

These documents are appendices to the paper by G. Wooten and P. Morrison. 1996+. Classification of vascular plant communities of the North Cascades using discreet space boundary analysis. Floradora Farms (<http://www.okanogan1.com/ecology/eco-ncas>).

Notes in proof

The original field studies misidentified differently sized plants of *Artemisia rigida* as *Artemisia cana* or *Artemisia arbuscula*. In these appendices, all instances of either *Artemisia arbuscula* (ARAB) or *Artemisia cana* have been changed to *Artemisia rigida* (ARRI).

Appendix 1. Glossary.

The following glossary lists definitions of some of the terminology in the text. See Lincoln et al. (1982) for the source of some of these definitions.

association a climax plant community characterized by two or more dominant species which have the life form typical of the formation to which the association belongs.

attributes the coded plant abundances in TWINSPAN two-way tables.

autoecology processes and interrelationships between individual organisms of the same species.

climax a more or less stable biotic community which is in equilibrium with existing environmental conditions and which represents the terminal stage of an ecological succession.

cohort a group of individual trees of a similar age within a stand containing multiple ages of trees.

community (vegetative) a group of plants that grow together and can be characterized by typical species.

composite sample a sample in which the attributes are given as the mean of plant abundances from a group of other samples.

detrended correspondence analysis a multidimensional ordination technique for derivation of low dimensional axes free of distortions present in previous ordination methods.

differential species a plant species with a presence level which is discriminative of a plant community in which it occurs.

discreet space regions of ordination space in which only local gradients are considered with respect to their effect on differential species in that region.

divisive (vs agglomerative) classification clustering classification methods that split groups of samples rather than group them together.

ecological space an depiction of an environment supporting a defined range of species that can be described in terms of important environmental gradients; as used here, this term is complementary to *ordination space* which refers to the process and depiction of those gradients, while *ecological space* refers to the environment itself.

ecosystem management a set of management tools and techniques directed toward management of natural resources, and generally for the benefit of the natural system before other values.

ecotone a continuous gradient between two habitat types; compare with mosaic, a patchy mixture of two communities within a given area.

ecotope the full range of adaptations of a species both within its niche and between adjacent communities.

ground truthing the identification and classification of geographic areas with predefined characteristics, such as Landsat spectral classes.

guild a group of species with similar niche requirements and thus similar roles in the community.

habitat type (Daubenmire, 1970, p. 5): "The aggregate of all areas that support, or can support, the same primary climax is a habitat type..."; (Pfister, 1976): "...the habitat type system is a method of site classification that utilizes the entire plant community as an integrated indicator of environmental factors as they affect species reproduction, competition, and plant community development. Both tree species and undergrowth species are used as environmental indicators. For forest habitat types, the primary classification unit is the potential dominant climax tree

species...The secondary subdivision is based on characteristic undergrowth dominants or species with high indicator values. The habitat types are named by the potential climax plant community type..."; (Pfister and Arno, 1980): "Habitat types represent environmental differences reflected by total vegetation composition and are named by the series and the characteristic undergrowth".

heierarchical classification a clustering technique in which the groups are arranged in a heierarchical tree.

krummholz dwarfed, often matlike trees, occurring at timberline due to climatic and edaphic, or soil, factors.

microniche a portion of the environment that is capable of supporting a different community from the surrounding matrix in an area.

mosaic community areas containing patches of two or more recognized, distinct communities.

niche the ecological role of a species in a community, often defined in terms of its habitat.

ordination the process of projection of points in a multidimensional species space of lowest dimensions.

ordination space a depiction of complex gradients as low dimensional axes derived from many species, see ecological space for a related term.

phase (Pfister and Arno, 1980) "Phases reflect minor environmental differences within a habitat type and are named by indicator species". As used here, phases would also include groups of dominant species which are interchangeable with corresponding abundances of equally likely, but not absolutely required, species.

plant abundances a measure of population frequencies for given plant species, here quantified by the use of cover values, which are areal projections of plant outlines onto a horizontal plane.

plot a defined sample area.

polythetic (vs. monothetic) classification a classification based on the values of numerous variables, in this case, plant species abundances.

raw data used synonymously here for the plural of relevé.

relevé a description of a unit sample area in terms of habitat and species abundances; a phytosocial record; used synonymously here with raw data.

sample a representative unit from a larger set; used here in the plural sense, e. g., as groups of relevés.

series a set of named habitat types all having the same dominant tree at climax.

spectral signature, spectral class, spectral polygon geographic regions mapped by scanning satellites with common measured spectral characteristics.

stand a geographic unit of vegetation with similar combinations of plant species; a community.

subcommunity a smaller community within the matrix of a larger landscape, that differs by more than one half of a complete species turnover from the landscape mosaic it is within.

two-way indicator species analysis (TWINSPAN) a heierarchical, polythetic, divisive classification technique based on reciprocal averaging within each division.

upland plant community plant communities with the preponderance of vascular vegetation not requiring the presence of wetland soils and hydrology.

wetland plant community plant communities with a preponderance of obligate wetland or riparian plant species; legally defined by additional soil and hydrological characteristics.

riparian plant community plant communities occurring in response to hydrologic factors, used here to include wetlands as just one type of riparian community.

Appendix 2. Classification key.

This is the classification key to 1433 North Cascades relevés with selective and restrictive indicator species. The key is in the same order which was used by the keying program FKEY. The names and labels of the sets are given followed by the number and percentage of relevés in each set, followed by the key leads and the number of relevés under each of those leads. The numbered leads are dichotomous and exclusive and the inequalities within the sets are redundant sets of *ord* statements; the sum of the subsets is therefore greater than the set total. Alphacodes are given in appendix 7. Trees with the letter "O" or "U" in the sixth column represent overstory (>10 m) and understory (<10 m) size classes, respectively. Note that since cover values of zero were counted as present (trace) in this study, the convention here is that species absent from a relevé are given by the expression: < 0.

1. OUT - Outliers		OUT (39, 2.7%)
2. CUT - Clearcut logged		CUT (14, 1.0%)
3. CUL - Cultivated: orchards, pastures, fallow ground		CUL (11, 0.8%)
3A: Orchard	TOTAL = 1	
PYMA \geq 20		1
3B: Fields, pastures	TOTAL = 7	
SECE \geq 40		3
MESA \geq 20		3
TRAE \geq 20		1
3C: Fallow, weeds	TOTAL = 3	
CEDI \geq 40		2
VETH \geq 20		1
4. - Riparian and forested wetlands; surface water present		
4A: RIC: (Eastside hardwood riparian and swamp)		RIC (3, 0.2%)
ALIN \geq 10 + BEOC \geq 10 + COST \geq 10 + URDI \geq 0		
4B: RIX: (Riparian)		RIX (81, 5.6%)
ALRU \geq 2 + ACMA \geq 0 + URDI \geq 0		13
ALRU \geq 0 + POTR2 \geq 0 + SASI2 \geq 0		7
ACMA \geq 10 + URDI \geq 10		4
THPL \geq 5 + EQAR \geq 1 + GLEL \geq 0		3
ABGR \geq 20 + EQAR \geq 1 + ACCO \geq 0 + SETR \geq 0		2
PICO \geq 2 + LEGL \geq 0 + TRLA4 \geq 0		1
SPDO \geq 5 + SOCA \geq 2		6
CRDO \geq 2 + SPIRA \geq 10 + CALAM \geq 0		2
RUPA \geq 5 + VASI \geq 5 + CACA \geq 0		1
SASI2 \geq 10 + LOIN \geq 2 + COST \geq 0 + SETR \geq 0		1
BEOC \geq 0		10
ALIN \geq 0		6
COST \geq 10		13
POTR2 \geq 10		14
POTR2 \geq 2 + LOIN \geq 2 + RILA \geq 0		2
ABLA2 \geq 10 + PIEN \geq 10 + VASI \geq 0 + SETR \geq 0		8
PIEN \geq 20 + EQAR \geq 0		6
PIEN \geq 40 + LEGL \geq 0		3
5. WET - Wetlands; generally low-gradient, non-forested		WET (89, 6.2%)
BEGL > 0		3
SACO2 \geq 5 + VASI \geq 20		1

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CARO2 ≥ 20	4
CACA ≥ 10	2
CACA ≥ 1 + EQAR ≥ 1	7
ERPO2 ≥ 0	9
MEAR3 ≥ 20	4
CASC5 ≥ 20	3
CASC5 ≥ 10 + CALE2 ≥ 10	5
CASC5 ≥ 5 + TRLA4 ≥ 5	12
TRLA4 ≥ 4 + HADI2 ≥ 0	20
TRLA4 ≥ 0 + SALIX ≥ 0	9
HADI2 ≥ 0 + PEGR ≥ 0	19
CANI2 ≥ 2 + KAMI ≥ 0	9
CANI2 ≥ 0 + GAHU ≥ 0 + KAMI ≥ 0	1
POVI2 ≥ 0	11
LEPY2 ≥ 0 + AGTH ≥ 0	10
EQHY ≥ 20	4
EQAR ≥ 0 + CAAQ ≥ 0	3
EQAR ≥ 0 + ACCO ≥ 0	7
EQAR ≥ 0 + KAMI ≥ 0	5
SECY2 ≥ 2	5
6. BUN - Shrub-bunchgrass; shrub-steppe	BUN (114, 8.0%)
ARRI ≥ 0	17
ARTR ≥ 20 + AGSP ≥ 10	11
ARTR ≥ 40 + PICO < 0	11
PUTR ≥ 10 + AGSP ≥ 10 + PIPO < 20	23
PUTR ≥ 5 + PHLI ≥ 0	21
PIPO ≥ 0 + SIAL ≥ 2 + AGSP ≥ 2	3
AGSP ≥ 20 + BASA ≥ 0 + RICE ≥ 0 + PSME < 20	16
AGSP ≥ 10 + BRTE ≥ 10	32
AGSP ≥ 5 + POSE ≥ 2	33
POBU ≥ 10 + BRTE ≥ 10	6
BRTE ≥ 10 + LULE ≥ 2	3
ERDO ≥ 5	4
ARTR2 ≥ 10	4
BASA ≥ 0 + BRTE ≥ 0 + AGSP ≥ 0 + PSME < 10 + PIPO < 10	60
BASA ≥ 0 + LOTR ≥ 0 + PIPO < 5 + ARCO < 0	17
POBU ≥ 0 + LIRU ≥ 0 + PIPO < 5	14
LONU ≥ 0 + LODI2 ≥ 0 + PSME < 5	10
PLPA ≥ 0 + PIPO < 5	18
7. ALS - Sitka alder avalanche chute shrubfields	ALS (34, 2.3%)
ALSI ≥ 40 + PICO < 0	
8. TSA - West central North Cascades upper elevation forest	TSA (74, 5.2%)
TSME ≥ 2 + VAME ≥ 20 + VAAL ≥ 2 + TSHE < 0 + SASC < 5 + POBI < 0 + PHEM < 2	4
TSME ≥ 20 + ABAM ≥ 2 + PIEN < 0 + VAME < 20 + VADE < 5 + CASP < 0 + POBI < 0 + CANI2 < 0 + XETE < 4 + LYSI < 0	17
ABAM ≥ 20 + TSME ≥ 0 + ABLA2 < 0 + PIEN < 0 + TSHE < 20 + VAME < 20 + VADE < 20 + CHNO < 20 + POBI < 0	15
ABAM ≥ 2 + TSME ≥ 10 + BLSP ≥ 0 + PHEM < 10 + CASP < 0	9
CHNO ≥ 40 + TSME ≥ 2 + ALSI ≥ 2	1
CLPY ≥ 20 + ATDI < 0	4

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TSME \geq 20 + ABAM \geq 10 + VAME \geq 20 + CASP $<$ 20 + LYSI $<$ 0 + VAME $<$ 50	14
TSME \geq 50 + VAME \geq 20	5
ABAM \geq 50 + TSME \geq 2 + VAME \geq 20	10
ABAM \geq 50 + TSME \geq 20 + VAME \geq 10	14
ABAM \geq 20 + TSME \geq 10 + VAME \geq 50 + CHNO \geq 2 + PIMO = 0	9
TSME \geq 10 + ABAM \geq 2 + CASP \geq 5 + SOSI \geq 0 + CANI2 $<$ 5 + LUPE $<$ 10	2
TSME \geq 20 + ABAM \geq 50 + VAME \geq 20 + RUPE \geq 10	1
ABAM \geq 20 + TSME \geq 20 + VAME \geq 50 + CHNO \geq 10	3
TSME \geq 20 + VAME \geq 50 + ABAM \geq 10 + PHEM \geq 2 + VADE $<$ 5	3
TSME \geq 30 + ABAM \geq 10 + CHNO \geq 0 + VAME \geq 40 + VADE \geq 10	1
TSME \geq 20 + CHNO \geq 25 + ABAM \geq 5 + ABLA2 \geq 2 + VAME \geq 20 + VADE \geq 5	1
ABAM \geq 20 + TSME \geq 10 + RHAL \geq 40 + VAME \geq 40	1
ABAM \geq 10 + VAME \geq 20 + VADE \geq 10 + SOSI \geq 2 + LUPE $<$ 5	5
TSME \geq 30 + ABAM \geq 2 + PHEM \geq 10 + VADE \geq 10 + RUPE \geq 0 + POBI $<$ 0	1
ABAM \geq 40 + CHNO \geq 10 + VAAL \geq 20	1
9. RUS - RUSP-ATFI shrubfield	RUS (6, 0.4%)
ATFI \geq 20 + RUSP \geq 20 + TSHE $<$ 5	5
RUSP \geq 10 + OPHO \geq 2 + ATFI \geq 0 + CHNO \geq 5 + ALSI \geq 5	1
10. POB - Western North Cascades high elevation meadows	POB (287, 20.0%)
POBI \geq 0 + ASEN $<$ 5 + SEIN $<$ 0 + FEVI $<$ 10 + ABLA2 $<$ 20	24
CANI2 \geq 0 + LUPE \geq 0	143
SOSI \geq 2 + PHEM \geq 0 + TSME $<$ 50	47
DEAT \geq 2 + PHEM \geq 0	29
DEAT \geq 0 + CANI2 \geq 2 + LOBR $<$ 0	50
PHEM \geq 0 + TSME \geq 0 + ABLA2 $<$ 20 + ABAM $<$ 20 + RHAL $<$ 20 + PIAL $<$ 0	158
VADE \geq 10 + PHEM \geq 2 + ABLA2 $<$ 10	136
LUPE \geq 10 + PHEM \geq 10 + ABLA2 $<$ 10	43
VADE \geq 2 + POFL2 \geq 2 + VEVI \geq 1 + CASP \geq 2 + FEVI $<$ 2	24
SPDE \geq 10	11
PHEM \geq 0 + SATO \geq 0	28
CHNO \geq 50	3
SOSI \geq 0 + SPDE \geq 0 + POBI \geq 0	8
VADE \geq 10 + LUHI \geq 20 + ABLA2 $<$ 50	1
CASP \geq 20 + VASI \geq 20 + VEVI \geq 20 + EPAN $<$ 5	2
CHNO \geq 30, TSME \geq 2, VADE \geq 10 + ABLA2 $<$ 40	8
TSME \geq 5, VADE \geq 10, SOSI \geq 2, ABLA2 \geq 10	9
TSME \geq 5 + ABLA2 \geq 5 + VAME \geq 10 + CASP \geq 5 + SOSI \geq 5 + VEVI \geq 5	1
ABAM \geq 0 + TSME \geq 0 + CHNO \geq 0 + VADE \geq 0 + VAME \geq 0 + PHEM \geq 0	31
TSME \geq 0 + CHNO \geq 0 + VADE \geq 10 + CAME \geq 0 + SPDE \geq 0	11
TSME \geq 5 + LALY \geq 0 + CAME \geq 20 + LUPE \geq 0	1
ABLA2 \geq 10 + ABAM \geq 5 + TSME \geq 0 + SOSI \geq 0 + POBI \geq 0 + LUPE \geq 0	2
11. ALP - East central North Cascades xeric alpine	ALP (7, 0.5%)
PIAL \geq 0 + SIAC \geq 0	4

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$ERCO \geq 0 + ERAU \geq 0$	5
$FEOV \geq 0 + CACA3 \geq 0 + SIAC \geq 0$	1
12. HIM - Central North Cascades high elevation meadows	HIM (219, 15.3%)
$LALY \geq 2 + TSME < 0$	34
$PIAL \geq 0 + VASC \geq 0$	71
$PIAL \geq 5 + FEVI \geq 0 + PIEN \geq 0$	9
$PIAL \geq 5 + JUPA \geq 0 + TSME < 0 + AMAL < 0$	12
$PICO \geq 2 + PIEN \geq 0 + VASC \geq 5 + ARCA2 \geq 0 + CARU < 0$	4
$PICO \geq 20 + VASC \geq 2 + CACO \geq 0 + LIBO2 < 0$	3
$ABLA2 \geq 20 + LAOC \geq 5$	1
$FEVI \geq 5 + PHDI \geq 5$	82
$FEVI \geq 20$	52
$PHDI \geq 2 + PTAQ < 10$	82
$PHEM \geq 10 + VADE \geq 10 + TSME < 20 + ABLA2 < 20$	2
$PHEM \geq 20 + VADE \geq 0 + SPDE \geq 0$	3
$CANI2 \geq 5$	7
$SOSI \geq 5 + VADE \geq 5$	3
$ANLA \geq 10$	15
$VASI \geq 0 + VEVI \geq 0 + ABAM < 0 + PTAQ < 10$	53
$CASP \geq 20 + ASEN \geq 5$	2
$ASEN \geq 20 + THOC \geq 20 + CASP \geq 0$	3
$ASEN \geq 20 + FEVI \geq 5 + VEVI \geq 0 + VASI \geq 0$	1
$CHNO \geq 5 + VAME \geq 20 + PHDI \geq 0$	3
13. TSH - West central North Cascades low elevation forest	TSH (218, 15.2%)
$TSHE \geq 0 + VASC < 0 + CASP < 0 + CANI2 < 0$	180
$TSHE \geq 20 + ABAM \geq 20$	81
$PSME \geq 0 + ACCI \geq 0$	12
$PSME \geq 20 + THPL \geq 20 + BENE \geq 2 + ABLA2 < 0$	50
$ACCI \geq 10 + RUPA \geq 2 + SASC < 20$	47
$PICO \geq 30 + GASH \geq 30$	14
$ABAM \geq 50 + RUPE \geq 20 + RISA \geq 0$	1
14. EAA - East central North Cascades mixed conifer; lower, drier	EAA (121, 8.4%)
$PIPO \geq 2 + VAME < 0$	68
$PSME \geq 10 + AMAL \geq 0 + SPBE \geq 0$	40
$PSME \geq 10 + AGSP \geq 0$	24
$PSME \geq 10 + CARU \geq 20 + CEVE \geq 2 + ABLA2 < 5$	3
$PSME \geq 10 + ARCO \geq 2$	19
$PSME \geq 50 + CARU \geq 0$	14
$PSME \geq 2 + CACO \geq 2 + ABLA2 < 0$	6
$ABGR \geq 0 + TSME < 0$	26
$POTR \geq 20 + VAME < 0$	10
$PREM \geq 2 + ACGL \geq 2 + ACCI < 2 + THPL < 0$	13
$HODI \geq 0 + ASEN < 0 + ABLA2 < 10$	36
$SYAL \geq 20$	9
15. EAB - East central North Cascades mixed conifer; higher, wetter	EAB (116, 8.1%)
$ABLA2 \geq 0 + VAME \geq 0 + TSHE < 0 + ALRU < 0$	74
$ABLA2 \geq 5 + PAMY \geq 5$	27
$ABLA2 \geq 2 + LULA \geq 5$	11
$ABLA2 \geq 0 + ACGL \geq 5$	4
$PICO \geq 0 + CARU \geq 0$	24

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$PSME \geq 5 + PAMY \geq 2$	29
$PSME \geq 0 + SHCA \geq 0 + SASC \geq 0$	4
$PSME \geq 10 + ACGL \geq 10$	2
$SASC \geq 5 + PICO < 0 + TSHE < 0$	17
$ALSI \geq 0 + PYSE \geq 0 + RULA \geq 0$	5
$SOSC2 \geq 5 + THOC \geq 0 + ASEN \geq 0 + ELGL \geq 0$	1
$PTAQ \geq 10 + THOC \geq 20$	4

Appendix 3. Indicator species for the classification sets.

This is a listing of important or indicator species noted for each classification set. It is not meant to be comprehensive, but is presented to help conceptualize the descriptions of the classification sets. Some of the leads are qualified with cover values or cooccurring species. Alphacodes are given in appendix 7.

ALP - Central North Cascades xeric alpine. PIAL, SIAC, ERCO, ERAU, FEOV, CACA3.

ALS - ALSI avalanche chutes. ALSI ($\geq 40\%$ cover, PICO absent).

BUN - Shrub-steppe or shrub bunchgrass. PIPO (0 - 20% cover), PSME (0 - 20% cover), ARRI, ARTR, ARTR2, PUTR, RICE, ERDO, AGSP, POSE, POBU, BRTE, BASA, LOTR, LONU, LODI2, LULE, PLPA, PHLI, SIAL, LIRU.

EAA - East central North Cascades mixed coniferous types; low elevation; dry. PIPO, PSME, ABGR, AMAL, SPBE, CEVE, PREM, ACGL, ACCI, HODI, SYAL, AGSP, CARU, ARCO, CACO.

EAB - East central North Cascades mixed conifer; higher, wetter, some shrubfields. ABLA2, PICO, PSME, SASC, ACGL, SOSC2, SHCA, ALSI, RULA, PAMY, PYSE, LULA, CARU, THOC, ASEN, ELGL, PTAQ.

HIM - Central North Cascades high elevation meadows. LALY, PIAL, PIEN, ABLA2, LAOC, PICO, CHNO, SOSI, VADE, VAME, VASC, PHEM, SPDE, PHDI, FEVI, JUPA, ARCA2, CACO, CANI2, ANLA, VASI, VEVI, CASP, ASEN.

POB - West central North Cascades upper elevation meadows. TSME, ABLA2, LALY, CHNO, SOSI, PHEM, VADE, SPDE, VAME, CAME, POBI, CANI2, LUPE, DEAT, CANI2, POFL2, VEVI, CASP, SATO, LUHI.

RIC - Eastern North Cascades riparian swamp. ALIN, BEOC, COST, URDI.

RIX - Riparian. ALRU, ACMA, BEOC, ALIN, POTR2, PIEN, THPL, SASI2, LEGL, SPDO, CRDO, RUPA, LOIN, RILA, COST, EQAR, URDI, GLEL, ACCO, SETR, TRLA4, VASI, CACA, ABLA2 (when occurring with PIEN, VASI, SETR), PICO (when occurring with LEGL, TRLA4), ABGR (when occurring with EQAR, ACCO, SETR), SOCA (when occurring with SPDO).

RUS - RUSP-ATFI Shrubfields. CHNO, ALSI, RUSP, OPHO, ATFI.

TSA - West central North Cascades upper elevation forest. TSME, ABAM, ABLA2, CHNO, VAME, VAAL, ALSI, CLPY, SOSI, RUPE, PHEM, VADE, RHAL, BLSP, CASP.

TSH - West central North Cascades low elevation forest. TSHE, PSME, THPL, PICO, ABAM, ACCI, RUPA, RUPE, RISA, GASH, BENE.

WET - Wetlands. BEGL, SACO2, KAMI, GAHU, VASI, CARO2, CACA, CASC5, CALE2, CANI2, CAAQ, EQAR, EQHY, ERPO2, MEAR3, TRLA4, HADI2, PEGR, POVI2, LEPY2, AGTH, ACCO, SECY2.

Appendix 4. Concordance with previously named habitat types, series, associations, phases and other plant communities.

This section is a concordance listing between classification sets from this study and previously described plant associations, series, habitat cover types, phases and other plant communities of the North Cascades and nearby areas. In general, zonal or regional characterizations were avoided (C. H. Merriam, in Arno and Hammerly, 1984, p. 175). Comparisons with other vegetative types was limited to the North Cascades for most of the forested types; comparisons were extended further for alpine, wetland and riparian associations since previous descriptions are incomplete for the North Cascades. Many of these communities correspond only roughly to others with the same name and some are seral stages or phases, thus some of the names have minor species and labelling changes, to correspond to their usage given here. Alphacodes are given in appendix 7.

Abbreviations of set names in this study:

- ALP - Central North Cascades xeric alpine
- ALS - ALSI avalanche chutes
- BUN - Shrub-steppe or shrub-bunchgrass
- CUL - Cultivated
- EAA - East central North Cascades mixed coniferous types; low elevation; dry
- EAB - East central North Cascades mixed conifer; higher, wetter, some shrubfields
- HIM - Central North Cascades high elevation meadows
- POB - West central North Cascades upper elevation meadows
- RIC - Eastern North Cascades riparian swamp
- RIX - Riparian
- RUS - RUSP-ATFI shrubfields
- TSA - West central North Cascades upper elevation forested
- TSH - West central North Cascades low elevation forested
- WET - Wetlands

References are as follows: (1) Williams and Lillybridge, 1983; (2) del Moral et al., 1976; (3) Douglas, 1969; (4) Williams and Smith, 1991; (5) Henderson and Peter, 1983; (6) Henderson and Peter, 1984; (7) Henderson and Peter, 1985; (8) Daubenmire and Daubenmire, 1968; (9) Pfister et al., 1977; (10) Henderson, 1974; (11) McLean, 1970; (12) Kovalchik, 1993; (13) Daubenmire, 1970; (14) Douglas and Bliss, 1977; (15) Tisdale and McLean, 1957; (16) Hamman, 1972; (17) Douglas, 1972; (18) Brayshaw, 1965; (19) Tisdale, 1947; (20) Agee and Kertis, 1987; (21) Borgias, 1984; (22) Larson, 1972; (23) Vanbianchi and Wagstaff, 1988; (24) Lillybridge et al, 1995.

<u>Previous description</u>	<u>Present study set(s)</u>	<u>Reference(s)</u>
ABAM-PIEN/RHAL-VAME/ARCO	EAB, RIX	2
ABAM-TSHE/OPHO	TSH	3
ABAM-TSHE/VAAL	TSH	2
ABAM-TSME/VAME-RUPE	POB, TSA, TSH	3
ABAM/ACCI	TSH	4, 24
ABAM/ACTR	TSH	4, 24
ABAM/BENE	TSH	6, 7
ABAM/depauperate	TSA, TSH	6, 7
ABAM/MEFE	TSA, TSH	4, 24
ABAM/OPHO	TSH	5, 6, 7, 24
ABAM/PAMY	EAB, TSH	1
ABAM/POMU	TSH	6, 7
ABAM/RHAL	TSA, TSH	1, 4
ABAM/RHAL/VAME	TSA, TSH	24
ABAM/RULA	TSA, TSH	24

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ABAM/RUPE	TSA, TSH	3, 7
ABAM/TITR	TSH	24
ABAM/TIUN	TSH	6, 7
ABAM/VAAL	TSA, TSH	4, 24
ABAM/VAAL-GASH	TSA, TSH	7
ABAM/VAAL/LIBO2	TSH	7
ABAM/VAAL/OPHO	RIX, TSH	6, 7
ABAM/VAME	EAB, POB, TSA, TSH	4, 6, 7
ABAM/VAME-PYSE	TSH	24
ABAM/VAME-RHAL/RULA	TSA, TSH	2
ABAM/VAME/CLUN	TSH	2, 24
ABAM/VAOV	TSA, TSH	2
ABGR-THPL/ACGL/RUPA-DODE	EAA, EAB, TSH	2
ABGR/ACCI	EAA, TSH	4, 24
ABGR/ACCI/CHUM	EAA, TSH	4, 24
ABGR/ACCI/CLUN	EAA, TSH	4, 24
ABGR/ACTR	EAA, EAB, TSH	4, 24
ABGR/ARCO	EAA, EAA	4, 24
ABGR/ARNE	EAA	4, 24
ABGR/BENE	EAA, TSH	4, 24
ABGR/BENE/CARU	EAA, TSH	4, 24
ABGR/CARU	EAA	4, 24
ABGR/CARU-LUPIN	EAA	4, 24
ABGR/CLUN	EAA, EAB, TSH	9
ABGR/HODI	EAA	4
ABGR/HODI/CARU	EAA	24
ABGR/LIBO2	EAA, EAB, TSH	9
ABGR/PAMY	EAA, TSH	8
ABGR/PTAQ/SPBE	EAA, TSH	4
ABGR/SPBE-PAMY/RUPA	EAA, TSH	2
ABGR/SPBE/PTAQ	EAA	24
ABGR/SYAL	EAA	4
ABGR/SYAL/CARU	EAA	24
ABGR/SYOR	EAA	4, 24
ABLA2-PIAL/VASC	HIM	9
ABLA2-PIEN/RHAL/ARCO	EAB, RIX	2
ABLA2-PIEN/VAME-PAMY	EAB, RIX	21
ABLA2-PSME/VAME-ARNE	EAB, HIM	2
ABLA2-TSME/VAME-RHAL-RULA	EAB, HIM, TSA	2
ABLA2/ALSI	EAB, RIX	9
ABLA2/ARCO	EAB, HIM	9
ABLA2/ARLA-POPU	EAB	24
ABLA2/ARLA/CAGE	EAB	4
ABLA2/ATFI	EAB, RIX	12
ABLA2/CARU	EAB	1, 4, 9, 24
ABLA2/CACA	EAB, RIX, HIM	9
ABLA2/COCA	EAB, RIX	12
ABLA2/GYDR	EAB, RIX	12
ABLA2/LEGL-VASC	EAB, RIX, WET	12
ABLA2/LIBO2	EAB	1, 4, 9, 24
ABLA2/LIBO2/VASC	EAB, HIM	9
ABLA2/LUHI	HIM, POB	4, 9, 24
ABLA2/PAMY	EAB	1, 8, 11, 24
ABLA2/PAMY/CARU	EAB	24

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ABLA2/PHEM	EAB	1
ABLA2/RHAL	EAB, TSA, RIX	1, 4, 24
ABLA2/RHAL/LUHI	EAB, TSA, RIX	24
ABLA2/RULA	EAB, TSA	4, 24
ABLA2/STAM	EAB, RIX	12
ABLA2/TRCA3	EAB	4, 24
ABLA2/TRLA4	RIX, WET	12
ABLA2/VACA	EAB, HIM, RIX	9, 12, 24
ABLA2/VACA/CLUN	EAB, HIM, RIX	9
ABLA2/VACCI	EAB, HIM	1
ABLA2/VADE	EAB, HIM, POB, TSA	24
ABLA2/VAME	EAB, HIM	24
ABLA2/VAME-RULA	EAB, HIM	2
ABLA2/VAMY	EAB, HIM	4
ABLA2/VASC	EAB, HIM	1, 4, 8, 9, 11, 24
ABLA2/VASC/ARLA	EAB, HIM	24
ABLA2/VASC/CARU	EAB, HIM	1, 9, 24
ABLA2/VASC/LUHI	HIM, POB, TSA	9, 24
ABLA2/VASC/THOC	EAB, HIM	9
ACCI-ALSI	EAB, RIX	23
ACCI-COST	EAB, RIX	23
AGSP-FEID	BUN	13
AGSP-FESC	BUN	19
AGSP-POSE	BUN	13
ALIN/EQUIS	RIC	12
ALIN/SYAL	RIC	12
ALSI	ALS	3
ALSI/ATFI	ALS, EAB	12
ALSI/mesic forb	ALS, EAB	12
ANLA	HIM, POB	3, 10, 14
ARLO/POSE	BUN	13
AROB-LULEL	ALP	16
ARTR-AGSP	BUN	15
ARTR-STCO2	BUN	15
ARTR/AGSP	BUN	11, 13
ARTR/FEID	BUN	11, 13, 15
ARTR/POSE	BUN	13
ARTR/STCO2	BUN	11, 13
ARTR2/AGSP	BUN	13
ARTR2/FEID	BUN	13
ATDI	HIM	3
CAAQ	RIX, WET	12
CABR	ALP, HIM	3, 14
CAME	HIM, POB	3, 14
CANA2	ALP, HIM	14
CANI2	HIM, POB, WET	3, 10, 12, 14, 17
CANI2-PEGR	HIM, POB	10
CAPH	ALP, HIM, POB	14
CARO2	WET	12
CASC3	ALP, HIM	14
CASC5	HIM, POB, RIX, WET	3, 12, 14
CASP	HIM, POB	3, 14, 17
CHNO/RHAL-MEFE	HIM, POB, TSA	3
CHNO/VAME	HIM, POB, TSA	2

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COST	RIX	12
CRDO(POTR)/SYAL	BUN	13
CRDO/SPDO	RIX	12
CRDO/SYAL	BUN	13
DAIN	HIM, WET	3, 12
DROC	ALP, HIM	3
ELCI savannah	BUN	18
ELCI/DIST	BUN	13
EMNI	HIM, POB	3, 14
EQUIS	RIX, WET	3
ERAU-LULEL	ALP, HIM	16
ERCO5/POSE	BUN	13
ERDO/POSE	BUN	13
ERPE-SPUM	ALP	10
ERPO2	WET	12
ERPY-LUPI	ALP, HIM	3
ERPY-SPUM	ALP, HIM	10
ERSP3/POSE	BUN	13
ERTH/POSE	BUN	13
FEID/ERHE	BUN	11, 13
FEID/RONU	BUN	13
FEID/SYAL	BUN	13
FEVI	HIM, POB	3, 14
FEVI-LULA	HIM, POB	10
GLEL	WET	12
LALY	HIM, POB	1, 3
LALY-ABLA2	ALP, HIM	9
LALY/CAME/LUPE	HIM, POB	24
LALY/DROC	HIM, POB	24
LALY/JUCO4	HIM, POB	24
LALY/LUHI	HIM, POB	4
LALY/VADE	HIM, POB	4
LALY/VADE-CAME	HIM, POB	24
LALY/VASC/LUHI	HIM, POB	24
LULA	HIM, POB	3, 14
LULA-CASP	HIM, POB	10
LULA-POBI	HIM, POB, TSA	10
LUPE	POB	3, 10, 17
PECO2-CASP	HIM, POB	16
PHDI-ARCA2	HIM	16
PHEM	HIM, POB, TSA	3, 14
PHEM-CAME	HIM, POB, TSA	3, 17
PHEM-VADE	HIM, POB, TSA	10
PHEM/LULA	HIM, POB, TSA	10
PHGL	ALP, HIM, POB	3, 14
PIAL	ALP, HIM	9
PIAL-ABLA2	ALP, HIM	8, 9, 11
PIAL-ABLA2/ARNE-PAMY	EAB, HIM	2
PIAL/CAME-LUPE	ALP, HIM	24
PIAL/CARU	EAB, HIM	1, 4, 24
PIAL/DROC	ALP, HIM	24
PIAL/FEVI	ALP, HIM	24
PIAL/JUCO4	ALP, HIM	24
PIAL/LUHI	EAB, HIM	4

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PIAL/VASC/LUHI	ALP, EAB, HIM	24
PICO-GASH	TSH	22
PICO/VACA	EAB, HIM	9
PICO/VASC	EAB, HIM	9
PICO/CARU	EAB, HIM	9
PIEN-ABLA2/MEFE	EAB, TSA, RIX	21
PIEN-ABLA2/PAMY-VAME	EAB, TSA, RIX	2
PIEN-ABLA2/VAME-RUPE	EAB, TSA	21
PIEN-ABLA2/VASC	EAB, RIX	21
PIEN/CASC5	RIX, WET	12
PIEN/CLUN	EAB, RIX	9
PIEN/COCA	EAB, RIX	12
PIEN/COST	RIX	12
PIEN/EQUIS	EAB, RIX	1, 4, 9, 12, 24
PIEN/GATR	EAB, RIX	9
PIEN/LIBO2	EAB, RIX	9
PIEN/SEST	EAB, HIM, RIX	9
PIEN/SMST	EAA, EAB, RIX	9
PIEN/SYAL	EAB, RIX	12
PIEN/VAME/RULA	EAB, TSA	2
PIPO-PSME/AGSP	BUN, EAA	1
PIPO-PSME/AGSP-CAGE	BUN, EAA	2
PIPO/AGSP	BUN, EAA	9, 11, 15, 24
PIPO/AGSP-ASDE	BUN, EAA	24
PIPO/CARU-AGSP	BUN, EAA	4, 24
PIPO/FEID	BUN, EAA	9, 11, 15
PIPO/PRVI	EAA, EAB	9
PIPO/PUTR	BUN, EAA	9, 18
PIPO/PUTR/AGSP	BUN, EAA	4, 9, 24
PIPO/RHUS	BUN	18
PIPO/SYAL	EAA, EAB	9
PIPO/SYAL/BERE	EAA, EAB	9
POBI-CASP	POB	10
POTR/ACGL	EAB, RIX	12
POTR/CARU	EAA, EAB	1
POTR/COST	RIX	12
POTR/SYAL	EAA, EAB	1
POTR2-ACMA	EAB, TSH, RIX	23
POTR2/ACGL	EAB, TSH, RIX	12
POTR2/ALIN	RIX	12
POTR2/COST	RIX	12
PSME-PICO/BENE-SPBE	EAB, TSH	22
PSME-PICO/GASH	EAB, TSH	22
PSME-PIPO/AGIN	BUN, EAA	1
PSME-PIPO/ARUV	BUN, EAA, EAB	18
PSME-PIPO/CARU	EAA, EAB	9
PSME-PIPO/PEFR3	BUN, EAA	4
PSME-PIPO/PUTR	BUN, EAA	4
PSME-TSHE/VAAL-LIBO2	EAB, TSH	2
PSME/ABGR/ACCI/TRLA2	EAB, TSH	2
PSME/AGSP	BUN, EAA	9, 11, 24
PSME/AGSP-ASDE	BUN, EAA	24
PSME/AGSP-CAGE	BUN, EAA	4
PSME/ARCO	EAA, EAB, HIM	9

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PSME/ARTRV	BUN, EAA	4
PSME/ARUV	EAA, EAB	1, 4, 9, 24
PSME/ARUV-PUTR	BUN, EAA, EAB	1, 4, 24
PSME/ARUV/CARU	EAA, EAB	18, 24
PSME/CAGE	BUN, EAA	24
PSME/CAGE	EAA, EAB	4, 9
PSME/CARU	EAA, EAB	1, 8, 11, 15, 18, 24
PSME/CARU-AGSP	EAA, EAB	9, 24
PSME/CARU-ARUV	EAA, EAB	9
PSME/CARU-CAGE	EAA, EAB	4
PSME/FEID	BUN, EAA	9, 11
PSME/JUCO4	EAA, EAB, HIM	9
PSME/LIBO2/CARU	BUN, EAA	9
PSME/LIBO2/SYAL	BUN, EAA	9
PSME/PAMY	EAA, EAB, TSH	1, 24
PSME/PAMY-CEVE/CAGE	EAA, EAB	2
PSME/PAMY/CARU	EAA, EAB	24
PSME/PEFR3	BUN, EAA, EAB	24
PSME/PUTR	BUN, EAA, EAB	24
PSME/PUTR/AGSP	BUN, EAA, EAB	24
PSME/PUTR/CARU	BUN, EAA, EAB	24
PSME/SPBE	EAA, EAB	9, 24
PSME/SPBE/CARU	EAA, EAB	24
PSME/SYAL	EAA, EAB	1, 8, 9, 18, 24
PSME/SYAL/AGSP	EAA, EAB	9, 24
PSME/SYAL/CAGE	EAA, EAB	4
PSME/SYAL/CARU	EAA, EAB	9, 24
PSME/SYOR	EAA, EAB	1, 9, 24
PSME/VACA	EAB, HIM	9, 24
PSME/VACCI	EAB, TSH	1
PSME/VAME-PAMY-RULA	EAB, TSH	2
PSME/VAME-RULA	EAB, TSH	2
PSME/VAMY	EAB, HIM, TSH	24
PSME/VAMY/CARU	EAB, HIM	24
PUTR/AGSP	BUN	13
PUTR/FEID	BUN	13
RHAL-VAME	TSA	3
RHUS-PHLE-PRVI talus	BUN	13
RUPA-EPAN	EAB, TSA	3, 17
RUPA-PTAQ	EAB, TSA	3
SALIX-SPIRA	RIX, WET	23
SATO	ALP, HIM, POB	10, 17
SPCR/POSE	BUN	13
SPDO	RIX	12
THPL-ARLU	TSH	23
THPL-TSHE	TSH	23
THPL-TSHE/VAAL-OPHO	TSH, RIX	3
THPL-TSHE/VAOV	TSH	3
THPL/ATFI	TSH, RIX	8, 12
THPL/CLUN	TSH, RIX	9, 12
THPL/GYDR	TSH, RIX	12
THPL/OPHO	TSH, RIX	8, 9, 12, 24
THPL/PAMY	EAB, TSH	8
THPL/RUPA/CLUN-EQAR	TSH, RIX	2

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TSHE-THPL/COST/CLUN-DODE	TSH, RIX	2
TSHE-THPL/PAMY-BENE	TSH	20
TSHE-THPL/VAAL/BLSP	TSH	2
TSHE/ABAM/GASH	TSH	3
TSHE/ACCI/ACTR	TSH	24
TSHE/ACCI/ASCA3	TSH	24
TSHE/ACCI/CLUN	TSH	24
TSHE/ACTR	TSH	4, 24
TSHE/ARNE	TSH	4, 24
TSHE/ASCA3	TSH	4, 24
TSHE/BENE	TSH	4, 5, 6, 7, 24
TSHE/CLUN	TSH, RIX	9, 12
TSHE/depauperate	TSH	5, 6, 7
TSHE/GASH	TSH	5, 6, 7
TSHE/LIBO2/CLUN	TSH, RIX	4
TSHE/LYAM	TSH, RIX	7, 24
TSHE/OPHO	TSH, RIX	4
TSHE/PAMY	EAB, TSH	8
TSHE/PAMY/CLUN	EAB, TSH	24
TSHE/POMU	TSH	5, 6, 7
TSHE/POMU-BENE	EAB, TSH	7
TSHE/POMU-GASH	EAB, TSH	6, 7
TSHE/POMU-TITR	EAB, TSH	7
TSHE/RUPE	TSH, RIX	12
TSHE/TITR-GYDR	EAB, TSH	5, 7
TSHE/VAAL	EAB, TSH	3, 6, 7
TSHE/VAME-ACCI/LIBO2	EAB, TSH	2
TSME-ABAM	POB, TSA	3
TSME-ABAM/RHAL-VAME	POB, TSA	2
TSME-ABAM/VAAL-MEFE	POB, TSA	2
TSME-ABAM/VADE-PHEM	POB, TSA	2
TSME-ABAM/VAME-MEFE	POB, TSA	2
TSME/CABI	POB, TSA	7
TSME/CLPY/BLSP	POB, RUS, TSA	5, 6
TSME/LUHI	HIM, POB, TSA	4, 24
TSME/MEFE	HIM, POB, TSA	9
TSME/MEFE-VAAL	POB, TSA	24
TSME/MEFE-VAME	HIM, POB, TSA	24
TSME/OPHO	RUS, TSA	5, 6, 7
TSME/PHEM-VADE	POB, TSA	5, 6, 7, 24
TSME/RHAL	POB, TSA	5
TSME/RHAL-PHEM	POB, TSA	6, 7
TSME/RHAL-VAAL	POB, TSA	24
TSME/RHAL-VAME	POB, TSA	6, 7, 24
TSME/RULA	POB, TSA	4, 24
TSME/RUSP	POB, RUS, TSA	6
TSME/VAAL	TSA, TSH	7, 24
TSME/VAAL-VAME	TSA, TSH	7
TSME/VADE	POB, TSA	4
TSME/VAME	POB, TSA	5, 6, 7, 24
TSME/VAME-PHEM	POB, TSA	2
TSME/VASC/LUHI	HIM, POB, TSA	24
TSME/XETE	POB, TSA	4
TSME/XETE/VAMY	POB, TSA	24

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VADE	HIM, POB	3, 10
VASI-LULA	HIM, POB	10
VASI-VEVI	HIM, POB	3, 10

Appendix 5. Plant community descriptions.

This is a brief summary of previously undescribed plant communities of the North Cascades. Comparison with previous descriptions in the literature was limited to the North Cascades for most of the forested types; comparisons were extended further for alpine, wetland and riparian associations, which are incomplete for the North Cascades. These were the most obvious or unique communities from the data set.

This is a listing of apparent dominants and high constancy plants in the plots. New or unique communities that appear different from literature descriptions are given in bold type, and comparisons with literature descriptions are referenced (see below). Many of the subsets here correspond only roughly to other classifications and some are seral stages or phases of previously described plant associations. The term phases here is used broadly to encompass both named habitat types with minor species differences as well as communities with equally replacable codominants, in which case codominants with less than 100% constancy are optionally designated with parentheses.

Mosaic communities (those plots containing two or more recognized, distinct communities, not gradually merging, as in an ecotone) are included here because community boundaries often did not match plot boundaries matching spectral polygons. Mosaic communities are designated with a plus sign (+) linking the two communities in the name. In some cases, composite samples were used to describe a community which possessed significant mosaic character, in which case only the most representative plot or plots are reported here. Plots listed in the set OUT were by definition not assigned to sets in this classification, however some of them are listed here where they appear to belong.

Important nomenclatural changes and differing from the time when the field sampling was finished include the following: ARTRV (*Artemisia tridentata* ssp. *vaseyana*) and ARTRW (*Artemisia tridentata* ssp. *wyomingensis*) each replace ARTR (*Artemisia tridentata*) where appropriate; SAPL (*Salix planifolia*) replaces SAPH (*Salix phylicifolia*); CABIB (*Caltha biflora* var. *biflora*) replaces CALE2 (*Caltha leptosepala*); CABIR (*Caltha biflora* var. *rotundifolia*) replaces CABI (*Caltha biflora*); CASAM (*Carex saxatilis* var. *major*) replaces CASA2 (*Carex saxatilis*); CASCP2 (*Carex scopulorum* var. *prionophylla*) replaces CAPR8 (*Carex prionophylla*); CAUT (*Carex utriculata*) replaces CARO2 (*Carex rostrata*); LULEL (*Lupinus lepidus* var. *lepidus*) replaces LULE2 (*Lupinus lepidus*); and POSES1 (*Poa secunda* ssp. *secunda*) replaces POGR5 (*Poa grayana*, *P. arctica*). These were changed when used in community names, but remain unchanged in the raw data.

Other optional replacements for alphacodes not used in this study are ACGLD (*Acer glabrum* var. *douglasii*) for ACGL (*Acer glabrum*); AGGLD (*Agoseris glauca* var. *dasycephala*) for most of the occurrences of AGGL (*Agoseris glauca*); LIBOL (*Linnaea borealis* var. *longiflora*) for LIBO2 (*Linnaea borealis*); and SPBEL (*Spiraea betulifolia* var. *lucida*) for SPBE (*Spiraea betulifolia*). Note should be made that in the plant association guide of Williams and Lillybridge (1983) and Lillybridge et al (1995), their AGIN (*Agropyron spicatum* var. *inerme*) is equivalent to AGSP (*Agropyron spicatum*) as used here, but it is not to be confused with AGIN2 (*Agropyron intermedium*) as used here. *Chamaecyparis nootkatensis* (D. Don) Spach (CHNO) has been merged with *Cupressus*, subg. *Chamaecyparis* as *Cupressus nootkatensis* D. Don.

Alphacodes are given in appendix 7. Trees with the letter "O" or "U" in the sixth column represent overstory (>10 m) and understory (<10 m) size classes, respectively. As is customary, different canopies represented here by tree species, shrub species and herb species are separated by a slash (/) and different species within canopies are separated by a dash (-). SASC was treated both ways depending on its relation to the other species. Some species are not treated well with this scheme, e. g. in KAMI/CANI2, the diminutive sedge CANI2 envelopes and overtops the even more diminutive shrub KAMI.

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Abbreviations of set names in this study:

ALP - Central North Cascades xeric alpine

ALS - ALSI avalanche chutes

BUN - Shrub-steppe or shrub-bunchgrass

CUL - Cultivated

EAA - East central North Cascades mixed coniferous types; low elevation; dry

EAB - East central North Cascades mixed conifer; higher, wetter, some shrubfields

HIM - Central North Cascades high elevation meadows

POB - West central North Cascades upper elevation meadows

RIC - Eastern North Cascades riparian swamp

RIX - Riparian

RUS - RUSP-ATFI shrubfields

TSA - West central North Cascades upper elevation forested

TSH - West central North Cascades low elevation forested

WET - Wetlands

References are as follows: (1) Williams and Lillybridge, 1983; (2) del Moral et al., 1976; (3) Douglas, 1969; (4) Williams and Smith, 1991; (5) Henderson and Peter, 1983; (6) Henderson and Peter, 1984; (7) Henderson and Peter, 1985; (8) Daubenmire and Daubenmire, 1968; (9) Pfister et al., 1977; (10) Henderson, 1974; (11) McLean, 1970; (12) Kovalchik, 1993; (13) Daubenmire, 1970; (14) Douglas and Bliss, 1977; (15) Tisdale and McLean, 1957; (16) Hamman, 1972; (17) Douglas, 1972; (18) Brayshaw, 1965; (19) Tisdale, 1947; (20) Agee and Kertis, 1987; (21) Borgias, 1984; (22) Larson, 1972; (23) Vanbianchi and Wagstaff, 1988; (24) Lillybridge et al, 1995;.

ALP - Central North Cascades xeric alpine

(PIAL)/AROB-ERAU. (*Pinus albicaulis*)/*Arenaria obtusiloba-Erigeron aureus*. Plots 47, 49, 92, 518. Similar to (PIAL)/SIAC-DROC (this set), PIAL/DROC (24), ERAU-LULEL (16), and AROB-LULEL (16). Occurring on xeric scree and fellfields in the Pasayten Pk and Mt Barney quadrangles with PIEN, CACA3, PODI, ERCO, LULEL, SIAC.

(PIAL)/SIAC-DROC. (*Pinus albicaulis*)/*Dryas octopetala-Silene albicaulis*. Plots 51, 71, 93. Similar to (PIAL)/AROB-ERAU (this set), PIAL/DROC (24) and DROC (3). Occurring on xeric scree and fellfields in the Pasayten Pk and Mt Barney quadrangles with PIEN, SIAC, CANA2, JUCO4, ERCO.

ALS - ALSI avalanche chutes

ALSI/ATFI. *Alnus sinuata/Athyrium filix-femina*. Plots 143, 680, 681. Similar or identical to ALSI/ATFI (12). Occurring in the Castle Peak quadrangle, Pasayten Wilderness, with RUSP, SARA, VEVI.

ALSI-RUSP/ATFI. *Alnus sinuata-Rubus spectabilis/Athyrium filix-femina*. Plots 683, 684, 1512, 1672. Intermediate between or possibly a mosaic with ALSI/ATFI (this set) and RUSP/ATFI (set RUS). Found on Mill Ck, Azurite Pk area, Mt Daniels, Steven's Pass, with CHNO, SARA, EPAN, ACGL, SOSI, SMST, URDI, RUPA.

ALSI/PTAQ. *Alnus sinuata/Pteridium aquilinum*. Plots 1099, 1138, 1255, 3001, 3007. Similar to RUPA/PTAQ (17). Found on Granite Cr, Agnes Cr., Deep Lk, and the Labyrinth Mtn quadrangle with TSME, PSME, ABLA2, ABAM, SOSI, SARA, PAMY, RULA, RUPA, RULA, VAME, BRVU, EPAN.

BUN - Shrub-steppe or shrub-bunchgrass

ARTR3/POSE + SCVA-SCAM + DIST. Mosaic of *Artemisia trifurcata/Poa secunda + Scirpus validus/Scirpus americanus + Distichlis stricta*, in concentric palustrine zones, and into the sagebrush. Plot 1714. The drier communities are similar to SPCR-POSE (13) and ARTR/POSE (13). These 4 communities occur on dolomitic soils at Hot Lakes near Oroville, with PIPO and BRTE. SCVA-SCAM and DIST are wetland communities, although the preponderance of adjacent vegetation forced them in with the ARTR-AGSP communities in the set BUN. A species of *Salicornia* here may indicate the presence of another community.

ARRI/AGSP-POSE. *Artemisia rigida/Agropyron spicatum-Poa secunda*. Plot 1277. Occurs on steep eroding north-facing basalt cliffs at the mouth of Tarpiscan Creek, Colockum Wildlife Area, and may be a mosaic community, with POSE occurring on small ledges. Similar to AGSP-POSE (13) and PHLE2-PRVI-AMAL talus garlands (13). Occurs with HARE, SADO2, MOOD, RHGL.

AGSP-FESC-POSE. *Agropyron spicatum-Festuca scabrella-Poa secunda*. Plots 1291, 1294. May be mosaics of AGSP/FESC (19) with AGSP-POSE (13), and also similar to FEID (13) types. Occurring on north facing, vernal moist slopes with deep basaltic soils, on Brushy Creek, Colockum Wildlife Area, with ARRI, ARTR2, ASLE3, LULA2, POSE, DOPU2, BAHO.

ARTR2/LOMAT/LILIA. *Artemisia tripartita/Lomatium/Liliaceae*. Plot 1726. Unique and distinctive. Occurs at north entrance to Quilomene Wildlife Area, in deep basaltic clay soils. Flora characterized by Lomatium, Camassia, Allium and others with starchy roots and compound inflorescences; with PIPO, ALMA, POSE, LOAM, LOGR, LOLE, LOTR, LONU, CAQU, TRMA.

ARRI-PESI + AGSP-POSE + EARTH/POSE. *Artemisia rigida-Pediocactus simpsonii and Agropyron spicatum-Poa secunda and Eriogonum thymoides/Poa secunda*. Plots 1278, 1279, 1290. May be a mosaic with AGSP-POSE (13), and also similar to ARRI/POSE (13), ERDO/POSE (13), and EARTH/POSE (13), but with PESI and higher covers of LULEA. On rocky basalt ridges in Colockum Wildlife Area, grading into Swauk Ck, Naneum Ck and Teanaway Ck, with BAHO, EARTH, HAST2, PEGA.

PUTR/TRMA. *Purshia tridentata/Trifolium macrocephalum*. Plot 1739. Occurring on rocky basaltic outwash soils on Green Mountain Road near Reecer Canyon, with POBU, FEBR, SYOR, LONU, BASA, STOC.

SAAM2-ALRH/ELCI + SAEX. *Salix amygdaloides-Alnus rhombifolia/Elymus cinereus and Salix exigua*. Plot 1281. Similar to ELCI savannah (18). A riparian community on West Bar, Colockum Wildlife Area, with RHRA, ACGL, RIAU, SAEX, EQAR, RONU.

RHGL/talus + PUTR/AGSP-BASA. Mosaic of *Rhus glabra/talus and Purshia tridentata/Agropyron spicatum-Balsamorhiza sagittata* (this set). Plot 1703. Communities similar to PIPO/RHUS (18), RHGL/AGSP (13), and PHLE2-PRVI-AMAL shrub garlands (13). Occurring near Conconully; with AGSP, RHRA, AMAL, ROWO.

PUTR/AGSP-BASA. *Purshia tridentata/Agropyron spicatum-Balsamorhiza sagittata*. Plots 336, 337, 1202, 1203. Similar to PIPO-PSME/AGSP (1), PIPO/AGSP (24) and PIPO/PUTR/AGSP (4, 24), but with insignificant tree cover. Occurring near Winthrop in Elbow Coulee, and near Lewis Butte with ARTR, HEUN, LODI2, SYAL.

EAA - East central North Cascades mixed coniferous types; low elevation; dry

PREM-ACGL/THOC. *Prunus emarginata-Acer glabrum/Thalictrum occidentale shrubfield*. Plot 331. Near Gilbert, upper Twisp R with CEVE, SYAL, PAMY, SASC, OSOC HYFE, LICO4.

PSME-PIMO/LIBO2. *Pseudotsuga menziesii*-*Pinus monticola*/*Linnaea borealis*. Plots 1517, 1518. Similar to PSME/PAMY (1), ABGR/PAMY (8), PSME/LIBO2/ (9), and PSME/PAMY-CEVE/CAGE (2) with some riparian character. Silver Falls, Entiat R, with THPL, ABGR, POTR2, PIPO, PAMY, BEAQ, SYAL.

PSME-PIPO(-PICO)/CEVE. *Pseudotsuga menziesii*-*Pinus ponderosa* (-*Pinus contorta*)/*Ceanothus velutinus*. Plots 1545, 1694, 1696. Similar to PSME/PAMY-CEVE/CAGE (2), PSME-PIPO/AGIN (1), PSME-PIPO/PUTR (4), or a seral stage of PSME/PAMY (4). This is a 20 year old burn on the Entiat R, with PAMY, BEAQ, DAGL.

EAB - East central North Cascades mixed conifer; higher, wetter, some shrubfields

PICO-SASC/VASC/CARU. *Pinus contorta*-*Salix scouleriana*-*Vaccinium scoparium*/*Calamagrostis rubescens*. Plots 212, 215, 216, 218, 219, 224, 227, 229. Similar to PICO/VASC (9), PICO/CARU (9), and seral stages of ABLA2/VASC (1, 4, 24), ABLA2/CARU (1, 4, 24), or PSME/CARU (1, 8, 11, 15, 18, 24). Chewuch R, Remmmel Ck, with JUCO4, PIEN, SPBE, PAMY, CARU.

ABLA2-PIMO/PAMY-VASC. *Abies lasiocarpa*-*Pinus monticola*/*Pachystima myrsinites*-*Vaccinium scoparium*. Plots 230, 234. Similar to ABLA2/LIBO2 (1, 4), ABLA2/PHEM (1), PSME/PAMY (24), ABLA2/VASC, (9, 24) and ABLA2-PIEN/VAME-PAMY (21). In forest with old growth character, Lake Creek Trail, with PIEN, PICO, PSME, SASC, VAME, CHUM, LIBO2, SPBE; openings due to white pine blister rust.

ABLA2-PIEN/TRLA4-EPGL2. *Abies lasiocarpa*-*Picea engelmannii*/*Trollius laxus*-*Epilobium glandulosum*. Plot 356. Unique wetland community near Naneum Meadow, with PYSE, RILA, MOCO, TRLO, DODE, MIGU, EPWA.

SOSC2-RUPA/ACRU. *Sorbus scopulina*-*Rubus parviflorus*/*Actaea rubra*. Plots 6, 118. Avalanche runout zones with some riparian character on Robinson Cr, Freezout Cr, Pasayten Wilderness, with PIEN, ACGL, SARA, VAME, THOC, EPAN.

SOSC2-PAMY/EPAN. *Sorbus scopulina*-*Pachystima myrsinites*/*Epilobium angustifolium*. Plots 415, 417. Avalanche runout zones on Ice Lakes Trail, Entiat areas, with VAME, EPAN, ELGL, RILA, SARA, RILA, PTAQ.

SASC/ELGL-HELA. *Salix scouleriana*/*Elymus glaucus*-*Heracleum lanatum*. Plots 649, 651, 657, 662. Similar to ABLA2/VASC (1), but more open, riparian character. On East Cr, with ABLA2, PAMY, ACGL, SYAL, LULA, BRCA, ASEN.

PIEN/SASC/ASEN-THOC. *Picea engelmannii*/*Salix scouleriana*/*Aster engelmannii*-*Thalictrum occidentale*. Plot 698. Similar to ABLA2/VASC/THOC (9), or possibly mosaic with ABLA2/CARU (1, 4). Louis L, Twisp area, with ABLA2, PSME, LULA, CARU.

SASC-ACCI-RUPA. *Salix scouleriana*-*Acer circinatum*-*Rubus parviflorus* shrubfield. Plots 1127, 1132. Similar to RUPA/EPAN (17). Agnes Cr, with RHPU, ACGL, PREM, PTAQ, EPAN, SMST, ARMA3, DIHO.

PTAQ-SOCA-ELGL-THOC. *Pteridium aquilinum*-*Solidago canadensis*-*Elymus glaucus*-*Thalictrum occidentale*. Plots 1892, 1893, 1895. Similar or identical to RUPA/EPAN or RUPA/PTAQ plots established in the same area by Douglas, 1972 (17). Green Mt Lookout Trail.

ARTRV/FEVI. *Artemisia tridentata vaseyana/Festuca viridula*. Plot 202 from the set out. Similar to PIAL/CARU (4) and PIAL/FEVI (24). Area grazed by cattle. Near Sweetgrass Butte, approx 20 km north of Winthrop, with ERPE, ORCO2, CARU, AGEL2(?), LULA, DENU3, SIPA, HAMI.

ARLU/ASEN-MEPA. *Artemisia ludoviciana/Aster engelmannii-Mertensia paniculata*. Plot 1041 from the set OUT. Similar to ASEN-ASFO-MEPA (set HIM); may be mosaiced with ACCI-SOSC2-SPDO (this set). ARLU is a common dominant throughout the North Cascades in rocky landslide stream channels. Napeequa R, with FEVI, ERPE, POARC, CASU4, CIED, ANAR2, BRCA, ARPA3, HYFE, ASFO.

ACCI-SOSC2-SPDO. *Acer circinatum-Sorbus scopulina-Spiraea douglasii*. Plot 1064 from the set OUT. May be mosaiced with ACCI-ALSI/ELGL-PTAQ (this set). On Napeequa R, with RHPU, SASC, PAMY, PTAQ.

ACCI-ALSI/ELGL-PTAQ. *Acer circinatum-Alnus sinuata/Elymus glaucus-Pteridium aquilinum*. Plot 1072 from the set OUT. Similar to ACCI-ALSI (23), ACGL-ALSI/THOC (this set), and SASC-ACCI-RUPA (this set). On White R, with EPAN, ANAR2, SOCA, THOC, VEVI.

AMAL/PAMY. *Amelanchier alnifolia/Pachystima myrsinites*. Plot 1168 from the set OUT. Unique community on Agnes Creek on talus debris flow, with 60% AMAL, 20% PAMY.

ACGL-ALSI/THOC + SACO2-LOIN. *Acer glabrum-Alnus sinuata/Thalictrum occidentale* and *Salix commutata-Lonicera involucrata*. Plot 1602 from the set OUT. Rocky avalanche chutes with riparian debris channels similar to ACCI-ALSI (23), ACCI-ALSI/ELGL-PTAQ (this set), and PTAQ-SOCA-ELGL-THOC (this set). Located on North Cr, near Twisp., with AMAL, SOSI, SARA, OREX, BRCA, SMRA, ANAR2, ARSY, LOBR.

TSME-ABLA2-SASC. Plot 1314 in the set OUT. A fire mosaic of *Tsuga mertensiana-Abies lasiocarpa-Salix scouleriana*. Similar to TSME/RULA (4, 24) and PSME/PAMY (1, 4, 24). Plot is located 2 km north of Steven's Pass with VAME, PTAQ, GAOV, RULA, PAMY, SOSI.

HIM - Central North Cascades high elevation meadows

ABLA2-PIAL/PAMY-VASC. *Abies lasiocarpa-Pinus albicaulis/Pachistima myrsinites-Vaccinium scoparium*. Plots 9, 11, 13, 15, 25, 27, 28, 57. Similar to ABLA2/VASC/CARU (1), ABLA2/VASC (1, 4, 24), and ABLA2-PIAL/VASC (9), but **not** similar to ABLA2/PAMY (1). ABLA2 and PIAL are completely codominant and often possess krummholz forms. Canopies are open and average 10%. This is the high elevation ecotope of PAMY. Plots on Monument Cr Trail, Burch Mt Trail, Fox Lakes area of south-central Pasayten Wilderness, with ARCA2, ARCO, PIEN, LULA.

VASC/FEVI-PHDI. *Vaccinium scoparium/Festuca viridula-Phlox diffusa*. Plots 79, 80, 85, 86, 87, 88. Subalpine parkland mosaics of tree stringers and talus islands in a FEVI matrix. Similar to LALY/LUHI (4), ABLA2/LUHI (4), PIAL/LUHI (4), ABLA2/VASC (1, 4), and ABLA2-PIAL/VASC (9), with low tree coverage. Plots located on Buckskin Ridge, north of Hart's Pass with LALY, PIEN, ABLA2, PIAL, LUHI, VACA, ERPE, LICA2, ARCA2, JUPA, HIGR, ANLA, THOC, BRCA.

LALY-PIEN/PHEM/LUHI. *Larix lyallii-Picea engelmannii/Phyllodoce empetriformis/Luzula hitchcockii*. Plots 53, 207, 208. Moderately open (canopy mean is 25%) subalpine parkland similar to LALY/LUHI (4), LALY/VASC/LUHI (24), PIAL/LUHI (4), PHEM-CAME (10). LALY, PIEN, ABLA2 and PIAL are all codominant in these communities, but tree stature may be dependent on favorable, often protected, microsites favoring LALY and PIEN. More diverse than LALY/LUHI, but low or lacking in VADE east of Hart's Pass, with multiple overstory species sometimes reaching old growth

Classification of North Cascades Vascular Plant Communities
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proportions. Locations are for near Fox Lk, Kidney Lk and Crystal Lk, Pasayten Wilderness, with PIAL, ABLA2, RHAL, VASC, CAME, JUPA.

ABLA2/FEVI. *Abies lasiocarpa/Festuca viridula*. Plots 607, 608, 609. Mosaic subalpine parkland similar to ABLA2/LUHI (4), FEVI-LULA (10), ABLA2/VAME (1, 4), and FEVI-PHDI (this set). Plots located near Surprise Lk, Chelan-Sawtooth Wilderness, with LALY, PIAL, PHDI, ARCA2, SEIN, AGGLD, LULA.

FEVI-PHDI + ANLA. *Festuca viridula-Phlox diffusa* and *Antennaria lanata*. Plots 520, 521, 522, 523. A mosaic of grassland and meadow similar to PHDI-ARCA2 (16), FEVI-LULA (10), VASC/FEVI-PHDI (this set), and ANLA (3, 10, 14). Several different phases of FEVI-PHDI may be distinguished in future studies, particularly in wetter or in rockier habitats. ANLA is an invader of bare, often level, soils which can maintain its presence through subsequent meadow formation stages. These plots are located in an area heavily grazed by sheep before 1950. Plots are located near Merchant's Basin, Boiling Lk, Chelan-Sawtooth Wilderness, with ARCA2, SEIN, AGGLD, LALY, PIEN, LULA.

FEVI-PHDI + ABLA2/VAME. Parklike mosaic of *Festuca viridula-Phlox diffusa* and *Abies lasiocarpa/Vaccinium membranaceum* tree islands. Plots 1189, 1190. Similar to ABLA2/VASC (1, 4), FEVI-LULA (10), ABLA2/FEVI (this set), and FEVI-PHDI (this set). Plots in Cutthroat Basin, with PAMY, VAME, LOBR, ARCA2.

ABLA2-PIEN(-CHNO)/VAME. *Abies lasiocarpa-Picea engelmannii(-Chamaecyparis nootkatensis)/Vaccinium membranaceum* shrubby avalanche chutes. Plots 84, 120. Similar to CHNO/VAME (3), PIEN-ABLA2/PAMY-VAME (2), ABLA2-PIEN/VAME-PAMY (21), ABLA2/PAMY (1), PIEN-ABLA2/VASC (21), CHNO/VADE/VASI (this set), ABLA2/VAME (24), ABLA2/VASC/CARU (24), and ABLA2-CHNO/VADE (this set). Pasayten Pk quadrangle and Freezeout Cr area, with PAMY, VASC, ALSI, RHAL, VASI, THOC, VEVI.

ABLA2/VADE. *Abies lasiocarpa/Vaccinium deliciosum*. Plots 463, 477, 481. Mosaic subalpine parkland similar to ABLA2/LUHI (4), ABLA2/VADE (24), FEVI-LULA (10), PHEM-LULA (10), and VADE (10). Plots located near Slate Peak, Snowy Lks, Lk Ann, with VASC, PHDI, RHAL, LUHI, CAME, ANLA, CANI2, LOBR, LULA.

ABLA2-CHNO/VADE. Avalanche chutes of *Abies lasiocarpa-Chamaecyparis nootkatensis/Vaccinium deliciosum*. Plots 1222, 1224, 1226, 1235. Similar to ABLA2-PIEN(-CHNO)/VAME (this set) and CHNO-VADE/VASI (this set). Plots above Squaw Lk, Cle Elum watershed, with PAMY, VAME, LOBR, LULA, FEVI, PHDI, ARCA2.

CHNO/VADE/VASI. Avalanche chutes of *Chamaecyparis nootkatensis/Vaccinium deliciosum/Valeriana sitchensis*. Plots 1886, 1887. Similar to ABLA2-CHNO/VADE (this set) and ABLA2-PIEN(-CHNO)/VAME (this set). Pugh Mtn quadrangle, with FEVI, VAME, SOSI, ELGL, ASEN.

ERPE-LICA2-THOC. *Erigeron peregrinus-Ligusticum canbyi-Thalictrum occidentale*. Plots 4, 76, 78. Diverse, mesic-to-wet subalpine meadows common in the central mountains of the North Cascades, e. g., these on Beauty Pk and above the Pasayten R, with FEVI, VEVI, POFL2, CAEL2, ERGR, LULA, ACMI.

SASC/FEVI-EPAN. *Salix scouleriana/Festuca viridula-Epilobium angustifolium* burn. Plot 1020. Seral to ABLA2/RHAL (4, 24) or ABLA2/RULA (4, 24). Plot located in upper South Creek, Twisp R watershed, with ANMA, LOBR, ARNE, ARCA2 and introduced DAGL, PHPR.

ASEN-ASFO-MEPA + CASP. A mosaic of *Aster engelmannii*-*Aster foliaceus*-*Mertensiana paniculata* and *Carex spectabilis*. Plots 1240, 1241. A series of meadows related to ARLU/ASEN-MEPA (set EAB), but less rocky, and with deeper soils. Also similar to CASP (3, 14, 17). Character is both wet and dry as shown by the cooccurrence of the two asters. Occurs in the Deep Lk area east of Mt Daniel with ABLA2, CHNO, CIED, POPU, THOC.

ABLA2/DAIN + SABA/ASFO-POFL2. *Abies lasiocarpa*/*Danthonia intermedia* mosaic with *Salix barclayi*/*Aster foliaceus*-*Potentilla flabellifolia* wet meadows. Plot 1247. Unique meandering wetland mosaic with tree islands and mesic meadows at the outlet of Deep Lk. With PIEN, SASI2, SOCA, VADE, SPDE, CACA.

POB - West central North Cascades upper elevation meadows

TSME-CHNO/SOSI. *Tsuga mertensiana*-*Chamaecyparis nootkatensis*/*Sorbus sitchensis*. Plot 1636. Similar to TSME/RHAL-VAME (5, 6, 7, 24), and TSME/PHEM-VADE (5, 6, 7, 24), but with less PHEM and VADE. This is a lush, shrubby version of TSME-CHNO found in several areas at high elevations, dominated by dwarf trees, sparse overstory and late snowmelt. Plot is located at Eagle Lk, with ABLA2, VAOV, RUSP, SPDE, ALSI, RUPE, RHAL, VEVI.

VASI-VEVI-CASP. *Valeriana sitchensis*-*Veratrum viride*-*Carex spectabilis*. Plots 673, 862. Similar to VADE/VASI-POBI (this set). Many CASP and VASI-VEVI communities were seen in the North Cascades, but these appear to be an evenly mixed cooccurrence. They occur in wet avalanche openings on Majestic Mountain near Azurite Pk and with TSME/PHEM-VADE (5, 6, 7) on High Divide in the Mt Larrabee quadrangle, with TSME, ABLA2, DEAT, LULA, POFL2, POBI, CANI2, VADE, SOS2, VAME, ARLA, THOC.

VADE/VASI-POBI. *Vaccinium deliciosum*/*Valeriana sitchensis*-*Polygonum bistortoides*. Plot 1888. Similar to TSME/PHEM/VADE (5, 6, 7), but more open. Also similar to VASI-VEVI-CASP (this set). Found in numerous alpine and subalpine settings, here on Pugh Mtn at 1600 m, 10° s-facing slope, with LULA, FEVI, umbelliferous flora.

RIC - Eastern North Cascades riparian swamp

ALIN-BEOC/COST/RIIN. *Alnus incana*-*Betula occidentalis*/*Cornus stolonifera*/*Ribes inerme*. Plots 1704, 1705, 1706. Similar to ALIN/SYAL (12). Found in Sinlahekin R bottomland, with ROWO, SYAL, URDI, RONA, RULE, SYAL, ARLA3.

RIX - Riparian

ACCI-RUPA. *Acer circinatum*-*Rubus parviflorus*. Plots 365, 378, 379, 1070. Similar to TSHE-THPL/PAMY-BENE (20), ACCI-COST (this set), and to ACCI-COST (23). Occurs on steep bedrock cliffs, which support mosaics of other lush communities including old growth coniferous types. Plots are found near Ross Lk, Perry Ck, and White R, with PSME, ATFI, BENE, ACMA, SOS2, PTAQ.

ACCI-COST. *Acer circinatum*-*Cornus stolonifera*. Plots 428, 429, 430. Similar or possibly identical to ACCI-COST (23); also similar to ACCI-RUPA (this set), COST-RUSP (this set), and COST (12). These plots occur above Hozomeen Lk with ALSI, PAMY, THOC.

COST. *Cornus stolonifera*. Plot 237. Cover of COST is 90% over 20 ac. Similar, and possibly identical to COST (12), except in having LOIN. Plot is on the Chewuch R, with PIEN, GATR, LOIN, POTR2, ALSI.

POTR2-POTR/SYAL/PYAS. *Populus trichocarpa*-*Populus tremuloides*/*Symphoricarpos albus*/*Pyrola asarifolia*. Plot 236. Similar or mosaiced with POTR2/COST (12), but **not** similar to POTR2/SYAL (1). Plot is on the Chewuch R, with PIEN, BEOC, ALSI, GATR.

POTR2-ALIN/COST. *Populus trichocarpa*-*Alnus incana*/*Cornus stolonifera*. Plots 1692, 1697. Similar or identical to POTR2/ALIN (12) and ALIN-BEOC/COST-RIIN (set RIC). These plots in the Silver Falls area, grading into adjacent PSME-PIPO upland forest. Plot also has SYAL, EPAN, PIPO, BEAQ, ROSA, PTAQ, SALIX.

PIEN/VASI-TRLA4 + ABLA2/RHAL (1) + ABLA2/PAMY (1, 8, 11). A mosaic of *Picea engelmannii*/*Valeriana sitchensis*-*Trollius laxus* with *Abies lasiocarpa*/*Rhododendron albiflorum* and *Abies lasiocarpa*/*Pachistima myrsinites* (1). Plots 31, 63. Similar to PIEN-ABLA2/VASC (21), ABLA2/VASC (1, 4, 8, 9, 11), ABLA2/LEGL-VASC (12), ABLA2/RHAL (4), ABLA2/PAMY (1, 8, 11), and ABLA2/VAME (this set). These plots on Billy Goat Pass, Pasayten Wilderness, with VASI, VASC, SETR, RHAL, ARLA, LUHI, SETR, LEGL.

PIEN/COCA/RUPE + ABLA2/VAME (1). A mosaic of *Picea engelmannii*/*Cornus stolonifera*/*Rubus pedatus* and *Abies lasiocarpa*/*Vaccinium membranaceum*. Plot 186. Similar to ABLA2/VACCI (1), but in an edaphic series, with soil and wetland properties controlling dominance and therefore with ABLA2 not able to replace PIEN in canopy or rooting area dominance. Similar to PIEN/COCA (12), ABLA2-PIEN/VAME/PAMY (21), PIEN/EQUIS (1, 24), and PIEN/GYDR (12). This plot on Castle Ck, with ABLA2, ALSI, VAME, SACO2, VASC, LOIN, GYDR, STAM.

ABGR/ROGY. *Abies grandis*/*Rosa gymnocarpa*. Plot 1813 and 1816 (set OUT). Similar to PSME/PAMY (4), ABGR/CARU (4). This plot is a patchy, partially open forest with past disturbances of partial logging or windthrow, perhaps indicating successional status. Presence of TSME at 1000 m in these stands is lower in elevation than expected west of the Cascades, and may indicate relict populations, rather than climax dominants (see Alverson and Arnett, 1986, p. 4, 17, for a brief discussion of relict stands). Occurring in Liberty area, with TSME, SPBE, BEAQ, LIBO2, ROGY, ALSI, PSME, PAMY, EQAR, RUPA, PTAQ, CLUN, ACRU.

SPDO/SOCA. *Spiraea douglasii*/*Solidago canadensis*. Plot 1065, 1073, 1129. Similar to CRDO/SPDO (12). Occurs in mosaics on Napeequa R, White R, Indian Ck and Chiwawa R with ABLA2, SASC, POTR, EPAN, LUPO, FEVI, VASI, THOC, ANAR2, ROSA, URDI.

RUS - RUSP-ATFI shrubfields

RUSP/ATFI. *Rubus spectabilis*/*Athyrium filix-femina*. Plots 691, 1465, 1511, 1634. also similar to TSME/CLPY/BLSP (5, 6). Found on Easy Pass, Judy Lk, Mt Daniel, Baring quadrangle, with SOSI, SASI2, SPDE.

RUSP/ATFI-PTAQ. *Rubus spectabilis*/*Athyrium filix-femina*-*Pteridium aquilinum*. Plots 846, 1670. Similar or mosaiced with ALSI-RUSP/ATFI (ALS set), but with less ALSI. Found on Bedal and Labyrinth Mt quadrangles, with ALSI, ACCI, DIFO, VAAL.

TSA - West central North Cascades upper elevation forested

TSME-CHNO. *Tsuga mertensiana*-*Chamaecyparis nootkatensis* boulder talus. Plots 844, 845. These are dwarf forests maintained by snowpack and may be referable to a woodland. Similar to TSME/RHAL-PHEM (6, 7) and TSME/RHAL-VAME(6, 7, 24), but without RHAL; also similar to TSME/VAME (5, 6, 7, 24), TSME/VAME-PHEM (2), and TSME/CLPY/BLSP (5, 6). Occurring on Sperry Peak with ABAM, ALSI, PHEM, LUPE, CLPY, LYAN, GAOV, LYSI.

ABAM/RHAL/depauperate. *Abies amabilis/Rhododendron albiflorum/depauperate* understory. Plot 1088. The depauperate understory of this plot is typical of ABAM at the eastern limit of its range, north of Lk Chelan, in the ABLA2 zone, except in its fairly high cover of RHAL (20%). In their description of ABAM/depauperate (6, 7), Henderson and Peter state that it is a somewhat artificial community, but one which has been well documented on the Olympic and Mt. Baker-Snoqualmie National Forests. This particular community would be a northeast North Cascades subdivision of those types, but it does not bear much resemblance to the lush multi-canopied forests described on the Wenatchee and Okanogan National Forests as ABAM/RHAL (1, 4). Willaims and Smith (1991, p. 122) describe regeneration problems in ABAM with distance from the maritime influence, and this plot seems to fit that description, being a single canopy stand with trees just reaching overstory height, but with only 2% regeneration cover. This plot occurs on Beebe Mtn with PYSE, RULA, VAME.

TSH - West central North Cascades low elevation forested

ACCI. *Acer circinatum*. Plot 3009. Similar to ACCI-RUPA (set WET) and other west Cascades shrub communities in the set WET. Also similar to TSHE/VAME-ACCI/LIBO2 (2) and TSHE-THPL/PAMY-BENE (20). Occurs on rocky cliffs at Steven's Pass, with PSME, POTR2, RUSP, PAMY, COCA, ASCA3.

WET - Wetlands

SAFA-SAPL/CASCP2. *Salix farriae-Salix planifolia/Carex scopulorum prionophylla*. Plots 90, 94, 96, 98. Similar or identical to SAFA/CASCP2 (12). Occurring in Horseshoe Basin, Pasayten Wilderness, with PIEN, CAATE, ERPE, DAIN, PHAL, TRLA4.

SACO2/CABIB. *Salix commutata/Caltha biflora biflora*. Plot 622. Found at Hart's Pass, with VADE, CANI2, CAUT (CARO2), SALIX, VEVI, POFL2.

SPDE/DOJE. A mosaic of *Spiraea densiflora/Dodecatheon jeffreyi* seeps in open TSME forest. Similar to SCCE2/EQAR (this set), CAAQ (12), TSME/CABI (7), TSME/PHEM/VADE (5, 6, 7), and TSME/VADE (4). SPDE/DOJE occupies wet springs and seeps in the subalpine zone. A species of *Carex* in this plot (no fruits, unidentifiable) may be the dominant, however other examples of this wetland were observed without *Carex* dominance, although several species of *Carex* or *Juncus* are characteristic in many seeps observed in the North Cascades. Plot 1460. Found near Eagle Lake area with TSME, VADE, CHNO, ERPE, SCCE2, EQAR, CABIB, ABAM, CAAQ.

KAMI/CANI2. *Kalmia microphylla/Carex nigricans*. Plots 111, 113, 155, 409, 502, 503, 587. Wetland mosaics within the ABLA2, TSME and PIEN zones in the east central North Cascades. These plots occur on Crater Mt, Frosty Pass, Larch Lakes Trail, Three-fingered Jack, and Park Lakes, with TSME, ABLA2, PIEN, PHEM, CAME, VADE, TOGL, CANI2, GECA, POFL2, PEOR5.

CABIR-CANI2-AGTH. *Caltha biflora rotundifolia-Carex nigricans-Agrostis thurberiana*. Plots 870, 872, 873, 877. Occurring along openings and streams adjacent to TSME/PHEM-VADE (5, 6, 7) or TSME-ABAM/VADE-PHEM (2). Occurring in the Crystal Lk area, with TSME, CHNO, PHEM, DEAT, HIMO, VADE, LUPE, CAME, EQAR, CAME, JUME, DOJE, SASI2, ABAM, and high cover areas of mosses.

LEPY2/AGTH. *Leptarrhena pyrolifolia/Agrostis thurberiana*. Plots 1221, 1234. Small pockets of spongy wetlands in subalpine settings of TSME/VADE (4) and ABLA2/RHAL (4). These plots at Squaw Lk and Deep Lk, with TSME, CHNO, ABLA2, PHEM, PSME, VADE, ABAM, PECO2 and high cover areas of mosses.

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SCCE2-EQAR. *Scirpus cespitosus-Equisetum arvense*. Plots 1467, 1631, 1637, 1638. Wet openings with TSME/PHEM-VADE (5, 6, 7). These plots at Eagle Lakes, with SPDE, CABIR, CAAQ, CASP, CHNO, CALA, VADE, DOJE, TOGL, ASFO, SPDE.

TRLA4-CABIB + PIEN/LEGL. A mosaic of *Trollius laxis-Caltha biflora biflora* and *Picea engelmannii/Ledum glandulosum*. Plots 30, 32. Similar or identical to PIEN/CASCP2 (12) and ABLA2/LEGL-VASC (12). Found in Billy Goat Peak drainages, with PHEM, ERPO2, ERPE, VEVI, CABIB, CANI2, PODI, SECY2, HADI2.

CACA-ERPO2. *Calamagrostis canadensis-Eriophorum polystachion*. Plots 991, 1014. Apparently a union of ERPO2 (12) and CACA (12), with additional presence of CAUT (12). Found at Tucquala Lk and Little Mosquito Lk, with PIEN, ABLA2, TSME, EQHY, LEGL, DAIN, CARO2, VASI, SACO2, EQAR, SPBE, AGTH.

CAUT. *Carex utriculata*. Plots 3002, 3003. Probably identical with CAUT (12), since this species tends to form clonal populations with other species excluded. Found at Schaeffer Lk area and in the Chickamin Cr quadrangle, with SPDO, ALNUS, CALAM, LYAM, COCA.

SPDO/CASAM. *Spiraea douglasii/Carex saxatilis major*. Plots 433, 434. Similar or identical to SALIX/SPIRA (23). Found at Willow Lk near Hozomeen; with CACA, CAMU2, LYAM, PHAR, MEAR3, EQAR, SALIX (2 species, one identified as SASI2).

Appendix 6. Plant community plot data.

This is a listing of site attributes and plants recorded in the communities presented in appendix 5. Alphacodes are given in appendix 7, and in Garrison and Skovlin (1976), except see appendix 5 for name changes. Trees with the letter "O" or "U" in the sixth column represent overstory (>10 m) and understory (<10 m) size classes, respectively.

Similar sets of relevés that were grouped together by TWINSpan are presented here as the mean abundances of all of those relevés. Information includes community name in bold, followed by set name and relevé numbers for that community. Site attributes include elevation (ELEV, in ft), followed optionally by a range of elevation for the community; slope, in degrees, or range of slopes, if there was more than one; aspect frequencies (ASPECT) in categories of N, E, S, W for sectors representing the four cardinal directions; canopy density, measured in the plot (CANOPY); total bare ground % cover (TBAR); water measured in the plot (WATER); and summed totals for coniferous trees (CONIF), deciduous trees (DECID), shrubs (SHRUBS) and herbs (HERBS). If none of the above information was available for the plot, a double dash was recorded.

Following the above is a listing of plants occurring in the plot. The first number after each plant name refers to the mean cover abundance and the second to the constancy of occurrence (as a percentage of the total number of relevés used in the description). Plants are sorted by mean from highest to lowest. Plants with 0% mean cover (trace) and < 50% constancy were deleted from this report. Below the plants is the total % cover for all the plants and a listing of the plants with trace cover (0-1%). The total % cover includes that from the plants that had only 1% cover, even though they are only listed in with the trace coverages.

Abbreviations of set names in this study:

ALP - Central North Cascades xeric alpine

ALS - ALSI avalanche chutes

BUN - Shrub-steppe or shrub-bunchgrass

EAA - East-central North Cascades mixed coniferous types; low elevation; dry

EAB - East-central North Cascades mixed conifer; higher, wetter, some shrubfields

HIM - Central North Cascades high elevation meadows

POB - Western-central North Cascades upper elevation meadows

RIC - Eastern North Cascades riparian swamp

RIX - Riparian

RUS - RUSP-ATFI shrubfields

TSA - West-central North Cascades upper elevation forested

TSH - West-central North Cascades low elevation forested

WET - Wetlands

(PIAL)/AROB-ERAU SET ALP, PLOTS 47, 49, 92, 518

ELEV 7788 (7700-8000), SLOPE 10-28, ASPECT: N-0, E-0, S-1, W-3

CANOPY --, TBAR 39, WATER --, CONIF 4, DECID --, SHRUBS 6, HERBS 72

CACA3 6 25

PIAL U 4 75

ARCA2 4 75

LULE2 4 75

CAHO 4 25

AROB 3 100

ERAU 3 100

PODI 3 100

ANLA 3 50

CAREX 3 50

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AGVA	3	25
FEOV	3	25
ANMI2	3	25
ERCO	2	75
JUPA	2	75
SEDE3	2	75
ANDR	2	50
SIAC	2	50
DROC	2	50
ERUM	2	25
DAIN	2	25

***TOTAL 86

TRACE: JUCO4, SELA2, PIEN U, PHEM, SIPR, ERPY, PONI, CO1, POCU, CANA2, DRPA2, OXCA2, VASC, VACA, CAEL2, JUNCU, POAL, CX2, GM2, ANAL, SALIX, PHDI, PEWA, ACMI

(PIAL)/SIAC-DROC SET ALP, PLOTS 51, 71, 93

ELEV 7575 (7500-7625), SLOPE 25-31, ASPECT: N-1, E-0, S-0, W-2

CANOPY --, TBAR 63, WATER --, CONIF 5, DECID --, SHRUBS 8, HERBS 31

DROC	5	100
PIAL U	2	100
SIAC	2	100
CANA2	2	100
JUCO4	2	67
ARUV	2	67
SANI	2	67
AROB	2	67
FEOV	2	67

***TOTAL 44

TRACE: PIEN U, ERCO, PEDA, PHGL, HALY, SABR, ANDR, POTEN, ABLA2U, ERAU, PHSE, POIN3, SAOP, CABR, ARRO, POVI, ANAL, GM1, GM2, POUN2, CASC3, PHDI, CAPH, DRABA

ALSI/ATFI SET ALS, PLOTS 143, 680, 681

ELEV 4320 (4240-4400), SLOPE 20-30, ASPECT: N-1, E-1, S-0, W-1

CANOPY 55, TBAR 2, WATER --, CONIF 1, DECID --, SHRUBS 97, HERBS 66

ALSI	87	100
ATFI	42	100
GYDR	7	33
VEVI	5	67
STRO	3	33
RSB	3	33
RHB	3	33
RUSP	2	67
MITEL	2	33
SMST	2	33
EPAN	2	33

***TOTAL 165

TRACE: SARA, ABAM U, VAME, RIHO, SALIX, SOSI, ELGL

ALSI-RUSP/ATFI SET ALS, PLOTS 683, 684, 1512, 1672

ELEV 3950 (3700-4300), SLOPE 20-33, ASPECT: N-1, E-1, S-1, W-1

CANOPY 35, TBAR 7, WATER 1, CONIF 17, DECID 2, SHRUBS 120, HERBS 57

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ALSI	60	100
ATFI	25	100
ACGL	13	50
RUSP	10	100
SARA	6	75
EPAN	6	75
SALIX	5	25
RUPA	4	100
CHNO U	4	75
GYDR	4	50
VAME	4	50
PAMY	4	25
MOSI	3	50
RSB	3	25
TSME O	3	25
RULA	3	25
GAOV	3	25
OPHO	2	75
URDI	2	50
SMRA	2	50
TSME U	2	50
SOSI	2	50
ABAM O	2	50
PTAQ	2	50

***TOTAL 196

TRACE: PSME U, RILA, SMST, CHNO O, GATR, THPL O, HYFE, PIEN O, PIEN U, THPL U, CACA, MITEL, RHB, ABLA2O, POTR2O, TSHE O, POTR2U, SOSC2, VASI, ANMA, ELGL, ARSY, ACRU, STREP, TEGR, VIOLA, FEOC, HELA, TIUN, ABAM U, SASI2, MEPA, PSME O, POFL2, DIFO, CASTI, HIERA, PRVU, ASCA3, CLUN, AQUIL, CIED, POMU

ALSI/PTAQ SET ALS, PLOTS 1099, 1138, 1255, 3001, 3007

ELEV 3832 (3040-4350), SLOPE 20-30, ASPECT: N-0, E-4, S-1, W-0

CANOPY 14, TBAR 2, WATER 0, CONIF 7, DECID 4, SHRUBS 81, HERBS 44

ALSI	65	100
PTAQ	17	100
RUPA	5	100
RULA	5	40
PAMY	5	40
BRVU	5	40
ATFI	5	20
SASC U	4	20
VAME	3	40
COCA	2	20
GAOV	2	20
LIBO2	2	20
SALIX	2	20
SASI2	2	20
ACTR	2	20

***TOTAL 148

TRACE: TSME U, PSME U, ABLA2U, ABAM U, SOSC2, CLUN, GATR, VIGL, THOC, HELA, DIHO, MEFE, RILA, OSMOR, ACGL, ARSY, CHNO U, SYAL, ASEN, MITEL, RUBUS, ELGL

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ARTR3/POSE + SCVA-SCAM + DIST SET BUN, PLOT 1714

ELEV 1200, SLOPE 0, ASPECT: N-1, E-0, S-0, W-0

CANOPY 10, TBAR 29, WATER 7, CONIF 17, DECID 1, SHRUBS 48, HERBS 33

ARTR3	40	100
PSME O	10	100
BRTE	10	100
POSE	10	100
PIPO O	4	100
ARDR	3	100
PUTR	3	100
SIJU	3	100
ACMI	3	100
PSME U	2	100
RHGL	2	100
SCVA	2	100

***TOTAL 99

TRACE: POTR U, PIPO U, CEDI, DRVE2, CO1, PUNU, DIST, AMAL, SYAL, RICE, OPFR, MEDIC, LIRU, MIGR, COPA, CALO, LOTR, TRDU, ARHO, ERIG, STEL, ASPU, PHLO, ERNI, BASA, SPCR, SARU, SCAM

ARRI/AGSP-POSE SET BUN, PLOT 1277

ELEV 1400, SLOPE 25, ASPECT: N-0, E-0, S-1, W-0

CANOPY --, TBAR 60, WATER --, CONIF --, DECID --, SHRUBS 11, HERBS 42

AGSP	18	100
BRTE	10	100
POSE	6	100
ARRI	5	100
ARTR	2	100
ERCO5	2	100

***TOTAL 50

TRACE: SADO2, MOOD, RHGL, PREM, ERNI, LODI, ERST2, HARE, PUTR, PEPR2, ERPO, STLE2, ALLIU, HADI, AMIN, CAQU, COGR2, ERSP3, CEDI, ACMI, BASA, DEPI, THCU

AGSP-FESC-POSE SET BUN, PLOTS 1291, 1294

ELEV 2500 (2300-2700), SLOPE 30, ASPECT: N-2, E-0, S-0, W-0

CANOPY --, TBAR 19, WATER --, CONIF --, DECID --, SHRUBS 8, HERBS 100

AGSP	45	100
FESC	20	100
POSE	16	100
ARRI	4	100
BASA	3	100
ASLE3	3	100
DRVE2	3	100
BAHO	3	100
ARTR2	3	50

***TOTAL 114

TRACE: ERHE, LULA2, CRAT, HADI, CATH, ACMI, DENU3, MITR, RICE, DODEC, BRTE, PHLE2, BRDO, HYCA, SEDUM, COPA, SCLI, LOTR, CYFR, ROSA, HARE, PHSP, PEGLC, CALOC, MIGR, DEPI, ALLIU, BASE, COLI2, PHLO, POMI, ARABI, ANMI2, ERLI

ARTR2/LOMAT-LILIA SET BUN, PLOTS 1726, 1727

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ELEV 4265 4250-4280), SLOPE 10, ASPECT: N-0, E-2, S-0, W-0
 CANOPY 16, TBAR 38, WATER --, CONIF 21, DECID --, SHRUBS 36, HERBS 34

ARTR2	33	100
PIPO O	11	100
PIPO U	10	100
ALMA	8	50
POSE	4	100
FESTU	4	100
LONU	2	100
CARU	2	50
LOAM	2	50
LOCA4	2	50
LOMA	2	50
HB1	2	50

***TOTAL 99

TRACE: PEFR3, SEDUM, LIBU, TRMA, AGSP, BAHO, ERDO, POA, ROSA, PUTR, HAST2,
 STLE2, BRTE, CATH, LOMAT, ERIOG, ACMI, MITR, MIGR, LULEA, ARDR2, ANFL,
 AMAL, LOTR, COPA, DELPH, RAGL, DENU3, LERE, MO1, ERLI, ARCO, EARTH, ARTR,
 PEGA, AGCR, LOGR, PHLO, CAQU, SEIN, PEPR, ANMI2

ARRI-PESI + AGSP-POSE + EARTH/POSE SET BUN, PLOTS 1278, 1279, 1290

ELEV 2213 (2000-2400), SLOPE 0-25, ASPECT: N-1, E-1, S-1, W-0
 CANOPY --, TBAR 57, WATER --, CONIF --, DECID --, SHRUBS 10, HERBS 39

AGSP	13	100
POSE	9	100
ARRI	5	100
BAHO	4	100
EARTH	3	100
HAST2	2	100
BRTE	2	100

***TOTAL 45

TRACE: ARTR, PEGA, PHLO, BASA, HADI, FEID, ASTRA, PESI, LULEA, ERLI, LOLE,
 MITR, SIHY, PUTR, ERSP3, PHCH, STLE2, PHLI, COGR2, OEAN, ACMI, CRBA2, LERE,
 ANFL, ERPO

PUTR/TRMA SET BUN, PLOT 1739

ELEV 3350, SLOPE 15, ASPECT: N-0, E-0, S-1, W-0
 CANOPY --, TBAR 12, WATER --, CONIF --, DECID --, SHRUBS 23, HERBS 108

PUTR	20	100
POBU	20	100
STOC	20	100
LONU	15	100
TRMA	10	100
BASA	10	100
BRTE	10	100
ALAL	10	100
ERLI	5	100
SYOR	2	100
FEBR	2	100
ACMI	2	100

***TOTAL 131

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TRACE: AMAL, ANST, LUPIN, MIGR, GM1, SEIN, ERDO, POSE, CR1, PHSP, CANU, GAAP, POMI, ERCO5, AGHE, COPA, ALLIU, EPMI, ERCI, LIRU, LI1, ALDO, HYCA, HIERA, LOTR, POSC

SAAM2-ALRH/ELCI + SAEX SET BUN, PLOT 1281

ELEV 1200, SLOPE 3, ASPECT: N-0, E-0, S-1, W-0

CANOPY --, TBAR 10, WATER 2, CONIF 10, DECID 5, SHRUBS 52, HERBS 63

ARTR	20	100
BRTE	20	100
SAEX	15	100
POBU	15	100
ALRH U	7	100
ELCI	5	100
POSC	5	100
RIAU	4	100
RONU	4	100
POSE	4	100
ALRH O	3	100
CHTE	3	100
MOPE	3	100
POTR O	2	100
SAAM2U	2	100
AMAL	2	100
ACGL	2	100
CLLI	2	100
MEDIC	2	100
CEDI	2	100
LYAL	2	100

***TOTAL 130

TRACE: SAAM2O, RHRA, RHGL, SB1, GAAP, HELA, ONAC, VICIA, SILO, PHHA, ACMI, CIIN, SIAL, TRDU, DISY, EQAR, RUMEX, PHRA, EREL2, POMI, ERCO5, AGSP

RHGL/talus + PUTR/AGSP-BASA SET BUN, PLOT 1703

ELEV 8202, SLOPE 30, ASPECT: N-0, E-0, S-1, W-0

CANOPY 1, TBAR 30, WATER --, CONIF 2, DECID --, SHRUBS 6, HERBS 107

AGSP	70	100
BRTE	25	100
RHGL	2	100

***TOTAL 115

TRACE: PIPO O, PIPO U, AMAL, ARDR, ROWO, SYAL, ACMI, DRVE2, ACGL, SACE, PUTR, TRDU, CAMA, PODO, COPA, RAGL, BASA, PHHA, LIPA, LUPIN

PUTR/AGSP-BASA SET BUN, PLOTS 336, 337, 1202, 1203

ELEV 3024 (2700-3420), SLOPE 11-32, ASPECT: N-0, E-1, S-2, W-1

CANOPY --, TBAR 20, WATER --, CONIF --, DECID --, SHRUBS 37, HERBS 62

PUTR	19	100
BASA	16	100
AGSP	11	100
ARTR	10	75
SYOR	8	50
BRTE	5	100
POBU	5	50
CEDI	5	25

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STOC	5	25
EPMI	2	75
LODI2	2	50
LOAM	2	50

***TOTAL 102

TRACE: COGR2, HEUN, ACMI, LOMA, LUSE, ERHE, STIPA, ERFI, CADR2, SEIN, SAMBU, MASA, MEBU, AMAL, TRDU, PHLI, SACE, CREPI, CRTO, SIAL, HACA, COLI2, BRCA, BRJA

PREM-ACGL/THOC SET EAA, PLOT 331

ELEV 3900, SLOPE 19, ASPECT: N-0, E-0, S-1, W-0

CANOPY --, TBAR --, WATER --, CONIF --, DECID --, SHRUBS 107, HERBS 47

PREM	65	100
THOC	35	100
SYAL	10	100
PAMY	10	100
CEVE	10	100
ACGL	10	100
OSOC	5	100
HYFE	3	100
SASC U	2	100
HAMI	2	100
CO1	2	100

***TOTAL 156

TRACE: AMAL, BEAQ, LICO4, BRVU

PSME-PIMO/LIBO2 SET EAA, PLOTS 1517, 1518

ELEV 2350, SLOPE 0, ASPECT: N-2, E-0, S-0, W-0

CANOPY 49, TBAR 8, WATER --, CONIF 79, DECID 3, SHRUBS, 46 HERBS 12

PSME O	20	100
PSME U	13	100
LIBO2	11	100
PIMO O	9	100
BEAQ	9	100
PIMO U	8	100
SYAL	8	100
PICO O	8	50
ABGR U	8	50
RHB	6	100
THPL U	4	100
PYAS	4	50
POTR2O	3	100
SALIX	3	100
PIEN O	3	50
ABGR O	3	50
THPL O	3	50
CHUM	3	50
COCA	3	50
PIPO O	2	100
PAMY	2	100
RSB	2	100
ELYMU	2	100
PIPO U	2	50

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ARUV 2 50
GM1 2 50

***TOTAL 153

TRACE: PIEN U, ROSA, VASC, ACMI, RUSP, RUPA, ANTEN, DAGL, CAREX, GALIU,
ALSI, BENE

PSME-PIPO(-PICO)/CEVE SET EAA, PLOTS 1545, 1694, 1696

ELEV 2537 (1400-4200), SLOPE 3-30, ASPECT: N-1, E-0, S-1, W-1

CANOPY 17, TBAR 40, WATER --, CONIF 42, DECID 3, SHRUBS 41, HERBS 27

CEVE 17 100

PSME O 10 67

PIPO O 9 67

PICO U 8 33

GM2 8 33

PSME U 7 100

PIPO U 7 100

PAMY 7 33

PUTR 7 33

CEDI 7 33

CARU 3 33

SPBE 2 33

PTAQ 2 33

POTR2O 2 33

ROSA 2 33

SALIX 2 33

SYAL 2 33

RHB 2 33

***TOTAL 114

TRACE: SASC U, ACMI, SHCA, PYSE, EPAN, FESTU, CACO, GM1, BEAQ, SARA

PICO-SASC/VASC/CARU SET EAB, PLOTS 212, 215, 216, 218, 219, 224, 227, 229

ELEV 4865 (3980-5730), SLOPE 1-33, ASPECT: N-0, E-2, S-4, W-2

CANOPY 63, TBAR 13, WATER --, CONIF 21, DECID --, SHRUBS 12, HERBS 16

PICO O 43 100

PICO U 16 88

VASC 14 75

CARU 12 75

ABLA2O 7 12

SASC U 6 75

LIBO2 4 50

ALSI 3 50

PIEN O 3 38

PIEN U 2 75

SPBE 2 75

PAMY 2 75

ABLA2U 2 50

LULA 2 38

***TOTAL 128

TRACE: JUCO4, VAME, LEGL, ARUV, COCA, SHCA, RUPA, PSME O, RHAL,
SASC O

ABLA2-PIMO/PAMY-VASC SET EAB, PLOTS 230, 234

ELEV 3670 (3380-3960), SLOPE 4-16, ASPECT: N-0, E-1, S-1, W-0

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CANOPY 52, TBAR 5, WATER --, CONIF --, DECID --, SHRUBS 29, HERBS 7

PIMO O	18	100
VASC	12	100
PICO O	10	100
PAMY	10	100
PIEN O	9	100
ABLA2U	9	100
ALSI	8	50
PSME O	7	100
ABLA2O	6	100
PIEN U	6	100
VAME	6	100
CARU	5	50
PSME U	4	100
SASC U	4	100
CHUM	3	100
LIBO2	2	100
SPBE	2	100
PIMO U	2	50
BEAQ	2	50

***TOTAL 136

TRACE: AMAL, PYSE, GOOB, PICO U, RHAL, ACGL, SASC O, ROGY, THOC, SMRA,
DIHO, PYPI, ARUV, RUPA, CACO

ABLA2-PIEN/TRLA4-EPGL2 SET EAB, PLOT 356

ELEV 5200, SLOPE 2, ASPECT: N-0, E-1, S-0, W-0

CANOPY 70, TBAR 2, WATER 3, CONIF 105, DECID --, SHRUBS 11, HERBS 92

PIEN O	65	100
PIEN U	20	100
MITEL	20	100
TRLA4	20	100
ABLA2O	10	100
ABLA2U	10	100
EPGL2	10	100
LULA	5	100
CARDA	5	100
MOCO	5	100
TRLO	5	100
DODE	5	100
POPU	5	100
RILA	4	100
PYSE	3	100
VAME	2	100
RAUN2	2	100
STRO	2	100
GATR3	2	100

***TOTAL 208

TRACE: RISA, VASC, ARLA, SAAR4, GATR, SETR, CAREX, VIGL, OSPU, VESE, MIGU,
VEVI, EPWA, LIGR, ARMO, HASA, ATFI, THOC, HB1

SOSC2-RUPA/ACRU SET EAB, PLOTS 6, 118

ELEV 4620 (4490-4750), SLOPE 12-32, ASPECT: N-0, E-2, S-0, W-0

CANOPY 29, TBAR 2, WATER --, CONIF 32, DECID --, SHRUBS 76, HERBS 57

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PIEN O	28	50
ACRU	21	100
ACGL	20	50
SOSC2	17	100
RUPA	11	100
VAME	10	50
EPAN	8	50
TIUN	8	50
RULA	5	50
SMST	4	50
ABLA2U	3	100
SARA	3	100
THOC	3	100
LOUT2	3	50
VEVI	3	50
GYDR	3	50
PAMY	2	100
GATR	2	100
SASC U	2	50
SYAL	2	50
RICE	2	50
SMRA	2	50
ABAM U	2	50
VASI	2	50
CLUN	2	50

***TOTAL 174

TRACE: HYFE, OSOC, PIEN U, RIBES, RILA, HELA

SOSC2-PAMY/EPAN SET EAB, PLOTS 415, 417

ELEV 4860 (4520-5200), SLOPE 13-23, ASPECT: N-0, E-0, S-1, W-1

CANOPY --, TBAR 3, WATER --, CONIF 6, DECID --, SHRUBS 59, HERBS 36

SOSC2	20	100
VAME	20	50
ELGL	13	50
SASC U	8	50
MEPA	8	50
PAMY	7	100
EPAN	6	100
RIVI	5	50
ABLA2U	3	50
ALSI	3	50
CAME2	3	50
CLUN	3	50
RILA	2	100
SARA	2	100
PTAQ	2	100
ABLA2O	2	50

***TOTAL 116

TRACE: PIEN U, RHAL, MOCO, ARENA, PIEN O, POPU, ARMA3, ACMI, HELA, ANMA, THOC, VASI, AQFO, GALIU, MITEL, CASP, MILE, VIGL, ADPE, SMST, CAREX, LUHI, FN1, ARLA, HIAL, EPILO, LOIN, PEWA, ASTER, FRAGA, OSCH

SASC/ELGL-HELA SET EAB, PLOTS 649, 651, 657, 662

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ELEV 4675 (4380-5400), SLOPE 12-30, ASPECT: N-0, E-0, S-4, W-0
 CANOPY 38, TBAR 4, WATER 0, CONIF 17, DECID 14, SHRUBS 55, HERBS 41

SASC U	18	100
PAMY	13	50
ABLA2U	10	75
ALSI	10	50
THOC	9	75
HELA	6	100
SYAL	6	75
ELGL	5	100
SASI2	5	25
RUPA	4	50
BRCA	4	50
ACGL	3	50
LULA	3	50
PIEN U	3	25
PSME U	3	25
VAME	3	25
VASC	3	25
CARU	3	25
ASEN	2	100
SARA	2	75
EPAN	2	75
ACMI	2	50
POTR U	2	25
RUSP	2	25

***TOTAL 138

TRACE: OSOC, RILA, URDI, ANMA, CIED, PIEN O, PSME O, AMAL, SOS2, LOIN,
 CRDO, RIHO, SOSI, VASI, CAHO, LOCI, ASMO, GATR, FEOC, HAMI

PIEN/SASC/ASEN-THOC SET EAB, PLOT 698

ELEV 5600, SLOPE 30, ASPECT: N-0, E-0, S-0, W-1
 CANOPY 25, TBAR 2, WATER --, CONIF 28, DECID 20, SHRUBS 7, HERBS 73

ASEN	25	100
PIEN U	20	100
SASC U	20	100
CARU	20	100
THOC	20	100
ABLA2U	4	100
PSME U	4	100
LULA	3	100
RUPA	2	100
RILA	2	100
PAMY	2	100
ANAR2	2	100

***TOTAL 128

TRACE: RIVI, ELGL, ACMI, HISC, CESA, OR1, CAMI2, AGOSE, EPAN, VIGL, POPU

SASC-ACCI-RUPA SET EAB, PLOTS 1127, 1132

ELEV 2430 (2420-2440), SLOPE 4-15, ASPECT: N-0, E-0, S-2, W-0
 CANOPY --, TBAR --, WATER --, CONIF --, DECID 39, SHRUBS 38, HERBS 11

SASC U	58	100
ACCI	25	100

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RUPA	3	100
RHPU U	3	50
SMST	3	50
PTAQ	3	50
DIHO	2	100
ACGL	2	50
CEVE	2	50
PAMY	2	50
AMAL	2	50

***TOTAL 117

TRACE: SARA, LOIN, SOS2, ALSI, THOC, ARMA3, CX1, MESM, OSCH, ACMA U,
 PREM, EPAN, VIGL, GALIU, SMRA, ASTER, HELA

PTAQ-SOCA-ELGL-THOC SET EAB, PLOTS 1892, 1893, 1895

ELEV 4933 (4900-5000), SLOPE 35-45, ASPECT: N-0, E-0, S-3, W-0

CANOPY --, TBAR 4, WATER --, CONIF --, DECID --, SHRUBS 20, HERBS 143

PTAQ	38	100
THOC	28	100
SOCA	12	100
ELGL	12	100
ARMA3	8	100
ANMA	7	100
FRAGA	7	67
SYAL	6	100
RUPA	5	33
VAME	5	33
VEVI	4	100
VASI	3	100
SMST	3	100
ACMI	3	67
EPAN	2	100
HELA	2	100
ASEN	2	100
LULA	2	67
HIERA	2	67
HODI	2	33
RUPE	2	33

***TOTAL 163

TRACE: POPR, BRCA, SOSI, CARO3, CAHO, PHDI, ARNO, FEVI, LICO4

ARTRV/FEVI SET EAB, PLOT 202

ELEV 5780, SLOPE 23, ASPECT: N-0, E-1, S-0, W-0

CANOPY --, TBAR 9, WATER --, CONIF 3, DECID --, SHRUBS --, HERBS --

ARTR	38	100
CAREX	12	100
FEVI	12	100
LULA	8	100
CASTI	7	100
CARU	7	100
HAMI	4	100
ACMI	4	100
ERPE	3	100
LUNA2	3	100

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ERUM 3 100

***TOTAL 109

TRACE: ABLA2U, PIAL U, PSME U, PAMY, MIGR, COGR2, THOC, AGEL2, SALIX,
EPAN, GM1, LOMAT, ORCO2, PODI, PODO, ERIGE, HB2, BRCA, DELPH, HB1, SIPA

ARLU/ASEN-MEPA SET EAB, PLOT 1041

ELEV 4800, SLOPE 14, ASPECT: N-0, E-0, S-1, W-0

CANOPY --, TBAR 7, WATER --, CONIF --, DECID --, SHRUBS --, HERBS 120

ARLU 30 100

CASU4 15 100

FEVI 15 100

ERPE 10 100

POARC 10 100

BRCA 10 100

MEPA 5 100

ACMI 5 100

ASEN 5 100

HYFE 5 100

CX1 3 100

ASFO 3 100

CIED 2 100

ANAR2 2 100

***TOTAL 120

TRACE: ARPA3, ARABI

ACCI-SOSC2-SPDO SET EAB, PLOT 1064

ELEV 2500, SLOPE 21, ASPECT: N-0, E-0, S-1, W-0

CANOPY 48, TBAR --, WATER --, CONIF --, DECID --, SHRUBS 94, HERBS 35

ACCI 40 100

SOSC2 35 100

SPDO 15 100

PTAQ 15 100

SMST 10 100

CLUN 8 100

SASC U 4 100

PAMY 4 100

RHB 2 100

***TOTAL 134

TRACE: RHPU U

ACCI-ALSI/ELGL-PTAQ SET EAB, PLOT 1072

ELEV 3600, SLOPE 20, ASPECT: N-0, E-0, S-1, W-0

CANOPY 40, TBAR 4, WATER --, CONIF 2, DECID 10, SHRUBS 60, HERBS 79

ACCI 40 100

PTAQ 30 100

ELGL 30 100

ALSI 20 100

POTR U 10 100

THOC 10 100

SOCA 3 100

VEVI 3 100

ABAM U 2 100

ANAR2 2 100

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***TOTAL 151
TRACE: EPAN

AMAL/PAMY SET EAB, PLOT 1168
ELEV 4050, SLOPE 6, ASPECT: N-0, E-0, S-1, W-0
CANOPY --, TBAR 32, WATER --, CONIF --, DECID --, SHRUBS 82, HERBS --
AMAL 60 100
PAMY 20 100
***TOTAL 82
TRACE: SOS2, SPBE, LICA2

ACGL-ALSI/THOC + SACO2-LOIN SET EAB, PLOT 1602
ELEV 4480, SLOPE 23, ASPECT: N-0, E-1, S-0, W-0
CANOPY --, TBAR 11, WATER --, CONIF 1, DECID --, SHRUBS 76, HERBS 36
ACGL 20 100
SACO2 15 100
SALIX 10 100
ALSI 10 100
THOC 10 100
RUPA 7 100
LOIN 5 100
OSOC 5 100
SMRA 5 100
PAMY 3 100
HAMI 3 100
LODI2 3 100
ARLU 3 100
SOSI 2 100
SARA 2 100
AMAL 2 100
HELA 2 100
***TOTAL 113
TRACE: PSME U, PHHA, EPAN, HYCA, ACMI, BRCA, OREX, COPA, ARDR2, ANAR2,
HB1, ARSY, SELA2, COGR2, LICO4, PONE2, TAOF, GATR, LOBR, ASEN, HEUN, PENST

TSME-ABLA2-SASC SET EAB, PLOT 1314
ELEV 4000, SLOPE 33, ASPECT: N-0, E-1, S-0, W-0
CANOPY 5, TBAR 27, WATER --, CONIF 42, DECID 10, SHRUBS 33, HERBS 21
VAME 15 100
PTAQ 15 100
TSME U 10 100
SASC U 10 100
PSME U 10 100
PSME O 5 100
ABLA2U 5 100
PIMO U 5 100
TSHE U 5 100
GAOV 5 100
PAMY 5 100
SOSI 5 100
RHB 5 100
ABAM U 2 100
RULA 2 100

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***TOTAL 106

TRACE: CHUM, ANMA, AMAL, PYAS, CX1, HIERA, VIOLA

ABLA2-PIAL/PAMY-VASC SET HIM, PLOTS 9, 11, 13, 15, 25, 27, 28, 57

ELEV 6642 (6280-7110), SLOPE 18-40, ASPECT: N-0, E-0, S-4, W-4

CANOPY 12, TBAR 35, WATER --, CONIF 39, DECID --, SHRUBS 29, HERBS 30

VASC	19	100
ABLA2U	14	100
PIAL U	8	100
PIAL O	7	50
PAMY	4	100
ABLA2O	3	50
LULA	3	25
ARCA2	2	88
ARCO	2	75
PICO U	2	62
LUHI	2	50
PIEN O	2	50
ARNE	2	38
FEVI	2	12

***TOTAL 101

TRACE: LOBR, SELA2, JUCO4, PEDA, CASTI, CARO, ANMI2, PSME U, CACO, ACMI, LALY U, PERA, GM1, CO1, SEIN, VECU, JUPA, ERGR, PODI, TSME U, RHAL, LUPIN, ANLA, ERPE, ARPA3, PICO O, CAEL2, FRAGA, OXCA2

VASC/FEVI-PHDI SET HIM, PLOTS 79, 80, 85, 86, 87, 88

ELEV 6450 (5230-6900), SLOPE 2-30, ASPECT: N-1, E-3, S-2, W-0

CANOPY 9, TBAR 14, WATER --, CONIF 18, DECID --, SHRUBS 23, HERBS 61

VASC	17	100
FEVI	9	100
PHDI	7	100
ABLA2U	7	67
ANLA	5	67
ABLA2O	5	17
JUPA	4	33
PIAL O	3	17
PIAL U	2	83
LUHI	2	83
CAREX	2	67
ACMI	2	67
ERPE	2	67
ERGR	2	67
LULA	2	50
VECU	2	50
PODI	2	33
VACA	2	33
LUPE	2	17

***TOTAL 100

TRACE: ARCA2, PEPR, ANOC, SEIN, ARLA, VASI, LICA2, LALY U, POFL2, PAMY, PIEN U, THOC, PERA, TRSP, PHEM, VAME, BRCA, FRVI, SIPR, VADE, CAME, HIGR, ARNIC, CAEL2

LALY-PIEN/PHEM/LUHI SET HIM, PLOTS 53, 207, 208

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ELEV 7110 (6685-7405), SLOPE 17-33, ASPECT: N-2, E-1, S-0, W-0
 CANOPY 25, TBAR 11, WATER --, CONIF 53, DECID --, SHRUBS 43, HERBS 18

VASC	31	100
LALY O	17	100
LUHI	12	100
ABLA2U	10	67
LALY U	9	100
PIAL U	7	100
PIEN O	6	100
PHEM	5	100
PIEN U	3	100
CAME	3	100
RHAL	3	33
PIAL O	2	67
JUPA	2	67
ANLA	2	33

***TOTAL 114

TRACE: VECU, ARCA2

ABLA2/FEVI SET HIM, PLOTS 607, 608, 609

ELEV 6973 (6900-7080), SLOPE 24-29, ASPECT: N-0, E-1, S-2, W-0
 CANOPY 3, TBAR 33, WATER --, CONIF 9, DECID --, SHRUBS 1, HERBS 82

FEVI	48	100
ABLA2U	4	100
LIGUS	4	100
ERPE	4	100
ARPA3	4	67
PIAL U	2	100
PHDI	2	100
ARCA2	2	100
AGGLD	2	100
ACMI	2	67
LALY U	2	33
SEINV	2	33

***TOTAL 91

TRACE: LULA, ANLA, CAMI2, JUPA, LUHI, ERPY, LALY O, POFL2, SEIN, VACA,
 ARMO, VEVI, ERUM

FEVI-PHDI + ANLA SET HIM, PLOTS 520, 521, 522, 523

ELEV 7125 (7060-7180), SLOPE 13-25, ASPECT: N-0, E-1, S-1, W-2
 CANOPY 4, TBAR 23, WATER 0, CONIF 6, DECID --, SHRUBS 3, HERBS 80

FEVI	29	100
LULA	12	100
ANLA	8	50
ARCA2	6	100
PHDI	4	100
SEIN	3	100
VACA	3	25
ERIGE	2	50
ERUM	2	50
LALY O	2	25
LIGR	2	25

***TOTAL 96

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TRACE: AGGL, PIEN O, LALY U, PIEN U, ERPE, CASTI, POFL2, PIAL U, ACMI, SEST2, JUPA, ABLA2O, ABLA2U, POCU, VECU, CACO2, VASI, TRLA4, SAAR4, LUHI, LICA2, ANMI2, ERPY, RAES, EPAL, TRSP, LOBR

FEVI-PHDI + ABLA2/VAME SET HIM, PLOTS 1189, 1190

ELEV 5575 (5230-5920), SLOPE 28-30, ASPECT: N-0, E-0, S-2, W-0

CANOPY 6, TBAR 16, WATER 1, CONIF 20, DECID --, SHRUBS 36, HERBS 65

FEVI	22	100
PAMY	18	100
ABLA2U	17	100
VAME	13	100
ASTER	9	100
PHDI	7	100
ARCA2	5	100
LOBR	4	100
HIAL2	4	100
CARO	3	100
LICA2	3	50
PIAL U	2	100
LULA	2	100
ACMI	2	100
ERGR	2	100
CAREX	2	50
ARNE	2	50

***TOTAL 129

TRACE: ABLA2O, PIAL O, JUPA, ELGL, THOC, PERA, HIAL, ERUM, SOS2, SACO2, RHAL, ALSI, LUHI

ABLA2-PIEN(-CHNO)/VAME SET HIM, PLOTS 84, 120

ELEV 5240 (5000-5480), SLOPE 20-24, ASPECT: N-0, E-1, S-1, W-0

CANOPY 2, TBAR 8, WATER --, CONIF 39, DECID --, SHRUBS 65, HERBS 24

ABLA2U	24	100
VAME	16	100
PAMY	12	100
CHNO U	10	50
VASC	8	50
RHAL	8	50
ALSI	6	100
PIEN U	5	100
RIBES	4	100
EPAN	4	100
SALIX	4	50
THOC	3	100
VASI	3	100
SOSC2	3	50
PERA	2	100
HELA	2	100
LOUT2	2	50
FEVI	2	50
RILA	2	50
SARA	2	50
LULA	2	50

***TOTAL 139

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TRACE: VEVI, LICA2, LUPIN, ERPE, ARNIC, FRVI, RULA, VIGL, ARCO, ARMA3, HISC,
 ASTER, CARO, ARLA, ELGL, CARO3, PEGR, HIAL, CAEL2

ABLA2/VADE SET HIM, PLOTS 463, 477, 481

ELEV 5920 (5860-6000), SLOPE 1-38, ASPECT: N-0, E-0, S-3, W-0

CANOPY 22, TBAR 15, WATER --, CONIF 33, DECID --, SHRUBS 37, HERBS 53

ABLA2O	20	67
ABLA2U	11	67
VADE	10	100
RHAL	8	33
PHEM	5	67
VAME	5	67
ANLA	5	33
CANI2	5	33
PAMY	3	67
LUHI	3	67
POFL2	3	67
PHDI	2	67
LULA	2	67
LICA2	2	67
VASI	2	67
ERPE	2	67
FEVI	2	67
PIEN O	2	33
VASC	2	33
SIPA	2	33
CX1	2	33
ANMA	2	33

***TOTAL 122

TRACE: CAME, CALE2, CAREX, VEVI, MIPE, THOC, SETR, TRLA4, ARLA, CAPAA,
 VECU, ANOC, JUPA, GECA, CASP, SOS2, POFR, LOBR, ARCA2, PHHA, ASEN, CASCS,
 PEBR, CAMI2

ABLA2-CHNO/VADE SET HIM, PLOTS 1222, 1224, 1226, 1235

ELEV 5430 (5320-5550), SLOPE 15-40, ASPECT: N-0, E-3, S-1, W-0

CANOPY 6, TBAR 34, WATER --, CONIF 30, DECID --, SHRUBS 37, HERBS 26

VADE	18	100
ABLA2U	15	100
VAME	12	100
FEVI	10	100
CHNO U	9	100
PHDI	4	100
ARCA2	3	100
PAMY	3	75
LULA	3	75
SOSC2	2	75
PECO2	2	75
JUPA	2	75
ABAM U	2	50

***TOTAL 96

TRACE: ABLA2O, PIMO U, ARNE, LOBR, ABAM O, TSME U, PIAL U, ACMI, ASEN,
 VASC, ERPE, PEDA, RULA, CRCR, SEST2, HB1, LUHY, PEPR, ANMA, SEDI

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CHNO/VADE/VASI SET HIM, PLOTS 1886, 1887

ELEV 5305 (5300-5310), SLOPE 20, ASPECT: N-0, E-0, S-2, W-0

CANOPY 9, TBAR 1, WATER --, CONIF 9, DECID --, SHRUBS 31, HERBS 91

VASI	23	100
FEVI	13	100
VADE	10	100
VAME	10	100
ASEN	10	100
SOSI	9	100
VEVI	9	100
ELGL	9	100
CHNO U	8	100
EPAN	8	100
ARLA	5	100
BRCA	4	100
LULA	4	100
THOC	4	100
POBI	3	100
RIBES	2	50

***TOTAL 135

TRACE: TSME U, ABLA2U, ANAR2, ASFO, POPR, HYFE, LICO4

ERPE-LICA2-THOC SET HIM, PLOTS 4, 76, 78

ELEV 5630 (5230-6250), SLOPE 8-26, ASPECT: N-0, E-1, S-1, W-1

CANOPY --, TBAR 8, WATER --, CONIF 5, DECID --, SHRUBS 16, HERBS 103

THOC	9	100
FEVI	8	67
CARU	5	33
CASP	5	33
SAMY	5	33
POST	4	33
ACMI	3	100
LICA2	3	100
ERPE	3	100
VEVI	3	67
POFL2	3	67
OSOC	3	33
BRSI	3	33
LULA	2	67
CAEL2	2	67
ERGR	2	67
OSMOR	2	67
CASU4	2	67
ARNIC	2	67
FRVI	2	67
PAMY	2	33
HEUN	2	33
CAREX	2	33

***TOTAL 115

TRACE: ABLA2U, CIED, PIEN U, PIAL U, DELPH, ABLA2O, ACCO, PHAL, VECU, VASI, HELA, RIVI, ARNE, JUCO4, AMAL, SAGR, HISC, LOGO, LOAM, ALLIU, HYFE, ASTER, CREPI, CYFR, SELA2, ANMI2, ERUM, ARCO, ANAR2, BROMU, POTEN, PONE, PHDI, JUPA, ELGL, LUHI, EPAN, CAMI

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SASC/FEVI-EPAN SET HIM, PLOT 1020

ELEV 5400, SLOPE 24, ASPECT: N-0, E-0, S-1, W-0

CANOPY --, TBAR 18, WATER --, CONIF 1, DECID 2, SHRUBS 22, HERBS 67

FEVI	20	100
EPAN	10	100
LOBR	8	100
ARNE	7	100
ARCA2	6	100
CEVE	5	100
PAMY	5	100
SALIX	5	100
ERUM	4	100
ANMA	4	100
PHDI	3	100
ASEN	3	100
SASC U	2	100
PHPR	2	100
DAGL	2	100
ACMI	2	100

***TOTAL 92

TRACE: ABLA2U, JUPA, HICY, ARMA3, CHEIL

ASEN-ASFO-MEPA + CASP SET HIM, PLOTS 1240, 1241

ELEV 4400, SLOPE 5, ASPECT: N-0, E-0, S-2, W-0

CANOPY 1, TBAR 8, WATER 4, CONIF 6, DECID --, SHRUBS 12, HERBS 110

ASEN	28	100
CASP	23	100
MEPA	13	100
THOC	13	50
SASI2	10	50
ACMI	8	100
ASFO	8	100
ABLA2U	3	100
CHNO U	3	100
POFL2	3	50
ARAM	3	50
CIED	2	100
MILE	2	50
ANAR2	2	50
ELGL	2	50
FEVI	2	50

***TOTAL 136

TRACE: VEVI, SPDE, SALIX, CABE, OXDI, SETR, ATDI, GATR, LULA, ERPE, BRCA, POPU, POGR5, HB1, EPGL, VEWO, ANMA, HELA, HB2, AGEX, LIGR, CARO3, SIPA, VIOLA, EPAL

ABLA2/DAIN + SABA/ASFO-POFL2 SET HIM, PLOT 1247

ELEV 5350, SLOPE 2, ASPECT: N-0, E-0, S-1, W-0

CANOPY 3, TBAR 4, WATER 2, CONIF 19, DECID --, SHRUBS 20, HERBS 117

POFL2	30	100
CAREX	25	100
DAIN	20	100

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ASFO	20	100
ABLA2U	15	100
SABA	10	100
SOCA	10	100
SASI2	3	100
VADE	3	100
PIEN U	2	100
SPDE	2	100
VACA	2	100
LULA	2	100
THOC	2	100
CACA	2	100

***TOTAL , 156,

TRACE: PIEN O, ABLA2O, SASI, VASI, ACMI, CARO2, AGTH, PUPA, BOMU, LIGR,
 PHAL, SETR, ANMA, GECA, EPAN, MEPA, VEVI, CIED, HB1

TSME-CHNO/SOSI SET POB, PLOT 1636

ELEV 4200, SLOPE 29, ASPECT: N-0, E-0, S-1, W-0

CANOPY 40, TBAR 46, WATER --, CONIF 60, DECID --, SHRUBS 111, HERBS 38

SOSI	30	100
CHNO O	25	100
VAOV	20	100
RUSP	15	100
ABLA2O	10	100
CHNO U	10	100
SPDE	10	100
ALSI	10	100
RUPE	10	100
RHAL	10	100
VEVI	10	100
HB1	10	100
TSME O	5	100
ABLA2U	5	100
TSME U	5	100
VASI	5	100
RUPA	3	100
GAOV	3	100
ATFI	3	100
ASFO	2	100
ELGL	2	100
MERTE	2	100

***TOTAL 209

TRACE: HB2, CASP, LUPE, LYCOP, PHEM, THOC, SASI, GM1, DESCH, EPAN, CAMI2,
 ARLA, AQFO, CENTA, VIOLA

VASI-VEVI-CASP SET POB, PLOTS 673, 862

ELEV 5700 (5600-5800), SLOPE 27-40, ASPECT: N-0, E-1, S-1, W-0

CANOPY 4, TBAR 1, WATER --, CONIF 13, DECID --, SHRUBS 10, HERBS 138

VASI	28	100
CASP	28	100
VEVI	21	100
POBI	18	50
THOC	13	50

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ABLA2U	10	100
ARLA	8	100
LULA	5	100
POFL2	5	100
SOSC2	4	50
TSME U	3	100
VAME	3	50
VIOLA	3	50
VADE	3	50
DEAT	3	50
ERPE	2	100
RHAL	2	50
HELA	2	50
ASEN	2	50

***TOTAL 169

TRACE: EPAN, PEBR, CIED, LUHI, ERGR, HIGR, RIHO, LUPI, ELGL, PHAL, RIBES

VADE/VASI-POBI SET POB, PLOT 1888

ELEV 5400, SLOPE 10, ASPECT: N-0, E-0, S-1, W-0

CANOPY 10, TBAR 2, WATER --, CONIF 10, DECID --, SHRUBS 30, HERBS 88

VADE	25	100
LULA	15	100
FEVI	15	100
POBI	10	100
VASI	10	100
ABLA2U	8	100
PHEM	5	100
HIGR	5	100
VEVI	5	100
PEBR	5	100
ANOC	5	100
ELGL	5	100
POFL2	3	100
CANI2	3	100
CHNO U	2	100
ERGR	2	100
ARLA	2	100

***TOTAL 128

TRACE: DEAT, ERPE, TRSP, LICO4, SIPA, ASFO, LYSI

ALIN-BEOC/COST/RIIN SET RIC, PLOTS 1704, 1705, 1706

ELEV 5577, SLOPE 0, ASPECT: N-3, E-0, S-0, W-0

CANOPY --, TBAR 0, WATER 2, CONIF --, DECID 70, SHRUBS 41, HERBS 19

BEOC O	35	100
COST	27	100
ALIN O	15	100
ALIN U	11	100
BEOC U	9	100
SYAL	9	100
URDI	9	100
RIIN	3	100
GM2	3	33
ARLA3	2	100

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CX1 2 67

***TOTAL 129

TRACE: RULE, GEMA, CRDO, GM1, CIVU, VETH, HB1

ACCI-RUPA SET RIX, PLOTS 365, 378, 379, 1070

ELEV 2580 (1820-3400), SLOPE 5-24, ASPECT: N-2, E-0, S-1, W-1

CANOPY 43, TBAR 3, WATER --, CONIF 24, DECID 13, SHRUBS 89, HERBS 35

ACCI 35 100

PSME O 16 50

RUPA 11 100

ATFI 10 50

BENE 10 25

PAMY 6 50

ACMA O 6 50

PTAQ 5 50

ALSI 5 25

THOC 4 25

SOSC2 3 50

ACMA U 3 50

RUSP 3 50

THPL U 3 25

COST 3 25

VASI 3 25

EPAN 2 100

RILA 2 50

URDI 2 50

CIAL 2 50

SMST 2 50

SASI2 2 25

***TOTAL 167

TRACE: ACGL, AMAL, HODI, SARA, MOPA, GATR, VIGL, PICO O, TSHE O,
THPL O, TSHE U, BEPA U, SASC U, LIBO2, VAPA, ROGY, PRVI, COCO2, OPHO, HYFE,
TEGR, ALRU O, ALRU U, CHNO O, CHNO U, ABLA2U, CLUN, DIHO, STRO, RULE,
CRCR, ELGL, FEOC, DRAR, CACA

ACCI-COST SET RIX, PLOTS 428, 429, 430

ELEV 3527 (3500-3580), SLOPE 28-31, ASPECT: N-0, E-0, S-0, W-3

CANOPY 7, TBAR 4, WATER --, CONIF 7, DECID --, SHRUBS 105, HERBS 3

ACCI 43 100

COST 28 100

ALSI 12 67

PAMY 9 100

ACGL 7 33

PSME O 3 33

TSME O 3 33

AMAL 3 33

ROGY 2 33

***TOTAL 114

TRACE: THOC, ACRU, RUPA, HB1, SMST, VIOLA

COST SET RIX, PLOT 237

ELEV 3330, SLOPE 0, ASPECT: N-1, E-0, S-0, W-0

CANOPY --, TBAR 1, WATER --, CONIF 2, DECID 1, SHRUBS --, HERBS 13

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COST	90	100
GATR	5	100
RUSP	2	100
LOIN	2	100

***TOTAL 113

TRACE: POTR2O, PIEN O, PIEN U, ALSI, SYAL, ROSA, CAREX, ARTEM, EQAR, GLEL, ELGL, PUPA, HELA, EPAN, SALIX, CIED, ERIGE, ASTER, ANMA, GEMA

POTR2-POTR/SYAL/PYAS SET RIX, PLOT 236

ELEV 3314, SLOPE 0, ASPECT: N-0, E-0, S-1, W-0

CANOPY 83, TBAR --, WATER --, CONIF 6, DECID 101, SHRUBS --, HERBS 20

POTR2O	50	100
POTR O	30	100
SYAL	20	100
PYAS	15	100
POTR U	10	100
POTR2U	10	100
PIEN U	3	100
ALSI	3	100
GATR	3	100
THOC	3	100
PIEN O	2	100
RUPA	2	100
VIGL	2	100
SMST	2	100
ASTER	2	100
CAREX	2	100

***TOTAL 170

TRACE: BEOC O, ABLA2U, ROSA, BEAQ, SALIX, COST, OSCH, BOMU, ATFI, RANUN, BROMU, VIED

POTR2-ALIN/COST SET RIX, PLOTS 1692, 1697

ELEV 1870 (1400-2340), SLOPE 14-25, ASPECT: N-0, E-0, S-0, W-2

CANOPY 35, TBAR 50, WATER ,
 ONIF, 45 DECID, 21 SHRUBS, 56 HERBS 22

PIPO O	15	100
PSME O	15	100
ALIN U	13	100
SYAL	13	100
COST	10	100
SALIX	10	100
PIPO U	8	100
PAMY	8	100
POTR2O	5	100
PSME U	5	100
PTAQ	5	100
CEVE	5	50
CARU	5	50
RHB	4	100
ARUV	3	50
CAREX	3	50
BEAQ	2	100
ROSA	2	100

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EPAN 2 100
 SASC U 2 50
 SPBE 2 50
 GM1 2 50
 BEOC O 2 50

***TOTAL 154

TRACE: RUPA, ABGR O, PIMO O, ABGR U, THPL U, AMAL, LIBO2, HODI, PUTR, ACMI,
 PENST, VASI, GM2, PREM, CHUM, PHHA, DAGL

PIEN/VASI-TRLA4 + ABLA2/RHAL + PSME/PAMY SET RIX, PLOTS 31, 63

ELEV 6150 (6000-6300), SLOPE 5-21, ASPECT: N-0, E-1, S-0, W-1

CANOPY 40, TBAR 4, WATER --, CONIF 59, DECID --, SHRUBS 33, HERBS 54

ABLA2O 28 100
 PIEN O 15 100
 ABLA2U 14 100
 VAAL 10 50
 PHEM 10 50
 ERGR 8 50
 VASI 6 100
 VAME 5 50
 ARLA 4 100
 THOC 4 50
 LUPE 4 50
 VASC 3 100
 TRLA4 3 100
 PERA 3 50
 PEBR 3 50
 RUPE 3 50
 PIEN U 2 100
 RHAL 2 100
 LUHI 2 100
 VIOLA 2 100
 SETR 2 100
 GM1 2 100
 VEVI 2 50
 CANI2 2 50

***TOTAL 157

TRACE: PIAL U, ARCO, OSCH, RANUN, CAREX, LALY U, SOS2, LEGL, LUPIN, HASA,
 CALE2, MIBR, LEPY2, LICA2, POFL2, ARRY, ERPE, MIPE

PIEN/COCA-RUPE + ABLA2/VAME SET RIX, PLOT 186

ELEV 4220, SLOPE 2, ASPECT: N-1, E-0, S-0, W-0

CANOPY 82, TBAR 3, WATER --, CONIF 93, DECID --, SHRUBS 71, HERBS 31

PIEN O 75 100
 RUPE 12 100
 ABLA2U 11 100
 VAME 10 100
 COCA 10 100
 EQAR 7 100
 SACO2 6 100
 ABLA2O 5 100
 ALSI 5 100
 VASC 4 100

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LOIN	4	100
GYDR	4	100
PYAS	3	100
SPDO	3	100
ARLA	3	100
STAM	3	100
LYAN	3	100
PIEN U	2	100
PYSE	2	100
SOSI	2	100
RILA	2	100
LOUT2	2	100
RIBES	2	100
MEFE	2	100
LEPY2	2	100
VASI	2	100

***TOTAL 195

TRACE: VAAL, ACGL, GM1, ASFO, STRO, EPAN, FRVE, HASA, HELA, VEVI, TRLA4

ABGR/ROGY SET RIX, PLOTS 1813, 1816

ELEV 3200, SLOPE 10-14, ASPECT: N-2, E-0, S-0, W-0

CANOPY 74, TBAR 3, WATER 3, CONIF 79, DECID --, SHRUBS 69, HERBS 11

ABGR O	20	100
PSME O	17	100
TSME O	16	100
LIBO2	14	100
ABGR U	13	100
ROGY	13	100
ALSI	8	100
PAMY	7	100
BEAQ	7	100
SPBE	7	100
CARU	5	50
PICO O	4	100
TSME U	4	100
CHUM	4	100
VAME	3	100
ABLA2O	3	50
PICO U	3	50
RUPA	2	100
COCA	2	100
PYSE	2	100
CLUN	2	100

***TOTAL 169

TRACE: PYAS, LOCI, EQAR, LUNA2, ACTR, LAOC O, ABLA2U, SYAL, ARMA3, ACGL, ARLA, DIHO, LULA, RILA, PYPI, TROV, ACRU, GOOB, EPAN, SHCA, LOIN, PTAQ, OSCH, SETR, ARCO, ACCO, PTAN, HODI, DAGL, ANGEL, VIOLA, PEDIC, LICO4

SPDO/SOCA SET RIX, PLOTS 1065, 1073, 1129

ELEV 2780 (2440-3400), SLOPE 2-20, ASPECT: N-0, E-0, S-3, W-0

CANOPY 37, TBAR 3, WATER 0, CONIF 6, DECID 50, SHRUBS 47, HERBS 50

SASC U	27	33
SPDO	10	100

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POTR U	8	33
ACCI	8	33
ALSI	8	33
SPPY	8	33
PTAQ	7	33
ACMI	6	67
SOCA	5	100
RUPA	5	33
THOC	4	67
ELGL	3	33
LIGUS	3	33
CAHO	3	33
ABLA2U	3	33
BRVU	3	33
EPAN	2	67
AMAL	2	33
PAMY	2	33
SYAL	2	33
ASTER	2	33
FRVI	2	33
FEVI	2	33

***TOTAL 135

TRACE: URDI, PSME O, ABAM U, PIEN U, VACA, CARU, ANAR2, CAREX, POFL2, LULA

RUSP/ATFI SET RUS, PLOTS 691, 1465, 1511, 1634

ELEV 4216 (3925-4700), SLOPE 10-34, ASPECT: N-0, E-4, S-0, W-0

CANOPY 17, TBAR 11, WATER 0, CONIF 4, DECID 5, SHRUBS 132, HERBS 51

RUSP	51	100
ATFI	31	100
SOSI	29	75
SASI2	22	50
SPDE	13	75
ALRU U	5	25
VAAL	4	50
VEVI	3	75
SALIX	3	50
RHB	3	50
RIHO	3	25
GYDR	3	25
SMST	3	25
MITEL	3	25
EPAN	2	75
SARA	2	50
MEFE	2	50
ALSI	2	50

***TOTAL 194

TRACE: TSME U, ABAM U, GATR, ABLA2U, VAME, CIAL, TSME O, MEPA, RULA, RUPE, CACA, VASI

RUSP/ATFI-PTAQ SET RUS, PLOTS 846, 1670

ELEV 3390 (2820-3960), SLOPE 16-22, ASPECT: N-1, E-1, S-0, W-0

CANOPY 15, TBAR 24, WATER 3, CONIF 11, DECID --, SHRUBS 66, HERBS 64

PTAQ	31	100
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RUSP	28	100
ALSI	23	100
ATFI	12	100
VAAL	6	100
CHNO O	5	50
ACCI	3	100
DIFO	3	100
MADI2	3	50
CHNO U	3	50
OPHO	3	50
RUPE	3	50
EPAN	3	50
ARSY	3	50
SMST	2	50
ANMA	2	50
VASI	2	50
RHB	2	50

***TOTAL 149

TRACE: RUPA, GATR, CLUN, ABLA2O, ABAM O, ABLA2U, ABAM U, SALIX, STREP, AGAL, SETR, TIUN, STCO4, MO1, LUPA, FESTU, VIOLA, MILE

TSME-CHNO SET TSA, PLOTS 844, 845

ELEV 3500 (3400-3600), SLOPE 35-40, ASPECT: N-0, E-0, S-2, W-0

CANOPY 33, TBAR 17, WATER --, CONIF 93, DECID --, SHRUBS 6, HERBS --

CHNO U	46	100
TSME U	21	100
TSME O	11	100
ABAM O	8	50
CHNO O	5	100
PHEM	3	100
ABAM U	3	50
ALSI	2	50

***TOTAL 102

TRACE: GAOV, ACCI, VAAL, CLPY, LYCOP, ER1, VAPA, LYSI, TROV, WOODS, VIOR2, SAFE, BLSP, LYSE, GECA

ABAM/RHAL/depauperate SET TSA, PLOT 1088

ELEV 5600, SLOPE 22, ASPECT: N-0, E-0, S-0, W-1

CANOPY 84, TBAR --, WATER --, CONIF 80, DECID --, SHRUBS 42, HERBS 3

ABAM O	40	100
ABAM U	40	100
RHAL	20	100
PYSE	10	100
RULA	5	100
VAME	5	100
VASI	3	100
RUPE	2	100

***TOTAL 125

TRACE: SOSOC2

ACCI SET TSH, PLOT 3009

ELEV 2580, SLOPE 16, ASPECT: N-0, E-0, S-1, W-0

CANOPY 2, TBAR 2, WATER --, CONIF 1, DECID 9, SHRUBS 115, HERBS 3

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ACCI	99	100
COCA	8	100
POTR2U	5	100
POTR2O	4	100
RUPA	3	100
PAMY	2	100
ASCA3	2	100

***TOTAL 127

TRACE: PSME O, SAMBU, RUBUS, DISPO

SAFA-SAPL/CASCP2 SET WET, PLOTS 90, 94, 96, 98

ELEV 7158 (7020-7290), SLOPE 0-15, ASPECT: N-1, E-1, S-0, W-2

CANOPY --, TBAR 5, WATER --, CONIF 6, DECID --, SHRUBS 27, HERBS 64

CASC5	19	100
SALIX	11	100
VASC	10	50
CAATE	6	50
CAREX	6	50
PIEN U	4	100
ERPE	4	100
TRLA4	4	75
JUPA	4	75
PHAL	3	75
PIAL U	2	75
PODI	2	75
TRSP	2	75
ANLA	2	50

***TOTAL 97

TRACE: ACMI, VEWO, FRVI, CAPA, ARNIC, HB1, AGVA, TRWO, AGCA, DAIN, POAL, AGID, LALY U, PHEM, ARMO, POTEN, LUHI, ERPO2

SACO2/CABIB SET WET, PLOT 622

ELEV 6540, SLOPE 1, ASPECT: N-1, E-0, S-0, W-0

CANOPY --, TBAR 5, WATER 15, CONIF 2, DECID --, SHRUBS 69, HERBS 32

SACO2	50	100
CANI2	10	100
VADE	5	100
CALE2	5	100
PHEM	4	100
CAME	4	100
CARO2	4	100
LUPE	4	100
SALIX	3	100
SALIX	3	100
ERPE	3	100
VEVI	2	100

***TOTAL 103

TRACE: ABLA2U, LALY U, CAIL, POFL2, CAEL2, HIGR, KAMI, DEAT, POA, AGHU, PHAL, ELPA2, PEGR, SEPA2, HADI2, EQAR, PODI, JUME, ANLA, VECU, LIGUS, CAPAO, ANUM

SPDE/DOJE SET WET, PLOT 1460

ELEV 3850, SLOPE 2, ASPECT: N-0, E-1, S-0, W-0

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CANOPY 10, TBAR 1, WATER 10, CONIF 27, DECID --, SHRUBS 14, HERBS 106

CAREX	40	100
RHB	20	100
CHNO U	10	100
DOJE	10	100
CAAQ	10	100
TSME U	7	100
TSME O	5	100
VADE	5	100
SPDE	5	100
CABI	5	100
ASTER	5	100
ERPE	5	100
ABAM U	3	100
SCCE2	3	100
JUEN	3	100
CHNO O	2	100
PHEM	2	100
EQAR	2	100

***TOTAL 147

TRACE: SOSI, RSB, TOGL, HABEN, CAMU2, JUNCU

KAMI/CANI2 SET WET, PLOTS 111, 113, 155, 409, 502, 503, 587

ELEV 6277 (4820-6900), SLOPE 0-32, ASPECT: N-1, E-1, S-4, W-1

CANOPY 1, TBAR 20, WATER 0, CONIF 12, DECID --, SHRUBS 41, HERBS 43

PHEM	16	100
CAME	11	100
CANI2	9	100
VADE	7	43
ABLA2U	6	57
ERPE	3	86
ANLA	3	71
KAMI	2	100
POFL2	2	86
LUPE	2	71
LALY U	2	57
VACA	2	43
ELPA2	2	43
CAPY	2	29
PIEN U	2	29

***TOTAL 85

TRACE: PEOR5, GECA, CASP, PHGL, CALE2, TOGL, VASI, LEPY2, PAFI,
TSME U, FEVI, POTEN, HB1, TSME O

CABIR-CANI2-AGTH SET WET, PLOTS 870, 872, 873, 877

ELEV 4555 (4460-4760), SLOPE 0-9, ASPECT: N-1, E-2, S-0, W-1

CANOPY 5, TBAR 2, WATER 4, CONIF 23, DECID --, SHRUBS 54, HERBS 84

PHEM	25	100
CANI2	25	100
VADE	21	100
AGTH	14	100
CABI	11	100
TSME U	8	100

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LUPE	7	100
CAME	6	100
CHNO U	5	100
DEAT	5	100
POFL2	5	25
TSME O	4	100
ABAM U	3	100
ERPE	3	100
EQAR	3	75
CASI3	3	75
ABAM O	2	100
DOJE	2	100
HIMO	2	50

***TOTAL 165

TRACE: JUME, CASP, SASI2, LEPY2, SOSI, CHNO O, ABLA2U, LYSI, VAME, RHAL, SPMI2, TOGL, PAFI, SAAR4, EPILO, GAOV, ARLA

LEPY2/AGTH SET WET, PLOTS 1221, 1234

ELEV 5510 (5500-5520), SLOPE 25-40, ASPECT: N-1, E-0, S-1, W-0

CANOPY 10, TBAR 33, WATER 1, CONIF 47, DECID --, SHRUBS 46, HERBS 10

VADE	16	100
CHNO U	13	100
ABLA2U	13	100
RHAL	13	50
TSME U	10	100
PHEM	6	100
TSME O	3	100
ABAM U	3	100
ARNE	3	50
VAME	3	50
PIAL U	2	100
PECO2	2	100
ABLA2O	2	50
GAOV	2	50
LULA	2	50

***TOTAL 115

TRACE: ABAM O, CAME, LEPY2, AGTH, PIEN U, RULA, CANI2, LYSI, VIOR2, PSME O, PSME U, PIMO U, PEDA, JUCO4, PAMY, SEDE3, CALAM, SEDI, PHDI, ARAM, VASI, LUPE, KAMI, TRSP, DOJE, VEVI, HIGR, CAREX, ARLA, JUPA, HIERA, CRCR, POMU, MILE, SEST2, LUHY, SAIN, PEPR

SCCE2-EQAR SET WET, PLOTS 1467, 1631, 1637, 1638

ELEV 3865 (3810-3890), SLOPE 0-2, ASPECT: N-3, E-0, S-1, W-0

CANOPY 17, TBAR 3, WATER 6, CONIF 24, DECID --, SHRUBS 12, HERBS 106

SCCE2	15	100
CALA	13	25
CAAQ	11	50
CASP	11	50
EQAR	8	100
LUZUL	8	25
CABI	7	100
CHNO U	7	75
SPDE	5	100

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TSME O	5	75
CX1	5	25
RHB	4	75
CHNO O	4	50
CALE5	4	25
DOJE	3	100
TSME U	3	50
ABLA2O	3	50
DEAT	3	50
CAREX	3	25
FEOV	3	25
VADE	2	100
HABEN	2	100
KAMI	2	75
VAAL	2	75
PEDIC	2	75
ABAM U	2	50
CALU	2	50

***TOTAL 149

TRACE: PHEM, TOGL, SOSI, ASFO, CACA, ERSP, ERPE, JUME, CAMU2, ABLA2U, HB1

TRLA4-CABIB + PIEN/LEGL SET WET, PLOTS 30, 32

ELEV 6360, SLOPE 0, ASPECT: N-0, E-1, S-0, W-1

CANOPY 2, TBAR 5, WATER --, CONIF 16, DECID --, SHRUBS 11, HERBS 102

CASC5	23	100
ERPO2	15	100
CALE2	11	100
CANI2	7	100
PODI	5	100
ERPE	5	100
PIEN O	5	50
LEGL	4	100
HADI2	4	100
TRLA4	4	100
ASTER	4	100
JUNCU	4	50
SECY2	4	50
PIEN U	3	100
PHEM	3	100
PICO O	3	50
VASC	3	50
CO1	2	100
MITEL	2	100
ABLA2U	2	50
PIAL U	2	50
PHAL	2	50

***TOTAL 126

TRACE: SALIX, LULA, FRAGA, CO2, EQUIS, OXCA2, EPAN, VEVI, PICO U

CACA-ERPO2 SET WET, PLOTS 991, 1014

ELEV 4310 (3320-5300), SLOPE 0, ASPECT: N-2, E-0, S-0, W-0

CANOPY 2, TBAR 1, WATER 38, CONIF 17, DECID --, SHRUBS 12, HERBS 67

ERPO2	20	100
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EQHY	18	50
CACA	16	100
LEGL	8	50
ABLA2U	5	50
DAIN	5	50
TSME U	3	50
CARO2	2	50
PIEN O	2	50
PIEN U	2	50
SACO2	2	50
EQAR	2	50
ERPE	2	50

***TOTAL 101

TRACE: TSME O, PIAL O, PIAL U, ABAM U, RIHO, SALIX, SPBE, SALIX, VAME, AGTH, CAIL, PEGR, CASP, CALE5, SABA, JUBA, SOCA, KAMI, TOGL, CEAR, VEVI, GECA, SECY2, PHAL, LIGUS, POFL2, ARMO

CAUT SET WET, PLOTS 3002, 3003

ELEV 2610 (2600-2620), SLOPE 0, ASPECT: N-2, E-0, S-0, W-0

CANOPY --, TBAR --, WATER 5, CONIF 7, DECID --, SHRUBS 67, HERBS 57

CARO2	40	100
SALIX	38	100
SPDO	15	100
ALNUS	13	100
CALAM	7	100
RHB	5	100
LYAM	3	100
PICO O	2	100
PIEN O	2	100
COCA	2	100

***TOTAL 135

TRACE: PICO U, PIEN U, ERIGE, THPL O, THPL U, ABLA2U, ANAR2, EPAN

SPDO/CASAM SET WET, PLOTS 433, 434

ELEV 2883 (2875-2890), SLOPE 0, ASPECT: N-1, E-1, S-0, W-0

CANOPY --, TBAR 22, WATER --, CONIF --, DECID --, SHRUBS 5, HERBS 82

MEAR3	25	100
CASAM	18	100
CAMU2	10	50
CACA	6	100
SPDO	5	50
APAN	5	50
ASFO	5	50
PHAR	5	50
EQAR	3	100
CATW	3	50
RANUN	2	50

***TOTAL 89

TRACE: ELPA, VISA, SALIX, SALIX, ROSA, SPIRA, COST, SALIX, LOIN

Appendix 7. Indicator species alphacodes

Following is a list of important or indicator plant species used in the key to the classification subsets (appendix 2), as descriptors for the indicator species (appendix 3), in the concordance with other plant associations (appendix 4), or in the communities described in this study (appendix 5). The list is alphabetical by alphacode followed by the scientific name used in Hitchcock and Cronquist (1973). Plants with three names refer to varietal or subspecific rankings.

Additional alphacodes for the relevés and composite samples in appendix 6 are referenced in Garrison and Skovlin (1976), with minor modifications from Almack et al. (1993).

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ABAM	<i>Abies amabilis</i>
ABGR	<i>Abies grandis</i>
ABLA2	<i>Abies lasiocarpa</i>
ACCI	<i>Acer circinatum</i>
ACCO	<i>Aconitum columbianum</i>
ACGL	<i>Acer glabrum</i>
ACMA	<i>Acer macrophyllum</i>
ACMI	<i>Achillea millefolium</i>
ACRU	<i>Actaea rubra</i>
ACTR	<i>Achlys triphylla</i>
AGEL2	<i>Agoseris elata</i>
AGGL	<i>Agoseris glauca</i>
AGGLD	<i>Agoseris glauca dasycephala</i>
AGIN	<i>Agropyron inerme</i>
AGROP	<i>Agropyron</i> spp.
AGSP	<i>Agropyron spicatum</i>
AGSPI	<i>Agropyron spicatum inerme</i>
AGTH	<i>Agrostis thurberiana</i>
ALIN	<i>Alnus incana</i>
ALMA	<i>Allium macrum</i>
ALNUS	<i>Alnus</i> spp.
ALRH	<i>Alnus rhombifolia</i>
ALRU	<i>Alnus rubra</i>
ALSI	<i>Alnus sinuata</i>
AMAL	<i>Amelanchier alnifolia</i>
ANAR2	<i>Angelica arguta</i>
ANGE	<i>Angelica genuflexa</i>
ANLA	<i>Antennaria lanata</i>
ANMA	<i>Anaphalis margaritacea</i>
ARRI	<i>Artemisia rigida</i>
ARCA2	<i>Arenaria capillaris</i>
ARCO	<i>Arnica cordifolia</i>
ARLA3	<i>Arctium lappa</i>
ARLU	<i>Artemisia ludoviciana</i>
ARMA3	<i>Arenaria macrophylla</i>
ARNE	<i>Arctostaphylos nevadensis</i>
AROB	<i>Arenaria obtusiloba</i>
ARPA3	<i>Arnica parryi</i>
ARRI	<i>Artemisia rigida</i>
ARSY	<i>Aruncus sylvester</i>
ARTEM	<i>Artemisia</i> spp.
ARTR	<i>Artemisia tridentata</i>
ARTR2	<i>Artemisia tripartita</i>
ARTR3	<i>Artemisia trifurcata</i>
ARTRV	<i>Artemisia tridentata vaseyana</i>
ARUV	<i>Arctostaphylos uva-ursi</i>
ASCA3	<i>Asarum caudatum</i>
ASEN	<i>Aster engelmannii</i>
ASFO	<i>Aster foliaceus</i>
ASLE3	<i>Astragalus leibergii</i>
ATDI	<i>Athyrium distentifolium</i>
ATFI	<i>Athyrium filix-femina</i>
BAHO	<i>Balsamorhiza hookeri</i>
BASA	<i>Balsamorhiza sagittata</i>

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BASE	<i>Balsamorhiza serrata</i>
BEAQ	<i>Berberis aquifolium</i>
BEGL	<i>Betula glandulosa</i>
BENE	<i>Berberis nervosa</i>
BERE	<i>Berberis repens</i>
BEOC	<i>Betula occidentalis</i>
BLSP	<i>Blechnum spicant</i>
BOMU	<i>Botrychium multifidum</i>
BRCA	<i>Bromus carinatus</i>
BROMU	<i>Bromus</i> spp.
BRTE	<i>Bromus tectorum</i>
BRVU	<i>Bromus vulgaris</i>
CAAQ	<i>Carex aquatilis</i>
CAATE	<i>Carex atrata erecta</i>
CABI	<i>Caltha biflora</i>
CABIB	<i>Caltha biflora biflora</i>
CABIR	<i>Caltha biflora rotundifolia</i>
CABR	<i>Carex breweri</i>
CACA	<i>Calamagrostis canadensis</i>
CACA3	<i>Carex capitata</i>
CACO	<i>Carex concinnoides</i>
CAEL2	<i>Castilleja elmeri</i>
CAGE	<i>Carex geyeri</i>
CALAM	<i>Calamagrostis</i> spp.
CALE2	<i>Caltha leptosepala</i>
CAME	<i>Cassiope mertensiana</i>
CAMU2	<i>Carex muricata</i>
CANA2	<i>Carex nardina</i>
CANI2	<i>Carex nigricans</i>
CAOB	<i>Carex obnupta</i>
CAPH	<i>Carex phaeocephala</i>
CAQU	<i>Camassia quamash</i>
CARO2	<i>Carex rostrata</i>
CARU	<i>Calamagrostis rubescens</i>
CASAM	<i>Carex saxatilis major</i>
CASA2	<i>Carex saxatilis</i>
CASCP2	<i>Carex scopulorum prionophylla</i>
CASC3	<i>Carex scirpoidea</i>
CASC5	<i>Carex scopulorum</i>
CASP	<i>Carex spectabilis</i>
CASU4	<i>Carex subfusca</i>
CATH	<i>Castilleja thompsonii</i>
CAUT	<i>Carex utriculata</i>
CEDI	<i>Centaurea diffusa</i>
CEVE	<i>Ceanothus velutinus</i>
CHNO	<i>Chamaecyparis nootkatensis</i>
CHUM	<i>Chimaphila umbellata</i>
CIED	<i>Cirsium edule</i>
CLPY	<i>Cladothamnus pyroliflorus</i> (<i>C. pyrolaeiflorus</i>)
CLUN	<i>Clintonia uniflora</i>
COCA	<i>Cornus canadensis</i>
COST	<i>Cornus stolonifera</i>
CRDO	<i>Crataegus douglasii</i>

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DAGL	<i>Dactylis glomerata</i>
DAIN	<i>Danthonia intermedia</i>
DEAT	<i>Deschampsia atropurpurea</i>
DECA	<i>Deschampsia caespitosa</i> (<i>D. caespitosa</i>)
DENU3	<i>Delphinium nuttallianum</i>
DIFO	<i>Dicentra formosa</i>
DIHO	<i>Disporum hookeri</i>
DIST	<i>Distichlis stricta</i>
DODE	<i>Dodecatheon dentatum</i>
DOJE	<i>Dodecatheon jeffreyi</i>
DOPU2	<i>Dodecatheon pulchellum</i>
DROC	<i>Dryas octopetala</i>
ELCI	<i>Elymus cinereus</i>
ELGL	<i>Elymus glaucus</i>
EMNI	<i>Empetrum nigrum</i>
EPAN	<i>Epilobium angustifolium</i>
EPGL2	<i>Epilobium glandulosum</i>
EPWA	<i>Epilobium watsonii</i>
EQAR	<i>Equisetum arvense</i>
EQHY	<i>Equisetum hyemale</i>
EQUIS	<i>Equisetum</i> spp.
ERAU	<i>Erigeron aureus</i>
ERCO	<i>Erigeron compositus</i>
ERCO5	<i>Eriogonum compositum</i>
ERDO	<i>Eriogonum douglasii</i>
ERGR	<i>Erythronium grandiflorum</i>
ERHE	<i>Eriogonum heracleoides</i>
ERHE2	<i>Erythronium hendersonii</i>
ERPE	<i>Erigeron peregrinus</i>
ERPO2	<i>Eriophorum polystachion</i>
ERPY	<i>Eriogonum pyrolaefolium</i>
ERSP3	<i>Eriogonum sphaerocephalum</i>
ERTH	<i>Eriogonum thymoides</i>
ERUM	<i>Eriogonum umbellatum</i>
FEBR	<i>Festuca bromoides</i>
FEID	<i>Festuca idahoensis</i>
FEOV	<i>Festuca ovina</i>
FESC	<i>Festuca scabrella</i>
FESTU	<i>Festuca</i> spp.
FEVI	<i>Festuca viridula</i>
GAHU	<i>Gaultheria humifusa</i>
GAOV	<i>Gaultheria ovatifolia</i>
GASH	<i>Gaultheria shallon</i>
GATR	<i>Galium triflorum</i>
GECA	<i>Gentiana calycosa</i>
GLEL	<i>Glyceria elata</i>
GYDR	<i>Gymnocarpium dryopteris</i>
HADI	<i>Hackelia diffusa</i>
HADI2	<i>Habenaria dilatata</i> (<i>Platanthera dilatata</i>)
HAMI	<i>Hackelia micrantha</i>
HARE	<i>Haplopappus resinosus</i>
HAST2	<i>Haplopappus stenophyllus</i>

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HELA	<i>Heracleum lanatum</i>
HEUN	<i>Helianthella uniflora</i>
HIGR	<i>Hieracium gracile</i>
HIMO	<i>Hippuris montana</i>
HODI	<i>Holodiscus discolor</i>
HYFE	<i>Hydrophyllum fendleri</i>
JUCO4	<i>Juniperus communis</i>
JUME	<i>Juncus mertensianus</i>
JUPA	<i>Juncus parryi</i>
KAMI	<i>Kalmia microphylla</i>
LALY	<i>Larix lyalli</i>
LAOC	<i>Larix occidentalis</i>
LAPA2	<i>Lathyrus pauciflorus</i>
LEGL	<i>Ledum glandulosum</i>
LEPY2	<i>Leptarrhena pyrolifolia</i>
LI1	Liliaceae family
LIBO2	<i>Linnaea borealis</i>
LICA2	<i>Ligusticum canbyi</i>
LICO4	<i>Lilium columbianum</i>
LIRU	<i>Lithospermum ruderales</i>
LOAM	<i>Lomatium ambiguum</i>
LOBR	<i>Lomatium brandegei</i>
LODI2	<i>Lomatium dissectum</i>
LOGR	<i>Lomatium grayi</i>
LOIN	<i>Lonicera involucrata</i>
LOLE	<i>Lomatium leptocarpum</i>
LOMAT	<i>Lomatium</i> spp.
LONU	<i>Lomatium nudicaule</i>
LOTR	<i>Lomatium triternatum</i>
LUHI	<i>Luzula hitchcockii</i>
LULA	<i>Lupinus latifolius</i>
LULA2	<i>Lupinus laxiflorus</i>
LULE	<i>Lupinus leucophyllus</i>
LULEA	<i>Lupinus lepidus aridus</i>
LULEL	<i>Lupinus lepidus lepidus</i>
LULE2	<i>Lupinus lepidus</i>
LUPE	<i>Luetkea pectinata</i>
LUPI	<i>Luzula piperi</i>
LUPIN	<i>Lupinus</i> spp.
LUPO	<i>Lupinus polyphyllus</i>
LYAM	<i>Lysichitum americanum</i>
LYSI	<i>Lycopodium sitchense</i>
MADI2	<i>Maianthemum dilatatum</i>
MEAR3	<i>Mentha arvensis</i>
MEBU	<i>Melica bulbosa</i>
MEFE	<i>Menziesia ferruginea</i>
MELO	<i>Mertensia longiflora</i>
MEPA	<i>Mertensia paniculata</i>
MESA	<i>Medicago sativa</i>
MIGU	<i>Mimulus guttatus</i>
MILE	<i>Mimulus lewisii</i>
MOCO	<i>Montia cordifolia</i>
MOOD	<i>Monardella odoratissima</i>
OPHO	<i>Oplopanax horridum</i>

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ORCO2	<i>Orobanche corymbosa</i>
OREX	<i>Oryzopsis exigua</i>
OSOC	<i>Osmorhiza occidentalis</i>
PAMY	<i>Pachistima myrsinites</i>
PECO2	<i>Pedicularis contorta</i>
PEFR3	<i>Penstemon fruticosus</i>
PEGA	<i>Penstemon gairdneri</i>
PEGR	<i>Pedicularis groenlandica</i>
PEOR5	<i>Pedicularis ornithorhyncha</i>
PERA	<i>Pedicularis racemosa</i>
PESI	<i>Pediocactus simpsonii</i>
PHAR	<i>Phalaris arundinacea</i>
PHDI	<i>Phlox diffusa</i>
PHEM	<i>Phyllodoce empetriformis</i>
PHGL	<i>Phyllodoce glanduliflora</i>
PHLE2	<i>Philadelphus lewisii</i>
PHLI	<i>Phacelia linearis</i>
PHPR	<i>Phleum pratense</i>
PHSP	<i>Phlox speciosa</i>
PIAL	<i>Pinus albicaulis</i>
PICO	<i>Pinus contorta</i>
PIEN	<i>Picea engelmannii</i>
PIMO	<i>Pinus monticola</i>
PINUS	<i>Pinus</i> spp.
PIPO	<i>Pinus ponderosa</i>
PLPA	<i>Plantago patagonica</i>
POA	<i>Poa</i> spp.
POBI	<i>Polygonum bistortoides</i>
POBU	<i>Poa bulbosa</i>
PODI	<i>Potentilla diversifolia</i>
POFL2	<i>Potentilla flabellifolia</i>
POGR5	<i>Poa grayana</i> (<i>P. arctica grayana</i>)
POMU	<i>Polystichum munitum</i>
PONI	<i>Potentilla nivea</i>
POSE	<i>Poa secunda</i>
POSES1	<i>Poa secunda</i> ssp. <i>secunda</i>
POTR	<i>Populus tremuloides</i>
POTR2	<i>Populus trichocarpa</i>
POVI	<i>Polemonium viscosum</i>
POVI2	<i>Polygonum viviparum</i>
PREM	<i>Prunus emarginata</i>
PRVI	<i>Prunus virginiana</i>
PSME	<i>Pseudotsuga menziesii</i>
PTAQ	<i>Pteridium aquilinum</i>
PUTR	<i>Purshia tridentata</i>
PYMA	<i>Pyrus malus</i>
PYSE	<i>Pyrola secunda</i>
RHAL	<i>Rhododendron albiflorum</i>
RHGL	<i>Rhus glabra</i>
RHPU	<i>Rhamnus purshiana</i>
RHRA	<i>Rhus radicans</i>
RIAU	<i>Ribes aureum</i>
RICE	<i>Ribes cereum</i>
RIIN	<i>Ribes inerme</i>

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RILA	<i>Ribes lacustre</i>
RISA	<i>Ribes sanguineum</i>
ROGY	<i>Rosa gymnocarpa</i>
RONA	<i>Rorippa nasturtium-aquaticum</i>
RONU	<i>Rosa nutkana</i>
ROSA	<i>Rosa</i> spp.
ROWO	<i>Rosa woodsii</i>
RULA	<i>Rubus lasiococcus</i>
RULE	<i>Rubus leucodermis</i>
RUPA	<i>Rubus parviflorus</i>
RUPE	<i>Rubus pedatus</i>
RUSP	<i>Rubus spectabilis</i>
SAAM2	<i>Salix amygdaloides</i>
SAAR4	<i>Saxifraga arguta</i>
SABA	<i>Salix barclayi</i>
SACO2	<i>Salix commutata</i>
SADO2	<i>Salvia dorrii</i>
SAEX	<i>Salix exigua</i>
SAFA	<i>Salix farriae</i>
SALIX	<i>Salix</i> spp.
SAMO2	<i>Salix monticola</i>
SANI	<i>Salix nivalis</i>
SAOC3	<i>Saxifraga occidentalis</i>
SAPH	<i>Salix phylicifolia</i>
SAPL	<i>Salix planifolia</i>
SARA	<i>Sambucus racemosa</i>
SASC	<i>Salix scouleriana</i>
SASI2	<i>Salix sitchensis</i>
SATO	<i>Saxifraga tolmiei</i>
SCAM	<i>Scirpus americanus</i>
SCCE2	<i>Scirpus cespitosus</i>
SCLI	<i>Schoenocrambe linifolia</i>
SCVA	<i>Scirpus validus</i>
SECE	<i>Secale cereale</i>
SECY2	<i>Senecio cymbalarioides</i>
SEIN	<i>Senecio integerrimus</i>
SELA2	<i>Sedum lanceolatum</i>
SETR	<i>Senecio triangularis</i>
SHCA	<i>Shepherdia canadensis</i>
SIAC	<i>Silene acaulis</i>
SIAL	<i>Sisymbrium altissimum</i>
SIPA	<i>Silene parryii</i>
SMRA	<i>Smilacina racemosa</i>
SMST	<i>Smilacina stellata</i>
SOCA	<i>Solidago canadensis</i>
SOSC2	<i>Sorbus scopulina</i>
SOSI	<i>Sorbus sitchensis</i>
SPBE	<i>Spiraea betulifolia</i>
SPCR	<i>Sporobolus cryptandrus</i>
SPDE	<i>Spiraea densiflora</i>
SPDO	<i>Spiraea douglasii</i>
SPIRA	<i>Spiraea</i> spp.
SPUM	<i>Spraguea umbellata</i>
STAM	<i>Streptopus amplexifolius</i>

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STCO2	<i>Stipa comata</i>
STIPA	<i>Stipa</i> spp.
STOC	<i>Stipa occidentalis</i>
STRO	<i>Streptopus roseus</i>
SYAL	<i>Symphoricarpos albus</i>
SYOR	<i>Symphoricarpos oreophilus</i>
TACE	<i>Taraxacum ceratophorum</i>
THOC	<i>Thalictrum occidentale</i>
THPL	<i>Thuja plicata</i>
TITR	<i>Tiarella trifoliata</i>
TIUN	<i>Tiarella unifoliata</i>
TOGL	<i>Tofieldia glutinosa</i>
TRAE	<i>Triticum aestivum</i>
TRCA3	<i>Trautvetteria caroliniensis</i>
TRLA2	<i>Trientalis latifolia</i>
TRLA4	<i>Trollius laxus</i>
TRLO	<i>Trifolium longipes</i>
TRMA	<i>Trifolium macrocephalum</i>
TRSP	<i>Trisetum spicatum</i>
TSHE	<i>Tsuga heterophylla</i>
TSME	<i>Tsuga mertensiana</i>
URDI	<i>Urtica dioica</i>
VAAL	<i>Vaccinium alaskaense</i>
VACA	<i>Vaccinium caespitosum</i>
VACCI	<i>Vaccinium</i> spp.
VADE	<i>Vaccinium deliciosum</i>
VAME	<i>Vaccinium membranaceum</i>
VAMY	<i>Vaccinium myrtillus</i>
VAOV	<i>Vaccinium ovalifolium</i>
VASC	<i>Vaccinium scoparium</i>
VASI	<i>Valeriana sitchensis</i>
VECU	<i>Veronica cusickii</i>
VETH	<i>Verbascum thapsus</i>
VEVI	<i>Veratrum viride</i>
VIGL	<i>Viola glabella</i>
XETE	<i>Xerophyllum tenax</i>

