

Non-forest Plant Communities of the Northern Oregon Coast Range and Vicinity



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Plant Communities

Mesic Meadows

Roemer's fescue (*Festuca roemerii*) – coastal

Roemer's fescue – high Coast Range

Blue wild rye (*Elymus glaucus*)

Star-flowered false lily-of-the-valley – California sedge (*Maianthemum stellatum*-*Carex californica*)

Golden slenderbanner (*Thermopsis gracilis* [syn. *T. montana*])

Virginia strawberry – California oatgrass (*Fragaria virginiana*-*Danthonia californica*)

Dry Meadows

Oregon sunshine (*Eriophyllum lanatum*) – Coast Range

California fescue (*Festuca californica*)

Dry Rock Gardens

Spreading phlox (*Phlox diffusa*)—Coast Range

Wallace's spikemoss – Cascade desert parsley (*Selaginella wallacei*-*Lomatium martindalei*)

Moist Rock Gardens

Crevice alumroot-Merten's saxifrage (*Heuchera michrantha* – *Saxifraga mertensiana*)

Rusty saxifrage-short camas (*Saxifraga ferruginea*-*Camassia quamash*)

Non-Forest Plant Community Classification

Methods

Field

- 1) In 2013 – 2014, reconnaissance observations were made across non-forest habitats on FS and BLM land in the Coast Range and Cascade foothills within the Salem BLM district area for plant communities that did not fit the USFS Northwest Oregon Non-forest Plant Community guide. One area within the Eugene BLM district was surveyed in 2015. Surveys were limited to prioritized selected USGS quad maps and some additional known special habitat areas.
- 2) Plots were then placed to best represent the plant community.
- 3) Plot size was standardized where possible per habitat type: standard meadow plots were 100 m² and subsampled in six 1 m² quadrats; standard rock garden plots were 10 m² and subsampled in three 1 m² quadrats. Plot dimension or area was adjusted if required to best represent the plant community.
- 4) Sample size—the objective was to sample a minimum of 5 plots per suspected new plant community across all topographic positions observed.
- 5) Percent cover of plant species was estimated in 1 m² pvc quadrats as well as the following data: thatch, exposed rock, gravel, and bare soil. Plant species with a trace presence were recorded in the larger macroplot. Environmental data recorded for each of the sites were elevation, slope, aspect, topographic moisture class, topographic macro position class, topographic micro position class.

Data Analyses

- 1) Data—Percent cover of plants was square root transformed. The following PRISM climate data were extracted to x,y coordinate plot centers: annual precipitation; Summer, Fall, Winter, and Spring precipitation; minimum December temperature; maximum August temperature. Headload was calculated using aspect and slope, following McCune & Keon (2002).
- 2) Comparing Cascade Range and new plant community data— Data from similar plant communities in the Non-forest Plant Communities of the northern Oregon Cascades (McCain et al. 2014) were combined with the new data and analyzed with One-Way Cluster Analysis using PC-ORD software (McCune & Mefford 2002) to determine group membership of the plots.
- 3) Determining plant community groups –The new plant community dataset was run through One-Way Cluster Analysis multiple times with group selections varying from 5 to 19 groups; this procedure allows the cluster algorithm to objectively assign plots to groups based on plant community composition. The plant community group sets, from 5 to 19 plant communities, were each run through Indicator Species Analyses in PC-ORD software to get an average p-value per number of group divisions. The lowest average p-value can indicate the optimum number of groups that are contained in the dataset (McCune & Grace 2002). A final cluster analysis was run to define plant community groups, using the Sorensen distance measure and the flexible beta linkage (beta = -0.25). Indicator Species Analysis was used to identify plant species indicators for each of the communities, and these were further tested in Multiple Response Permutation Procedures analysis in PC-ORD software, which tests membership among groups (McCune & Mefford 2002). Plant community groups were named based on most significant indicator species or highest constancy in the group.

- 4) Plant community and environmental gradient relationships—The plant community data set and a secondary matrix of field collected and calculated environmental data were run through Non-metrical Multidimensional Scaling Ordination (NMS) in PC-ORD software to examine community and environmental relationships; parameters were 400 maximum iterations, 0.00001 instability criterion, 6 starting axes, 40 real runs, and 50 randomized runs. NMS graph axes were rotated to maximize environmental parameters. Plant community groups were also plotted with selected average precipitation and temperature data to further illustrate climate and plant community relationships. Environmental data were also summarized as plot averages for each community.

Results

- 1) Cascade Range vs. new plant community data—Cascade plant community plots reasonably separated from new plant community plots in cluster analysis (**Fig 1**).
- 2) New plant community groups—Indicator species analysis (ISA) initially suggested 14 plant community groups were present in the new dataset. Three groups of 'junk' plots were removed to arrive at 11 plant community groups; one of those groups was split into two groups, based on species composition and environmental parameter differences (**Fig 2**). The result is 12 plant communities that appear different than those found in the Cascades: Roemer's fescue – coastal, Roemer's fescue—high bald, blue wild rye, star-flowered lily-of-the-valley—California sedge, golden slenderbanner, California fescue, Virginia strawberry—California oatgrass, Oregon Sunshine –Coast Range, spreading phlox –Coast Range, Wallace's spikemoss—Cascade desert parsley, rusty saxifrage—short camas, crevice alumroot—wood saxifrage (**Fig 3**). ISA found indicator plant species for each group (**Table 1**). The most significant ISA indicator species for the Roemer's fescue type were those found in the coastal version of the community (**Table 1**). MRPP found all plant communities to be significantly different (**Table 2**-at end of doc).
- 3) Environmental parameters—Several plant communities were separated out into defined windows of precipitation and temperature (**Fig 4, Fig 5**).

These plant communities are draft types and review is needed to determine final defined plant communities

NEEDS FOR FINAL VERSION

- reviewed plant communities
- finalized maps with consistent text and landmarks
- compare and reference all prior plant community work
- complete NRCS soil types
- flesh out this outline, standardize formatting and write final report
- index
- key to final plant community types
- complete species constancy tables for each group in an appendix.
- literature cited
- complete pollinator and wildlife habitat importance information per type

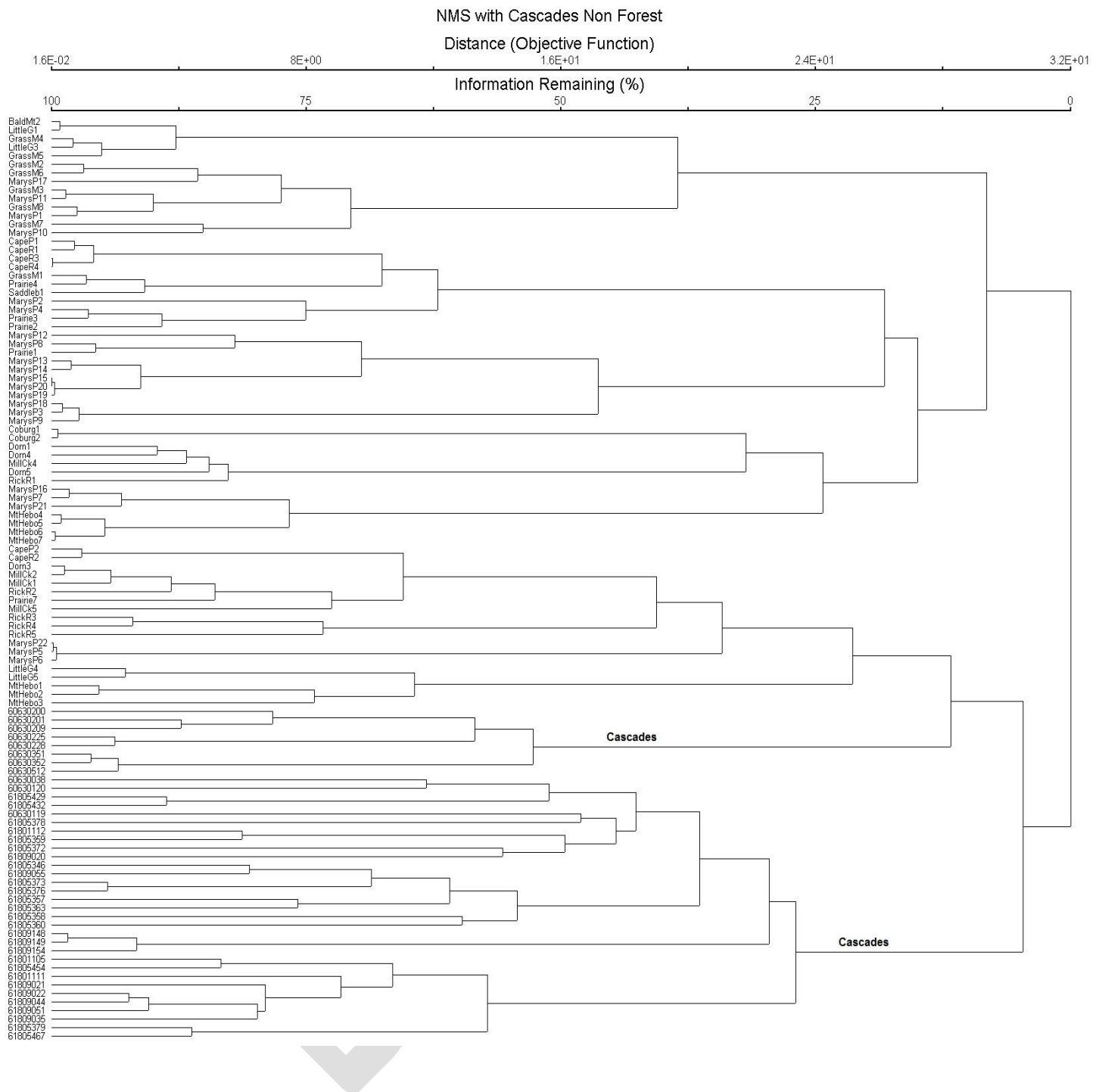


Figure 1. One-Way Cluster Analysis results of combined new non-forest and most similar Cascade Range plant community data from McCain et al. (2014). Cascade Range plots are those with eight digit plot numbers.

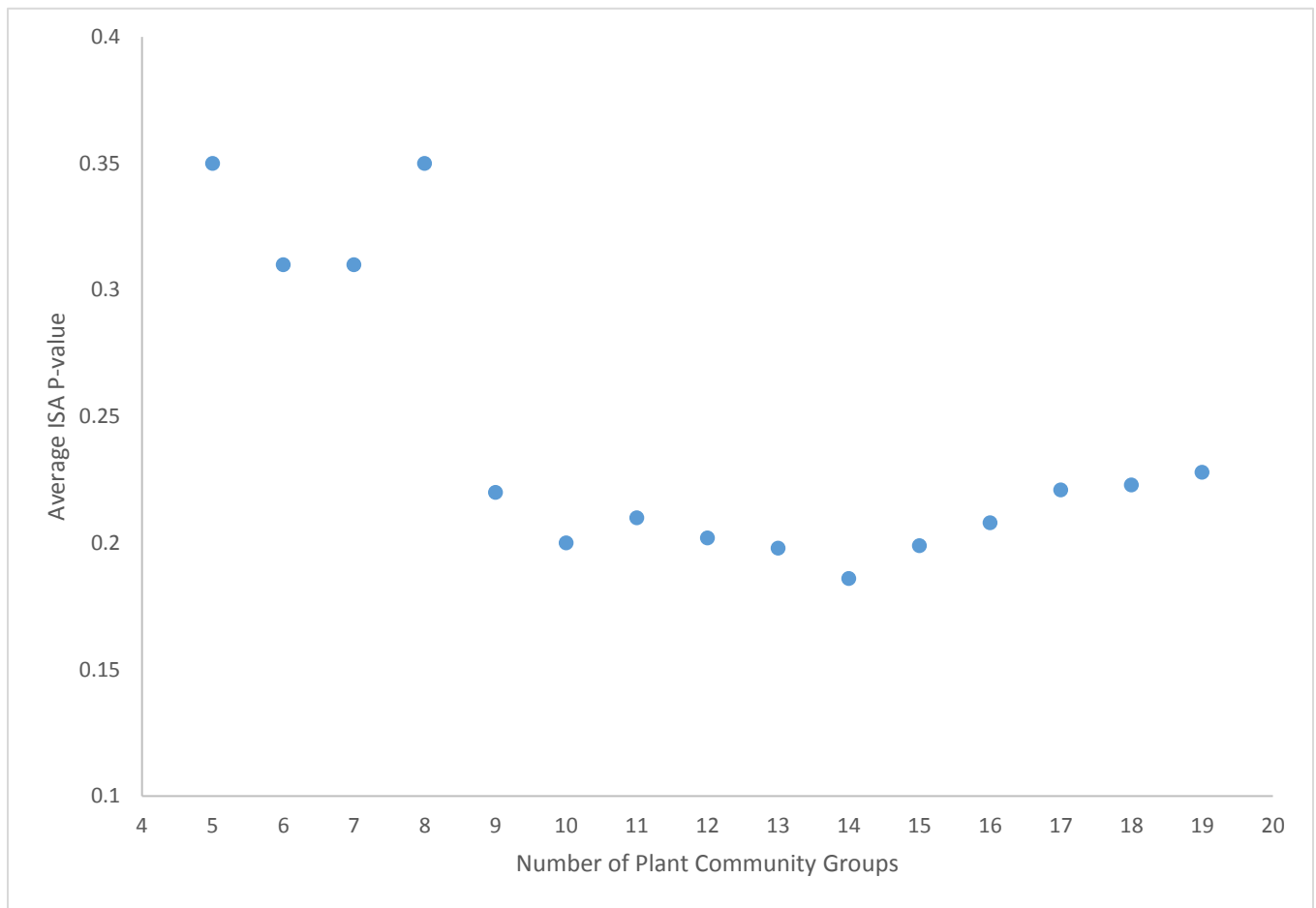


Figure 2. Results of average Indicator Species Analysis (ISA) average p-value per set of cluster identified plant community group sets: 5 groups through 19 groups.

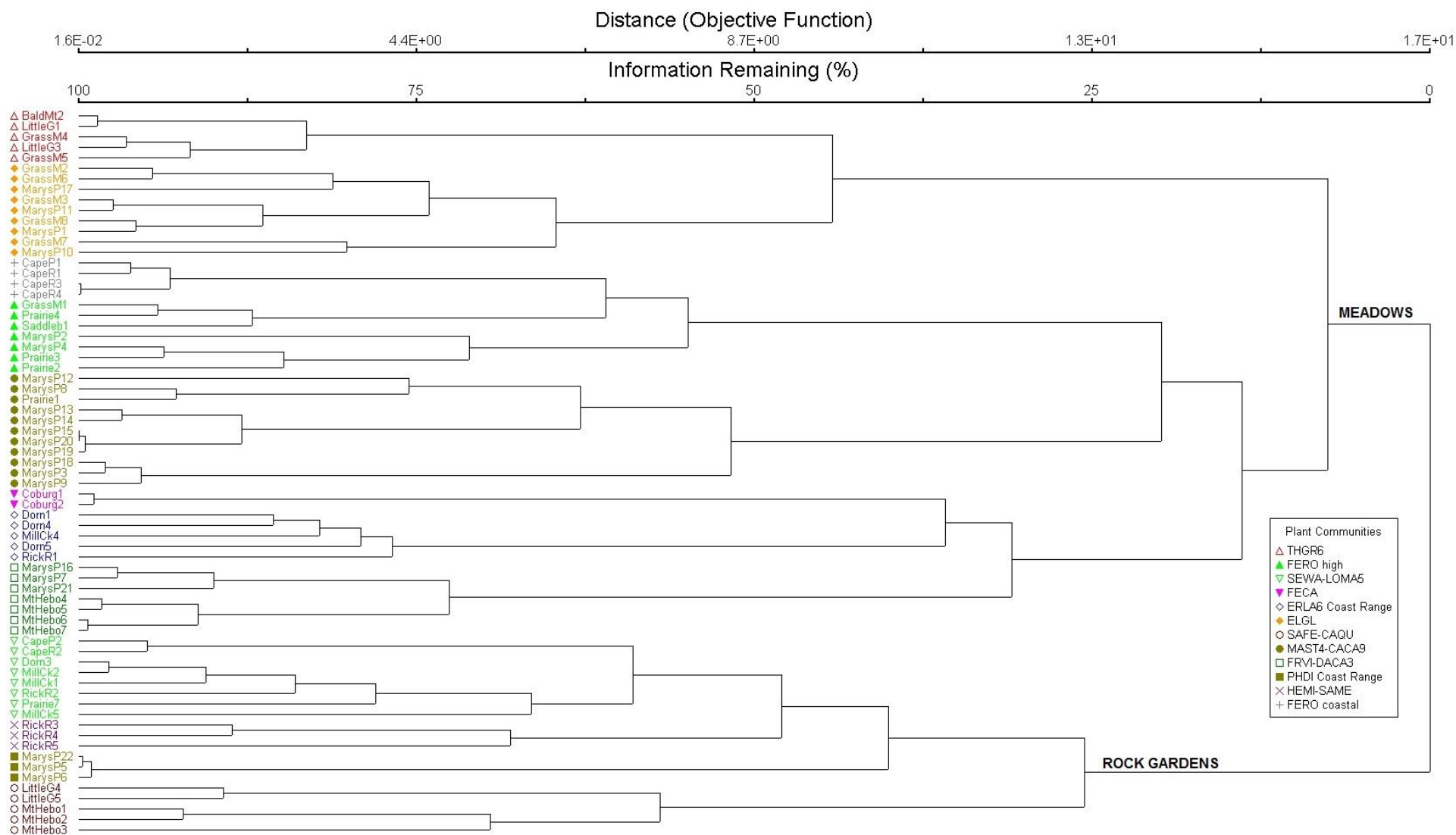


Figure 3. One-Way Cluster Analysis results for 12 plant community groups groups. THGR6 = *Thermopsis gracilis* (syn. *T. montana*), FER0 high = *Festuca roemerii* (high Coast Range bald), SEWA-LOMA5 = *Selaginella wallaceii*-*Lomatium martindaleii*, FECA = *Festuca californica*, ERLA6 Coast Range = *Eriophyllum lanatum* Coast Range version, ELGL = *Elymus glaucus*, SAFE-CAQU = *Saxifraga ferruginea*-*Cammasia quamash*, MAST4-CACA9 = *Maianthemum stellatum*-*Carex californica*, FRVI-DACA3 = *Fragaria virginiana*-*Danthonia californica*, PHDI3 Coast Range = *Phlox diffusa* Coast Range version, HEMI-SAME = *Heuchera macrantha*-*Saxifraga mertensiana*, FER0 coastal = *Festuca roemerii* coastal version.

Table 1. Indicator Species Analysis results. Top two, if there was more than one, significant indicator species per group

Community Group	Species	Indicator Value	p-value
THGR6	THGR6	100	0.0002
SEWA-LOMA5	SEWA	74.9	0.0002
	PHNE2	62.5	0.003
FECA	FECA	100	0.001
	LIAP	100	0.001
ERLA6	ERLA6	97.5	0.0002
	BADE2	80	0.0004
ELGL	ELGL	36.6	0.003
	AGPA8	31.9	0.0422
SAFE7-CAQU2	SAFE	100	0.0002
	CAQU2	77.2	0.0006
MAST4-CACA9	MAST4	76	0.0002
	CACA9	37.9	0.008
FRVI-DACA3	FRVI	89.3	0.0002
	DACA3	38.9	0.005
PHDI3	PHDI3	100	0.0002
	ERCA14	100	0.0002
HEMI7-SAME7	HEMI7	100	0.0002
	SAME7	66.7	0.0024
FERO	FERO	36.1	0.0004
	LULI2*	100	0.002
	PSCA13*	100	0.0002
* = coast FERO indicators			

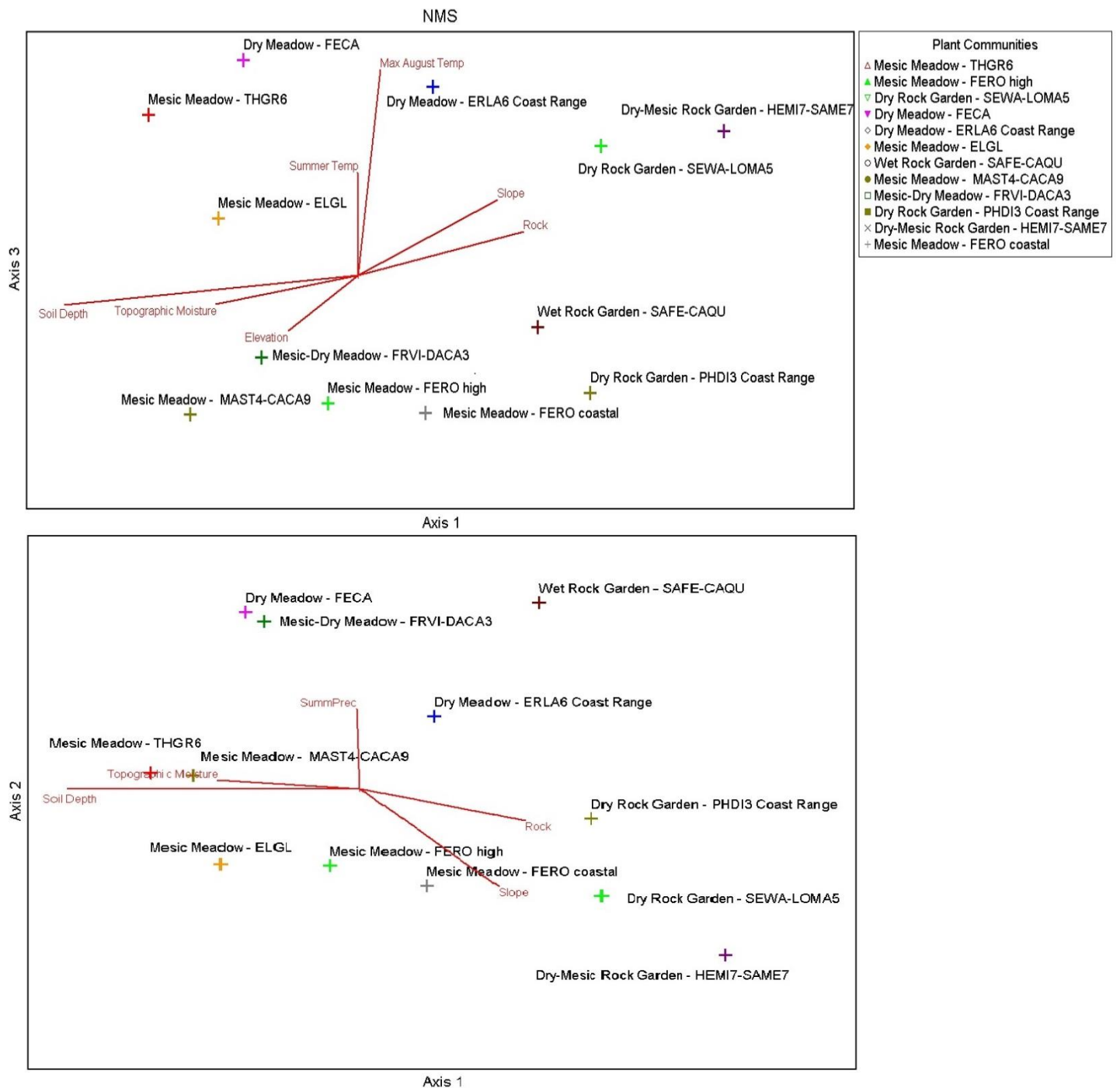


Figure 4. Non-metric Multidimensional Scaling Ordination results for new plant community data ordinated on environmental gradients. Plus symbols are centroids of plot clusters for each plant community.

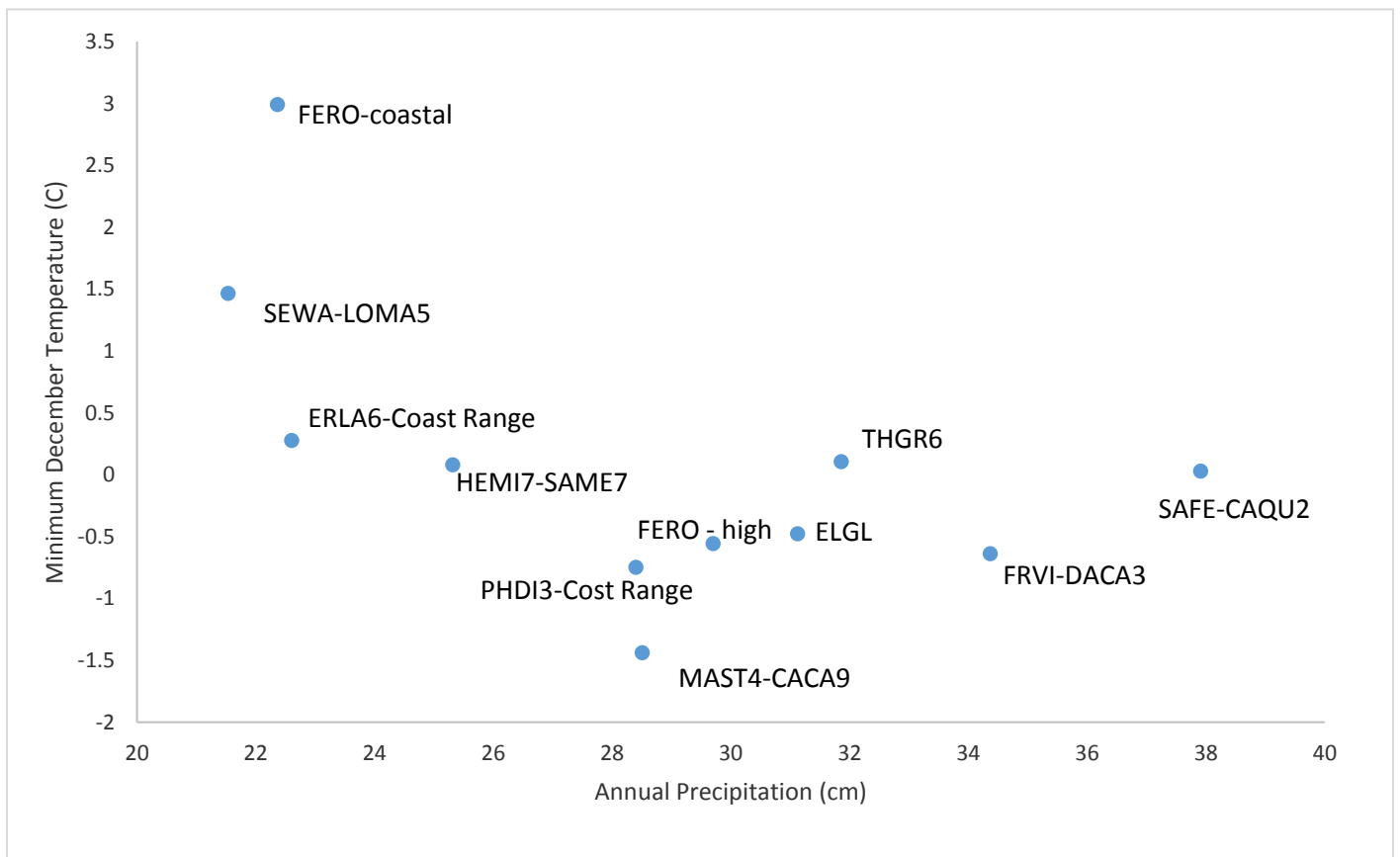


Figure 5. Plant community plot averages for minimum December temperature and Annual precipitation

Festuca roemerii (Roemer's fescue) [low elevation – coast]

Mesic Meadow

FERO [low elevation – coast]



Summary

Roemer's fescue dominated meadow on moderately steep slopes, with relatively shallow soil near the coast. The presence of Camas and monkey flower indicates the occurrence of seeps. All plots sampled were located in the Cape Perpetua area on Siuslaw National Forest. This plant community was likely more common prior to the influx of invasive non-native plants. All other sites observed with potential were dominated by non-native pasture grasses. Other intact sites may exist that were not known at the time of this study. Another similar Roemer's fescue community occurs at higher elevation (above 850 meters) in a colder climatic zone in the Coast Range; it differs mostly in the forb component.

Several species found in this plant community, including Roemer's fescue, are known to be important hosts for pollinators.

N = 4 Siuslaw NF

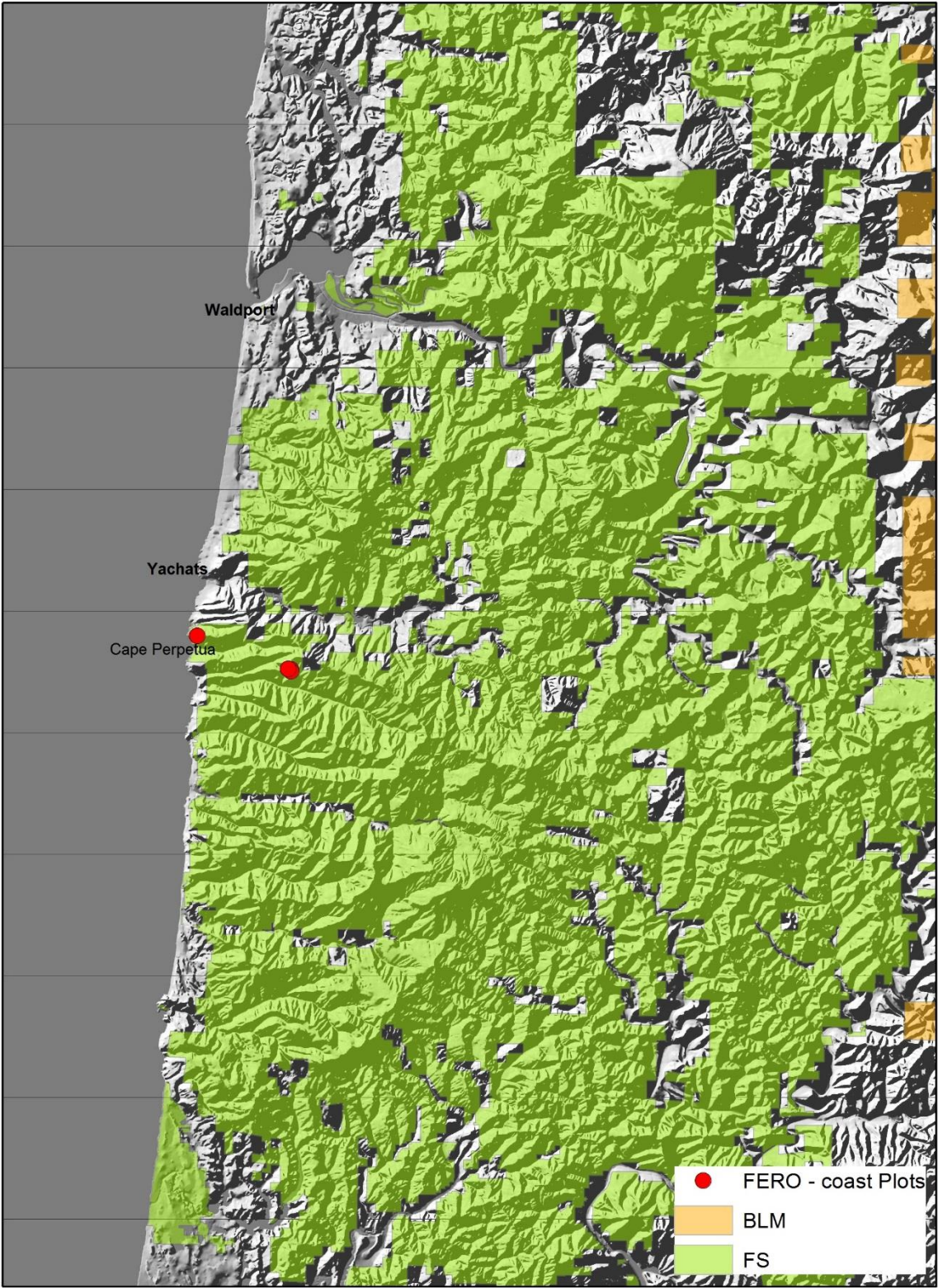
Plant Code	Scientific Name	Common Name	Type	Mean Cover (%)	Constancy (%)
FERO	<i>Festuca roemerii</i>	Roemer's fescue	graminoid	33.1	100
LURI	<i>Lupinus rivularis</i>	Riverbank lupine	forb	1.2	100
PRVU	<i>Prunella vulgaris</i>	common selfheal	forb	1.0	100
PSCA13	<i>Pseudognaphalium californicum</i>	California cudweed	forb	0.8	100
POGL8	<i>Potentilla glandulosa</i>	sticky cinquefoil	forb	0.6	100
CLAM	<i>Clarkia amoena</i>	farewell-to-Spring	forb	1.3	75
BRCO3	<i>Brodiaea coronaria</i>	crown bodiaea	forb	0.8	75
ALAM2	<i>Allium amplexans</i>	narrowleaf onion	forb	0.5	75
MASA	<i>Madia sativa</i>	coast tarweed	forb	0.2	75
CAQU2	<i>Camassia quamash</i>	small camas	forb	1.5	50
DACA3	<i>Danthonia californica</i>	California oatgrass	graminoid	1.4	50
BRSI	<i>Bromus sitchensis</i>	Alaska brome	graminoid	0.7	50
DAPU3	<i>Daucus pusillus</i>	American wild carrot	forb	0.5	50
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	0.2	50
LOFO2	<i>Lotus formosissimus</i>	seaside bird's-foot trefoil	forb	0.2	50
LIBI	<i>Linanthus bicolor</i>	true babystars	forb	0.1	50
MIGU	<i>Mimulus guttatus</i>	seep monkey flower	forb	0.1	50

FERO [low elevation – coast]. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

FERO [low elevation – coast]. Environment table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	2.99	2.65	4.01
Annual Precipitation cm	22.36	20.13	23.11
Summer Temperature C°	15.19	13.64	15.70
<u>Physical</u>			
Elevation m	368.25	227.00	433.00
Slope %	57.50	45.00	70.00
Gravel Cover %	0.45	0.10	1.00
Rock Cover %	0.00	0.00	0.00
Bare Soil Cover %	1.33	0.10	2.00
Soil Depth (A horizon) cm	16.50	15.00	18.00
Thatch %	53.86	40.00	60.00
Aspect: S = 2, SW = 1, W = 1			

Soils (NRCS 2016): Klickitat stony loam, 30-50% slopes; Neskowin rock outcrop complex, 20 to 99% slopes



Festuca roemerii (Roemer's fescue) [high elevation Coast Range]

FERO [high elevation Coast Range]



Summary

Roemer's fescue dominated meadow on high (above 850 meters) Coast Range balds; plots were sampled on Marys Peak, Grass Mountain, Prairie Mountain, and a small remnant site on Saddlebag Mountain. This type mostly occurs on south and southwest facing slopes and is similar to a low elevation Roemer's fescue type, which occupies a warmer climatic environment near the coast on shallower soils. The coastal type differs in the forb component, which is a different species complex and is more diverse. A Roemer's fescue community is known to occur at lower elevations in the foothills of the Willamette Valley, but those areas were not investigated in this study.

Several species found in this plant community, including Roemer's fescue, are known to be important hosts for pollinators.

N=7 Salem BLM, Siuslaw NF

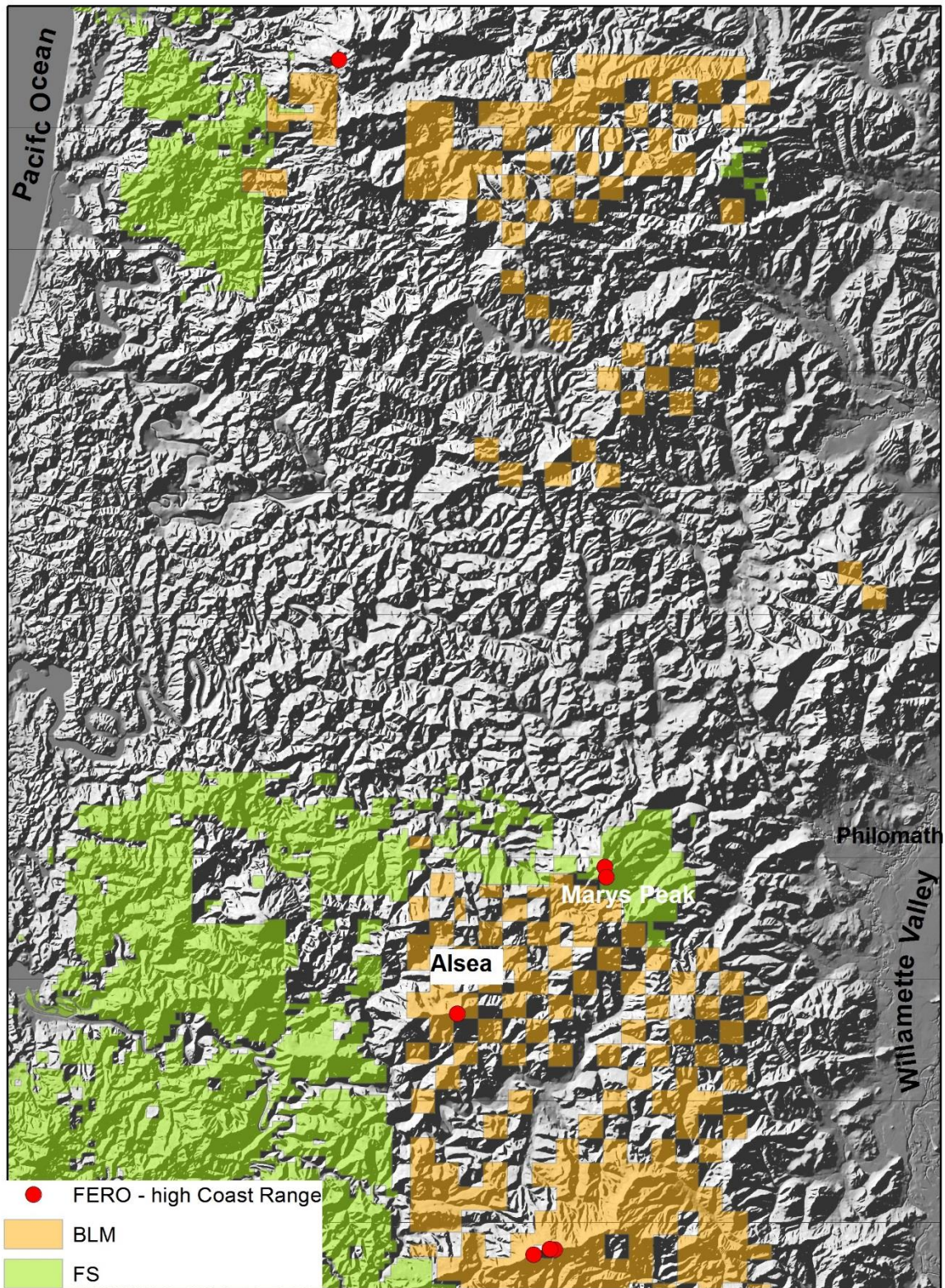
FERO [high elevation Coast Range]. Constancy table. Mean canopy cover for species in greater than 29% of plots.

Plant Code	Scientific Name	Common Name	Type	Mean Cover (%)	Constancy (%)
FERO	<i>Festuca roemerii</i>	Roemer's fescue	graminoid	27.7	100
PTAQ	<i>Pteridium aquilinum</i>	bracken fern	fern	19.2	71
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	6.8	71
ACMI2	<i>Achillea millefolium</i>	yarrow	forb	7.3	57
DACA3	<i>Danthonia californica</i>	California oatgrass	graminoid	5.6	43
CACA9	<i>Carex californica</i>	California sedge	graminoid	2.3	43
CEAR4	<i>Cerastium arvense</i>	meadow chickweed	forb	0.1	43
LULA4	<i>Lupinus latifolius</i>	boradleaf lupine	forb	17.2	29
LUCO6	<i>Luzula comosa</i>	Pacific woodrush	graminoid	10.0	29
AGPA8	<i>Agrostis pallens</i>	seashore bentgrass	graminoid	6.4	29
VIAD	<i>Viola adunca</i>	early blue violet	forb	5.5	29

FERO [high elevation Coast Range]. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	-0.56	-1.62	0.16
Annual Precipitation cm	29.70	27.04	36.46
Summer Temperature C°	16.21	14.36	17.53
<u>Physical</u>			
Elevation m	1138	850	1347
Slope %	20.71	10.00	50.00
Gravel Cover %	0.03	0.00	0.10
Rock Cover %	0.00	0.00	0.00
Bare Soil Cover %	0.76	0.00	2.50
Soil Depth (A horizon) cm	52.57	8.00	60.00
Thatch %	36.16	10.00	65.83
Aspect: S = 3, SW = 3, W = 1			

Soils (NRCS 2016): Mulkey medial loam, 3-30% slopes, Valsetz-Yellowstone complex, 3-30% slopes



Elymus glaucus (blue wild rye)

ELGL



Summary

This community is dominated by blue wild rye and occurs in the meadow plant community complex on high Coast Range balds. It has been observed occurring adjacent to the Roemer's fescue type on mostly south facing slopes. Environmental factors separating the two plant communities are subtle and may have to do with soil properties or disturbance history. The closest plant community described in the Cascades Non-forest Plant Community Guide (McCain et al. 2014) is the blue wild rye – California brome type, but it has only a few species in common. Plots were sampled on Marys Peak and Grass Mountain.

N = 6 Salem BLM, Siuslaw NF

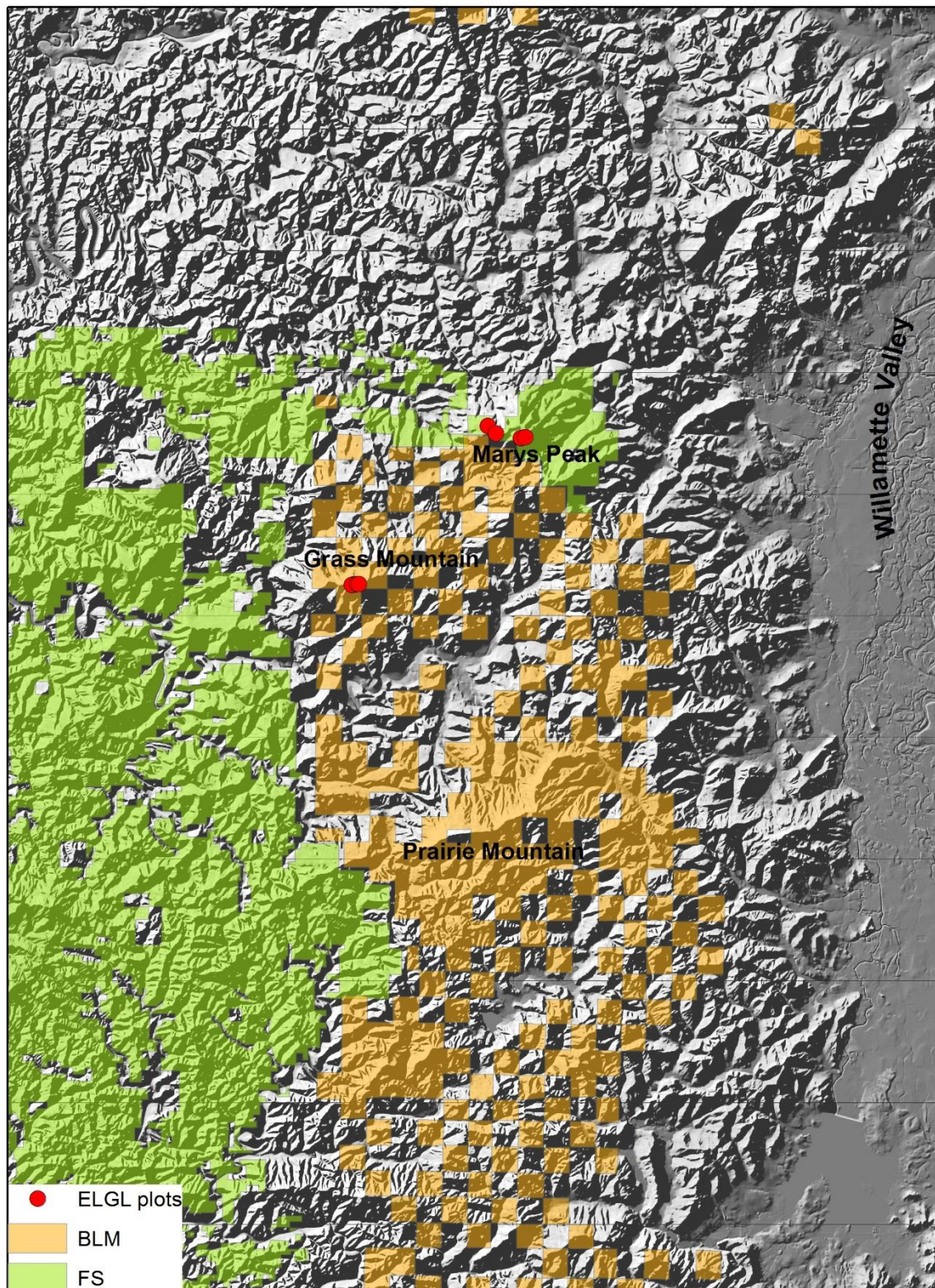
ELGL. Constancy table. Mean canopy cover for species in greater than 30% of plots.

Row Labels	Scientific Name	Common Name	Type	Mean Cover (%)	Constancy (%)
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	19.11	100
CACA9	<i>Carex californica</i>	California sedge	graminoid	10.68	89
AGPA8	<i>Agrostis pallens</i>	seashore bentgrass	graminoid	6.24	78
BRCA5	<i>Bromus carinatus</i>	California brome	graminoid	0.59	78
PTAQ	<i>Pteridium aquilinum</i>	bracken fern	fern	2.66	56
GAAP2	<i>Galium aparine</i>	sticky willy	forb	2.21	56
ACMI2	<i>Achillea millefolium</i>	yarrow	forb	5.47	44
FERO	<i>Festuca roemerii</i>	Roemer's fescue	graminoid	3.33	44
		California			
RUUR	<i>Rubus ursinus</i>	blackberry	shrub	3.15	44
MESU	<i>Melica subulata</i>	Alaska oniongrass	graminoid	0.86	44
CEAR4	<i>Cerastium arvense</i>	meadow chickweed	forb	0.79	44
LULA4	<i>Lupinus latifolius</i>	broadleaf lupine	forb	0.76	44
CAPA14	<i>Carex pachystachya</i>	chamisso sedge	graminoid	1.36	33

ELGL. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	-0.48	-1.62	0.00
Annual Precipitation cm	31.13	28.58	32.01
Summer Temperature C°	16.20	15.67	16.37
<u>Physical</u>			
Elevation m	1083	850	1293
Slope %	23.00	2.00	60.00
Gravel Cover %	0.04	0.00	0.20
Rock Cover %	0.00	0.00	0.00
Bare Soil Cover %	0.73	0.00	5.18
Soil Depth (A horizon) cm	60.00	60.00	60.00
Thatch %	59.66	24.50	96.30
Aspect: SE = 3, S = 2, SW = 2, W = 1, E = 1			

Soils (NRCS 2016): Mulkey medial loams, 3-30% and 30-60% slopes



Mesic Meadow

Carex californica – *Maianthemum stellatum* (California sedge –star flowered false lily of the valley)

CACA9 – MAST4



Summary

Mesic meadow community dominated by California sedge and starry false lily-of-the-valley is found on mostly north and east slopes on Coast Range balds. Sites on other aspects tend to be shaded by adjacent forest stands. Plots were sampled on Marys Peak and Prairie Mountain.

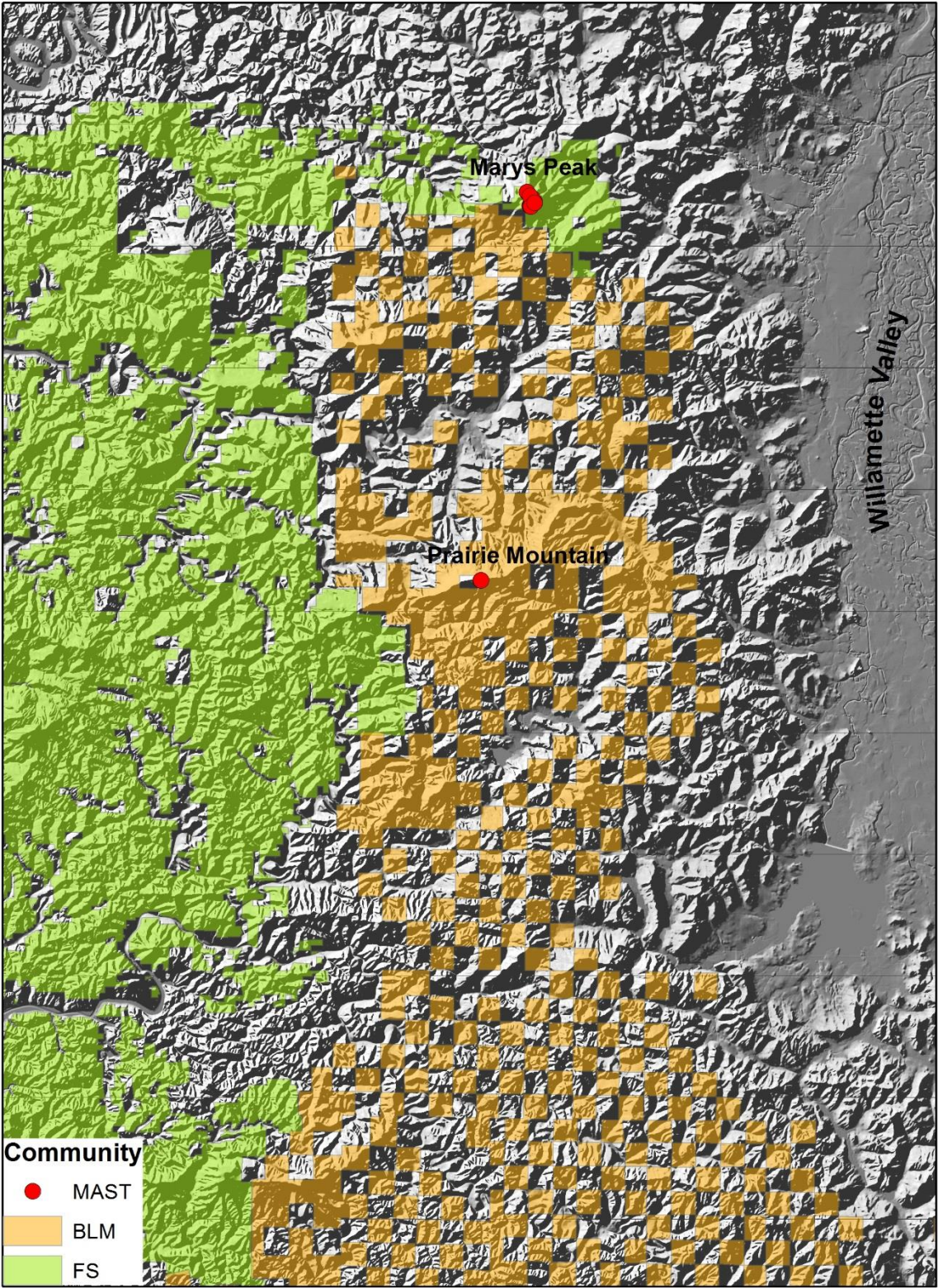
N = 11 plots, Salem BLM, Siuslaw NF

CACA9 – MAST4. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

Species Code	Scientific Name	Common Name	Type	Average Cover (%)	Constancy (%)
CACA9	<i>Carex californica</i>	California sedge	<i>graminoid</i>	26.4	91
MAST4	<i>Maianthemum stolonifera</i>	starry false lily-of-the-valley	<i>forb</i>	33.2	82
LICO	<i>Lilium columbianum</i>	Columbia lily	<i>forb</i>	0.2	73
FERO	<i>Festuca roemerii</i>	Roemer's fescue	<i>graminoid</i>	6.1	73
LUCO6	<i>Luzula comosa</i>	Pacific woodrush	<i>graminoid</i>	1.5	64
ACMI2	<i>Achillea millefolium</i>	yarrow	<i>forb</i>	3.7	64
CEAR4	<i>Cerastium arvense</i>	meadow chickweed	<i>forb</i>	0.8	55
VIGL	<i>Viola glabella</i>	pioneer violet	<i>forb</i>	3.6	54
LULA4	<i>Lupinus latifolius</i>	broadleaf lupine	<i>forb</i>	10.3	45
DACA3	<i>Danthonia californica</i>	California oatgrass	<i>graminoid</i>	2.4	36
BRCA5	<i>Bromus carinatus</i>	California brome	<i>graminoid</i>	5.3	36

CACA9 – MAST4. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	-1.44	-1.62	-0.32
Annual Precipitation cm	28.51	27.75	28.58
Summer Temperature C°	15.78	15.67	16.92
<u>Physical</u>			
Elevation m	1305	1200	1363
Slope %	12.00	2.00	30.00
Gravel Cover %	0.05	0.00	0.30
Rock Cover %	0.25	0.00	2.70
Bare Soil Cover %	0.32	0.00	1.00
Soil Depth (A horizon) cm	60.00	60.00	60.00
Thatch %	31.83	3.70	52.50
Aspect: N = 3, NW = 2, NE = 1, E = 2, SE = 2, SW = 1			



Thermopsis gracilis [syn *T. montana*] (Slender goldenbanner)

THGR6



Summary

This slender goldenbanner dominated plant community, which usually contains blue wild rye, was observed on south facing Coast Range balds at around 1000 meters in elevation. It was observed at Grass Mountain, Little Grass Mountain, and Bald Mountain on Salem BLM. It occurred adjacent to the Roemer's fescue and blue wild rye types described in this document. Environmental factors separating the slender goldenbanner plant community from those in close proximity are subtle and may have to do with soil properties or disturbance history.

Slender golden banner and other species found in this plant community are known to be important hosts for pollinators.

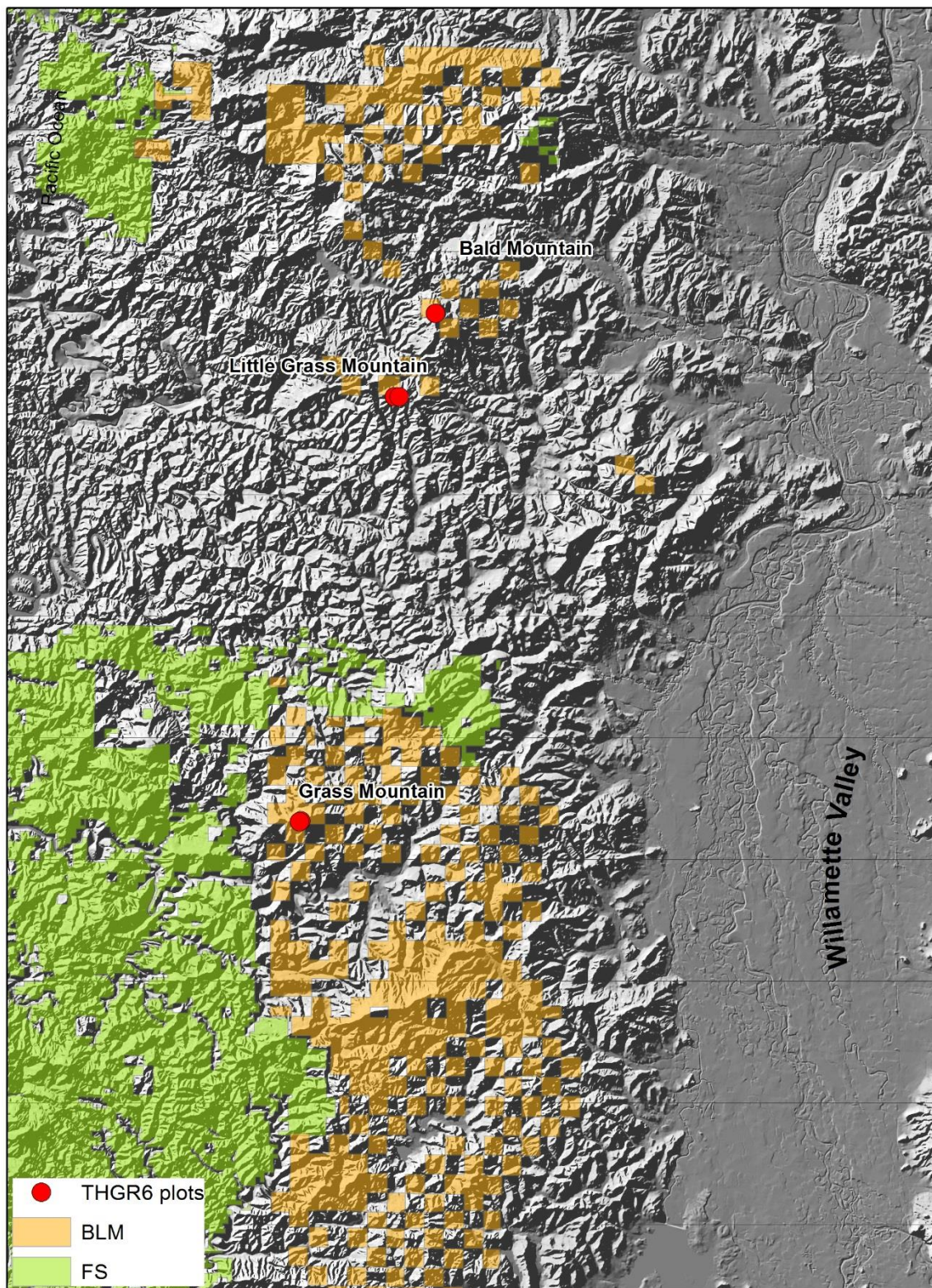
[Note: Is this an artifact of disturbance (possibly a disturbed blue wild rye type) or could it be described as a plant community?]

THGR6. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

Plant Code	Scientific Name	Common Name	Type	Ave Cover (%)	Constancy (%)
THGR6	<i>Thermopsis gracilis</i>	slender goldenbanner	forb	56.57	100
PTAQ	<i>Pteridium aquilinum</i>	bracken fern	fern	19.14	100
RUUR	<i>Rubus ursinus</i>	California blackberry	shrub	13.27	80
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	6.46	80
GAAP2	<i>Galium aparine</i>	bedstraw	forb	0.20	80
ACMI2	<i>Achillea millefolium</i>	yarrow	forb	1.90	60
CACA9	<i>Carex californica</i>	California sedge	graminoid	1.13	60
CEAR4	<i>Cerastium arvense</i>	meadow chickweed	forb	0.90	60
CAPA14	<i>Carex pachystachya</i>	camisso sedge	graminoid	0.89	60
AGPA8	<i>Agrostis pallens</i>	seashore bentgrass	graminoid	0.54	60
MESU	<i>Melica subulata</i>	Alaska oniongrass	graminoid	0.09	60
BRCA5	<i>Bromus carinatus</i>	California brome	graminoid	6.34	40
LULA4	<i>Lupinus latifolius</i>	broadleaf lupine	forb	0.28	40
FRVE	<i>Fragaria vesca</i>	woodland strawberry	forb	0.27	40
OXSU	<i>Oxalis suksdorfia</i>	Suksdorf woodsorrel	forb	0.22	40
LICO	<i>Lilium columbianum</i>	Columbia lily	forb	0.06	40

THGR6. Environmental Table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	0.11	-0.45	0.55
Annual Precipitation cm	31.86	27.40	34.81
Summer Temperature C°	16.28	15.71	16.48
<u>Physical</u>			
Elevation m	972.80	867.00	1083.00
Slope %	17.00	5.00	25.00
Gravel Cover %	0.00	0.00	0.00
Rock Cover %	0.00	0.00	0.00
Bare Soil Cover %	0.02	0.00	0.10
Soil Depth (A horizon) cm	60.00	60.00	60.00
Thatch %	53.75	10.00	98.70
Aspect: SE=3, S=1, SW=1			



Mesic Meadow

Fragaria virginiana – *Danthonia californica* (Virginia strawberry--California oatgrass)

FRVI – DACA3



Summary

This strawberry and California oatgrass dominated community makes up Mt Hebo's summit meadows, where not overtaken by exotic weeds. It can also be found in a few small areas on Marys Peak. This plant community may occur on other high balds in the Coast Range. This plant community is important because it contains the blue violet, which is the sole food source of the Oregon Silverspot Butterfly (OSB) caterpillar, and Mt Hebo currently holds Oregon's largest population; OSB nectar plants, yarrow and golden rod, are also components of this plant community.

Several species found in this plant community, including California oatgrass, are known to be important hosts for pollinators.

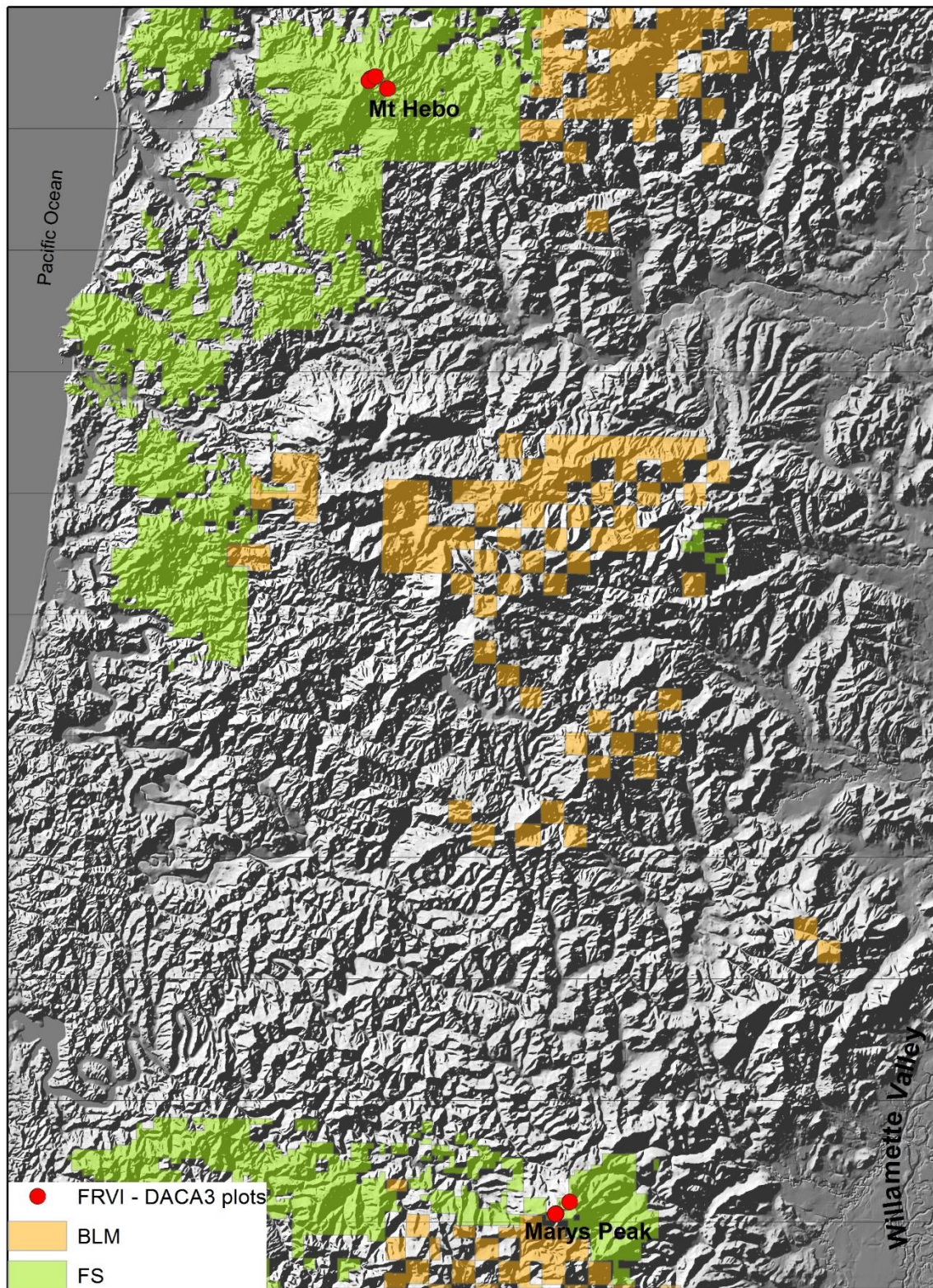
N = 7 Siuslaw NF

FRVI – DACA3. Constancy table. Mean canopy cover for native species in greater than 30% of plots

Plant Code	Scientific Name	Common Name	Type	Mean Cover (%)	Constancy (%)
FRVI	<i>Fragaria virginiana</i>	Virginia strawberry	forb	21.6	100
DACA3	<i>Danthonia californica</i>	California oatgrass	graminoid	6.9	100
LUCO6	<i>Luzula comosa</i>	Pacific woodrush	graminoid	0.9	100
PTAQ	<i>Pteridium aquilinum</i>	bracken fern	fern	7.5	86
LULA4	<i>Lupinus latifolius</i>	broadleaf lupine	forb	2.0	86
ACMI2	<i>Achillea millefolium</i>	yarrow	forb	3.5	71
VIAD	<i>Viola adunca</i>	early blue violet	forb	0.9	71
IRTE	<i>Iris tenax</i>	tough leaf iris	forb	5.1	57
CACA9	<i>Carex californica</i>	California sedge	graminoid	2.0	57
SOCA6	<i>Solidago canadensis</i>	western goldenrod	forb	1.4	43
AGPA8	<i>Agrostis pallens</i>	seashore bentgrass	graminoid	0.9	43
FERO	<i>Festuca roemerii</i>	Roemer's fescue	graminoid	0.8	43
RUUR	<i>Rubus ursinus</i>	California blackberry	shrub	0.5	43
LICO	<i>Lilium columbianum</i>	Columbia lily	forb	0.1	43

FRVI – DACA3. Environment table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	-0.64	-0.94	-0.19
Annual Precipitation cm	34.37	30.30	40.48
Summer Temperature C°	15.30	13.82	16.28
<u>Physical</u>			
Elevation m	1094.20	987.00	1180.00
Slope %	13.60	10.00	18.00
Gravel Cover %	1.33	0.00	6.00
Rock Cover %	0.00	0.00	0.00
Bare Soil Cover %	3.45	0.00	16.20
Soil Depth (A horizon) cm	48.00	30.00	60.00
Thatch %	32.59	1.22	51.25
Aspect: W = 3, SW = 2, SE = 1, E = 1			



Dry Meadow

Eriophyllum lanatum (Oregon sunshine)– Coast Range

ERLA6 – Coast Range



Summary

This dry meadow community occurs on the east flank of the Coast Range above 700 meters on moderately steep, thin soil bands between rock outcrops, which hosts a Martindale's Lomatium rock garden plant community. An integration of the Martindale's Lomatium and Oregon sunshine plant communities occur on this landscape as well. Plots were sampled on Mill Creek Ridge, Dorn Peak, and Rickreall Ridge, Salem BLM. Cheatgrass (*Bromus tectorum*), dogtail grass (*Cynosurus echinatus*), and soft brome (*Bromus hordeaceus*) have invaded most sites visited in these areas. This community is important because it contains several plant species important to pollinators, including the Pacific dotted blue butterfly, which the butterflies and caterpillars feed almost exclusively on buckwheats. A similar Oregon sunshine community occurs in the Cascades (McCain et al. 2014), but differs in enough species to separate out as at least a Coast Range phase.

Oregon sunshine and other species found in this plant community are known to be important hosts for pollinators.

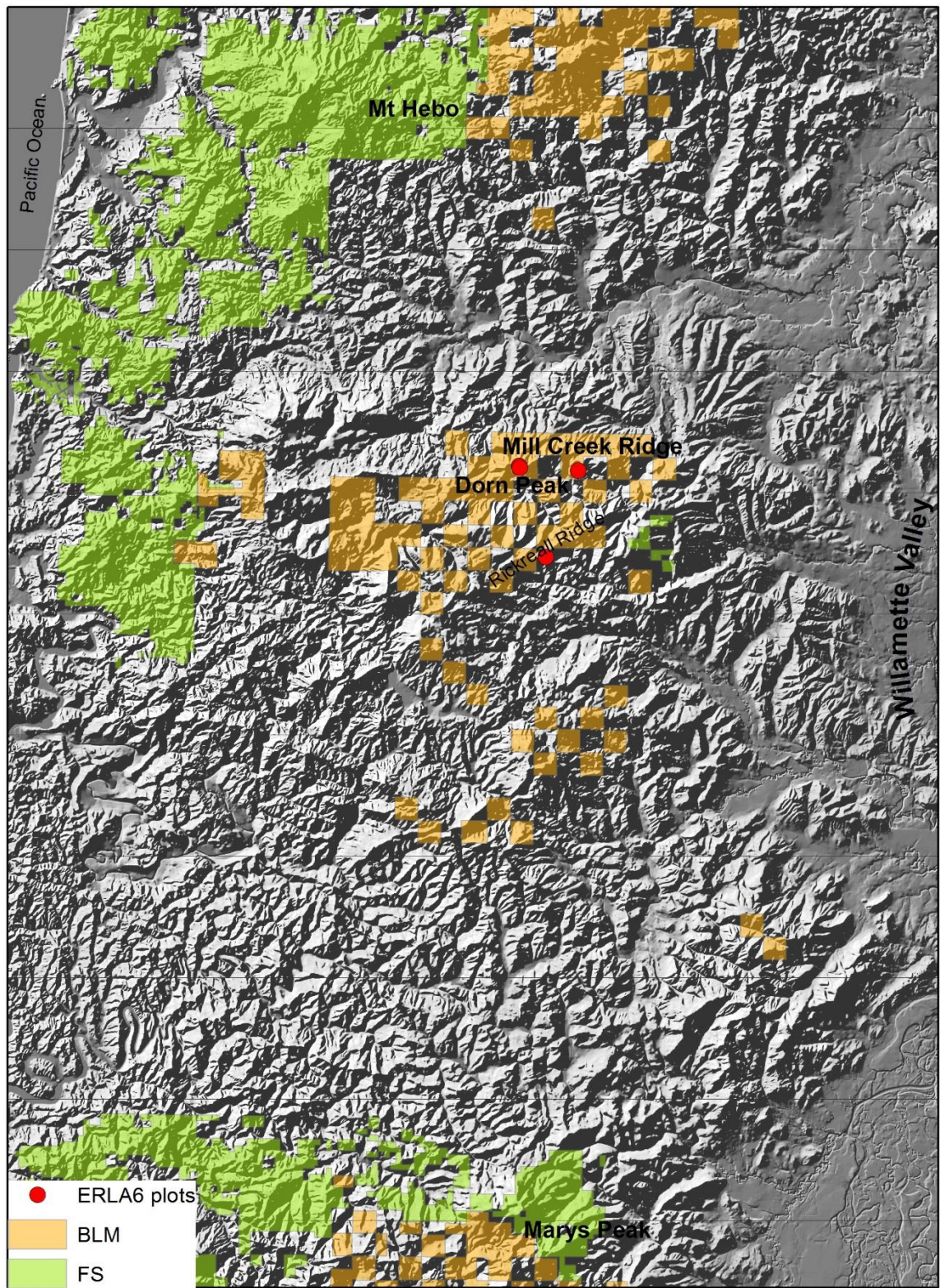
N = 5 plots Salem BLM

ERLA – Coast Range. Constancy table. Canopy cover for native species with greater than 30% constancy.

Plant Code	Scientific Name	Common Name	Type	Mean Cover (%)	Constancy (%)
ERLA6	<i>Eriophyllum lanatum</i>	Oregon sunshine	forb	6.2	100
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	1.1	100
DACA3	<i>Danthonia californica</i>	California oatgrass	graminoid	1.0	100
ACMI2	<i>Achillea millefolium</i>	yarrow	forb	2.6	80
CLAM	<i>Clarkia amoena</i>	farewell-to-Spring	forb	0.9	80
BRCA5	<i>Bromus carinatus</i>	California brome	graminoid	0.9	80
LOMI	<i>Lotus micranthus</i>	desert deervetch	forb	0.5	80
LOUT	<i>Lomatium utriculatum</i>	common lomatium	forb	0.5	80
MAEX	<i>Madia exigua</i>	small tarweed	forb	0.5	80
ACLE8	<i>Achnatherum lemmoni</i>	Lemmon's needlegrass	graminoid	0.5	80
ERCO	<i>Eriogonum compositum</i>	arrowleaf buckwheat	forb	1.3	60
KOMA	<i>Koeleria macrantha</i>	prairie Junegrass	graminoid	0.5	60
ERUM	<i>Eriogonum umbellatum</i>	sulfur flower buckwheat	forb	0.4	60
LUCO6	<i>Luzula comosa</i>	Pacific woodrush	graminoid	0.3	60
BRCO3	<i>Brodiaea coronaria</i>	crown brodiaea	forb	0.1	60
BADE2	<i>Balsamorhiza deltoidea</i>	deltoid balsamroot	forb	2.9	40
VERONICA	<i>Veronica</i> sp.	speedwell	forb	0.1	40
DAPU3	<i>Daucus pusillus</i>	American wild carrot	forb	0.1	40
GISP3	<i>Githopsis specularioides</i>	common bluecup	forb	0.1	40

ERLA – Coast Range. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	0.28	0.02	0.54
Annual Precipitation cm	22.61	20.74	25.32
Summer Temperature C°	16.53	15.87	16.90
<u>Physical</u>			
Elevation m	731.60	507.00	867.00
Slope %	44.00	25.00	55.00
Gravel Cover %	2.64	0.30	7.50
Rock Cover %	0.34	0.00	1.00
Bare Soil Cover %	22.60	0.40	73.75
Soil Depth (A horizon) cm	13.20	3.00	30.00
Thatch %	17.93	0.33	41.67
Aspect: S = 1, NE = 1, W = 1, SW = 1, E = 1			



Festuca californica (California fescue)

FECA



Summary

This California fescue dominated community was observed in large meadow gaps of Oregon oak stands on the west flank of Cascade Range foothills. These sites were in the Coburg Hills on Eugene BLM. Only 2 plots were sampled. This plant community needs further work and data may already reside in FS Ecology Oak datasets. Query additional data and include in this non-forest plant community document or add these data to a future Oak community analysis?

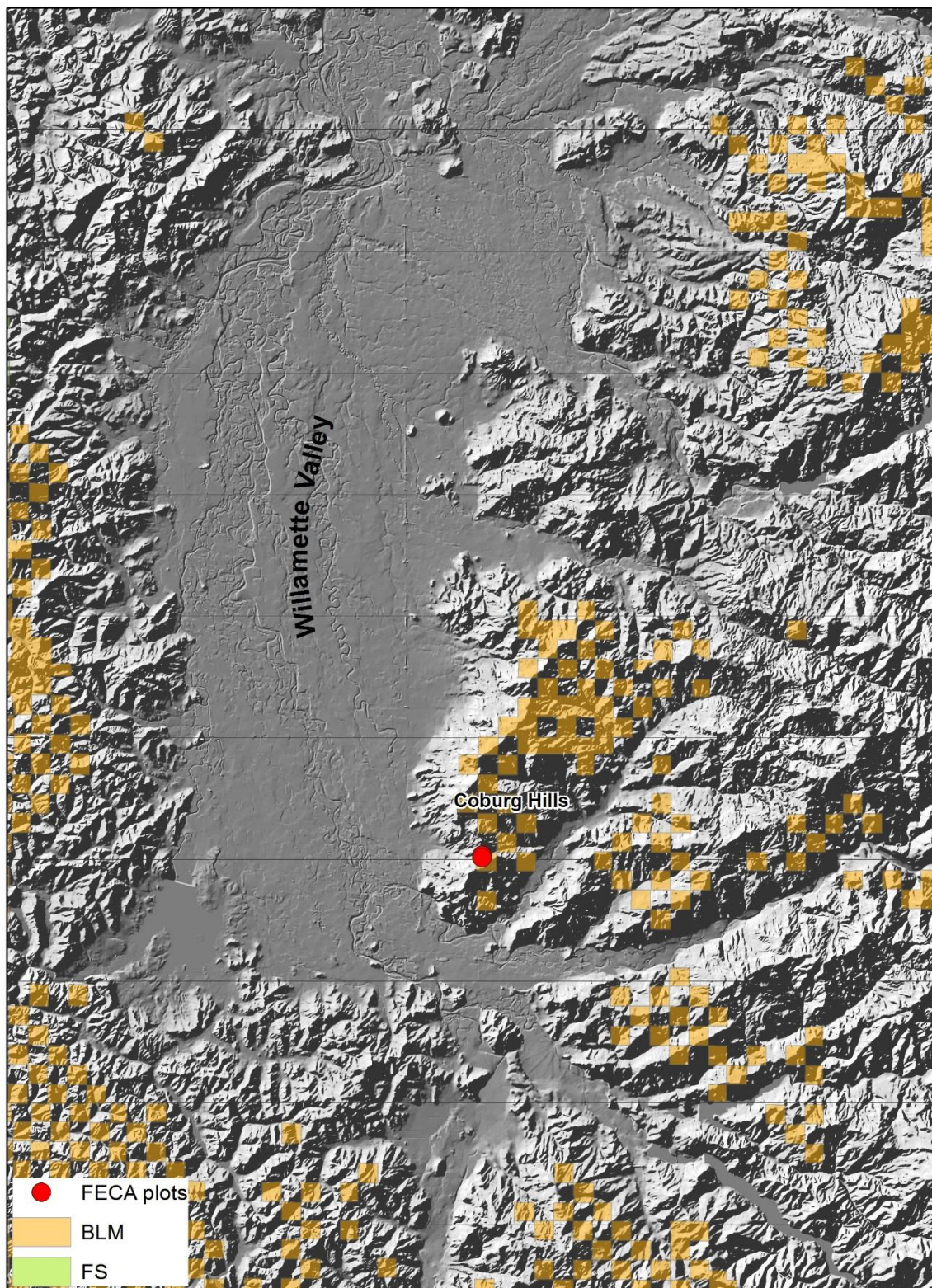
N = 2 Eugene BLM

FECA. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

Plant Code	Scientific Name	Common Name	Type	Ave Cover (%)	Constancy (%)
FECA	<i>Festuca californica</i>	California fescue	graminoid	35.05	100
GASH	<i>Gaultheria shallon</i>	salal	shrub	5.55	100
SYAL	<i>Symphoricarpus alba</i>	common snowberry	shrub	3.00	100
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	1.56	100
FRVI	<i>Fragaria virginiana</i>	Virginia strawberry	forb	0.31	100
LIAP	<i>Ligusticum apiifolium</i>	celeryleaf licorice root	forb	0.13	100
TODI	<i>Toxicodendron diversilobum</i>	poison oak	shrub	8.75	50
RUUR	<i>Rubus ursinus</i>	California blackberry	shrub	6.75	50
IRTE	<i>Iris tenax</i>	tough leaf Iris	forb	1.25	50
PTAQ	<i>Pteridium aquilinum</i>	bracken fern	fern	1.15	50
ANAR3	<i>Angelica arguata</i>	Lyall's angelica	forb	1.00	50
LAHO2	<i>Lathyrus holochlorus</i>	thinleaf pea	forb	0.32	50
VIAM	<i>Vicia americana</i>	American vetch	forb	0.26	50
ROGY	<i>Rosa gymnocarpa</i>	dwarf rose	shrub	0.26	50
MAGR3	<i>Madia gracilis</i>	grassy tarweed	forb	0.22	50
GAAP2	<i>Galium aparine</i>	bedstraw	forb	0.10	50
HODI	<i>Holodiscus discolor</i>	oceanspray	shrub	0.06	50
QUGA	<i>Quercus garryana</i>	Oregon oak	tree	0.06	50
VAPA	<i>Vaccinium parviflorum</i>	red huckleberry	shrub	0.06	50

FECA. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	-0.38	-0.38	-0.38
Annual Precipitation cm	17.42	17.42	17.42
Summer Temperature C°	0.05	0.00	0.10
<u>Physical</u>			
Elevation m	17.34	17.34	17.34
Slope %	0.00	0.00	0.00
Gravel Cover %	733.00	733.00	733.00
Rock Cover %	20.00	15.00	25.00
Bare Soil Cover %	0.11	0.00	0.22
Soil Depth (A horizon) cm	28.50	27.00	30.00
Thatch %	71.00	64.50	77.50
Aspect: W=2			



Phlox diffusa (spreading phlox) – Coast Range

PHDI3



Summary

This Phlox dominated dry rock garden community is found at the highest elevation (>4000') in the coast range on South and West facing slopes in thin-soil areas around exposed rock outcrops. So far it has only been observed on Marys Peak. *Phlox diffusa* plants have been found on Sugarloaf Mountain and Saddle Mountain farther North in the Oregon Coast Range (CPNH 2016); these areas would be worth future surveys for this *Phlox diffusa* community. The *P. diffusa* plant community described in the northern Oregon Cascades non-forest guide has only a few species in common.

Several species found in this plant community are known to be important hosts for pollinators.

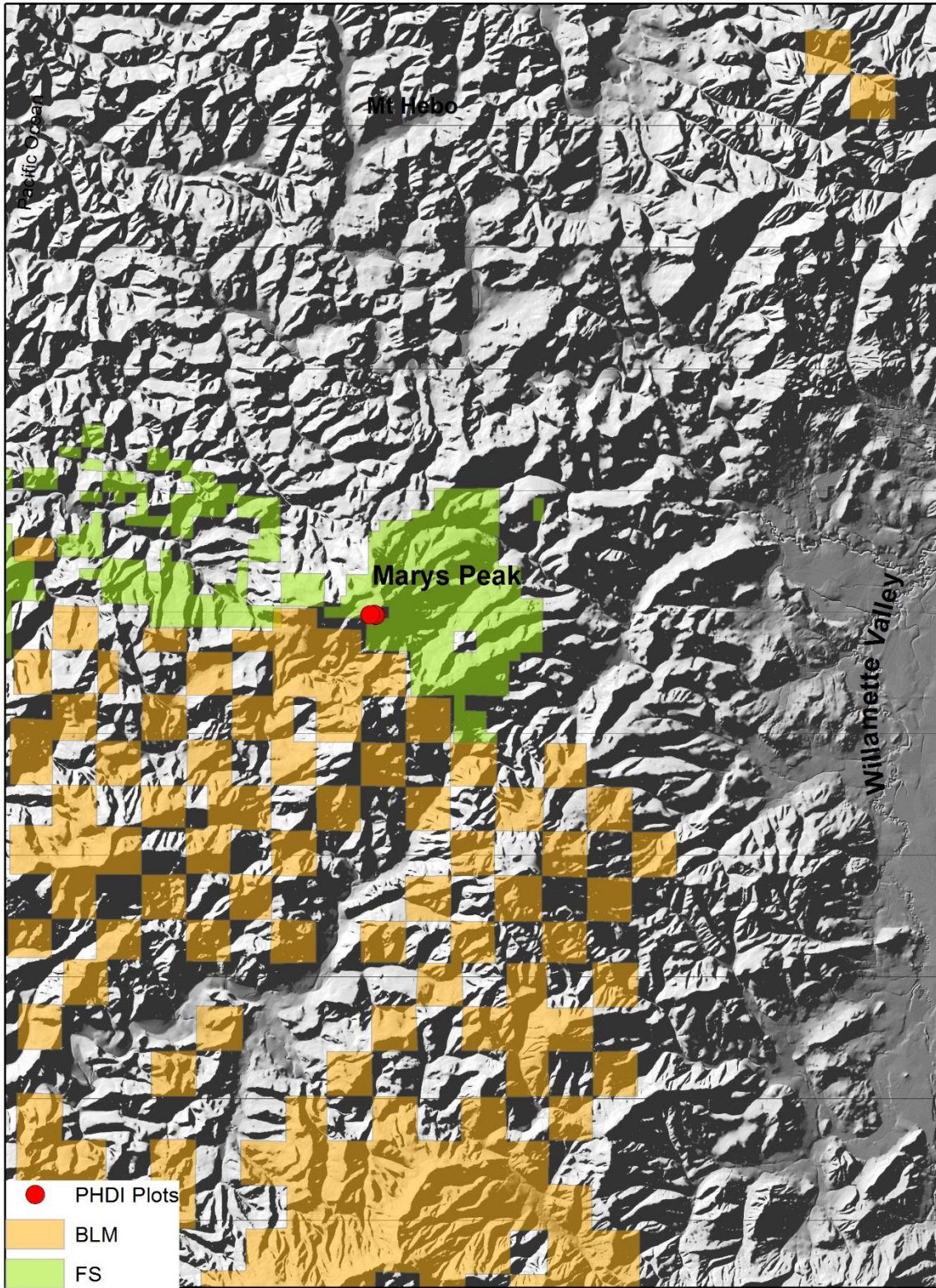
N = 3 plots (Siuslaw NF) Marys Peak

PHDI3. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

Plant Code	Scientific Name	Common Name	Type	Ave Cover (%)	Constancy (%)
PHDI3	<i>Phlox diffusa</i>	spreading phlox	Forb	20.2	100
LOMA5	<i>Lomatium martindaleii</i>	Cascade desert parsley	Forb	4.3	100
ALCR4	<i>Allium crenatum</i>	Olympic onion	Forb	2.2	100
PECA16	<i>Pentstemon cardwellii</i>	Cardwell's beardtongue	Forb	2.2	100
FERO	<i>Festuca roemerii</i>	Roemer's fescue	graminoid	1.8	100
CAHI9	<i>Castilleja hispidum</i>	harsh paintbrush	Forb	1.2	100
SIDOD	<i>Sidalcea douglassii</i>	Douglas' catchfly	Forb	0.9	100
ERCA14	<i>Erysimum capitatum</i>	western wallflower	Forb	0.1	100
GICA5	<i>Gilia capitata</i>	blue gilia	Forb	0.1	100
LULE2	<i>Lupinus lepidus</i>	Pacific lupine	Forb	0.7	67
LUCO6	<i>Luzula comosa</i>	Pacific woodrush	Forb	0.2	67
CEAR4	<i>Cerastium arvense</i>	meadow chickweed	Forb	0.1	67
ACMI2	<i>Achillea millefolia</i>	yarrow	Forb	0.1	67
COPA3	<i>Collinsia parviflora</i>	blue-eyed Mary	Forb	0.1	67
APAN2	<i>Apocynum androsaemifolium</i>	dogbane	Forb	0.3	33
KOMA	<i>Koeleria macrantha</i>	prairie junegrass	graminoid	0.3	33
ERUM	<i>Eriogonum umbellatum</i>	sulphur-flowered buckwheat	Forb	0.1	33

PHDI3. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	-0.75	-0.90	-0.55
Annual Precipitation cm	28.40	28.11	28.60
Summer Temperature C°	15.67	15.67	15.67
<u>Physical</u>			
Elevation m	1270.33	1250.00	1308.00
Slope %	18.33	15.00	20.00
Gravel Cover %	34.63	6.40	62.50
Rock Cover %	18.33	14.00	25.00
Bare Soil Cover %	5.85	0.75	10.00
Soil Depth (A horizon) cm	2.00	0.50	3.00
Thatch %	0.26	0.10	0.50
Aspect: S=2, W=1			



Dry Rock Garden

Selaginella wallacei– *Lomatium martindaleii* (Wallace's spikemoss – Cascade desert parsley)

SEWA – LOMA5



Summary

This spikemoss dominated community with sparse forbs occurs on mostly South facing rock outcrops through-out the Coast Range study area. This plant community is often invaded by the moss, *Racomitrium canescens*, which often occupies a large area of the habitat. Sites sampled were from Mill Creek Ridge, Rickreall Ridge, and Prairie Mountain on Salem BLM and the Cape Perpetua area on Siuslaw NF. This plant community is similar to the Rock Garden [steep, xeric] type described in the northern Oregon Cascades non-forested plant community guide, which is also spikemoss dominated. However, Cascades community's grass and forb component is entirely different. A larger sample size in the Coast Range type might include some other dry site plants in common with the Cascades description, Oceanspray and stonecrop; the potential additional species in common are not likely to combine them.

Several species found in this plant community are known to be important hosts for pollinators.

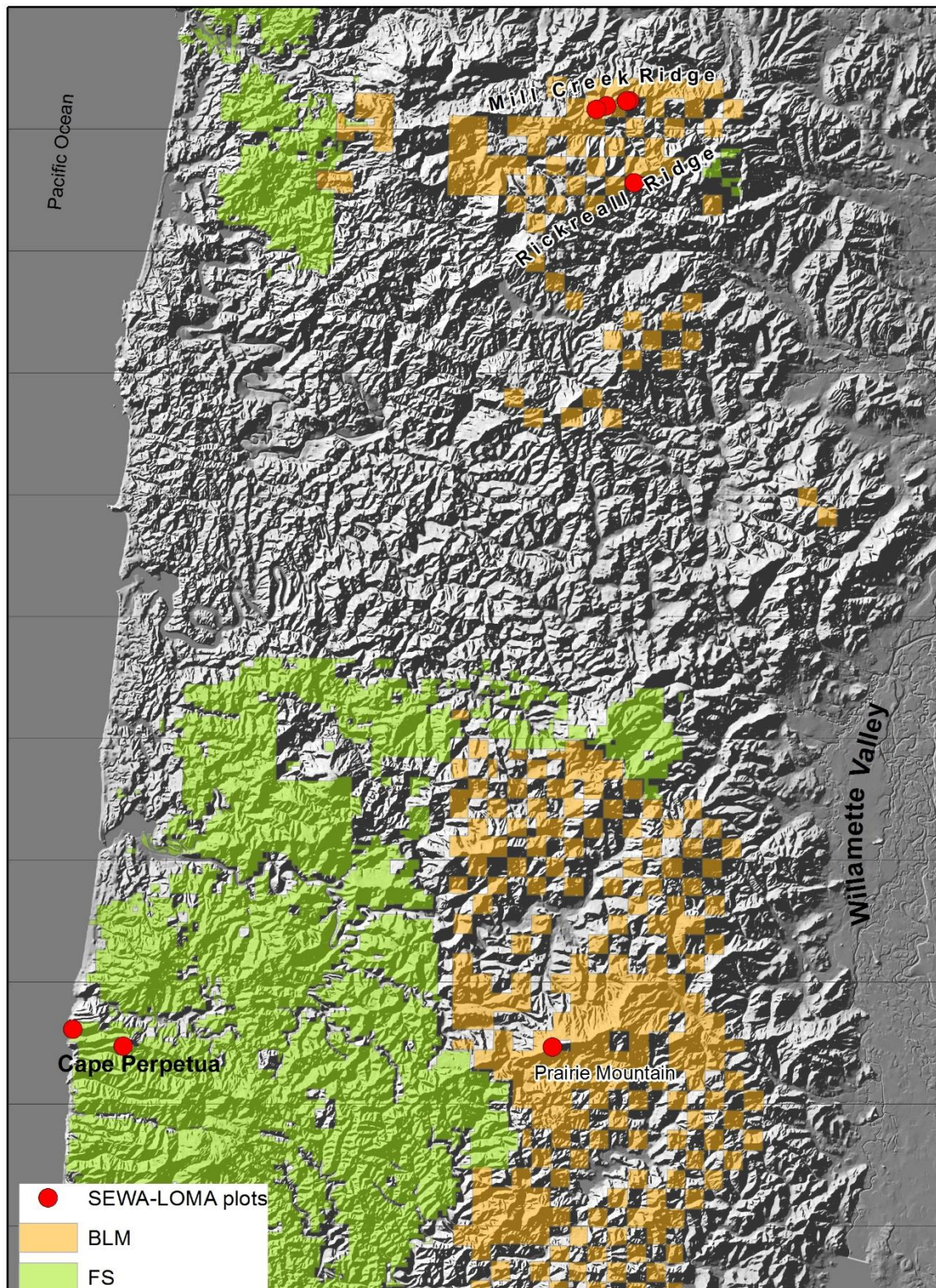
N = 8 plots, Salem BLM, Siuslaw NF

SEWA-LOMA5. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

Plant Code	Scientific Name	Common Name	Type	Ave Cover (%)	Constancy (%)
SEWA	<i>Selaginella wallaceii</i>	Wallace's spikemoss	fern allie	6.1	100
LOMA5	<i>Lomatium martindaleii</i>	Cascade desert parsley	forb	2.8	75
PHNE2	<i>Phacelia nemoralis</i>	shade phacelia	forb	1.5	63
CLAM	<i>Clarkia amoena</i>	farewell-to-Spring	forb	0.2	50
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	0.1	50
ALCR4	<i>Allium crenatum</i>	Olympic onion	forb	0.1	50
GICA5	<i>Gilia capitata</i>	blue gilia	forb	0.1	50
MAEX	<i>Madia exigua</i>	small tarweed	forb	0.1	38

SEWA – LOMA5. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	1.47	0.02	4.01
Annual Precipitation cm	21.54	20.13	23.11
Summer Temperature C°	15.90	13.64	16.72
<u>Physical</u>			
Elevation m	571.40	227.00	842.00
Slope %	80.00	70.00	85.00
Gravel Cover %	0.14	0.00	0.40
Rock Cover %	30.66	5.00	60.00
Bare Soil Cover %	0.25	0.00	0.40
Soil Depth (A horizon) cm	0.50	0.50	0.50
Thatch Cover %	0.28	0.10	1.00
Aspect: S=5, SE=2, E=1			



Heuchera macrantha-*Saxifraga mertensiana*

(crevice alumroot-Merten's saxafrage)

HEMI7-SAME7



Summary

This saxifrage and moss dominated community was found on the steep, north side rock wall of Rickreall Ridge on Salem BLM. Some dry site species, such as oceanspray and Douglas' catchfly occur in dry microsites within this community. This plant community is expected to occur on similar moist steep rock faces at mid-elevation areas in the northern Coast Range. Like the Coast Range dry rock garden community described in this work, it has species in common with the Rock Garden type described in the northern Oregon Cascades non-forest plant community guide. However, this Coast Range type only has a few species in common with that in the Cascades. With only 3 plots and one location, this type needs further study.

Several species found in this plant community are known to be important hosts for pollinators.

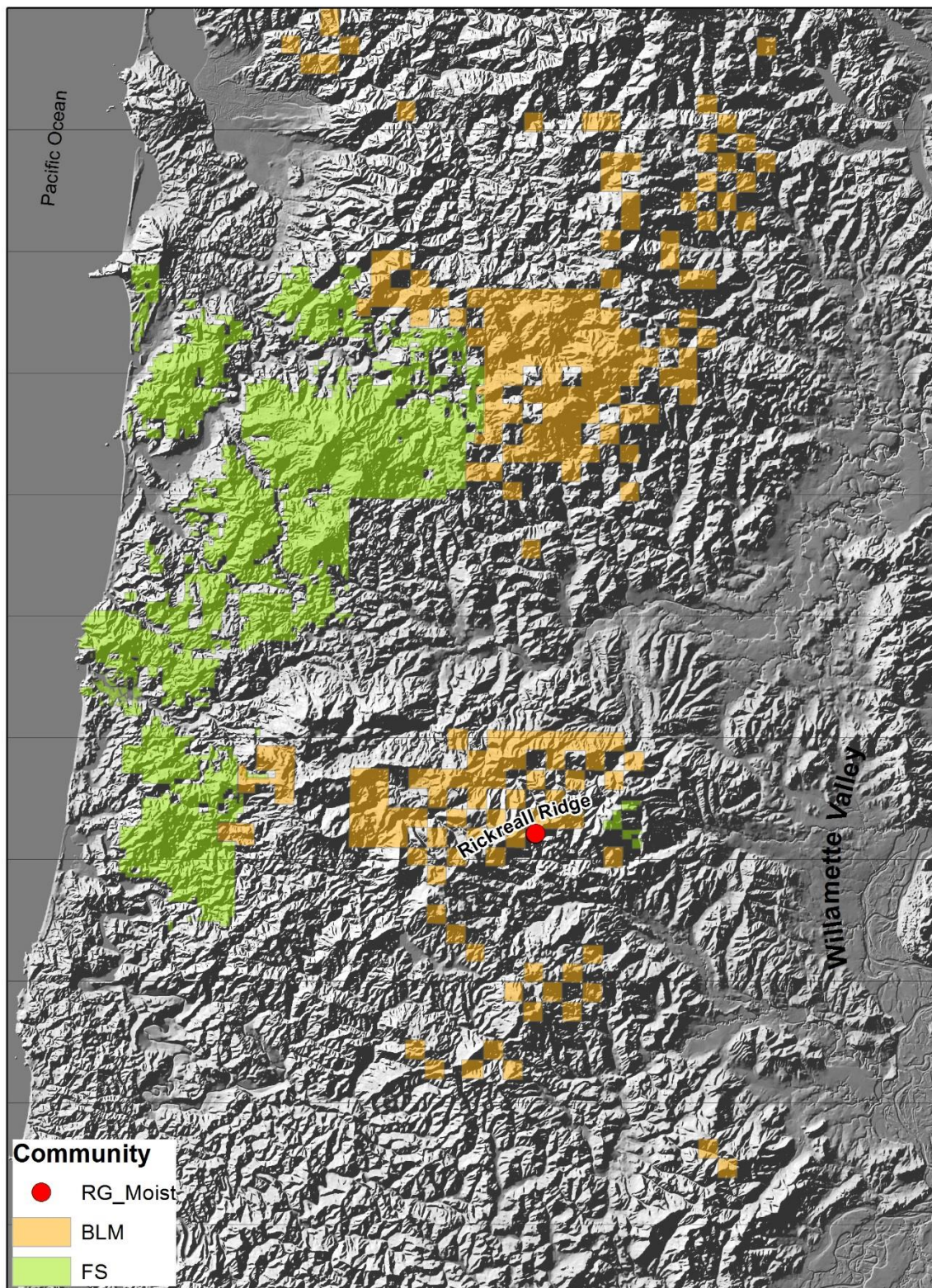
N = 3 (Salem BLM)

HEMI7-SAME7. Constancy table. Mean canopy cover for native species in greater than 30% of plots.

Plant Code	Scientific Name	Common Name	Type	Ave Cover (%)	Constancy (%)
HEMI7	<i>Heuchera micrantha</i>	crevice alumroot	forb	15.5	100
SIDOD	<i>Sidalcea douglassii</i>	Douglas' catchfly	forb	2.1	100
LOMA5	<i>Lomatium martindaleii</i>	Cascade desert parsley	forb	0.3	100
Moss1	Moss need ID	moss	moss	65	100
SAME7	<i>Saxifraga mertensiana</i>	wood saxifrage	forb	18	67
SEWA	<i>Selaginella wallaceii</i>	Wallace's spikemoss	fern allie	2	67
MOPA2	<i>Montia parviflora</i>	littleleaf miner's lettuce	forb	0.3	67
SESP	<i>Sedum spathulifolium</i>	broadleaf stonecrop	forb	0.3	67
HODI	<i>Holodiscus discolor</i>	oceanspray	shrub	5	33
POGR9	<i>Potentilla gracilis</i>	slender cinquefoil	forb	0.6	33
BRCA5	<i>Bromus carinatus</i>	California brome	graminoid	0.1	33
ELGL	<i>Elymus glaucus</i>	blue wild rye	graminoid	0.1	33

HEMI7-SAME7. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	0.08	0.08	0.08
Annual Precipitation cm	25.32	25.32	25.32
Summer Temperature C°	15.87	15.87	15.87
<u>Physical</u>			
Elevation m	871.33	867.00	880.00
Slope %	81.67	75.00	90.00
Gravel Cover %	0.10	0.10	0.10
Rock Cover %	38.67	8.50	65.00
Bare Soil Cover %	0.10	0.10	0.10
Soil Depth (A horizon) cm	0.67	0.50	1.00
Thatch Cover %	0.90	0.10	2.50
Aspect: NW=3			



Wet Rock Garden

Saxifraga ferruginea – *Camassia quamash*

(rusty saxifrage – short camas)

SAFE – CAQU2



Summary

This saxifrage and camas plant community occupies seasonally wet areas flat topped or mild sloped rock outcrops. It was observed and sampled on the summits of Mt Hebo on the Siuslaw NF and Little Grass Mountain on Salem BLM. Camas is known to be important to local tribes.

N = 5 plots (Siuslaw NF, Salem BLM)

SAFE-CAQU2. Constancy table. Canopy cover for native species with greater than 30% constancy.

Plant Code	Scientific Name	Common Name	Type	Ave Cover (%)	Ave Constancy (%)
CAQU2	<i>Camassia quamash</i>	small camas	forb	5.7	100
SAFE	<i>Saxifraga ferruginea</i>	russethair saxifrage	forb	3.8	100
PECA16	<i>Penstamen cardwellii</i>	Cardwell's beardtongue	forb	1.1	60
MOPA2	<i>Montia parviflora</i>	littleleaf miner's lettuce	forb	0.5	60
STERE2	<i>Stereocaulon</i> sp.	snow lichen	lichen	5.0	60
AGPA8	<i>Agrostis pallens</i>	seashore bentgrass	graminoid	1.8	40
MADIA	<i>Madia</i> sp.	tarweed	forb	0.5	40
CEAR4	<i>Cerastium arvense</i>	meadow chickweed	forb	0.5	40

SAFE-CAQU2. Environmental table.

Environmental Variables	Mean	Minimum	Maximum
<u>Climate</u>			
Minimum December Temperature C°	0.03	-0.28	0.55
Annual Precipitation cm	37.91	33.08	40.56
Summer Temperature C°	14.88	13.82	16.48
<u>Physical</u>			
Elevation m	963.80	883.00	1060.00
Slope %	12.20	5.00	25.00
Gravel Cover %	2.58	0.10	8.80
Rock Cover %	18.16	1.10	42.50
Bare Soil Cover %	1.28	0.00	6.40
Soil Depth (A horizon) cm	8.20	0.00	30.00
Thatch %	0.74	0.10	2.30
Aspect: S=2, SW=1, W=2			

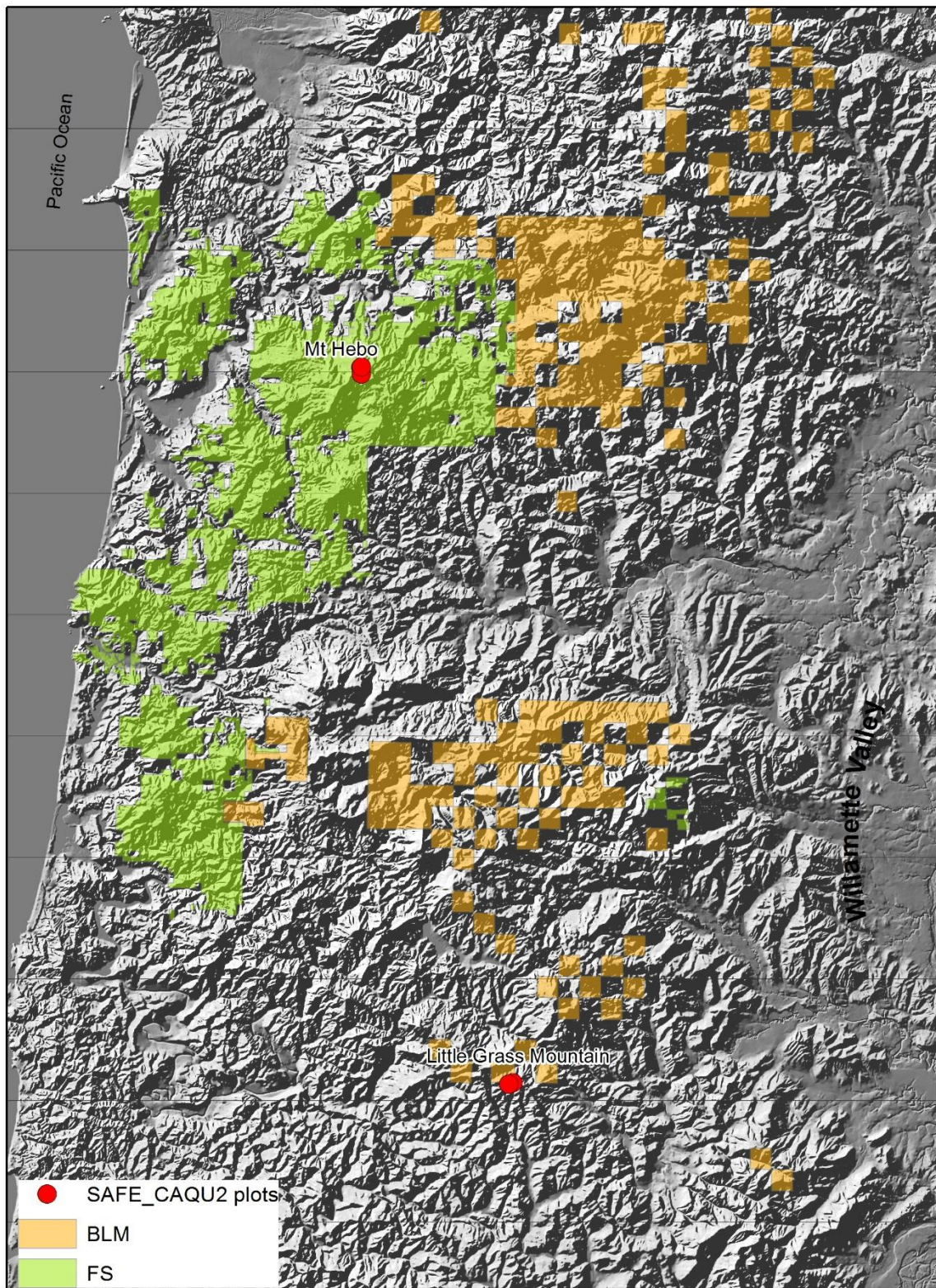


Table 2a. Mult-Response Permutation Procedure (MRPP) results for testing plant community group membership. P-values <0.05 indicate plant community group species composition is significantly different. T = test statistic and indicates the strength of separation between groups. A = agreement statistic and indicates heterogeneity within groups.

Group Comparisons			T	A	p-value
ELGL	vs.	FRVI-DACA3	-8.60495986	0.25005988	0.0001
ELGL	vs.	HEMI7-SAFE7	-6.21944243	0.21528369	0.0002
ELGL	vs.	MAST4-CACA9	-8.30401845	0.15524678	0.0000
ELGL	vs.	PHDI3	-6.73974497	0.31251188	0.0002
ELGL	vs.	SAFE7-CAQU2	-7.57667907	0.20903926	0.0001
ELGL	vs.	ERLA6	-7.67487523	0.21276172	0.0001
ELGL	vs.	FECA	-5.28265684	0.23038278	0.0035
ELGL	vs.	FERO-coast	-7.08434503	0.28358144	0.0001
ELGL	vs.	FERO-high	-6.06844871	0.126902	0.0002
ELGL	vs.	SEWA-LOMA5	-9.86146452	0.24754699	0.0000
ELGL	vs.	THGR6	-7.12835404	0.20099605	0.0001
ERLA6	vs.	ELGL	-7.67487523	0.21276172	0.0001
ERLA6	vs.	FERO-high	-6.79207315	0.23058528	0.0004
ERLA6	vs.	FRVI-DACA3	-6.69264584	0.26551629	0.0004
ERLA6	vs.	HEMI7-SAFE7	-4.30839999	0.24927409	0.0035
ERLA6	vs.	MAST4-CACA9	-7.86012845	0.20812075	0.0000
ERLA6	vs.	PHDI3	-4.41511119	0.37395172	0.0036
ERLA6	vs.	SAFE7-CAQU2	-5.44518415	0.2215944	0.0015
ERLA6	vs.	FECA	-3.66559273	0.31884733	0.0103
ERLA6	vs.	FERO-coast	-5.11349278	0.3376838	0.0027
ERLA6	vs.	SEWA-LOMA5	-6.91342148	0.19937925	0.0002
ERLA6	vs.	THGR6	-5.74450418	0.30787201	0.0016
FECA	vs.	ELGL	-5.28265684	0.23038278	0.0035
FECA	vs.	ERLA6	-3.66559273	0.31884733	0.0103
FECA	vs.	FERO-high	-4.52935543	0.26274017	0.0059
FECA	vs.	FRVI-DACA3	-4.31838967	0.30475552	0.0059
FECA	vs.	HEMI7-SAFE7	-2.16833751	0.39838022	0.0000
FECA	vs.	MAST4-CACA9	-4.94620263	0.21076889	0.0029
FECA	vs.	PHDI3	-2.22820019	0.62421158	0.0000
FECA	vs.	SAFE7-CAQU2	-3.45865163	0.30744002	0.0117
FECA	vs.	FERO-coast	-2.97639361	0.53034667	0.0160
FECA	vs.	SEWA-LOMA5	-4.87974718	0.25324942	0.0049
FECA	vs.	THGR6	-3.60212647	0.40299548	0.0106

Table 2b. Cont.

Group Comparisons			T	A	p-value
FERO-coast	vs.	ELGL	-7.08434503	0.28358144	0.0001
FERO-coast	vs.	ERLA6	-5.11349278	0.3376838	0.0027
FERO-coast	vs.	FECA	-2.97639361	0.53034667	0.0160
FERO-coast	vs.	FERO-high	-4.75990908	0.13630664	0.0009
FERO-coast	vs.	FRVI-DACA3	-6.19704978	0.37785945	0.0006
FERO-coast	vs.	HEMI7-SAFE7	-3.64149777	0.39330631	0.0092
FERO-coast	vs.	MAST4-CACA9	-7.29957886	0.2495386	0.0000
FERO-coast	vs.	PHDI3	-3.70242479	0.54529882	0.0093
FERO-coast	vs.	SAFE7-CAQU2	-4.88203889	0.31558454	0.0026
FERO-coast	vs.	SEWA-LOMA6	-6.5919203	0.29781231	0.0003
FERO-coast	vs.	THGR6	-5.13391904	0.46165427	0.0027
FERO-high	vs.	ELGL	-6.06844871	0.126902	0.0002
FERO-high	vs.	FRVI-DACA3	-7.25036022	0.22283174	0.0002
FERO-high	vs.	HEMI7-SAFE7	-5.27623872	0.22693639	0.0007
FERO-high	vs.	MAST4-CACA9	-6.50923138	0.13662056	0.0001
FERO-high	vs.	PHDI3	-5.52909384	0.30778135	0.0007
FERO-high	vs.	SAFE7-CAQU2	-6.52639843	0.21655764	0.0003
FERO-high	vs.	ERLA6	-6.79207315	0.23058528	0.0004
FERO-high	vs.	FECA	-4.52935543	0.26274017	0.0059
FERO-high	vs.	FERO-coast	-4.75990908	0.13630664	0.0009
FERO-high	vs.	SEWA-LOMA5	-8.32594382	0.22800459	0.0001
FERO-high	vs.	THGR6	-6.76324744	0.28338996	0.0003
FRVI-DACA3	vs.	HEMI7-SAFE7	-5.31414355	0.28419011	0.0007
FRVI-DACA3	vs.	PHDI3	-5.53710167	0.39873354	0.0007
FRVI-DACA3	vs.	ELGL	-8.60495986	0.25005988	0.0001
FRVI-DACA3	vs.	ERLA6	-6.69264584	0.26551629	0.0004
FRVI-DACA3	vs.	FECA	-4.31838967	0.30475552	0.0059
FRVI-DACA3	vs.	FERO-coast	-6.19704978	0.37785945	0.0006
FRVI-DACA3	vs.	FERO-high	-7.25036022	0.22283174	0.0002
FRVI-DACA3	vs.	MAST4-CACA9	-8.29716617	0.19248746	0.0000
FRVI-DACA3	vs.	SAFE7-CAQU2	-6.63675196	0.26076914	0.0003
FRVI-DACA3	vs.	SEWA-LOMA5	-8.77401841	0.29235652	0.0001
FRVI-DACA3	vs.	THGR6	-6.78312956	0.34302432	0.0005

Table 2c. Cont.

Group Comparisons			T	A	p-value
MAST4-CACA9	vs.	FRVI-DACA3	-8.29716617	0.19248746	0.0000
MAST4-CACA9	vs.	HEMI7-SAFE7	-5.82643521	0.18730466	0.0003
MAST4-CACA9	vs.	PHDI3	-6.76167772	0.25851382	0.0001
MAST4-CACA9	vs.	ELGL	-8.30401845	0.15524678	0.0000
MAST4-CACA9	vs.	ERLA6	-7.86012845	0.20812075	0.0000
MAST4-CACA9	vs.	FECA	-4.94620263	0.21076889	0.0029
MAST4-CACA9	vs.	FERO-coast	-7.29957886	0.2495386	0.0000
MAST4-CACA9	vs.	FERO-high	-6.50923138	0.13662056	0.0001
MAST4-CACA9	vs.	SAFE7-CAQU2	-7.70120223	0.19845387	0.0000
MAST4-CACA9	vs.	SEWA-LOMA5	10.32960752	0.2344326	0.0000
MAST4-CACA9	vs.	THGR6	-7.92980311	0.24061247	0.0000
PHDI3	vs.	HEMI7-SAFE7	-2.89698082	0.41070019	0.0221
PHDI3	vs.	ELGL	-6.73974497	0.31251188	0.0002
PHDI3	vs.	ERLA6	-4.41511119	0.37395172	0.0036
PHDI3	vs.	FECA	-2.22820019	0.62421158	0.0000
PHDI3	vs.	FERO-coast	-3.70242479	0.54529882	0.0093
PHDI3	vs.	FERO-high	-5.52909384	0.30778135	0.0007
PHDI3	vs.	FRVI-DACA3	-5.53710167	0.39873354	0.0007
PHDI3	vs.	MAST4-CACA9	-6.76167772	0.25851382	0.0001
PHDI3	vs.	SAFE7-CAQU2	-4.179282	0.32895876	0.0037
PHDI3	vs.	SEWA-LOMA5	-5.49193744	0.26136694	0.0005
PHDI3	vs.	THGR6	-4.41844085	0.49005539	0.0035
SAFE7-CAQU2	vs.	FRVI-DACA3	-6.63675196	0.26076914	0.0003
SAFE7-CAQU2	vs.	HEMI7-SAFE7	-3.97744197	0.22162837	0.0035
SAFE7-CAQU2	vs.	MAST4-CACA9	-7.70120223	0.19845387	0.0000
SAFE7-CAQU2	vs.	PHDI3	-4.179282	0.32895876	0.0037
SAFE7-CAQU2	vs.	ELGL	-7.57667907	0.20903926	0.0001
SAFE7-CAQU2	vs.	ERLA6	-5.44518415	0.2215944	0.0015
SAFE7-CAQU2	vs.	FECA	-3.45865163	0.30744002	0.0117
SAFE7-CAQU2	vs.	FERO-coast	-4.88203889	0.31558454	0.0026
SAFE7-CAQU2	vs.	FERO-high	-6.52639843	0.21655764	0.0003
SAFE7-CAQU2	vs.	SEWA-LOMA5	-7.03832205	0.21005242	0.0001
SAFE7-CAQU2	vs.	THGR6	-5.60004249	0.29476104	0.0014

Table 2d. Cont.

Group Comparisons			T	A	p-value
SEWA-LOMA5	vs.	ELGL	-9.86146452	0.24754699	0.0000
SEWA-LOMA5	vs.	ERLA6	-6.91342148	0.19937925	0.0002
SEWA-LOMA5	vs.	FECA	-4.87974718	0.25324942	0.0049
SEWA-LOMA5	vs.	FERO-high	-8.32594382	0.22800459	0.0001
SEWA-LOMA5	vs.	FRVI-DACA3	-8.77401841	0.29235652	0.0001
SEWA-LOMA5	vs.	HEMI7-SAFE7	-4.57725985	0.14866552	0.0009
SEWA-LOMA5	vs.	MAST4-CACA9	10.32960752	0.2344326	0.0000
SEWA-LOMA5	vs.	PHDI3	-5.49193744	0.26136694	0.0005
SEWA-LOMA5	vs.	SAFE7-CAQU2	-7.03832205	0.21005242	0.0001
SEWA-LOMA5	vs.	FERO-coast	-6.5919203	0.29781231	0.0003
SEWA-LOMA5	vs.	THGR6	-7.56433471	0.30032075	0.0002
THGR6	vs.	ELGL	-7.12835404	0.20099605	0.0001
THGR6	vs.	ERLA6	-5.74450418	0.30787201	0.0016
THGR6	vs.	FECA	-3.60212647	0.40299548	0.0106
THGR6	vs.	FERO-coast	-5.13391904	0.46165427	0.0027
THGR6	vs.	FERO-high	-6.76324744	0.28338996	0.0003
THGR6	vs.	FRVI-DACA3	-6.78312956	0.34302432	0.0005
THGR6	vs.	HEMI7-SAFE7	-4.31976579	0.33437003	0.0035
THGR6	vs.	MAST4-CACA9	-7.92980311	0.24061247	0.0000
THGR6	vs.	PHDI3	-4.41844085	0.49005539	0.0035
THGR6	vs.	SAFE7-CAQU2	-5.60004249	0.29476104	0.0014
THGR6	vs.	SEWA-LOMA5	-7.56433471	0.30032075	0.0002

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