

GUIDE TO PLANT ASSOCIATIONS ON THE OLYMPIC EXPERIMENTAL STATE FOREST

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WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

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Third Approximation



Guide to Plant Associations on the Olympic State Experimental Forest

This classification is derived from a publication that is still in development by Richard Bigley and Sabra Hull. This draft is for use only by DNR Forest Inventory Staff and is not to be reproduced without permission of the authors.

SMST	Smilacina stellata	Starry false solomon's seal
SOSI	Sorbus sitchensis	seal
SPCA5	Sphagnum capillaceum	Sitka mountain ash
SPHAGNUM	Sphagnum sp.	Common sphagnum
STAM	Streptopus amplexifolius	Sphagnum sp.
STCA2	Stellaria calycantha	Clasping-leaved twisted-stalk
STC04	Stachys cooleyae	stalk
STCR	Stellaria crispa	Northern stellaria
STME2	Stachys mexicana	Cooley's hedge-nettle
STREP	Streptopus sp.	Crisped stellaria
STRO	Streptopus roseus	Mexican betony
STST	Streptopus streptopoides	Streptopus sp.
TABR	Taxus brevifolia	Rosy twisted-stalk
THPL	Thuja plicata	Dwarf twisted-stalk
TITR	Tiarella trifoliata	Pacific yew
TIUN	Tiarella unifoliata	Western red cedar
TOME	Tolmiea menziesii	Three-leaved foamflower
TRLA2	Trientalis latifolia	Single-leaved foamflower
TROV	Trillium ovatum	Piggyback plant
TSHE	Tsuga heterophylla	Broad-leaved starflower
VAAL	Vaccinium alaskaense	Pacific trillium
VACCI	Vaccinium sp.	Western hemlock
VAHE	Vancouveria hexandra	Alaska huckleberry
VAOV	Vaccinium ovalifolium	Huckleberry sp.
VAOV2	Vaccinium ovatum	Inside-out flower
VAPA	Vaccinium parvifolium	Oval-leaf huckleberry
VICIA	Vicia sp.	Evergreen huckleberry
VIGL	Viola glabella	Red huckleberry
VIOLA	Viola sp.	Vetch sp.
VIOR2	Viola orbiculata	Stream violet
		Violet sp.
		Backwoods violet

WASHINGTON DNR OLYMPIC EXPERIMENTAL STATE FOREST

KEY TO THE FOREST ZONE

Third Approximation (April 24, 2000)

1. Western redcedar > 10% in overstory. Western hemlock, lodgepole pine, and/or Sitka spruce may also be present. Site shows evidence of a high water table **(WA0701)** Western redcedar zone.
2. Pacific silver fir \geq 5% in overstory or at least 50 seedlings per acre or if 1500' in elevation, Pacific silver fir > 1% in overstory or 20 seedlings per acre. Pacific silver fir.
3. Sitka spruce > 1% in overstory or at least 20 established seedlings per acre. Sitka spruce zone.
4. Sitka spruce < 1% in overstory or 20 seedlings per acre. Western hemlock zone.

Plot area table

Percent of one tenth acre	Side of a square	Diameter	Square feet
10 %	20.9'	23.6'	436'
5 %	14.8'	16.6'	217.8'
1 %	6.6'	7.4'	43.6'

Washington DNR Olympic

Experimental State Forest

Draft Key to the Forest Zones

1a. If one of the following two conditions is met.

(1) Pacific silver fir \geq 5% in overstory or at least 50 established Pacific silver fir seedlings per acre, or

(2) Elevation \geq 1500 feet and Pacific silver fir \geq 1% in overstory or at least 20 established Pacific silver fir seedlings per acre Pacific Silver Fir Zone

1b. If neither of the two conditions in 1a are met go to 2

2a. Sitka spruce > 1 % in overstory or at least 20 established Sitka spruce seedlings per acre or Sitka spruce basal area \geq 50 ft²/acre Sitka Spruce Zone

2b. Sitka spruce < 1 % in overstory or fewer than 20 established Sitka spruce seedlings per acre or Sitka spruce basal area < 50 ft²/acre Western Hemlock Zone

OPHO	Oplopanax horridum	Devil's club
OSCH	Osmorhiza chilensis	Sweet cicely
OXOR	Oxalis oregana	Oregon oxalis
PEFR	Petasites frigidus	Coltsfoot
PICA	Pityopus californica	Pine-foot
PISI	Picea sitchensis	Sitka spruce
PLF2	Pleuriscopora fimbriolata	Fringed-pinesap
PLSC5	Pleurozium schreberi	Silkmoss
PLUN5	Plagiothecium undulatum	Flat moss
POGL4	Polypodium glycyrrhiza	Licorice fern
POJU5	Polytrichum juniperinum	Haircap moss
POMU	Polystichum munitum	Swordfern
POMUI	Polystichum minutum var. imbricans	Spiny swordfern
PSME	Pseudotsuga menziesii	Douglas fir
PTAN	Pteropora andromeda	Pine drops
PTAQ	Pteridium aquilinum	Bracken fern
PYFU	Pyrus fusca	Western crabapple
PYPI	Pyrola picta	White-veined pyrola
PYSE	Pyrola secunda	Sidebells pyrola
PYUN	Pyrola uniflora	Woodnymph
RHL05	Rhytidiadelphus loreus	Wire moss
RHPU	Rhamnus purshiana	Cascara
RHR05	Rhytidiadelphus robusta	Pipecleaner moss
RIBES	Ribes sp.	Currant sp.
RIBR	Ribes bracteosum	Stink currant
ROGY	Rosa gymnocarpa	Baldhip rose
RUBUS	Rubus sp.	Rubus sp.
RULA	Rubus lasiococcus	Dwarf bramble
RUPA	Rubus parviflora	Thimbleberry
RUPE	Rubus pedatus	Five-leaved bramble
RUSP	Rubus spectabilis	Salmonberry
RUUR	Rubus ursinus	Trailing blackberry
SALIX	Salix sp.	Willow sp.
SARA	Sambucus racemosa	Red elderberry
SEOR	Selaginella oregana	Oregon selaginella

GASH Gaultheria shallon
 GATR Galium triflorum
 GEPU Geranium pusillum
 GEVI Geranium viscosissimum
 GOOB Goodyera oblongifolia
 GRASS Grass sp.
 GYDR Gymnocarpium dryoptera
 HIAL Hieracium albiflorum
 HYMO Hypopitys monotropa
 HYSP5 Hylocomium splendens
 HYTE Hydrophyllum tenuipes
 ILX Ilix sp.
 ISST5 Isoetecium stoloniferum
 JUEF Juncus effusus
 LAMU Lactuca muralis
 LEGR Ledum groenlandicum
 LEME5 Leucolepis menziesii
 LIB02 Linnaea borealis
 LICA3 Listera caurina
 LIC03 Listera cordata
 LILIU Lilium sp.
 LIVER Liverwort sp.
 LUPA Luzula parviflora
 LYAM Lysichitum americanum
 LYCL Lycopodium clavatum
 MAD2 Maianthemum dilatatum
 MEFE Menziesia ferruginea
 MIGU Mimulus guttatus
 MIPE Mitella pentandra
 MITELLA Mitella sp.
 MNIUM Mniium sp.
 MOSI Montia siberica
 MOSS Moss sp.
 MOUN2 Monotropa uniflora
 OESA Oenanthe sarmentosa

Salal
 Sweetscented bedstraw
 Small-flowered crane's-bill
 Sticky purple geranium
 Rattlesnake plantain
 Grass sp.
 Oak fern
 White-flowered hawkweed
 Pinesap
 Step moss
 Pacific waterleaf
 English holly
 Hairmoss
 Soft rush
 Wall lettuce
 Bog Labrador tea
 Palmtree moss
 Twinflower
 Heart-leaf twayblade
 Northwestern twayblade
 Lilium sp.
 Liverwort sp.
 Smallflowered woodrush
 Skunk cabbage
 Running pine
 False lily-of-the-valley
 Fool's huckleberry
 Yellow mimulus
 Alpine mitrewort
 Mitella sp.
 Leafmoss
 Candyflower
 Moss sp.
 Indianpipe
 Water parsley

Draft key to Plant Associations of the Pacific Silver Fir Zone

- 1a. Bunchberry (COCA) + Round-leaved violet (VIOR2) + Fair lily-of-the-valley (MAD12) \geq 10% ABAM/COCA **WA0001** pg. 23
- 1b. Bunchberry (COCA) + Round-leaved violet (VIOR2) + Fair lily-of-the-valley (MAD12) $<$ 10% go to 2
 - 2a. Salal (GASH) \geq 5% go to 3
 - 2b. Salal (GASH) \geq 5% go to 5
- 3a. Skunk Cabbage (LYAM) \geq 1% ABAM/GASH-LYAM **WA0004** pg. 28
- 3b. Skunk Cabbage (LYAM) \geq 1% go to 4
 - 4a. White-veined pyrola (PYPI) + Pacific trillium (TROV) + Oregongrape (BENE) \geq 1% ABAM/GASH **WA0006** pg. 30
 - 4b. White-veined pyrola (PYPI) + Pacific trillium (TROV) + Oregongrape (BENE) \geq 1% ABAM/GASH **WA0003** pg. 29
- 5a. Oregon oxalis (OXOR) \geq 5% go to 6
- 5b. Oregon oxalis (OXOR) \geq 5% go to 7
 - 6a. Salal (GASH) present ABAM/GASH-OXOR **WA0005** pg. 26
 - 6b. Salal (GASH) absent ABAM/OXOR-CLUN **WA0007** pg. 25
- 7a. Alaska huckleberry (VAAL) \geq 25% ABAM/VAAL **WA0008** Pg. 24
- 7b. Alaska huckleberry (VAAL) \geq 25%
 ABAM/DEPAUPERA (See foot note on Western hemlock key) **WA0002** pg. 27

Draft Key to Plant Associations of the Sitka Spruce Zone

- 1a. Salal (GASH) \geq 5% go to 2
 1b. Salal (GASH) < 5% go to 4
- 2a. Skunk Cabbage (LYAM) and Salmonberry (RUSP)
 \geq 5% PISI/GASH-LYAM **WA0103** pg. 20
- 2b. Skunk Cabbage (LYAM) and Salmonberry (RUSP)
 < 5% go to 3
- 3a. Fool's huckleberry (MEFE) \geq 5% ... PISI/GASH-MEFE **WA0104** pg. 21
- 3b. Fool's huckleberry (MEFE) < 1% PISI/GASH **WA0102** pg. 22
- 4a. Oregon oxalis (OXOR) \geq 5% PISI/OXOR **WA0105** pg. 17
 4b. Oregon oxalis (OXOR) < 5% go to 5
- 5a. Deerfern (BLSP) \geq 5% PISI/BLSP-POMU **WA0101** pg. 18
 5b. Deerfern (BLSP) < 5% PISI/POMU-TROV
 (See foot note on Western hemlock key) **WA0106** pg 19

ABAM
 ACCI
 ACMA
 ACRU
 ACTR
 ADBI
 ADPE
 ALRU
 ANDE
 ARSY
 ATFI
 BEAQ
 BENE
 BLSP
 BOEL
 CAREX
 CASC2
 CHUM
 CLUN
 COCA
 COLA
 COMA3
 CORAL
 COSC
 COST2
 CYFR
 DICRA
 DIFO
 DIHO
 DISM
 DRAU2
 EUORS
 GALIU
 GAOR

Abies amabilis
 Acer circinatum
 Acer macrophyllum
 Actae rubra
 Achlys triphylla
 Adenocauon bicolor
 Adiantum padatum
 Anus rubra
 Anemone deltoidea
 Aruncus sylvester
 Athyrium filix-femina
 Berberis aquifolium
 Berberis nervosa
 Blechnum spicant
 Boykinia elata
 Carex sp.
 Campanula scouleri
 Chimaphila umbellata
 Clintonia uniflora
 Cornus canadensis
 Coptis lacinata
 Corallorhiza maculata
 Corallorhiza sp.
 Corydalis scouleri
 Cornus stolonifera
 Cystopteris fragilis
 Dicranium sp.
 Dicentra formosa
 Disporum hookeri
 Disporum smithii
 Dryopteris austriaca
 Eurhychium oreganum
 Galium sp.
 Galium oreganum

Pacific silver fir
 Vine maple
 Big-leaf maple
 Baneberry
 Vanillaleaf
 Trail plant
 Maidenhair fern
 Red alder
 Western white anemone
 Goatsbeard
 Ladyfern
 Tall oregongrape
 Oregongrape
 Deerfern
 Slender boykinia
 Sedge sp.
 Bellflower
 Prince's pine
 Queencup beadlily
 Bunchberry
 Cutleaf goldthread
 Spotted coralroot
 Coralroot sp.
 Scouler's corydalis
 Red-osier dogwood
 Brittle bladderfern
 Dicranum sp.
 Bleeding heart
 Hooker's fairybells
 Smiths fairybells
 Shield fern
 Feathermoss
 Bedstraw sp.
 Oregon bedstraw

Draft Key to Plant Associations of the Western Hemlock Zone

- 1a. Oregon oxalis (OXOR) \geq 5% go to 2
- 1b. Oregon oxalis (OXOR) $<$ 5% go to 4
 - 2a. Vine maple (ACCI) \geq 5% . . . TSHE/ACCI-OXOR **WA0201** pg. 14
 - 2b. Vine maple (ACCI) $<$ 5% go to 3
- 3a. Salal (GASH) \geq 1% TSHE/GASH-OXOR **WA0206** pg. 12
- 3b. Salal (GASH) $<$ 1% TSHE/OXOR-DRAU2 **WA0207** pg. 13
 - 4a. Salal (GASH) \geq 5% go to 5
 - 4b. Salal (GASH) $<$ 5% go to 7
- 5a. Skunk cabbage (LYAM) +
Bunchberry (COCA) \geq 1% TSHE/GASH-LYAM **WA0205** pg. 8
- 5b. Skunk cabbage (LYAM) +
Bunchberry (COCA) $<$ 1% go to 6
 - 6a. Smith's fairy bells (DISM) and Pacific trillium
(TROV) present TSHE/GASH/DISM **WA0204** pg. 10
 - 6b. Smith's fairy bells (DISM) and Pacific trillium
(TROV) absent TSHE/GASH **WA0203** pg. 9
- 7a. Deerfern (BLSP) \geq 1% go to 8
- 7b. Deerfern (BLSP) $<$ 1% TSHE/POMU **WA0208** pg. 16
 - 8a. Sweetscented bedstraw (GATR) + Candyflower
(MOSI) \geq 1% . . . TSHE/BLSP-MOSI **WA0202** pg. 15
 - 8b. Sweetscented bedstraw (GATR) + Candyflower
(MOSI $<$ 1%. . . TSHE/MEFE-BLSP¹ **WA0209** pg. 11

¹ Check the species and coverage values on site with the description of the plant association. If the description does not match the site vegetation, reduce the coverage values in the key by 50% and rekey the plot. If there is no vegetation that matches the key or coverage is less than 50% of required values, **WA0209** is the default for the western hemlock zone; **WA0106** for the Sitka spruce zone and **WA0002** for the Pacific Silver fir zone.

TSHE/GASH-LYAM

Western hemlock/salal-skunk cabbage

Vegetation

Understory Species: This association is distinguished from all other associations in the western hemlock (TSHE) zone by the presence of bunchberry (COCA) and five-leaved bramble (RUPE), and higher coverage of skunk cabbage (LYAM) and cascara (RHPU) than occur elsewhere in the western hemlock (TSHE) zone. The shrub layer includes high coverage of salal (GASH), variable coverage of fool's huckleberry (MEFE) and moderate coverage of Alaska huckleberry (VAAL), cascara (RHPU), and sometimes low coverage of red huckleberry (VAPA) and salmonberry (RUSP). False lily-of-the-valley (MAD12) and clasping-leaved twisted-stalk (STAM) are common components of the herb layer. Deerfern (BLSP) is the only fern that typically shows up on these sites. Feathermoss (EUOR5) flat moss (PLUN5), and wire moss (RHLO5) appeared on every site, and stepmoss (HYSP5) can have moderately high coverage.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold). N=4

Cons.	Average Cover Percent					
	0- 1	>1- 5	>5- 25	>25- 50	>50- 75	>75- 100
100 Bunchberry		X				
100 Cascara			X			
100 Clasping-leaved twisted-stalk		X				
100 Deerfern			X			
100 False lily-of-the-valley			X			
100 Feathermoss			X			
100 Five-leaved bramble		X				
100 Flat moss		X				
100 Fool's huckleberry			X			
100 Salal				X		
100 Skunk cabbage			X			
100 Stepmoss			X			
100 Wire moss			X			
25 Candyflower	X					
25 Vine maple	X					

SPECIES	PISI GASH MEFE N=4 CONCOV	TSHE GASH LYAM N=4 CONCOV	TSHE GASH DISM N=15 CONCOV	TSHE MEFE BLSP N=9 CONCOV	TSHE GASH OXOR N=7 CONCOV	TSHE OXOR DRAU2 N=12 CONCOV	TSHE ACCI OXOR N=4 CONCOV	TSH BLSP MOSE N=4 CONCOV	TSHE POMU N=5 CONCOV
FERNS & ALLIES									
Bracken fern		7	3						
Brittle bladderfern					14	1			
Deerfern	100	8	100	100	100	100	100	100	100
Ladyfern	50	1	27	1	56	1	75	1	100
Maidenhair fern									
Oak fern									
Oregon seaiginnella									
Running pine									
Shield fern	25	1	40	1	44	1	25	1	60
Sphagnum sp.									
Swordfern	50	2	100	10	100	29	10	30	100
MOSES									
Common sphagnum	25	1		11	1				
Dicanum sp.	100	1	40	1	44	1		50	20
Feathermoss	100	2	100	8	100	10	100	8	100
Flat moss	100	2	87	4	89	9	50	8	100

SPECIES	PISI GASH MEFE N=4 CONCOV	PISI GASH LYAM N=4 CONCOV	TSHE GASH N=24 CONCOV	TSHE GASH DISM N=15 CONCOV	TSHE MEFE BLSP N=9 CONCOV	TSHE GASH OXOR N=7 CONCOV	TSHE OXOR DRAU2 N=12 CONCOV	TSHE ACCI OXOR N=4 CONCOV	TSH BLSP MOSI N=4 CONCOV	TSHE POMU N=5 CONCOV
HERBS cont.										
Starry false solomons seal										
Sticky purple geranium	25	1								
Stream violet										
Sweet cicely										
Sweetscented bedstraw	25	1	7	1				25	1	100
Three leaved foamflower	50	1	21	1	40	1	56	1	71	1
Trail plant										
Twirflower	50	3	50	1						
Vanillaleaf										
Wall lettuce				13	1				25	1
Water parsley										20
Western white anemone										
White-flowered hawkweed							8	1		
White veined pyrola										
Woodnymph	25	1	33	1	40	1	67	1	25	1
Yellow Mimulus									75	1

TSHE/GASH
Western hemlock/salal

Vegetation

Understory Species: This association is very similar to the TSHE/GASH-DISM association except that it tends to have less swordfern (POMU), and is less likely to have Smith's fairybells (DISM), three-leaved foarnflower (TITR), and Pacific trillium (TROV). The shrub component includes moderate to high coverage of salal (GASH) and low to moderate coverage of fool's huckleberry (MEFE), Alaska huckleberry (VAAL), and red huckleberry (VAPA). Salmon-berry (RUSP) may also be present with variable coverage. None of the forb species appeared consistently on all plots, but clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), Oregon oxalis (OXOR), Smith's fairybells (DISM), three-leaved foarnflower (TITR), and woodnymph (PYUN) are all possible in trace or low coverage. Deerfern (BLSP) showed up on all plots with variable coverage, and swordfern (POMU) may also appear with low coverage. The moss layer may include flat moss (PLUN5), feathermoss (EUOR5), stepmoss (HYSP5), and wire moss (RHL05).

Common and/or Important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=24

Cons. % Species	Average Cover Percent					
	0-	>1-	>5-	>25-	>50-	>75
100 Deerfern						X
100 Flat moss						X
100 Salal					X	
96 Red huckleberry						X
92 Fool's huckleberry						X
92 Stepmoss						X
88 Alaska huckleberry						X
88 Wire moss						X
71 Swordfern						X
21 Oregon oxalis						X
21 Smith's fairybells						X
8 Candyflower						X
8 Pacific trillium						X
4 Skunk cabbage						X
4 Vine maple						X

TSHE/GASH-DISM

Western hemlock/salai-Smith's fairybells

Vegetation

Understory Species: This association is very similar to the TSHE/GASH association, and differs only in that it tends to have more swordfern (POMU), and is more likely to support Smith's fairybells (DISM), three-leaved foamflower (TITR), and Pacific trillium (TROV). Smith's fairybells (DISM), although it is used to define this site type, will not necessarily appear on every site. The shrub layer is very similar to that of the TSHE/GASH association, and may include red huckleberry (VAPA), fool's huckleberry (MEFE), salal (GASH), Alaska huckleberry (VAAL) and salmonberry (RUSP). The herb layer may include clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), Pacific trillium (TROV), Smith's fairybells (DISM), three-leaved foamflower (TITR), and woodnymph (PYUN). Deerfern (BLSP) is present, sometimes with high coverage, and swordfern has variable coverage. Feathermoss (EUOR5) and flat moss (PLUN5) are the principle moss species.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.)

Cons. % Species	Average Cover Percent					
	0- 1	>1- 5	>5- 25	>25- 50	>50- 75	>75 100
100 Deerfern			X			
100 Feathermoss			X			
100 Red huckleberry			X			
100 Salal				X		
100 Swordfern			X			
87 Flat moss	X					
87 Fool's huckleberry		X				
87 Smith's fairybells	X					
60 Pacific trillium	X					
13 Candyflower	X					
13 Oregon oxalis	X					
7 Sweetscented bedstraw	X					

SPECIES	PISI GASH MEFE N=4 CON/COV	TSHE GASH LYAM N=4 CON/COV	TSHE GASH N=24 CON/COV	TSHE GASH DISM N=15 CON/COV	TSHE MEFE BLSP N=9 CON/COV	TSHE GASH OXOR N=7 CON/COV	TSHE OXOR DRAU2 N=12 CON/COV	TSHE ACCI OXOR N=4 CON/COV	TSH BLSP MOSI N=4 CON/COV	TSHE POMU N=5 CON/COV
HERBS cont.										
Pacific waterleaf										
Piggy back plant										
Pine drops	25	1	4	1	11	1				20
Pinefoot			8	1						1
Pinesap			4	1						
Queens beadlily			8	1						
Rattlesnake plantain										
Rosy twisted-stalk						8	1			
Scouler's corydalis										
Sidebells pyrola										
Single-leaved foamflower										
Skunk cabbage		100	8	4	1	14	1	25	1	
Slender boykinia			4	1	13	1	25	1		
Small-flowered crane-bill		25	3							
Smith's fairybells	50	1	21	1	87	1	67	1	50	1
Spotted coralroot				7	1				100	1
										60

SPECIES	PISI GASH MEFE N=4 CON/COV	PISI GASH N=4 CON/COV	TSHE GASH LYAM N=4 CON/COV	TSHE GASH N=24 CON/COV	TSHE GASH DISM N=15 CON/COV	TSHE MEFE BLSP N=9 CON/COV	TSHE GASH OXOR N=7 CON/COV	TSHE OXOR DRAU2 N=12 CON/COV	TSHE ACCI OXOR N=4 CON/COV	TSH BLSP MOSI N=4 CON/COV	TSHE POMU N=5 CON/COV									
HERBS cont.																				
Criped stellaria																				
Cutleaf goldthread																				
Dwarf twisted-stalk																				
False-lily-of-the-valley	50	1	100	5	25	3	40	1	22	1	14	1	25	1	75	1				
Fringed pinesap																				
Goatsbeard																				
Heart-leaf twayblade	50	1	50	1	13	1	13	1	22	1			17	1						
Hooker's fairybells																				
Indianpipe																				
Inside-out flower																				
Mexican botony																				
Northwestern twayblade																				
Oregon bedstraw					4	1	7	1							50	1	40	1		
Oregon oxalis					21	1	13	3	22	1	100	25	100	61	10	26	20	1		
Pacific trillium	25	1	100	1	8	1	60	1	44	1	57	1	75	1	10	1	75	1	60	1

TSHE/MEFE-BLSP

Western hemlock/fool's huckleberry-deerfern

Vegetation

Understory Species: This association is similar to the TSHE/BLSP-MOSI association, except that it lacks sweetscented bedstraw (GATR) and candyflower (MOSI) in the herb layers. The shrub layer consists of salal (GASH), fool's huckleberry (MEFE), Alaska huckleberry (VAAL), and red huckleberry (VAPA) in low coverage. The herb layer is quite sparse, and may include clasping-leaved twisted-stalk (STAM), woodnymph (PYUN), smallflowered woodrush (LUPA), Smith's fairybells (DISM), and Pacific trillium (TROV). Deerfern (BLSP) and swordfern (POMU) show up consistently, with moderate coverage. Feathermoss (EUOR5), flat moss (PLUN5) and wire moss (RHL05) are common mosses on this site type.

Common and/or important understory species In order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=9

Cons. % Species	Average Cover Percent					
	0- 1	>1- 5	>5- 25	>25- 50	>50- 75	>75 100
100 Deerfern					X	
100 Feathermoss				X		
100 Red huckleberry		X				
100 Salal		X				
100 Swordfern				X		
89 Alaska huckleberry				X		
89 Flat moss				X		
89 Fool's huckleberry	X					
89 Smith's fairybells	X					
44 Pacific trillium	X					
22 Oregon oxalis	X					
11 Skunk cabbage	X					

TSHE/GASH-OXOR
Western hemlock/salal-Oregon oxalis

Vegetation

Understory Species: While very similar to both the TSHE/DRAU2OXOR and TSHE/ACCI-OXOR associations, this association generally has higher coverage of salal (GASH) than the TSHE/ORAU2-OXOR association and has less of the vine maple (ACCI) which distinguishes the TSHE/ACCI-OXOR association. The shrub layer is characterized by moderate to high coverage of salal (GASH), low coverage of salmonberry (RUSP), and variable coverage of fool's huckleberry (MEFE), huckleberry (VAAL), and red huckleberry (VAPA). Moderate to high coverage of Oregon oxalis (OXOR) is the dominant feature of the herb layer, which may also include trace amounts of three-leaved foamflower (TITR), Smith's fairybells (DISM) and Pacific trillium (TROV). Deerfern (BLSP) and swordfern (POMU) are common in the fern layer in moderate coverage, and shield fern (DRAU2) and ladyfern (ATFI) may also appear with trace coverage. Feathermoss (EUOR5) and flat moss (PLUN5) are common in the understory, and silkmoss (PLSC5) may also show up.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=7

Cons.	Average Cover Percent					
	0-	>1-	>5-	>25-	>50-	>75
% Species	1	5	25	50	75	100
100 Deerfern			X			
100 Feathermoss			X			
100 Flatmoss		X				
100 Oregon oxalis				X		
100 Red huckleberry			X			
100 Salal				X		
100 Swordfern			X			
86 Alaska huckleberry			X			
86 Fool's huckleberry			X			
86 Salmonberry		X				
71 Smith's fairybells		X				
57 Pacific trillium		X				
14 Skunk cabbage		X				
14 Vine maple		X				

SPECIES	TSHE POMU N=5 COV	TSHE RUSP MOSI N=4 COV	TSHE ACCI OXOR N=4 COV	TSHE OXOR DRAU2 N=12 COV	TSHE GASH OXOR N=7 COV	TSHE MEFE BLSP N=9 COV	TSHE GASH DISM N=15 COV	TSHE GASH N=24 COV	TSHE GASH LYAM N=4 COV	PISI GASH N=4 COV	PISI GASH MEFE N=4 COV
	COV	COV	COV	COV	COV	COV	COV	COV	COV	COV	COV
SFRUBS cont.											
Silka mountain ash									25		
Stink currant								4			
Tail oregonrape							7				
Thimbleberry				8			7				
Trailing blackberry							7			25	
Vine maple							7				
Western crabapple							4		25		
HERBS							3		50		
Alpine mitrewort											
Backwood violet											
Baneberry											
Bellflower											
Bleeding heart										25	
Broad-leaved starflower											50

SPECIES	PISI GASH MEFE N=4 CONCOV	PISI GASH LYAM N=4 CONCOV	TSHE GASH DISM N=15 CONCOV	TSHE MEFE BLSP N=9 CONCOV	TSHE GASH OXOR N=7 CONCOV	TSHE OXOR DRAU2 N=12 CONCOV	TSHE ACCI OXOR N=4 CONCOV	TSH BLSP MOSI N=4 CONCOV	TSHE POMU N=5 CON COV
SHRUBS cont.									
Evergreen huckleberry	25 1	4 1							
Five-leaved bramble		100 2							
Fool's huckleberry	100 9	100 8	87 6	89 4	86 8	67 3	75 1	100 2	60 1
Oregongrape			25 5						20 1
Oval-leaf huckleberry		29 7				3 2			20 1
Prince's pine									
Red elderberry			7 1			17 2		25 1	
Red huckleberry	100 8	75 1	100 6	100 4	100 9	100 6	75 6	100 2	100 1
Red-osier dogwood									
Rubus sp.								25 1	20 1
Salal	100 50	100 39	100 26	100 2	100 28	92 1	10 5	100 1	80 1
Salmonberry	75 1	50 8	60 1	67 2	86 1	83 3	50 8	75 2	40 1
Sitka mountain ash		25 1							
Slink currant		4 1							
Tail oregongrape			7 3						
Thimbleberry			7 1			8 1			

TSHE/DRAU2-OXOR
Western hemlock/shield fern-Oregon oxalis

Vegetation

Understory Species: This association is very similar to the TSHE/GASH-OXOR and TSHE/ACCI-OXOR associations, but is distinguished from the TSHE/GASH-OXOR association because it has only trace amounts of salal (GASH), and from the TSHE/ACCI-OXOR association because it has little vine maple (ACCI). The shrub layer may support variable coverage of Alaska huckleberry (VAAL), red huckleberry (VAPA), fool's huckleberry (MEFE), and salmonberry (RUSP). The herb layer is dominated by high coverage of Oregon oxalis (OXOR) and may have traces of smallflowered woodrush (LUPA), three-leaved foamflower (TITR), Smith's fairybells (DISM), and Pacific trillium (TROV). Swordfern (POMU) is present with moderate to high coverage, shield fern (DRAU2) has low coverage, and deerfern (BLSP) coverage is variable. Coverage of feathermoss (EUOR5) can be high, and flat moss (PLUN5) and wire moss (RHL05) are also common.

Common and/or Important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N-12

Cons. % Species	Average Cover Percent					
	0-1	1-5	>5-25	>25-50	>50-75	>75-100
100 Deerfern		X				
100 Feathermoss			X			
100 Flat moss		X				
100 Oregon oxalis					X	
100 Red huckleberry			X			
100 Swordfern					X	
92 Salal		X				
92 Shield fern		X				
83 Alaska huckleberry		X				
83 Ladyfern		X				
83 Salmonberry		X				
75 Pacific trillium		X				
75 Wire moss			X			
67 Fool's huckleberry		X				
67 Smith's fairybells		X				
50 Candyflower		X				
8 Vine maple		X				

TSHE/ACCI-OXOR

Western hemlock/vine maple-Oregon **oxalis**

Vegetation

Understory Species: This association is separated from the TSHE/DRAU2-OXOR -and TSHE/GASH-OXOR associations by the presence (above trace coverage) of vine maple (ACCI), which may occupy gaps in the canopy. The shrub layer supports variable coverage of salal (GASH), fool's huckleberry (MEFE) and huckleberry (VAAL). Red huckleberry (VAPA) was absent from the four plots sampled. The only forb with significant coverage is Oregon oxalis (OXOR), but Pacific trillium (TROV), Smith's fairybells (DISM), and smallflowered woodrush (LUPA) may show up with trace to low coverage. Swordfern (POMU) and deerfern (BLSP) coverage are moderate to high. Ladyfern (ATFI) may be present in trace amounts. Feathermoss (EUOR5), stepmoss (HYSP5), and wire moss (RHL05) are the most common moss species for this site type.

Common and/or Important understory species-in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary Indicators for the association bold.) N=4

Cons.	Average Cover Percent					
	0-1	>1-5	>5-25	>25-50	>50-75	>75
% Species	1	5	25	50	75	100
100 Deerfern			X			
100 Feathermoss			X			
100 Oregon oxalis				X		
100 Pacific trillium	X					
100 Salal		X				
100 Stepmoss	X					
100 Swordfern				X		
100 Vine maple			X			
75 Fool's huckleberry	X					
75 Smallflowered woodrush	X					
75 Wire moss	X					
50 Smith's fairybells	X					
25 Bedstraw sp.	X					
25 Candyflower	X					
25 Skunk cabbage	X					
25 Sweetscented bedstraw	X					

SPECIES	PISI GASH MEFE N=4 CON/ COV	PISI GASH N=4 CON/ COV	TSHE GASH LYAM N=4 CON/ COV	TSHE GASH N=24 CON/ COV	TSHE GASH DISM N=15 CON/ COV	TSHE MEFE BLSP N=9 CON/ COV	TSHE GASH OXOR N=7 CON/ COV	TSHE OXOR DRAU2 N=12 CON/ COV	TSHE ACCI OXOR N=4 CON/ COV	TSH BLSP MOSI N=4 CON/ COV
TREES										
Big leaf maple										
Douglas fir	25	15		7	3		14	63		25
Pacific silver fir			25	3	4	3				
Pacific yew			50	9						
Red alder					25	1				
Sitka spruce	100	8	75	15						
Western hemlock	100	49	100	74	100	81	100	78	100	80
Western red cedar	25	38		8	26	8	14	15	25	3
Willow sp.										
SHRUBS										
Alaska huckleberry	75	11	100	15	88	8	86	9	83	2
Baldhip rose										
Cascara			50	8	100	6			50	1
Devil's club							14	1	8	1

SPEICES	ABAMC OCA N=2 CONCOV	ABAMV AAL N=5 CONCOV	ABAM OXOR CLUN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEFAUPE N=13 CONCOV	ABAM GASH LYAM N=3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYPI N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLSP POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=6 CONCOV
MOSES cont.												
Hairmoss			4	1	9	1	67	2	38	1	75	50
Leaf moss			8	1	9	1	67	9	75	1	100	83
Licorice fern			4	1			10	1			25	1
Liverwort sp.			8	1	9	1	67	9	38	1	75	67
Palmtree moss									13	15	25	1
Pipecleaner moss												
Stepmoss		20	15		36	5	100	11	75	3	50	2
Wiremoss		80	3	46	7	91	67	2	90	14	75	1
GRASSES & GRASS LIKE PLANTS												
Grass sp.		40	1	27	1	18	100	1	25	1	75	50
Sedge sp.											25	1
Smallflower woodrush		50	1	46	1	36	33	1	88	1	100	67
Soft rush												17

TSHE/BLSP-MOSI
Western hemlock/deerfern-candyflower

Vegetation

Understory Species: This association is very similar to the TSHE/MEFE-BLSP association, but is characterized by the presence of sweetscented bedstraw (GATR) and candyflower (MOSI), which may indicate some degree of disturbance to the forest floor. The shrub component consists of trace to low coverage of salal (GASH), fool's huckleberry (MEFE), Alaska huckleberry (VAAL), red huckleberry (VAPA), and salmonberry (RUSP). False lily-of-the-valley (MAD12), clasping-leaved twisted-stalk (STAM), woodnymph (PYUN), smallflowered woodrush (LUPA), three-leaved foarnflower (TITR), Smith's fairybells (DISM), candyflower (MOSI), and sweetscented bedstraw (GATR) may be present with trace to low coverage. Swordfern (POMU) tends to have fairly high coverage, deerfern (BLSP) has moderate to low coverage, and shield fem (DRAL12) and ladyfern (ATFI) have trace to low coverage. Feathermoss (EUOR5), flat moss (PLUN5), PLIN5, stepmoss (HYSP5), and wire moss (RHL05) are all common mosses for this site type, with variable coverage.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary Indicators for the association bold.) N=4

Cons. % Species	Average Cover Percent					
	0- 1	>1- 5	>5- 25	>25- 50	>50- 75	>-75 100

100 Candyflower						X
100 Clasping-leaved twisted-stalk						X
100 Deerfern						X
100 Feathermoss						X
100 Flat moss						X
100 Fool's huckleberry						X
100 Ladyfern						X
100 Leafmoss						X
100 Red huckleberry						X
100 Salal			X			
100 Smallflowered woodrush						X
100 Smith's fairybells						X
100 Sweetscented bedstraw			X			
100 Swordfern						X
100 Three-leaved foamflower						X
75 Pacific trillium						X

TSHE/POMU
Western hemlock/swordfern

Vegetation

Understory Species: There is nothing particularly distinctive about this site type, except that it has trace to low coverage of all species, except for swordfern (POMU), which had significant coverage on three of five plots and trace coverage on the other two. Species to be expected in the shrub layer are fool's huckleberry (MEFE), red huckleberry (VAPA), and salal (GASH). Common species for the herb layer include Pacific trillium (TROV) and Smith's fairybells (DISM). In addition to the swordfern (POMU), deerfern (BLSP) and shield fern (DRAU2) are commonly present in the fern component. Feathermoss (EUOR5) and flat moss (PLUN5) appear regularly in the moss layer.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary Indicators for the association bold.) N=5

	Average Cover Percent						
	Cons.	0- 1	>1- 5	>5- 25	>25- 50	>50- 75	>75 100
% Species		1	5	25	50	75	100

100 Deerfern	X						
100 Feathermoss	X						
100 Flat moss	X						
100 Red huckleberry	X						
100 Swordfern				X			
80 Salal	X						
60 Fool's huckleberry	X						
60 Pacific trillium	X						
60 Shield fern	X						
60 Smith's fairybells	X						
40 Candyflower	X						
20 Oregon oxalis	X						

SPECIES	ABAM COCA N=2 CONCOV	ABAM VIAL N=5 CONCOV	ABAM OXOR CLUN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEPAUPE N=13 CONCOV	ABAM GASH LYAM N=3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYPI N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLSP POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=6 CONCOV
	FERNS & ALLIES											
Bracken fern							5	1				
Brittle bladderfern		20										
Deerfern	10	15	60	2	92	4	100	10	100	3	100	15
Lady fern	50	1	20	1	73	2	15	1	75	1	75	1
Maidenhair fern											25	1
Oak fern				4	3							
Oregon selaginella							10	1				
Running pine	50	3	15	2	18	1	18	2				
Shield moss			45	1	73	1	15	1	88	1	100	1
Swordfern			77	9	91	20	75	1	100	13	100	15
MOSSES												
Common sphagnum												83
Dicranumsp.							25	1	75	1	25	1
Feather moss	50	1	80	1	69	4	100	14	100	8	100	2
Flat moss			100	1	73	4	100	3	100	1	100	9
Haircap moss			20	1	27	3	25	1	50	1	100	3

Species	ABAM COCA N=2 CONCOV	A BAM VAAL N=5 CONCOV	ABAM OXOR CLUN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEP/AUFE N=13 CONCOV	ABAM GASH LYAM N=3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYP1 N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLS P POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=6 CONCOV
HERES conil.												
Starry false sdtomon's seal	10 3		38 2					8 1			25 1	
Sticky purple geranium			4 1									17 1
Stream violet			4 1	9 1								
Sweet cicely			31 1									
Sweetscented bed straw			20 1		8 1				63 1			17 1
Three-leaved foalflower	10 2	60 1	85 1	82 1	54 1	33 3	15 1	9 1	75 1	50 1	50 1	67 1
Trail plant			4 1									
Twinnflower	10 19	20 1	4 1		15 1	67 9						
Vanilla leaf			42 3		15 1				13 3		25 1	
Wall lettuce		20 1	4 1	9 1	15 1			9 1	38 1		75 1	
Water parsley												17 1
Western white anemone			8 1									
White-flowered hawkweed	50 1	20 1	15 1	18 1	8 1		5 1					
White-veined pyrrola	50 1	60 1	42 1	18 1	31 1		5 1	82 1				
Woodthymph		80 1	23 1	18 1	54 1		15 1	36 1	25 1		25 1	33 1
Yellow Mimulus			12 1		8 1							

PISI/OXOR
Sitka spruce/Oregon oxalis

Vegetation

Understory Species: The shrub layer on this association is relatively sparse, with possible low coverage of red huckleberry (VAPA), fool's huckleberry (MEFE), salal (GASH) and salmonberry (RUSP). In the herb layer the most outstanding feature is consistently high coverage of Oregon oxalis (OXOR), which distinguishes this site type from all others in the sitka spruce (PISI) zone. Other forb may include candyflower (MOSI), Smith's fairybells (DISM), Pacific trillium (TROV), and three-leaved foarnflower (TITR) all with relatively low coverage. Swordfern (POMU) and shield fern (DRAU2) are well represented with variable coverage, and deerfern (BLSP) is present with low coverage. Feathermoss (EUOR5) and flat moss (PLUN5) are present with variable coverage.

Common and/or important understory species in or der of decreasing constancy with expected coverage range on the plots where they occur. (Primary Indicators for the association bold.) N=8

Cons.	Average Cover Percent					
	0-1	>1-5	>5-25	>25-50	>50-75	>75-100

100 Deerfern		X				
100 Feathermoss			X			
100 Flat moss		X				
100 Oregon oxalis					X	
100 Swordfern			X			
88 Red huckleberry		X				
88 Salmonberry		X				
88 Shield fern		X				
88 Smallflowered woodrush		X				
88 Smith's fairybells		X				
38 Fool's huckleberry		X				
38 Salal		X				
13 Skunk cabbage		X				

PISI/BLSP-POMU
Sitka spruce-deerfern-swordfern

Vegetation

Understory Species: This association is distinguished from the PISI/OXOR association by lower coverage of Oregon **Oxalis** (**OXOR** and higher coverage of deerfern (BLSP). Fool's huckleberry (MEFE), red huckleberry (VAPA), and salmonberry (RUSP) dominate the shrub component of this association, the red huckleberry (VAPA) with generally higher coverage than is seen in the PISI/OXOR association. Coverage of forb is uniformly low, with Oregon oxalis (OXOR) having the highest coverage. Candyflower (MOSI), clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), Smith's fairybells (DISM), and three-leaved foamflower (TITR) are all possible with low coverage on these sites. Deerfern (BLSP) and swordfern (POMU) are common with moderate coverage, and shield fern (DRAU2) is present with low coverage. The moss component of this association includes feathermoss (EUOR5), flat moss (PLUN5), haircap moss (POJU5), and stepmoss (HYSP5), with low to moderate coverage.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=2

Cons. % Species	Average Cover Percent					
	0-1	>1-5	>5-25	>25-50	>50-75	>75-100
100 Deerfern			X			
100 Feathermoss		X				
100 Flat moss			X			
100 Fool's huckleberry		X				
100 Haircap moss		X				
100 Oregon oxalis		X				
100 Red huckleberry			X			
100 Salmonberry		X				
100 Shield fern		X				
100 Smallflowered woodrush		X				
100 Smith's fairybells		X				
100 Stepmoss		X				
100 Swordfern			X			
50 Salal		X				

Species	ABAM COCA N=2 CONCOV	ABAM VAAL N=5 CONCOV	ABAM OXOR CLUN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEPRUPE N=13 CONCOV	ABAM GASH LYAM N=3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYP1 N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLSP POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=6 CONCOV
HERBS cont.												
Pacific waterleaf									13		25	
Piggyback plant			4	1					13		25	
Pine drops		40	1									
Pine-foot					13	1						
Pinesap								9				17
Queencup bedstraw	10	9	60	2	9	1	67	1	13			
Rattlesnake plantain			4	1	9	1						
Rosy twisted-stalk			27	3								
Scouler's corydalis			4	1								
Sidebells pyrola	10	1	8	1								
Single-leaved foamflower					8	1						
Skunk cabbage						100	11	5	13	1		100
Slender boykinia	10	2	60	1	42	3	18	1				17
Smallflowered crane's bill						67	9					
Smith's fairybells	10	2	20	1	65	1	64	1	88	1	100	1
Spotted cowfoot			40	1								33

Species	ABAM COCA N=2 CONCOV	ABAM VAAL N=5 CONCOV	ABAM OXOR CLUN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEPAUPE N=15 CONCOV	ABAM GASH LYAM N=3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYPI N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLSP POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=6 CONCOV
Herbs cont.												
Crisped stellaria				9 1								
Cutleaf goldthread						15 1						
Dwarf twisted-stalk	40 2		27 1									
False-lily-of-the-valley	10 15	60 5	77 4	55 3	31 1	100 2	25 1	9 1	38 1	50 1	100 1	67 1
Fringed pinesap			4 1									
Goats beard			4 1									
Heart-leaf twayblade	50 1	60 1	19 1		31 1	33 1	10 1	46 1				17 1
Hooker's fairybells			4 1									
Indianpipe		20 1			8 1			9 1	13 1			
Inside-out flower									13 1		25 1	50 1
Mexican betony									25 1			
Northern stellaria												17 1
Northwest twayblade												
Oregon bedstraw									25 1		25 1	33 1
Oregon oxalis	50 15	60 2	100 46	100 14	69 1		15 6	64 11	100 62	100 3	50 1	17 1
Pacific trillium	10 2	40 1	77 1	36 1	62 1	33 1	20 1	73 1	75 1		100 1	33 1

PISI/POMU-TROV
Sitka spruce/swordfern-Pacific trillium

Vegetation

Understory Species: Coverages on this association are low in all but the fern layer. In the shrub layer, red huckleberry (VAPA) and salal (GASH) are present with trace coverages. The forb layer is equally sparse, with false lily-of-the-valley (MAD12), Pacific trillium (TROV), and Smith's fairybells (DISM) appearing consistently but with very low coverage. Swordfern (POMU) coverage is moderate to high, and deerfern (BLSP), ladyfern (ATFI), and shield fern (DRAU2) can be present with low coverage. Feathermoss (EUOR5), flat moss (PLUN5), and PLIN5 are also common, but sparse.

Common and/or Important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=4

Cons.	Average Cover Percent					
	0-	>1-	>5-	>25-	>50-	>75
% Species	1	5	25	50	75	100

- 100 False lily-of-the-valley** X
- 100 Feathermoss X
- 100 Flat moss X
- 100 Leafmoss X
- 100 Pacific trillium** X
- 100 Red huckleberry X
- 100 Shield fern X
- 100 Smith's fairybells** X
- 100 Swordfern** X
- 75 Deerfern X
- 75 Fool's huckleberry X
- 75 Salal X
- 50 Oregon oxalis X
- 25 Salmonberry X

PISI/GASH-LYAM

Sitka spruce/salal-skunk cabbage

Vegetation

Understory Species: This association is distinguished by having the only significant skunk cabbage (LYAM) coverage in the sitka spruce (PISI) zone. The shrub layer includes Alaska huckleberry (VAAL), fool's huckleberry (MEFE), red huckleberry (VAPA), salal (GASH), salmonberry (RUSP); fool's huckleberry (MEFE) and salal (GASH) which can have high coverage. A variety of mesic forb can show up in the understory, typically with low coverage. These can include clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), inside-out flower (VAHE), and three-leaved foamflower (TITR). Swordfern (POMU) can be present, but is likely to have fairly low coverage. Deerfern (BLSP) and ladyfern (ATFI) may also appear, with variable coverage. Common sphagnum (SPCA5) is common in the moss layer, with higher coverage than is seen on other associations in the sitka spruce (PISI) zone. Flat moss (PLUN5), feathermoss (EUOR5), haircap moss (POJU5), stepmoss (HYSP5), and wire moss (RHL05) are also common.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary Indicators for the association bold.) N=6

Cons.	Average Cover Percent					
	0- % Species	>1-	>5-	>25-	>50-	>75
	1	5	25	50	75	100
100 Alaska huckleberry			X			
100 Deerfern			X			
100 Fool's huckleberry			X			
100 Red huckleberry		X				
100 Salal				X		
100 Skunk cabbage			X			
100 Stepmoss			X			
100 Wire moss		X				
83 Clasping-leaved twisted-stalk		X				
83 Common sphagnum			X			
83 Dicranum sp.		X				
83 Flat moss		X				
83 Haircap moss		X				
83 Ladyfern		X				
83 Leafmoss		X				
83 Salmonberry			X			
50 Swordfern		X				
17 Oregon oxalis		X				

Species	ABAM COCA N=2 CONCOV	ABAM VAAL N=5 CONCOV	ABAM OXCR CLLN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEPALPE N=15 CONCOV	ABAM GASH LYAM N3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYPI N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLSP POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=2 CONCOV
SHRUBS cont.												
Trailing blackberry				9	1	15	5	1	50	1	50	1
Vine maple		20	3	9	1	8			23	19		
Western crabapple												
Herbs												
Alpine mitrewort			4	1								
Backwoods violet	10	9	20	1	27	1		18	2			
Baneberry				4	1							
Bellflower				4	1							
Bleeding heart				15	2			9	1	13	1	
Broad-leaved strawberry						8	1					
Bunchberry	10	15	40	1	9	1			13	1	50	1
Candyflower		60	1	64	1	23	1	18	1	63	1	50
Clasping-leaved twisted-silk	10	2	40	1	31	1	25	1	9	1	25	1
Collisfoot				4	1	33	1					
Codley hedge-nettle											25	3
Corallroot sp.							5	1				

Species	ABAM COCA N=2 CONCOV	ABAM VAAL N=5 CONCOV	ABAM OXOR CLUN N=26 CONCOV	ABAM GASH OXOR N=11 CONCOV	ABAM DEPAJPE N=15 CONCOV	ABAM GASH LYAM N=3 CONCOV	ABAM GASH N=20 CONCOV	ABAM GASH PYPI N=11 CONCOV	PISI OXOR N=8 CONCOV	PISI BLSP POMU N=2 CONCOV	PISI POMU TROV N=4 CONCOV	PISI GASH LYAM N=6 CONCOV
SHURBS.com												
English holly										25	1	
Evergreen huckleberry												
Five-leaved bramble	50	15						9	1			17
Fool's huckleberry	10	8	4	15	2	4	100	27	5	38	1	100
Oregon grape			4	1	9	1		45	9			
Oval-leaf huckleberry			8	1	18	2		20	1			
Prince's pine			4	1								17
Red elderberry			27	1	23	1			25	1		
Red huckleberry	10	33	88	6	100	7	96	4	100	8	100	9
Red-osier dogwood										9	1	
Salal					40	2	100	38	1	50	1	7
Salmonberry	50	1	62	1	54	1	55	1	18	1	100	25
Sitka mountain ash												83
Stink current		20	1									
Tall oregon grape												
Thimbleberry			4	3								

PISI/GASH-MEFE
Sitka spruce/salal-fool's huckleberry

Vegetation

Understory Species: The absence of skunk cabbage (LYAM) is the primary feature that separates this association from the PISI/GASH-LYAM association. The relatively high coverage of fool's huckleberry (MEFE) separates it from the PISI/GASH association. Fool's huckleberry (MEFE), red huckleberry (VAPA), salal (GASH) and salmonberry (RUSP) occupy the shrub layer, salal (GASH) can have high coverage. The herb layer is similar to the PISI/GASH-LYAM association, with clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), Smith's fairybells (DISM), and three-leaved foamflower (TITR) common with low coverage. Deerfern (BLSP) can have moderate coverage, and swordfern (POMU) may also be present. Moss cover consists of feathermoss (EUOR5), flat moss (PLUN5), PLIN5, wire moss (RHLO5) and possibly stepmoss (HYSP5). Moss coverage is quite variable.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=4

Cons.	Average Cover Percent					
	0-	>1-	>5-	>25-	>50-	>75-
% Species	1	5	25	50	75	100
100 Deerfern						X
100 Dicranum sp.		X				
100 Feathermoss		X				
100 Flat moss		X				
100 Fool's huckleberry				X		
100 Leafmoss				X		
100 Red huckleberry				X		
100 Salal						X
100 Wire moss			X			
75 Clasping-leaved twisted stalk		X				
75 Salmonberry		X				
50 False lily-of-the-valley		X				
50 Swordfern		X				
50 Smith's fairybells		X				
50 Three-leaved foamflower		X				

PISI/GASH
Sitka spruce/salal

Vegetation

Understory Species: Low coverage of fool's huckleberry (MEFE) and the absence of skunk cabbage (LYAM) separate this association from the PISI/GASH-LYAM and PISI/GASH-MEFE associations. Red huckleberry (VAPA) and salal (GASH) may have moderate coverage, and salmonberry (RUSP) and red elderberry (SARA) may also be present with fairly low coverage. Coverage in the herb layer is mostly low, though false lily-of-the-valley (MAD12) may have moderate coverage, and two of the five plots sampled had twinflower (LIB02) with coverage of a few percent. Other forb likely to appear are Pacific trillium (TROV), heartleaf twayblade (LICA3), and Smith's fairybells (DISM). bracken fern (PTAQ), deerfern (BLSP), and swordfern (POMU) are all common with moderate coverage. Feathermoss (EUOR5) and stepmoss (HYP5) may have high coverage, and flat moss (PLUN5) and wire moss (RHL05) are also common on this association.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=4

Cons.	Average Cover Percent					
	0- % Species	>1- 5	>5- 25	>25- 50	>60- 75	>75 100
100 Red huckleberry			X			
100 Salal			X			
100 Pacific trillium		X				
100 Smith's fairybells		X				
100 Deerfern			X			
100 Swordfern			X			
100 Feathermoss				X		
100 Flat moss		X				
100 Wire moss		X				
75 False lily-of-the-valley			X			
76 Fool's huckleberry		X				
75 Salmonberry		X				

Species	ABAM COCA N=2 CON/COV	ABAM VAAL N=5 CON/COV	ABAM OXOR CLUN N=26 CON/COV	ABAM GASH OXOR N=11 CON/COV	ABAM DEPAUPE N=13 CON/COV	ABAM GASH LYAM N=3 CON/COV	ABAM GASH N=20 CON/COV	ABAM GASH PYPI N=11 CON/COV	PISI OXOR N=8 CON/COV	PISI BLSP POMU N=2 CON/COV	PISI POMU TROV N=4 CON/COV	PISI GASH LYAM N=6 CON/COV
TREES.												
Big-leaf maple									38	23	50	8
Douglas fir									50	21	15	23
Pacific silver fir	10	39	100	43	20	3	20	3				17
Pacific yew												15
Red alder												
Sitka spruce									75	21	75	11
Western hemlock	10	15	100	41	100	38	100	65	100	13	100	15
Western red cedar	10	26	20	15	8	1	100	38	20	18	9	50
Willow sp.												19
SHRUBS												
Alaska huckleberry	10	39	100	38	77	2	100	23			50	3
Baldhip rose												100
Cascara												50
Devils club	50	1										1
Dwarf bramble	50	3										1
English holly												25

ABAM/GASH-PYPI
Silver fir/salal-white veined pyrola

Vegetation

Understory Species: This site type is very similar to the ABAM/GASH type, and is separated from this type by combined coverage of Oregongrape (BENE), Pacific trillium (TROV), and white-veined pyrola (PYPI). See ABAM/GASH description.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.)
N=11

Cons.	Average Cover Percent					
	0-	>1-	>5-	>25-	>50-	>75
%Species	1	5	25	50	75	100
100 Deerfern		X				
100 Red huckleberry			X			
100 Salal				X		
82 Feathermoss			X			
82 White-veined pyrola		X				
73 Pacific trillium		X				
64 Alaska huckleberry		X				
64 Oregon oxalis			X			
45 Oregongrape			X			
18 Backwoods violet		X				
9 False lily-of-the-valley		X				

ABAM COCA
Silver fir/bunchberry

Vegetation

Understory Species: Like all associations in the silver fir (ABAM) zone, the huckleberries and fool's huckleberry (MEFE) have consistent and often high coverage. Salal (GASH) is notably absent from these plots, and other shrubs have sporadic occurrence. Perhaps the distinguishing features of this association are high coverage of both bunchberry (COCA) and false lily-of-the-valley (MAD12) combined with the absence of salal (GASH). Five-leaved bramble (RUPE) only occurred on 1 of 2 plots in this association but had the highest single coverage of any of the plots sampled. Five-leaved bramble (RUPE) is a common associate with bunchberry (COCA) on cool sites with tendencies for shorter growing seasons. The herb layer supports a rich array of lilies, including starry false solomon's seal (SMST), queencup beadlily (CLUN), false lily-of-the-valley (MAD12), Pacific trillium (TROV), Smith's fairybells (DISM), and clasping-leaved twisted-stalk (STAM), whose coverages are variable. Other common forb on these sites are bunchberry (COCA), with high coverage, twinflower (LIB02), and backwood's violet (VIOR2). Deerfern (BLSP) is common, and is the only fern likely to have high coverage on these sites. Wire moss (RHL05) may have fairly high coverage, and feathermoss (EUOR5) may also occur.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=2

Cons.	Average Cover Percent					
	0-	>1-	>5-	>25-	>50-	>75
% Species	1	5	25	50	75	100
100 Alaska huckleberry						X
100 Backwoods violet				X		
100 Bunchberry				X		
100 Clasping-leaved twisted-stalk		X				
100 Deerfern -				X		
100 False lily-of-the-valley				X		
100 Fool's huckleberry				X		
100 Pacific trillium		X				
100 Queencup beadlily				X		
100 Red huckleberry						X
100 Smith's fairybells		X				
100 Twinflower				X		
50 Five-leaved bramble				X		
50 Oregon oxalis				X		
50 White-veined pyrola		X				

ABAMVAAL
Silver fir/Alaska huckleberry

Vegetation

Understory Species: Perhaps the most outstanding feature of this association is consistently high Alaska huckleberry (VAAL) coverage. Other shrubs include red huckleberry (VAPA) with variable coverage and occasional low coverage of salal (GASH) and fool's huckleberry (MEFE). Among the herbs, Oregon oxalis (OXOR), queencup beadlily (CLUN), and false lily-of-the-valley (MAD12) may occur with moderate coverage. Woodnymph (PYUN) shows up consistently with low coverage. Deerfern (BLSF) is the most common fern, with ladyfern (ATFI) and swordfern (POMU) occurring occasionally with low coverage. Feathermoss (EUOR5), flat moss (PLUN5) and wire moss (RHL05) are present fairly consistently, and can have high coverage.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=5

Cons.	Average Cover Percent					
	0- 1	>11- 5	>5- 25	>25- 50	>50- 75	>75 100
100 Alaska huckleberry				X		
100 Flat moss		X				
100 Red huckleberry			X			
80 Feathermoss		X				
80 Woodnymph		X				
60 Deerfern		X				
60 False lily-of-the-valley			X			
60 Five-leaved bramble		X				
60 Oregon oxalis		X				
60 Queencup beadlily		X				
60 Slender boykinia		X				
60 Three-leaved foarnflower		X				
60 White-veined pyrola		X				
40 Bunchberry		X				
40 Pacific trillium		X				
40 Salal		X				
20 Backwoods violet		X				
20 Stepmoss			X			

ABAMGASH
Silver fir/salal

Vegetation

Understory Species: Relatively high salal (GASH) coverage is typical of this **site type, combined** with varying amounts of Alaska huckleberry (VAAL), red huckleberry (VAPA), and fool's huckleberry (MEFE). Oregongrape (BENE) is absent. In the herb layer, low coverage of many mesic species are possible, such as clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), and Pacific trillium (TROV). Deerfern (BLSF) and swordfern (POMU) are common, as are feathermoss (EUOR5), flat moss (PLUN5) and wire moss (RHL05). These sites are somewhat delicately distinguished from ABAM/GASH-PYPI sites by trace amounts of white-veined pyrola (PYPI) and Pacific trillium (TROV) (which may occur on ABAM/GASH sites and usually occur on ABAM/GASH-PYPI sites) and trace amounts of Oregongrape (BENE) (which may occur on ABAM/GASH-PYPI sites but doesn't occur on ABAM/GASH sites).

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=20

Cons.	Average Cover Percent					
	0- 1	>1- 5	>5- 25	>25- 50	>50- 75	>75 100
100 Deerfern					X	
100 Feathermoss					X	
100 Flat moss		X				
100 Salal					X	
95 Red huckleberry		X				
90 Alaska huckleberry					X	
90 Wire moss					X	
75 Swordfern		X				
70 Fool's huckleberry		X				
25 False lily-of-the-valley		X				
20 Pacific trillium		X				
15 Oregon oxalis					X	
5 Skunk cabbage					X	
5 White-veined pyrola		X				

ABAM/GASH-LYAM
Silver fir/salal-skunk cabbage

Vegetation

Understory Species: These sites tend to have a fairly rich shrub component, including Alaska huckleberry (VAAL), cascara (RHPU), fool's huckleberry (MEFE), red huckleberry (VAPA) and salal (GASH) with mostly moderate coverage. The distinguishing characteristic of this site type is the moderate coverage of skunk cabbage (LYAM). Other site types may have <1 percent skunk cabbage (LYAM), but this site type will always have a low to moderate coverage. Other forb include such mesic species as bunchberry (COCA), clasping-leaved twisted-stalk (STAM), false lily-of-the-valley (MAD12), and deerfern (BLSP). Common sphagnum (SPCA5) is common on this site type, and may have a high coverage. Flat moss (PLUN5), feathermoss (EUOR5), and stepmoss (HYSP5) are also common with variable coverages.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=3

Cons.	Average Cover Percent					
	0- % Species	>1- 5	>5- 25	>25- 50	>50- 75	>75- 100
100 Alaska huckleberry			X			
100 Bunchberry		X				
100 Cascara			X			
100 Clasping-leaved twisted-stalk		X				
100 Deerfern			X			
100 False lily-of-the-valley		X				
100 Feathermoss			X			
100 Flat moss		X				
100 Fool's huckleberry			X			
100 Red huckleberry			X			
100 Salal			X			
100 Skunk cabbage			X			
100 Stepmoss			X			
67 Common sphagnum		X				
67 Queencup beadlily		X				
33 Pacific trillium		X				

ABAM/OXOR-CLUN
Silver fir/Oregon oxalis-queencup beadlily

Vegetation

Understory Species: The shrub layer of this association is occupied by low but fairly consistent coverage of Alaska huckleberry (VAAL), red huckleberry (VAPA), and salmonberry (RUSP). In the herb layer, Oregon oxalis (OXOR) appears consistently with high coverage. Other common forb includes false lily-of-the-valley (MAD12), Pacific trillium (TROV), queencup beadlily (CLUN), Smith's fairybells (DISM), and three-leaved foamflower (TITR). This association can be separated from the ABAM/COCA types by the low coverage and sporadic occurrence of backwood's violet (VIOR2) and less consistent, lower coverage of Alaska huckleberry (VAAL). Swordfern (POMU) may show up, sometimes with high coverage, and ladyfern (ATFI) and deerfern (BLSP) are common as well. Feathermoss (EUOR5) and flat moss (PLUN5) are likely components of the moss layer, with moderate coverage.

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=26

Cons.	Average Cover Percent					
	0- % Species	>1- 5	>5- 25	>25- 50	50- 75	>75- 100
100 Oregon oxalis						X
92 Deerfern		X				
88 Red huckleberry			X			
85 Three-leaved foamflower		X				
81 Queencup beadlily		X				
77 False lily-of-the-valley		X				
77 Pacific trillium		X				
77 Swordfern				X		
73 Ladyfern		X				
65 Smith's fairybells		X				
62 Alaska huckleberry		X				
61 Salmonberry		X				
42 White-veined pyrola		X				
23 Backwoods violet		X				
12 Bunchberry		X				
4 Oregongrape		X				

ABAM/GASH-OXOR
Silver fir/salal-Oregon oxalis

Vegetation

Understory Species: **Red huckleberry (VAPA)**, **Alaska huckleberry (VAAL)**, salmonberry (RUSP), and salal (GASH) dominate the shrub layer with variable coverage and high constancy. The most common forb are Oregon oxalis (OXOR), which occurs consistently and with high coverage, and three-leaved foamflower (TITR) and false lily-of-the-valley (MADI2) with low to moderate coverage. Swordfern (POMU) can occur with high coverage, as can deerfern (BLSP), ladyfern (ATFI) is common but typically has fairly low coverage. Feathermoss (EUOR5), flat moss (PLUN5) and wire moss (RHL05) are all well represented in the bryophyte component. These sites could be confused with the ABAM/GASH-PYPI association which has more consistent (though low) coverage of white-veined pyrola (PYPI) and less consistent, often lower coverage of salmonberry (RUSP).

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=11

Cons.	Average Cover Percent					
	0- % Species	>1- 5	>5- 25	>25- 50	>50- 75	>75- 100
100 Deerfern			X			
100 Flat moss			X			
100 Oregon oxalis				X		
100 Red huckleberry			X			
100 Salal		X				
100 Salmonberry		X				
91 Alaska huckleberry			X			
91 Swordfern			X			
91 Wire moss		X				
82 Feathermoss			X			
82 Three-leaved foarnflower		X				
65 False lily-of-the-valley		X				
36 Pacific trillium		X				
18 White-veined pyrola		X				
9 Bunchberry		X				
9 Oregongrape		X				
9 Queencup beadlily		X				

ABAM DEPAUPERATE
Silver fir depauperate

Vegetation

Understory Species: The understory of this association is typically quite sparse, with red huckleberry (VAPA) and deerfern (BLSP) having the highest potential coverage in general. Common, but with lower coverages, are queencup beadlily (CLUN), Oregon oxalis (OXOR), swordfern (POMU), Pacific trillium (TROV), Alaska huckleberry (VAAL) and salal (GASH) Feathermoss (EUOR5) and flat moss (PLUN5) may appear, with variable coverage. There may not be enough understory on these sites to allow use of the association key. If this is the case, identify the site by its location (upper slopes and ridge crests).

Common and/or important understory species in order of decreasing constancy with expected coverage range on the plots where they occur. (Primary indicators for the association bold.) N=13

Cons.	Average Cover-Percent					
	0- % Species	>1- 5	>5- 25	>25- 50	>50- 75	>75- 100
92 Deerfern						X
92 Red huckleberry						X
92 Swordfern						X
77 Alaska huckleberry						X
77 Flat moss						X
69 Feathermoss						X
69 Oregon oxalis						X
62 Pacific trillium						X
54 Salal						X
46 Queencup beadlily						X
31 False lily-of-the-valley						X
15 Oregongrape					X	
8 Bunchberry					X	