

PACIFIC SILVER FIR SERIES

Abies amabilis

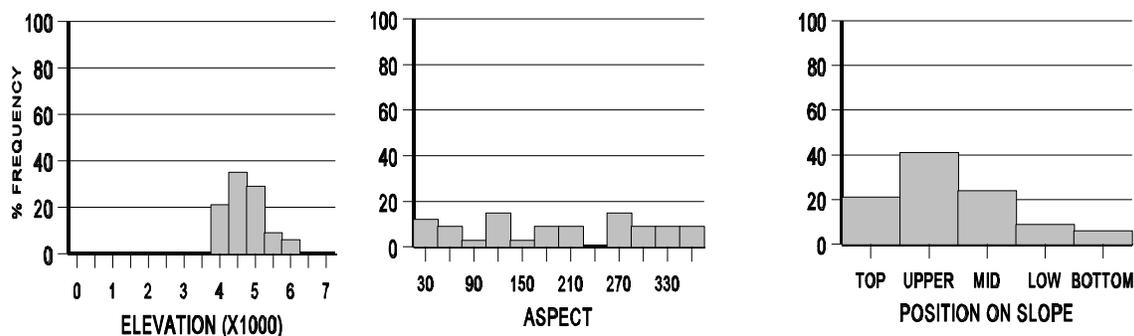
ABAM

Lisa A. McCrimmon

Pacific silver fir grows along the Pacific coast from southeastern Alaska to the northern Oregon Coast Range. It is also found in the upper elevations of the Washington and Oregon Cascades. In the Cascades, Pacific silver fir reaches its southern limits near the Prospect and Butte Falls Ranger Districts of the Rogue River National Forest and the Sky Lakes Wilderness. Isolated stands, relics from the Ice-age, are found in cirques in the Klamath Geological Province of southern Oregon and northern California. Pacific silver fir is likely limited by the Mediterranean environment of southwestern Oregon, its droughty summers, and frequent fires.

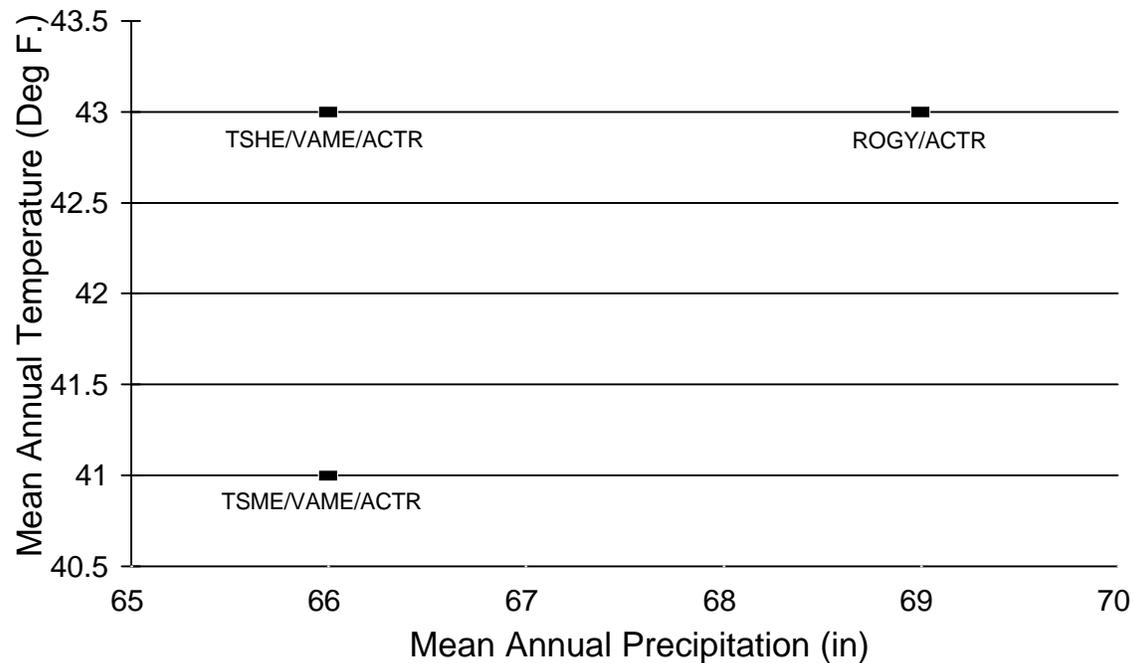
The Pacific Silver Fir Series extends through the higher elevations of the Umpqua National Forest, ending in the northeastern corner of the Prospect Ranger District of the Rogue River National Forest. Its topographical and vegetational characteristics overlap with other Series. At lower elevations, the Pacific Silver Fir Series is replaced by the Western Hemlock and White Fir Series, and at higher elevations by the Shasta Red Fir and Mountain Hemlock Series.

Elevation for the Pacific Silver Fir Series ranges from approximately 4000 feet to 6150 feet in the southern Oregon Cascades. All aspects are represented and slopes range from flat to very steep. Topographical position ranges from ridge tops to the valley bottoms, but the Series is most frequently found between ridge tops and the middle one-third of the slope.



The Pacific Silver Fir Series generally occurs in areas that are cool and wet. Average annual temperature ranges from 39 degrees F to 45 degrees F with an average of 42 degrees F. Average annual precipitation varies between 60 inches and 80 inches with an average of 68 inches. The relative environments of the plant associations are shown on page ABAM 2. Each association is plotted by average annual temperature and average annual precipitation.

Parent material is highly variable. Although andesite and basalt are the most common, diorite, pumice, ash, and tephra are occasionally found. Soils range from moderately deep to deep.



Surface gravel cover ranges from 0 to 50 percent, with an average of 7 percent. Surface rock cover ranges from 0 to 25 percent, with an average of 5 percent. Exposed bedrock cover ranges from 0 to 15 percent, with an average of 2 percent. Bare ground ranges from 0 to 7 percent, with an average of 1 percent. Litter cover ranges from 85 to 99 percent, with an average of 98 percent. Moss cover ranges from 1 to 20 percent, with an average of 5 percent.

Due to frequent disturbance regimes in southwest Oregon, Douglas-fir, an early seral species, is the dominant tree in the overstory of the Pacific Silver Fir Series. Pacific silver fir regeneration is abundant in the understory. On warmer sites, western hemlock is present, and on cooler sites, mountain hemlock is present. Dwarf bramble and thin-leaved huckleberry occur frequently throughout the Series, with baldhip rose, dwarf Oregon grape, and Pacific blackberry common.

Total species richness (number of species of vascular plants) was calculated for each association. The average total species richness for the Pacific Silver Fir Series ranges between 25 and 36 species. Richness is rated as very low, 25 to 26 species; low, 27 to 29 species; intermediate, 30 to 31 species; high, 32 to 34 species; and very high, 35 to 36 species.

Estimates of total cover by vegetation layer were made for wildlife interpretations. Upper layer tree cover ranges from 62 percent in Pacific Silver Fir-Mountain Hemlock/Thin-leaved Huckleberry/Vanillaleaf to 74 percent in Pacific Silver Fir-Western Hemlock/Thin-leaved Huckleberry/Vanillaleaf and averages 70 percent for the Series. Mid-layer tree cover ranges from 32 to 38 percent and averages 35 percent. Lower layer tree cover ranges from 30 to 41 percent and averages 32 percent. High shrub cover ranges from 1 to 10 percent and averages 5 percent. Low shrub cover ranges from 14 to 19 percent and averages 16 percent. Herb/grass cover ranges from 25 to 37 percent and averages 29 percent.

Three final plant associations have been identified for the Series in southwestern

Oregon. They were described from 34 Forest Service plots. The following shows the relationship between draft and final plant associations. The draft associations are listed, with final associations below, each in order of most to least common, with the percentage of plots that make up each association (refer to Methods section).

ABAM-ACCI/TITR (N=14)

ABAM/ROGY/ACTR (86%)

ABAM-TSHE/VAME/ACTR (7%)

ABCO/BENE2/ACTR (7%)

ABAM-TSHE/CLUN (N=6)

ABAM-TSHE/VAME/ACTR (67%)

ABAM-TSME/VAME/ACTR (17%)

TSHE-ABAM (17%)

ABAM/VAME-RULA (N=15)

ABAM-TSME/VAME/ACTR (60%)

ABAM/ROGY/ACTR (33%)

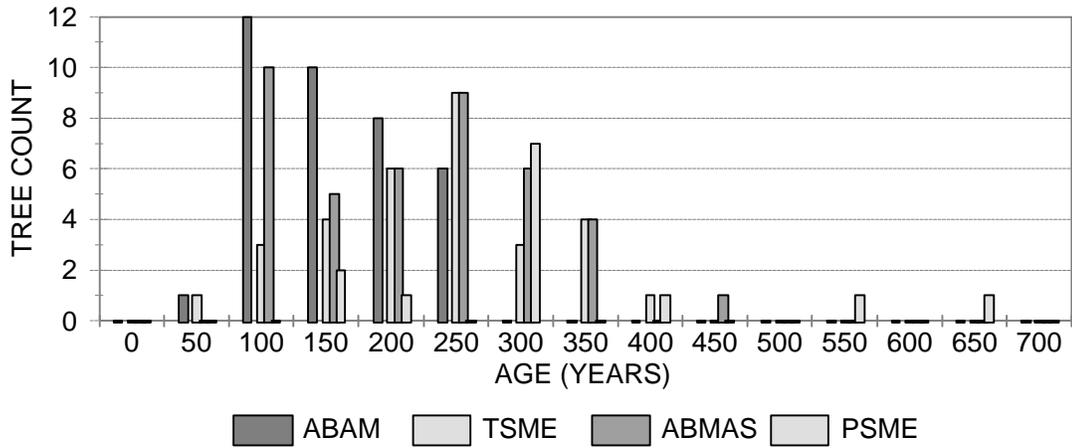
TSME-ABMAS/VAME/CHUM (7%)

KEY TO THE PACIFIC SILVER FIR PLANT ASSOCIATIONS

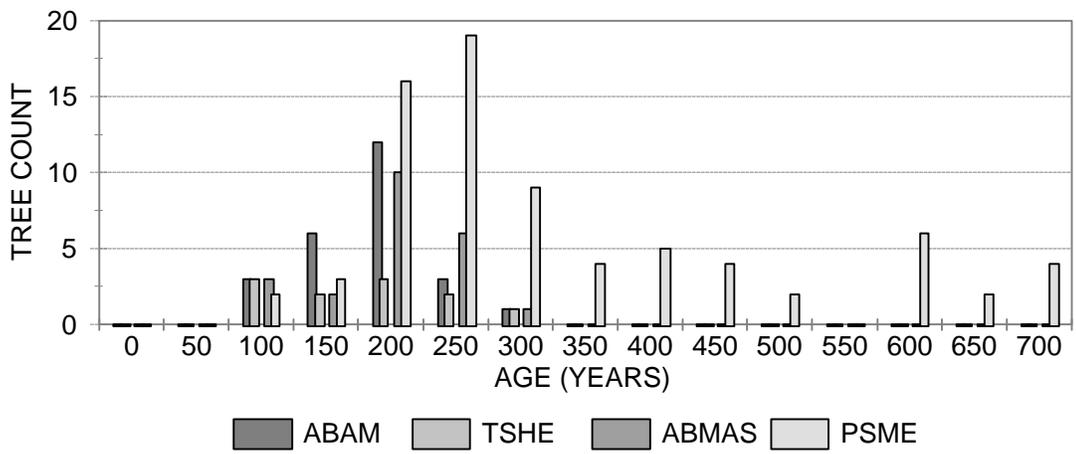
- 1a. Mountain hemlock (TSME) present. 2
- 1b. Mountain hemlock (TSME) absent. 3
- 2a. Mountain hemlock (TSME) present in understory with usually 15 percent or greater cover. Golden chinquapin (CACH6) and Douglas maple (ACGL) absent. Three or less of the following present: baldhip rose (ROGY), vanillaleaf (ACTR), western twinflower (LIBOL), starry false Solomon's-seal (SMST), or rattlesnake-plantain (GOOB2). ABAM-TSME/VAME/ACTR
Page ABAM 6
- 2b. Mountain hemlock (TSME) present in understory with usually 10 percent or less cover. Golden chinquapin (CACH6) and/or Douglas maple (ACGL) present. Four or more of the following present: baldhip rose (ROGY), vanillaleaf (ACTR), western twinflower (LIBOL), starry false Solomon's-seal (SMST), or rattlesnake-plantain (GOOB2). ABAM/ROGY/ACTR
Page ABAM 8
- 3a. Western hemlock (TSHE) present with greater than 20 percent cover (overstory and understory combined). 4
- 3b. Western hemlock (TSHE) present with less than 15 percent cover (overstory and understory combined). ABAM/ROGY/ACTR
Page ABAM 8
- 4a. Thin-leaved huckleberry (VAME), vanillaleaf (ACTR), coolwort foamflower (TITRU), western twinflower (LIBOL), and rattlesnake-plantain (GOOB2) present. ABAM-TSHE/VAME/ACTR
Page ABAM 10
- 4b. At least one or more of the following species absent: thin-leaved huckleberry (VAME), vanillaleaf (ACTR), coolwort foamflower (TITRU), western twinflower (LIBOL), or rattlesnake-plantain (GOOB2). ABAM/ROGY/ACTR
Page ABAM 8

Ecology plot data that seemed vaguely interesting and filled this page.

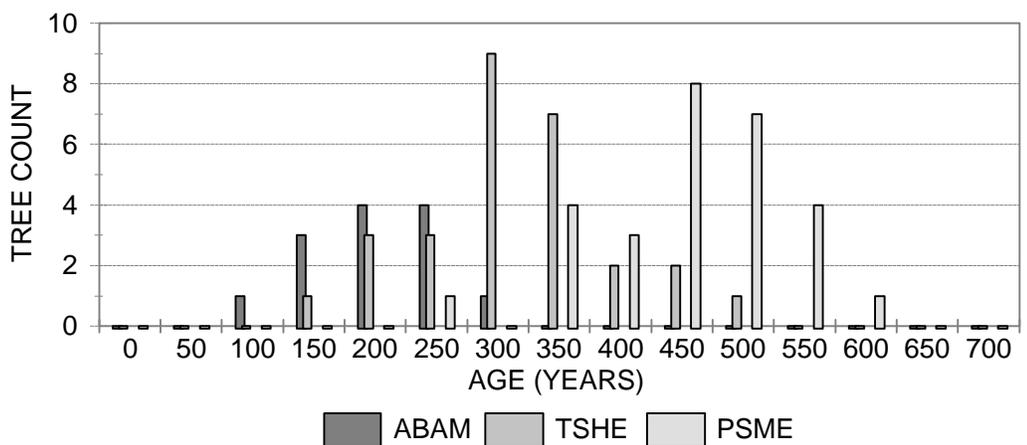
ABAM-TSME/VAME/ACTR



ABAM/ROGY/ACTR



ABAM-TSHE/VAME/ACTR



ABAM 6

PACIFIC SILVER FIR-MOUNTAIN HEMLOCK/THIN-LEAVED
HUCKLEBERRY/VANILLALEAF

Abies amabilis-*Tsuga mertensiana*/*Vaccinium membranaceum*/*Achlys triphylla*

ABAM-TSME/VAME/ACTR (N=10; FS=10)

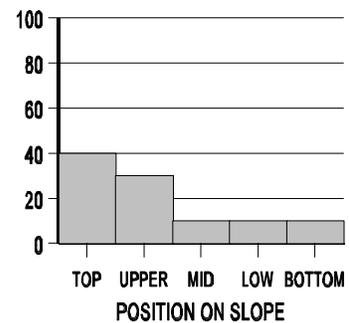
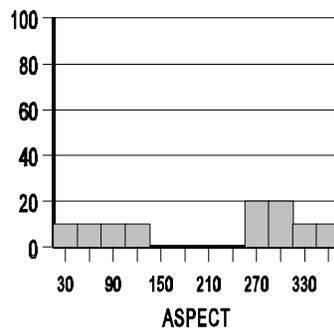
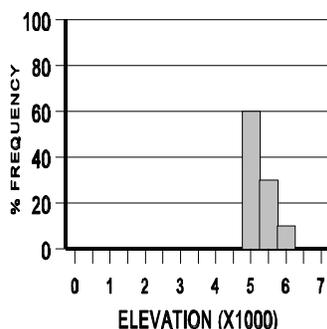


Distribution. Pacific Silver Fir-Mountain Hemlock/Thin-leaved Huckleberry/Vanillaleaf occurs on the Diamond Lake and North Umpqua Ranger Districts, Umpqua National Forest, and the Prospect Ranger District, Rogue River National Forest.

Distinguishing Characteristics. Pacific Silver Fir-Mountain Hemlock/Thin-leaved Huckleberry/Vanillaleaf is present at the highest elevations and the coldest temperatures of the Series. Mountain hemlock and thin-leaved huckleberry are frequently present, both indicators of the cold environment.

Soils. Parent material is most commonly basalt and andesite, pumice or tephra. Soils are moderately deep to deep, with an average depth of greater than 40 inches. Average surface rock cover is 4 percent, with 6 percent gravel.

Environment. Elevation averages 5390 feet. Pacific Silver Fir-Mountain Hemlock/



Thin-leaved Huckleberry/Vanillaleaf occurs predominantly on west, north, and east aspects and rarely on south aspects. Slope averages 25 percent and ranges from 6 to 48 percent. Ridge top and upper one-third slope positions predominate.

Vegetation Composition and Structure. Total species richness is very low for the Series, averaging 25 species. Shasta red fir generally dominates the overstory, with Pacific silver fir frequent, mountain hemlock and western white pine common, and Douglas-fir occasional. Pacific silver fir dominates the understory, with mountain hemlock occurring frequently with low to moderate covers. Shasta red fir occurs frequently in the understory, with western white pine common, and white fir occasional. Shrub richness is very low for the Series. Thin-leaved huckleberry and dwarf bramble are found frequently, with baldhip rose and Oregon boxwood occasional. In the herb/grass layer, vanillaleaf and queen's cup occur frequently. One-sided pyrola, white inside-out-flower, northwest listera, starry false Solomon's-seal, common prince's-pine, leafy lousewort, and whitevein pyrola occur commonly. Moss cover averages 4 percent.

Upper layer tree cover is low for the Series, averaging 62 percent. Mid-layer and lower layer tree covers are both low, averaging 32 and 30 percent, respectively. High shrub cover is low, averaging 1 percent, but low shrub cover is high, averaging 19 percent. Herb/grass cover is also low, ranging from 0 to 60 percent, and averaging 25 percent.

| Common name | Code | Constancy | Cover | Richness |
|-----------------------------|--------|-----------|-------|----------|
| <u>Overstory trees</u> | | | | 4 |
| Shasta red fir | ABMAS | 90 | 39 | |
| Pacific silver fir | ABAM | 90 | 10 | |
| Mountain hemlock | TSME | 70 | 13 | |
| Western white pine | PIMO3 | 70 | 5 | |
| Douglas-fir | PSME | 40 | 13 | |
| <u>Understory trees</u> | | | | 4 |
| Pacific silver fir | ABAM | 100 | 33 | |
| Mountain hemlock | TSME | 100 | 13 | |
| Shasta red fir | ABMAS | 80 | 8 | |
| Western white pine | PIMO3 | 50 | 2 | |
| <u>Shrubs</u> | | | | 4 |
| Thin-leaved huckleberry | VAME | 90 | 10 | |
| Dwarf bramble | RULA2 | 80 | 5 | |
| <u>Herbs</u> | | | | 14 |
| Vanillaleaf | ACTR | 80 | 9 | |
| Queen's cup | CLUN2 | 80 | 5 | |
| One-sided pyrola | PYSE | 70 | 2 | |
| White inside-out-flower | VAHE | 70 | 2 | |
| Northwest listera | LICA10 | 70 | 1 | |
| Starry false Solomon's-seal | SMST | 60 | 2 | |
| Common prince's-pine | CHUM | 60 | 2 | |
| Leafy lousewort | PERA | 50 | 1 | |
| Whitevein pyrola | PYPI2 | 50 | 1 | |
| Common beargrass | XETE | 40 | 6 | |
| Coolwort foamflower | TITRU | 40 | 3 | |
| Round-leaved violet | VIOR | 40 | 3 | |

PACIFIC SILVER FIR/BALDHIP ROSE/VANILLALEAF

Abies amabilis/Rosa gymnocarpa/Achlys triphylla

ABAM/ROGY/ACTR (N=17; FS=17)

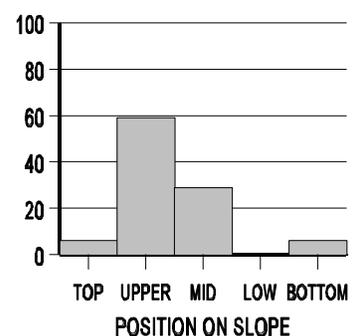
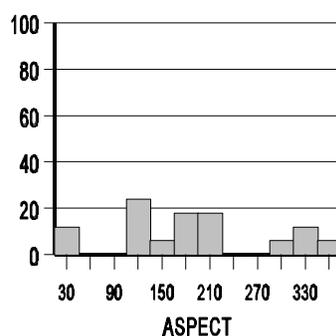
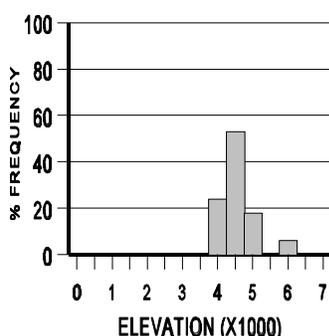


Distribution. Pacific Silver Fir/Baldhip Rose/Vanillaleaf occurs on all Ranger Districts of the Umpqua National Forest and may also occur on the Prospect Ranger District, Rogue River National Forest.

Distinguishing Characteristics. Pacific Silver Fir/Baldhip Rose/Vanillaleaf is found at warm temperatures and high precipitation relative to the other plant associations in the Series. Douglas-fir and white fir are frequently found in the understory, with western hemlock and mountain hemlock occurring occasionally and only with low covers. Western hemlock indicates warmer sites and mountain hemlock cooler sites.

Soils. Parent materials are commonly andesite or tephra, with some diorite. Soils are moderately deep to deep, with an average depth of greater than 45 inches. Average surface rock cover is 6 percent, with 6 percent gravel.

Environment. Elevation averages 4830 feet. Pacific Silver Fir/Baldhip Rose/



Vanillaleaf occurs on most aspects, although rarely on east and west aspects. Slope averages 39 percent and ranges from 19 to 65 percent. Upper and middle one-third slope positions predominate.

Vegetation Composition and Structure. Total species richness is very high for the Series, averaging 36 species. Overstory tree layer is dominated by Douglas-fir, with Pacific silver fir and white fir common. Western white pine, Shasta red fir, and western hemlock occur occasionally. Pacific silver fir dominates the understory with Douglas-fir and white fir occurring frequently, and western hemlock, Shasta red fir, and Pacific yew occasionally. Vine maple occurs commonly, and often in abundance. Baldhip rose, dwarf Oregongrape, dwarf bramble, and Pacific blackberry frequently occur in the shrub layer. Vanillaleaf, western twinflower, starry false Solomon's-seal, rattlesnake-plantain, white inside-out-flower, threeleaf anemone, queen's cup, common prince's-pine, and Oregon fairybell are frequently occurring herbs. Moss cover averages 5 percent.

Upper layer tree cover is high for the Series, averaging 73 percent. Mid-layer tree cover is also high, averaging 38 percent, and lower layer tree cover is low, averaging 30 percent. High shrub cover is intermediate, averaging 6 percent, and low shrub cover is low, averaging 14 percent. Herb/grass cover is intermediate for the Series, ranging from 5 to 95 percent, with an average of 28 percent.

| Common name | Code | Constancy | Cover | Richness |
|-----------------------------|-------|-----------|-------|----------|
| <u>Overstory trees</u> | | | | 3 |
| Douglas-fir | PSME | 100 | 38 | |
| Pacific silver fir | ABAM | 53 | 16 | |
| White fir | ABCO | 53 | 7 | |
| <u>Understory trees</u> | | | | 6 |
| Pacific silver fir | ABAM | 100 | 35 | |
| Douglas-fir | PSME | 88 | 8 | |
| White fir | ABCO | 82 | 6 | |
| Vine maple | ACCI | 71 | 23 | |
| <u>Shrubs</u> | | | | 8 |
| Baldhip rose | ROGY | 100 | 1 | |
| Dwarf Oregongrape | BENE2 | 76 | 5 | |
| Dwarf bramble | RULA2 | 76 | 2 | |
| Pacific blackberry | RUUR | 76 | 2 | |
| Thin-leaved huckleberry | VAME | 59 | 3 | |
| <u>Herbs</u> | | | | 18 |
| Vanillaleaf | ACTR | 94 | 8 | |
| Western twinflower | LIBOL | 88 | 3 | |
| Starry false Solomon's-seal | SMST | 88 | 2 | |
| Rattlesnake-plantain | GOOB2 | 88 | 1 | |
| White inside-out-flower | VAHE | 82 | 2 | |
| Threeleaf anemone | ANDE3 | 82 | 1 | |
| Queen's cup | CLUN2 | 82 | 1 | |
| Common prince's-pine | CHUM | 76 | 4 | |
| Oregon fairybell | DIHOO | 76 | 2 | |
| White trillium | TROV2 | 71 | 1 | |

ABAM 10

PACIFIC SILVER FIR-WESTERN HEMLOCK/THIN-LEAVED
HUCKLEBERRY/VANILLALEAF

Abies amabilis-Tsuga heterophylla/Vaccinium membranaceum/Achlys triphylla

ABAM-TSHE/VAME/ACTR (N=7; FS=7)

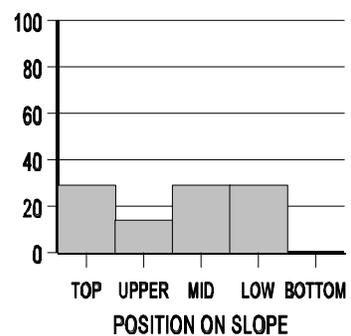
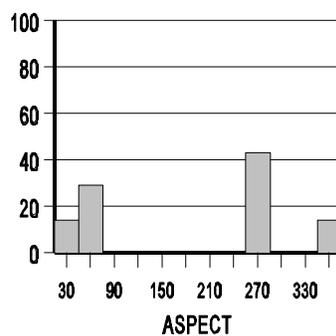
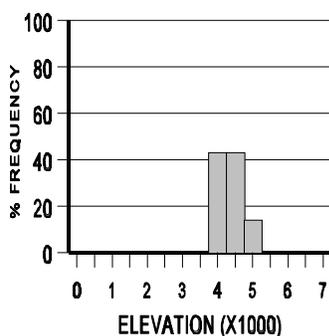


Distribution. Pacific Silver Fir-Western Hemlock/Thin-leaved Huckleberry/Vanillaleaf occurs on the Cottage Grove and Diamond Lake Ranger Districts, and likely, the North Umpqua Ranger District, Umpqua National Forest.

Distinguishing Characteristics. Pacific Silver Fir-Western Hemlock/Thin-leaved Huckleberry/Vanillaleaf is the lowest in elevation and one of the warmer associations of the Series. Western hemlock is frequently present at moderate covers in both the overstory and understory, indicating relatively warm conditions.

Soils. Parent material is mostly andesite, with some diorite and ash. Soils are moderately deep to deep, with an average depth of greater than 47 inches. Average surface rock cover is 6 percent, with 10 percent gravel.

Environment. Elevation averages 4600 feet. Pacific Silver Fir-Western Hemlock/Thin-leaved Huckleberry/Vanillaleaf occurs on west and north aspects and rarely



on south aspects. Slope averages 28 percent and ranges from 3 to 50 percent. Slope position ranges from ridge top down to the lower one-third slope.

Vegetation Composition and Structure. Total species richness is high for the Series, averaging 33 species. Overstory tree layer is dominated by Douglas-fir, with western hemlock occurring frequently, and Pacific silver fir commonly. White fir, western white pine, and Engelmann spruce occur occasionally. Understory is dominated by Pacific silver fir, with western hemlock occurring frequently at low covers. Pacific yew, Douglas-fir, white fir, and western white pine occur occasionally. Vine maple, though occasional, may be dense in some areas. In the shrub layer, thin-leaved huckleberry and dwarf bramble occur frequently. In the herb/grass layer, vanillaleaf, coolwort foamflower, western twinflower, rattlesnake-plantain, common prince's-pine, white trillium, and Oregon fairybell occur frequently. Moss cover averages 7 percent.

Upper layer tree cover is high for the Series, averaging 74 percent. Mid-layer tree cover is low, averaging 33 percent. Lower layer tree, high shrub, and low shrub covers are all high, averaging 41, 10, and 18 percent, respectively. Herb/grass cover is also high for the Series, ranging from 3 to 90 percent, with an average of 37 percent.

| Common name | Code | Constancy | Cover | Richness |
|-----------------------------|--------|-----------|-------|----------|
| <u>Overstory trees</u> | | | | 4 |
| Douglas-fir | PSME | 100 | 39 | |
| Western hemlock | TSHE | 86 | 22 | |
| Pacific silver fir | ABAM | 71 | 14 | |
| <u>Understory trees</u> | | | | 4 |
| Pacific silver fir | ABAM | 100 | 39 | |
| Western hemlock | TSHE | 100 | 23 | |
| <u>Shrubs</u> | | | | 9 |
| Thin-leaved huckleberry | VAME | 100 | 5 | |
| Dwarf bramble | RULA2 | 86 | 2 | |
| Dwarf Oregongrape | BENE2 | 71 | 2 | |
| Pacific blackberry | RUUR | 71 | 1 | |
| Pacific rhododendron | RHMA3 | 57 | 15 | |
| <u>Herbs</u> | | | | 17 |
| Vanillaleaf | ACTR | 100 | 5 | |
| Coolwort foamflower | TITRU | 100 | 4 | |
| Western twinflower | LIBOL | 100 | 3 | |
| Rattlesnake-plantain | GOOB2 | 100 | 1 | |
| Common prince's-pine | CHUM | 86 | 3 | |
| White trillium | TROV2 | 86 | 1 | |
| Oregon fairybell | DIHOO | 86 | 1 | |
| Starry false Solomon's-seal | SMST | 71 | 13 | |
| Bunchberry | COCA13 | 71 | 6 | |
| Queen's cup | CLUN2 | 71 | 1 | |
| Cutleaf goldthread | COLA3 | 57 | 4 | |
| White inside-out-flower | VAHE | 57 | 3 | |
| Western wild ginger | ASCA2 | 57 | 1 | |