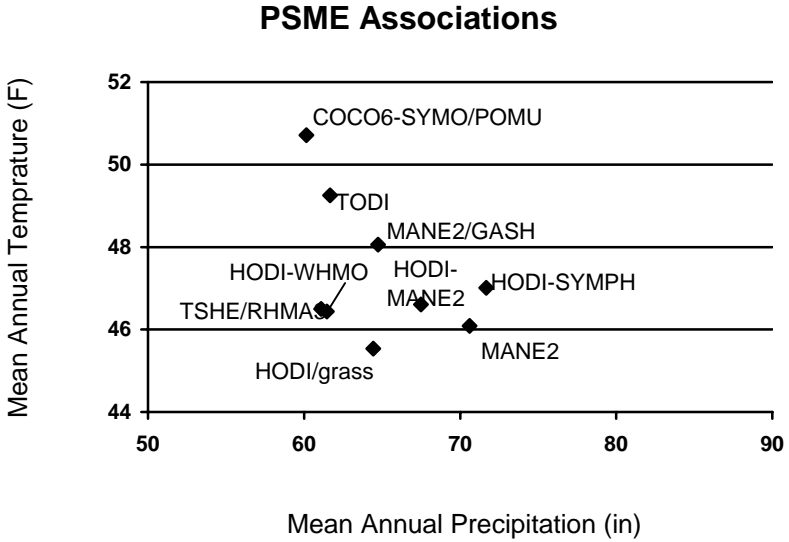


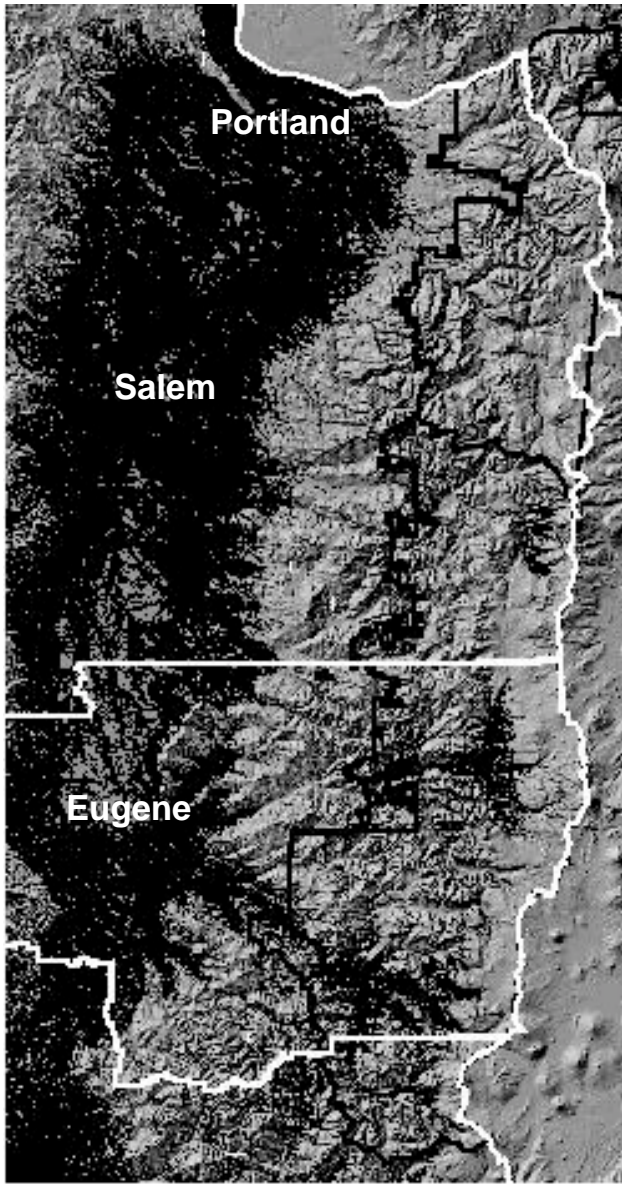
Introduction to the Douglas-fir series

The Douglas-fir series is warm and dry. It occurs widely in low precipitation, low elevation sites, but also is common on dry microsites, shallow or skeletal soils, on warm aspects across a wide elevation range.

This series has the highest vascular plant diversity (species per plot) of all the forested series in NW Oregon. Both overstory and understory diversity is high. Most Douglas-fir series plots had at least two species of hardwood trees present. Oregon white oak appears to be an early seral member of several of the Douglas-fir associations, including Douglas-fir/poison oak, Douglas-fir/California hazel-snowberry, and the Douglas-fir/oceanspray group.

The graph below shows the relative distribution of the plant association plot averages for mean annual temperature versus total annual precipitation (data from Oregon Climate Service's statewide GIS layers).





Series distribution (in black) from 2001 draft USFS R6 Potential Natural Vegetation model (Henderson, in prep).

Douglas-fir-western hemlock/rhododendron

Pseudotsuga menziesii-*Tsuga heterophylla*/*Rhododendron macrophyllum*

PSME-TSHE/RHMA3

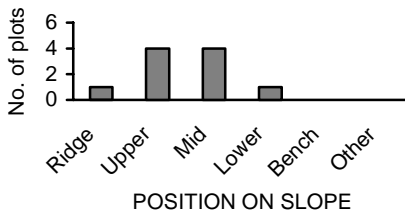
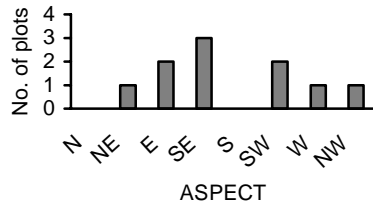
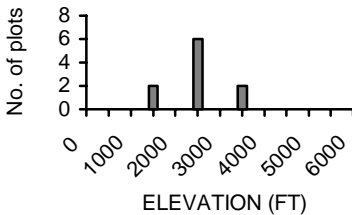
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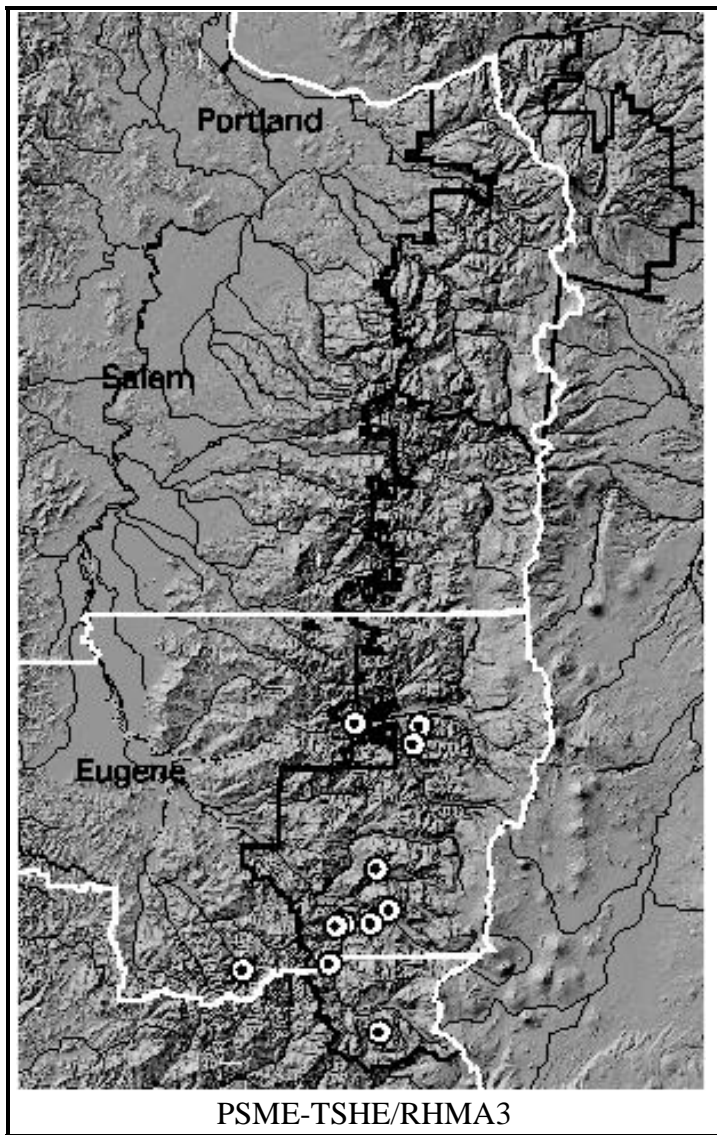
N=10 (WIL=9; EBLM=1)

Environment and Distribution

This is an uncommon plant association that occurs at the south end of the study area on relatively dry sites. Plots are located on gentle to steep slopes averaging 34% (range 8-70%) primarily on middle and upper slope positions. Aspect varies, but half the plots are on southeast or southwest facing slopes. This association occurs at relatively high elevations for the Douglas-fir zone, with elevation of sample plots averaging 2,491 feet (range 1,620-3,500 ft.). This type can occur intermingled with western hemlock associations on unfavorable microsites.

Soils tend to be moderately deep and stony. Some deep clay soils may occur.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME-TSHE/RHMA3 association is dominated by Douglas-fir, often with a component of incense-cedar and/or western hemlock, madrone, or grand fir. Canopy closure of mature trees on sample plots averages 67%. Cover of understory trees averages 11%, the highest of any of the Douglas-fir series.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	53
Incense-cedar	CADE27	80	16
Western hemlock	TSHE	70	7
Pacific madrone	ARME	40	10
Grand fir	ABGR	40	4
Understory trees			
Douglas-fir	PSME	80	2
Incense-cedar	CADE27	70	8
Golden chinquapin	CHCH7	60	2
Grand fir	ABGR	40	8
Western hemlock	TSHE	30	7
Shrubs			
Dwarf Oregon grape	MANE2	100	18
Salal	GASH	100	43
Rhododendron	RHMA3	100	21
Baldhip rose	ROGY	90	1
Trailing blackberry	RUUR	90	1
Vine maple	ACCI	80	11
Whipple vine	WHMO	70	5
Oceanspray	HODI	60	9
Herbaceous			
Sword fern	POMU	90	3
Redwoods violet	WISE3	80	4
Vanilla leaf	ACTR	70	1
Sweetscented bedstraw	GATR3	70	1
White hawkweed	HIAL2	70	1
Bracken fern	PTAQ	70	1
Twinflower	LIBO3	60	6
Star-flower	TRLA6	60	2

This association has a well-developed shrub layer, with tall shrubs averaging 44% cover and low shrubs averaging 61% cover. The shrub layer includes salal, rhododendron and dwarf Oregon grape as dominants, and usually significant amounts of vine maple, oceanspray, and/or whipple vine. The composition of the shrub layer is typical of warm, well-drained sites.

Herb cover is relatively low, averaging 13% cover. Sword fern, redwoods violet and star-flower tend to be the most abundant herbs. Moss cover averages 23%.

PSME-TSHE/RHMA3 plots average 181 years with a range of 75 to 252 years, the oldest in the series. Stands are moderately stocked; live basal area averages 247 ft²/acre, which is an intermediate value for the Douglas-fir series.

Plots average 33 vascular plant species, which is near the mean for the Douglas-fir series. However, the series tends to have higher values than other forested series in western Oregon.

Management Implications

This association represents sites of moderate productivity relative to the Douglas-fir zone as a whole. Nitrogen deficient soils and summer drought limit conifer growth.

	Site Index PSME
Mean	132
SE	5
Range	80-174
Age	155
n	17

Rhododendron, vine maple and grasses compete with conifer seedlings. Planted seedlings should be shaded on southerly aspects. Burning can induce germination and establishment of snowbrush. Burning, which consumes the duff layer, will reduce site

productivity.

Douglas-fir/poison oak

Pseudotsuga menziesii/*Toxicodendron diversiloba*

PSME/TODI

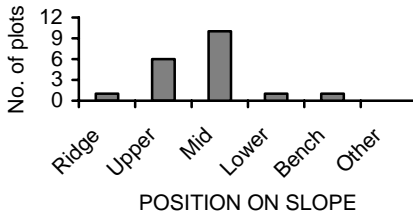
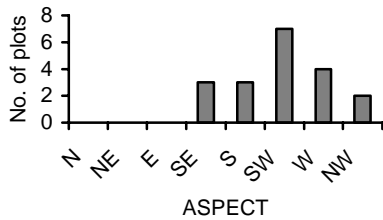
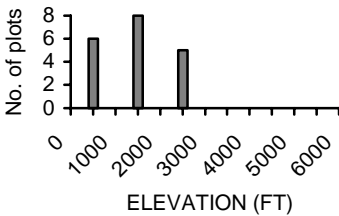
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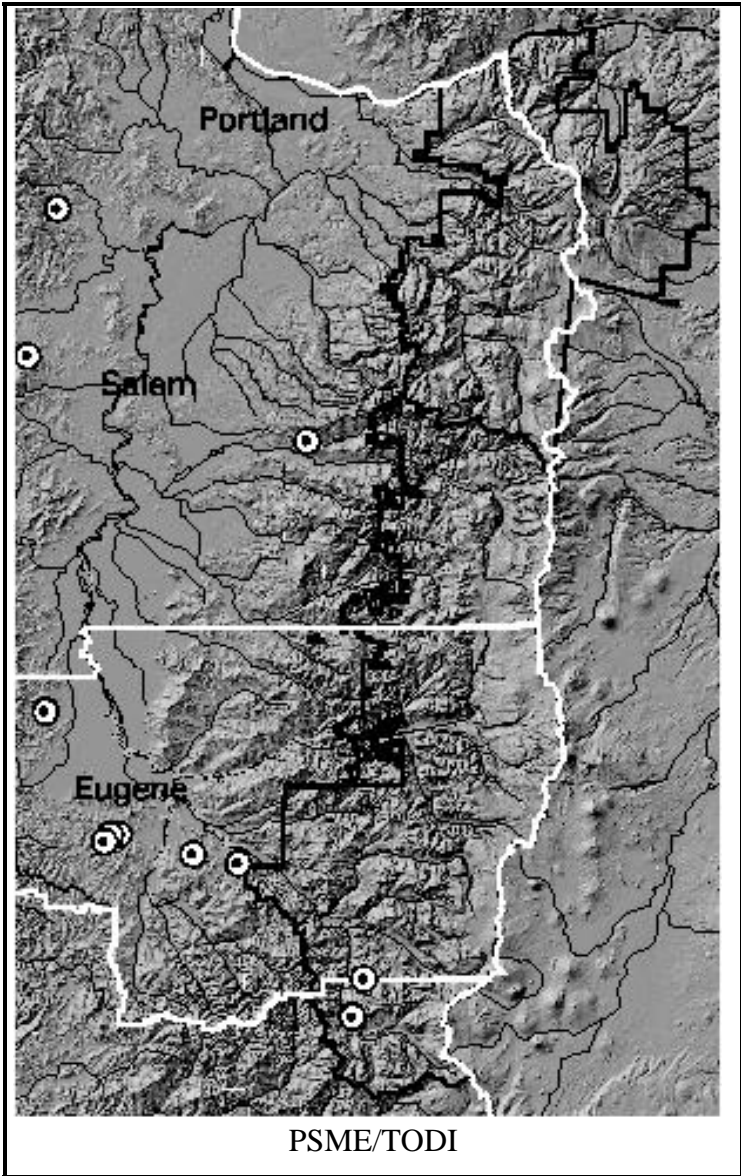
N=19 (WIL=5; EBLM=10; SBLM=4)

Environment and Distribution

This plant association occurs primarily along the margins of the Willamette Valley on hot, dry sites with high mean annual temperatures and very low precipitation. Plots are located on gentle to steep slopes averaging 36% (range 5-70%), primarily on middle and upper slope positions. Aspects are primarily southerly or westerly. This association occurs at relatively low elevations, averaging 1,401 feet (range 730-2,465 ft.).

Soils tend to be gravelly loam, skeletal, or deep clays, severely limiting soil moisture availability during the growing season.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME /TODI association is dominated by Douglas-fir, often with a component of big-leaf maple, Pacific madrone, Incense-cedar, ponderosa pine, Oregon white oak and/or grand fir. Sugar pine and black oak can also occur. Canopy closure of mature trees on sample plots averages 70%. Cover of understory trees is low, averaging 3%.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	57
Pacific madrone	ARME	53	6
Big-leaf maple	ACMA3	42	17
Incense-cedar	CADE27	42	6
Ponderosa pine	PIPO	37	12
Oregon white oak	QUGA4	32	9
Grand fir	ABGR	21	tr
Understory trees			
Douglas-fir	PSME	84	13
Big-leaf maple	ACMA3	42	12
Pacific madrone	ARME	42	3
Incense-cedar	CADE27	42	5
Oregon white oak	QUGA4	26	Tr
Grand fir	ABGR	21	Tr
Shrubs			
Poison oak	TODI	100	28
Baldhip rose	ROGY	95	2
California hazel	COCO6	84	9
Trailing blackberry	RUUR	79	2
Trailing snowberry	SYMO	68	9
Oceanspray	HODI	58	5
Hairy honeysuckle	LOHI2	53	2
Herbaceous			
Sword fern	POMU	100	4
Pathfinder	ADBI	84	1
Wild strawberry	FRVE	84	1
Snow queen	SYRE	74	2
Sweetscented bedstraw	GATR3	68	1
Yerba buena	SADO5	68	2
Star-flower	TRLA6	68	1

This association has a moderately developed shrub layer, with tall shrubs averaging 17% cover and low shrubs averaging 41% cover. The shrub layer is dominated by poison oak, and usually smaller amounts of baldhip rose, California hazel, and/or trailing blackberry. The composition of the shrub layer is typical of warm to hot, dry sites with well-drained soils. Herb cover is relatively low, averaging 16% cover. The composition of the herb layer indicates warm sites. Moss cover averages 47%.

PSME/TODI plots average 152 years and a range of 88 to 250 years. Stands are moderately stocked; live basal area averages 280 ft²/acre, a moderate value for the Douglas-fir series.

Plots average 34 vascular plant species, about average for the Douglas-fir series which tends to have higher values than other forested series in western Oregon.

Management Implications

Site productivity is the lowest of all lower elevation forested plant associations sampled. Ponderosa pine grows better than Douglas-fir on some sites. Soils are either rocky and shallow or deep clay. Summer drought severely limits conifer growth and planted seedlings should be shaded especially on southerly aspects. Ponderosa and sugar pine, as well as Oregon white oak and black oak are of special interest to a variety of forest users.

	Site Index PIPO	Site Index PSME
Mean	112	115
SE	4	3
Range	80-130	68-172
Age	154	142
n	12	61

Post disturbance competition from big leaf maple, madrone, and shrubs and grasses may cause seedling mortality. Fire, which consumes the duff layer, can degrade the site. Site disturbance

can also stimulate establishment of Scotch broom. People sensitive to poison oak should take precautions when in this plant association.

Douglas-fir/dwarf Oregon grape-salal

Pseudotsuga menziesii/*Mahonia nervosa*-*Gaultheria shallon*

PSME/MANE2-GASH

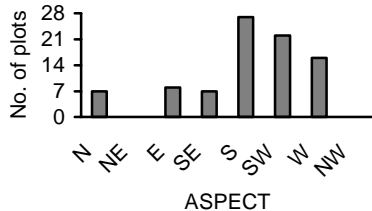
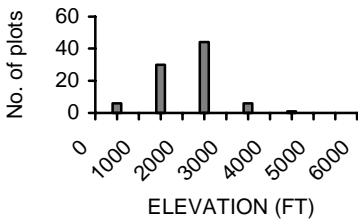
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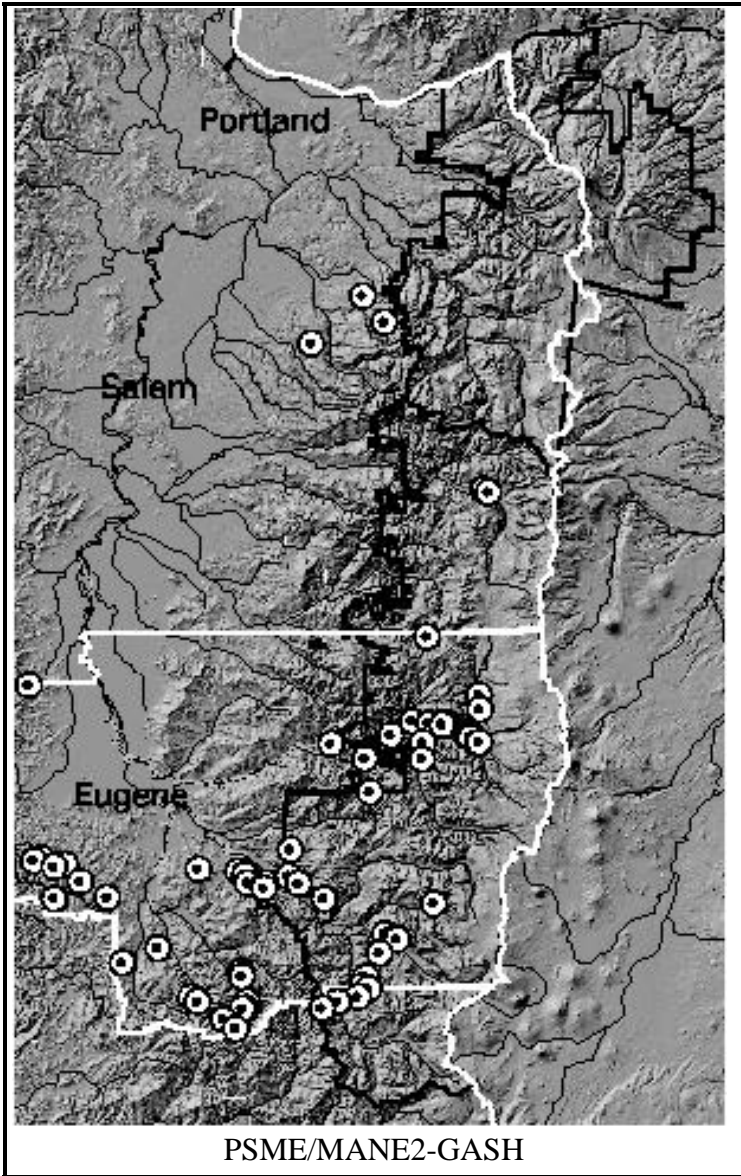
N=87 (SIU=1; WIL=43; EBLM=37; SBLM=6)

Environment and Distribution

PSME/MANE2-GASH is a common plant association in the Douglas-fir zone, occurring primarily on relatively dry sites in the southern portion of the Old Cascades and the margins of the Willamette Valley. This plant association is often transitional to warm, dry western hemlock associations. Plots are on gentle to steep slopes averaging 43% (range 7-90%), primarily on middle and upper slope and ridge positions. Most plots are on south to west facing aspects. This association occurs over a range of elevations, but primarily below 3,000 feet. Elevation averages 2,016 feet (range 590-4,080 ft.).

Soils tend to be gravelly or cobbly and well drained, with clay loam or silty clay loam. Some sites have shallow soils.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/MANE2-GASH association is dominated by Douglas-fir, often with a component of incense-cedar, big-leaf maple, madrone, and western hemlock. Canopy closure of mature trees on sample plots averages 71%. Cover of understory trees is low, averaging 4%. This association has a relatively well-developed shrub layer, with tall shrubs averaging 26% cover and low shrubs averaging 55% cover. The shrub layer includes salal, dwarf Oregon grape, and often vine maple and/or oceanspray as dominants. The composition of the shrub layer is typical of warm, dry sites with well-drained soils.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	61
Incense-cedar	CADE27	46	14
Big-leaf maple	ACMA3	43	8
Pacific madrone	ARME	30	4
Western hemlock	TSHE	29	4
Understory trees			
Douglas-fir	PSME	70	3
Golden chinquapin	CHCH7	41	2
Incense-cedar	CADE27	33	4
Western hemlock	TSHE	28	7
Shrubs			
Salal	GASH	100	41
Dwarf Oregon grape	MANE2	95	13
Baldhip rose	ROGY	87	2
Trailing blackberry	RUUR	83	1
California hazel	COCO6	74	6
Oceanspray	HODI	63	10
Whipple vine	WHMO	62	5
Vine maple	ACCI	59	17
Herbaceous			
Sword fern	POMU	94	7
Star-flower	TRLA6	71	1
Three-leaved anemone	ANDE3	70	1
Redwoods violet	WISE3	68	2
Sweetscented bedstraw	GATR3	67	1
Bracken fern	PTAQ	67	4
Twinflower	LIBO3	66	4

Herb cover is relatively low, averaging 18% cover. Sword fern, bracken fern, and/or twinflower tend to be the most abundant herbs. Moss cover averages 24%.

This plant association is often transitional to warm, dry western hemlock associations; some stands may key to this association because of local lack of western hemlock seed sources.

Sample plots occur over a wide range of stand ages. Some of the stands in the PSME/MANE2-GASH sample are the oldest in the series, with a mean of 149 years and a range of 52 to 350 years. Stands are moderately stocked; live basal area averages 279 ft²/acre, which is a moderate value for the Douglas-fir series.

Plots average 33 vascular plant species, about average for the Douglas-fir series, which tends to have higher values than other forested series in western Oregon.

Management Implications

Summer drought inhibits conifer growth and seedling survival. Conifer seedlings should be shaded on south slopes. Once established, Douglas-fir grows moderately well.

	Site Index PSME
Mean	131
SE	2
Range	43-207
Age	157
n	214

Competition from associated hardwood and shrub species can affect conifer growth and survival. Fire may lower site productivity when duff layers are consumed and when soils are shallow.

Douglas-fir/oceanspray-dwarf Oregon grape

Pseudotsuga menziesii/*Holodiscus discolor*-*Mahonia nervosa*

PSME/HODI-MANE2

(old code: PSME/HODI-BENE)

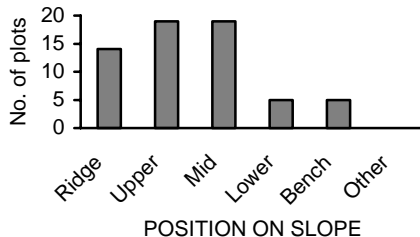
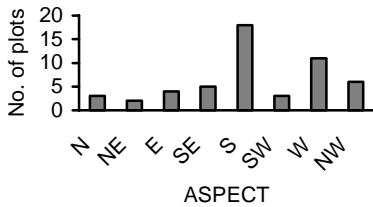
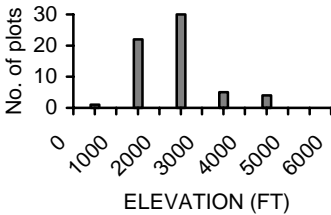
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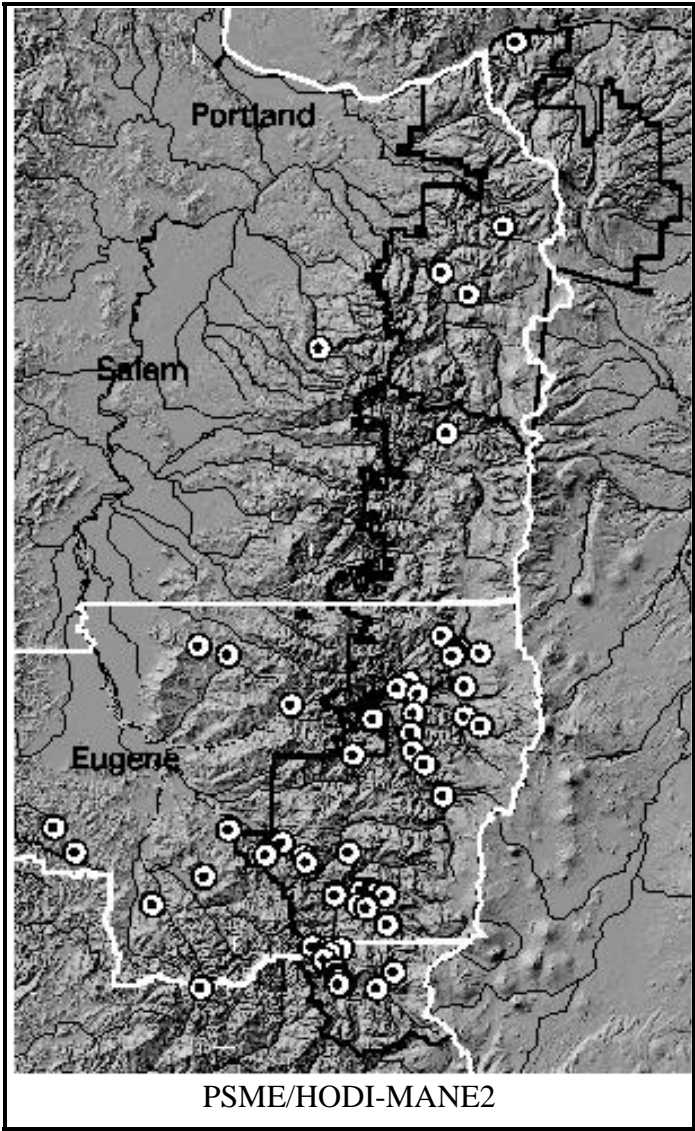
N=62 (MTH=8; WIL=42; EBLM=11; SBLM=1)

Environment and Distribution

This is a common plant association in the Douglas-fir zone that occurs primarily in the south of the study area on hot, dry sites. Plots are located on gentle to steep slopes averaging 47% (range 2-88%) primarily on middle and upper slope and ridge positions. Most plots are on southerly or westerly aspects. This association occurs at a range of elevations, but primarily below 3,000 feet. Elevation averages 2,326 feet (range 650-4,300 ft.).

Soils tend to be either shallow and gravelly or heavy clay. Soils are well drained.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/HODI-MANE2 association is dominated by Douglas-fir, often with a component of incense-cedar, big-leaf maple, and/or Pacific madrone. Sugar pine and golden chinquapin are also common. Canopy closure of mature trees on sample plots averages 74%. Cover of understory trees is low, averaging 5%.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	65
Incense-cedar	CADE27	42	14
Big-leaf maple	ACMA3	40	11
Pacific madrone	ARME	31	5
Understory trees			
Douglas-fir	PSME	69	4
Incense-cedar	CADE27	37	3
Big-leaf maple	ACMA3	33	1
Pacific dogwood	CONU4	31	5
Shrubs			
Dwarf Oregon grape	MANE2	98	24
Baldhip rose	ROGY	92	4
Oceanspray	HODI	90	11
Trailing snowberry	SYMO	85	7
Trailing blackberry	RUUR	73	2
California hazel	COCO6	71	7
Vine maple	ACCI	58	17
Whipple vine	WHMO	58	6
Herbaceous			
Sword fern	POMU	84	8
Star-flower	TRLA6	77	1
Pathfinder	ADBI	68	2
White hawkweed	HIAL2	63	1
Three-leaved anemone	ANDE3	60	1
Rattlesnake plantain	GOOB2	60	1
Twintflower	LIBO3	53	7

This association has a moderately well developed shrub layer, with tall shrubs averaging 30% cover and low shrubs averaging 36% cover. The shrub layer is usually dominated by dwarf Oregon grape, and often contains oceanspray and vine maple as co-dominants. The composition of the shrub layer is typical of warm, dry sites with well-drained soils. Herb cover is moderate, averaging 25% cover. Sword fern, pathfinder, and/or twinflower tend to be the most abundant herbs. Moss cover averages 33%.

Sampled PSME/HODI-MANE2 stands are of average age for the series, with a mean of 153 years and a range of 42 to 251 years. Stands are relatively densely stocked; live basal area averages 314 ft²/acre, which is a relatively high value for the Douglas-fir series.

Plots average 34 vascular plant species, near the average for the Douglas-fir series which tends to have higher values than other forested series in western Oregon.

Management Implications

These are warm, dry sites, typically with shallow soils. Summer drought limits conifer growth and seedling survival. Douglas-fir seedlings should be shaded on south slopes. Ponderosa pine and sugar pine may grow better than Douglas-fir.

	Site Index PIPO	Site Index PSME
Mean	126	127
SE	9	2
Range	105-156	68-201
Age	167	148
n	5	121

Competition from shrubs and grasses can cause conifer mortality. Fires that consume the duff layer may accelerate dry ravel of skeletal soils common to this type and reduce already low levels

of soil nitrogen.

Douglas-fir/dwarf Oregon grape

Pseudotsuga menziesii/Mahonia nervosa

PSME/MANE2

(old code: PSME-TSHE/BENE)

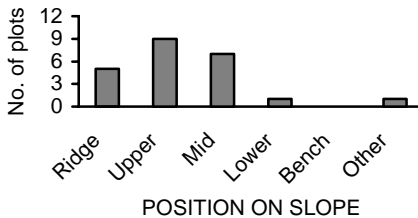
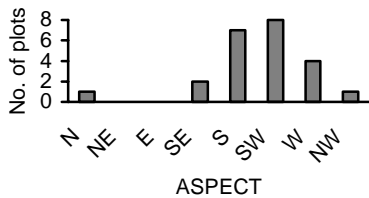
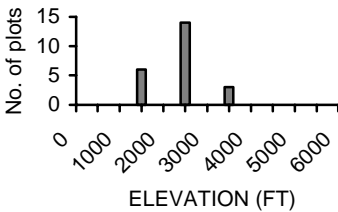
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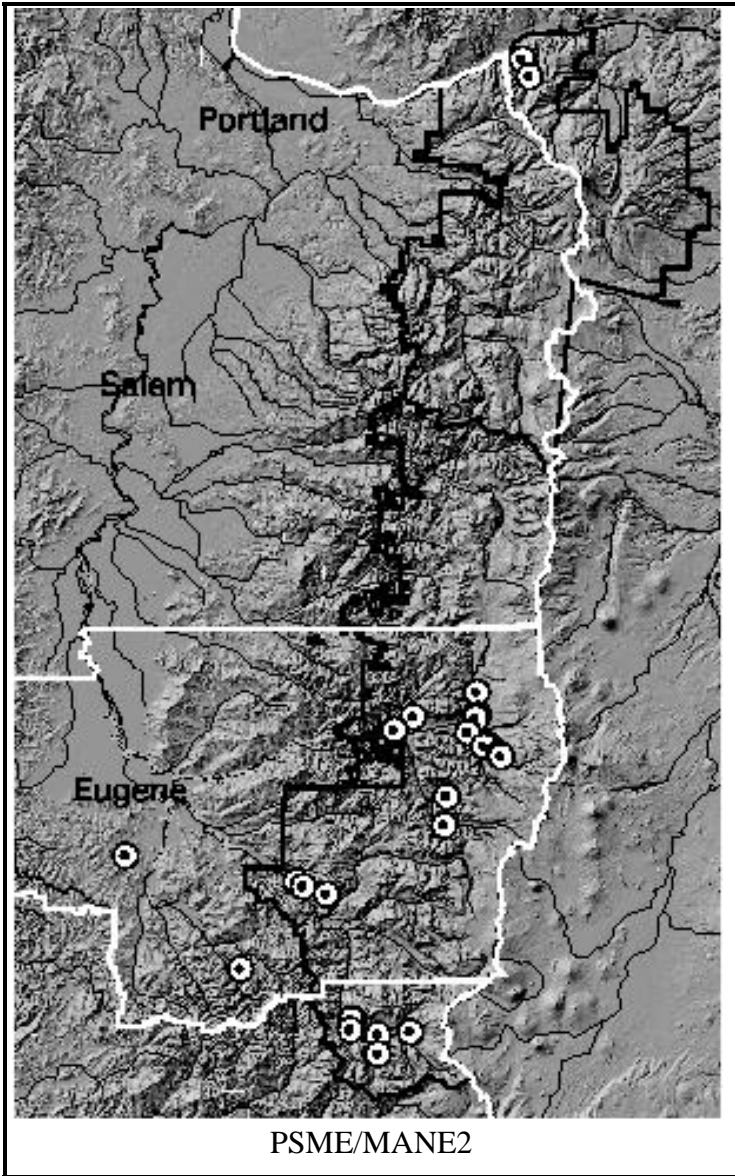
N=23 (MTH=3; WIL=17; EBLM=2; SBLM=1)

Environment and Distribution

This association occurs in the southern portion of the study area in the transition between Douglas-fir and western hemlock zones. Plots are located on gentle to steep slopes averaging 45% (range 6-85%) primarily on middle and upper slope and ridge positions. Most plots occur on south to west facing slopes. This association occurs mostly below 3,000 feet, with plot elevation averaging 2,334 feet (range 1,060-3,590 ft.).

Soils tend to be a shallow, gravelly loam.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/MANE2 association is dominated by Douglas-fir, often with a component of incense-cedar, big-leaf maple, and/or Pacific madrone. Canopy closure of mature trees on sample plots averages 79%. Cover of understory trees is very low, averaging 2%.

This association has a moderately developed shrub layer, with tall shrubs averaging 13% cover and low shrubs averaging 32% cover. The shrub layer is dominated by dwarf Oregon grape, usually with small amounts of other dry site shrubs. The composition of the shrub layer is typical of warm, dry, and well-drained sites.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	68
Big-leaf maple	ACMA3	61	11
Incense-cedar	CADE27	48	15
Pacific madrone	ARME	39	4
Understory trees			
Douglas-fir	PSME	70	2
Big-leaf maple	ACMA3	52	1
Pacific dogwood	CONU4	52	1
Incense-cedar	CADE27	30	5
Shrubs			
Dwarf Oregon grape	MANE2	100	26
Baldhip rose	ROGY	87	2
Trailing snowberry	SYMO	74	2
California hazel	COCO6	70	2
Trailing blackberry	RUUR	70	1
Oceanspray	HODI	52	2
Whipple vine	WHMO	52	2
Herbaceous			
White hawkweed	HIAL2	91	1
Vanilla leaf	ACTR	78	2
Pathfinder	ADBI	78	2
Sword fern	POMU	78	4
Star-flower	TRLA3	78	2
Three-leaved anemone	ANDE3	70	1
Rattlesnake plantain	GOOB2	70	1
Sweetscented bedstraw	GATR3	65	1

Herb cover averages 21% cover. Sword fern, star-flower, vanilla leaf, and pathfinder tend to be the most abundant herbs. Moss cover averages 32%.

PSME/MANE2 plots average 131 years (range 53-250 years). Stands are densely stocked; live basal area averages 324 ft²/acre, the highest value for the Douglas-fir series. This plant association and PSME/MANE2-GASH, are transitional to the warm, dry western hemlock associations such as TSHE/MANE2-DRY-NWO Cascades and TSHE/MANE2-DRY-NWO Cascades.

Plots average 32 vascular plant species, about average for the Douglas-fir series, which tends to have higher values than other forested series in western Oregon.

Management Implications

Summer drought can slow conifer establishment and cause seedling mortality in combination with competition from associated hardwoods and shrubs. Conifer seedlings should be shaded on southerly aspects. When present, sugar pine may grow better than Douglas-fir.

	Site Index PSME
Mean	126
SE	5
Range	62-184
Age	148
n	39

Fire may damage shallow soils and remove the duff layer leading to dry ravel and reduced soil nitrogen levels in already deficient soils.

Douglas-fir/California hazel-snowberry/sword fern

Pseudotsuga menziesii/*Corylus cornuta*-*Symphoricarpos mollis*/*Polystichum munitum*

PSME/COCO6-SYMO/POMU

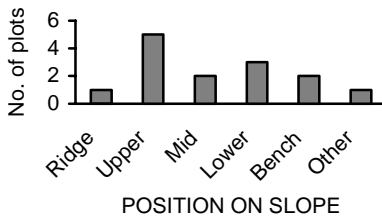
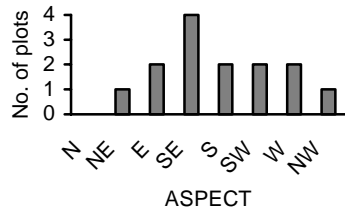
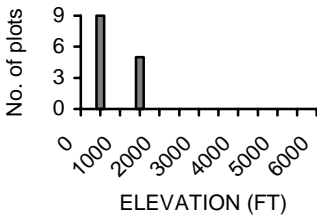
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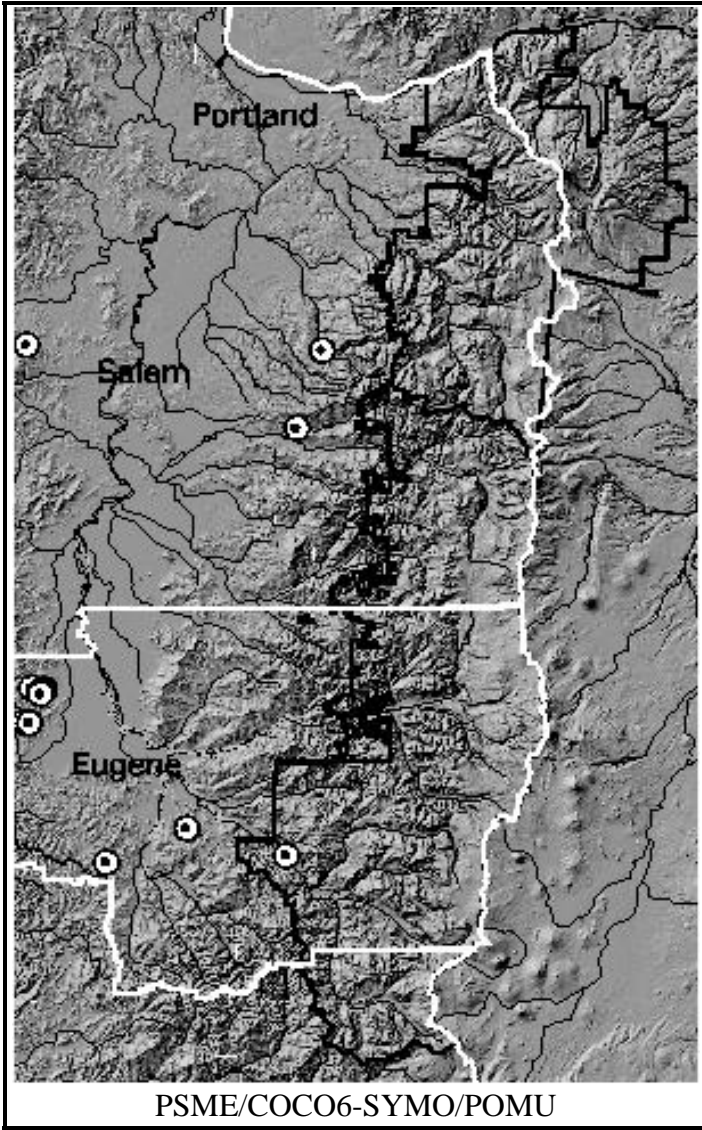
N=14 (WIL=1; EBLM=10; SBLM=3)

Environment and Distribution

This is an uncommon plant association that occurs primarily along the margins of the Willamette Valley on relatively hot, dry sites, at the lowest elevations in the Douglas-fir zone and with the lowest annual precipitation. Plots are located on gentle to steep slopes averaging 32% (range 3-92%) on a variety of slope positions. Aspect varies, but half the plots are on southeast or southwest facing slopes. Plots average 1,028 feet (range 640-1,710 ft.).

Soils are well drained and composed of silt loam, silty clay, or clay.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/COCO6-SYMO/POMU association is dominated by Douglas-fir, often with a component of big-leaf maple and/or Oregon white oak. Canopy closure of mature trees on sample plots averages 76%. Cover of understory trees is very low, averaging 1%.

This association has a moderately developed shrub layer, with tall shrubs averaging 31% cover and low shrubs averaging 29% cover. The shrub layer includes California hazel and trailing snowberry as dominants, and usually significant amounts of oceanspray, trailing blackberry and/or poison oak. The composition of the shrub layer is typical of warm to hot and dry sites with well-drained soils.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	71
Big-leaf maple	ACMA3	50	17
Oregon white oak	QUGA4	29	1
Understory trees			
Douglas-fir	PSME	57	1
Big-leaf maple	ACMA3	71	1
Golden chinquapin	CHCH7	43	Tr
Oregon white oak	QUGA4	29	2
Shrubs			
California hazel	COCO6	100	13
Trailing blackberry	RUUR	100	6
Oceanspray	HODI	93	9
Baldhip rose	ROGY	93	2
Poison oak	TODI	86	4
Trailing snowberry	SYMO	86	16
Herbaceous			
Pathfinder	ADBI	100	1
Sword fern	POMU	100	34
Wild strawberry	FRVE	86	1
Inside-out flower	VAHE	86	7
Big leaf sandwort	MOMA3	79	1
Fairy-bells	DISPO	79	2
Sweet cicely	OSCH	79	Tr
Yerba buena	SADO5	71	1
Bracken fern	PTAQ	64	5

Herb cover is relatively high, averaging 51% cover. Sword fern dominates the herb layer, usually with significant amounts of inside-out flower and bracken fern. Moss cover averages 27%.

On average, sampled PSME/COCO6-SYMO/POMU stands are the youngest in the series, with a mean of 113 years and a range of 86 to 246 years. Stands have low stocking density; live basal area averages 217 ft²/acre, the lowest value for the Douglas-fir series.

There is an average of 34 vascular plant species per plot in this association, near average for the Douglas-fir series which tends to have higher values than other forested series in western Oregon. PSME/COCO6-SYMO/POMU averages three hardwood species per plot, highest in the series, which may be related to the age of the sampled stands.

Management Implications

Douglas-fir growth in this association is on average the best of all the Douglas-fir types. Summer drought limits conifer growth, but not as severely due to better soils and increased available water. Soil conditions do not appear to be as limiting as those associated with PSME/TODI.

	Site Index PSME
Mean	146
SE	4
Range	68-226
Age	113
n	56

Moderate intensity fire may damage thin soils. Disturbed sites may be invaded by Scotch broom (*Cytisus scoparius*) or other non-native invasive species.

Douglas-fir/oceanspray-whipple vine

Pseudotsuga menziesii/*Holodiscus discolor*-*Whipplea modesta*

PSME/HODI-WHMO

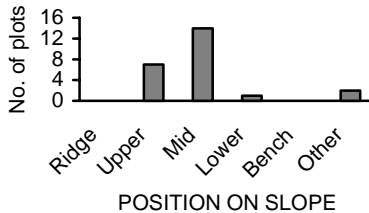
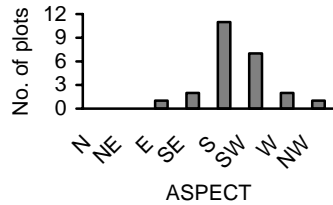
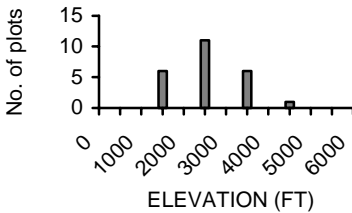
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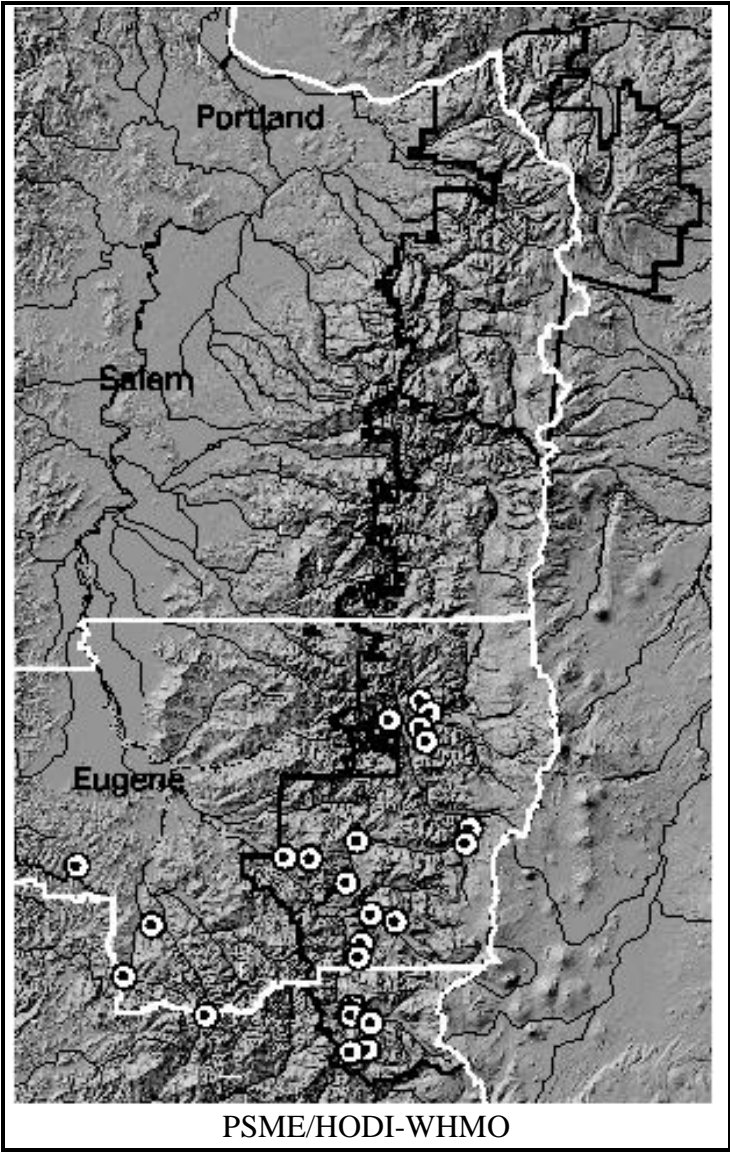
N=24 (WIL=20; EBLM=4)

Environment and Distribution

This plant association occurs at the southern portion of the study area on hot, dry sites. Plots are located on gentle to steep slopes averaging 52% (range 12-98%), primarily on middle and upper slope positions. Aspects of plots are primarily south or southwest. This association occurs at relatively high elevations for the Douglas-fir zone, with plot elevation averaging 2,515 feet (range 1,060-4,200 ft.).

Soils are either skeletal and rocky or deep clay.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/HODI-WHMO association is dominated by Douglas-fir, often with a component of incense-cedar, Pacific madrone, big-leaf maple, and/or sugar pine. Canopy closure of mature trees on sample plots averages 74%. Cover of understory trees is low averaging 4%.

This association has a relatively sparse shrub layer, with tall shrubs averaging 13% cover and low shrubs averaging 23% cover. The shrub layer includes whipple vine and oceanspray as dominants, and usually significant amounts other dry site shrubs. The composition of the shrub layer is typical of warm to hot and dry sites with well-drained soils.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	62
Incense-cedar	CADE27	58	17
Pacific madrone	ARME	42	5
Big-leaf maple	ACMA3	38	6
Sugar pine	PILA	38	4
Understory trees			
Douglas-fir	PSME	71	4
Incense-cedar	CADE27	54	9
Grand fir	ABGR	42	2
Shrubs			
Whipple vine	WHMO	100	15
Baldhip rose	ROGY	96	2
Oceanspray	HODI	88	9
Trailing snowberry	SYMO	88	4
Dwarf Oregon grape	MANE2	79	5
California hazel	COCO6	79	3
Trailing blackberry	RUUR	79	2
Poison oak	TODI	63	3
Herbaceous			
Sword fern	POMU	92	4
White hawkweed	HIAL2	88	1
Pathfinder	ADBI	83	1
Wild strawberry	FRVE	83	1
Rattlesnake plantain	GOOB2	75	1
Star-flower	TRLA6	75	2
Big leaf sandwort	MOMA3	71	2

Herb cover averages 20%, and moss cover averages 37%.

Plots average 154 years (81 to 250 years). Stands were moderately stocked, with an average live basal area of 323 ft²/acre.

Plots average 37 vascular plant species, which is high for the Douglas-fir series, which tends to have higher values than other forested series in western Oregon.

Management Implications

	Site Index PIPO	Site Index PSME
Mean	126	117
SE	13	3
Range	90-160	60-162
Age	146	138
n	5	53

Growing seasons in this association are long and dry. Douglas-fir grows moderately well after establishment. Re-establishment of conifer seedlings is difficult. Conifer seedlings

should be shaded. Sugar pine and Ponderosa pine may be better for planting in openings. Slash fires that consume the duff layer may accelerate dry ravel of shallow soils and reduce already low levels of soil nitrogen.

Douglas-fir/oceanspray/grass

Pseudotsuga menziesii/Holodiscus discolor/Grass

PSME/HODI/Grass

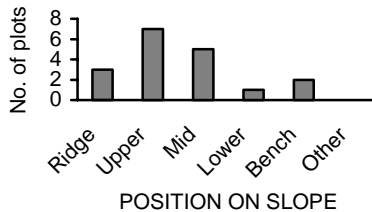
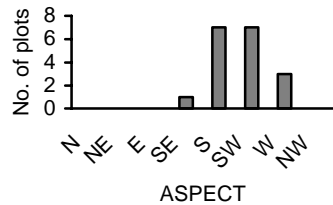
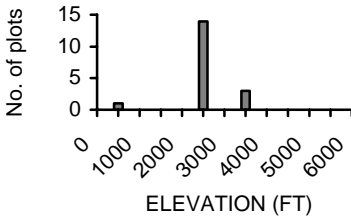
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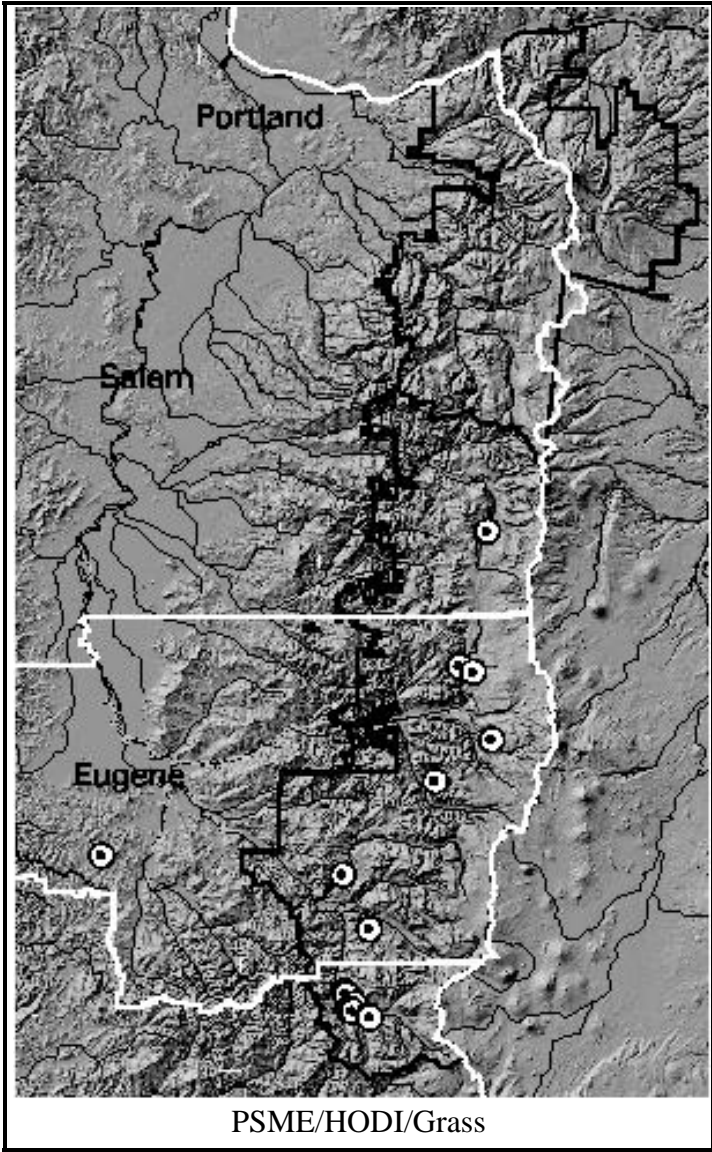
N=18 (WIL=17; EBLM=1)

Environment and Distribution

This plant association occurs in the central and southern portions of the study area on hot, dry sites. Plots are located on gentle to steep slopes averaging 39% (range 10-71%), primarily from mid-slope to the ridge. Aspects are south to west. This association occurs primarily between 2,000 and 3,000 feet in elevation, with sample plots averaging 2,399 feet (range 940-3,140 ft.).

Soils are either thin and rocky, or deep with heavy clay.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/HODI/Grass association is dominated by Douglas-fir, often with a component of Incense-cedar, big-leaf maple, sugar pine, and/or Pacific madrone. Canopy closure of mature trees on sample plots averages 73%. Cover of understory trees averages 8%.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	63
Big-leaf maple	ACMA3	50	14
Incense-cedar	CADE27	45	5
Sugar pine	PILA	39	9
Grand fir	ABGR	39	1
Pacific madrone	ARME	33	1
Understory trees			
Douglas-fir	PSME	78	4
Grand fir	ABGR	56	1
Incense-cedar	CADE27	39	7
Shrubs			
Baldhip rose	ROGY	90	2
Trailing blackberry	RUUR	90	1
Tall Oregon grape	BEAQ	85	3
California hazel	COCO6	85	4
Dwarf Oregon grape	MANE2	80	3
Trailing snowberry	SYMO	80	9
Oceanspray	HODI	75	7
Whipple vine	WHMO	55	4
Herbaceous			
Pathfinder	ADBI	85	2
White hawkweed	HIAL2	85	1
Big leaf sandwort	MOMA3	80	2
Wild strawberry	FRVE	80	3
Sword fern	POMU	80	2
Star-flower	TRLA6	80	2
Rattlesnake plantain	GOOB2	75	1
Scouler's harebell	CASC7	70	2
Yerba buena	SADO5	70	1
Twinflower	LIBO3	60	4
Grasses			
Columbia brome	BRVU	65	5
Western fescue	FEOC	60	1

This association has a relatively sparse shrub layer, with tall shrubs averaging 15% cover and low shrubs averaging 16% cover. The shrub layer includes a variety of dry site shrubs such as oceanspray, trailing snowberry, and whipple vine. Herb cover averages 24% cover, with small amounts of a variety of forbs and grasses. Moss cover averages 44%.

Stands in the PSME/HODI/Grass average 181 years old and range from 72 to 250 years old. Stands are relatively densely stocked; live basal area averages 333 ft²/acre.

Plots average 39 vascular plant species, highest in the Douglas-fir series which tends to have higher values than other forested series in western Oregon.

Management Implications

Growing seasons in this association are typically long and dry with relatively mild winters. Conifer seedlings should be shaded. Conifers grow moderately well. Sugar pine and Ponderosa pine may grow better than Douglas-fir.

	Site Index PIPO	Site Index PSME
Mean	136	126
SE	2	4
Range	126-143	92-234
Age	142	138
n	7	50

Conifer establishment is difficult in openings. Fires that consume the duff layer may accelerate dry ravel of shallow soils and reduce already low soil nitrogen levels.

Douglas-fir/oceanspray-snowberry

Pseudotsuga menziesii/*Holodiscus discolor*-*Symphoricarpus* sp.

PSME/HODI-SYMPH

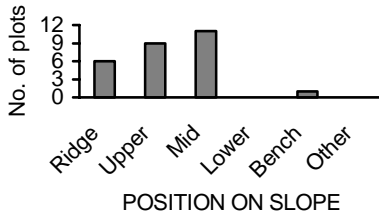
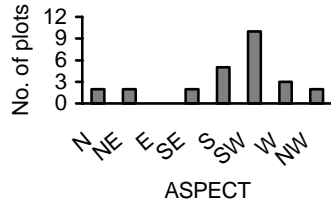
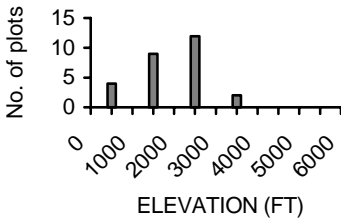
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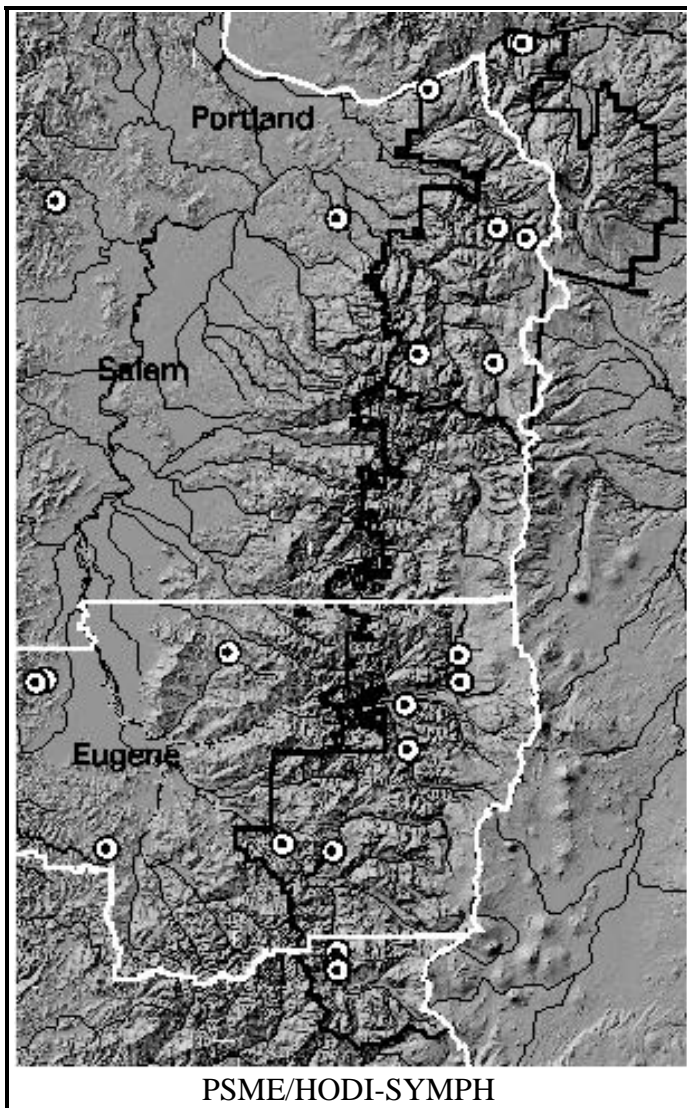
N=27 (MTH=10; WIL=10; EBLM=4; SBLM=3)

Environment and Distribution

This plant association is scattered throughout the study area on relatively dry sites. Plots are located on flat to steep slopes averaging 41% (range 0-80%), primarily from mid-slope to the ridge. Aspect varies, but southerly aspects are most common. This association occurs primarily below 3,000 feet; plots average 1,941 feet (range 630-3,625 ft.).

Soils are well drained and composed of silty clay loam or clay.





Vegetation Composition, Structure, and Diversity

The overstory in the PSME/HODI-SYMPH association is dominated by Douglas-fir, sometimes with a component of big-leaf maple. Pacific madrone, incense-cedar, Pacific dogwood, and Oregon white oak are often present. Canopy closure of mature trees on sample plots averages 73%. Cover of understory trees is low, averaging 2%.

This association has a relatively sparse shrub layer with tall shrubs averaging 18% cover and low shrubs averaging 23% cover. The shrub layer includes snowberry and/or trailing snowberry as dominants, and usually significant amounts of vine maple and/or oceanspray. The composition of the shrub layer is typical of warm, dry sites with well-drained soils.

Common name	Code	Constancy	Cover
Overstory trees			
Douglas-fir	PSME	100	67
Big-leaf maple	ACMA3	37	11
Understory trees			
Douglas-fir	PSME	56	3
Cascara buckthorn	FRPU7	41	2
Pacific dogwood	CONU4	37	2
Shrubs			
Baldhip rose	ROGY	89	2
Oceanspray	HODI	81	10
California hazel	COCO6	78	5
Trailing blackberry	RUUR	70	2
Trailing snowberry	SYMO	67	21
Dwarf Oregon grape	MANE2	63	3
Vine maple	ACCI	52	9
Snowberry	SYAL	30	7
Herbaceous			
Sword fern	POMU	81	3
Star-flower	TRLA6	81	2
Wild strawberry	FRVE	80	3
Big leaf sandwort	MOMA3	74	1
Sweetscented bedstraw	GATR3	67	1
Bracken fern	PTAQ	63	7
Pathfinder	ADBI	63	2
White hawkweed	HIAL2	63	1

Herb cover is relatively low, averaging 18% cover. Moss cover averages 33%.

Stands average 116 years old (range 53-240 years). Stands are moderately stocked; live basal area averages 264 ft²/acre, which is a moderate value for the Douglas-fir series.

Plots average 30 vascular plant species, a relatively low value for the Douglas-fir series which tends to have more diversity than other forested series in western Oregon.

Management Implications

	Site Index PSME
Mean	145
SE	4
Range	75-221
Age	114
n	64

More mesic and generally better soil conditions provide for better productivity of these sites. Douglas-fir grows well, although summer drought limits conifer growth. Conifer seedling should be shaded on south aspects.

Shrub competition should be minor on most sites. Fire that consumes the duff layer will reduce site productivity.

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