus* ("greasewood," "balm," "spice"). Applegate Valley.
- OPZ.....Ponderosa pine woodland ("timber" or "pine openings") with hazel understory. NO OTHER CONIFERS OR OAKS.
- OSH.....Sitka spruce woodland with various combinations of Douglas fir, western hemlock, red cedar, grand fir, red alder, bigleaf maple. "Dense" or "brushy" understory may contain vine maple, salmonberry, thimbleberry, huckleberry, salal, garrya ("tassel"), twinberry, hazel, "lilac," "crowberry," coyote bush. Rarely with shore pine, hazel. Primarily loam soils, with wetland pockets on bottomlands.
- OSMPF.....Moist Jeffrey pine or ponderosa pine - sugar pine - Douglas fir - incense cedar woodland on ultramafic soils. An unmappable mix of woodland and forest on ultramafic soils. "Ponderosa pine" of GLO presumably includes Jeffrey pine. Douglas fir may dominate pines in older stands. Understory poorly documented but includes manzanita, chinquapin, honeysuckle, myrtle, with occasional oak, live oak and sticky laurel. Illinois Valley and foothills.
- OSOP.....Mixed oak (white oak, black oak) - mixed pine (Jeffrey pine, ponderosa pine) woodland, usually on ultramafic soils. "Ponderosa pine" of GLO presumably includes Jeffrey pine. Density may range to savanna on low interior valley hills and plains. May include incense cedar. Understory buckbrush ("greasewood"), oak, lilac, hazel, manzanita, or unspecified. NO FIR. Applegate and Illinois valleys and foothills.
- OSP .....Shore pine woodland on sandy soils or rocky headlands. May include scattering Douglas fir, Sitka spruce, western hemlock, or madrone, with Port Orford cedar ("white cedar") along south coast. Understory may include salal, manzanita, hazel, ceanothus ("lilac"), evergreen huckleberry, and rhododendron. Alder, willow, and salmonberry may occur near water. If "openings," "good grassland," or "good grazing," use SSP. Intermixed with PD on partly stabilized dunes.
- OSPFJ.....Ponderosa pine - sugar pine - black oak - white oak woodland similar to OMPFC but usually without fir. May include incense cedar and occasionally western juniper. Woody undergrowth absent to sparse, or patchy chaparral. Grass "thin," "plenty," or "good." Southern Cascades. NO FIR.
- OSPOF....."Open" Jeffrey pine or ponderosa pine - oak woodland with Douglas fir in places, on gravelly outwash fans OR terraces with ultramafic influence. "Ponderosa pine" of GLO presumably includes Jeffrey pine. Species composition poorly documented. Undergrowth manzanita, oak, lilac, buckbrush ("greasewood"), or unspecified. Applegate and Illinois valleys.
- OSW .....White oak "swale," with no additional information. Probably a seasonally moist/dry shallow drain or bottom with brush and/or grass understory. Rogue Valley.
- OSYP.....Scattered mixed pine (Jeffrey pine, ponderosa pine) woodland on droughty ultramafic soils. "Ponderosa pine" of GLO presumably includes Jeffrey pine which may be dominant. Some Douglas fir may also be present. Stand composition poorly documented and density may

range to savanna in places. Understory unspecified, often "very little." NO OAK. Applegate and Illinois valleys and foothills.

- OWB..... White oak woodland, often with black oak. Understory unspecified or "thick" or with "patches" of *Ceanothus cuneatus* ("greasewood") or manzanita, often with grass or "good grazing." Ponderosa pine, "bugwood" (*Cercocarpus betuloides*) or madrone ("laurel") occasional but are not diagnostic. May have 10-40% unmappable inclusions of SWO and PU. On droughty hill and ridge slopes. Applegate and Rogue valleys. Intergrades with SWO.
- OWCP ..... Complex of 40-60% woodland (OMOPK, OPFOK, OPOJ), 20-40% shrubland (HCHO, HMO, HSC, HSO), 10-20% and prairie (PUD), and 0-10% savanna. Southern Cascades.
- OWFC..... High-elevation white fir - Douglas fir - ponderosa pine - incense cedar woodland, often dense. White fir may be sole dominant on colder high-elevation north slopes. Incense cedar and sugar pine occasional. Undergrowth "dense" or "heavy" balm (*Ceanothus velutinus*). NO OAK. Southern Cascades.
- OWM..... White oak woodland on slopes with "bugwood" (*Cercocarpus betuloides*). On dry north-facing hillslopes between prairie and forest. Ponderosa pine or black oak uncommon and not diagnostic. Rogue Valley.

**P. Prairie.** Distances to witness trees mostly 200-800 (1750) links [132-528 (1155) ft], no witness trees at all, or no mention of any vegetation. Stands described as various types of "prairie" or "plains;" understory mostly herbaceous or graminoid. Alternate descriptions also shared with some types of savanna and woodland include "fern prairie," "open slopes," "bald hills," "open land," "little grass," "good grass," "good grazing," and "good cattle range."

- P ..... Prairie, wet and dry undifferentiated. Includes "swale" and "glade" if adjacent line segments are prairie. May contain "thickets" or "scattering" trees if most distances > 100 links. If "tidal prairie" or "grassy tidal flat" use WSM.
- PA..... Dry prairie on valley floor, non-flooding stream terraces, or in upland swales. Trees absent or with "scattering" or "a few scattering" white oak, sometimes black oak or ponderosa pine. May have unmappable inclusions of PBS containing patches of *Ceanothus cuneatus* ("greasewood"). May have 10-20% unmappable inclusions of HUR, FAT, PBS, and PF. On both clayey and loamy soils. Applegate, Illinois, and Rogue valleys, southern Cascades.
- PAD..... Dry prairie on valley floor, plains, and non-flooding or non-riparian bottomlands. May include "scattering" juniper, pine, and oak. Described as "fine prairie," "rich grass" or "beautiful prairie." Southern Cascades.
- PABS..... Mixture of valley floor prairie and mounded prairie (PA, PBS). Rogue Valley.
- PASH..... Mixture of valley floor prairie and a "few scattering bunches" of ash, with seasonal moisture or occasional flooding (PA, PF). On bottomlands with meandering creek channels and "swaley" areas. May include scattered white oak, ponderosa pine and hawthorn. It cannot be determined from GLO notes if tree density in ash clumps fits forest or woodland spacing.
- PB..... "Brushy prairie," "brush and fern prairie," "fern prairie," "fern and willow prairie," or composition unknown. May contain salal, hazel, chinquapin, whortleberry, thimbleberry, grass, "good grazing," and scattering trees, "fir stubs," or logs from previous burn. If "fern openings," "fern land," or "open fern hills" with few or no trees, use EF.
- PBS..... Mounded prairie on valley floor or tablelands, with intermound vernal pools and rock netting.

- Mounds may have thick "patches" of *Ceanothus cuneatus* ("greasewood"). May also contain "a few scattering oak," sometimes with ceanothus undergrowth. Rogue Valley.
- PBSK..... Mounded prairie on valley floor or tablelands, with intermound rock netting. No mention of hydrology or vernal pools. May include scattered juniper, black oak, white oak, and ponderosa pine, or patches of same. Southern Cascades.
- PBW ..... Wet "brushy" or "bushy" prairie. May have hardhack, rose.
- PD..... Sand dune prairie or grassland, "sandy prairie," "sandy plains," "sand hills covered with grass," "sand glades." Sometimes with unmappable inclusions of FSP, OSP or SSP islands or "glades."
- PDM ..... *Dry meadow, composition not described. Occurring on "flats," "level land," or "bottoms," but no other information given. Probably alkaline with creeping wild rye (Leymus triticoides). Northern Basin and Range.*
- PF ..... Wet or seasonally wet "creek prairie," "prairie bottom," "marshy swale," "springy swale," or "swaley" prairie in floodplains and riparian zones. With seasonal moisture or occasional flooding. Low-elevation. Applegate, Illinois, and Rogue valleys.
- PFAT ..... Mixture of "creek prairie" (PF), "creek timber" (FAT), and "creek brush" (HUR). Illinois Valley, Rogue Valley.
- PFD ..... Creek or valley bottom prairie, sometimes with "good grass." Willows, briars, or other woody species along creek. May include "scattering timber" of ponderosa pine and some seasonally dry prairie undifferentiated from the wet bottoms. Southern Cascades.
- PM..... Mounded prairie.
- PS ..... *"Rocky," "stony," or "gravelly" prairie with bunchgrass, low sagebrush, sometimes with a few scattered ponderosa pine or juniper. Presumably with more grass cover than HSG.*
- PSP ..... *Prairie with scattered ponderosa pine, sagebrush ("sage"), bitterbrush ("greasewood"), and bunchgrass.*
- PU..... Dry upland prairie on steep or gentle slopes, or tops of ridges. May have scattering trees, most with distances from corners > 100 links, and inclusions of woodland or savanna. Understory unspecified or with references to abundant grass ("good grazing," "hills covered with grass," "good grass," "bald hills," etc.). Intergrades with PA in Rogue Valley.
- PUD..... Upland prairie on moderate to steep slopes at mid elevations, with sparse mixed oak, ponderosa pine and/or juniper, or patches/groves of same. Woody undergrowth usually absent or with some chaparral or buckbrush, but may also include a few "dense thickets." Southern Cascades.
- PUS ..... Upland prairie on ultramafic soils, with scattered Jeffrey pine or ponderosa pine. Sometimes with white oak or "patches of greasewood." On gentle valley terraces and moderate to steep slopes. "Ponderosa pine" of GLO presumably includes Jeffrey pine. May have unmappable inclusions of SSRR, pine - oak or pine - fir woodland, HUR, and PF. Soils may be stony or shallow. Applegate and Illinois valleys.
- PW..... Seasonally or perennially wet prairie, "prairie marsh," "swamp prairie," "marshy prairie." May have scattering ash, oak, willow or hardhack, most with distances from corners > 100 links. If "tidal prairie" use WSM. If "grass marsh" or "grass swamp" use WG. Both sides of Cascades.

**S. Savanna.** Distances to witness trees mostly (100) 200-400 links [(66) 132-265 ft]; stands described as "openings" or "scant". Understory "open," mostly herbaceous or graminoid but may contain some shrubs. With "good grazing," "good pasturage," "splendid grass," "good for stock," "grass in abundance," or not described.

SA..... Ash savanna.

SB..... Black oak savanna, often with ponderosa pine and madrone ("laurel"). Southern Lane County and southward.

SBF..... Black oak - Douglas fir savanna. Umpqua Valley and southward.

SF ..... Douglas fir savanna, "fir openings," "fir and fern openings." Understory may contain fern. NO OAK.

SFC..... Low to mid-elevation dry Douglas fir savanna with combinations of incense cedar, madrone ("laurel"), ponderosa pine, sugar pine, and bigleaf maple. Understory with grass. Madrone frequently used for witness trees. Umpqua Valley and southward. NO HEMLOCK, NO WHITE OR BLACK OAK.

SFDA..... Low-elevation Douglas fir - lodgepole pine - ash - white oak savanna. Wetter areas may include quaking aspen and cottonwood. Understory may include hazel, willow, vine maple, salal, ninebark, crabapple, hawthorn, spiraea, and briars. Oak, pine, and fir used as witness trees. Puget Trough.

SFHC..... Northern mesic mixed conifer (or "fir, etc.") savanna with little understory and "good grazing." May include various combinations of Douglas fir, western hemlock, red cedar, grand fir, with lesser amounts of bigleaf maple, dogwood, white oak, red alder, madrone ("laurel"). From southern Lane County and southward, this type intergrades with FFHE, FED, FFHO. NO ASH, BLACK OAK, SILVER OR NOBLE FIR ("larch"), OR PINE.

SFHO..... Southern mixed dry conifer savanna with various combinations of Douglas fir, western hemlock, Port Orford cedar ("white cedar"), grand fir, oak, live oak, madrone, chinquapin, myrtle. Sparse understory may include Sargent oak, live oak, madrone, rhododendron, yew, salal, evergreen huckleberry, ceanothus ("greasewood," "bluewood"), manzanita, elder, gooseberry, briars. With "bunchgrass" or "good grazing." Southern Coast Range. NO SPRUCE.

SFOM ..... Lower-elevation (mostly < 2000 ft) dry Douglas fir - white oak - black oak - madrone ("laurel") savanna, often with ponderosa pine or sugar pine. Oak and madrone consistently used for witness trees. May also include bigleaf maple, incense cedar ("redwood"), and red cedar. Southern Lane County and southward.

SFP ..... Douglas fir - ponderosa pine savanna.

SJ..... *Western juniper savanna. Where distances to witness trees are not available, distinguished from OJ ("scattering juniper") as "a few scattering juniper" or "here and there a juniper." Columbia Basin, Blue Mountains, Northern Basin and Range.*

SO..... White oak savanna. If thick understory is present, use OOZ.

SOA..... White oak - ash savanna.

SOB..... White oak - black oak savanna, usually with madrone ("laurel"), often with ponderosa pine. May contain unmappable inclusions of "brush," "oak brush," "oak grubs," or "thick undergrowth" (= woodland) in ravines and along streams. Southern Lane County and southward. NO DOUGLAS FIR.

- SOF ..... White oak - Douglas fir savanna. Understory mostly herbaceous. Madrone may be present from southern Lane County and southward.
- SOFp ..... White oak - Douglas fir - ponderosa pine savanna.
- SOP ..... White oak - ponderosa pine savanna.
- SP ..... Pine savanna. Usually ponderosa pine, or pine species unspecified. May include Jeffrey pine on ultramafic soils.
- SPF ..... Fir and ponderosa pine savanna. With few trees and mostly "open timber, good grazing." Undergrowth usually not listed or includes only serviceberry, tasselwood (*Holodiscus discolor*), or rose. Southern Cascades.
- SPMO ..... Ponderosa pine - mixed oak (black oak, white oak) savanna, usually with madrone ("laurel"). Douglas fir and incense cedar present in lesser amounts. Understory unspecified, "little," "very little," "some," or "very sparse." May contain ceanothus ("greasewood," "lilac"), manzanita, "good grass," or "good grazing." Sometimes rocky. Includes ultramafic soils. May have 10-40% unmappable inclusions of FFDF, FFON, OOP, PU, SWO, or riparian types. Sometimes called "level pine plains," "pine plains," "rolling pine timber," "open pine timber." On valley floor or hillslopes, Applegate and Rogue valleys, Umpqua Divide.
- SPO ..... *Ponderosa pine - white oak savanna in eastern Columbia River Gorge and east slope of Mount Hood.*
- SPOC ..... Mid elevation savanna of ponderosa pine, fir (probably Douglas fir), white or black oak, and incense cedar ("redwood"). Undergrowth poorly described but including "greasewood" (probably *Ceanothus*), mountain mahogany, serviceberry, lilac, oak, and sage. Southern Cascades.
- SSH ..... "Lightly timbered" Sitka spruce savanna with "no undergrowth." May contain various combinations of Douglas fir, western hemlock, red cedar, grand fir, red alder, bigleaf maple.
- SSP ..... Shore pine savanna on sandy soils or rocky headlands. May include Douglas fir, Sitka spruce, western hemlock, madrone, with Port Orford cedar ("white cedar") and chinquapin present in Coos and Curry counties. Understory may include salal, evergreen huckleberry, rhododendron, chinquapin, madrone, manzanita. Rarely with hazel. Red alder, willow, and salmonberry may occur near water. May include "openings," "good grazing," "good grassland," or "bunchgrass." Intermixed with PD on partly stabilized dunes.
- SSPBu ..... Burned SSP, often with scattered trees surviving fire.
- SSRR ..... Scattered stunted ponderosa pine and Jeffrey pine on gravelly, cobblestone outwash plains on droughty ultramafic soils. Species composition poorly documented. Understory unspecified except for buckbrush ("greasewood"). Includes unmappable inclusions of woodland. Illinois Valley, near mouth of Rough and Ready Creek.
- SWO ..... White oak savanna, sometimes with ponderosa pine or black oak. Understory usually unspecified. Often occurring as unmappable inclusions in woodland or prairie, or with inclusions of OWB. Valley floor and foothills, Rogue Valley. Differs from SO in occasional presence of ponderosa pine and black oak. Differs from SOB by only occasional presence of black oak, and absence of madrone.

## U. Unvegetated

- UB ..... "Bald," composition unknown. Trees lacking, but shrub and herb layers not described.
- UG ..... Gravel bars and riverwash. May have scattered willow or "brush" in unmappable patches.

- UP ..... *"Dry lakebed, "alkali flat," "alkali lakebed" (playa), if no vegetation is recorded. May contain unmappable inclusions of salt grass. If plat map identifies dry lake bed feature as "sage flat" use HAC. Northern Basin and Range.*
- UR ..... Rock outcrops, talus, exposed bedrock, scree slopes, "barren slopes," "barren" lava flows, lava beds, cinder cones, boulder fields, "boulder slides," "slide rock," "rocky glades," rocky scablands, rocky coastal headlands, unvegetated or sparsely-vegetated landslides, "fault line," "fault crack," and "dyke." May have scattered "scrubby" or stunted trees.
- US ..... Sand bar, sand beach, "sandy barrens," sand dunes, sand "reef," tidal mudflats (estuarine or riverine), "quicksand." May have inclusions of willow, "brush," or "tide flats." Witness trees > 400 links distant.

## **W. Water and wetlands (except for wet prairie [P] and shrub swamps [H])**

- W ..... Water bodies >1 chain across. Includes ocean, rivers, sloughs, ponds, beaver ponds, lakes, "marshy lakes" and "bayous."
- WD ..... Montane fen ("swamp") with scattering to dense lodgepole pine ("bull pine"), sometimes quaking aspen. May include huckleberry, "good grass," larch, fir, or Engelmann spruce.
- WDBu ..... Burned WD.
- WE ..... *Seasonally dry lakebed "liable to overflow" with annual or ephemeral vegetation rarely specified. Sometimes includes "foxtail grass," (probably *Hordeum jubatum*). If saltgrass present use WSG. Northern Basin and Range.*
- WG ..... "Grass marsh," "grassy swamp," "marshy prairie," "grassy swale," "marshy pond." May contain willows and tules. If "marshy prairie" use PW.
- WK ..... Skunk cabbage marsh.
- WMU ..... Marsh, "wet meadow," "swampy meadow," "meadow land," "meadow," "marshy bottomland," "marshy swale," "wet ground," "marshy ground," "springy ground," composition unknown. May intergrade with WSU. If "tidal marsh" use WSM. If "prairie marsh" use PW. If "grass marsh" use WG.
- WP ..... Pond lily aquatic bed, sometimes with skunk cabbage and rush.
- WPC ..... Low-elevation cranberry "marsh" or "swamp." May include shore pine, red alder, bracken fern, salal, and sphagnum. Coast.
- WPCM ..... Montane cranberry "marsh" or "swamp." May include lodgepole pine and huckleberry, otherwise composition not described. Cascades.
- WS ..... Seasonally-flooded shallow lake, pond or slough > 1 chain across. Includes "shoal lakes," "shoal ponds," vernal pools.
- WSG ..... *Intermittently or seasonally flooded sodic salt grass flats. Other perennial vegetation may include wiregrass (*Juncus balticus*), tule, "foxtail grass" (probably *Hordeum jubatum*). Usually "swampy," "wet," "overflowed in spring and early summer," "unfit for cultivation." Also includes "formerly overflowed" land when surveyor extends older lines onto formerly flooded lakebeds. If shrubs present, used HGW. Northern Basin and Range.*
- WSM ..... Tidal marsh, salinity undifferentiated. Includes "tide lands," "tidal prairie," "grass tide marsh," "grassy tide flat," "tide bottom prairie," "coarse grass tide prairie," "subject to overflow at high tide," and "freshet" if along coast. Few or no trees. Sitka spruce or crabapple may be included on elevations or at landward edge of marsh. Use only if "tide" specifically mentioned. Use FSL if witness trees are < 100 links distant.

- WSP..... Unmappable mixture of shore pine swamp and undifferentiated "marsh." May contain dwarf shore pine, Sitka spruce, crabapple, salal. Ground "mucky," some flooded. Similar to WPC but lacking cranberry and sphagnum.
- WSU ..... "Swamp, "open swamp," or "dry swamp," composition unknown. Includes "beaver swamp" or "beaver dam swamp" if no species recorded. Very wet and miry. May intergrade with WMU. If "swamp prairie" or "good grazing" use PW. If grass is recorded, use WG. If species are given, use FALW or HD.
- WT ..... *Seasonally or perennially-flooded tule marsh or swamp. May include unmappable inclusions of "swamp grass," "coarse grass," wiregrass (Juncus balticus), and saltgrass. Sometimes with inclusions of drier "hay meadow" (WTG). Eastern Cascades, northern Basin and Range.*
- WTG ..... *Seasonally-flooded "low bottom" or "hay meadow." May contain bluejoint, "wild hay grass," wire grass (Juncus balticus), "meadow grass," and rye grass "subject to overflow in spring months." Sometimes called "lake" or "marsh," with unmappable inclusions of wetter tule and "swamp grass" (WT) in deeper water. Mowed by ranchers for hay. East Cascades, Northern Basin and Range.*
- WU ..... Wetland, composition unknown. Includes "swale," "swale land," or "open swale" in forest or shrubland. If "swale" is in prairie, use PW.
- WW ..... Wapato marsh, sometimes with "rushes" or pond lily.

## Lookup table for vegetation units lacking species names

"Bald hills" = P.

"Bar" = UG.

"Bayou," composition unknown = W.

"Briar brush" or "briar thicket" = HR.

"Brush," composition unknown = HU.

"Brushy swamp," "brushy marsh," "brushy swale," composition unknown = HSS.

"Dead" forest = use "Bu" suffix.

"Fallen timber" = If not adjacent to burned or storm-damaged forest, do not map. If adjacent to burned forest, map as burn. If adjacent to storm-damaged forest, map as storm damage.

"Glade," composition unknown. In prairie = P, in forest or shrubland = NG unless "good grass" or "good grazing" is present, in which case = P.

"Grass" = P.

"Grassy glade" = P.

"Grassy swamp" = WG.

"Marsh," "marshy ground," "marshy swale," composition unknown = WMU.

"Marshy thicket," composition unknown = HSS.

"Meadow," composition unknown = P.

"Opening," "open ground," "open space" in forest, composition unknown = NG. Isolated open area in forest, not to be confused with savanna "openings."

"Plains" = P.

"Shoal lake" = WS.

"Slough," composition unknown = W.

"Springy ground" = WMU.

"Swale," composition unknown: in prairie = P, in forest or shrubland = WU.

"Swamp" or "bog swamp," composition unknown = WSU.

"Swampy" or "marshy" lake or pond = W.

"Swampy thicket," composition unknown = HSS.

"Thicket," composition unknown = HU.

"Wet meadow" or "wet ground," composition unknown = WMU.

"Young" forest = use "Y" suffix.

## Discontinued codes and their equivalents (old code => new code)

BU => HU	UW => W
F => EF	UWM => WMU
FA (Rogue Valley) => FAS	UWS => WS
FAL => FALW	V => PV
FASP => PASH	WSS => HSS
FAW (Rogue Valley) => FAS	
FBBu => HBBu	
FCL => FFCL	
FFD => FF	
FFDE => FFDF	
FFHCA => FFHA	
FFHCB => FFHCBu	
FFHCP => FFHP	
FFHMC => FFHC	
FFOAZ => FFO	
FFOB => OFOBZ	
FFOBZ => OFOBZ	
FFOPZ => OFOPZ	
FFOZ => OFOZ	
FFZ => OFZ	
FFZBu => OFZBu	
FOBF => FFOM	
FOZ => OOZ	
FPP => FPD	
FW => HW	
FWLM => FALW	
G => UG	
NSU => WSU	
NU => HU	
NWU => WU	
OBW => OWB	
OFHCP => FFHPP	
OFHCPBu => FFHPPBu	
OFHZ => OFHC	
OFOAPZ => OFOPZ	
OFOAZ => OFOZ	
OFOAZBu => OFOZBu	
OFOB => OOB	
OFOBZ => OFOM	
OPFZ => FFP	
OPFZBu => FFPBu	
OObF => OFOM	
OPF => FPF	
OPFJ => OPJ	
OPFP => FPF	
OPFS => FPF	
OPG => OP	
OPMOM => OPOM	
OPS => OP	
OPV => OPMO	
PFH => PFAT	
PFOAZ => OFOAZ	
PFOZ => OFOZ	
PM (Rogue Valley) => PBS	
PO => OWB & PF	
PV => WS	
R => UR	
S => US	
SFH ==> SSH	
SO (Rogue Valley) => SWO	
SOBF => SFOM	
SOBFP => SFOM	
SOBP => SOB	
SSOP => SPMO	
T => WT	