Field Guide to Riparian Plant Communities in Northwestern Oregon

United States Department of Agriculture

Forest Service

Pacific Northwest Region

January 2005

Field Guide to Riparian Plant Communities in Northwestern Oregon

Condensed from

Riparian Plant Communities of Northwest Oregon:
Streamside Plant Communities

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United States Department of Agriculture
Forest Service
Pacific Northwest Region

Technical Paper
R6-NR-ECOL-TP-01-05

January, 2005

Acknowledgements

USDA Forest Service, the Oregon Watershed Enhancement Board, the Environmental Protection Agency, and USDI Bureau of Land Management supported production of the two parent volumes.

This interagency project was the result of collaboration among members of the Northwest Oregon Ecology Group and cooperators from The Nature Conservancy/Oregon Natural Heritage Program (now Oregon Natural Heritage Information Center). Mt. Hood, Siuslaw, and Willamette National Forests and Eugene and Salem BLM Districts strongly supported the effort and encouraged synthesis of existing, independently collected data into a unified product for northwest Oregon.

Cover art: *Thuja plicata*, from the United States Department of Agriculture Forest Service Collection, Hunt Institute for Botanical Documentation, Carnegie Mellon University, Pittsburgh, PA.

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APPENDICES

INTRODUCTION TO THE FIELD GUIDE TO RIPARIAN PLANT COMMUNITIES IN NORTHWESTERN OREGON

Purpose

This field guide combines classifications of common streamside plant communities and native freshwater wetland communities in Northwest Oregon. It is a condensed version of two separate works which are both available on the CD that accompanies this book. The information is also available for reference or to download as a zipfile from the Interagency Clearinghouse of Ecological Information, Pacific NW Region website: http://www.reo.gov/ecoshare/Publications/Documents/FieldGuides/NWOriparian/

In both the CD and downloadable versions, the full guide is broken down into smaller file sizes for ease of downloading and printing. The files were created in Adobe Acrobat 5.0. Links within the document will lead you to appropriate sections. For example, opening the “Title Page, Acknowledgements, Table of Contents” file allows the reader to browse the contents of the entire guide. When the open-handed cursor turns into a pointing hand, there is a link available. Throughout the entire Table of Contents the pointing hand should be visible. Clicking on the link to which the hand is pointing will open the appropriate file and lead the reader to the selected section. The reader can return to files previously viewed by either clicking on the “Back” button in the browser or by finding green boxes within the document that direct the reader to other sections of the Guide.

The purpose of the field guide is to allow an observer to identify communities in the field from key indicator species and environmental factors. A more complete discussion is available from the larger guides.

This field guide is organized in two major sections: streamside communities and freshwater wetland communities. Each section has its own introduction, keys, and community descriptions.

Many sites along streams or rivers include patches of wetlands where drainage is very poor. The most distinctively ‘wetland’ wetland-communities are identified and described only in the wetlands section. Wetland communities which commonly occur on floodplains are included in the streamside keys, with leads to the wetland association name and page number in the wetland section.

The appendix provides a list of species occurring frequently in the riparian plant communities. The list is sorted first by scientific name, and then by common names. Wetland Indicator Status is included (US Army

Corps of Engineers 1987). Names of non-native species in Appendix I, Species List, are italicized.

The full guides offer more information on the communities contained in the field guide. Please refer to these full guides which include:

In Riparian Plant Communities of Northwest Oregon: Streamside Plant Communities:

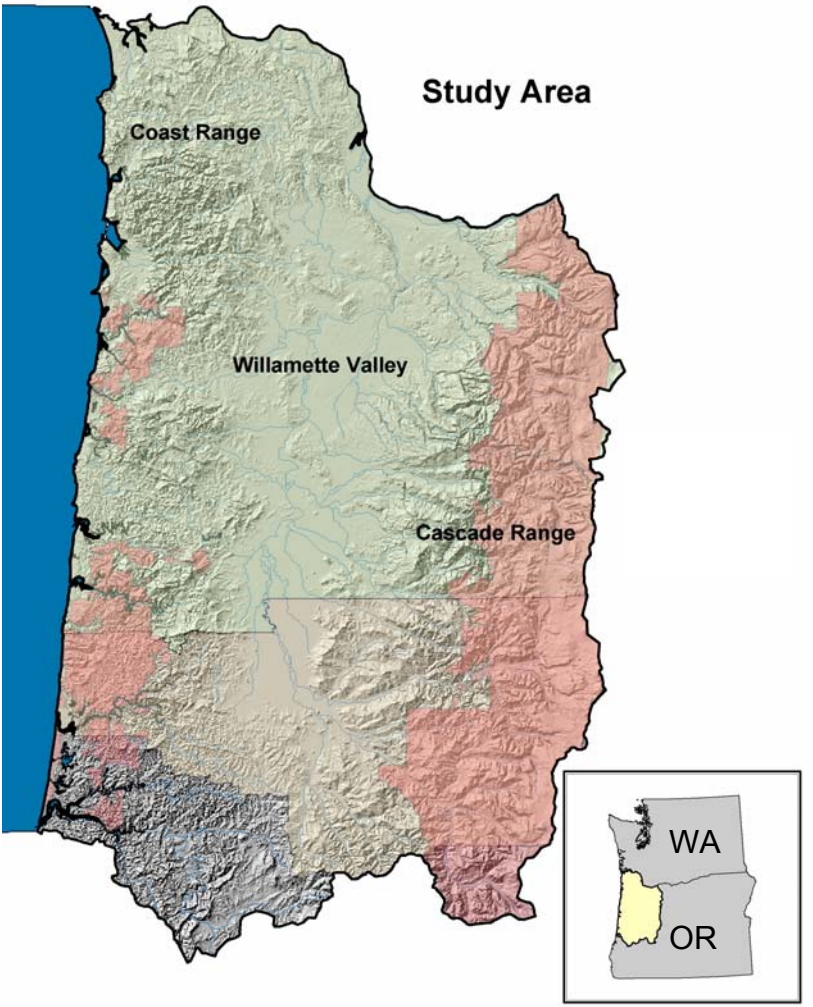
- More detailed description of study methods, data sources, analyses.
- Ecosystem processes influencing streamside communities.
- Comparison of Coast and Cascades: major patterns by geomorphic group
- Non-native plant species in riparian zones.
- Plant community distribution shown in valley cross-sections
- Community descriptions, including color photographs, soil profile sketches, and wetland rating.
- More inclusive cover/constancy tables for each community (Appendix in an Excel table).

In Native Freshwater Plant Associations of Northwestern Oregon:

- More detailed description of study methods, data sources, analyses
- National Vegetation Classification system units, Nature Serve ecological system name, and global and state rank.
- More detailed information on environment and ecology.
- Global distribution of the plant association.
- List of other studies related to the plant community.
- More complete cover/constancy tables for each community.

The two sections are organized differently. The streamside section is divided first into three geographic areas, then by geomorphic groups. The wetlands section divides communities into forest and woodland, shrubland, herbaceous, and nonvascular groupings, and includes information on geographic distribution in the descriptions of each type.

The streamside study area includes only sites west of the Cascades Crest. Note that the wetlands section includes a small section of the east slope of the Cascades and along the lower Columbia River.


Study Area
Coast Range
Willamette Valley
Cascade Range
WA
OR

PRIMARY KEY TO FIELD GUIDE TO RIPARIAN PLANT COMMUNITIES IN NORTHWESTERN OREGON

This key, based on site characteristics and vegetation, leads to the major keys for both sections in the guide.

1a. In or bordering perennial or seasonal pools, ponds, and lakes ..... **Wetland keys**
1b. Habitat otherwise 2

2a. Within freshwater intertidal or subtidal zone along coastal rivers, or hydrated by these zones ..... **Wetland keys**
2b. Above hydrating influence of freshwater intertidal or subtidal zones 3

3a. In stream channels, along edges of active streams or rivers, or on steep or rocky stream banks, sometimes irrigated by seepage or waterfall spray 4
3b. Habitat otherwise 7

4a. Aquatic beds submerged or floating in perennial stream channels or exposed in intermittent channels ..... **Wetland keys**
4b. Vegetation not aquatic beds 5

5a. *Artemisia lindleyana* dominant or codominant ..... **Wetland keys**
5b. *Artemisia lindleyana* absent 6

6a. *Euthamia occidentalis* dominant or codominant ..... **Wetland keys**
6b. *Euthamia occidentalis* absent ..... **Streamside keys**

7a. Depressions or seepage areas adjacent to montane *Phyllodoce* heath near timberline ..... **Wetland keys**
7b. Not associated with montane *Phyllodoce* heath 8

8a. Perennially wet organic or muck soils ..... **Wetland keys**
8b. Soils otherwise 9

9a. *Alnus incana, Alnus viridis* ssp. *sinuata, Cornus sericea, Spiraea douglasii,* or *Salix* dominant or codominant, on deep silty loam soils ..... **Wetland keys**
9b. Dominant species otherwise, or the same species on shallow or rocky soils 10

10a. Seasonally-flooded *Salix* or *Populus tremuloides* in depressions over bedrock ..... **Wetland keys**
10b. Vegetation and substrate otherwise 11

11a. *Picea sitchensis* and *Pinus contorta* var. *contorta* swamps ..... **Wetland keys**
11b. Vegetation otherwise 12

12a. Seasonally to perennially wet herbaceous marsh, prairie, or montane meadow, sometimes in depressions over bedrock, or associated with seepage or intermittent streams in prairie ..... **Wetland keys**
12b. Vegetation and habitat otherwise 13

13a. Floodplains, stream terraces, or swales with shallow soils over cobbles, colluvium, or bedrock, or no soil ..... **Streamside keys**
13b. Floodplains, stream terraces, or swales with deep silt loam soils .. 14

14a. Primary species in shrub or herb layers *Spiraea douglasii, Symphoricarpos albus, Athyrium filix-femina, Carex aquatilis* var. *aquatilis, Carex deweyana* ssp. *leptopoda, Carex obnupta, Lysichiton americanus*, or *Oenanthe sarmentosa,* often with seasonally-flooded pools 15
14b. Shrub or herb layers otherwise, seasonally-flooded pools usually lacking ..... **Streamside keys**

15a. *Oplopanax horridus, Ribes bracteosum, Rubus spectabilis,* or *Vaccinium ovalifolium* codominant or conspicuous, or *Carex obnupta* absent or inconspicuous ..... **Streamside keys**
15b. *Oplopanax horridus, Ribes bracteosum, Rubus spectabilis,* or *Vaccinium ovalifolium* absent or inconspicuous, or *Carex obnupta* codominant or conspicuous..... **Wetland keys**

TABLE OF CONTENTS FOR STREAMSIDE PLANT COMMUNITIES OF NORTHWEST OREGON

Introduction to the Streamside Plant Communities

Purpose

The classification is mainly floristic, that is, it relies on plant species composition and abundance to sort samples into groups. The analysis then explores what conditions the samples have in common. The major descriptors for these conditions are broad bioregional area, elevation, geomorphic surface, soil texture, soil depth, and substrate type.

Scope/study area

The streamside section is divided into the three major regions in Northwest Oregon. For the Westside Cascades and Coast Range, the community descriptions are organized along a geomorphic gradient: stream level, floodplain, terrace, to valley wall. The Willamette Valley section is not divided by geomorphic surfaces.

Sites were selected to represent relatively unmanaged reaches, though clearly overall watershed condition affected channel conditions and disturbance events. Sites with adjacent clearcuts or in stream buffers were not sampled.

Plots were excluded where communities were dominated by non-native species. It is clear that the samples from the Valley represent the rare exceptional remnants, and that the majority of similar geomorphic settings there support more altered, invaded communities.

Methods

Data from several different though similar protocols have been integrated for this classification. Of the 680 plots assigned to streamside plant communities, 441 were in the Cascades, 146 in the Coast, and 93 in the Willamette Valley. Information on some variables is incomplete. This is particularly true for soil data.

The sampling protocols consisted of locating a cluster of plots at a site or else along a transect across a creek. Each plot was chosen to represent a different community/geomorphic surface.

Plot methods

Variable plot sizes were used to fit geomorphic and community boundaries. For USFS and BLM plots, data included location, environmental factors (elevation, aspect, slope, etc.), geomorphic surface, substrate, and vegetation composition and abundance. Tree sizes and ages were collected for a sub-sample of trees rooted in the plot in some data sets.

Data analysis

Two-way indicator-species analysis (TWINSPAN) (Hill 1979) was the primary method in classifying the communities. Because the environmental variables were so inconsistent among the datasets, environmental factors were evaluated qualitatively in refining communities and interpreting relationships between the plant communities and physical settings.

Some species were excluded from the analysis: the epiphyte *Polypodium glychirrizae* (licorice fern), and plants identified in the field to group only (eg willow, grass, carex, composite, etc.). Also, a species was dropped from a plot if it was noted as occurring in that plot only on stumps or logs. Some datasets had limited information on whether tree cover was from trees rooted in the community or simply overhanging it. Where plot information showed that recorded tree cover for a plot was most likely coming from outside the community, the species was dropped from that plot.

Some communities were fairly rare in the sample because they aren't common under undisturbed canopies. Willow types are under represented in the streamside section for this reason, and also because they were sometimes identified only to genus when they were found on plots. However, several more willow types are described in the wetland section.

Community descriptions

Each community description contains:

- table of the most common and abundant species
- plot elevation ranges
- description of the geomorphic environment and soils
- short narrative on plant community
- description of similar types if applicable.

Each community description is titled with scientific name, common name, and PLANTS code from the USDA National Resource Conservation Service PLANTS database (USDA-NRCS 1999). Common names are from local references, especially from Pojar and MacKinnon (1994). Scientific names follow taxonomy consistent with the Oregon Flora Project unofficial 2003 working list, though taxonomy for that project will be finalized with publication of the *Flora of Oregon* (Dr. Scott Sundberg, personal communication, November 18, 2002). For forested communities where the overstory may be either or both of two species, the two species are listed in parentheses. For example (*Alnus rubra-Acer macrophyllum*) indicates that *Alnus rubra* and/or *Acer macrophyllum* are found in the community. Sample size and plot origin are noted.

Note that the larger version of the streamside section uses common names in most descriptions. The condensed field guide relies on scientific names, in part to be consistent between the streamside and wetland sections, but also because the scientific names are less ambiguous.

Each community description features a table summarizing the most common species present. The community tables are sorted by layer: overstory trees (>12' tall), tree seedlings (<12 feet tall), shrubs, and herbs. Within each layer, species are sorted by constancy (% of plots within the community which had the species), and then by abundance (typical cover--average cover for the species on those plots where the species occurred). In the Willamette Valley section, trees of all sizes are treated as a single layer. Note that names of exotic species included in the community tables are italicized.

Geomorphic surfaces

Several geomorphic surface names are used to describe major physical settings. Note that floristics and soils were more closely related than floristics and surface. Since the soil and substrate are directly related to the geomorphic surfaces and their typical disturbances, the surface

GEOMORPHIC SURFACE	**CHARACTERISTICS**
Sand/gravel bars	Deposits of sands or gravels, often over coarser materials—generally within normal high water line
Cobble bar	Cobble surface generally within or adjacent to stream, on island or bank—under water during normal high flow; generally with shallow sandy soils
Boulder bar	Boulder dominated deposit—at least partially flooded annually; generally with shallow sandy soils, though some old glacial Cascades sites are exceptions
Active/annual floodplain	Flattish surface at or near water level even at low flow—under water during normal high flow
Floodplain	Flat to gently sloping surface subject to fairly frequent floods—soils generally enriched with fines; generally shallow water table
Lower terrace	Flat to gently sloping surface subject to infrequent floods-alluvial or colluvial origin; soils variable
Upper terrace	Elevated flat to gently sloping surface subject to catastrophic flooding only; often present at tributary junctions; generally deep well-drained soils
Steep bank/cutbank	Over-steepened slope with lower margin near active fluvial zone; sometimes slide scars; often unstable;
Valley wall	Generally steep slopes from valley floor to hillside slope break (inner gorge wall)
Toeslope	Gentle to steep slope at base of hillside, often well-watered
Overflow channel/old channel	Side channels active during high flow; often with obvious sub-surface flow

proves to be very important in understanding where and how the communities develop.

Substrate

Silt, sand, gravel, cobble, boulder, and bedrock are common terms in description of soil or substrate. Silts are fine texture, high in moisture and nutrient holding capacity. Sands are gritty, dry, and poor in fertility. Gravels, cobbles, and boulders make up bars and banks. High proportions of such coarse sediments generally indicate excessive drainage and poor moisture conditions during the dry season. Sites with bedrock near the surface often have very poor drainage.

Substrate size classes

Sand	<2 mm	Grainy
Fine gravel	2-24 mm	Pea to marble size
Coarse gravel	24-64 mm	Marble to tennis ball
Cobble	64-256 mm	Tennis ball to basketball
Boulder	256-1096 mm	Basketball and larger
Bedrock	> 1096 mm	Large solid surface

* Most substrate descriptions in this section combine fine and coarse gravel.

About keys

Keys are at the beginning of each section (Cascades, Coast, and Willamette Valley).

Keys are guidelines, not rules. Small constellations of species usually, but not always, occur in combinations and amounts that lend themselves to keys. Invariably, there are exceptions.

Use the key, then look at the description for the community. Does it have the right combination of major species? Does the environment (elevation, geomorphic surface, soil description) seem to fit? Ignore the trees for a moment. Does it have indicators such as *Petasites frigidus*, *Adiatum pedatum, Lysichiton americanum*? Does it have shrubs or not? Does it have *Rubus spectabilis* or *Ribes bracteosum*? Both? Which saxifrages (*Tolmeia menziesii, Tiarella trifoliata, Boykinia occidentalis, Mitella ovalis*)? More *Athyrium filix-femina* or more *Polystichum munitum*? What about *Oxalis*? Follow the major leads to get to some reasonable choices.

If the plant-oriented key doesn't seem to lead to the right place, use the geomorphic surface as a guide. Look through the community descriptions that fit the physical setting for the community. Is it within the normal high water line (within channel)? On cobble bars or channel margins? On terraces or steep banks?

There can be groups of species which co-occur as indicators. The key may have a lead that says, " if the sum of Species A, B, and C is greater than species X…". In the field, you may have one or two of A, B, and C, and they may be about the same as species X. This sort of variability can be expected. If the rest of the community description fits your site, then this choice is reasonable.

The tree component seems particularly variable. Where tree names are included in the community name, it shows that most plots had the tree species. However, they also may be absent. The community name should be interpreted as indicating that the community has the potential to include mature trees. Note that with rather small sample sizes, not all of the trees that might occur were recorded. For example, it is very likely that some communities labeled as *Alnus rubra* types or *Acer macrophyllum* types could easily support the other species. Where communities are named as hardwood types, conifers can occur, but are not consistent. If your site has conifers as well as hardwoods, it can still be included in the hardwood type.

Northwest Oregon Westside Cascades

Cascades key

A. Herbaceous community, *Petasites frigidus* not dominant herb; rocky substrate within channel

1. *Montia parvifolia* dominant; small patches on bedrock or boulders ..... **Montia parvifolia** p. 26

2. *Corydalis aquae-gelidae* dominant; narrow gravel deposits beside cold water channels ..... **Corydalis aquae-gelidae** p. 28

3. *Mimulus guttatus* dominant; in cobbles or on boulders ..... **Mimulus guttatus** p. 27

B. *Petasites frigidus* dominant or codominant herb

1. S*alix sitchensis* an important shrub; point bars or cobble bars within highwater line ..... **Petasites frigidus-*Salix sitchensis phase*** p. 31

2. *Equisteum arvense* present ..... **Petasites frigidus-*Equisetum arvense phase*** p. 32

3. *Ribes bracteosum* a dominant shrub; channel margins ..... **Ribes bracteosum/Petasites frigidus** p. 41

4. *Ribes bracteosum* and *Salix sitchensis* absent or minor; sandy cobble or boulder bars/active channel shelves ..... **Petasites frigidus-Stachys cooleyae** p. 35

C. *Mitella ovalis* and *Boykinia occidentalis* both present; channel margins ..... **Boykinia occidentalis-Mitella ovalis** p. 37

D. *Tiarella trifoliata* dominant herb, shrubs absent or trace; channel margins ..... **Tiarella trifoliata** p. 39

E. *Oxalis* dominant, with *Hydrophyllum tenuipes*; *Polysticum munitum* and *Athyrium filix-femina* often abundant; *Alnus rubra* overstory may be present; moderate to steep banks ..... **Oxalis-Hydrophyllum tenuipes** p. 71

F. *Adiatum pedatum* an important herb; seeps, often steep, rocky banks..... **Adiatum pedatum** p. 96

G. *Senecio triangularis* and *Heracleum lanatum* and/or *Boykinia major* present; shrubs nearly absent; fine soils, water tables near the surface, moderate to high elevations
..... **Senecio triangularis-Caltha leptosepala** p. 98

See related communities in herbaceous wetlands key (Christy pp. 204), especially *Calamagrostis canadensis* Association (Christy p. 256), *Caltha leptosepala ssp. howellii* Association (Christy p. 259), and *Caltha leptosepala ssp. howellii-Carex obnupta* Association (Christy p. 260)

H. Senecio triangularis, with *Heracleum lanatum*, *Aster modestus*, and/or *Aconitum columbianum*; shrubs varied; flat to gently sloping cobble bars or active floodplains at mid- to high elevations
.....**Senecio triangularis-Aster modestus** p. 44

See related communities in herbaceous wetlands key (Christy pp. 204), especially *Senecio triangularis* Association (Christy p. 322)

For more herb-dominated communities (aquatic beds, emergent marshes, marshes, fens/peatlands, or wet prairies), see herbaceous wetlands key (Christy pp. 204).

I. *Alnus rubra*/herb communities

1. *Elymus glaucus* dominant under *Alnus rubra*; cobbly floodplains or islands.....**Alnus rubra/Alymus glaucus** p. 46

2. *Claytonia siberica* and *Tolmeia menziesii* dominant under *Alnus rubra*; active floodplains/cobble bars
..... **Alnus rubra/Tolmeia menziesii-Claytonia sibirica** p. 50

3. *Oxalis* dominant, with *Hydrophyllum tenuipes. Polysticum munitum* and *Athyrium filix-femina* often abundant. *Alnus rubra* overstory may be present; Moderate to steep banks
.....**Oxalis-Hydrophyllum tenuipes** p. 71

4. *Oxalis* and *Polysticum munitum* co-dominant under variety of tree species; Acer circinatum often important, other shrubs minor or absent; steep banks, terraces
.....**Alnus rubra~Acer macrophyllum/Oxalis** p. 73

5. *Alnus rubra*/*Lysichiton americanus* swamps

a. *Carex obnupta* >=5%, dominant or co-dominant with *Lysichiton americanus*
.....***Alnus rubra/Carex obnupta-Lysichiton americanus*** (Christy p. 209)

b. *Carex obnupta* <5%, *Athyrium filix-femina* may be co-dominant with *Lysichiton americanus*.
... ***Alnus rubra/Athyrium filix-femina-Lysichiton americanus*** (Christy p. 208)

J. Shrub communities (may have tree overstories)—not dominated by *Rubus spectabilis* and/or *Ribes bracteosum*

1. *Vaccinium ovalifolium*-*Vaccinium alaskaense* dominant or co-dominant

a. Two or more members of the moderate to high elevation suite of herbs (*Achlys triphylla, Cornus canadensis, Linnea borealis, Tiarella trifoliata*, *Clintonia uniflora*) represented; active floodplains,banks, cobble bars, moderate to higher elevations .....**Vaccinium ovalifolium** p. 68

b. *Rubus spectabilis* an important shrub, mature conifer cover <20%, *Lysichiton americanus* present; poorly drained sites at moderate to higher elevations
..... **Vaccinium ovalifolium-Rubus spectabilis/Lysichiton americanum** p. 108

c. Mature conifer cover >20% and *Abies amabilis* present >5%; wetland indicators (*Caltha leptosepala*, *Lysichiton americanus*, or *Viola palustris*) present; silver fir zone; alternating hummocks and swales
.....**Abies amabilis/Vaccinium ovalifolium wetland** p. 112

2. *Vaccinium membranaceum* dominant, under *Picea engelmannii* in mountain hemlock zone
..... **Picea engelmannii/Vaccinium membranaceum** p. 106

3. *Alnus viridis* dominant, often with *Vaccinium ovalifolium* and *Ribes lacustre*, with members of the moderate to high elevation suite of herbs (*Achlys triphylla, Cornus canadensis, Linnea borealis, Tiarella trifoliata*, *Clintonia uniflora*) represented; cobble bars and active floodplains in mid-to upper elevations..... **Alnus viridis** p. 66

4. *Rubus parviflorus* among several shrubs with members of the moderate to high elevation suite of herbs (*Achlys triphylla, Cornus canadensis, Linnea borealis, Tiarella trifoliata*, *Clintonia uniflora*) represented, *Rubus spectabilis* minor or absent; low terraces or narrow flats behind cobble levees
..... **Rubus parviflorus/Achlys triphylla** p. 48

5. *Symphoricarpos albus* dominant, *Rubus spectabilis* >=5%; terraces/steep banks
... **Alnus rubra/Symphoricarpos albus-Rubus spectabilis** p. 82

6. *Corylus cornuta*>5%, often large floodplains and terraces of major rivers
...**Forested Corylus cornuta/Polystichum munitum group** p. 87

a. *Polysticum munitum>Oxalis*
.... **Corylus cornuta/Polystichum munitum-*hardwood phase*** p. 89

b. *Acer circinatum* dominant or co-dominant

1) *Oxalis>Polysticum munitum*; *Tsuga heterophylla* often in tree layer
..... **Corylus cornuta/Polystichum munitum-*Tsuga heterophylla/Acer circinatum-Oxalis phase*** p. 91

2) *Oxalis* absent, *Polysticum munitum* <5%, *Acer macrophyllum* and *Pseudotsuga menziesii* frequently in tree layer
..... **Corylus cornuta/Polystichum munitum-*Acer macrophyllum/Acer circinatum phase*** p. 93

7. *Corylus cornuta* =<5%, *Tiarella trifoliata* >=2%; several tree species in overstory including *Acer macrophyllum*, *Thuja plicata*, *Tsuga heterophylla*; wide terrace/elevated floodplains of large river valleys
..... **(Acer macrophyllum-Alnus rubra)/Acer circinatum/ Tiarella trifoliata** p. 85

8. *Cornus sericea* dominant shrub, herb layer >10% *Lysichiton americanus*
..... ***Cornus sericea/Lysichiton americanus*** (Christy p. 226)

9. *Spiraea douglassii* thicket..... ***Spiraea douglassii*** (Christy p. 242)

10. Willow communities
    a. *Salix lucida* co-dominant with *Salix sitchensis, Lysichiton americanus* swamp
    .....***Salix lucida ssp. lasiandra/Salix sitchensis/Lysichiton americanus*** (Christy p. 240)

    b. *Salix lucida* minor or absent, *Salix sitchensis* dominant, with *Lysichiton americanus* and/or *Carex aquatlis* the dominant herbs..... ***Salix sitchensis* complex** (Christy p. 241)

11. *Thuja plicata* dominant overstory tree, *Lysichiton americanus* dominant herb, *Oxalis* <5%
    .....***Thuja plicata/Lysichiton americanus*** (Christy p. 220)

K. Shrub layers dominated by *Rubus spectabilis, Ribes bracteosum* and/or *Oplopanax horridum*

1. *Oplopanax horridum* dominant or co-dominant with *Rubus spectabilis* and/or *Ribes bracteosum*
.....**Oplopanax horridum-Rubus spectabilis group** p. 99

a. *Thuja plicata* overstory
.....**Oplopanax horridum-Rubus spectabilis-*Thuja plicata* phase** p 104

b. *Alnus rubra* and/or *Tsuga heterophylla* dominant tree overstory (*Thuja plicata* minor or absent)
.....**Oplopanax horridum-Rubus spectabilis-*Alnus rubra* phase** p. 102

c. Tree overstory absent
..... **Oplopanax horridum-Rubus spectabilis-*shrub phase*** p. 101

2. *Ribes bracteosum* dominant or co-dominant

a. *Ribes bracteosum* dominant or co-dominant with *Rubus spectabilis*, *Petasites frigidus* or *Stachys cooleyae* the dominant herb; cobble bars/banks, active floodplains ..... **Ribes bracteosum/Petasites frigidus** p. 41

b. *Rubus parviflorus* among several shrubs with members of the moderate to high elevation suite of herbs (*Achlys triphylla, Cornus canadensis, Linnea borealis, Tiarella trifoliata*, *Clintonia uniflora*) represented, *Rubus spectabilis* minor or absent .....**Rubus parviflorus/Achlys triphylla** p. 48

c. *Oxalis* <3%, *Tolmeia menziesii* >2%; *Alnus rubra* and/or *Acer macrophyllum* often present .....**(Alnus rubra-Acer macrophyllum)/Ribes bracteosum-Rubus spectabilis/Tolmeia menziesii** p. 52

d. *Oxalis* >3%

1) *Oxalis, Tiarella trifoliata* and *Mitella ovalis* each >3% .....**Ribes bracteosum-Rubus spectabilis/Tiarella trifoliata-Mitella ovalis** p. 60

2) *Mitella ovalis* absent ..... **Ribes bracteosum-Rubus spectabilis/Oxalis group** p. 62

a) Tree overstory present, generally *Alnus rubra* and/or *Thuja plicata* ..... **Ribes bracteosum-Rubus spectabilis/Oxalis *Alnus rubra phase*** p. 65

b) Tree overstory absent or minor ... **Ribes bracteosum-Rubus spectabilis/Oxalis *shrub phase*** p. 64

3. *Rubus spectabilis* dominant shrub; *Ribes bracteosum* absent or minor

a. *Lysichiton americanus* swamps

1) *Rubus spectabilis* and *Vaccinium ovalifolium* generally co-dominant shrubs. Other cool, moist indicator shrubs (*Ribes lacustre*, *Alnus incana*, *Viburnum edule*) often present, mature conifer cover <20%, *Lysichiton americanus* present ..... **Vaccinium ovalifolium-Rubus spectabilis/Lysichiton americanum** p. 108

2) *Thuja plicata* in overstory; Oxalis >=5%; *Ribes bracteosum* can be present .....**Thuja plicata/Rubus spectabilis/Lysichiton americanum-Oxalis** p. 110

b. *Symphoricarpos albus* dominant or co-dominant, *Rubus spectabilis* >=5%; terraces/steep banks ..... **Alnus rubra/Symphoricarpos albus-Rubus spectabilis** p. 82

c. *Tolmeia menziesii* important herb .....**Rubus spectabilis/Tolmeia menziesii group** p. 54

1) *Tolmeia menziesii*>*Oxalis*; *Rubus parviflorus* often important; trees absent or minor ..... **Rubus spectabilis/Tolmeia menziesii-*shrub phase*** p. 56

2) *Alnus rubra* and/or *Acer macrophyllum* in overstory, *Tolmeia menziesii* dominant or codominant with *Oxalis* ..... **Rubus spectabilis/Tolmeia menziesii-*Alnus rubra phase*** p. 58

d. *Oxalis* dominant herb, *Tolmeia menziesii* minor or absent; terrace, banks, floodplains
.....**Rubus spectabilis/Oxalis group** p. 75

1) *Thuja plicata* in overstory
..... **Rubus spectabilis/Oxalis-*Thuja plicata phase*** p. 80

2) *Alnus rubra* in overstory
..... **Rubus spectabilis/Oxalis-*Alnus rubra phase*** p. 78

3) Overstory trees minor or absent
..... **Rubus spectabilis/Oxalis-*shrub phase*** p. 77

For more shrub-dominated communities (shrub swamps), see shrubland wetlands key (Christy p. 200).

For more tree-dominated communities (forested swamps), see forest and woodlands wetlands key (Christy p. 198).

In channel plant communities

Montia parvifolia
Streambank springbeauty
MOPA2

N=4 (MHNF 4)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Rubus spectabilis	50	2
Herbs		
Montia parvifolia	100	14
Mimulus guttatus	75	3
Oxalis	75	1
Tolmiea menziesii	50	2
Claytonia sibirica	50	2
Galium triflorum	50	1
Polystichum munitum	50	1
Circaea alpina	50	1

Elevations: 800 to 2500 feet (average 1550 feet).

Geomorphic surfaces: Active channel area

Substrate/soils: Occurs as small patches growing in pockets on bedrock or large boulders.

Community: The Montia parvifolia community is herb dominated; *Montia parvifolia* with minor amounts of *Mimulus guttatus* and *Oxalis* are typical.

Mimulus guttatus
Yellow monkeyflower
MIGU

N=9 (MHNF 8, WNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Herbs		
Mimulus guttatus	100	22
Epilobium sp.	100	8
Cardamine cordifolia	44	2
Glyceria striata	33	8
Athyrium filix-femina	33	3
Montia parvifolia	33	3
Luzula parviflora	33	2

Elevations: 240 to 3800 feet (average 2685 feet).

Geomorphic surfaces: Active channel area

Substrate/soils: Pockets of sand or silt in cobbles, logs, or boulders.

Community: The Mimulus guttatus community is a patchy herbaceous type found on boulders or cobbles at or within the high water line. *Mimulus guttatus* is the dominant herb, though fireweeds are also present. Grasses are almost always present (89% constancy), averaging 7% cover. Graminoids are present in 56% of the plots, averaging 5% cover. The surrounding plant series include western hemlock and silver fir.

Corydalis aquae-gelidae
Cold-water cordyalis
COAQ

N=3 (MHNF 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Herbs		
Corydalis aquae-gelidae	100	67
Senecio pseudaureus	67	5
Senecio triangularis	67	2
Aconitum columbianum	67	1
Aster modestus	67	1
Delphinium glareosum	67	1

Elevations: 3140 feet to 3170 feet (average 3155 feet).

Geomorphic surfaces: Gravel/cobble bars on islands or banks, within a foot of high water line.

Substrate/soils: 0 to 2 cm of sands or silts over the coarser fragments.

Community: Corydalis aquae-gelidae is an herbaceous community of mid- to upper elevations. It is dominated by *Corydalis aquae-gelidae*, which dominates the narrow gravel deposits beside cold water channels. *Alnus incana* and *Physocarpus capitatus* may be present in trace amounts. Adjacent upland plant associations are in the silver fir and western hemlock plant series.

Plot notes from one site measured in mid-July noted that the corydalis was growing in the stream, though the site might be above water level during summer low flow.

Corydalis aquae-gelidae is a Sensitive Plant Species for Oregon and Washington. The community is fairly uncommon. All three plots in this sample are from Stone Creek, Bear Springs Ranger District, Mt. Hood NF.

***Petasites frigidus* group**
Coltsfoot group
PEFR5 group

Group description followed by descriptions of two phases: *Petasites frigidus-Salix sitchensis* phase and *Petasites frigidus-Equisetum arvense* phase

N=11 (MHNF 11)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Alnus rubra	64	2
Shrubs		
Salix sitchensis	82	23
Rubus spectabilis	27	3
Herbs		
Petasites frigidus	91	25
Mimulus guttatus	82	2
Equisetum arvense	73	15
Stachys cooleyae	73	3
Grass (unknown)	55	1
Athyrium filix-femina	45	2
Aster modestus	45	1
Tolmiea menziesii	45	1
Oxalis	45	1
Montia parvifolia	45	1
Cinna latifolia	36	1

Elevations: 220 to 2280 feet (average 1650 feet).

Geomorphic surfaces: Cobble or boulder bars or banks at or below the normal high water line. The surfaces are subject to seasonal high energy flow.

Substrate/soils: Sands or gravelly sands in a cobble or boulder matrix with very little accumulation of fine sediments or organic material. They are wet much of the year, but have little moisture or nutrient holding capacity.

Community: The Petasites frigidus group is a lower elevation early seral community within the active channel. *Salix*, *Petasites frigidus*, *Equisetum arvense*, and *Oxalis trilliifolia* are common pioneer species on freshly scoured or deposited cobble bars. They are among the riparian species that can be delivered to a site by flood waters and root in an in- or near-channel surface.

Similar types: The Petasites frigidus-*Salix sitchensis* phase and *Petasites frigidus-Equisetum arvense* phase are similar to the Petasites frigidus-Stachys cooleyae plant community. The Petasites frigidus-Stachys cooleyae type tends to have more active floodplain species (*Ribes bracteosum, Stachys cooleyae, Athyrium filix-femina, Oxalis trilliifolia*), and less *Mimulus guttatus*, a very wet indicator.

***Petasites frigidus-Salix sitchensis* phase**
Coltsfoot-*Sitka willow phase*
PEFR5-*SASI2 phase*

N=6 (MHNF 6)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Alnus rubra	50	2
Shrubs		
Salix sitchensis	100	32
Rubus spectabilis	33	4
Herbs		
Petasites frigidus	83	10
Stachys cooleyae	67	5
Mimulus guttatus	67	3
Equisetum arvense	50	1
Oxalis	50	1
Montia parvifolia	50	1
Tolmiea menziesii	50	1

Elevations: 220 to 2100 feet (average 1550 feet).

Geomorphic surfaces: Cobble bars or lower banks, often point bars, within the normal high water line.

Substrate/soils: Sands or gravelly sands in a cobble or boulder matrix. One plot was on bedrock "with some pockets of cobbles, sands, and gravels". These sites are inundated annually, and have not accumulated fine sediments, organic matter, or litter. They are generally wet for much of the year, but have little moisture or nutrient holding capacity

Community: Petasites frigidus-*Salix sitchensis phase* is an early seral community of the active channel area. Young *Alnus rubra* and minor amounts of *Rubus spectabilis* are sometimes found. *Salix sitchensis* dominates the community. *Salix*, *Petasites frigidus*, and O*xalis trillifolia* are among the riparian species that can be delivered to a site by flood waters and root in an in- or near-channel surface.

***Petasites frigidus- Equisetum arvense* phase**
Coltsfoot-*common horsetail phase*
PEFR5-*EQAR phase*

N=5 (MHNF 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Alnus rubra	80	3
Shrubs		
Salix sitchensis	60	6
Herbs		
Petasites frigidus	100	37
Equisetum arvense	100	22
Mimulus guttatus	100	2
Stachys cooleyae	80	3
Unknown grass	80	1
Athyrium filix-femina	60	2
Aster modestus	60	1
Epilobium glaberrimum	40	8
Circaea alpina	40	1
Tolmiea menziesii	40	1
Angelica arguta	40	1
Cinna latifolia	40	1
Montia parvifolia	40	1
Juncus ensifolius	40	Tr
Oxalis	40	Tr

Elevations: 1480 to 2280 feet (average 1510 feet).

Geomorphic surfaces: Cobble bars (often point bars) at or below normal high water line. The surfaces are subject to seasonal high energy flow.

Substrate/soils: Sand pockets in cobbles.These sites do not have developed soils, and have very little accumulations of fine sediments or organic material. They are wet much of the year, but have little moisture or nutrient holding capacity.

Community: The Petasites frigidus-*Equisetum arvense phase* is an herbaceous community within the active channel. Minor amounts of *Alnus rubra* seedlings and *Salix sitchensis* frequently occur. Sedges and rushes are generally present (80% constancy), summed cover averaging 4%. *Mimulus guttatus,* particularly, indicates that these sites are very wet much of the year.

Petasites frigidus and *Equisteum arvense* are common pioneer species on freshly scoured or deposited cobble bars. *Petasites frigidus* and *Oxalis* often root from pieces deposited during the flood.

Channel margins-cobble bars/banks

Petasites frigidus-Stachys cooleyae
Coltsfoot-Cooley's betony
PEFR5-STCO14

N=45 (MHNF 27, WNF 16, EBLM 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Alnus rubra	51	13
Thuja plicata	27	3
Shrubs		
Acer circinatum	40	19
Rubus spectabilis	33	2
Ribes bracteosum	31	2
Herbs		
Petasites frigidus	87	20
Galium triflorum	78	2
Stachys cooleyae	64	10
Claytonia sibirica	58	1
Athyrium filix-femina	56	6
Tolmiea menziesii	56	4
Oxalis	42	5
Mimulus guttatus	36	2
Lactuca muralis	33	1
Montia parvifolia	31	1

Elevations: 920 to 3520 feet (average 2,370 feet).

Geomorphic surfaces: Sandy cobble bars, boulder bars, and active channel shelves. Surfaces are inundated annually. Height above normal high water averaged <1 foot.

Substrate/soils: Undeveloped thin layers of coarse sand over gravels, cobbles, and boulders. Water table depths of 3-40 cm were recorded. Thin silty sand horizons can develop due to presence of large wood trapping the finer sediments. Moisture and nutrient retention are poor, due to limited accumulation of fine sediments and organic matter.

Community: Petasites frigidus-Stachys cooleyae is the most common Cascades streamside community, although none was found in Salem

BLM plots. This is an herb dominated community which can support very young *Alnus rubra* or *Thuja plicata*, but seldom saplings. There is often an overhanging *Acer circinatum* canopy, but the shrub layer is generally sparse.

Similar types: The Petasites frigidus-Stachys cooleyae community is similar to the Petasites frigidus group (Alnus viridis/Petasites frigidus and Petasites frigidus-Equisetum arvense), largely found within the high water line. The Petasites frigidus-Stachys cooleyae type has a wider range of species that can occur on floodplains. It appears to bridge the in-channel and channel margin/active floodplain transition.

Boykinia occidentalis-Mitella ovalis
Coast boykinia-oval-leaved mitrewort
BOOC2-MIOV

N=22 (WNF 13, EBLM 5, SBLM 4)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	18	37
Trees-seedlings		
Alnus rubra	27	22
Tsuga heterophylla	27	12
Thuja plicata	18	3
Herbs		
Mitella ovalis	100	4
Boykinia occidentalis	95	14
Galium triflorum	91	3
Athyrium filix-femina	64	6
Tolmiea menziesii	55	15
Oxalis	50	12
Stachys	50	11
Carex deweyana	50	11
Adiantum pedatum	50	4
Petasites frigidus	45	7
Lactuca muralis	45	5
Tiarella trifoliata	45	4
Polystichum munitum	41	4
Bromus vulgaris	41	4
Claytonia sibirica	41	1

Elevations: 920-3085 feet (average 2,170 feet).

Geomorphic surfaces: Cobble and boulder bars and islands, alluvial fans, and lower banks.

Substrate/soils: Relatively shallow (average 37 cm), very gravelly horizons over gravels, cobbles and boulders. A horizons are loamy (silt loam, silty clay loams, sandy clay loams, or loamy sand). B horizons are often sandy clay loams or loamy sands.

Community: Boykinia occidentalis-Mitella ovalis is an herb dominated community of low to moderate elevations. Stands of *Alnus rubra* saplings occur in some samples. This community is frequently reset by floods and does not support mature conifers or older hardwoods. The shrub layer is sparse. The herb layer is marked by dominance of saxifrages, grasses, and graminoids. Grasses are almost always present (95% constancy), summed cover averaging 21%. Graminoids (sedges or wood-rushes) are present in 81% of the plots, averaging 17% cover.

Tiarella trifoliata
Foamflower
TITR

N=3 (WNF 2, MHNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Tsuga heterophylla	100	5
Shrubs		
Rubus spectabilis	67	1
Herbs		
Tiarella trifoliata	100	13
Galium aparine	100	7
Athyrium filix-femina	100	2
Claytonia sibirica	100	Tr
Anemone deltoidea	67	8
Polystichum munitum	67	6
Circaea alpina	67	5
Tolmiea menziesii	67	3
Mitella ovalis	67	2
Galium triflorum	67	1
Montia parvifolia	67	Tr

Elevations: 2740 to 3400 feet (average 3,165 feet).

Geomorphic surfaces: Cobble bars, islands and lower banks.

Substrate/soils: Coarse sands in a matrix of cobbles.

Community: Tiarella trifoliata is an herb dominated community of cooler, moderate elevation sites. *Tsuga heterophylla* seedlings were recorded on all plots, but no older trees were present. The shrub layer is nearly absent, though *Rubus spectabilis* may be in trace amounts. The herb layer is marked by dominance of saxifrages and ferns. Two samples were within the silver fir zone. All samples were north of the North Santiam River

Similar types: This community is very similar to the Boykinia occidentalis-Mitella ovalis type. The Tiarella trifoliata type is cooler and

more northerly than the lower, warmer *Boykinia occidentalis*-dominated community that was sampled only south of the North Santiam River.

Ribes bracteosum/Petasites frigidus
Stink currant/coltsfoot
RIBR/PEFR5

N=16 (MHNF 12, WNF 3, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	19	53
Trees-seedlings		
Alnus rubra	25	8
Thuja plicata	25	2
Shrubs		
Ribes bracteosum	100	31
Rubus spectabilis	75	8
Herbs		
Petasites frigidus	94	20
Athyrium filix-femina	75	3
Galium triflorum	75	1
Stachys cooleyae	63	10
Tolmiea menziesii	56	7
Circaea alpina	56	2
Oxalis	50	5
Claytonia sibirica	44	2
Bromus vulgaris	38	7
Lactuca muralis	31	4

Elevations: 1390 to 3000 feet (average 2360 feet).

Geomorphic surfaces: Cobble bars and banks, islands, inactive channels, and active floodplains. Inundated annually.

Substrate/soils: Pockets of shallow (ave.19cm) sand, gravelly sand, or cobbly sand over gravels and cobbles. Most plots showed <1 cm litter and no organic layer.

Community: Ribes bracteosum/Petasites frigidus is a shrub and herb dominated community of moderate elevations. The canopy is very open, tree cover averaging only 16%. Mature *Alnus rubra* were in only 19% of the plots (canopy heights average 55 feet). Three cohorts of Alnus were

aged on one plot (16 years, 20 years, 47 years), suggesting repeated floods. Grasses are present in 75% of the plots (ave. 4% cover). Graminoids occur on 56% of the plots (ave. 9% cover).

The presence of shrubs and some Alnus indicate that the surfaces have some stability and are not reset annually. Note the low *Rubus spectabilis* and *Oxalis* cover compared to cobble substrates with more developed soils, and the dominance of the *Petasites frigidus* and *Stachys cooleyae* typical of herb dominated channel margin types.

Cobble bars and low floodplains

Senecio triangularis-Aster modestus
Arrowleaf groundsel-great northern aster
SETR-ASMO3

N=9 (MHNF 8, WNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Picea engelmannii	22	10
Trees-seedlings		
Tsuga heterophylla	56	2
Picea engelmannii	44	2
Shrubs		
Spiraea douglasii	67	2
Alnus incana	56	8
Physocarpus capitatus	56	6
Herbs		
Senecio triangularis	89	9
Heracleum lanatum	89	4
Aster modestus	78	8
Aconitum columbianum	78	6
Vancouveria hexandra	78	4
Stachys cooleyae	78	3
Galium triflorum	78	2
Mertensia paniculata	78	2
Senecio pseudoaureus	67	10
Trautvetteria caroliniensis	56	5
Athyrium filix-femina	56	5
Achlys triphylla	56	2
Tiarella trifoliata var. unifoliata	56	1
Valeriana sitchensis	56	1
Viola glabella	44	3
Cornus unalaschkensis	44	1

Elevations: 3120 to 4810 feet (average 3,360 feet).

Geomorphic surfaces: Active floodplains, cobble bars, and inactive channels. Slopes were extremely gentle, from 0 to 7%. The community is typically adjacent to the channel, 0 to 2 feet above the stream.

Substrate/soils: Shallow silts, sandy silts or mucks over gravels and cobbles. Water tables were generally within 30cm of the surface.

Community: Senecio triangularis-Aster modestus is an herb-rich community of flat cobbly surfaces in cool, higher elevations. *Picea engelmannii* can occasionally be found in the overstory. Shrubs are generally present.

Most of the samples came from Stone Creek on the Mt. Hood NF, near Timothy Lake. The Willamette sample came from the Mink Lake Basin in Three Sisters Wilderness. Adjacent upland plant associations ranged from mountain hemlock types, through silver fir associations, to cool western hemlock associations in cold air drainage environments.

Alnus rubra/Elymus glaucus
Red alder/blue wildrye
ALRU2/ELGL

N=9 (MH 7, WNF 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	100	58
Trees-seedlings		
Pseudotsuga menziesii	56	4
Acer macrophyllum	56	1
Alnus rubra	44	36
Thuja plicata	44	1
Shrubs		
Rubus ursinus	67	6
Rubus spectabilis	67	3
Herbs		
Elymus glaucus	100	29
Polystichum munitum	89	3
Lactuca muralis	78	3
Claytonia sibirica	67	11
Tolmiea menziesii	67	5
Athyrium filix-femina	56	1
Equisetum arvense	44	2
Digitalis purpurea	44	2
Stachys cooleyae	44	1
Galium triflorum	44	1
Maianthemum stellatum	44	1

Elevations: 1090 feet to 2220 feet (average 1765 feet).

Geomorphic surfaces: Cobbly floodplains or islands 0-6 feet above normal high waterline (average 2.5 feet).

Substrate/soils: 5 to 45 cm of gravelly sands, very fine sand, or silty sands over gravel and/or cobbles. Litter is often washed away by winter flow, and little organic material accumulates on these sites.

Community: Alnus rubra/Alymus glaucus is a grassy mid-elevation forested floodplain community of the larger creeks and rivers. The overstory is dominantly *Alnus rubra*, less than 25 years old in the sample. Tree regeneration is often a dense stand of young *Alnus rubra*, but generally includes *Pseudotsuga menziesii* and *Acer macrophyllum*, or *Thuja plicata*. The shrub layer is sparse. Total grass cover in Alnus rubra/Alymus glaucus is the highest among all streamside communities in this section. Geomorphic surface, substrate, lack of soil development, and stand ages indicate that this community is frequently flooded, and is reset every few decades.

Similar types: Alnus rubra/Alymus glaucus is similar to Alnus rubra/Rubus spectabilis, but has lower, less constant *Rubus spectabilis* and fewer ferns. It may occur on drier, coarser substrates, perhaps farther away from the water table during the summer.

Rubus parviflorus/Achlys triphylla
Thimbleberry/Vanilla-leaf
RUPA/ACTR

N=10 (MHNF 10)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Taxus brevifolia	60	17
Tsuga heterophylla	60	13
Thuja plicata	50	7
Shrubs		
Rubus parviflorus	100	8
Acer glabrum var. douglasii	70	12
Ribes lacustre	60	12
Berberis nervosa	60	3
Acer circinatum	50	15
Ribes bracteosum	50	10
Rosa pisocarpa	40	5
Paxistima myrsinites	30	3
Herbs		
Achlys triphylla	90	4
Linnaea borealis	50	21
Cornus unalaschkensis	50	5
Galium triflorum	50	2
Tiarella trifoliata var. unifoliata	40	3
Trillium ovatum	40	1
Polystichum munitum	30	1
Luzula parviflora	30	1
Epilobium	30	1
Anemone lyallii	30	1
Lactuca muralis	30	1

Elevations: 2400 feet to 3680 feet (average 3150 feet).

Geomorphic surfaces: Low terraces or narrow flats, often behind cobbly levees and between steep conifer dominated valley walls or toeslopes on one side, and the channel. 0 to 3 feet above normal high water line.

Substrate/soils: Shallow silts or sands in a matrix of cobbles.

Community: Rubus parviflorus/vanilla-leaf is a shrub community of mid- to higher elevations. Conifer regeneration is plentiful (average 27% cover). Few seedlings appear to reach maturity. Mature trees occur on only 20% of plots. The important shrub species include a mix of upland and riparian species.

Adjacent upland plant associations were in the western hemlock series; most often Western hemlock/rhododendron/Oregon grape. The most common herb species in the Rubus parviflorus/Achlys triphylla community occur in the Western hemlock/rhododendron/Oregon grape upland plant association.

Alnus rubra/Tolmeia menziesii-Claytonia siberica
Red alder/piggyback plant-Siberian miner's lettuce
ALRU2/TOME-CLSI2

N=11 (MHNF 9, WNF 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	100	69
Acer macrophyllum	27	28
Trees-seedlings		
Pseudotsuga menziesii	45	3
Tsuga heterophylla	45	1
Thuja plicata	36	21
Acer macrophyllum	36	17
Shrubs		
Rubus spectabilis	64	4
Rubus parviflorus	36	28
Herbs		
Claytonia sibirica	100	13
Tolmiea menziesii	91	23
Stachys cooleyae	82	3
Lactuca muralis	73	3
Petasites frigidus	73	2
Galium triflorum	73	2
Oxalis	56	3
Athyrium filix-femina	45	9
Dicentra formosa	45	1
Polystichum munitum	36	11
Circaea alpina	36	5
Hydrophyllum tenuipes	36	Tr
Epilobium glaberrimum	36	Tr

Elevations: 1390 to 2500 feet (average 1960 feet).

Geomorphic surfaces: Cobble or boulder bars, active floodplains, banks, and islands.

Substrate/soils: Thin (2-35cm) layers of sands or gravelly sands over sandy cobbles, gravels, and boulders.

Community: Alnus rubra/Tolmeia menziesii-Claytonia sibirica is an herb-dominated community which occurs under a dense young *Alnus rubra* canopy in moderately low elevations. *Rubus spectabilis* is frequent but not abundant.

Stands are often sapling and pole size*Alnus rubra* (<9" dbh), less than 25 years old. Seedlings from several tree species are common, especially *Thuja plicata, Pseudotsuga menziesii, Tsuga heterophylla*, and *Acer macrophyllum*. The conifers are not found as overstory trees with this community.

Shallow sands, high ground cover of exposed surface boulders, frequently flooded geomorphic surfaces, and very young *Alnus rubra* stands suggest that this community develops with frequent, fairly high energy flooding. *Rubus spectabilis-Ribes bracteosum* communities or similar *Rubus spectabilis* types might develop if these surfaces receive silt deposits and accumulate organic matter in the upper horizons.

(***Alnus rubra-Acer macrophyllum)/Ribes bracteosum-Rubus spectabilis/Tolmiea menziesii***
(Red alder-big leaf maple)/stink currant-salmonberry/piggyback plant
(ALRU2-ACMA3)/RIBR-RUSP/TOME

N=14 (MHNF 9, WNF 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	64	41
Thuja plicata	29	26
Acer macrophyllum	21	52
Trees-seedlings		
Tsuga heterophylla	43	2
Acer macrophyllum	36	4
Shrubs		
Ribes bracteosum	100	24
Rubus spectabilis	79	17
Acer circinatum	36	16
Herbs		
Tolmiea menziesii	100	11
Athyrium filix-femina	79	10
Galium triflorum	79	2
Stachys cooleyae	79	2
Claytonia sibirica	79	2
Oxalis	71	2
Polystichum munitum	57	2
Lactuca muralis	43	1
Hydrophyllum tenuipes	36	7
Circaea alpina	36	6
Montia parvifolia	36	4
Petasites frigidus	36	1

Elevations: 800 to 3000 feet (average 2225 feet).

Geomorphic surfaces: Cobble bars, boulder bars, and active floodplains. Plots averaged 1.6 feet above average high water line and 15 feet away from the channel.

Substrate/soils: Sands to gravelly sands (average 30 cm) over sand in a matrix of cobbles and/or boulders. Note that the similar Alnus rubra/Ribes bracteosum-Rubus spectabilis/Oxalis community generally has soils with more silt in the top horizons.

Community: (Alnus rubra-Acer macrophyllum)/Ribes bracteosum-Rubus spectabilis/Tolmeia menziesii is a moderate elevation community. The canopy is most commonly found dominated by *Alnus rubra*, but the same understory occurs under *Acer macrophyllum*, especially on the Willamette NF. In the North Fork Clackamas drainage, *Thuja plicata* can be found in the overstory with the *Alnus rubra*. Overstory trees averaged 30% canopy cover. Canopy height averaged 62 feet. Near-channel geomorphic surfaces, coarse soil texture, and low cover of *Polystichum munitum* and *Oxalis* suggest that this community is reset more frequently than the Ribes bracteosum-Rubus spectabilis/Oxalis-*Alnus rubra phase*.

***Rubus spectabilis/Tolmiea menziesii* group**
Salmonberry/piggyback plant group
RUSP/TOME group

Group description followed by descriptions of two phases: *Rubus spectabilis/Tolmiea menziesii* –shrub phase, and *Rubus spectabilis/Tolmiea menziesii-Alnus rubra* phase

N=25 (MHNF 16, EBLM 5, WNF 2, SBLM 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	76	47
Acer macrophyllum	28	29
Trees-seedlings		
Acer macrophyllum	40	5
Alnus rubra	36	12
Tsuga heterophylla	20	7
Thuja plicata	20	2
Shrubs		
Rubus spectabilis	100	24
Rubus parviflorus	44	12
Herbs		
Tolmiea menziesii	92	13
Galium triflorum	76	4
Claytonia sibirica	68	7
Athyrium filix-femina	64	17
Stachys cooleyae	64	7
Oxalis	60	8
Polystichum munitum	56	5
Lactuca muralis	56	3
Petasites frigidus	44	27
Circaea alpina	44	9

Elevations: 220 to 4120 feet (average 1875 feet).

Geomorphic surfaces: Cobble bars, banks, islands, and annual floodplains. Plots averaged 4 feet above average high water line, and 21 feet from the average high water line.

Substrate/soils: Loamy sands in the A horizon (ave. 8 cm) over B horizons (ave.18cm) of sands mixed with gravel or gravel/cobble. C horizons are also sands with gravels or gravels mixed with cobbles and boulders. Half the pits show buried soils which are exploited by roots. O horizons are 2 to 3 cm thick.

Community: The Rubus spectabilis/Tolmeia menziesii group generally has young *Alnus rubra* and/or young *Acer macrophyllum*, but can occur without trees. *Tolmeia menziesii, Stachys cooleyae* and *Petasites frigidus* are common in active floodplain/stream bank communities. *Polystichum munitum* and *Oxalis* tend to have lower cover where *Ribes bracteosum* is dominant, as in the closely related *Ribes bracteosum* type: (Alnus rubra-Acer macrophyllum)/Ribes bracteosum-Rubus spectabilis/Tolmeia menziesii. *Polystichum munitum* and *Oxalis* cover are lower in this group overall than in the somewhat similar steep bank/terrace Rubus spectabilis/Oxalis group. Low *Oxalis* and *Polystichum munitum* covers generally are associated with slightly coarser soil textures or shallower soil depths. Dense stands of *Alnus rubra* can reestablish in the loamy sands on top of the gravel/cobble substrate. Often the trees can tap into buried O and A layers.

***Rubus spectabilis/Tolmeia menziesii*-shrub phase**
Salmonberry/piggyback plant–*shrub phase*
RUSP/TOME-*shrub phase*

N=5 (EBLM 2, SBLM 1, MHNF 1, WNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Rubus spectabilis	100	27
Rubus parviflorus	60	12
Acer circinatum	40	8
Herbs		
Athyrium filix-femina	100	29
Galium triflorum	100	6
Tiarella trifoliata	80	9
Circaea alpina	60	19
Tolmiea menziesii	60	18
Boykinia occidentalis	60	16
Petasites frigidus	60	12
Bromus sitchensis	60	7
Lactuca muralis	60	6
Claytonia sibirica	60	5
Bromus vulgaris	40	9
Oxalis	40	8
Mitella ovalis	40	7
Adiantum pedatum	40	6
Carex deweyana	40	5
Stellaria crispa	40	3
Equisetum arvense	40	2
Montia parvifolia	40	2
Anaphalis margaritacea	40	1

Elevations: 1050 to 4120 feet (average 2,250 feet).

Geomorphic surfaces: Cobble/boulder bars, islands, and annual floodplains.

Substrate/soils: Loam or loamy sands in the A horizon (ave. 5 cm) over B horizons (ave. 22 cm) of loamy sand or sand mixed with gravel or

gravel/cobble. C horizons are also sands with gravels or gravels mixed with cobbles and boulders. Some pits show buried soils which are exploited by roots. Development of O horizon 1 to 4 cm thick, as well as the A horizon suggest that although disturbance may be relatively frequent, there is enough time for some soil building processes.

Community: Rubus spectabilis/piggybank plant-*shrub phase* is an herb-dominated community with a strong *Rubus spectabilis* and *Rubus parviflorus* component. Grasses are typically abundant (11% average summed cover and 80% constancy). *Polystichum munitum* and *Oxalis*, markers of deeper, finer substrates and less frequent disturbance, are minor or absent from most of this community.

***Rubus spectabilis/Tolmeia menziesii-Alnus rubra* phase**
Salmonberry/piggyback plant-*red alder phase*
RUSP/TOME-*ALRU2 phase*

N=20 (MHNF 15, EBLM 3, SBLM 1, WNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	95	51
Acer macrophyllum	35	29
Trees-seedlings		
Acer macrophyllum	50	6
Alnus rubra	40	13
Shrubs		
Rubus spectabilis	100	25
Rubus parviflorus	40	11
Rubus ursinus	35	11
Herbs		
Tolmiea menziesii	100	13
Claytonia sibirica	70	8
Galium triflorum	70	3
Oxalis	65	8
Polystichum munitum	65	6
Athyrium filix-femina	55	15
Stachys cooleyae	55	4
Lactuca muralis	55	3
Petasites frigidus	40	24
Circaea alpina	40	7

Elevations: 220 to 2780 feet (average 1,780 feet).

Geomorphic surfaces: Cobble/boulder bars and islands, and active floodplains.

Substrate/soils: Loamy sands in the A horizon (ave. 9 cm) over B horizons (ave. 17cm) of sands mixed with gravel or gravel/cobble. C horizons are also sands with gravels or gravels mixed with cobbles and boulders. Some profiles have buried soils which are exploited by roots. Development of O horizon 2 to 5 cm thick, as well as the A horizon suggest that although disturbance may be relatively frequent, there is

enough time for some soil building processes. Deeper soils seem to be associated with tributary junctions and active alluvial fans.

Community: The Rubus spectabilis/piggybank plant-*Alnus rubra phase* is a low to moderate elevation community dominated by *Alnus rubra*, sometimes with *Acer macrophyllum*. *Polystichum munitum* is more constant than *Athyrium filix-femina*. *Athyrium filix-femina* also occurs at lower cover in this phase than in the Rubus spectabilis/Tolmeia menziesii-*shrub phase*. Graminoids (sedges, rushes, woodrush) are common and abundant, occurring on 70% of the plots and averaging 14% summed cover. True grasses occur on on 60% of the plots, averaging 24% summed cover.

This community often supports dense stands of *Alnus rubra* that can reestablish in the loamy sands on top of the gravel/cobble substrate. Often the trees can tap into buried O and A layers. Conifer saplings were not observed in the sample, probably due to substrate limitations and disturbance frequency.

Ribes bracteosum-Rubus spectabilis/Tiarella trifoliata-Mitella ovalis
Stink currant-salmonberry/foamflower-oval-leaved mitrewort
RIBR-RUSP/TITR-MIOV

N=17 (EBLM 8, SBLM 8, WNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Acer macrophyllum	12	24
Trees-seedlings		
Tsuga heterophylla	18	5
Shrubs		
Ribes bracteosum	100	24
Rubus spectabilis	88	27
Vaccinium parvifolium	47	4
Herbs		
Athyrium filix-femina	100	16
Tiarella trifoliata	94	12
Polystichum munitum	88	19
Mitella ovalis	88	8
Oxalis	82	29
Tolmiea menziesii	76	13
Galium triflorum	76	4
Adiantum pedatum	71	7
Carex deweyana	71	2
Blechnum spicant	59	8
Boykinia occidentalis	53	6
Petasites frigidus	53	5
Circaea alpina	47	4
Bromus	41	4
Stellaria crispa	41	2

Elevations: 920 to 3400 feet (average 1600 feet).

Geomorphic surfaces: Bars, banks, islands, and floodplains.

Substrate/soils: Gravels or gravels with cobbles in the A horizon, gravels/cobbles in the B horizon, over cobbles, boulders, or bedrock. A

horizon loamy sands or sandy loams average 11 cm. C, BC, or R horizons generally were found at 33 cm.

Community: Ribes bracteosum-Rubus spectabilis/Tiarella trifoliata-Mitella ovalis is a shrub-dominated community mainly of the lower elevations. Very few overstory trees were recorded (24% of plots). Few tree seedlings appear to survive to maturity. The rich herb layer is dominated by ferns and several saxifrages. The herb layer has the highest average cover (81%) among the Cascades *Rubus spectabilis* types. Grasses are almost always present (94% constancy), summed cover averaging 7%. Graminoids (sedges and wood-rush) occur on 76% of the plots, averaging 13% summed cover.

All BLM Ribes bracteosum-Rubus spectabilis group plots are in this community. Diagnostic species for the low elevation Cascades/Cascades foothills include *Boykinia occidentalis, Mitella ovalis*, and *Carex deweyana*. *Ribes bracteosum* generally indicates cobbly and thin soiled environments, but the soils have enough fines to support the *Oxalis.* The complement of saxifrages appears to tolerate frequent flooding, as well.

Similar types: This community appears to be a lower-elevation analogue of the Ribes bracteosum-Rubus spectabilis/Oxalis group.

***Ribes bracteosum-Rubus spectabilis/Oxalis* group**
Stink currant-salmonberry/sorrel group
RIBR-RUSP/OXALI group

Group description followed by constancy tables only for two phases: *Ribes bracteosum-Rubus spectabilis/Oxali- shrub phase* and *Ribes bracteosum-Rubus spectabilis/Oxalis-Alnus rubra phase*

N= 35 (MHNF 31, WNF 1, SBLM 2, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	60	29
Thuja plicata	26	16
Trees-seedlings		
Alnus rubra	40	7
Tsuga heterophylla	26	2
Shrubs		
Ribes bracteosum	100	23
Rubus spectabilis	89	21
Herbs		
Oxalis	100	20
Athyrium filix-femina	83	7
Tolmiea menziesii	71	5
Polystichum munitum	63	5
Stachys cooleyae	54	2
Galium triflorum	49	2
Claytonia sibirica	46	1
Circaea alpina	43	2
unknown grass	40	3

Elevations: 800-3040 feet (average 2080 feet).

Geomorphic surfaces: Bars, banks, islands, and floodplains.

Substrate/soils: Poorly developed gravelly soils over cobbles or boulders. Top horizons are silty sands or sandy silts to about 30cm, over extremely cobbly or gravelly sand. Some pits had water tables within 35-50cm, but most were at least 1 meter above the water table during summer low flow.

The plot with the highest *Thuja plicata* component was the only plot where a gley layer was found within a meter of bedrock.

Community: The Ribes bracteosum-Rubus spectabilis/Oxalis group most often occurs as the *Alnus rubra*-dominated Ribes bracteosum-Rubus spectabilis/Oxalis-*Alnus rubra phase*. In the North Fork Clackamas drainage, *Thuja plicata* also is commonly found in the overstory. Where no mature trees are present (Ribes bracteosum-Rubus spectabilis/Oxalis-*shrub phase*), high shrub cover remained constant, but low shrub cover doubled, and herb cover increased 130%, though understory species composition is the same. Alnus canopy is moderate (average 33% cover; average plot canopy height 46'). Logs often act as substrate for upland species not typically rooted in the community.

This community has much less *Polystichum munitum* and *Athyrium filix-femina* that the Rubus spectabilis/Oxalis group, which has more loams, deeper top horizons, and more organic matter and which often has older, larger trees.

***Ribes bracteosum-Rubus spectabilis/Oxalis*-shrub phase**
Stink currant-salmonberry/sorrel-*shrub phase*
RIBR-RUSP/OXALI-*shrub phase*

N=13 (MHNF 11, EBLM 1, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Ribes bracteosum	100	30
Rubus spectabilis	92	26
Herbs		
Oxalis	100	27
Athyrium filix-femina	92	9
Tolmiea menziesii	69	4
Stachys cooleyae	69	3
Tiarella trifoliata	62	3
Polystichum munitum	54	7
Grass (unknown)	54	5
Galium triflorum	54	3
Corydalis scouleri	46	10
Adiantum pedatum	46	2
Claytonia sibirica	46	1
Circaea alpina	38	2

Only the constancy table is included for this phase, which is extremely similar in occurrence and composition to the Alnus rubra dominated phase of the Stink-currant-Rubus spectabilis/Oxalis group. It seems likely that Alnus rubra phase can develop from the shrub-dominated phase, in intervals between stand-resetting floods.

Refer to the Ribes bracteosum-Rubus spectabilis/Oxalis group section (above) for a fuller description of the community.

***Ribes bracteosum-Rubus spectabilis/Oxali-Alnus rubra* phase**
Stink currant-salmonberry/sorrel-*red alder phase*
RIBR-RUSP/OXALI-*ALRU2 phase*

N=22 (MHNF 19, WNF 2, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	95	29
Thuja plicata	41	16
Trees-seedlings		
Alnus rubra	45	4
Shrubs		
Ribes bracteosum	100	20
Rubus spectabilis	86	18
Acer circinatum	36	9
Herbs		
Oxalis	100	16
Athyrium filix-femina	77	6
Tolmiea menziesii	73	5
Polystichum munitum	68	3
Stachys cooleyae	45	2
Hydrophyllum tenuipes	45	2
Galium triflorum	45	2
Circaea alpina	45	1
Claytonia sibirica	45	1
Petasites frigidus	36	5

Only the constancy table is included for this phase, which is extremely similar in occurrence and composition to the shrub-dominated phase of the Stink-currant-Rubus spectabilis/Oxalis group. It seems likely that Alnus rubra phase can develop from the shrub-dominated phase, in intervals between stand-resetting floods.

Refer to the Ribes bracteosum-Rubus spectabilis/Oxalis group section (above) for a fuller description of the community.

Alnus viridis
Sitka alder
ALVI5

N=14 (MHNF 13, WNF 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Tsuga heterophylla	43	12
Shrubs		
Alnus viridis	100	18
Vaccinium ovalifolium	79	14
Ribes lacustre	64	6
Viburnum edule	57	11
Rubus spectabilis	57	4
Ribes bracteosum	43	6
Rubus parviflorus	43	4
Menziesia ferruginea	36	6
Gaultheria ovatifolia	36	2
Herbs		
Achlys triphylla	79	6
Tiarella trifoliata var. unifoliata	71	2
Cornus unalaschkensis	64	7
Linnaea borealis	57	12
Athyrium filix-femina	57	7
Streptopus amplexifolius	43	1
Orthilia secunda	36	2
Clintonia uniflora	36	2
Mitella breweri	36	1
Senecio triangularis	36	Tr

Elevations: 3270 to 4720 feet (average 3,784 feet).

Geomorphic surfaces: Flat to very gently sloping cobble bars, cobbly islands, or active floodplains.

Substrate/soils: Shallow layers (generally <20cm) of silt, sand, or silty sand over cobbles or within a cobble matrix. Two plots with deeper (36-52 cm) soils had rhododendron in the shrub layer.

Community: The Alnus viridis community is a shrubby mid- to upper-elevation community. It occurs in the upper range of the western hemlock zone, in the silver fir zone, and into the mountain hemlock zone. Cold air drainage effects can be seen in this community. For example, *Tsuga mertensiana* seedlings are found where silver fir associations form the adjacent upland associations. Mature conifers are seldom present. Mature hardwood trees were not recorded in the sample, though *Alnus rubra* seedlings occurred on 28% of the plots.

Similar types: The Vaccinium ovalifolium community is very similar in composition and distribution to the Alnus viridis type and could be considered a phase of the same basic community. The Vaccinium ovalifolium community can occur on a wider range of geomorphic surfaces, and occasionally on deeper, poorly drained soils. The Alnus viridis community is more restricted to cobble bars and islands very close to or within the normal high water line.

Vaccinium ovalifolium
Oval-leaved huckleberry
VAOV

N=18 (MHNF 14, WNF 2, SBLM 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Tsuga heterophylla	56	7
Abies amabilis	39	7
Taxus brevifolia	33	8
Shrubs		
Vaccinium ovalifolium/V. alaskaense	100	18
Ribes lacustre	72	3
Rubus spectabilis	67	11
Menziesia ferruginea	39	10
Sorbus sitchensis	39	4
Ribes bracteosum	33	5
Viburnum edule	33	3
Herbs		
Achlys triphylla	94	6
Cornus unalaschkensis	89	7
Linnaea borealis	56	6
Tiarella trifoliata var. unifoliata	56	5
Clintonia uniflora	56	4
Streptopus amplexifolius	44	1
Athyrium filix-femina	33	9
Boykinia major	33	6
Gymnocarpium dryopteris	33	5
Streptopus lanceolatus var. curvipes	33	2

Elevations: 3000 to 4340 feet (average 3,705 feet).

Geomorphic surfaces: Active floodplains, banks, and cobble bars.

Substrate/soils: Relatively shallow top horizons of silts or silty sands (average 24 cm) in a matrix of cobbles. Exposed bedrock or large boulders were also noted. This community also occurs on deep (>80cm) but poorly drained soils, with silt or silts over sands, and mottling at 25 cm. The latter sites may be related to the Abies amabilis/Vaccinium

ovalifolium community, where mature trees are found on well-drained microsites provided by hummocks.

Community: The Vaccinium ovalifolium community occurs at higher elevations than similar *Rubus spectabilis*-dominated types. It is generally found in the silver fir zone, but is also found in the upper western hemlock zone. The distribution extends into the mountain hemlock zone. Cold air drainage effects are often evident in this community. Few tree seedlings reach maturity. This community seems to be the higher elevation analogue for the Rubus spectabilis/Oxalis types, considering soils, geomorphic surfaces, and stand structure.

Similar types: The Alnus viridis community is very similar in composition and distribution to the Vaccinium ovalifolium type, and could be considered a phase of the same basic community. The Alnus viridis type occurs exclusively adjacent to the channel on shallow silty sands or sands on cobble bars, cobbly floodplains or islands. It does not occur with deeper poorly drained soils.

Steep banks/terraces

Oxalis-Hydrophyllum tenuipes
Sorrel-Pacific waterleaf
OXALI-HYTE

N=7 (WNF 4, MHNF 1, EBLM 1, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	14	60
Herbs		
Oxalis (O. trillifolia)	100	36
Hydrophyllum tenuipes	100	5
Galium triflorum	86	2
Polystichum munitum	71	17
Athyrium filix-femina	71	15
Tolmiea menziesii	71	1
Stachys cooleyae	43	14
Adiantum pedatum	43	5
Claytonia sibirica	43	1
Prosartes hookeri	43	1

Elevations: 1150 feet to 2600 feet (average 2142 feet).

Geomorphic surfaces: Moderate to steep banks, occasionally adjacent to an active channel shelf or active floodplain. Surfaces tend to be steep and above average winter flow. This is a moist bank community, but generally not one subject to yearly scour or deposition.

Substrate/soils: Soils ranged from sands mixed with gravels and cobbles, to deeper soils with silty clay loam to silty clay textures in a gravel/cobble matrix. Two soil descriptions noted colluvial materials in the substrates.

Community: Oxalis-Hydrophyllum tenuipes is a low to moderate elevation herbaceous community. *Alnus rubra* and *Acer macrophyllum* seedlings and saplings are occasionally present. Overhanging conifer cover can be dense. The shrub layer is generally minor, though a thick *Acer circinatum* canopy was recorded on two plots.

Similar types: The Oxalis-Hydrophyllum tenuipes community is similar to the (Alnus rubra-Acer macrophyllum)/Oxalis type, but without a tree

component. Riparian indicators more common or abundant in the Oxalis-Hydrophyllum tenuipes community include *Athyrium filix-femina* and *Stachys cooleyae*. The herbaceous type may represent similar bank environments, but slightly wetter and/or younger than (Alnus rubra-Acer macrophyllum)/Oxalis.

(*Alnus rubra-Acer macrophyllum)/Oxalis*
(Red alder-big leaf maple)/Sorrel
(ALRU2-ACMA3)/OXALI

N=16 (MHNF 8, WNF 5, EBLM 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	56	50
Acer macrophyllum	38	47
Tsuga heterophylla	38	35
Thuja plicata	31	28
Trees-seedlings		
Tsuga heterophylla	38	3
Shrubs		
Acer circinatum	63	20
Rubus ursinus	50	2
Oemleria cerasiformis	38	2
Herbs		
Oxalis	100	27
Polystichum munitum	88	21
Galium triflorum	81	1
Athyrium filix-femina	63	5
Lactuca muralis	56	1
Adiantum pedatum	50	2
Tolmiea menziesii	44	3
Claytonia sibirica	44	1
Corydalis scouleri	38	31
Bromus vulgaris	38	6
Vancouveria hexandra	38	4
Petasites frigidus	38	1

Elevations: 920 to 2580 feet (average 1734 feet).

Geomorphic surfaces: Steep cobbly or bouldery banks (12-45% slope), or on terraces.

Substrate/soils: Soils on the steep banks are shallow loams or silty sands in a matrix of cobbles or boulders. Terrace plots had loamy clay,

silty clay or silts in the top horizons, above clays or sandy clays over cobbles. Deep organic layers were noted on some plots. Soil depths were 45 to 60 cm. Anaerobic conditions were noted for one plot where gleying occurred within the top 20 cm.

Community: The (Alnus rubra-Acer macrophyllum)/Oxalis community can occur under a variety of tree species. Hardwood or mixed hardwood-conifer canopies are most common. Typical shrub cover is low, with *Acer circinatum* often the abundant species. *Corydalis scourleri* is an important associated species in this community in the Mt. Hood NF.

Terrace plots had older trees (140-275 years old,). Tree ages and geomorphic surfaces suggest that this environment is not reset often by floods. Bank plots supported younger stands (9-70 years). Some stands had multiple ages which suggest successive non-stand replacement floods.

Similar types: The Oxalis-Hydrophyllum tenuipes community is very similar to the (Alnus rubra-Acer macrophyllum)/Oxalis type, but without the tree component. The herbaceous type may represent similar bank environments, but slightly wetter and/or younger.

***Rubus spectabilis/Oxalis* group**
Salmonberry/Sorrel group
RUSP/OXALI group

Group description followed by descriptions of three phases: *Rubus spectabilis/Oxalis*–shrub phase, *Rubus spectabilis/Oxalis-Alnus rubra* phase, and *Rubus spectabilis/Oxalis-Thuja plicata* phase

N=28 (MHNF 15, EBLM 7, SBLM 4, WNF 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	50	43
Thuja plicata	21	48
Shrubs		
Rubus spectabilis	100	21
Vaccinium parvifolium	43	6
Ribes bracteosum	32	2
Herbs		
Oxalis	100	29
Polystichum munitum	89	25
Athyrium filix-femina	64	14
Galium triflorum	54	3
Claytonia sibirica	50	3
Adiantum pedatum	43	6
Tolmiea menziesii	43	4
Stachys cooleyae	43	3
Tiarella trifoliata	36	6
Circaea alpina	36	3
Bromus vulgaris	32	4

Elevations: 800 to 2740 feet (average 1667feet).

Geomorphic surfaces: Terraces, banks, and floodplains.

Substrate/soils: Mt. Hood soil data show most plots had a top layer (average 11cm) of silty sand, sandy silt, sand or silty clay loam over sands in a cobble matrix. Soil data from BLM sites showed that loams (silt loam, loam, silty clay loam, sandy clay loam) formed the A and AB

layer (ave 18cm.). The B layer (aver 41 cm) was most commonly loamy, but ranged from sand to sandy clay. Gravels made up more of the coarse fragments in the A and B horizons than cobbles. All soil pits had cobbles and/or boulders in the R layer.

Community: Rubus spectabilis/Oxalis is a moderate elevation community that occurs with *Alnus rubra* (Rubus spectabilis/Oxalis-*Alnus rubra phase*) and/or *Thuja plicata* (Rubus spectabilis/Oxalis-*Thuja plicata phase*), but frequently occurs without trees in the overstory (Rubus spectabilis/Oxalis-*shrub phase*). Shrub and herb composition in all three groups is very similar. Among *Rubus spectabilis* communities, Rubus spectabilis/Oxalis occurs on soils with deeper organic layers and finer size fractions, smaller coarse fragments, and deeper soils. The sites are more fertile and with higher moisture availability. Older tree ages as well as smaller coarse fragment sizes and finer soil textures suggest that these sites have less frequent disturbance and slower water during floods. Multiple tree ages on some sites may indicate flooding which does not necessarily remove existing trees.

***Rubus spectabilis/Oxali*-shrub phase**
Salmonberry/Sorrel-*shrub phase*
RUSP/OXALI-*shrub phase*

N=11 (MHNF 4, SBLM 3, EBLM 3, WNF 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Tsuga heterophylla	18	15
Trees-seedlings		
Tsuga heterophylla	18	5
Shrubs		
Rubus spectabilis	100	18
Vaccinium parvifolium	45	5
Acer circinatum	36	18
Herbs		
Oxalis	100	32
Polystichum munitum	100	24
Athyrium filix-femina	82	12
Adiantum pedatum	73	5
Galium triflorum	64	2
Claytonia sibirica	55	2
Tiarella trifoliata	36	7
Blechnum spicant	36	6
Bromus vulgaris	36	5
Tolmiea menziesii	36	3
Montia parvifolia	36	2

Only the constancy table is included for this phase, which is extremely similar in occurrence and composition to the *Alnus rubra* dominated phase of the Rubus spectabilis/Oxalis group. It seems likely that *Alnus rubra* phase can develop from the shrub-dominated phase, in intervals between stand-resetting floods.

Refer to the Rubus spectabilis/Oxalis group section (above) for a fuller description of the community.

***Rubus spectabilis/Oxalis-Alnus rubra* phase**
Salmonberry/sorrel-*red alder phase*
RUSP/OXALI-*ALRU2 phase*

N=11 (MHNF 7, EBLM 4)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	100	53
Trees-seedlings		
Acer macrophyllum	45	3
Thuja plicata	36	2
Tsuga heterophylla	36	1
Shrubs		
Rubus spectabilis	100	22
Vaccinium parvifolium	36	8
Ribes bracteosum	36	3
Herbs		
Oxalis	100	27
Polystichum munitum	73	21
Tolmiea menziesii	55	6
Galium triflorum	55	3
Stachys cooleyae	55	3
Athyrium filix-femina	45	18
Bromus vulgaris	45	4
Adiantum pedatum	36	7
Tiarella trifoliata	36	6
Claytonia sibirica	36	5
Maianthemum stellatum	36	4
Circaea alpina	36	4

Only the constancy table is included for this phase, which is extremely similar in occurrence and composition to the shrub dominated phase of the Rubus spectabilis/Oxalis group. It seems likely that Alnus rubra phase can develop from the shrub-dominated phase, in intervals between stand-resetting floods.

Grasses are generally present (73% constancy), averaging 5% cover. Graminoids occur on 55% of the plots, averaging 6% cover. Refer to the Rubus spectabilis/Oxalis group section (above) for a fuller description of the community.

***Rubus spectabilis/Oxalis-Thuja plicata* phase**
Salmonberry/sorrel-*western redcedar phase*
RUSP/OXALI-*THPL phase*

N=6 (MHNF 4, EBLM 1, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Thuja plicata	100	48
Alnus rubra	33	32
Trees-seedlings		
Tsuga heterophylla	33	1
Shrubs		
Rubus spectabilis	100	24
Vaccinium parvifolium	50	7
Ribes bracteosum	50	2
Oplopanax horridum	33	1
Herbs		
Oxalis	100	26
Polystichum munitum	100	23
Athyrium filix-femina	67	18
Claytonia sibirica	67	2
Blechnum spicant	50	13
Dicentra formosa	50	10
Circaea alpina	50	4
Stachys cooleyae	50	1
Trillium ovatum	50	Tr
Viola glabella	33	25
Corydalis scouleri	33	23
Hydrophyllum tenuipes	33	20
Tiarella trifoliata	33	9
Galium triflorum	33	5
Maianthemum dilatatum	33	4

Elevations: 1060 to 2200 feet (average 1750 feet).

Geomorphic surfaces: Terraces or islands elevated above normal high water level.

Substrate/soils: Generally deeper and finer texture than most *Rubus spectabilis* communities. Top horizons were loams (sandy loam, silt loam) over sandy clay loams to silty clays. Two detailed profile descriptions recorded buried soils, one clearly associated with charcoal and coarse woody material. One pit showed poor drainage: mottling at 25cm and gleying at 55 cm, with water at 70 cm. Another pit had water level at 90 cm. Surface organic layers were shallow to extremely thick (2-40 cm).

Community: The Rubus spectabilis/Oxalis-*Thuja plicata phase* has a well developed overstory of *Thuja plicata,* sometimes with *Alnus rubra*. Elevated geomorphic surface, finer soil textures, clay illuviation, and larger tree sizes suggest that these sites, though periodically flooded, have a relatively long interval between major events which reset the stands. One plot note speculated that the *Thuja plicata* appeared to stabilize the surface, though it was still subject to flooding.

Alnus rubra/Symphoricarpos albus-Rubus spectabilis
Red alder/common snowberry-salmonberry
ALRU2/SYAL-RUSP

n=2 (MH 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	100	43
Trees-seedlings		
Alnus rubra	100	1
Acer macrophyllum	50	8
Shrubs		
Symphoricarpos albus	100	43
Rubus spectabilis	100	10
Rubus parviflorus	100	5
Acer circinatum	50	12
Rosa pisocarpa	50	10
Salix sitchensis	50	8
Corylus cornuta	50	7
Salix scouleriana	50	7
Ribes bracteosum	50	2
Herbs		
Pteridium aquilinum	100	13
Stachys cooleyae	100	4
unknown grass	100	3
Corydalis scouleri	50	8
Scirpus microcarpus	50	8
Oxalis	50	3
Heracleum lanatum	50	2
Polystichum munitum	50	2

Elevations: 1600 feet.

Geomorphic surfaces: Upper banks. Plots were two feet above normal high waterline, and 4 to 10 feet from the waterline.

Substrate/soils: Deep very gravelly to cobbly sands. The ground surface was 60-65% litter covering bare ground. Exposed surface rock

(gravel, cobbles, boulders, bedrock) was very low (12% cover) for riparian shrub types.

Community: Both plots are from the Salmon River on the Mt. Hood NF. Alder canopy is moderate (15-70%, 30-50' canopy height). The community has one of the densest shrub layers among the Cascades types. The adjacent plant association in the sample was Western hemlock/Oregon Oxalis-NWO Cascades.

This community has a very small sample size. This description is unlikely to describe the range of conditions associated with such habitats. More intensive sampling along the transition between the Willamette Valley/foothills and the Cascades could provide more data on this community which seems to blend the Willamette Valley Symphoricarpos albus-Corylus cornuta type with the Cascades *Rubus spectabilis* groups.

High terraces/major floodplains

(***Acer macrophyllum-Alnus rubra)/Acer circinatum/Tiarella trifoliata***
(Big leaf maple-red alder)/vine maple/foamflower
(ACMA3-ALRU2)/ACCI/TITR

N=9 (WNF 9)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Acer macrophyllum	67	36
Thuja plicata	56	36
Tsuga heterophylla	56	15
Alnus rubra	44	64
Pseudotsuga menziesii	33	16
Trees-seedlings		
Thuja plicata	78	1
Abies grandis	67	5
Tsuga heterophylla	56	3
Acer macrophyllum	56	3
Shrubs		
Acer circinatum	100	40
Rubus ursinus	89	3
Oemleria cerasiformis	67	8
Herbs		
Polystichum munitum	89	9
Tiarella trifoliata	89	7
Claytonia sibirica	89	1
Athyrium filix-femina	78	10
Tolmiea menziesii	78	7
Galium triflorum	78	2
Hydrophyllum tenuipes	78	2
Asarum caudatum	78	2
Maianthemum stellatum	78	1
Circaea alpina	67	3
Adiantum pedatum	67	3
Bromus vulgaris	67	1

Elevations: 2140 to 4220 feet (average 2,520 feet).

Geomorphic surfaces: High terraces or wide, elevated floodplains, generally adjacent to or associated with overflow channels. This suggests subsurface flow through the underlying cobble valley fill. One plot is from an intermittent channel in the same area which also suggests seasonal subsurface flow.

Substrate/soils: No soil data are available. However, the community composition indicates deep loamy well drained soils capable of supporting trees and thick *Acer circinatum*.

Community: (Acer macrophyllum-Alnus rubra)/Acer circinatum/Tiarella trifoliata is a mid-elevation forested floodplain community. The overstory generally has *Acer macrophyllum* and/or *Alnus rubra*, with a mixture of conifers. The shrub layer is dominated by *Acer circinatum* over a diverse herb layer. Grasses are almost always present (89% constancy), averaging 4% cover.

Forested *Corylus cornuta/Polystichum munitum* group
Forested California hazel/sword fern group
Forested COCO6/POMU group

Group description followed by descriptions of three phases: Forested *Corylus cornuta/Polystichum munitum*-hardwood phase, Forested *Corylus cornuta/Polystichum munitum-Tsuga heterophylla/Acer circinatum /Oxalis* phase, and Forested *Corylus cornuta/Polystichum munitum-Acer macrophyllum/Acer circinatum* phase

N=20 (WNF 18, EBLM 1, Willamette Valley 1)

This constancy table is for the entire group combined. The individual phases are then presented separately.

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Acer macrophyllum	42	31
Alnus rubra	33	42
Pseudotsuga menziesii	33	25
Calocedrus decurrens	33	12
Trees-seedlings		
Acer macrophyllum	50	3
Shrubs		
Corylus cornuta	100	25
Acer circinatum	92	24
Rubus ursinus	92	4
Vaccinium parvifolium	67	3
Oemleria cerasiformis	58	3
Symphoricarpos albus	42	5

* Herb species listed on next page.

Elevations: 1050 to 2380 feet (average 1444 feet).

Geomorphic surfaces: Two variants: one present on upper banks and toeslopes; the other in wide river valleys on old terraces of large rivers below dams.

SPECIES	CONSTANCY %	TYPICAL COVER %
Herbs		
Polystichum munitum	92	27
Oxalis	83	19
Vancouveria hexandra	75	5
Galium triflorum	75	1
Athyrium filix-femina	58	3
Adiantum pedatum	58	2
Adenocaulon bicolor	50	Tr
Maianthemum stellatum	50	Tr
Bromus vulgaris	42	1
Thalictrum occidentale	42	Tr
Stachys cooleyae	42	Tr
Claytonia sibirica	42	Tr

Substrate/soils: No soils data are available.

Community: This group may be considered a single community, with a variety of tree species over an understory dominated by *Acer circinatum* and *Corylus cornuta*, with the herb layer made up primarily by *Polystichum munitum* and *Oxalis*. Samples come from the low elevation central Willamette NF and Eugene BLM McKenzie Resource Area.

The old terrace locations may be altered by changed flood regimes below dams. In the absence of large flows, the terrace variant could eventually develop a *Tsuga heterophylla-Pseudotsuga menziesii* overstory, similar to the other bank/toe slope variant.

Forested *Corylus cornuta/Polystichum munitum*-hardwood phase
Forested California hazel/sword fern-hardwood phase
Forested COCO6/POMU-hardwood phase

N=6 (WNF 6, from 2 sites)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Calocedrus decurrens	67	12
Alnus rubra	50	48
Acer macrophyllum	33	40
Pseudotsuga menziesii	33	19
Populus trichocarpa	33	15
Fraxinus latifolia	17	40
Abies grandis	17	12
Thuja plicata	17	3
Trees-seedlings		
Acer macrophyllum	50	4
Thuja plicata	33	4
Fraxinus latifolia	33	1
Shrubs		
Corylus cornuta	100	30
Rubus ursinus	100	6
Acer circinatum	83	22
Symphoricarpos albus	83	5
Oemleria cerasiformis	83	4
Herbs		
Polystichum munitum	100	33
Oxalis	83	10
Bromus vulgaris	83	1
Vancouveria hexandra	67	4
Galium triflorum	67	1
Thalictrum occidentale	67	1
Festuca subulata	67	Tr
Carex deweyana	50	4
Prunella vulgaris	50	Tr
Stachys cooleyae	50	Tr

Elevations: 1090 to 1210 feet (average 1150 feet).

Geomorphic surfaces: Large flat to gently sloping terraces or abandoned channels in wide river valleys.

Substrate/soils: Underlying substrates are generally cobbly. Soils data are not available.

Community: Forested Corylus cornuta/Polystichum munitum-*hardwood phase* is a low elevation forested floodplain community sampled on large terraces along the South Fork McKenzie River. The overstory is typically hardwood dominated, but conifers, especially *Calocedrus decurrens*, are also present. Grasses are fairly important (83% constancy), averaging 5% cover.

The Forested Corylus cornuta/Polystichum munitum-*hardwood phase* indicates moister conditions than the *Acer macrophyllum/Acer circinatum phase*, but is drier than the *Tsuga heterophylla/Acer circinatum/Oxalis phase* within the group.

Similar types: This community is similar to the Willamette Valley Symphoricarpos albus/Urtica dioica-*Fraxinus latifolia/Sambucus racemosa-Corylus cornuta phase*.

Forested *Corylus cornuta/Polystichum munitum-Tsuga heterophylla/Acer circinatum/Oxalis* phase
Forested California hazel/sword fern-*western hemlock/vine maple/sorrel phase*
Forested COCO6/POMU-*TSHE/ACCI/OXALI phase*

N=6 (WNF 5, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Tsuga heterophylla	50	38
Acer macrophyllum	50	15
Pseudotsuga menziesii	33	35
Trees-seedlings		
Tsuga heterophylla	67	5
Alnus rubra	50	7
Acer macrophyllum	50	1
Shrubs		
Acer circinatum	100	27
Corylus cornuta	100	15
Vaccinium parvifolium	100	3
Rubus ursinus	83	1
Berberis nervosa	50	3
Rubus parviflorus	50	1

* Herb species listed on next page.

Elevations: 1050 feet to 2380 feet (average 1745 feet).

Geomorphic surfaces: Toeslopes, upper banks, and terraces.

Substrate/soils: One soil description from a steep valley wall showed a deep silty loam to silty clay soil.

SPECIES	CONSTANCY %	TYPICAL COVER %
Herbs		
Oxalis	83	36
Polystichum munitum	83	15
Vancouveria hexandra	83	8
Athyrium filix-femina	83	4
Adiantum pedatum	83	3
Galium triflorum	83	1
Maianthemum stellatum	83	Tr
Tiarella trifoliata	67	5
Achlys triphylla	67	1
Adenocaulon bicolor	67	Tr
Trillium ovatum	67	Tr
Blechnum spicant	50	2
Linnaea borealis	50	2
Prosartes	50	1
Claytonia sibirica	50	Tr
Anemone deltoidea	50	Tr
Lactuca muralis	50	Tr

Community: Forested Corylus cornuta/Polystichum munitum-*Tsuga heterophylla/Acer circinatum/Oxalis phase* is a lower elevation forested riparian community. Several plots had a well developed conifer overstory, often with mature (41-320 year old) *Tsuga heterophylla* or extremely large *Pseudotsuga menziesii.*

The Forested Corylus cornuta/Polystichum munitum-*Tsuga heterophylla/Acer circinatum/Oxalis phase* indicates the moistest environments in the group.

Similar types: This community is similar to the upland Western hemlock/Oregon Oxalis-NWO Cascades plant association, but the riparian character is marked by the presence of *Alnus rubra, Athyrium filix-femina, Adiatum pedatum*, and *Blechnum spicant*. *Oxalis trilliifolia*, also a riparian indicator, was noted on several plots.

Forested *Corylus cornuta/Polystichum munitum-Acer macrophyllum/Acer circinatum* phase
Forested California hazel/sword fern-*big leaf maple/vine maple phase*
Forested COCO6/POMU-*ACMA3/ACCI phase*

N=8 (WNF 7, Willamette Valley 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Acer macrophyllum	75	39
Pseudotsuga menziesii	63	45
Abies grandis	25	25
Fraxinus latifolia	25	4
Trees-seedlings		
Acer macrophyllum	63	2
Tsuga heterophylla	63	1
Fraxinus latifolia	38	1
Shrubs		
Rubus ursinus	100	4
Acer circinatum	88	45
Corylus cornuta	88	17
Oemleria cerasiformis	50	4
Symphoricarpos albus	50	2
Rubus parviflorus	50	2
Herbs		
Galium triflorum	100	2
Polystichum munitum	88	2
Bromus vulgaris	75	8
Fragaria vesca	63	1
unknown grass	50	11
Synthyris reniformis	50	3
Hypericum perforatum	50	2
Maianthemum stellatum	50	2
Anemone deltoidea	50	1

Elevations: 255 feet to 2350 feet (average 1675 feet).

Geomorphic surfaces: Old cobbly floodplains, often in wide river valleys with major side channels or overflow channels. Flooding would occur only during major flood events.

Substrate/soils: Cobbly. No soils data are available for these samples. Cobbly sites are generally very well drained, with relatively poor water holding capacity.

Community: Forested Corylus cornuta/Polystichum munitum-*Acer macrophyllum/Acer circinatum phase* is a dry shrubby forested community of large streams and rivers at low to moderate elevations. The herb layer is dominated by grasses; summed cover averaged 15% (constancy 88). Many of the species present indicate warm dry environments (*Satureja douglasii, Synthyris renifromis, Fragaria vesca, Symphoricarpos albus*). The adjacent upland plant associations often indicate more mesic conditions. Willamette NF plots are all from the South Fork McKenzie River drainage, within the western hemlock plant series. This is a reversal from the common pattern in forested riparian communities, where the streamside vegetation indicates moister conditions than on the adjacent hillsides.

Forested Corylus cornuta/Polystichum munitum-*Acer macrophyllum/Acer circinatum phase* is the driest community in the Forested Corylus cornuta/Polystichum munitum group.

Others (seeps, swamps, wetlands, other)

Adiatum pedatum
Maidenhair fern
ADPE

N=23 (WNF 10, MHNF 7, EBLM 5, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Tsuga heterophylla	35	5
Shrubs		
Rubus spectabilis	39	4
Herbs		
Adiantum pedatum	100	23
Polystichum munitum	78	12
Oxalis	65	20
Athyrium filix-femina	65	14
Galium triflorum	61	4
Mitella ovalis	43	5
Vancouveria hexandra	43	5
Tiarella trifoliata	39	5
Claytonia sibirica	39	1
Trillium ovatum	39	1
Blechnum spicant	35	15
Aruncus dioicus	35	9

Elevations: 240 to 4620 feet (average 2,030 feet).

Geomorphic surfaces: Steep cutbanks and cliffs, averaging over 100% slope, or gentler mossy bedrock surfaces bathed by groundwater or waterfall spray.

Substrate/soils: Two general types were found: Some soils were 2 to 5 cm of silt, sand, or clay over bedrock, with soil held together by fern roots and protected by the thick organic layer largely composed of old fern fronds. Other soils were deeper (30 to 100 cm), with saturated layers at 50 to 70 cm, generally over bedrock. Water often is described as flowing over bedrock contact or through cracks or between layers in the rock. Slides are the most likely major disturbance for these surfaces.

Community: Adiatum pedatum is an herb-dominated community on steep cutbanks, cliffs, bedrock, and seeps. Shallow soils with saturated horizons and/or bedrock relatively near the surface on steep slopes limit development of the tree component.

Senecio triangularis-Caltha leptosepala
Arrowleaf groundsel-broad-leaved marsh-marigold
SETR-CALE4

N=7 (MHNF 4, WNF 2, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Vaccinium ovalifolium	29	5
Herbs		
Senecio triangularis	100	19
Caltha leptosepala	57	18
Mimulus guttatus	57	2
Boykinia major	43	7
Calamagrostis canadensis	43	7
Pleuropogon refractus	43	5
Veratrum viride	43	5
Epilobium anagallidifolium	43	5
Stachys cooleyae	43	2
Epilobium glaberrimum	43	1
Saxifraga odontoloma	29	37
Epilobium ciliatum ssp. watsonii	29	19
Trautvetteria caroliniensis	29	4
Carex luzulina	29	2
Castilleja	29	1
Platanthera stricta	29	1

Elevations: 3120 to 4420 feet (average 3,720 feet).

Geomorphic surfaces: Variable.

Substrate/soils: Always in fine textured soil with water very near the surface. Two plots were on steep muck covered bedrock or cobbles by waterfalls or cascades. Two others were in silts over rock by channel margins, while two were in wetlands.

Community: Senecio triangularis-broad-leaved marsh-marigold is an herbaceous community of moderate to high elevations, mainly in the silver fir and mountain hemlock zones.

***Oplopanax horridum-Rubus spectabilis* group**
Devils club-salmonberry group
OPHO-RUSP group

Group description followed by descriptions of three phases: *Oplopanax horridum-Rubus spectabilis*-shrub phase, *Oplopanax horridum-Rubus spectabilis-Alnus rubra* phase, and *Oplopanax horridum-Rubus spectabilis-Thuja plicata* phase

N=31 (MHNF 23, WNF 4, EBLM 2, SBLM2)

This constancy table is for the entire group combined.

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	42	24
Thuja plicata	23	27
Trees-seedlings		
Tsuga heterophylla	23	1
Shrubs		
Oplopanax horridum	100	31
Rubus spectabilis	77	23
Ribes bracteosum	71	14
Herbs		
Oxalis	87	22
Athyrium filix-femina	84	13
Tolmiea menziesii	68	8
Polystichum munitum	55	7
Galium triflorum	45	2
Maianthemum stellatum	42	2
Claytonia sibirica	42	1
Hydrophyllum tenuipes	39	10

Elevations: 920 to 4120 feet (average 2370 feet).

Geomorphic surfaces: Two general types of sites: gentle (0-20% slope) cobbly floodplains or stream banks on steep (80-100% slope) seepy cliffs and upper banks. The *Thuja plicata* phase can occupy other environments which suggest sub-surface flow, including wetland perched on a terrace and an adjacent area with subsurface flow, abandoned

beaver sites, a muddy overflow channel, and a mostly saturated mid-channel island.

Substrate/soils: Substrates vary, from shallow silty sands over cobbles to deeper soils (silt, silty sands, loams, sandy silts) with cobbly matrix. The finer textured top horizons and deeper soils are more common in the *Alnus rubra* and *Thuja plicata* phases. The group seems strongly associated with wet well-aerated rooting zones.

Community: The Oplopanax horridum-Rubus spectabilis group crosses a wide elevational range in the Cascades. *Alnus rubra* and/or *Thuja plicata* make up the tree layer where present. The shrub layer is dominated by *Oplopanax horridum*. *Rubus spectabilis* and *Ribes bracteosum* are generally present and abundant.

Similar types: The Oplopanax horridum-Rubus spectabilis group is similar to the Ribes bracteosum-Rubus spectabilis/Oxalis group.

***Oplopanax horridum-Rubus spectabilis*-shrub phase**
Devils club-salmonberry-*shrub phase*
OPHO-RUSP-*shrub phase*

N=14 (MHNF 11, WNF 2, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Oplopanax horridum	100	34
Rubus spectabilis	71	20
Ribes bracteosum	64	10
Herbs		
Oxalis	86	21
Athyrium filix-femina	79	10
Tolmiea menziesii	71	4
Polystichum munitum	57	8
Gymnocarpium dryopteris	50	7
Galium triflorum	50	4
Maianthemum stellatum	36	2
Claytonia sibirica	36	1

Elevations: 800 to 4120 feet (average 2354 feet).

Geomorphic surfaces: Gentle (0-20% slope) cobbly floodplains and stream banks or on steep (80-100% slope) seepy cliffs and upper banks.

Substrate/soils: Substrates vary, from shallow silty sands over cobbles to deeper soils with a cobbly matrix. One site was a rock cliff. The community seems strongly associated with wet well-aerated rooting zones.

Community: Oplopanax horridum-Rubus spectabilis-*shrub phase* is a shrub and herb dominated community found across a wide elevation range. *Oplopanax horridum* and *Rubus spectabilis* are the dominant shrubs; *Ribes bracteosum* is also commonly present but at lower cover.

O*plopanax horridum-Rubus spectabilis-Alnus rubra* phase
Devil's club-salmonberry-*red alder phase*
OPHO-RUSP-*ALRU2 phase*

N=11 (MHNF 9, SBLM 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	73	24
Tsuga heterophylla	36	20
Shrubs		
Oplopanax horridum	100	32
Rubus spectabilis	82	25
Ribes bracteosum	82	19
Vaccinium ovalifolium/V.alaskaense	45	11
Herbs		
Oxalis	91	20
Athyrium filix-femina	82	13
Hydrophyllum tenuipes	64	6
Tolmiea menziesii	55	9
Polystichum munitum	55	7
Streptopus amplexifolius	45	2
Maianthemum stellatum	45	2
Dicentra formosa	45	2
Claytonia sibirica	45	1
Stachys cooleyae	36	5
Galium triflorum	36	1
Trillium ovatum	36	1

Elevations: 1420 to 3190 feet (average 2400').

Geomorphic sufaces: Two general types of sites: gentle (2-19% slope) cobbly floodplains and stream banks or on steep (60-100% slope) seepy cliffs and cut banks.

Substrate/soils: Substrates vary, from shallow silty sands over cobbles to deeper soils (silt, silty sands, loams, sandy silts) with a cobbly matrix. The finer textured top horizons are somewhat deeper than the Oplopanax horridum-Rubus spectabilis-*shrub phase*. The community seems strongly associated with wet well-aerated rooting zones.

Community: Oplopanax horridum-Rubus spectabilis-*Alnus rubra phase* is a community with a fairly open overstory of *Alnus rubra* and/or *Tsuga heterophylla* over a thick shrub layer. The herb layer is somewhat sparser than similar Oplopanax horridum phases.

Young *Alnus rubra* stands were most common, but *Tsuga heterophylla* up to 110 years were recorded. One low elevation site had a 153 year old *Abies grandis* present. This suggests that these communities are subject to periodic flooding that can be powerful enough to eliminate the overstory trees. However, for some sites, intervals between flooding may be long enough for conifer establishment and growth to sizes which may allow the trees to survive less severe flood events.

Similar types: This community could be considered a phase of the Ribes bracteosum-Rubus spectabilis/Oxalis group, but it occurs with species combinations common in higher elevation communities, including *Vaccinium ovalifolium*, *Maianthemum stellatum* and *Steptopus amplexifolius*.

***Oplopanax horridum-Rubus spectabilis-Thuja plicata* phase**
Devil's club-salmonberry-*western redcedar phase*
OPHO-RUSP-*THPL phase*

N=6 (MHNF 3, WNF 2, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Thuja plicata	100	35
Alnus rubra	67	27
Acer macrophyllum	33	48
Taxus brevifolia	33	8
Trees-seedlings		
Thuja plicata	50	3
Shrubs		
Oplopanax horridum	100	26
Rubus spectabilis	83	21
Ribes bracteosum	67	13
Sambucus racemosa	50	6
Herbs		
Athyrium filix-femina	100	18
Tolmiea menziesii	83	14
Oxalis	83	29
Polystichum munitum	50	8
Hydrophyllum tenuipes	50	3
Maianthemum stellatum	50	3
Galium triflorum	50	2
Claytonia sibirica	50	Tr

Elevations: 920 to 2600 feet (average 2035 feet).

Geomorphic surfaces: Variable, including a wetland perched on a terrace and an adjacent area with subsurface flow, around abandoned beaver sites, a muddy overflow channel, and a mostly saturated mid-channel island.

Substrate/soils: Relatively deep with organic matter accumulating at the surface. Textures were silt loams or silty clay loams over clay, sandy clay or sand. The two sites associated with old beaver activity showed high organic matter mixed with sand in the top horizons over cobbles.

Soil textures and tree ages suggest that erosive flooding may be relatively infrequent. Soils stay wet most of the year.

Community: Oplopanax horridum-Rubus spectabilis-*Thuja plicata phase* is a community with an overstory of *Thuja plicata* and *Alnus rubra or Acer macrophyllum*. *Thuja plicata* stands were older than most trees sampled in *Rubus spectabilis* communities, and averaged 32" dbh (range14-45"). *Alnus rubra* in one stand were over 100 years.

Similar types: Thuja plicata/Oplopanax horridum-Rubus spectabilis has more *Oplopanax horridum, Ribes bracteosum*, and *Tolmeia menziesii* than Thuja plicata/Rubus spectabilis/Oxalis. It also has less *Polystichum munitum*. Together, these suggest that the *Oplopanax horridum* community is somewhat wetter.

Picea engelmannii/Vaccinium membranaceum
Engelmann spruce/big huckleberry
PIEN/VAME

N=3 (WNF 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Picea engelmannii	100	20
Tsuga mertensiana	67	8
Abies lasiocarpa	67	4
Trees-seedlings		
Abies lasiocarpa	100	3
Tsuga mertensiana	67	1
Shrubs		
Vaccinium membranaceum	100	18
Ribes	100	9
Rubus pedatus	67	3
Herbs		
Achlys triphylla	100	5
Clintonia uniflora	100	4
Valeriana sitchensis	100	2
Orthilia secunda	100	1
Trillium ovatum	100	Tr
Tiarella trifoliata	67	3
Mitella breweri	67	3
Athyrium filix-femina	67	3
Viola glabella	67	2
Viola	67	2
Senecio triangularis	67	1
Trisetum cernuum	67	1
Xerophyllum tenax	67	1
Anemone deltoidea	67	1

Elevations: 4720 to 4880 feet (average 4805 feet).

Geomorphic surfaces: Banks, cobble/boulder bars, and overflow channels, often along intermittent channels

Substrate/soils: No soils data are available for these sites.

Community: Picea engelmannii/Vaccinium membranaceum is a community sampled in the high elevation Mink Lake Basin in the Willamette NF's Three Sisters Wilderness area. Adjacent stands for all three sites are in the Mountain hemlock/Vaccinium membranaceum/ beargrass plant association. Trees may be rooted in the plots or may overhang the banks and bars. The shrub layer is fairly sparse. The herb layer has species common to the mesic Mountain hemlock/big leaf huckleberry/queencup beadlily upland plant association, including *Achlys triphylla*, *Clintonia uniflora*, *Valeriana sitchensis*, and *Orthilia secunda*. However, it also includes low cover of more riparian species such as *Mitella brewerii* and *Athyrium filix-femina*, as well as *Picea engelmannii*. Trees noted on one plot were saplings and poles. These surfaces may be flooded during high winter flow.

Vaccinium ovalifolium-Rubus spectabilis/Lysichiton americanum
Oval-leaved huckleberry-salmonberry/skunk cabbage
VAOV-RUSP/LYAM3

N=9 (MHNF 9)

Species	Constancy %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	33	48
Trees-seedlings		
Alnus rubra	33	9
Abies amabilis	33	2
Shrubs		
Rubus spectabilis	100	10
Vaccinium ovalifolium	89	20
Ribes bracteosum	56	12
Ribes lacustre	44	3
Alnus incana	33	27
Viburnum edule	33	7
Menziesia ferruginea	33	5
Lonicera involucrata	33	4
Herbs		
Lysichiton americanum	100	8
Tiarella trifoliata var. unifoliata	67	3
Gymnocarpium dryopteris	56	7
Achlys triphylla	56	4
Athyrium filix-femina	56	4
Streptopus lanceolatus var. curvipes	56	4
Streptopus amplexifolius	56	3
Boykinia major	44	12
Cornus unalaschkensis	44	4

Elevations: 3000 to 4130 feet (average 3725 feet).

Geomorphic surfaces: Inactive side channels or other sites where subsurface flow was noted. One site was in a wetland associated with a lake. Plots averaged less than 5% slope. Most samples are on Lowe Creek, Clackamas Ranger District, Mt. Hood NF.

Substrate/soils: Water tables were encountered in all soil pits at depths from 2-65 cm (average 36 cm). Mottles at 10-30 cm were found in a third of the pits. Several sites had muck layers over sandy horizons. Most were relatively deep soils (average 78 cm), with silty sands, sands, or silts over gravels or cobbles. Sandy horizons often overlay horizons of silt or sandy silt.

Community: Vaccinium ovalifolium-Rubus spectabilis/Lysichiton americanum is a higher elevation forested swamp community generally found in the silver fir zone. It is a shrub dominated type that can occur under an *Alnus rubra* canopy (average 19 foot canopy height). *Alnus rubra* stands ranged from seedlings/sapling stages to older patches with ages up to115 years old. One site had *Picea engelmannii* in the overstory.

These sites are too poorly drained for many conifer species. Many of the surfaces are clearly subject to frequent flooding as well.

Thuja plicata/Rubus spectabilis/Lysichiton americanum/Oxalis
Western red cedar/salmonberry/skunk cabbage-sorrel
THPL/RUSP/LYAM3-OXALI

N=6 (MHNF 4, SBLM 1, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Thuja plicata	67	18
Alnus rubra	50	18
Shrubs		
Rubus spectabilis	83	16
Ribes bracteosum	67	46
Oplopanax horridum	67	2
Sambucus racemosa	50	1
Herbs		
Oxalis	100	19
Lysichiton americanum	100	13
Athyrium filix-femina	100	9
Mitella ovalis	50	8
Dryopteris carthusiana	50	4
Polystichum munitum	50	2

Elevations: 1460 to 3600 feet (average 2507 feet).

Geomorphic surfaces: Surfaces with subsurface flow adjacent to creeks, old stream channels, stream bank seeps, or in a fen.

Substrate/soils: Poorly drained. Mottling or gleying were found at an average of 25 cm. Summer water table was at 15-19 cm. Top horizons were generally silt loams or silty clay loams over silty clays or sandy clays. Few sites had exposed surface coarse fragments. Several sites had mucky top layers.

Community: Thuja plicata/Rubus spectabilis/Lysichiton americanum/Oxalis is a forested wetland community in moderate elevations. Overstory trees averaged 33%, though some may have been overhanging this community (84 feet average canopy height). Trees on plots in this community were larger than most other *Rubus spectabilis* types. Site trees ranged from 61 to 96 years old. One plot had *Thuja plicata* with diameters up to 43".

Poorly drained soils limit this community to species which can be successful with high water tables and occasional flooding, such as *Thuja plicata* and *Lysichiton americanum*.

Abies amabilisVaccinium ovalifolium
Silver fir/oval-leaved huckleberry
ABAM/VAOV

N=4 (MHNF 4)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Abies amabilis	100	18
Chamaecyparis nootkatensis	75	9
Tsuga heterophylla	75	7
Picea engelmannii	50	10
Alnus rubra	50	9
Trees-seedlings		
Abies amabilis	100	5
Tsuga heterophylla	100	2
Chamaecyparis nootkatensis	75	5
Alnus rubra	50	7
Picea engelmannii	50	1
Shrubs		
Vaccinium ovalifolium	100	32
Rhododendron albiflorum	75	11
Ribes lacustre	75	2
Rubus spectabilis	75	1
Viburnum edule	75	Tr
Sorbus sitchensis	50	2
Gaultheria ovatifolia	50	2
Vaccinium membranaceum	50	1
Spiraea douglasii	50	Tr

* Herb species listed on next page.

Elevations: 3040 to 4520 feet (average 4000 feet).

Geomorphic surfaces: Flat with forested hummocks, typically found in wetlands along perennial or intermittent channels.

Substrate/soils: Deep muck/peat accumulations, with evidence of buried soils. Soils are generally wet, with the water table from 0 to 35 cm.

SPECIES	CONSTANCY %	TYPICAL COVER %
Herbs		
Cornus unalaschkensis	100	13
Clintonia uniflora	100	1
Tiarella trifoliata var. unifoliata	75	6
Athyrium filix-femina	75	6
Achlys triphylla	75	6
Caltha leptosepala	50	8
Carex echinata	50	5
Trautvetteria caroliniensis	50	3
Lysichiton americanum	50	2
Valeriana sitchensis	50	2
Viola glabella	50	1
Streptopus amplexifolius	50	1
Viola palustris	50	1

Community: Abies amabilis/Vaccinium ovalifolium is a wet forested community in the silver fir zone. This is a diverse mixed community of alternating hummocks and swales. Mature trees occur on slightly raised hummocks, often of rooted wood.

The difference between the oldest and youngest site trees on a plot averaged 98 years. In these communities, tree establishment appears to be gradual, occurring either in response to small intermediate disturbances or singly. Major disturbance intervals in this community may be fairly long.

Northwest Oregon Coast Range

Coast Range key

A. Herbaceous community within channel-immersion tolerant species present, often grassy and weedy

1. *Chrysosplenium glechomifolium* >=5% .....**Chrysosplenium glechomifolium** p.121

2. *Equisetum* present, *Equisetum*>*Oenanthe sarmentosa* ..... **Equisetum** p.119

See *Equisetum arvense* for wetland phase (Christy p.296)

3. *Oenanthe sarmentosa* present, *Oenanthe sarmentosa*> *Equisetum* .....**Oenanthe sarmentosa** p.123

See *Oenanthe sarmentosa* for wetland phase (Christy p. 312)

B. Herbaceous community at channel margin or mid-channel bar, immersion tolerant species (*Chrysosplenium glechomifolium, Oenanthe sarmentosa*, *Mimulus guttatus*) absent. *Oxalis, Athyrium filix-femina*, and *Tolmeia menziesii* codominant, *Rubus spectabilis* and *Ribes bracteosum* absent .....**Oxalis-Tolmeia menziesii** p.126

For more herb-dominated communities (aquatic beds, emergent marshes, marshes, fens/peatlands, or wet prairies), see herbaceous wetlands key (Christy pp. 204).

C. Shrub communities; trees may be present (See also D, E and F for special tree communities.)

1. *Corylus cornuta* dominant

a. *Rubus spectabilis* important shrub ..... **Acer macrophyllum/Corylus cornuta-Rubus spectabilis** p. 151

b. *Rubus spectabilis* absent, *Acer circinatum* important shrub .....**Corylus cornuta-Acer circinatum/Oxalis** p. 146

2. *Rubus spectabilis* and/or *Ribes bracteosum* >5% or dominant shrubs

a. *Ribes bracteosum* an important shrub

1) *Oplopanax horridum* dominant or co-dominant, *Rubus spectabilis* minor or absent
.....**Oplopanax horridum-Ribes bracteosum** p. 137

2) Immersion tolerant species *Chrysosplenium glechomifolium* and/or *Oenanthe sarmentosa* present, at channel margin
... **Rubus spectabilis-Ribes bracteosum/Chrysosplenium glechomifolium** p. 128

3) Immersion tolerant species absent
..... **Rubus spectabilis-Ribes bracteosum group** p. 131

a) *Tiarella trifoliata* > sum of *Stachys, Claytonia sibirica* and *Mimulus dentatus*, or sum of the 3 <5%
..... **Rubus spectabilis-Ribes bracteosum-*Tiarella trifoliata phase*** p. 135

b) Sum *of Stachys, Claytonia sibirica* and *Mimulus dentatus* >5%
..... **Rubus spectabilis-Ribes bracteosum-*Stachys phase*** p. 133

b. *Rubus spectabilis*>5%, *Ribes bracteosum* minor or absent

1) *Vaccinium alaskaense* dominant
..... **Vaccinium alaskaense-Rubus spectabilis** p. 150

2) *Corylus cornuta* dominant or codominant with *Rubus spectabilis*
.....**Acer macrophyllum/Corylus cornuta-Rubus spectabilis** p. 151

3) Sum of *Athyrium filix-femina* and *Tolmeia menziesii*> *Polystichum munitum*
.....**Rubus spectabilis/Tolmeia menziesii-Oxalis group** p. 139

a) *Athyrium filix-femina>Polystichum munitum* or *Mitella ovalis*>2%
.....**Rubus spectabilis/Tolmeia menziesii-Oxalis-*Mitella ovalis phase*** p. 141

b) *Polystichum munitum>Athyrium filix-femina*, or *Mitella ovalis* absent
.....**Rubus spectabilis/Tolmeia menziesii-Oxalis-*Polystichum munitum phase*** p. 143

4) *Polystichum munitum*>sum of Athyrium filix-femina and *Tolmeia menziesii Rubus spectabilis* communities on terraces, steep banks, and slides, transitional to upland

a) Steep bank/slides, moist indicators (*Stachys, Tolmeia menziesii*) absent or very minor
..... **Rubus spectabilis-Acer circinatum** p. 153

b) *Stachys* and/or *Tolmeia menziesii* always present
..... **Rubus spectabilis/Polystichum munitum** p. 148

3. *Spiraea douglassii* thicket, see *Spiraea douglassii* Association (Christy p. 242)

D. *Alnus rubra/Lysichiton americanum* swamps

1. *Carex obnupta* >=5%, dominant or co-dominant with *Lysichiton americanum*
.....***Alnus rubra/Carex obnupta-Lysichiton americanus*** (Christy p. 209)

2. *Carex obnupta* <5%, *Athyrium filix-femina* may be co-dominant with *Lysichiton americanum*,
..... ***Alnus rubra/Athyrium filix-femina-Lysichiton americanus*** (Christy p. 208)

E. Sitka spruce swamps

1. *Carex obnupta* dominant herb, with *Lysichiton americanum* and *Oenanthe sarmentosa* in wet hollows
.....***Picea sitchensis/Carex obnupta-Lysichiton americanus*** (Christy p. 215)

2. *Lysichiton americanum* swamp, *Carex obnupta* minor or absent, *Cornus sericea* dominant shrub
..... ***Picea sitchensis/Cornus sericea/Lysichiton americanus*** (Christy p. 216)

F. Willow communities

1. *Salix lucida* co-dominant with *Salix sitchensis, Lysichiton americanum* swamp
.....***Salix lucida ssp. lasiandra/Salix sitchensis/Lysichiton americanus*** (Christy p. 240)

2. *Salix lucida* minor or absent, *Salix sitchensis* dominant, with *Lysichiton americanum* and/or *Carex aquatalis var. dives* the dominant herbs..... ***Salix sitchensis* complex** (Christy p. 241)

For more shrub-dominated communities (shrub swamps), see shrubland wetlands key (Christy p. 200).

For more tree-dominated communities (forested swamps), see forest and woodlands wetlands key (Christy p. 198).

In channel:

Equisetum
Horsetail
EQUIS

N=7 (SNF 6, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-seedlings		
Alnus rubra	29	Tr
Shrubs		
Rubus spectabilis	71	1
Herbs		
Equisetum	100	28
Athyrium filix-femina	86	4
Stachys mexicana	86	2
Oxalis trilliifolia	71	9
Digitalis purpurea	71	4
Tolmiea menziesii	71	3
Oenanthe sarmentosa	71	3
Galium triflorum	71	1
Holcus lanatus	57	5
Glyceria striata	57	4
Mimulus moschatus	57	3
Senecio jacobaea	57	2
Mimulus dentatus	57	2
Veronica americana	57	2
Cirsium arvense	57	1
Viola glabella	57	Tr
Carex deweyana	43	4
Stellaria media	43	3
Petasites frigidus	43	2
Rumex obtusifolius	43	2
Scirpus microcarpus	43	2
Claytonia sibirica	43	1
Prunella vulgaris	43	1
Bromus vulgaris	43	1
Stellaria crispa	43	1
Cirsium	43	Tr

Juncus	43	Tr
Chrysosplenium glechomifolium	43	Tr
Polystichum munitum	43	Tr
Cardamine occidentalis	43	Tr

Elevations: 30 to 600 feet (average 280 feet).

Geomorphic surfaces: Gently sloping sandy gravel/cobble bars within annual flood zone in wide valleys (>100m). Summer low flow is generally within 20 cm. A second setting occurs with beaver dams. These sites are flooded much of the winter.

Substrate/soils: Depositional bar sites have pockets or thin layers of sand overlaying coarser alluvium. Beaver dam sites can have fairly deep poorly drained soil. One pit had a water table within 10 cm of the surface and mottling at 36cm, soil textures silt over silt loam. Another site had coarse sand deposited over fine sand, overlying sandy clay, and clay.

Community: The Equisetum community is a weedy, grassy community with almost no shrub layer and very low overhanging tree cover. *Alnus rubra* seedlings may be present, but no mature trees are found. Grasses average 27% summed cover; graminoids (sedges, bulrushes) 4% cover. Weeds such as *Phalaris arundinacea* can completely dominate this open, frequently disturbed community. Both settings provide good seedbeds for opportunistic weedy species and species tolerant of flooding.

Chrysosplenium glechomaefolium
Water-carpet
CHGL5

N=7 (SNF 5, SBLM 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Rubus spectabilis	86	16
Sambucus racemosa	57	16
Herbs		
Chrysosplenium glechomifolium	100	25
Athyrium filix-femina	100	7
Oxalis	86	18
Tolmiea menziesii	86	13
Oenanthe sarmentosa	71	9
Stachys mexicana	71	4
Mitella ovalis	57	11
Claytonia sibirica	57	10
Poa trivialis	43	54
Urtica dioica ssp. gracilis	43	9
Polystichum munitum	43	6
Mitella caulescens	43	3
Glyceria striata	43	3
Blechnum spicant	43	2
Equisetum	43	2
Bromus vulgaris	43	2
Stellaria crispa	43	2
Mimulus dentatus	43	1
Digitalis purpurea	43	Tr

Elevations: 30 to 1440 feet (average 315 feet).

Geomorphic surfaces: Often directly adjacent to the channel, in overflow channels, or in a swamp. Most sites are at or just above summer low flow.

Substrate/soils: Generally on gravel or cobble substrates. Sandy loams over sands, or sandy clay loams over sandy clays over coarse alluvium. Rooting depth is limited by water or anaerobic conditions near the surface.

Community: Chrysosplenium glechomifolium is an herbaceous community occurring on surfaces that are inundated much of the year. Flood tolerant indicators include *Chrysosplenium glechomifolium, Oenanthe sarmentosa*, and *Ranunculus repens var. repens. Rubus spectabilis* and *Sambucus racemosa* can occur in this community, but often provide overhanging cover only. This open, frequently disturbed community has the highest typical cover in grasses of all streamside types in northwest Oregon. It can also be extremely weedy. *Poa trivialis* and *Ranunculus repens var. repens* can be dominants on some plots. Giant knotweeds (*Polygonum cuspidatum , P. sachalinense, P. polystachyum*) can also invade this community.

These sites are too frequently disturbed and under water too long to develop a stable tree and shrub component.

Oenanthe sarmentosa
Waterparsley
OESA

N=5 (SNF 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	20	25
Trees-seedlings		
Alnus rubra	40	Tr
Shrubs		
Rubus spectabilis	80	2
Sambucus racemosa	80	2
Ribes bracteosum	40	1
Herbs		
Oenanthe sarmentosa	100	17
Athyrium filix-femina	100	3
Tolmiea menziesii	80	17
Ranunculus repens var. repens	80	16
Oxalis trilliifolia	60	5
Urtica dioica ssp. gracilis	60	5
Rumex obtusifolius	60	4
Galium triflorum	60	1
Digitalis purpurea	60	Tr
Claytonia sibirica	60	Tr
Agrostis exarata	40	48
Heracleum lanatum	40	38
Scirpus microcarpus	40	13
Glyceria striata	40	5
Mitella ovalis	40	3
Festuca subulata	40	3
Carex deweyana	40	2
Holcus lanatus	40	1
Prunella vulgaris	40	1
Stachys mexicana	40	1
Stellaria crispa	40	Tr

Elevations: 30 to 420 feet (average 225 feet).

Geomorphic surfaces: Annually flooded sandy bars and islands, or bedrock channel margins.

Substrate/soils: Sands to loamy sands or silt loams in cobbles and boulders, saturated, anaerobic conditions in the lower profile, with summer water tables within 45 to 60 cm of the surface.

Community: Oenanthe sarmentosa is an herb dominated community, though *Rubus spectabilis* and *Sambucus racemosa* are frequently present at very low cover. Grasses, graminoids, and exotic species are prominent in this open, frequently disturbed type. Grasses average 38% summed cover. Graminoids (sedges, bulrushes) average 18% summed cover. Exotic species are present on every plot, averaging 38% cover.

These surfaces are flooded much of the winter. Disturbance and rooting conditions prevent succession to stable conifer stands. Risk of invasion by aggressive exotic species is high.

The Oenanthe sarmentosa community can be adjacent to the channel, or it can occur above the Equisetum or Chrysosplenium glechomifolium types.

Mid-channel bars or channel margin:

Oxalis-Tolmeia menziesii
Sorrel-piggyback plant
OXALI-TOME

N=13 (EBLM 6, SBLM 4, SNF 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Shrubs		
Vaccinium parvifolium	46	9
Herbs		
Oxalis	100	32
Athyrium filix-femina	100	17
Tolmiea menziesii	100	16
Polystichum munitum	77	14
Stachys	62	14
Mitella ovalis	54	13
Adiantum pedatum	54	7
Galium triflorum	54	4
Stellaria crispa	54	2
Claytonia sibirica	46	4
Tiarella trifoliata	38	12
unknown grass	38	8
Circaea alpina	38	5

Elevations: 100 to 915 feet (average 650 feet).

Geomorphic surfaces: Narrow active annual floodplains and steep stream banks.

Substrate/soils: Generally fairly shallow, with mottling and/or gleying within 50 cm. Water tables are often within 50 cm. O layers are well developed. A horizons are silt loams or sandy loams. B horizons are sandy clay loams, silty clay loams, or silty sands. Gleyed horizons can be perched above bedrock or cobble/gravel creekbed material. Multiple B horizons in some soil pits are evidence of repeated floods resetting the surfaces.

These active floodplains have well developed soils, but rooting conditions are affected by the shallow water table. The geomorphic surfaces are flooded annually.

Community: Oxalis-Tolmeia menziesii is an herbaceous community of low to moderate elevations across the Coast Range. Overhanging deciduous tree canopy is common, although only one plot had an *Alnus rubra* seedling (15 years old). The shrub layer is generally minor.

This community lacks the species such as *Oenanthe sarmentosa* or *Chrysosplenium glechomifolium* which are well adapted to depositional bars frequently under prolonged flooding. The community also had a much lower percentage of grasses and weeds than the in-channel herbaceous communities.

Rubus spectabilis-Ribes bracteosum/Chrysosplenium glechomifoloium
Salmonberry-stink currant/water-carpet
RUSP-RIBR/CHGL5

N=19 (SNF 14, SBLM 4, EBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	26	69
Shrubs		
Rubus spectabilis	100	22
Ribes bracteosum	84	17
Herbs		
Athyrium filix-femina	95	17
Tolmiea menziesii	95	13
Chrysosplenium glechomifolium	89	10
Oxalis	86	25
Polystichum munitum	74	11
Galium triflorum	68	3
Stachys mexicana	68	2
Oenanthe sarmentosa	63	5
Viola glabella	63	1
Claytonia sibirica	53	2
Mimulus dentatus	47	5
Mitella ovalis	47	3
Mimulus guttatus	47	2
Equisetum	47	1
Blechnum spicant	42	3
Stellaria crispa	42	1
Carex	37	2
Tiarella trifoliata	37	2
Glyceria striata	37	1
Carex deweyana	37	1
Bromus vulgaris	37	1
Cardamine angulata	37	tr

Elevations: 50 to 1440 (average 560 feet).

Geomorphic surfaces: Mid-channel bars, annual floodplains and stream banks. These sites are flooded much of the winter. Some surfaces were bisected by active or overflow channels.

Substrate/soils: Seepy silt-covered bedrock floodplains or gravel-, cobble-, and boulder-bars. Soils varied. The community generally occurs where water is within 70 cm. Annual floodplain plots had sandy loams or loamy sands with mottles or gleying within 60 cm overlaying coarse alluvium or bedrock. Depositional bars had shallow sand layers over cobbles. Sites are most often directly adjacent to the channel. Occasionally, the Equisetum or Chrysosplenium glechomifolium communities can be found between the channel and the Rubus spectabilis-Ribes bracteosum/Chrysosplenium glechomifolium community.

Community: The Rubus spectabilis-Ribes bracteosum/Chrysosplenium glechomifolium community is a mid-channel bar or channel-margin type. Overstory *Alnus rubra, Acer macrophyllum*, and *Picea engelmannii* 5 to 45 years old, are found on a few plots. Some members of a suite of flood-tolerant indicators are always present, including *Chrysosplenium glechomifolium, Oenanthe sarmentosa, Mimulus guttatus*, and *Scirpus microcarpus*. Where trees are present, shrub covers are higher and *Polystichum munitum* more common. Where trees are absent, *Petasites frigidus* tends to occur more often.

Active channel shelf/active floodplain/first floodplains

***Rubus spectabilis-Ribes bracteosum* group**
Salmonberry-stink currant group
RUSP-RIBR group

Group description followed by descriptions of two phases: Rubus spectabilis-Ribes bracteosum-*Stachys phase* and *Rubus spectabilis-Ribes bracteosum-Tiarella trifoliata* phase.

N=28 (SBLM 14, EBLM 8, SNF 6)

This constancy table is for the entire group combined. The individual phases are then presented separately.

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	36	40
Shrubs		
Ribes bracteosum	100	23
Rubus spectabilis	96	48
Acer circinatum	39	15
Sambucus racemosa	36	15
Herbs		
Oxalis	89	22
Athyrium filix-femina	89	10
Tolmiea menziesii	86	18
Polystichum munitum	79	15
Galium triflorum	61	5
Stachys	57	17
Stellaria crispa	46	1
Mimulus dentatus	43	5
Adiantum pedatum	43	3
Claytonia sibirica	43	3
Tiarella trifoliata	36	12
Mitella caulescens	36	9
Circaea alpina	36	5

Geomorphic surfaces: Active annual floodplains and cutbanks. Summer water tables are below 50 cm.

Substrate/soils: Surfaces are relatively stable, and have well developed A and B horizons under organic layers 3 to 10 cm deep. Buried soils in several plots show that these sites experience major erosion/deposition events. A horizons are loams (ave.15 cm). B horizons are most often sandy loams (ave. 19 cm), but can be loamy sands to sands.

These sites are frequently flooded, but not often subject to high energy flows that would remove organic material and fines. Many sites accumulated logs that could also slow flood waters and protect vegetation.

Community: The Rubus spectabilis-Ribes bracteosum group is very common on active floodplains and banks. *Alnus rubra* or *Acer macrophyllum* can establish and survive moderate disturbances. Shrub competition may reduce tree regeneration. The Rubus spectabilis-Ribes bracteosum-*Stachys phase* soils are generally coarser and shallower, with more sandy loams and sands in the top horizons. The Rubus spectabilis-Ribes bracteosum-*Tiarella trifoliata phase* appears to have deeper, more organic-rich and finer textured soils. *Rubus spectabilis* cover is very high in the *Tiarella trifoliata* phase, averaging 59%.

***Rubus spectabilis-Ribes bracteosum-Stachys* phase**
Salmonberry-stink currant-*betony phase*
RUSP-RIBR-*STACH phase*

N=9 (SBLM 6, EBLM 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	56	27
Shrubs		
Rubus spectabilis	100	27
Ribes bracteosum	100	20
Sambucus racemosa	44	12
Oplopanax horridum	33	19
Herbs		
Athyrium filix-femina	100	7
Tolmiea menziesii	89	25
Oxalis	89	23
Stachys	89	11
Galium triflorum	89	6
Polystichum munitum	78	15
Mimulus dentatus	78	6
Claytonia sibirica	78	4
Circaea alpina	67	6
Stellaria crispa	67	3
Stachys	56	10
Bromus	56	8
Carex deweyana	56	7
Adiantum pedatum	56	3
Mitella caulescens	44	11
Blechnum spicant	44	5
Digitalis purpurea	44	1
Montia parvifolia	33	10
Chrysosplenium glechomifolium	33	7
Hydrophyllum	33	3
Ranunculus uncinatus	33	2

SPECIES	CONSTANCY %	TYPICAL COVER %
unknown grass	33	2
Cardamine angulata	33	1
Dicentra formosa	33	1

Elevations: 320 to 1390feet (average 780 feet).

Geomorphic surfaces: Bars, islands, or active floodplains within normal high water line. Some plots were on steep cutbanks with shallow soils.

Substrate/soils: Soils tend to be somewhat coarser and shallower than the average for the group, with more sandy loams and sands in the top horizons. A horizons average 11 cm, and B horizons average 14 cm.

Community: Rubus spectabilis-Ribes bracteosum-Stachys phase is shrub dominated, with a rich herb layer.

Within the Rubus spectabilis-Ribes bracteosum group, the Rubus spectabilis-Ribes bracteosum-*Stachys phase* has more consistent *Stachys, Claytonia sibirica*, and *Mimulus dentatus*. Average *Rubus spectabilis* cover in the *Stachys* phase is less than half the average cover in the *Tiarella trifoliata* phase.

Alnus rubra and *Acer macrophyllum* can establish and persist in this community. Deciduous tree ages ranged from 10 to 105 years. No overstory conifers were recorded.

***Rubus spectabilis-Ribes bracteosum-Tiarella trifoliata* phase**
Salmonberry-stink currant-*foamflower phase*
RUSP-RIBR-*TITR phase*

N=18 (SBLM 7, SNF 6, EBLM 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	28	52
Shrubs		
Ribes bracteosum	100	25
Rubus spectabilis	94	63
Acer circinatum	50	16
Sambucus racemosa	33	16
Vaccinium parvifolium	33	3
Herbs		
Oxalis	89	20
Polystichum munitum	83	15
Tolmiea menziesii	83	13
Athyrium filix-femina	83	11
Tiarella trifoliata	50	12
Galium triflorum	44	2
Stachys	39	4
Adiantum pedatum	39	3
Stellaria crispa	39	tr
Hydrophyllum tenuipes	33	5

Elevations: 320 to 1540 feet (average 710 feet).

Geomorphic surfaces: Active annual floodplains adjacent to the channel, sometimes within normal high water line. This type also occurs in sites such as a large raised alluvial fan at a tributary junction and on steep slopes on very narrow second order streams without a developed valley floor.

Substrate/soils: A horizons are loams and silt loams, averaging 20 cm depth. B horizons are sandy loams or silt loams, and average 25 cm depth. The Rubus spectabilis-Ribes bracteosum-*Tiarella trifoliata phase* appears to have deeper, more organic rich, and finer textured soils than the *Stachys* phase.

Community: Rubus spectabilis-Ribes bracteosum-*Tiarella trifoliata phase* has extremely dense shrub cover. *Rubus spectabilis* cover is very high (average 59%) in the *Tiarella trifoliata* phase, approximately twice the average in the *Stachys* phase. *Alnus rubra* can establish and persist in this type. Competition from dense *Rubus spectabilis* may reduce tree survival.

Oplopanax horridum-Ribes bracteosum
Devil's club-stink currant
OPHO-RIBR

N=3 (SBLM 3)

Species	Constancy %	Typical cover %
Trees-seedlings		
Tsuga heterophylla	33	8
Abies grandis	33	Tr
Shrubs		
Oplopanax horridum	100	57
Ribes bracteosum	100	42
Herbs		
Oxalis	100	50
Athyrium filix-femina	100	25
Adiantum pedatum	100	7
Tiarella trifoliata	100	7
Galium triflorum	67	3
Tolmiea menziesii	67	3
Maianthemum dilatatum	33	30
Bromus	33	20
Blechnum spicant	33	10
Carex deweyana	33	10
Stachys mexicana	33	7
Viola glabella	33	5
unknown grass	33	5
Chrysosplenium glechomifolium	33	3
Oenanthe sarmentosa	33	2
Streptopus amplexifolius	33	2
Thalictrum occidentale	33	2
Mimulus dentatus	33	Tr
Mitella caulescens	33	Tr

Elevations: 1120 to 1540 feet (average 1300 feet).

Geomorphic surfaces: Annual floodplains and a steep stream bank.

Substrate/soils: Organic layers averaged 3 cm, much less than in the Rubus spectabilis-Ribes bracteosum group. A layers were silty clay loams or loamy sands (average 12 cm), over sandy clay loam or silty clay loam B horizons (average 18 cm). C horizons were sandy clays or sands in cobbles or gravels. Gley layers, indicating anaerobic conditions, were noted in two plots at an average depth of 28 cm. In those two soils, summer water table was found at an average depth of 60 cm.

Community: Oplopanax horridum-Ribes bracteosum is a shrub dominated community. In this small sample, it occurred at moderate elevations on Salem BLM Coast Range lands.

Small sample size limits confidence in the full description of this community. *Rubus spectabilis* did not occur in these plots. However, *Rubus spectabilis* was present on other plots on all three locations. *Oplopanax horridum* can indicate well aerated saturated conditions. *Adiatum pedatum*, always present in these plots, also frequently indicates water flowing through the soil profile for much of the year.

***Rubus spectabilis/Tolmeia menziesii-Oxalis* group**
Salmonberry/piggyback plant-sorrel group
RUSP/TOME-OXALI group

Group description followed by descriptions of two phases*: Rubus spectabilis/Tolmeia menziesii-Oxalis-Polystichum munitum* phase and *Rubus spectabilis/Tolmeia menziesii-Oxalis-Mitella ovalis* phase
N=24 (SNF 15, SBLM 5, EBLM 4)

This constancy table is for the entire group combined. The individual phases are then presented separately.

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	38	54
Shrubs		
Rubus spectabilis	100	32
Acer circinatum	42	31
Sambucus racemosa	42	26
Vaccinium parvifolium	42	1
Herbs		
Tolmiea menziesii	100	20
Athyrium filix-femina	100	14
Stachys	92	9
Oxalis	88	35
Polystichum munitum	83	15
Galium triflorum	63	3
Stellaria crispa	63	3
Claytonia sibirica	54	2
Tiarella trifoliata	46	8
Mitella ovalis	42	17
Carex deweyana	42	8
Blechnum spicant	38	6
Adiantum pedatum	38	3
Marah oreganus	38	2
Viola glabella	38	1

Elevations: 30 to 1390 feet (average 430 feet).

Geomorphic surfaces: Active floodplains, stream banks, and low terraces.

Substrate/soils: Depth to water table was 40-94 cm. Gleying is noted in most soil descriptions (ave. 43 cm depth). Several sites had buried soils; one had 5 distinct A horizons. The organic layer averaged 4 cm. A horizons are silt loam, occasionally clay loam or sand. B horizons are loamy. Coarse fragments are low. Bedrock or cobble streambed is within 1m.

Community: Rubus spectabilis/Tolmeia menziesii-Oxalis group is a widespread shrubby type. *Alnus rubra* forms an overstory in a third of the plots. *Sitka spruce* co-occurred with the Alnus on 3 plots*; Acer macrophyllum* was found on 3 plots. Wildlife use is heavy. Elk browse reduced *Rubus spectabilis, Polystichum munitum, Athyrium filix-femina*, and grasses significantly.

Rubus spectabilis/Tolmeia menziesii-Oxalis-*Mitella ovalis phase* is generally on floodplains and lower banks. Rubus spectabilis/Tolmeia menziesii-Oxalis-*Polystichum munitum phase* is found on steep banks/valley walls and low terraces.

***Rubus spectabilis/Tolmeia menziesii-Oxalis-Mitella ovalis* phase**
Salmonberry/piggyback plant-sorrel-*oval-leaved mitrewort phase*
RUSP/TOME-OXALI-*MIOV phase*

N=8 (EBLM 4, SNF 3, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	25	50
Shrubs		
Rubus spectabilis	100	32
Vaccinium parvifolium	50	1
Acer circinatum	38	25
Herbs		
Athyrium filix-femina	100	26
Tolmiea menziesii	100	7
Oxalis	88	38
Polystichum munitum	88	6
Stachys	88	5
Mitella ovalis	75	23
Tiarella trifoliata	75	9
Stellaria crispa	63	1
Blechnum spicant	50	5
Galium triflorum	50	5
Adiantum pedatum	50	3
Carex deweyana	38	11
Circaea alpina	38	4
Galium aparine	38	4
Hydrophyllum tenuipes	38	1

Elevations: 100 to 915 feet (average 550 feet).

Geomorphic surfaces: Annual floodplains and low banks. Summer water tables are within 42-94 cm of the surface.

Substrates/soils: Soils are fairly shallow, averaging 63 cm to bedrock or cobble streambed. Textures are fine, generally silt loam A horizons, and silt loam, loamy sand, or sandy clay loam B horizons. Gley layers are

common in soil descriptions, at less than 50 cm depth. Several pits showed buried soils which are tapped by roots.

Community: Rubus spectabilis/Tolmeia menziesii-Oxalis-*Mitella ovalis phase* is shrub dominated. No trees were found within this phase, though overhanging tree canopies can be dense. *Athyrium filix-femina* cover is almost always higher than *Polystichum munitum* cover, which marks this phase as slightly wetter than the Rubus spectabilis/Tolmeia menziesii-Oxalis-*Polystichum munitum phase*.

The Rubus spectabilis/Tolmeia menziesii-Oxalis-*Mitella ovalis phase* appears to be too shallow, poorly drained, and too frequently disturbed to support a tree component. However, soil organic material and moisture holding capacity are high.

Rubus spectabilis/Tolmeia menziesii-Oxalis-Polystichum munitum phase
Salmonberry/piggyback plant-sorrel-*sword fern phase*
RUSP/TOME-OXALI-*POMU phase*

N=16 (SNF 12, SBLM 4)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	44	55
Acer macrophyllum	19	37
Picea sitchensis	19	28
Trees-seedlings		
Picea sitchensis	19	1
Shrubs		
Rubus spectabilis	100	33
Sambucus racemosa	56	24
Acer circinatum	44	34
Ribes bracteosum	38	1
Vaccinium parvifolium	38	Tr
Herbs		
Tolmiea menziesii	100	29
Athyrium filix-femina	100	5
Stachys	94	12
Oxalis	88	27
Polystichum munitum	81	22
Claytonia sibirica	75	3
Galium triflorum	69	2
Stellaria crispa	63	4
Marah oreganus	50	2
Viola glabella	50	1
Carex deweyana	44	6
Mimulus dentatus	38	2
Mimulus guttatus	38	Tr

Elevations: 30 to 1390 feet (average 370 feet).

Geomorphic surfaces: Steep banks and low terraces.

Substrate/soils: Moderately deep (60 to 90 cm). Most profiles are above summer water table level. A horizons are silt loams or clay loams 12-20 cm deep over silty clay loams, clay loams or loamy clay B horizons 48 to 55 cm deep. Some profiles showed buried soils. One profile had gleying at 75 cm. Note that the *Mitella ovalis* phase had shallower depths to anaerobic conditions and/or bedrock, and consistently higher water table.

Community: Rubus spectabilis/Tolmeia menziesii-Oxalis-*Polystichum munitum phase* is shrub-dominated. *Alnus rubra, Acer macrophyllum*, and *Sitka spruce* can establish and survive on these sites. More trees are found in this phase of the Rubus spectabilis/Tolmeia menziesii-Oxalis group than in the *Mitella ovalis* phase. *Athyrium filix-femina* is always present but at lower cover than *Polystichum munitum*, which is not true for the *Mitella ovalis* phase of this group.

Elk browse on some plots was noted to significantly affect cover of *Rubus spectabilis, Polystichum munitum, Athyrium filix-femina*, and grasses.

Rubus spectabilis competition for tree regeneration can be severe.

Terraces/steep toeslopes

Steep slide areas

Corylus cornuta-Acer circinatum/Oxalis
California hazel-vine maple/sorrel
COCO6-ACCI/OXALI

N=2 (EBLM 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Acer macrophyllum	50	80
Tsuga heterophylla	50	40
Shrubs		
Corylus cornuta	100	28
Acer circinatum	100	18
Gaultheria shallon	50	Tr
Herbs		
Oxalis	100	55
Polystichum munitum	100	15
Athyrium filix-femina	100	13
Bromus vulgaris	100	3
Adenocaulon bicolor	100	2
Circaea alpina	100	2
Blechnum spicant	50	15
Galium triflorum	50	5
Tiarella trifoliata	50	5
Hydrophyllum tenuipes	50	3
Equisetum	50	2
unknown grass	50	2
Adiantum pedatum	50	Tr
Asarum caudatum	50	Tr
Bromus sitchensis	50	Tr
Streptopus lanceolatus var. curvipes	50	Tr
Trillium ovatum	50	Tr
Viola	50	Tr

Elevations: 840 to 915 feet.

Geomorphic surfaces: Gently sloping floodplains or terraces.

Substrate/soils: Fairly shallow soil (54 to 59 cm). A horizons are silt loams 5-10 cm thick. B horizons are loam or sandy loam 18-41 cm deep,

over sand/sandstone C layers. One site had mottling (evidence of fluctuating anaerobic conditions) at 46 cm, and summer water table at 64 cm. Rooting depth was 50 to 60 cm.

Community : Corylus cornuta-Acer circinatum/Oxalis occurs under heavy *Acer macrophyllum* or *Tsuga heterophylla* overstories. Both plots are from Eugene BLM's South Valley area, and represent the southeast Coast Range. In this low precipitation zone of the Coast Range, *Rubus spectabilis* distribution is much more confined in the riparian areas.The geomorphic surfaces, moderately deep soil, and tree ages (*Tsuga heterophylla* 38 years, *Acer macrophyllum* 108) suggest that these sites are not frequently reset, though still subject to flood effects.

Similar types: This community is a moister version of the Cascades' Forested Corylus cornuta/Polystichum munitum group. In areas with higher precipitation in the Coast Range, similar geomorphic surfaces and soils would support a *Rubus spectabilis* community, possibly a member of the Rubus spectabilis/Tolmeia menziesii-Oxalis group.

Rubus spectabilis/Polystichum munitum
Salmonberry/sword fern
RUSP/POMU

N=25 (SNF 18, EBLM 4, SBLM 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	48	46
Acer macrophyllum	20	43
Shrubs		
Rubus spectabilis	100	56
Acer circinatum	68	19
Sambucus racemosa	60	14
Ribes bracteosum	56	2
Vaccinium parvifolium	48	1
Herbs		
Polystichum munitum	100	23
Oxalis	92	21
Stachys	84	6
Athyrium filix-femina	84	4
Tolmiea menziesii	72	4
Claytonia sibirica	64	1
Galium triflorum	60	2
Stellaria crispa	56	1
Luzula parviflora	44	Tr
Blechnum spicant	40	3
Maianthemum dilatatum	40	2
Marah oreganus	36	1
Viola glabella	36	Tr

Elevations: 100 to 870 feet (average 450 feet).

Geomorphic surfaces: Gentle terraces or steep banks and valley walls.

Substrate/soils: Deep (average 77 cm) well drained loams (silt loams, silty clay loams, sandy loams, and loams), though some profiles had clays in the C horizons. These sites had deep, organic rich substrates; rooting conditions are excellent. Most sites too high for frequent flooding.

Community: The Rubus spectabilis/Polystichum munitum community is a common terrace/valley wall. Mature *Alnus rubra* are recorded in almost half the plots. Conifers were present on 24% of the plots. The group is dominated by extremely dense *Rubus spectabilis*. Saxifrages and *Athyrium filix-femina* are at very low cover compared to most of the communities closer to the stream channel.

Terraces were most likely to have overstory trees rooted in the plots. Three quarters of the plots with gentle slopes (=<20%) had mature trees. Less than half the steep slopes (>20%) had trees. Tree ages ranged from 21 to 135 years. Light limitation from *Alnus rubra* canopy as well as the *Rubus spectabilis* may limit conifer establishment and survival.

Significant elk or deer browse was frequently observed in this community. Mountain beaver burrows were noted on several of the steep plots.

Vaccinium alaskaense-Rubus spectabilis
Alaska huckleberry-salmonberry
VAAL-RUSP

N=1 (SBLM 1)

SPECIES	TYPICAL COVER %
Shrubs	
Vaccinium alaskaense/Vaccinium ovalifolium	85
Rubus spectabilis	30
Vaccinium parvifolium	10
Menziesia ferruginea	8
Herbs	
Polystichum munitum	65
Blechnum spicant	10
Scoliopus hallii	9
Oxalis trilliifolia	8
Athyrium filix-femina	7
Boykinia occidentalis	3
Prosartes hookeri	2
Streptopus amplexifolius	2

Elevation: 1200 feet.

Geomorphic surfaces: The plot is on a steep toeslope position.

Substrate/soils: Fairly deep (100cm+) colluvial soil. There is a deep (20cm) O layer. The A layer is a clay loam, the BA layer is loamy clay, and the Bt horizon (at 70cm) is a clay. Gravels make up the minor coarse fragment component.

Community: This is a single plot which represents a coastal variant of the Cascadian Vaccinium ovalifolium type. The plot is from Salem BLM's Warnicke Creek in the Valley of the Giants area. This area has plant associations that indicate cool, moist environments more similar to some Cascadian conditions than most of the Coast Range (eg Western hemlock/Vaccinium alaskaense/oxalis-NWO Coast, and Western hemlock/oxalis-Achlys triphylla). One other plot from the Warnicke Creek cluster is incorporated in the Cascadian Boykinia occidentalis-Mitella ovalis description.

Acer macrophyllum/Corylus cornuta-Rubus spectabilis
Big leaf maple/California hazel-salmonberry
ACMA3/COCO6-RUSP

N=3 (SNF 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Acer macrophyllum	100	67
Pseudotsuga menziesii	67	35
Thuja plicata	33	35
Rhamnus purshiana	33	25
Trees-seedlings		
Acer macrophyllum	33	5
Thuja plicata	33	4
Shrubs		
Corylus cornuta	100	25
Rubus spectabilis	100	13
Rhamnus purshiana	100	1
Vaccinium ovatum	67	13
Acer circinatum	67	3
Gaultheria shallon	67	1
Sambucus racemosa	67	1
Herbs		
Polystichum munitum	100	65
Galium triflorum	100	Tr
Stachys mexicana	67	3
Athyrium filix-femina	67	1
Claytonia sibirica	67	1
Marah oreganus	67	1
Tellima grandiflora	67	1
Blechnum spicant	67	Tr
Oxalis	67	Tr
Tolmiea menziesii	67	Tr

Elevations: 150 to 270 feet (average 230 feet).

Geomorphic surfaces: Very steep valley walls/toeslopes or elevated terraces.

Substrate/soils: Silt loams to loams.

Community: Acer macrophyllum/Corylus cornuta-Rubus spectabilis is a warm, well drained forested community sampled in the southern Siuslaw NF. These sites are either on raised terraces immune to most floods or on steep colluvial valley walls. The main processes controlling vegetation in this community are not fluvial. *Rubus spectabilis* cover is relatively minor, and other riparian species such as *Athyrium filix-femina, Tolmeia menziesii*, or *Stachys* are present but in low abundance. This community is a transitional type, moister than the upslope plant associations but dominated by upland species. Succession to conifers occurs over time, though extremely steep slopes may limit stability.

Rubus spectabilis-Acer circinatum
Salmonberry-vine maple
RUSP-ACCI

N=8 (EBLM 4, SNF 3, SBLM 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Alnus rubra	25	23
Pseudotsuga menziesii	25	18
Shrubs		
Rubus spectabilis	100	51
Acer circinatum	88	43
Vaccinium parvifolium	75	5
Sambucus racemosa	38	7
Rhamnus purshiana	38	6
Herbs		
Polystichum munitum	100	34
Oxalis	100	15
Athyrium filix-femina	88	11
Adiantum pedatum	50	3
Claytonia sibirica	50	1
Galium triflorum	50	1
Blechnum spicant	38	12
Stachys mexicana	38	4
Dicentra formosa	38	3
Tiarella trifoliata	38	2
Stellaria crispa	38	1

Elevations: 75 to 1230 feet (average 600 feet).

Geomorphic surfaces: Very steep valley walls and cutbanks, averaging 91% slope. Fluvial processes are most likely to affect this community indirectly, if channel changes undercut the over-steepened slopes to cause slides.

Substrate/soils: Deep and well drained. A horizons are silt loams, silty clay loams, or sandy silts averaging 22 cm thick. AB horizons are sandy loams, silt loams, silty clay loams or clay loams averaging 27 cm. B horizons are silty clays, silt loams, sandy silts or sandy loams, averaging

35 cm. C horizons are found at an average depth of 104 cm. Only one profile showed anaerobic conditions, with mottling at a meter. Coarse fragments above the C horizon in the profile were generally colluvial, rather than alluvial, in origin.

Community: Rubus spectabilis-Acer circinatum is a shrub dominated community found on steep valley walls and toeslopes. Riparian indicators such as *Tolmeia menziesii* are minor or absent in this community. *Rubus spectabilis* competition and slope instability may limit long-term conifer development in this community. On one plot, tree regeneration followed creation of an opening from a log falling onto the site. Such events may allow scattered conifers to establish. Some of the largest, oldest conifers in the sample occurred in this community.

Willamette Valley

Willamette Valley key

A. *Equisetum hyemale* the dominant herb under *Populus trichocarpa* overstory ..... **Populus trichocarpa/Equisetum hyemale** p. 162

B. *Maianthemum stellatum* the dominant herb

1. *Symphoricarpos albus* the dominant shrub under hardwood overstory
..... **Forested Symphoricarpos albus/Maianthemum stellatum** p. 181

2. *Symphoricarpos albus* absent or minor, *Thuja plicata* dominant overstory species.. **Thuja plicata/Maianthemum stellatum** p. 184

C. *Rubus spectabilis* dominant or co-dominant shrub under hardwood overstory

1. *Symphoricarpos albus* present (>trace)
..... **(Populus trichocarpa-Fraxinus latifolia)/Rubus spectabilis-Symphoricarpos albus** p. 176

2. *Symphoricarpos albus* absent
.... **Hardwood/Rubus spectabilis/Hydrophyllum tenuipes** p. 174

D. *Symphoricarpos albus* the dominant shrub, *Rubus spectabilis* absent or minor; under hardwood overstory

1. *Maianthemum stellatum* the dominant herb
..... **Forested Symphoricarpos albus/Maianthemum stellatum** p. 181

2. *Camassia quamash* the dominant herb under *Fraxinus latifolia* overstory
..... **Fraxinus latifolia/Symphoricarpos albus/Camassia quamash** p. 183

3. *Urtica dioica* and/or *Hydrophyllum tenuipes* together>5%
..... **Symphoricarpos albus/Urtica dioica group** p. 165

a. *Oemleria cerasiformis*>5%
. **Symphoricarpos albus-Urtica dioica-*(Acer macrophyllum-Populus trichocarpa)/Oemleria cerasiformis phase*** p. 170

b. Fraxinus latifolia an overstory dominant, *Sambucus racemosa* dominant or co-dominant shrub
..... **Symphoricarpos albus-Urtica dioica-*Fraxinus latifolia/Sambucus racemosa-Corylus cornuta phase*** p. 166

c. *Symphoricarpos albus* the dominant shrub, or co-dominant with *Corylus cornuta*
. **Symphoricarpos albus-Urtica dioica-*(Acer macrophyllum-Populus trichocarpa)/Corylus cornuta phase*** p. 168

4. *Urtica dioica* and *Hydrophyllum tenuipes* absent, herb layer sparse, *Rubus ursinus* generally present

a. *Fraxinus latifolia* or *Quercus garryana* overstory, *Carex obnupta* absent or minor
..... **(Fraxinus latifolia-Quercus garryana)/Symphoricarpos albus** p. 178

b. *Acer macrophyllum* and/or *Populus trichocarpa* overstory
..... **Acer macrophyllum/Symphoricarpos albus** p. 180

5. *Urtica dioica* and Hydrophyllum tenuipes absent, *Carex obnupta* >20% under *Fraxinus latifolia* overstory
..... ***Fraxinus latifolia/Symphoricarpus albus*** (Christy p. 214)

E. *Corylus cornuta* dominant shrub under hardwood overstory

1. *Symphoricarpos albus*>5%
..... **Symphoricarpos albus-Urtica dioica-*(Acer macrophyllum-Populus trichocarpa)/Corylus cornuta phase*** p. 168

2. *Symphoricarpos albus* <5%
.....**(Fraxinus latifolia-Populus trichocarpa)/Corylus cornuta/Hydrophyllum tenuipes** p. 163

F. *Sambucus racemosa* dominant shrub, *Symphoricarpos albus* also important shrub species, Fraxinus latifolia an overstory dominant, *Urtica dioica* and/or *Hydrophyllum tenuipes* >5%
..... **Symphoricarpos albus-Urtica dioica-*Fraxinus latifolia/Sambucus racemosa-Corylus cornuta phase*** p. 166

G. Vine maple dominant shrub, common snowberry absent or minor, California hazel minor, Oregon ash and overstory dominant, Pacific waterleaf abundant, nettle often co-dominant herb.
..... **Fraxinus latifolia/Acer circinatum/Hydrophyllum tenuipes-Urtica dioica** p. 172

H. Shrubs absent or trace, *Urtica dioica* >50, *Acer macrophyllum* and/or *Alnus* overstory ..... **(Acer macrophyllum-alder)/Urtica dioica** p. 161

I. *Spiraea douglasii* >10%, and dominant shrub

1. *Spiraea douglasii* the dominant shrub under *Fraxinus latifolia* ..... ***Fraxinus latifolia/Spiraea douglasii*** (Christy p. 213)

2. *Spiraea douglasii* thicket without tree canopy ..... ***Spiraea douglasii*** (Christy p. 242)

J. *Cornus sericea* dominant shrub under *Populus trichocarpa* overstory, *Impatiens capensis* often dominant herb
..... ***Populus balsamifera* ssp. *trichocarpa/Cornus sericea, Impatiens capensis*** (Christy p. 218)

K. Willow shrub swamp

1. *Salix hookeriana* shrub swamp, *Carex obnupta* often important herb..... ***Salix hookeriana-(Salix sitchensis)*** (Christy p. 237)

2. *Salix lucida* shrub swamp ..... ***Salix lucida* ssp. *lasiandra/Urtica dioica* ssp. *gracilis*** (Christy p. 239)

3. *Salix sitchensis* dominant, with *Lysichiton americanum* and/or *Carex aquatalis var. dives* the dominant herbs
..... ***Salix sitchensis*** complex (Christy p. 241)

L. *Fraxinus latifolia* overstory above sedge dominated herb layer

1. *Spiraea douglasii* <=10% but most abundant shrub, *Carex aquatalis var. dives* >=20% and dominant herb under *Fraxinus latifolia* overstory
. ***Fraxinus latifolia/Carex aquatilis var. aquatilis*** (Christy p. 210)

2. *Carex deweyana* and/or *Juncus patens* dominant herbs under *Fraxinus latifolia* overstory, *Rubus ursinus* and *Spiraea douglasii* may be present
   ..... ***Fraxinus latifolia/Carex deweyana-Urtica dioica ssp. Gracilis*** (Christy p. 211)

3. *Carex obnupta* >=20% and dominant herb under *Fraxinus latifolia* overstory, *Rubus ursinus, Spiraea douglasii*, and *Symphoricarpos albus* may be present
   ..... ***Fraxinus latifolia/Carex obnupta*** (Christy p. 212)

For more herb-dominated communities (aquatic beds, emergent marshes, marshes, fens/peatlands, or wet prairies), see herbaceous wetlands key (Christy pp. 204).

For more shrub-dominated communities (shrub swamps), see shrubland wetlands key (Christy p. 200).

For more tree-dominated communities (forested swamps), see forest and woodlands wetlands key (Christy p. 198).

Willamette Valley

A note on alder: Both white alder (*Alnus rhombifolia*) and red alder (*Alnus rubra*) are present in riparian areas of low elevations of the central and southern Willamette Valley. The two species have similar appearance, and can grow next to each other. *Alnus rubra* is found at slightly higher elevations along the valley margin and in the NW Oregon Cascades and Coast Range. No *Alnus rhombifolia* was recorded in the Willamette Valley plots; only 6 of the sites had alder. Unfortunately, it is not possible to tell if the two species were distinguished in the field. Visits in 2004 to the three most northerly alder sites found only *Alnus rubra* t. Whether the same is true in the more southerly Willamette Valley riparian zones is uncertain. Therefore, most references in the Willamette Valley section have been generalized to *Alnus*/Alder.

(***Acer macrophyllum-Alnus)/Urtica dioica***
(Big leaf maple-alder)/nettle
(ACMA3-ALNUS)/URDI

N=6 (Willamette Valley 6)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Acer macrophyllum	50	100
Alnus	50	62
Shrubs		
Sambucus racemosa	50	1
Herbs		
Urtica dioica ssp. gracilis	100	76
Hydrophyllum tenuipes	100	44
Carex deweyana	83	7
Tellima grandiflora	67	9
Galium aparine	67	8
Claytonia sibirica	33	5
Equisetum arvense	33	4
Stellaria calycantha	33	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classed as floodplain forests. Two plots are from Clackamas County (Willamette and Clackamas Rivers), two plots from Marion County (Mill Creek), and two from Polk County (Luckiamute River). The plots ranged from 0 to 15 feet above summer flow (average 6 feet), and from 0 to 200 feet from the main channel (average 52 feet).

Community: (Acer macrophyllum-alder)/Urtica dioica is a deciduous forested floodplain community. The overstory can be either *Acer macrophyllum* or *Alnus*. *Populus trichocarpa* and *Fraxinus latifolia* can also occur. With *Fraxinus latifolia*, the forb component has more wet indicator species. The shrub layer is sparse, over a thick herb layer.

Populus trichocarpa/Equisetum hyemale
Black cottonwood/scouring-rush
POBAT/EQHY

N=5 (Willamette Valley 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Populus trichocarpa	80	66
Alnus	40	42
Acer macrophyllum	40	33
Shrubs		
Symphoricarpos albus	40	5
Acer circinatum	40	4
Rubus ursinus	40	1
Herbs		
Equisetum hyemale	100	64
Polystichum munitum	80	13
Urtica dioica ssp. gracilis	40	2

Elevations: average 480 feet.

Geomorphic environment: The sampling ecologist noted locations as temporarily flooded higher terraces near the large rivers, such as the Willamette and North Santiam. Plots averaged 20 feet above the main channel, and were from 200-500 feet from the main channel. No soils data are available. One site was in Yamhill County (Willamette River), and 4 sites were in Marion County (North Santiam River-Geren Island).

Community: Populus trichocarpa/Equisetum hyemale is a forested floodplain community. The overstory is most often *Populus trichocarpa* and/or *Alnus* or *Acer macrophyllum*, but *Alnus* can be the only tree species present. *Abies grandis* and *Pseudotsuga menziesii* were also recorded on one plot. The shrub layer is generally sparse. The herb layer is a dense sward of *Equisetum hyemale* with *Polystichum munitum*.

(***Fraxinus latifolia-Populus trichocarpa)/Corylus cornuta/Hydrophyllum tenuipes***
(Oregon ash-black cottonwood)/California hazel/Pacific waterleaf (FRLA-POBAT)/COCO6/HYTE

N=5 (Willamette Valley 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Fraxinus latifolia	40	83
Populus trichocarpa	40	70
Acer macrophyllum	20	25
Shrubs		
Corylus cornuta	100	50
Oemleria cerasiformis	60	8
Rubus spectabilis	60	1
Symphoricarpos albus	40	2
Sambucus racemosa	40	1
Acer circinatum	40	1
Herbs		
Hydrophyllum tenuipes	100	75
Galium aparine	60	Tr
Carex deweyana	60	Tr
Urtica dioica ssp. gracilis	40	5
Stachys cooleyae	40	3
Athyrium filix-femina	40	1
Claytonia sibirica	40	1
Tellima grandiflora	40	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classed as floodplain forests, slough or shrub. The plots ranged from 3 to 21 feet above summer flow (average 13 feet), and from 9 to 500 feet from the main channel (average 232 feet). Three plots are from Clackamas County (Willamette River, Pudding River, Eagle Creek), two plots from Marion County (Willamette River).

Community: (Fraxinus latifolia-Populus trichocarpa)/Corylus cornuta/Hydrophyllum tenuipes is generally a forested floodplain

community. The overstory is dominated by *Fraxinus latifolia, Populus trichocarpa*, or sometimes *Acer macrophyllum*.

Similar types: This type seems somewhat wetter than the strongly related Symphoricarpos albus/Urtica dioica group: (*Fraxinus latifolia/Sambucus racemosa-Corylus cornuta phase* and *(Acer macrophyllum-Populus trichocarpa)/Corylus cornuta phase*). (Fraxinus latifolia-Populus trichocarpa)/Corylus cornuta/Hydrophyllum tenuipes has less *Rubus ursinus*, *Sambucus racemosa, Symphoricarpos albus* and *Urtica dioica*, and more *Corylus cornuta, Oemleria cerasiformis,* and *Hydrophyllum tenuipes*.

Forested *Symphoricarpos albus/Urtica dioica* group
Forested common snowberry/nettle group
Forested SYAL/URDI group

Group constancy table followed by descriptions for three phases: *Symphoricarpos albus/Urtica dioica-Fraxinus latifolia/Sambucus racemosa-Corylus cornuta* phase, *Symphoricarpos albus/Urtica dioica-*(*Acer macrophyllum-Populus trichocarpa)/Sambucus racemosa-Corylus cornuta* phase and *Symphoricarpos albus/Urtica dioica-(Acer macrophyllum-Populus trichocarpa)/Sambucus racemosa-Oemlaria cerasiformis* phase

N=34 (Willamette Valley 34)

Constancy table for the group as a whole:

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Acer macrophyllum	65	70
Populus trichocarpa	38	58
Fraxinus latifolia	26	46
Shrubs		
Symphoricarpos albus	91	37
Sambucus racemosa	50	9
Corylus cornuta	41	15
Rubus ursinus	38	12
Herbs		
Oemleria cerasiformis	38	8
Urtica dioica ssp. gracilis	88	39
Hydrophyllum tenuipes	85	32
Galium aparine	50	1
Carex deweyana	47	3
Claytonia sibirica	44	14

Community: The Symphoricarpos albus/Urtica dioica group is the most commonly sampled type in the communities from the Willamette Valley.

***Symphoricarpos albus/Urtica dioica-Fraxinus latifolia/Sambucus racemosa-Corylus cornuta* phase**
Common snowberry/nettle-*Oregon ash/red elderberry-California hazel phase*
SYAL/URDI-*FRLA/SARA2-COCO6 phase*

N=7 (Willamette Valley 7)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Fraxinus latifolia	100	44
Alnus	29	60
Shrubs		
Sambucus racemosa	100	15
Corylus cornuta	57	16
Symphoricarpos albus	57	13
Rubus ursinus	43	31
Acer circinatum	29	42
Crataegus douglasii	29	30
Rubus spectabilis	29	2
Herbs		
Urtica dioica ssp. gracilis	100	51
Hydrophyllum tenuipes	71	53
Tellima grandiflora	57	14
Carex deweyana	57	8
Athyrium filix-femina	29	2
Claytonia sibirica	29	1
Tolmiea menziesii	29	1
Marah oreganus	29	1
Cardamine oligosperma	29	Tr
Polystichum munitum	29	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classes as floodplain forests (79%) or sloughs (21%). Half the samples were from the mainstem Willamette River. Surface clay deposits were noted on 2 plots. The plots ranged from 1 to 21 feet above summer flow (average 12 feet), and from 0 to 500 feet

from the channel (average 117 feet). Four plots are from Marion County, two plots each from Benton, Clackamas, Polk, and Yamhill Counties, and 1 plot from Linn County.

Community: Symphoricarpos albus/Urtica dioica-*Fraxinus latifolia/Sambucus racemosa-Corylus cornuta phase* is a forested floodplain community . The overstory is Fraxinus latifolia, often with *Alnus* and occasionally *Quercus garryana*.

Similar types: This phase of the Symphoricarpos albus/Urtica dioica group has lower and less constant *Symphoricarpos albus* cover than the *Acer macrophyllum-Populus trichocarpa* phase. With the overstory of *Fraxinus latifolia* and *Alnus*, it indicates a slightly wetter environment.

***Symphoricarpos albus/Urtica dioica -(Acer macrophyllum-Populus trichocarpa)/Corylus cornuta* phase**
Common snowberry/nettle-*(Big leaf maple-black cottonwood)/California hazel phase*
SYAL/URDI-(*ACMA3-POBAT)/COCO6 phase*

N=13 (Willamette Valley 13)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Acer macrophyllum	69	75
Populus trichocarpa	54	64
Shrubs		
Symphoricarpos albus	100	42
Corylus cornuta	62	16
Rubus ursinus	62	7
Sambucus racemosa	62	5
Rubus spectabilis	38	3
Herbs		
Urtica dioica ssp. gracilis	92	41
Hydrophyllum tenuipes	85	33
Carex deweyana	38	1
Galium triflorum	31	11
Claytonia sibirica	31	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classes as floodplain forests (79%) or sloughs (21%). Half the samples were from the mainstem Willamette River. Surface clay deposits were noted on 2 plots. The plots ranged from 1 to 21 feet above summer flow (average 12 feet), and from 0 to 500 feet from the channel (average 117 feet). Four plots are from Marion County, two plots each from Benton, Clackamas, Polk, and Yamhill Counties, and 1 plot from Linn County.

Community: Symphoricarpos albus/Urtica dioica-*(Acer macrophyllum-Populus trichocarpa) Corylus cornuta phase* is a forested floodplain community. The overstory is *Acer macrophyllum* and/or *Populus trichocarpa*. The shrub layer is dominated by *Symphoricarpos albus*, with *Corylus cornuta, Rubus ursinus*, and *Sambucus racemosa* as the most

common associated species. *Urtica dioica* and *Hydrophyllum tenuipes* are both very abundant.

***Symphoricarpus albus/Urtica dioica-(Acer macrophyllum-Populus trichocarpa)/Oemleria cerasiformis* phase**
Common snowberry/nettle-*(Big leaf maple-black cottonwood)/Indian plum phase*
SYAL/URDI-*(ACMA3-POBAT)/OECE phase*

N=14 (Willamette Valley 14)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Acer macrophyllum	86	65
Populus trichocarpa	36	57
Shrubs		
Symphoricarpos albus	100	40
Oemleria cerasiformis	71	11
Herbs		
Hydrophyllum tenuipes	93	23
Galium aparine	93	1
Urtica dioica ssp. gracilis	79	29
Claytonia sibirica	64	23
Carex deweyana	50	1
Dicentra formosa	43	7
Tellima grandiflora	36	20
Polystichum munitum	36	2

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classes as floodplain forests (86%) or sloughs (14%). The plots ranged from 1 to 18 feet above summer flow (average 8 feet), and from 0 to 200 feet from the main channel (average 72 feet). Five of the samples were from the mainstem Willamette River; five were from the mainstem Clackmas River; three were from the Luckiamute River; one from Ankeny Slough (USFWS). Five plots are from Clackamas County, four plots from Marion County, three plots from Polk County, and two plots from Lane County.

Community: Symphoricarpos albus/Urtica dioica-*(Acer macrophyllum-Populus trichocarpa)/Oemleria cerasiformis phase* is a forested floodplain community. The overstory is *Acer macrophyllum* and/or *Populus trichocarpa. Symphoricarpos albus* dominates the shrub layer,

with *Oemleria cerasiformis* as an important associated species. The lush understory is typically composed of *Hydrophyllum tenuipes*, *Galium aparine, Urtica dioica, Claytonia sibirica*, and *Carex deweyana*.

Fraxinus latifolia/Acer circinatum/Hydrophyllum tenuipes-Urtica dioicaSymphoricarpos albus/Urtica dioica
Oregon ash/vine maple/Pacific waterleaf-nettle
FRLA/ACCI/HYTE-URDI

N=8 (Willamette Valley 8)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Fraxinus latifolia	75	69
Acer macrophyllum	25	63
Alnus	25	45
Shrubs		
Acer circinatum	100	59
Corylus cornuta	25	9
Oemlaria cerasiformis	25	5
Herbs		
Hydrophyllum tenuipes	88	52
Urtica dioica ssp. gracilis	75	21
Tellima grandiflora	63	2
Carex deweyana	63	1
Dicentra formosa	50	5
Claytonia sibirica	50	4
Galium aparine	50	2
Polystichum munitum	38	3

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classed as floodplain forests (7 plots) or sloughs (1 plot). The plots ranged from 0 to 15 feet above summer flow (average 5 feet), and from 0 to 100 feet from the channel (average 19 feet). Sites ranged from small creeks (Senecal, Marion County) to the Clackmas River. Five plots are from Clackamas County (four from Milo McIver State Park), and one plot each from Linn, Marion, and Polk Counties.

Community: Fraxinus latifolia/Acer circinatum/Hydrophyllum tenuipes/Urtica dioica is a forested floodplain community. The overstory is *Fraxinus latifolia*, often with *Acer macrophyllum* or *Alnus*. The *Alnus* species present in these plots was *Alnus rubra*. The shrub layer is

dominated by *Acer circinatum*, with *Corylus cornuta* and *Oemleria cerasiformis* as the most common associated species. The herb layer generally has abundant *Hydrophyllum tenuipes*, with *Urtica dioica* a co-dominant. *Tellima grandiflora* and *Carex deweyana* also occur in over half the plots.

Similar types: This community shares many species with the Symphoricarpos albus/Urtica dioica-Fraxinus latifolia/Sambucus racemosa-Corylus cornuta phase, but with *Acer circinatum* in the place of *Symphoricarpos albus*.

Hardwood/Salmonberry/Pacific waterleaf
Hardwood/*Rubus spectabilis/Hydrophyllum tenuipes*
Hardwood/RUSP/HYTE

N=5 (Willamette Valley 5)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Alnus	40	80
Populus trichocarpa	40	55
Fraxinus latifolia	20	100
Acer macrophyllum	20	90
Shrubs		
Rubus spectabilis	100	50
Corylus cornuta	60	10
Sambucus racemosa	40	8
Herbs		
Hydrophyllum tenuipes	100	38
Carex deweyana	80	3
Urtica dioica ssp. gracilis	60	28
Galium aparine	60	25
Claytonia sibirica	60	11
Dicentra formosa	40	9
Athyrium filix-femina	40	2
Polystichum munitum	40	1
Stachys cooleyae	40	1

Geomorphic environment: Soil, substrate and geomorphic surface data are unavailable. Plots were 2 to 12 feet above river level (average 7 feet), and from 1 to 200 feet from the main creek channel. Plots were located in Benton (Camp Adair) and Clackamas (Milo McIver State Park, Molalla River State Park) counties.

Community: Hardwood/Rubus spectabilis/Hydrophyllum tenuipes is a Willamette Valley forested floodplain community. It can occur under a range of overstory tree species, *including Alnus, Populus trichocarpa, Fraxinus latifolia*, and *Acer macrophyllum. Rubus spectabilis* is the dominant shrub, though *Corylus cornuta* and *Sambucus racemosa* commonly occur. The herb layer is dominated by *Hydrophyllum tenuipes* and *Urtica dioica*, almost always with *Carex deweyana* present. *Galium*

aparine and *Claytonia sibirica* are also common and abundant. *Alnus rubra* was confirmed at the Clackamas County sites.

(***Populus trichocarpa-Fraxinus latifolia)/Rubus spectabilis-Symphoricarpos albus***
(Black cottonwood-Oregon ash)/salmonberry-snowberry (POBAT-FRLA)/RUSP-SYAL

n=7 (WV 7)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Populus trichocarpa	86	65
Fraxinus latifolia	43	73
Acer macrophyllum	14	10
Shrubs		
Rubus spectabilis	100	76
Symphoricarpos albus	86	10
Sambucus racemosa	86	5
Rubus ursinus	43	6
Cornus sericea	43	5
Herbs		
Urtica dioica ssp. gracilis	71	21
Hydrophyllum tenuipes	71	1
Impatiens capensis	57	Tr

Geomorphic environment: One Molalla River State Park site was visited in 2004. The community there is on the main floodplain of the Willamette River, near the confluence with the Molalla River. The plot is on a gentle, slightly convex surface. Silt deposited on tree boles in the plot showed evidence of flood waters from 8 to 9 feet deep. The soil pit was in a deep silt deposit, probably resulting from the last major flood. In a concavity at one end of the surface, the community transitioned into a *Fraxinus latifolia-Populus trichocarpa* dominated *Carex obnupta* wetland.

Soil, substrate and geomorphic surface data are unavailable for the other sites. Plots were 9 to 21 feet above river level (average 14 feet), and from 115-500 feet from the channel. Plots were located in Clackamas (Molalla SP), Marion (Minto, Wilsonville), Polk (Luckiamute) and Yamhill (Grand Island) counties.

Community: (Populus trichocarpa-Fraxinus latifolia)/Rubus spectabilis-Symphoricarpos albus is a shrubby Willamette Valley forested floodplain community. Tree canopy is fairly dense *Populus trichocarpa* and/or

Fraxinus latifolia. The thick shrub layer is dominated by *Rubus spec*tabilis with *Symphoricarpos albus* and *Sambucus racemosa*. The herb layer is very sparse. The most common and abundant herb is *Urtica dioica*, though *Hydrophyllum tenuipes* and *Impatiens capensis* are usually present.

(***Fraxinus latifolia-Quercus garryana)/Symphoricarpos albus*** **(Oregon ash-Oregon white oak)/common snowberry (FRLA-QUGA4)/SYAL**

N=11 (Willamette Valley 11)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Fraxinus latifolia	82	62
Quercus garryana	64	62
Shrubs		
Symphoricarpos albus	100	70
Rubus ursinus	82	3
Oemleria cerasiformis	36	10
Herbs		
Polystichum munitum	45	6
Galium aparine	45	2
Carex deweyana	36	4
Torilis	36	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Muddy Creek in the Finley Wildlife Refuge was visited in 2004. The community there is on the floodplains of a tightly meandering low gradient creek that is deeply incised with rectangular cross section. The Muddy Creek floodplain is wide. Terraces are barely in evidence. Floodplains are inundated annually. Silt lines in this community on both sides of the creek are about two feet higher than bankfull.

Soil, substrate and geomorphic surface data are unavailable for the other sites. The plots ranged from 1 to 18 feet above summer flow (average 8 feet), and from 3 to 500 feet from the channel (average 41 feet). Four plots were from Linn County (Butte, Little Muddy, and N. Santiam drainages), three plots from Clackamas County (Camassia Creek, Milo McIver State Park-Clackamas River), three plots from Benton County (William L. Finley National Wildlife Refuge-Muddy Creek), and one from Polk County (Soap Creek).

Community: (Fraxinus latifolia-Quercus garryana)/Symphoricarpos albus is a floodplain forest community. It has a *Fraxinus latifolia* and/or *Quercus garryana* overstory over a thick shrub layer dominated by

Symphoricarpos albus. Rubus *ursinus* is the most common associated species. *Oemleria cerasiformis* is often present. The herb layer is relatively sparse. *Polystichum munitum* and *Galium aparine* are the most typical species.

Acer macrophyllyum/Symphoricarpos albus
Big leaf maple/common snowberry
ACMA3/SYAL

N=2 (Willamette Valley 2)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Acer macrophyllum	100	55
Populus trichocarpa	50	75
Shrubs		
Symphoricarpos albus	100	88
Rubus ursinus	100	6
Oemleria cerasiformis	50	2
Rubus spectabilis	50	2
Herbs		
Carex deweyana	100	Tr
Hydrophyllum tenuipes	100	Tr
Heracleum lanatum	50	3
Galium triflorum	50	1

Elevations: less than 600 feet.

Geomorphic environments: Environmental data for this type are minimal. The plots ranged from 12 to 21 feet above summer flow, and from 30 to 200 feet from the channel. Both plots are from the main Willamette River, one site from a slough in Linn County, the other from a floodplain forest plot near Wilsonville in Marion County.

Community: Sample size is extremely limited for this community. Acer macrophyllum/Symphoricarpos albus is a floodplain forest. It occurs with an overstory of *Acer macrophyllum* and often *Populus trichocarpa*. *Symphoricarpos albus* dominates the understory. *Rubus ursinus* is the other typical associated shrub species. The herb layer is very sparse under the dense shrub layer, with *Carex deweyana* and *Hydrophyllum tenuipes* present in trace amounts.

Forested *Symphoricarpos albus/Maianthemm stellatum*
Forested common snowberry/starry false Solomon's seal
Forested SYAL/MAST4

N=4 (Willamette Valley 4)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Fraxinus latifolia	50	80
Acer macrophyllum	50	29
Pseudotsuga menziesii	25	90
Populus trichocarpa	25	50
Alnus	25	20
Thuja plicata	25	15
Taxus brevifolia	25	5
Shrubs		
Symphoricarpos albus	100	56
Oemleria cerasiformis	50	18
Acer circinatum	50	12
Corylus cornuta	50	4
Rubus ursinus	50	Tr
Herbs		
Maianthemum stellatum	100	43
Galium aparine	75	Tr
Equisetum hyemale	50	10
Vancouveria hexandra	50	1
Impatiens capensis	50	1
Thalictrum occidentale	50	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. The plots ranged from 2 to 8 feet above summer flow, and from 0 to 30 feet from the channel. Remarks on one plot sheet record that clay covered 90% of the plot. Two plots were from the Clackamas River (Clackamas County), one from the Middle Fork Willamette River (Lane County), and one from the Willamette River (Marion County).

Community: Forested Symphoricarpos albus/false Solomon's-seal is a floodplain community. It can occur under dense canopies of *Fraxinus*

latifolia, Populus trichocarpa, Acer macrophyllum, or *Pseudotsuga menziesii*. A thick shrub layer is dominated by *Symphoricarpos albus. Oemleria cerasiformis* and *Acer circinatum* are often abundant, while *Corylus cornuta* and *Rubus ursinus* are also frequently present. *Maianthemum stellatum* is the dominant herb.

Fraxinus latifolia/Symphoricarpos albus/Camasia quamash
Oregon ash/common snowberry/common camas
FRLA/SYAL/CAQU2

N=3 (Willamette Valley 3)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees		
Fraxinus latifolia	100	52
Quercus garryana	67	80
Shrubs		
Symphoricarpos albus	100	59
Spiraea douglasii	67	1
Rosa eglanteria	67	1
Herbs		
Camassia quamash	100	32
Ranunculus uncinatus	67	3
Rumex crispus	67	Tr
Galium aparine	67	Tr

Elevations: less than 600 feet.

Geomorphic environment: Environmental data for this type are minimal. Sites were classed as floodplain forests. Water table depth was at the surface. The plots ranged from 5 to 8 feet above summer flow (average 6 feet), and from 15 to 50 feet from the main channel (average 30 feet). All three plots are from at William L. Finley Wildlife Refuge Benton County (Muddy Creek).

Community: Fraxinus latifolia/Symphoricarpos albus/Camassia quamash is a forested floodplain community. The overstory is *Fraxinus latifolia*, usually with *Quercus garryana*. The shrub layer is dominated by *Symphoricarpos albus*, with *Spiraea douglassii* and the non-native *Rosa eglanteria* as commonly associated species. *Camassia quamash* is the herb layer dominant. *Ranunculus uncinatus*, the exotic *Rumex crispus*, and *Galium aparine* are often present but at low cover.

Camassia quamash is an ephemeral species, and similar habitats sampled late in the summer might not show the presence of this species. Such a small sample size does not present strong evidence on typical composition or abundance.

Western redcedar/Starry false Solomon's-seal
THPL/MAST4

N=5 (WNF 4, Willamette Valley 1)

SPECIES	CONSTANCY %	TYPICAL COVER %
Trees-overstory		
Thuja plicata	100	68
Acer macrophyllum	60	41
Taxus brevifolia	60	29
Pseudotsuga menziesii	40	19
Alnus	40	8
Trees-seedlings		
Thuja plicata	60	3
Acer macrophyllum	40	11
Tsuga heterophylla	40	7
Shrubs		
Oemleria cerasiformis	80	1
Rubus ursinus	80	1
Acer circinatum	60	38
Oplopanax horridum	40	2
Herbs		
Maianthemum stellatum	100	30
Polystichum munitum	80	8
Galium triflorum	80	1
Anemone deltoidea	80	1
Trillium ovatum	80	Tr
Athyrium filix-femina	60	4
Vancouveria hexandra	60	2
Osmorhiza berteroi	60	1
Tiarella trifoliata	60	1
Petasites frigidus	40	3
Aruncus dioicus	40	2
Prosartes hookeri	40	1
Adiantum pedatum	40	1
Hydrophyllum tenuipes	40	1
Bromus vulgaris	40	Tr

Elevations: less than 600 to 2390 feet.

Geomorphic environment: Low terraces or elevated islands on unconstrained reaches of relatively large 4th to 6th order streams in the margins of the Willamette Valley. Soils data are from one plot. It had a loamy top horizon with increasing gravel content with depth. No surface coarse fragments were recorded from that site. The Willamette Valley site was on the lower Clackamas River. Willamette NF samples were from the South Fork McKenzie watershed.

Community: The Thuja plicata/Maianthemum stellatum community occurs under dense *Thuja plicata* canopy, often with *Acer macrophyllum* and *Taxus brevifolia*. *Pseudotsuga menziesii* and *Alnus* may also be present. *Acer circinatum* is the most abundant shrub and is present in almost two-thirds of the plots. *Oemleria cerasiformis* and Rubus ursinus are typically present in trace amounts. The understory is dominated by *Maianthemum stellatum*, with *Polystichum munitum* the second important species.

These sites are reset infrequently, though flooding may allow establishment of *Alnus rubra* without removing the existing overstory. Presence of wet-indicator species, such as *Oplopanax horridum, Athyrium filix-femina* and *Petasites frigidus* as well as the *Thuja plicata* overstory mark this community as riparian.

TABLE OF CONTENTS FOR NATIVE FRESHWATER PLANT ASSOCIATIONS OF NORTHWESTERN OREGON

III. HERBACEOUS ASSOCIATIONS

Introduction

This wetlands section provides keys, descriptions, and stand tables for 122 native freshwater plant associations (14 forest and woodland, 28 shrub, 78 herbaceous, 2 nonvascular) in northwestern Oregon, based on analysis of data from 1,992 plots distributed throughout the study area. Descriptions are provided for eight other plant associations for which there are no plot data. Northwestern Oregon as defined in this section includes the north half of both the Coast Range and Western Cascade ecoregions, and all of the Willamette Valley ecoregion. The Western Cascade ecoregion also includes a significant portion of the east slope of the Cascade Range, down to an elevation of about 3,000 feet in the north to 5,000 feet in the south.Note that the streamside section does not include the east slope of the Cascade Range. Data from some wetlands in coastal Douglas County and western Klamath County were also included where wetland associations from these adjoining areas are known or suspected to occur within the study area.

This section describes only wetland associations with seasonal to perennial hydration, excluding irregularly flooded streamside vegetation (see streamside section of this field guide, or McCain 2004 for a more complete treatment). Salt marsh and brackish plant associations were also excluded, as were undersampled freshwater stands of *Carex lyngbyei* and *Schoenoplectus americanus* that occur up to 50 miles upstream from salt water in the Columbia River

Major Wetland Types

Aquatic beds. Freshwater ponds, lakes, and sloughs are habitat for aquatic bed and emergent marsh associations and occur throughout northwestern Oregon. Along the coast, most large lakes formed when shifting sands blocked streams draining the Coast Range, creating deep lakes with steep slopes whose water levels may drop as much as 6-8 feet during the summer. Lakes and ponds also occur within the dune sheet in areas where the water table is at the surface. They are typically shallow and subject to seasonal changes in water levels, and some are unique because of their large size and extensive aquatic bed and emergent plant associations. Ponds, lakes, and sloughs are also associated with floodplains of major rivers throughout the study area, particularly on broad flats associated with the Willamette and Columbia Rivers. Water levels here typically recede in summer, so gravel banks and mud flats may appear, stranding some aquatic plants, but creating habitat for emergent species. Peatlands and headwater basins also contain pools, ponds, and tarns with aquatic bed associations. Ponds

and pools may also occur midslope, associated with benches and slump or sag ponds in landslide topography, often associated with marshes or peatlands that develop on these sites. Aquatic bed vegetation in ponds is usually entirely submerged or may have leaves floating at the surface. Most vegetation is rooted in sand, gravel, silt or mud, but some species are free-floating and drift about with wind and current. Extensive monotypic stands are typical of this kind of vegetation. If the water body is large enough, discrete clumping or zonation of single species can be seen, with mixtures occurring in the ecotones. Since 1850, much of this habitat has been lost to river channelization, has silted in naturally, or has been filled or recontoured for agriculture.

Marshes. Marsh associations occur in depressions in various landforms, particularly headwall basins and floodplains. They may also occur midslope, associated with benches and slump or sag ponds in landslide topography. Water levels typically recede in summer, exposing gravel or mud flats and creating habitat for some seasonal species. Aquatic species may become stranded in these communities and persist with modified morphology, if the substrate is wet enough. If good zonation is present, it is possible to see weak-stemmed or decumbent species in the deeper water, or species specifically adapted to later exposure on mud flats, followed by taller herbs and shrubs on the landward side. Perennially wet marshes are usually too wet for the noxious grass *Phalaris arundinacea* to become established. Channelization, flood control and agriculture have caused extensive losses of these habitats. The *Saggitaria latifolia* association that was once common throughout the region in floodplain marshes inundated until midsummer largely has been displaced by *Phalaris arundinacea* except in the Columbia River bottoms. Mud flat associations along the lower Columbia River have suffered a similar fate.

Peatlands. Most peatlands in Oregon are fens rather than bogs, being hydrated by mineral-rich surface or groundwater, lacking a domed peat profile, and having a pH generally higher than 5.5. Many fens, however, contain localized *Sphagnum* hummocks or lawns with a pH as low as 4, and may be classified as "poor fen." They occur in depressions in various landforms, particularly in interdunal depressions, headwall basins, and floodplains. Peatlands may also occur around midslope slump or sag ponds in landslide topography. They are usually perennially saturated but local areas of surface drying are not uncommon. These wetlands are widespread in northwestern Oregon but usually small in area, and occurrences in the Willamette Valley are now rare. Drainage, filling, peat mining, conversion to commercial cranberry production, and plant succession have destroyed many sites, and losses continue to occur despite wetland regulations that were designed to protect them.

The small area they occupy in the landscape is causing some conservation organizations to pass them over in the "bigger is better" philosophy that currently dominates the field. It is important to properly document the components of these ecosystems and to develop new conservation priorities to help protect representative examples in the state. Coastal fens in Oregon are floristically distinct from those north of the Columbia River (e.g., Golinski 1999; Vitt et al. 1999) and those at higher elevations in the Cascade and Coast Ranges (Seyer 1979, 1981, 1983; Wilson 1986; Frenkel et al. 1986), making them unique in North America and highly-ranked elements in state Heritage Program methodology.

Wet prairies. The name prairie refers here to wet grasslands that developed on clay or silt loam soils in the Willamette Valley, on the Columbia River bottoms, and along the coast. Although best known for *Deschampsia caespitosa,* they contain many other species of grasses, sedges and herbs. Before flood control, wet prairies on the Columbia River bottoms were frequently flooded well into summer, and not much is known about their original composition because widespread invasion of *Phalaris arundinacea* has displaced many native species. Some stands were probably *Deschampsia caespitosa* prairie and others were *Carex aperta* prairie, and they intergraded with a complex of marshes and sloughs on the river bottoms. Willamette Valley prairie developed on heavy clay loam soils that created a seasonally perched water table that was often isolated hydrologically from streams and rivers. These sites are usually dry by late spring but depressions may retain water well into the summer. Few vernal pools are known to remain in the Willamette Valley and none are described in this guide. The Willamette Valley prairie is unique and one of the rarest ecosystems in the Pacific Northwest, containing a number of endemic plant species. It developed under a regime of frequent fire from both lightning and native Americans (Boyd 1999), but after settlement by Euroamericans it went into rapid decline. Considerable research is now being done on fire ecology and restoration in this habitat, but after twenty years of study most plant associations still remain unpublished. The few Willamette Valley prairie associations described in this guide are provided to help document the vegetation, but much work remains to be done.

Shrub swamps. Shrub swamps are wetlands dominated by shrubs and they occur at all elevations throughout northwestern Oregon. They occur on floodplains and basins, and most tolerate a variable water regime. Community structure ranges from scattered shrubs with intervening herbaceous component, to dense and impenetrable stands of *Salix, Cornus stolonifera,* and *Spiraea douglasii.* Riparian shrub swamp associations are highly variable and difficult to classify. Many contain

various mixtures of the same species, with or without a partial tree canopy. Historically, willow swamps were the second most abundant wetland vegetation (after wet prairies) forming a wet landscape described by early explorers and land surveyors of the region. Many of these systems were maintained or enhanced by beavers and have since been lost to drainage and conversion to farming.

Forested wetlands (swamps). This section includes only forested wetland associations occurring in seasonally to perennially flooded depressions, or with perennially wet soils throughout the stands. The major associations are dominated by *Alnus rubra, Fraxinus latifolia*, *Picea sitchensis,* or *Thuja plicata.* The extent of forested wetlands in northwestern Oregon is now much diminished from what it was in 1850. General Land Office survey notes from the 1850's show that riparian forest in the Willamette Valley was in some areas as much as five miles wide, but most stands are now reduced to narrow strips fringing streams and rivers (Benner and Sedell 1997). Probably at least 100,000 acres of this forest were cleared for agriculture and fuelwood. On the coast, old-growth *Picea sitchensis* swamp is very rare because most stands were readily accessible for logging and suitable sites may never have been numerous or extensive. Of an estimated 14,000 acres in Oregon in 1850, about 1,700 remain today, representing an 88 percent loss.

Disturbance Processes

The major agents of wetland disturbance in northwestern Oregon have been beavers, floods, landslides, tsunamis, windthrow, fire, and people. These forces mediate the supply, movement, and chemistry of water and sediments and shape the development of different types of vegetation.

Beavers. Beavers occur throughout the Pacific Northwest, their work most evident as beaver dams, beaver ponds, and plugged culverts. Less evident is the extensive cropping of wetland and streamside vegetation by beavers that den in streambanks without the familiar dams or lodges. Many wetlands developed on sediments trapped by long-vanished beaver dams, and in narrow drainages these wetlands persist as series of terraces extending upstream in stairstep fashion, the beaver dams no longer visible. Although beavers are seemingly ubiquitous today, some researches have estimated that historic populations in Oregon were ten times larger than what they are today. Their numbers were decimated first by commercial trapping prior to 1845, then by diminishing wetland acreage caused by their trapping, and finally by a rush of agricultural drainage projects.

Floods. Floods are the primary force influencing landforms and vegetation on river bottoms. They vary in magnitude and either destroy, create, or maintain wetlands. High-energy floods in constrained valleys may fill wetlands with sediment and create new wetlands by reworking sediments to create depressions. They frequently destroy beaver dams and expose accumulated sediments to erosion and rapid invasion by upland species. They also have less impact on some wetlands by simply rehydrating them after summer drying. Floods had their greatest effect on wetlands prior to construction of flood control dams in the Willamette River basin and on the Columbia River. Historically, two distinct seasonal flood regimes existed, one initiated by winter rain west of the Cascades, the other by spring snowmelt east of the Cascades. Winter floods ("rain floods") primarily affected the Willamette Valley and spring floods ("freshets") affected the Columbia River bottoms. Along the Columbia River, flood heights gradually diminished downstream, and below river mile 40 the broad estuary and strong tidal influence dissipated its effects. Floodwaters of 20 to 30 feet at Vancouver would rise to only 2 to 5 feet in the estuary (U.S. Army Corps of Engineers 1948, 1988). The spring floods on the Columbia River bottoms kept much of the floodplain under water until June or sometimes July, maintaining much wet prairie and seasonal willow and ash swamps that were later invaded by *Phalaris arundinacea* in the absence of prolonged flooding.

Landslides. Like floods, landslides and debris torrents both create and destroy wetlands. Those occurring midslope may form isolated slump or sag ponds that are often associated with marshes and peatlands. Larger-scale landslide topography usually contains clusters of ponds over a large area. Debris torrents are concentrated in narrow stream valleys and scour riparian marshes and beaver impoundments associated with the streambed. Wetlands sometimes form in the jumbled deposits at the base of the flow.

Tsunamis. Sediment cores indicate that tsunamis have repeatedly inundated salt marshes, swamps, and peatlands along the coast of the Pacific Northwest. Burial by marine sediments and associated tectonic uplift or subsidence destroys wetlands and creates new ones, but these processes are not well documented in Oregon.

Windthrow. Windthrow is usually a minor agent of disturbance in our wetlands but locally could be catastrophic in a major storm. *Picea sitchensis* swamps on the coast are the most vulnerable wetlands. The roots of *Picea* cannot grow in perennially wet, anoxic soil and instead form wide-spreading but very shallow systems that, combined with buttresses at the base of the trunk, serve to keep the tree rocking back and forth on the spongy substrate. Windthrow is common in these

stands, creating canopy gaps for the dense shrub layer and reproducing trees. Windthrow of small trees is sometimes seen in peatlands where the weight of the tree becomes insupportable in the soft ground.

Fire. Fire probably played a major role historically in most wetlands in northwestern Oregon except for the wettest of coastal swamps. Ignition sources were both aboriginal and by lightning, the former being most common in the Willamette Valley (Boyd 1999). Fire-scarred trees or stumps may often be found in the center of wetlands, and soil pits or sediment cores frequently contain charcoal, but these are the only evidence for fire in and around wetlands. While forest fires in upland settings have been well studied locally, no studies have focused on the role of fire in Oregon wetlands except for Willamette Valley prairie.

People. Although people have lived in northwestern Oregon for at least 10,000 years, large-scale human-caused changes to wetlands did not occur until after 1850. The greatest losses of wetland habitat in northwestern Oregon are directly attributable to settlement and land conversion. Agricultural drainage, livestock grazing, logging, groundwater pumping, urban and industrial development, and road construction have all taken their toll and made some wetland associations extremely rare. Recreational off-road vehicles, horseback riding, and hiking can damage wetlands if traffic is concentrated in fragile areas.

Exotic Plants

Despite their location, certain wetland habitats appear to be especially vulnerable to invasion by exotic species. Recently drained sites with exposures of bare sediments, such as those occurring behind broken or abandoned beaver dams, are favored habitat for upland weeds as long as inundation does not recur in the second growing season. In contrast, seasonally-flooded mudflat associations on floodplains are rarely invaded by weeds as long as water persists into the growing season and suppresses weed development. Some aquatic bed associations are vulnerable to aggressive aquatic weeds and can be completely replaced by them. Well-known weedy species in our area include *Myriophyllum aquaticum, Egeria densa, Ludwigia uruguayensis, Potamogeton crispus,* and *Myriophyllum spicatum.* The most serious pests of lower-elevation emergent marsh and wet prairie are *Phalaris arundinacea, Agrostis stolonifera, Poa pratensis, Iris pseudacorus,* and *Alopecurus pratensis*. *Phalaris arundinacea* and *Agrostis stolonifera* are less common above 4,000 feet in the Cascade Range, but *Poa pratensis* extends well into subalpine meadows, where it may have been introduced as a forage species in range improvement programs, or brought in inadvertently by

sheep.

Methods

Datasets. The datasets used in this analysis were collected by many individuals from 1966 to the present, and are listed in the full guide. Data were collected from a variety of plots sizes and transects scattered throughout the study area, and were usually placed subjectively in order to characterize perceived differences in vegetation. Plots of 10-500 m^2 ("macroplots") were usually sampled to characterize homogeneous stands, while plots of 0.10-1 m^2 ("microplots") were sampled to characterize either homogeneous stands remote from ecotones or changing zones of vegetation within ecotones. Microplots were either free-standing or sampled along transects. Whenever possible, plots were located in sites free of obvious human-caused disturbance. It is difficult to avoid disturbed sites at lower elevations, where pervasive ditching, drainage, and eutrophication have affected virtually all larger wetlands at one time or another.

All plot data included percent cover of individual species and the vegetation layer to which the species belong. Environmental variables varied widely among datasets and were absent for some.

Data analysis. This section attempts to describe only wetland associations with seasonal to perennial hydration. Plant associations were identified using cluster analysis, TWINSPAN, and Bray-Curtis ordination provided in PC-ORD (McCune and Mefford 1999), and manual analysis of association tables generated by ECOTOOLS (Smith 1997). In all cases, cover values were averaged for all plots within a plant association. Because of the differences in plot size and environmental data gathered in macroplots and microplots, data from these two plot types were analyzed separately. Although bryophytes are extremely good indicators of certain wetland plant associations, many datasets did not identify individual species. Where data are available, the species are enumerated in the descriptions of each association.

Classification. The classification in this section conforms with the National Vegetation Classification System (NVCS): [http://biology.usgs.gov/npsveg/nvcs.html; http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol]. Each association is named after one or more diagnostic species in each vegetation layer. Following the NVCS, a 25% cover cutoff was used to segregate tree and shrub associations from herbaceous associations. Dominant species in the herb layer were defined as having at least 20%

cover, following the 1987 Wetland Delineation Manual (U.S. Army Corps of Engineers 1987), or having the highest cover available in depauperate stands.

Many wetland species tend to form monotypic stands over relatively large areas but they also often form mixed stands with other types. When species are capable of forming monotypic stands of 100 m^2 or more, they were recognized as distinct plant associations instead of patches. In the field, monotopic types are generally >25 m^2 except for vernal pool associations that may occur in patches as small as 1-5 m^2.

Results

Keys and descriptions. Identification keys and descriptions are provided for 122 plant associations (14 forest and woodland, 28 shrub, 78 herbaceous, 2 nonvascular). Abbreviated stand tables are provided with the description for each association when plot data are available. Descriptions for several associations include phases that have been identified or are expected to occur in the region. Each phase is described briefly or is simply listed if detailed analysis has not been done.

For convenience, *Salix lucida* ssp. *lasiandra* associations were placed together with other *Salix* associations in the shrub class, despite the fact that under favorable conditions *Salix lucida* ssp. *lasiandra* can reach tree height of 30 or 40 feet in western Oregon. In the stand tables for each association it is listed as a tree.

KEY TO NATIVE FRESHWATER WETLAND PLANT ASSOCIATIONS OF NORTHWESTERN OREGON

1a. Combined tree cover generally at least 25%
..... Key to **Forest and Woodland Associations** (p. 198)
1b. Combined tree cover generally < 25 % 2

2a. Combined shrub cover generally at least 25%
..... Key to **Shrubland Associations** (p. 200)
2b. Combined shrub cover generally < 25% 3

3a. Graminoid, forb, or fern cover generally at least 25 %, or highest cover available in layer; bryophyte, lichen, or algal cover various
..... Key to **Herbaceous Associations** (p. 204)
3b. Graminoid, forb, or fern cover generally < 25%; bryophyte, lichen, or algal cover generally > 25%, or highest cover available in layer
..... Key to **Nonvascular Associations** (p. 207)

I. FOREST AND WOODLAND ASSOCIATIONS

Mature trees > 12 feet tall, crowns overlapping, cover generally 60-100%.

Note: Some stands with tree cover at least 25 % may key to shrubland or herbaceous associations if trees are only occasional or peripheral in the associations.

Characterized by having one of the following tree species, either mature or reproducing, generally with at least 20% cover:

(1) *Abies amabilis* ..... A
(2) *Abies lasiocarpa* ..... B
(3) *Alnus rubra* C
(4) *Fraxinus latifolia* ..... D
(5) *Picea engelmannii* ..... E
(6) *Picea sitchensis* ..... F
(7) *Pinus contorta* var. *contorta* [shore pine]
..... *Pinus contorta* var. *contorta/Carex obnupta* (p. 217)
(8) *Pinus contorta* var. *latifolia* [lodgepole pine] ..... G
(9) *Populus balsamifera* ssp. *trichocarpa*
..... *Populus balsamifera* ssp. *trichocarpa /Cornus sericea/ Carex deweyana* ssp. *leptopoda* (p. 218)
(10) *Populus tremuloides*
..... *Populus tremuloides /Carex obnupta* (p. 219)

(11) *Salix lucida* ssp. *lasiandra*
..... **Key to Shrubland Associations** (p. 200)
(12) *Thuja plicata* .....A
(13) *Tsuga heterophylla*.....A

A. *Abies amabilis, Thuja plicata*, and/or *Tsuga heterophylla*:
1a. *Ledum glandulosum* present
.....*Tsuga heterophylla /Ledum glandulosum/ Carex obnupta - Lysichiton americanus* (p. 221)
1b. *Ledum glandulosum* absent 2

2a. *Thuja plicata* present
.....*Thuja plicata/Lysichiton americanus* (p. 220)
2b. *Thuja plicata* absent .**Key to Herbaceous Associations** (p. 204)

B. *Abies lasiocarpa*:
1a. *Vaccinium uliginosum* with > 20% cover
..... **Key to Shrubland Associations** (p. 200)
1b. *Vaccinium uliginosum* with < 20% cover or absent
.....**Key to Herbaceous Associations** (p. 204)

C. *Alnus rubra*:
1a. *Carex obnupta* with at least 5% cover and usually dominant or codominant with *Lysichiton americanus*
.....*Alnus rubra/Carex obnupta - Lysichiton americanus* (p. 209)
1b. *Carex obnupta* with < 5% cover or absent; *Athyrium filix-femina* and/or *Lysichiton americanus* usually with ≥ 20% cover
Alnus rubra/Athyrium filix-femina - Lysichiton americanus (p. 208)

D. *Fraxinus latifolia*: Characterized by having one of the following pecies, usually with at least 20% cover, but sometimes less in stands with depauperate understories:
(1) *Callitriche heterophylla*
.....**Key to Herbaceous Associations** (p. 204)
(2) *Carex aquatilis* var. *aquatilis*
..... *Fraxinus latifolia/Carex aquatilis* var. *aquatilis* (p. 210)
(3) *Carex deweyana*, sometimes with as little as 1% cover in stands with depauperate understory .....*Fraxinus latifolia/ Carex deweyana - Urtica dioica* ssp. *gracilis* (p. 211)
(4) *Carex obnupta* .....*Fraxinus latifolia/Carex obnupta* (p. 212)
(5) *Spiraea douglasii* .....*Fraxinus latifolia/Spiraea douglasii* (p. 213)
(6) *Symphoricarpos albus*
.....*Fraxinus latifolia/Symphoricarpos albus* (p. 214)

E. *Picea engelmannii*:
1a. *Vaccinium uliginosum* with > 20% cover
..... **Key to Shrubland Associations** (p. 200)
1b. *Vaccinium uliginosum* with < 20% cover or absent .....
.....**Key to Herbaceous Associations** (p. 204)

F. *Picea sitchensis*:
1a. *Cornus sericea* present; on tidal surge plain of large coastal rivers
..*Picea sitchensis/Cornus sericea/Lysichiton americanus* (p. 216)
1b. *Cornus sericea* absent; not on surge plain
Picea sitchensis/Carex obnupta - Lysichiton americanus (p. 215)

G. *Pinus contorta* var. *latifolia* [lodgepole pine]:
1a. *Vaccinium uliginosum* with > 20% cover
..... **Key to Shrubland Associations** (p. 200)
1b. *Vaccinium uliginosum* with < 20% cover or absent
.....**Key to Herbaceous Associations** (p. 204)

II. SHRUBLAND ASSOCIATIONS

Mature shrubs < 12 feet tall, crowns overlapping or remote, shrub cover generally > 25 %, tree cover generally < 25 %.

Note: Some stands with shrub cover at least 25 % may key to herbaceous associations if shrubs are only occasional or peripheral in the associations.

Characterized by having one of the following shrub species with highest cover, usually at least 20%, or highest cover available in layer:
(1) *Alnus incana*..... *Alnus incana/Lysichiton americanus* (p. 222)
(2) *Alnus viridis* ssp. *sinuata* .....A
(3) *Betula nana* .....B
(4) *Cornus sericea* .....*Cornus sericea*/*Lysichiton americanus* (p. 226)
(5) *Corylus cornuta* .....**Key to Herbaceous Associations** (p. 204)
(6) *Kalmia microphylla* C
(7) *Gaultheria shallon* ..... D
(8) *Ledum glandulosum* .....E
(9) *Lonicera caerulea* .....**Key to Herbaceous Associations** (p. 204)
(10)*Lonicera involucrata* .**Key to Herbaceous Associations** (p. 204)
(11)*Malus fusca* .....F
(12)*Myrica gale* ..... G
(13)*Rosa pisocarpa* .....**Key to Herbaceous Associations** (p. 204)
(14)*Rosa gymnocarpa* ....**Key to Herbaceous Associations** (p. 204)

(15) *Salix commutata* ..... *Salix commutata* (p. 235)
(16) *Salix geyeriana* ..... *Salix geyeriana* (p. 236)
(17) *Salix hookeriana* ..... H
(18) *Salix lucida* ssp. *lasiandra* I
(19) *Salix sitchensis* ..... *Salix sitchensis* (p. 241)
(20) *Spiraea douglasii* ..... J
(21) *Vaccinium caespitosum* ..... K
(22) *Vaccinium macrocarpon*
..... *Vaccinium uliginosum/Carex obnpta* (p. 247)
(23) *Vaccinium oxycoccos*
..... *Vaccinium uliginosum/Dodecatheon jeffreyi – Caltha leptosepala ssp. howellii* (p. 249)
(24) *Vaccinium uliginosum* L

A. *Alnus viridis* ssp. *sinuata*:
1a. *Lysichiton americanus* with at least 20% cover
..... *Alnus viridis* ssp. *sinuata/Lysichiton americanus* (p. 223)
1b. *Lysichiton americanus* with < 20% cover or absent 2

2a. *Scirpus microcarpus* with at least 20% cover
..... *Alnus viridis* ssp. *sinuata/Scirpus microcarpus* (p. 224)
2b. *Scirpus microcarpus* with < 20% cover or absent
..... **Key to Herbaceous Associations** (p. 204)

B. *Betula nana*:
1a. *Vaccinium uliginosum* with at least 20% cover
..... *Vaccinium uliginosum/Dodecatheon jeffreyi - Caltha leptosepala* ssp. *howellii* (p. 249)
1b. *Vaccinium uliginosum* with < 20% cover or absent
..... *Betula nana/Carex aquatilis* var. *dives* (p. 225)

C. *Kalmia microphylla*:
1a. *Vaccinium uliginosum* with at least 20% cover
..... *Vaccinium uliginosum/Dodecatheon jeffreyi - Caltha leptosepala* ssp. *howellii* (p. 249)
1b. *Vaccinium uliginosum* with < 20% cover or absent
..... *Kalmia microphylla/Carex aquatilis* var. *dives* (p. 227)

D. *Gaultheria shallon*:

1a. *Vaccinium uliginosum* and *Deschampsia caespitosa* present ..... *Vaccinium uliginosum/Deschampsia cespitosa - Carex obnupta* (p. 248)

1b. *Vaccinium uliginosum* and *Deschampsia caespitosa* absent *Ledum glandulosum - Gaultheria shallon/Carex obnupta* (p. 228)

E. *Ledum glandulosum*:

1a. *Gaultheria shallon* with at least 20% cover *Ledum glandulosum - Gaultheria shallon/Carex obnupta* (p. 228)

1b. *Gaultheria shallon* with < 20% cover or absent 2

2a. *Myrica gale* with at least 20% cover .....*Ledum glandulosum - Myrica gale* (p. 47)

2b. *Myrica gale* with < 20% cover or absent 3

3a. *Carex obnupta* most conspicuous species in herb layer or evident adjacent to plot ..... *Ledum glandulosum/Carex obnupta/Sphagnum* (p. 229)

3b. *Carex obnupta* not most conspicuous species in herb layer 4

4a. *Darlingtonia californica* present or evident adjacent to plot; *Sanguisorba officinalis* absent . *Ledum glandulosum/Darlingtonia californica/Sphagnum* (p. 230)

4b. *Darlingtonia californica* absent; *Sanguisorba officinalis* present ..*Ledum glandulosum/Sanguisorba officinalis Sphagnum* (p. 232)

F. *Malus fusca*:

1a. *Salix hookeriana* conspicuous in plot or evident adjacent to plot; coastal ..... *Salix hookeriana - Malus fusca/Carex obnupta - Lysichiton americanus* (p. 238)

1b. *Salix hookeriana* absent; not coastal .....*Malus fusca/Carex obnupta* (p. 233)

G. *Myrica gale*:

1a. *Ledum glandulosum* generally with at least 20% cover .....*Ledum glandulosum - Myrica gale* (p. 231)

1b. *Ledum glandulosum* with < 20% cover or absent .....*Myrica gale*/*Carex aquatilis* var. *dives* (p. 234)

H. *Salix hookeriana*:

1a. *Malus fusca* conspicuous in plot or evident adjacent to plot ..... *Salix hookeriana - Malus fusca/Carex obnupta - Lysichiton americanus* (p. 238)

1b. *Malus fusca* absent 2

2a. *Carex obnupta* and *Lysichiton americanus* usually both present in plot or evident adjacent to plot; coastal ..... *Salix hookeriana - Malus fusca/Carex obnupta - Lysichiton americanus* (p. 238)

2b. *Lysichiton americanus* absent; not coastal ..... *Salix hookeriana* - (*Salix sitchensis*) (p. 237)

I. *Salix lucida* ssp. *lasiandra*:

1a. *Salix sitchensis* present in plot or evident adjacent to plot, usually with > 20% cover ..... *Salix lucida* ssp. *lasiandra/ Salix sitchensis/Lysichiton americanus* (p. 240)

1b. *Salix sitchensis* with < 20% cover or absent ..... *Salix lucida* ssp. *lasiandra/Urtica dioica* ssp. *gracilis* (p. 239)

J. *Spiraea douglasii*:

1a. *Vaccinium uliginosum, Deschampsia caespitosa*, and *Sphagnum* usually present or evident adjacent to plot ..... *Spiraea douglasii - Vaccinium uliginosum/ Carex obnupta - Deschampsia caespitosa* (p. 243)

1b. *Vaccinium uliginosum* and *Deschampsia caespitosa* absent 2

2a. *Salix hookeriana* conspicuous in plot or evident adjacent to plot ..... *Salix hookeriana - Malus fusca/Carex obnupta - Lysichiton americanus* (p. 238)

2b. *Salix hookeriana* absent 3

3a. *Carex cusickii* present or evident adjacent to plot ..... *Spiraea douglasii/Sphagnum* (p. 244)

3b. *Carex cusickii* absent, other herbs <10 % cover or absent ..... *Spiraea douglasii* (p. 242)

K. *Vaccinium caespitosum*:

1a. *Xerophyllum tenax* present or evident adjacent to plot, flooded openings absent ..... *Vaccinium caespitosum/ Xerophyllum tenax - Sanguisorba officinalis* (p. 246)

1b. *Xerophyllum tenax* absent, flooded openings present ..... *Vaccinium caespitosum/Sanguisorba officinalis – Carex obnupta* (p. 245)

L. *Vaccinium uliginosum*:

1a. *Spiraea douglasii* codominant or evident adjacent to plot
..... *Spiraea douglasii - Vaccinium uliginosum/Carex obnupta - Deschampsia caespitosa* (p. 243)

1b. *Spiraea douglasii* not codominant 2

2a. Herb layer with < 10 % cover or absent
..... *Vaccinium uliginosum/Dodecatheon jeffreyi - Caltha leptosepala* ssp. *howellii* (p. 249)

2b. Herb layer with at least 10% cover, usually > 20% 3

3a. *Dodecatheon jeffreyi* and *Caltha leptosepala* ssp. *howellii* with highest cover available in herb layer
..... *Vaccinium uliginosum/Dodecatheon jeffreyi - Caltha leptosepala* ssp. *howellii* (p. 249)

3b. *Dodecatheon jeffreyi* and *Caltha leptosepala* ssp. *howellii* not with highest cover available in herb layer 4

4a. *Salix hookeriana* present or conspicuous adjacent to plot
..... *Vaccinium uliginosum/Carex obnupta* (p. 247)

4b. *Salix hookeriana* absent
..... *Vaccinium uliginosum/Deschampsia cespitosa - Carex obnupta* (p. 248)

III. HERBACEOUS ASSOCIATIONS

Graminoid, forb, or fern cover generally > 25 %; tree and shrub cover generally < 25%.

One the following herb species with highest cover in herb layer, usually at least 20% or highest cover available in depauperate stands, or one of 2-3 most abundant species in herb layer:

(1) *Athyrium filix-femina* ..... *Athyrium filix-femina* (p. 250)
(2) *Azolla filiculoides* or *A. mexicana*
..... *Azolla* (*filiculoides, mexicana*) (p. 251)
(3) *Bidens cernua* ..... *Bidens cernua* (p. 252)
(4) *Bidens frondosa* ..... *Bidens frondosa* (p. 253)
(5) *Boykinia major* ..... *Boykinia major* (p. 254)
(6) *Brasenia schreberi* ..... *Brasenia schreberi* (p. 255)
(7) *Calamagrostis canadensis* .... *Calamagrostis canadensis* (p. 256)
(8) *Calamagrostis nutkaensis* ..... *Calamagrostis nutkaensis* (p. 257)
(9) *Callitriche heterophylla* ..... *Callitriche heterophylla* (p. 258)
(10) *Caltha leptosepala* ssp. *howellii* ..... A

(54)*Ludwigia palustris*
..... *Ludwigia palustris - Polygonum hydropiperoides* (p. 308)
(55)*Menyanthes trifoliata* ..... *Menyanthes trifoliata* (p. 309)
(56)*Nephrophyllidium crista-galli*
..... *Nephrophyllidium crista-galli* (p. 310)
(57)*Nuphar lutea* ssp. *polysepala*
..... *Nuphar lutea* ssp. *polysepala* (p. 311)
(58)*Oenanthe sarmentosa* ..... *Oenanthe sarmentosa* (p. 312)
(59)*Paspalum distichum* ..... *Paspalum distichum* (p. 313)
(60)*Polygonum amphibium* ..... *Polygonum amphibium* (p. 314)
(61)*Polygonum hydropiperoides*
..... *Ludwigia palustris - Polygonum hydropiperoides* (p. 308)
(62)*Potamogeton natans* ..... *Potamogeton natans* (p. 315)
(63)*Ranunculus aquatilis* ..... *Ranunculus aquatilis* (p. 316)
(64)*Ranunculus flammula* ..... *Ranunculus flammula* (p. 317)
(65)*Sagittaria latifolia* ..... *Sagittaria latifolia* (p. 318)
(66)*Sanguisorba officinalis* ..... D
(67)*Schoenoplectus acutus* ..... *Schoenoplectus acutus* (p. 320)
(68)*Scirpus microcarpus* ..... *Scirpus microcarpus* (p. 321)
(69)*Senecio triangularis* ..... *Senecio triangularis* (p. 322)
(70)*Sparganium angustifolium* ..... *Sparganium angustifolium* (p. 323)
(71)*Sparganium eurycarpum* ..... *Sparganium eurycarpum* (p. 324)
(72)*Torreyochloa pallida* var. *pauciflora*
..... *Torreyochloa pallida* var. *pauciflora* (p. 325)
(73)*Trichophorum caespitosum*
..... *Trichophorum caespitosum* (p. 326)
(74)*Triteleia hyacinthina* ..... *Triteleia hyacinthina* (p. 327)
(75)*Typha latifolia* ..... *Typha latifolia* (p. 328)
(76)*Utricularia macrorhiza* ..... *Utricularia macrorhiza* (p. 329)

A1. *Sanguisorba officinalis* usually codominant, *Carex obnupta* and/or *Carex cusickii* conspicuous in plot or evident adjacent to plot; Coast Range ..... *Caltha leptosepala* ssp. *howellii - Carex obnupta* (p. 260)
A2. *Sanguisorba officinalis, Carex obnupta, Carex cusickii* absent or with < 5% cover; Cascade Range *Caltha leptosepala* ssp. *howellii* (p. 259)

B1. *Nuphar lutea* ssp. *polysepala* present; coastal
..... *Carex aquatilis* var. *dives - Comarum palustre* (p. 267)
B2. *Nuphar lutea* ssp. *polysepala* absent; montane
..... *Carex aquatilis* var. *dives* (p. 266)

C1. *Carex unilateralis* and *Danthonia californica* usually present
..... *Deschampsia caespitosa - Danthonia californica* (p. 288)

C2. *Carex unilateralis* and *Danthonia californica* absent 2
2a. A*rtemisia lindleyana* present, *Juncus balticus* absent; low elevation
..... *Deschampsia caespitosa - Artemisia lindleyana* (p. 287)
2b. A*rtemisia lindleyana* absent; Cascade Range 3

3a. *Juncus balticus* codominant
..... *Deschampsia caespitosa - Juncus balticus* (p. 289)
3b. *Juncus balticus* not codominant; any other combinations of species
..... *Deschampsia caespitosa* montane "wet meadow" complex (p. 285)

D1. *Carex aquatilis* var*. dives* conspicuous in plot or evident adjacent to plot; *Carex obnupta* and *Carex cusickii* absent; Cascade Range
..... *Sanguisorba officinalis - Carex aquatilis* var*. dives* (p. 319)
D2. *Carex aquatilis* var*. dives* absent, *Carex obnupta* and/or *Carex cusickii* conspicuous in plot or evident adjacent to plot; Coast Range
..... *Caltha leptosepala* ssp*. howellii - Carex obnupta* (p. 259)

IV. NONVASCULAR ASSOCIATIONS

Bryophyte, lichen, or algal cover generally > 25%; graminoid, forb, fern, tree, or shrub cover generally < 25%.

Most abundant species in moss layer:

1a. *Fontinalis antipyretica* ..... *Fontinalis antipyretica* (p. 330)
1b. *Polytrichum commune* ..... *Polytrichum commune* (p. 331)

Alnus rubra/Athyrium filix-femina - Lysichiton americanus

Red alder/lady fern - skunk cabbage

Plots sampled: 21 (macro)

Environment:
Elevation (ft): ave. 1549 (500-4130)
Slope (deg): ave. 1 (0-5)
Landform position: floodplains, terraces
Hydrology: seasonally moist to perennially moist
Soils: mostly loam, some organic muck or rocky

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	95	72	0	95
Thuja plicata	10	Tr	0	7
Acer macrophyllum	5	Tr	0	4
Reproducing trees				
Alnus rubra	19	3	0	30
Thuja plicata	10	Tr	0	3
Tsuga heterophylla	5	Tr	0	3
Picea engelmannii	5	Tr	0	2
Malus fusca	5	Tr	0	2
Shrub layer				
Rubus spectabilis	43	3	0	50
Acer circinatum	24	4	0	50
Herb layer				
Lysichiton americanus	100	50	3	95
Athyrium filix-femina	95	17	0	85
Oenanthe sarmentosa	57	4	0	30
Stachys ciliata	52	2	0	10
Claytonia sibirica	48	3	0	35
Tolmiea menziesii	33	3	0	25
Urtica dioica ssp. *gracilis*	33	1	0	10
Moss layer				
Moss	43	7	0	80

Description: Habitat is woodland or forest, sometimes with seasonal pools. Stands are dominated by *Alnus rubra* in both mature and reproducing layers, with a small representation of *Thuja plicata* in both layers. *Rubus spectabilis* is abundant in the shrub layer in about half of the plots. *Lysichiton americanus* and *Athyrium filix-femina* dominate the herb layer, which contains over 65 other species, most with low constancy and cover. Moss cover is usually on elevated microsites such as logs and tip-up mounds.

Alnus rubra/Carex obnupta - Lysichiton americanus

Red alder/slough sedge - skunk cabbage

Plots sampled: 26 (6 macro, 20 micro)

Environment:

Elevation (ft): ave. 300 (30-2800)

Slope (deg): ave. 1 (0-10)

Landform position: floodplains, basins, lower slopes, benches

Hydrology: perennially saturated or perennially moist

Soils: mostly organic, some silt loam or sand

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	100	89	40	95
Thuja plicata	8	1	0	20
Picea sitchensis	8	1	0	15
Frangula purshiana	8	Tr	0	10
Tsuga heterophylla	8	Tr	0	3
Reproducing trees				
Thuja plicata	4	Tr	0	10
Picea sitchensis	4	Tr	0	1
Pseudotsuga menziesii	4	Tr	0	Tr
Shrub layer				
Rubus ursinus	15	Tr	0	4
Salix hookeriana	12	3	0	50
Gaultheria shallon	12	Tr	0	5
Herb layer				
Carex obnupta	100	29	5	85
Lysichiton americanus	92	57	0	90
Athyrium filix-femina	23	1	0	10
Polystichum munitum	15	2	0	45
Moss layer				
Moss	8	Tr	0	3
Unvegetated				
Bare ground	50	7	0	35

Vegetation and ecology: Habitat is forested wetland (swamp). Some sites are silted-in beaver ponds, and others are in peatlands where the association occurs in nutrient-rich laggs adjacent to uplands. Alders are usually between 20-50 years old and relatively few species are present in the shrub and herb layers. *Thuja plicata, Picea sitchensis,* and *Tsuga heterophylla* are peripheral or limited to elevated microsites. The shrub layer may be more dense on stumps and logs. *Polystichum munitum* may be abundant on logs and stumps. Expanses of treacherously deep muck frequently occur between clumps of *Carex* and *Lysichiton*. *Sphagnum* does not occur in this association but *Eurhynchium praelongum* is common. Stands along streams may be flooded for brief periods after winter storms.

Fraxinus latifolia/Carex aquatilis* var*. aquatilis

Oregon ash/aquatic sedge

Plots sampled: 2 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally wet to flooded
Soils: clay loam with seasonal perched water table

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Fraxinus latifolia	100	75	70	80
Shrub layer				
Spiraea douglasii	100	7	3	10
Rubus ursinus	100	4	2	5
Lonicera involucrata	100	3	3	3
Symphoricarpos albus	50	2	0	3
Amelanchier alnifolia	50	1	0	1
Rosa nutkana	50	Tr	0	1
Crataegus douglasii	50	Tr	0	Tr
Crataegus monogyna	50	Tr	0	Tr
Herb layer				
Carex aquatilis	100	50	20	80
Veratrum californicum	100	14	3	25
Carex deweyana ssp. *leptopoda*	100	4	2	5
Carex obnupta	100	3	2	3
Geum macrophyllum	100	2	2	2
Phalaris arundinacea	100	2	1	2
Epilobium ciliatum	100	2	1	2
Galium triflorum	100	Tr	Tr	Tr
Mimulus guttatus	50	13	0	25
Oenanthe sarmentosa	50	4	0	8

Vegetation and ecology:
Habitat is riparian forest. This association is known from only two plots and but is described here because it may be a relic of a more widespread historic vegetation type. It represents a mix of lowland and cold-soil vegetation of higher elevations. The shrub layer is diverse but cover is not particularly high. Proximity to settlement and agriculture is indicated by presence of exotic species such as *Crataegus monogyna, Phalaris arundinacea, Poa trivialis,* and *Lolium arundinaceum*.

Fraxinus latifolia/Carex deweyana - Urtica dioica* ssp. *gracilis

Oregon ash/Dewey sedge - California nettle

Plots sampled: 2 (macro)

Environment:
Elevation (ft): ave. 255 (10- 500)
Slope (deg): 0
Landform position: bottoms
Hydrology: seasonally flooded to moist
Soils: silt loams

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Fraxinus latifolia	100	78	75	80
Shrub layer				
Rubus ursinus	50	9	0	18
Spiraea douglasii	50	5	0	10
Herb layer				
Carex deweyana ssp. *leptopoda*	100	31	1	60
Juncus patens	50	13	0	25
Phalaris arundinacea	50	3	0	5
Veronica scutellata	50	1	0	2
Geum macrophyllum	50	1	0	1
Juncus tenuis	50	1	0	1
Juncus effusus	50	Tr	0	Tr
Agrostis exarata	50	Tr	0	Tr
Perideridia gairdneri	50	Tr	0	Tr
Stellaria calycantha	50	Tr	0	Tr
Elymus glaucus	50	Tr	0	Tr
Moss layer				
Moss	100	6	1	11

Vegetation and ecology:
Habitat is riparian forest. These stands occur in depressions on river and creek bottoms and were subject to sometimes prolonged seasonal inundation prior to flood control in western Oregon. Floodwaters may pool and persist into the growing season, suppressing herbaceous vegetation. *Urtica dioica* ssp. *gracilis* may be abundant in the herb layer although it is not represented in these plots. Depressions may contain no vegetation, only litterfall or recent deposits of silt, and these may become densely colonized by *Fraxinus* seedlings during the year following deposition. Tree trunks usually have thick sleeves of mosses that trap sediment and mark high water lines with silt stains. Many stands that now only flood occasionally probably contain more herbaceous vegetation than what existed before flood control. Invasion by *Phalaris arundinacea* and *Solanum dulcamara* can be particularly severe around openings in the canopy, displacing smaller native species.

Fraxinus latifolia/Carex obnupta

Oregon ash/slough sedge

Plots sampled: 18 (macro)

Environment:

Elevation (ft): ave. 669 (500-1700)
Slope (deg): ave. 0 (0-2)
Landform position: floodplains and benches
Hydrology: seasonally flooded to saturated
Soils: silt and clay loams, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Fraxinus latifolia	100	64	25	90
Populus balsamifera ssp. *trichocarpa*	11	1	0	15
Frangula purshiana	11	Tr	0	5
Abies grandis	6	Tr	0	Tr
Reproducing trees				
Fraxinus latifolia	11	Tr	0	1
Alnus rubra	6	Tr	0	Tr
Shrub layer				
Rubus ursinus	67	6	0	36
Rosa nutkana	33	Tr	0	1
Symphoricarpos albus	28	3	0	20
Spiraea douglasii	22	1	0	8
Physocarpus capitatus	22	Tr	0	3
Corylus cornuta	22	Tr	0	2
Herb layer				
Carex obnupta	100	76	25	100
Polypodium glycyrrhiza	50	Tr	0	Tr
Carex deweyana ssp. *leptopoda*	33	2	0	15
Polystichum munitum	33	1	0	10
Moss layer				
Moss	83	12	0	50

Vegetation and ecology: Habitat is riparian forest. The shrub layer is diverse but averages less than 10 percent cover, with occasionally high cover of *Rubus ursinus, Symphoricarpos albus, Cornus sericea,* or *Acer circinatum. Carex obnupta* dominates the herb layer. Forty other herbaceous species are reported from plots but most have less than 15 percent cover. The presence of *Veratrum viride* and *Rudbeckia occidentalis* in a stand of *Fraxinus* is unusual because these species are more typical of elevations above 2000-3000 feet.

Fraxinus latifolia/Spiraea douglasii

Oregon ash/Douglas spiraea

Plots sampled: 3 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains
Hydrology: seasonally flooded to saturated
Soils: silt and clay loams

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Fraxinus latifolia	100	74	50	90
Shrub layer				
Spiraea douglasii	100	85	60	100
Cornus sericea	25	Tr	0	1
Herb layer				
Carex obnupta	25	10	0	40
Ranunculus uncinatus	25	Tr	0	1
Apiaceae	25	Tr	0	Tr
Rumex crispus	25	Tr	0	Tr
Poa trivialis	25	Tr	0	Tr
Epilobium ciliatum	25	Tr	0	Tr
Moss layer				
Moss	50	1	0	4

Vegetation and ecology:
Habitat is riparian woodland or forest with open to closed canopy. *Fraxinus latifolia* is the only tree species present, and stands are characterized by a very dense shrub layer of *Spiraea douglasii* with little else present but *Carex obnupta.* Stands may be extensive along floodplains and some have no doubt developed on abandoned pasture land and old prairie.

Fraxinus latifolia/Symphoricarpos albus

Oregon ash/snowberry

Plots sampled: 2 (macro)

Environment:

Elevation (ft): ave. 790 (500-1080)
Slope (deg): ave. 1 (0-1)
Landform position: floodplain depressions
Hydrology: seasonally flooded
Soils: silt and clay loams

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Fraxinus latifolia	100	80	75	85
Shrub layer				
Symphoricarpos albus	100	55	50	60
Rubus ursinus	100	33	Tr	65
Corylus cornuta	50	20	0	40
Cornus sericea	50	6	0	12
Amelanchier alnifolia	50	5	0	10
Acer circinatum	50	Tr	0	Tr
Herb layer				
Carex obnupta	100	60	45	75
Carex deweyana ssp. *leptopoda*	100	1	Tr	2
Athyrium filix-femina	50	1	0	2
Galium triflorum	50	1	0	1
Botrychium virginianum	50	Tr	0	Tr
Galium aparine	50	Tr	0	Tr
Moss layer				
Moss	100	3	1	5

Vegetation and ecology: Habitat is riparian forest. *Fraxinus latifolia* is typically the only tree present in these stands. *Symphoricarpos albus* and *Rubus ursinus* may cover up to half the shrub layer, and *Corylus cornuta* may sometimes have cover up to 40 percent. The herb layer is dominated by monotypic stands of *Carex obnupta* with few other species present. Depressions with *Carex obnupta* may remain flooded into the growing season.

Picea sitchensis/Carex obnupta - Lysichiton americanus

Sitka spruce/slough sedge - skunk cabbage

Plots sampled: 27 (7 macro, 20 micro)

Environment:
Elevation (ft): ave. 24 (20-40)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic or muck

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea sitchensis	100	66	30	85
Alnus rubra	19	2	0	25
Thuja plicata	7	1	0	30
Tsuga heterophylla	4	1	0	20
Reproducing trees				
Tsuga heterophylla	4	Tr	0	1
Shrub layer				
Gaultheria shallon	37	4	0	30
Rubus spectabilis	30	3	0	20
Vaccinium parvifolium	30	3	0	20
Herb layer				
Carex obnupta	96	66	0	95
Lysichiton americanus	74	20	0	70
Oenanthe sarmentosa	22	1	0	20
Maianthemum dilatatum	22	1	0	8
Moss layer				
Moss	11	3	0	70

Vegetation and ecology:
Habitat is forested wetland (swamp) in coastal fens. The association occurs peripheral to open mire or shrub-swamp and often develops in nutrient-rich laggs adjacent to uplands. *Eurhynchium praelongum* is the most common moss, but several species of *Sphagnum* become more frequent near the Columbia River and northward with increasing precipitation. *Picea sitchensis* grows slowly in perennially saturated soils and trees with diameters of 25-40 inches have been found to be 200-500 years old, generally much older than upland spruce with comparable diameters. These "swamp spruce" have a characteristic growth form with shallow and spreading root systems, buttressed trunks, and reduced crown spread. Large wads of *Polypodium scouleri*, and thick mats of epiphytic mosses, particularly *Antitrichia curtipendula*, are typical on upper trunks and limbs. Windthrow is frequent, creating gaps for regeneration of *Picea*, often as resprouts from fallen boles.

Picea sitchensis/Cornus sericea/Lysichiton americanus

Sitka spruce/creek dogwood/skunk cabbage

Plots sampled: 15 (macro)

Environment:
Elevation (ft): ave. 5 (5-6)
Slope (deg): 0
Landform position: floodplains
Hydrology: seasonally flooded to perennially saturated
Soils: muck or organic

Vegetation and ecology:
Habitat is forested wetland (swamp) on floodplains of large coastal rivers, with daily freshwater tidal flooding. Stands occur on natural levees along river channels and larger tidal creeks, and form perimeters around typically lower and wetter interiors composed of either willow swamp or emergent marsh. *Tsuga heterophylla* is occasional on logs and stumps. A nearly impenetrable shrub layer is characteristic of these stands.

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea sitchensis	100	24	5	65
Alnus rubra	73	7	0	20
Thuja plicata	67	8	0	25
Frangula purshiana	67	4	0	20
Populus balsamifera ssp. *trichocarpa*	60	19	0	80
Reproducing trees				
Thuja plicata	13	Tr	0	2
Picea sitchensis	13	Tr	0	1
Shrub layer				
Cornus sericea	100	22	3	50
Rubus spectabilis	87	6	0	25
Rosa nutkana	80	3	0	10
Rubus ursinus	80	1	0	4
Rubus parviflorus	73	3	0	10
Vaccinium parvifolium	73	1	0	2
Gaultheria shallon	67	4	0	15
Oemleria cerasiformis	67	1	0	5
Symphoricarpos albus	67	1	0	5
Acer circinatum	60	5	0	20
Malus fusca	60	3	0	10
Salix sitchensis	40	5	0	40
Herb layer				
Lysichiton americanus	100	10	2	35
Athyrium filix-femina	93	2	0	10
Adiantum pedatum	93	1	0	2
Impatiens capensis	80	10	0	50
Carex obnupta	73	6	0	35
Oenanthe sarmentosa	60	2	0	5

Pinus contorta var*. contorta/Carex obnupta* Association

Shore pine/slough sedge

Plots sampled: 93 (11 macro, 82 micro)

Environment:

Elevation (ft): ave. 76 (20-100)
Slope (deg): 0
Landform position: former deflation plains, ancient marine terraces
Hydrology: seasonally flooded, dry in summer
Soils: sand, sometimes with duripan

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	99	30	0	85
Shrub layer				
Vaccinium ovatum	16	1	0	15
Vaccinium uliginosum	12	2	0	75
Gaultheria shallon	10	1	0	40
Herb layer				
Carex obnupta	100	27	1	75
Dichanthelium acuminatum var. *fasciculare*	9	1	0	15
Deschampsia caespitosa	6	1	0	50
Agrostis	5	Tr	0	10
Argentina egedii	3	Tr	0	20
Juncus lesueurii	3	Tr	0	10
Moss layer				
Moss	76	30	0	95
Unvegetated				
Bare ground	14	7	0	95
Litter	1	Tr	0	15

Vegetation and ecology:

Habitat is seasonally-flooded depressions in stabilized sand dunes along the coast. Most stands are 30-75 years old, with canopy cover between 0-85 percent. *Pinus contorta* is usually the only reproducing conifer present. The sparse shrub layer grows on mounds in and around the depressions. The density of the herb layer varies inversely with depth and duration of winter flooding. Drought-tolerant *Warnstorfia exannulata, Sphagnum mendocinum, Polytrichum commune,* and *Fontinalis howellii* are the most conspicuous mosses. Inclusions of the *Salix hookeriana - Malus fusca/Carex obnupta - Lysichiton americanus* association may occur in deeper depressions where water persists later in the season. Sand in dried-up depressions is often stained with iron. Peat does not develop at these sites because summer drying oxidizes any organic material.

Populus balsamifera* ssp. *trichocarpa* /*Cornus sericea*/*Carex deweyana* ssp. *leptopoda

Black cottonwood/creek dogwood/Dewey sedge

Plots sampled: 3 (macro)

Environment:
Elevation (ft): ave. 8 (5-10)
Slope (deg): 0
Landform position: floodplains
Hydrology: perennially saturated
Soils: silt loam or muck

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Populus balsamifera ssp. *trichocarpa*	100	48	30	75
Salix lucida ssp. *lasiandra*	67	8	0	15
Shrub layer				
Cornus sericea	100	47	20	60
Rubus ursinus	67	2	0	3
Rubus spectabilis	67	2	0	4
Herb layer				
Impatiens capensis	100	33	25	50
Carex deweyana ssp. *leptopoda*	100	1	1	2
Athyrium filix-femina	67	1	0	2
Lysichiton americanus	67	1	0	2
Scutellaria lateriflora	67	1	0	1
Solanum dulcamara	33	Tr	0	1
Callitriche	33	Tr	0	1
Prunella vulgaris	33	Tr	0	1

Vegetation and ecology:
Habitat is forested wetland (swamp) in floodplains of large coastal rivers, with daily freshwater tidal flooding. Portions are flooded at high tide, but trees are restricted to areas elevated above the water. *Fraxinus latifolia* may be frequent. The shrub layer may include *Salix sitchensis* and very low cover of other species such as *Rubus ursinus, Rubus spectabilis, Malus fusca,* and *Physocarpus capitatus.* Because much of the understory is flooded at high tide, there are few herbaceous species present with any appreciable cover. Seeds of weedy *Phalaris arundinacea, Iris pseudacorus,* and *Ranunculus repens* are capable of rafting into the interior of stands at high tide and can occur almost anywhere. Despite the relative abundance of *Impatiens capensis*, which may not be native to the Pacific Northwest, *Carex deweyana* ssp. *leptopoda* is used here to distinguish these occurrences west of the Cascade Range from some *Populus balsamifera* ssp. *trichocarpa/Cornus sericea* stands reported from east of the Cascades.

Populus tremuloides/Carex obnupta

Quaking aspen/slough sedge

Plots sampled: 1 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position:
floodplains, depressions
Hydrology: seasonally
flooded to saturated
Soils: silt loam or organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Populus tremuloides	100	50	50	50
Shrub layer				
Spiraea douglasii	100	80	80	80
Salix hookeriana	100	10	10	10
Herb layer				
Carex obnupta	100	Tr	Tr	Tr
Moss layer				
Moss	100	98	98	98

Vegetation and ecology: The single known occurrence of this association in Oregon is in a seasonally-flooded depression on shallow-soiled basalt scabland. It is described here because it may be a relic of type that was more widespread historically. Seasonal flooding is from precipitation but summer drying precludes formation of peat. The moss layer is covered up to 98 percent by *Sphagnum mendocinum.* Large expanses of swamp vegetation once occurred in the northern Willamette and Tualatin valleys and this association may have been part of it. *Populus tremuloides* still occurs in a number of low-elevation sites in Clackamas, Multnomah and Washington Counties, but most are on uplands that do not support wetland vegetation, and it becomes very rare at low elevations south of Clackamas County. These wetlands are thought to be more frequent in western Washington and perhaps extend to southwestern British Columbia but have not been sampled adequately. *Spiraea douglasii* and other species of *Sphagnum* have been observed in some stands in Washington. Despite the abundance of *Spiraea douglasii* in this association, *Carex obnupta* is used here to distinguish these low-elevation occurrences west of the Cascade Range from some *Populus tremuloides/Spiraea douglasii* stands reported from east of the Cascades.

Thuja plicata/Lysichiton americanus

Western red cedar/skunk cabbage

Plots sampled: 8 (macro)

Environment:

Elevation (ft): ave. 2925 (1300-3800)
Slope (deg): ave. 6 (0-14)
Landform position: floodplains, benches, and various slope positions with impeded drainage
Hydrology: perennially moist
Soils: loams

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Thuja plicata	100	36	15	80
Abies amabilis	50	10	0	25
Tsuga heterophylla	50	8	0	30
Pseudotsuga menziesii	50	3	0	15
Reproducing trees				
Thuja plicata	63	2	0	5
Tsuga heterophylla	50	1	0	3
Abies amabilis	38	1	0	2
Shrub layer				
Rubus spectabilis	63	1	0	2
Vaccinium ovalifolium	50	3	0	8
Acer circinatum	38	Tr	0	2
Herb layer				
Lysichiton americanus	100	28	8	60
Athyrium filix-femina	63	2	0	6
Galium triflorum	63	Tr	0	1
Blechnum spicant	50	6	0	30
Maianthemum dilatatum	38	1	0	7
Viola glabella	38	1	0	5
Listera	38	Tr	0	Tr
Asarum caudatum	38	Tr	0	Tr
Moss layer				
Moss	38	3	0	10

Vegetation and ecology:

Habitat is forested wetland (swamp) with shallow depressions among the trees. Stands are dominated by *Pseudotsuga menziesii*, when present, is usually peripheral in stands because of wet soils. *Rubus spectabilis* and *Vaccinium ovalifolium* occur in about half the plots, while the herb layer is dominated by *Lysichiton americanus*. *Athyrium filix-femina* has fairly high constancy but consistently low cover. Both shrub and herb layers are extremely diverse, with over 70 species present in the latter, sometimes making classification difficult. Trees and shrubs occupy elevated microsites, while *Lysichiton americanus* occupies wetter bottoms. *Sphagnum* occurs only at higher elevations.

Tsuga heterophylla/Ledum glandulosum/Carex obnupta - Lysichiton americanus
Western hemlock/Labrador tea/slough sedge - skunk cabbage

Plots sampled: 8 (macro)

Environment:
Elevation (ft): 25
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated to flooded
Soils: organic muck and peat

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Tsuga heterophylla	100	19	4	60
Pinus contorta var. contorta	75	11	0	60
Thuja plicata	38	7	0	32
Picea sitchensis	25	2	0	8
Shrub layer				
Gaultheria shallon	100	21	12	40
Ledum glandulosum	100	14	4	32
Vaccinium ovatum	75	4	0	8
Vaccinium parvifolium	38	2	0	4
Herb layer				
Carex obnupta	100	42	16	60
Lysichiton americanus	100	4	4	4
Juncus	88	11	0	20
Oenanthe sarmentosa	50	2	0	4
Blechnum spicant	38	2	0	4
Moss layer				
Moss	100	20	4	36

Vegetation and ecology:
Habitat is forested wetland (swamp) in coastal fens. Stands occur adjacent to open peatlands and shrub-swamps. Most trees and shrubs occur on elevated microsites such as decaying logs, stumps, and old root wads. Both *Thuja plicata* and *Pinus contorta* var. *contorta* may be suppressed or killed in waterlogged soils. The dense shrub layer may contain small amounts of *Myrica californica*. *Sphagnum palustre* or *S. henryense* are conspicuous in the moss layer. Stands are subject to windthrow in severe winter storms but appear to be self-perpetuating in the absence of major disturbance.

II. SHRUBLAND ASSOCIATIONS

Alnus incana/Lysichiton americanus

White alder/skunk cabbage

Plots sampled: 7 (macro)

Environment:
Elevation (ft): ave. 3789 (3120-4580)
Slope (deg): ave. 5 (0-15)
Landform position: floodplains, basins, benches, slopes
Hydrology: seasonally moist to perennially saturated
Soils: mostly organic, some loam

Vegetation and ecology: Habitat is montane fens and shrub-swamp. *Alnus incana* may form dense stands with a variety of other shrubs. Over 60 species occur in the herb layer, making the understory extremely diverse and stands difficult to classify. This is why a number of publications have used "mesic forb" to characterize these stands.

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	57	4	0	15
Tsuga heterophylla	29	1	0	7
Thuja plicata	14	2	0	15
Abies amabilis	14	1	0	5
Reproducing trees				
Tsuga heterophylla	57	1	0	3
Picea engelmannii	29	1	0	5
Abies amabilis	14	1	0	5
Thuja plicata	14	1	0	4
Abies grandis	14	Tr	0	Tr
Shrub layer				
Alnus incana	100	50	20	81
Ribes bracteosum	43	2	0	10
Herb layer				
Lysichiton americanus	100	34	8	75
Athyrium filix-femina	86	14	0	55
Glyceria striata	86	5	0	15
Carex laeviculmis	71	6	0	20
Senecio triangularis	71	4	0	10
Stachys ciliata	71	1	0	4
Veronica americana	71	Tr	0	1
Maianthemum stellatum	57	2	0	6
Trautvetteria caroliniensis	57	1	0	7
Viola glabella	57	1	0	5
Moss layer				
Moss	14	6	0	40

Alnus viridis* ssp*. sinuata/Lysichiton americanus

Sitka alder/skunk cabbage

Plots sampled: 3 (macro)

Environment:

Elevation (ft): ave. 3287 (2100-4400)
Slope (deg): ave. 2 (0-4)
Landform position: depressions, seepage slopes
Hydrology: moist to perennially saturated
Soils: mostly organic, some silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus monticola	33	2	0	5
Reproducing trees				
Thuja plicata	33	3	0	10
Tsuga heterophylla	33	Tr	0	Tr
Picea engelmannii	33	Tr	0	Tr
Shrub layer				
Alnus viridis ssp. *sinuata*	100	72	60	90
Ribes bracteosum	67	4	0	10
Herb layer				
Lysichiton americanus	100	53	25	80
Athyrium filix-femina	67	9	0	20
Glyceria striata	67	8	0	20
Mimulus guttatus	67	Tr	0	1
Epilobium ciliatum ssp. *watsonii*	67	Tr	0	Tr
Moss layer				
Moss	33	5	0	16

Vegetation and ecology:

This association is a wetter variant of the *Alnus viridis* ssp. *sinuata* - *Athyrium filix-femina* association and contains considerably more *Lysichiton americanus* in the herb layer. Trees are scarce and are peripheral or limited to seedlings, and include *Pinus monticola, Thuja plicata, Tsuga heterophylla,* or *Picea engelmannii*. *Alnus viridis* ssp. *sinuate* is the primary shrub with lesser amounts of *Ribes bracteosum*, *Ribes lacustre*, and up to eight other species of shrubs that may form very dense thickets. The herb layer is diverse with over 30 species reported, but *Lysichiton americanus, Athyrium filix-femina, Glyceria striata, Senecio triangularis, Stachys ciliata, Scirpus microcarpus,* and *Oenanthe sarmentosa* are the most abundant. The diverse understory makes stands difficult to classify, and this is why a number of publications have used "mesic forb" to characterize these stands.

Alnus viridis ssp. *sinuata/Scirpus microcarpus*

Sitka alder/small-fruited bulrush

Plots sampled: 2 (macro)

Environment:
Elevation (ft): ave. 3315 (3280-3350)
Slope (deg): 2
Landform position: depressions, seepage slopes
Hydrology: seasonally moist to moist
Soils: silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *latifolia*	50	30	0	60
Picea engelmannii	50	2	0	3
Reproducing trees				
Picea engelmannii	50	1	0	2
Abies amabilis	50	1	0	1
Thuja plicata	50	Tr	0	Tr
Tsuga heterophylla	50	Tr	0	Tr
Shrub layer				
Alnus viridis ssp. *sinuata*	100	58	50	65
Amelanchier alnifolia	50	5	0	10
Herb layer				
Scirpus microcarpus	100	65	60	70
Orthilia secunda	100	1	1	1
Viola palustris	50	10	0	20
Cornus canadensis	50	8	0	15

Vegetation and ecology:
This association is a variant of the *Alnus viridis* ssp. *sinuata/Athyrium filix-femina* association that contains primarily *Scirpus microcarpus* in the herb layer. Trees are scarce and peripheral or limited to seedlings, and include *Pinus contorta* var. *latifolia, Picea engelmannii, Abies amabilis, Thuja plicata,* and *Tsuga heterophylla*. *Alnus viridis* ssp. *sinuata* is the primary shrub with a lesser amount of *Amelanchier alnifolia* recorded, and may form very dense thickets. The herb layer is diverse with 20 species recorded, but *Scirpus microcarpus*, *Viola palustris* and *Cornus Canadensis* are the most abundant. The diverse understory makes stands difficult to classify, and this is why a number of publications have used "mesic forb" to characterize these stands.

Betula nana/Carex aquatilis* var. *dives

Bog birch/Sitka sedge

Plots sampled: 2 (macro)

Environment:
Elevation (ft): ave. 3959 (3300-4618)
Slope (deg): 0
Landform position: depressions
Hydrology: perennially saturated to flooded
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Betula nana	100	43	35	50
Salix myrtillifolia	50	28	0	55
Salix geyeriana	50	20	0	40
Spiraea douglasii	50	15	0	30
Alnus incana	50	5	0	10
Lonicera involucrata	50	5	0	10
Herb layer				
Carex aquatilis var. *dives*	100	65	60	70
Lysichiton americanus	100	2	Tr	3
Eleocharis quinqueflora	50	3	0	5
Polygonum bistortoides	50	2	0	3
Equisetum arvense	50	2	0	3
Hypericum anagalloides	50	1	0	2
Moss layer				
Moss	50	10	0	20

Vegetation and ecology: Habitat is montane fens. Although no trees were recorded from the plots, *Pinus contorta* var. *latifolia* and *Picea engelmanii* may be peripheral or occur on elevated microsites. *Betula nana* is the primary shrub, and with a variety of other shrubs such as *Salix myrtillifolia*, *Salix geyeriana, Spiraea douglasii,* or *Alnus incana,* it may form very dense thickets 8-10 feet tall. The herb layer is mostly a monotypic stand of *Carex aquatilis* var. *dives* with trace amounts of *Lysichiton americanus, Eleocharis quinqueflora, Polygonum bistortoides, Equisetum arvense*, and about 10 other species. Some stands may remain flooded with shallow water well into the growing season.

Cornus sericea/Lysichiton americanus
Creek dogwood/skunk cabbage

Plots sampled: 2 (macro)

Environment:
Elevation (ft): ave. 2500, (1640-3360)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated or seasonally flooded
Soils: organic or muck

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Frangula purshiana	50	2	0	3
Reproducing trees				
Fraxinus latifolia	50	3	0	6
Shrub layer				
Cornus sericea	100	80	65	95
Acer circinatum	100	4	1	6
Rubus ursinus	100	1	Tr	2
Herb layer				
Lysichiton americanus	100	20	15	25
Lemna minor	50	3	0	5
Carex obnupta	50	2	0	3
Moss layer				
Moss	50	30	0	60
Unvegetated				
Litter	50	10	0	20
Bare ground	50	3	0	5

Vegetation and ecology:
Habitat is montane shrub swamp. This association is typically a tall, dense stand of *Cornus sericea* with lesser amounts of *Acer circinatum*. and *Rubus ursinus.* The herb layer is primarily a stand of *Lysichiton americanus* with small amounts of *Lemna minor* and *Carex obnupta*, depending on elevation and amount of seasonal flooding. Very few other herbs are present and expanses of mud or muck are typical. Mosses are conspicuous and bare ground is an artifact of seasonal flooding.

Kalmia microphylla/Carex aquatilis var. dives

Swamp laurel/Sitka sedge

Plots sampled: 6 (3 macro, 3 micro)

Environment:
Elevation (ft): ave. 4338, (2300-5410)
Slope (deg): ave. 1 (0-2)
Landform position: depressions, flats
Hydrology: moist to perennially saturated
Soils: mostly organic, some silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *latifolia*	17	3	0	20
Reproducing trees				
Pinus contorta var. *latifolia*	17	Tr	0	1
Pinus monticola	17	Tr	0	1
Picea engelmannii	17	Tr	0	1
Tsuga mertensiana	17	Tr	0	Tr
Tsuga heterophylla	17	Tr	0	Tr
Shrub layer				
Kalmia microphylla	100	24	15	35
Vaccinium uliginosum	33	2	0	10
Vaccinium	17	6	0	35
Gaultheria	17	Tr	0	2
Herb layer				
Carex echinata ssp. *echinata*	33	3	0	15
Drosera rotundifolia	33	3	0	10
Carex aquatilis var. *dives*	33	1	0	3
Lysichiton americanus	33	Tr	0	1
Moss layer				
Moss	100	81	36	100
Unvegetated				
Litter	50	5	0	10

Vegetation and ecology: Habitat is montane fens. This type occurs at small scale on isolated hummocks within a wet lawn matrix, and at larger scale around hummocky edges of mires. Trees occur on elevated hummocks or "tree islands" . The herb layer has more than 20 species recorded, but has low cover and the moss layer is most conspicuous. *Carex aquatilis* var. *dives* is usually more abundant than indicated in these plots, these being more of a *Sphagnum* phase with fewer herbs present. The moss layer is composed almost entirely of tightly-packed mats of *Sphagnum capillifolium* and *Aulacomniun palustre*.

Ledum glandulosum - Gaultheria shallon/Carex obnupta

Labrador tea - salal/slough sedge

Plots sampled: 33 (2 macro, 31 micro)

Environment:

Elevation (ft): ave. 86, (20-1030)

Slope (deg): ave. 0 (0-4)

Landform position: floodplains, benches, and flats

Hydrology: seasonally moist to perennially saturated

Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	21	4	0	40
Reproducing trees				
Tsuga heterophylla	15	Tr	0	5
Frangula purshiana	15	Tr	0	5
Picea sitchensis	12	Tr	0	3
Thuja plicata	12	Tr	0	2
Alnus rubra	3	Tr	0	1
Shrub layer				
Ledum glandulosum	100	37	25	80
Gaultheria shallon	100	18	4	50
Spiraea douglasii	52	4	0	20
Herb layer				
Carex aquatilis var. *dives*	64	19	0	60
Carex obnupta	52	11	0	60
Agrostis exarata	45	3	0	15
Cornus canadensis	39	2	0	15
Blechnum spicant	30	1	0	10
Moss layer				
Moss	48	10	0	80
Unvegetated				
Litter	15	2	0	20

Vegetation and ecology: Habitat is coastal fens. It occurs around the edges of open mires subject to successional infilling by trees and shrubs, and in regenerating swamp that has been logged, burned, or killed by prolonged flooding. The diverse shrub layer includes elements from open peatlands, shrub swamp, and swamp forest. The herb layer contains more than 20 species from both open mire and developing forest, but there are no obvious dominant species. *Sphagnum palustre* and *Sphagnum henryense* are conspicuous in the moss layer, with up to 80 percent cover, with trace amounts of *Sphagnum mendocinum* and *Sphagnum capillifolium*. This ecotonal association is valuable as edge habitat for a variety of animals and is always present in mires with a range of seral stages.

Ledum glandulosum/Carex obnupta/Sphagnum

Labrador tea/slough sedge/sphagnum

Plots sampled: 92 (micro)

Environment:
Elevation (ft): ave. 57 (20-2800)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	23	2	0	30
Reproducing trees				
Thuja plicata	27	3	0	40
Tsuga heterophylla	1	Tr	0	10
Frangula purshiana	1	Tr	0	1
Shrub layer				
Ledum glandulosum	100	25	2	60
Vaccinium oxycoccos	48	4	0	35
Spiraea douglasii	33	4	0	35
Vaccinium uliginosum	21	2	0	30
Herb layer				
Carex obnupta	74	12	0	60
Drosera rotundifolia	51	2	0	20
Carex echinata ssp. *phyllomanica*	41	4	0	35
Lysichiton americanus	28	4	0	40
Blechnum spicant	24	3	0	35
Eriophorum chamissonis	24	1	0	15
Moss layer				
Moss	92	55	0	100
Unvegetated				
Litter	3	Tr	0	30

Vegetation and ecology: Habitat is coastal fens in poorly-drained basins, and on floating lake-fill mats. Well-developed *Sphagnum* hummocks 1-3 feet taller than surrounding wet hollows are typical. *Vaccinium oxycoccos, Drosera rotundifolia, Lysichiton americanus, Eriophorum chamissonis, Trientalis europaea* ssp. *arctica*, *Carex echinata* ssp. *phyllomanica,* and *Carex leptalea* are diagnostic species even though they may not always be abundant. The *Sphagnum* hummocks are sufficiently elevated above the influence of groundwater to be somewhat drier and they have lower pH and nutrient status than what is found in hollows. Hollows consist almost entirely of lawns of *Sphagnum angustifolium, Sphagnum pacificum*, or bare mud.

Phases: (1) *Sphagnum palustre* and/or *Sphagnum henryense,* (2) *Sphagnum fuscum*.

Ledum glandulosum/Darlingtonia californica/Sphagnum

Labrador tea/darlingtonia/sphagnum

Plots sampled: 60 (1 macro, 59 micro)

Environment:
Elevation (ft): ave. 40 (20-40)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	25	Tr	0	5
Reproducing trees				
Tsuga heterophylla	17	Tr	0	2
Picea sitchensis	10	Tr	0	5
Frangula purshiana	2	Tr	0	1
Shrub layer				
Ledum glandulosum	100	31	10	60
Vaccinium oxycoccos	67	9	0	40
Vaccinium uliginosum	63	18	0	70
Spiraea douglasii	25	2	0	25
Herb layer				
Darlingtonia californica	100	18	1	50
Drosera rotundifolia	87	1	0	10
Eriophorum chamissonis	65	10	0	35
Carex aquatilis var. *dives*	53	2	0	15
Comarum palustre	37	5	0	35
Carex cusickii	30	3	0	30
Carex leptalea	28	2	0	25
Moss layer				
Moss	100	59	1	99

Vegetation and ecology: Habitat is coastal fens in poorly-drained basins, on floating lake-fill mats, or on duripan soils with perched water tables. Woody vegetation is confined to *Sphagnum* hummocks. *Darlingtonia californica, Drosera rotundifolia, Eriophorum chamissonis, Carex aquatilis* var. *dives,* and *Comarum palustre* dominate the herb layer, and *Empetrum nigrum* is occasional.

Phases: (1) *Sphagnum palustre* and/or *Sphagnum henryense,* (2) *Sphagnum fuscum*.

Ledum glandulosum - Myrica gale

Labrador tea - sweet gale

Plots sampled: 0

Environment:
Elevation (ft): ave. 40 (20-40)
Slope (deg): 0
Landform position: depressions and flats
Hydrology: perennially saturated
Soils: organic or muck

Vegetation and ecology: Habitat is coastal fens. The association has been observed in the field but not sampled, so a quantitative description of the vegetation is not available. It forms dense shrub stands 3-6 feet tall on perennially-saturated peat in minerotrophic peatlands, and occurs in low-gradient drainages where water is ponded. Standing water may occur in hollows. Trees are absent, and the shrub layer is composed exclusively of *Ledum glandulosum* and *Myrica gale* in approximately equal amounts with total shrub cover about 95 percent. The herb layer has not been documented, but is no doubt depauperate because of dense shading. The moss layer contains scattered mats of *Sphagnum angustifolium* with lesser amounts of *Sphagnum palustre* or *Sphagnum henryense*. *Myrica gale* fixes atmospheric nitrogen and is an important source of this element in mires. The tall growth of shrubs in this association may indicate past or ongoing disturbance to groundwater flows or water quality.

This association is only known from the northern coast of Oregon, where it occurs in Gearhart Bog in Clatsop County. Early collections indicate that *Myrica gale* once extended as far south as Lincoln County, with a questionable record from Curry County, but Clatsop County is currently the southernmost known locality.

Ledum glandulosum/Sanguisorba officinalis/Sphagnum
Labrador tea/burnet

Plots sampled: 45 (micro)

Environment:
Elevation (ft): ave. 283, (100-2800)
Slope (deg): 0
Landform position: floodplains, depressions, ancient marine terraces
Hydrology: mostly perennially saturated, some seasonally flooded
Soils: mostly organic, some sandy

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Frangula purshiana	2	Tr	0	8
Shrub layer				
Ledum glandulosum	100	27	3	80
Gaultheria shallon	27	1	0	10
Rubus ursinus	9	Tr	0	4
Vaccinium uliginosum	4	1	0	35
Herb layer				
Sanguisorba officinalis	100	21	3	60
Carex echinata ssp. *phyllomanica*	67	3	0	15
Blechnum spicant	64	15	0	60
Agrostis exarata	53	2	0	12
Drosera rotundifolia	38	1	0	3
Sisyrinchium californicum	33	4	0	30
Moss layer				
Moss	73	28	0	99

Vegetation and ecology:
Habitat is coastal and Coast Range fens. The association typically forms well-developed hummocks 1-2 feet taller than surrounding mire vegetation. Mature trees are absent. Several unusual species occur in this association along the southern coast of Oregon but do not extend to the northernmost sites. *Veratrum californicum* and *Carex buxbaumii* are more typical of middle to upper elevations in the Cascade Range, while *Sisyrinchium californicum, Helenium bolanderi, Rhynchospora capitellata, Senecio triangularis* var. *angustifolius,* and *Lilium occidentale* are more typical of mires in northern California. Hummocks are dominated by *Sphagnum palustre* and *Sphagnum henryense*, and may include *Cladina portentosa* ssp. *pacifica*. Hollows consist almost entirely of lawns of *Sphagnum angustifolium* and *Sphagnum pacificum*, but bare mud bottoms or standing water are occasional. Many of the hollows are in elk and deer trails, and may serve to channel mineral-rich water through the mires.

Malus fusca/Carex obnupta

Crabapple/slough sedge

Plots sampled: 1 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Malus fusca	100	60	60	60
Salix geyeriana	100	10	10	10
Spiraea douglasii	100	3	3	3
Herb layer				
Carex obnupta	100	97	97	97
Veronica scutellata	100	Tr	Tr	Tr

Environment:
Elevation (ft): 200-2560
Slope (deg): 0
Landform position:
floodplains, depressions, benches
Hydrology: seasonally flooded to perennially moist
Soils: muck or loam

Vegetation and ecology: Habitat is depressions in both deciduous and coniferous forest. Several examples of this association have been observed in the field but only one plot has been sampled. All trees are peripheral to the wetlands. The most typical expression known to the author is a dense, monotypic stand of *Malus fusca* with a monotypic understory of *Carex obnupta*. Depending on hydroperiod, the understory ranges from nearly 100 percent cover of *Carex obnupta* to very low cover of any other vegetation because of prolonged seasonal ponding. The plot reported here also contains *Salix geyeriana* and *Spiraea douglasii*. The association may have been more widespread historically, as large expanses of swamp vegetation once occurred in the northern Willamette and Tualatin valleys. These wetlands have not been sampled adequately.

Myrica gale/Carex aquatilis* var*. dives

Sweet gale/Sitka sedge

Plots sampled: 1 (macro)

Environment:
Elevation (ft): 3100
Slope (deg): 1
Landform position: floodplains, montane basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Myrica gale	100	60	60	60
Spiraea douglasii	100	2	2	2
Betula nana	100	1	1	1
Herb layer				
Carex aquatilis var. *dives*	100	25	25	25
Sanguisorba officinalis	100	25	25	25
Agrostis thurberiana	100	Tr	Tr	Tr

Vegetation and ecology: Habitat is fens. This association has not been sampled extensively and more plots are needed. Trees are absent, and the shrub layer is composed primarily of *Myrica gale* from 2-4 feet tall with cover up to 95 percent. The single montane plot reported here also contains *Spiraea douglasii* and *Betula nana,* but coastal expressions would not contain *Betula*. The herb layer here contains *Carex aquatilis* var*. dives* in both coastal and montane sites, and the moss layer may contain *Sphagnum*. *Myrica gale* fixes atmospheric nitrogen and is an important source of this element in mires. It appears to favor edges of pools and former ditches that have infilled with poorly-consolidated peat, where water movement and nutrient status may be greater than in other peatland situations. In Oregon, it occurs at Gearhart Bog in Clatsop County, and may never have been very extensive. Early collections indicate that *Myrica gale* once extended as far south as Lincoln County, with a questionable record from Curry County, but Clatsop County is currently the southernmost known locality. Kunze (1994) noted that most occurrences of this association in the northern Puget Trough are in poor condition, presumably because of human disturbance, and that *Myrica gale* was once more widespread.

Salix commutata

Undergreen willow

Plots sampled: 4 (1 macro, 3 micro)

Environment:
Elevation (ft): 5250
Slope (deg): 6
Landform position: slope
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix commutata	100	26	20	35
Spiraea densiflora	25	2	0	8
Cassiope mertensiana	25	2	0	7
Kalmia microphylla	25	2	0	7
Herb layer				
Carex nigricans	75	31	0	75
Carex scopulorum	75	13	0	25
Pedicularis attollens	75	1	0	2
Aster alpigenus	50	1	0	5
Ligusticum grayi	50	1	0	4
Tofieldia glutinosa ssp. *occidentalis*	50	Tr	0	1
Juncus balticus	25	4	0	15

Vegetation and ecology: Habitat is subalpine fens. The association occurs at the wet end of subalpine heath and intergrades with the *Carex nigricans* and *Carex scopulorum* associations. Woody plants are confined to hummocks and the remaining vegetation is wet lawn. The plots reported here do not record any trees but *Tsuga mertensiana* and *Abies lasiocarpa* may be present on hummocks. *Salix commutata* is the primary species in the shrub layer, with an average cover of 26 percent and ranging from 20-35 percent. The other four shrub species recorded occur at low constancy and very low cover. The primary species in the herb layer are *Carex nigricans* and *Carex scopulorum*, one or the other of which is usually present in the plot. *Juncus balticus* may form significant patches, but the other species recorded all occur with very low cover.

***Salix geyeriana* complex**

Geyer willow

Plots sampled: 7 (macro)

Environment:
Elevation (ft): ave. 4552 (2560-6575)
Slope (deg): ave. 0 (0-1)
Landform position: floodplains, basins
Hydrology: seasonally to perennially flooded
Soils: mostly organic, some loam

Vegetation and ecology: Habitat is montane fens. Plots are highly variable. Species with significant patch size suggest five phases that need more study:

Phases: (1) *Carex aquatilis* var. *aquatilis*, (2) *Carex aquatilis* var. *dives,* (3) *Carex nigricans - Carex scopulorum*, (4) *Carex obnupta*, (5) *Scirpus microcarpus*.

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix geyeriana	100	56	20	98
Spiraea douglasii	43	8	0	40
Salix myrtillifolia	29	3	0	10
Salix commutata	29	1	0	10
Herb layer				
Veronica americana	57	Tr	0	1
Carex aquatilis var. *dives*	43	21	0	60
Dodecatheon jeffreyi	43	1	0	4
Carex aquatilis var. *aquatilis*	29	6	0	40
Carex utriculata	29	5	0	30
Hypericum anagalloides	29	3	0	15
Calamagrostis stricta ssp. *inexpansa*	29	1	0	7
Equisetum arvense	29	1	0	5
Muhlenbergia filiformis	29	1	0	5
Lysichiton americanus	29	1	0	2
Antennaria argentea	29	Tr	0	2
Epilobium ciliatum ssp. *watsonii*	29	Tr	0	1
Platanthera dilatata	29	Tr	0	1
Veronica serpyllifolia	29	Tr	0	1
Geum macrophyllum	29	Tr	0	1
Carex scopulorum	14	6	0	40
Carex nigricans	14	6	0	40
Scirpus microcarpus	14	3	0	20
Carex obnupta	14	1	0	10
Moss layer				
Moss	29	9	0	60

***Salix hookeriana* - (*Salix sitchensis*)**

Hooker willow - (Sitka willow)

Plots sampled: 2 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix hookeriana	100	78	65	90
Salix sitchensis	50	8	0	15
Spiraea douglasii	50	3	0	6
Herb layer				
Carex obnupta	50	40	0	80
Moss layer				
Moss	100	41	Tr	81

Environment:
Elevation (ft): ave. 1044 (500-1587)
Slope (deg): ave. 1 (0-1)
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially moist
Soils: silt loam

Vegetation and ecology: Habitat is depressions in floodplains and potholes in basalt scabland. The association is undersampled but reported here because it is common and widespread in the Willamette Valley, along the Columbia River, and at lower elevations in the Cascade Range. It represents clonal shrub swamps of the inland morphotype of *Salix hookeriana* that was previously called *Salix piperi*. Shrub swamps of this species occur in two phases determined by composition of the herb layer. Stands are typically dense thickets and are either monotypes of *Salix hookeriana* or have admixtures of *Salix sitchensis* and/or *Spiraea douglasii*. In the two plots reported here, *Salix hookeriana* has an average cover of 78 percent and ranging from 65-90 percent. Densely branched adventitious roots on the lower stems of *Salix hookeriana* and large whitish mats of dried algae may remain draped like tents over roots and trunks after water levels recede. *Fontinalis antipyretica* and *Dichelyma uncinata* are conspicuous in the moss layer.

Phases: (1) Monotypic S*alix hookeriana*, (2) *Carex obnupta*.

Salix hookeriana - (*Malus fusca*)/*Carex obnupta* - *Lysichiton americanus*

Hooker willow - Oregon crabapple/slough sedge - skunk cabbage

Plots sampled: 16 (macro)

Environment:
Elevation (ft): ave. 34 (10-100)
Slope (deg): ave. 0 (0-1)
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	31	2	0	15
Picea sitchensis	19	3	0	25
Shrub layer				
Salix hookeriana	88	30	0	95
Spiraea douglasii	88	13	0	50
Malus fusca	81	45	0	95
Lonicera involucrata	38	1	0	5
Ledum glandulosum	31	1	0	3
Herb layer				
Carex obnupta	100	40	2	75
Lysichiton americanus	63	18	0	50
Oenanthe sarmentosa	31	Tr	0	3
Athyrium filix-femina	31	Tr	0	2
Blechnum spicant	25	Tr	0	1
Moss layer				
Moss	25	2	0	14

Vegetation and ecology:
Habitat is shrub swamp in peat-filled basins, adjacent to lakes and ponds, on old deflation plains, and interspersed with open mire in fens. Perennially wet soils usually preclude establishment of conifers, but occasional *Alnus rubra*, *Pinus contorta* var. *contorta,* or *Picea sitchensis* may occur on hummocks or peripheral to the wetland. The shrub layer is dense and tangled. The herb layer, usually dominated by *Carex obnupta* and *Lysichiton americanus*, may have expanses of deep muck soil exposed in the most shaded places. Epiphytic mosses and *Polypodium glycyrrhiza* are abundant in the canopy of tall shrubs. The moss layer contains mostly *Eurhynchium praelongum*, but one site is habitat for the rare *Limbella fryei*. *Sphagnum palustre* occurs in this association in Clatsop County, and occurs in similar sites farther north. Stands appear to be long-lived, maintained by wet soils and gap succession. The willows sustain frequent crown damage from winter storms and heavy browsing by beavers, followed by vigorous resprouting. The association is prime feeding and denning habitat for beaver.

Salix lucida* ssp. *lasiandra/Urtica dioica* ssp. *gracilis

Pacific willow/California nettle

Plots sampled: 6 (macro)

Environment:

Elevation (ft): ave. 98 (10-500)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially saturated
Soils: mostly silt loam, some sandy loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix lucida ssp. *lasiandra*	100	67	50	90
Fraxinus latifolia	17	1	0	3
Shrub layer				
Cornus sericea	33	1	0	5
Sambucus racemosa	17	7	0	40
Salix sitchensis	17	5	0	30
Salix fluviatilis	17	1	0	4
Herb layer				
Phalaris arundinacea	83	19	0	40
Impatiens capensis	50	12	0	35
Urtica dioica ssp. *gracilis*	33	13	0	40
Bidens frondosa	33	9	0	50
Leersia oryzoides	33	7	0	20
Moss layer				
Moss	17	Tr	0	1

Vegetation and ecology:

Habitat is shrub swamp around shallow lakes and ponds, and along low-gradient streams and river channels. In some stands *Salix lucida* ssp. *lasiandra* may not exceed shrub height. Because of a history of grazing and proximity to agricultural and urban areas, the herb layer is usually dominated by exotic cultivars of *Phalaris arundinacea.* Sites with seasonal inundation may have a higher component of native species in the herb layer such as *Urtica dioica* ssp. *gracilis, Bidens frondosa,* and *Leersia oryzoides.* Many sites are associated with shallow ponds and associated mudflat vegetation. Stands are used extensively by beaver and *Salix lucida* ssp. *lasiandra* resprouts vigorously following cropping. Trees appear to senesce after about 40 years and may not readily reproduce if stands are heavily infested with *Phalaris arundinacea*. Stands are often flooded in winter and historically were sometimes flooded into the growing season, but they need late-season draw-down to survive. Use of water control structures to keep shallow lakes flooded in summer have killed several large stands of *Salix lucida* ssp. *lasiandra* in the Portland area, destroying valuable shrub swamp but creatinig new mudflat habitat.

Salix lucida ssp. lasiandra/Salix sitchensis/Lysichiton americanus
Pacific willow/Sitka willow/skunk cabbage

Plots sampled: 9 (macro)

Environment:
Elevation (ft): ave. 239 (5-2100)
Slope (deg): ave. 0 (0-1)
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: mostly loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix lucida ssp. *lasiandra*	89	20	0	60
Picea sitchensis	22	1	0	5
Reproducing trees				
Populus balsamifera ssp. *trichocarpa*	11	1	0	5
Shrub layer				
Salix sitchensis	89	28	0	75
Spiraea douglasii	78	11	0	30
Cornus sericea	67	13	0	70
Rubus ursinus	67	1	0	3
Lonicera involucrata	56	1	0	5
Rosa nutkana	44	2	0	10
Rubus spectabilis	44	2	0	5
Herb layer				
Lysichiton americanus	100	19	1	60
Athyrium filix-femina	78	10	0	60
Impatiens capensis	78	8	0	30
Oenanthe sarmentosa	67	4	0	20
Scirpus microcarpus	67	3	0	7
Vicia gigantea	44	Tr	0	1
Carex obnupta	33	7	0	55
Equisetum fluviatile	33	1	0	2
Veratrum californicum	33	Tr	0	2
Phragmites australis	33	Tr	0	2

Vegetation and ecology: Habitat is floodplain depressions and sites with freshwater tidal irrigation. The association forms dense shrub swamps with considerable amounts of standing water. *Salix lucida* ssp. *lasiandra* is often only shrub or tall shrub height. *Picea sitchensis, Alnus rubra,* and *Populus balsamifera* ssp. *trichocarpa* are only occasional and confined to hummocks. The shrub layer contains almost 20 different species. More than 30 species are reported from the herb layer, but cover is usually low because of the dense shrub layer. *Lysichiton americanus, Athyrium filix-femina, Impatiens capensis, Oenanthe sarmentosa, Carex obnupta* and *Carex aquatilis* var. *dives* are hallmarks of freshwater tidal surge plain along the lower Columbia River.

***Salix sitchensis* complex**

Sitka willow

Plots sampled: 7 (macro)

Environment:
Elevation (ft): ave. 2789 (500-4474)
Slope (deg): ave. 1 (0-3)
Landform position: floodplains, basins
Hydrology: perennially moist to saturated
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	14	Tr	0	2
Reproducing trees				
Picea engelmannii	14	1	0	8
Abies amabilis	14	Tr	0	Tr
Shrub layer				
Salix sitchensis	100	70	25	99
Spiraea douglasii	29	4	0	20
Alnus viridis ssp. *sinuata*	29	1	0	5
Salix geyeriana	14	4	0	30
Vaccinium uliginosum	14	4	0	25
Herb layer				
Lysichiton americanus	71	16	0	70
Carex aquatilis var. *dives*	43	18	0	90
Senecio triangularis	29	1	0	5
Carex echinata ssp. *echinata*	29	1	0	2
Viola palustris	29	Tr	0	2
Moss layer				
Moss	14	Tr	0	1

Vegetation and ecology: Habitat is depressions on floodplains and in fens. Plots are highly variable and probably composed of numerous phases that need further study. *Alnus rubra, Picea engelmannii,* and *Abies amabilis* are reported in small amounts but are probably peripheral to the wetlands.

Phases: (1) Monotypic *Salix sitchensis* , (2) *Lysichiton americanus*, (3) *Carex aquatilis* var. *dives*, (4) *Carex obnupta*, (5) *Scirpus microcarpus.*

Spiraea douglasii

Douglas spiraea

Plots sampled: 4 (macro)

Environment:

Elevation (ft): ave. 2235 (500-4100)
Slope (deg): 1 (0-5)
Landform position: toe slopes, floodplains, basins
Hydrology: seasonally to perennially moist
Soils: mostly loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Spiraea douglasii	100	95	90	100
Salix hookeriana	25	3	0	10
Crataegus douglasii	25	1	0	4
Herb layer				
Polygonum punctatum	25	1	0	3
Myosotis laxa	25	Tr	0	Tr
Poa trivialis	25	Tr	0	Tr
Rumex crispus	25	Tr	0	Tr
Epilobium ciliatum	25	Tr	0	Tr
Stellaria media	25	Tr	0	Tr
Moss layer				
Moss	50	1	0	2

Vegetation and ecology: Habitat is shrub swamp in riparian zones, prairies, and fens. Plots are highly variable and indicate that numerous phases are present that need further study. Twenty-seven other plots were left unclassified. The association described here is more or less monotypic and common at lower elevations. Trees are absent or peripheral. The shrub layer is dominated by *Spiraea douglasii* with an average cover of 95 percent, and is so dense that the herb layer is nearly nonexistent. Changes in hydrology may enhance dense stands. More northerly examples may contain *Myrica gale* and *Ledum glandulosum.* Stands may be extensive along floodplains and some have no doubt developed on abandoned pasture land and old prairie.

Spiraea douglasii - Vaccinium uliginosum/Carex obnupta - Deschampsia caespitosa

Douglas spiraea - bog blueberry/slough sedge - tufted hairgrass

Plots sampled: 57 (2 macro, 55 micro)

Environment:
Elevation (ft): ave. 27 (20-100)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally to perennially moist
Soils: mostly organic, some sand

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Spiraea douglasii	89	46	0	85
Vaccinium uliginosum	77	34	0	90
Salix hookeriana	18	2	0	25
Herb layer				
Carex obnupta	53	8	0	50
Deschampsia caespitosa	35	8	0	45
Moss layer				
Sphagnum	63	27	0	95
Moss	2	Tr	0	2

Vegetation and ecology: Habitat is coastal marshes and fens. The association forms wet lawns, low hummocks, and lake-fill mats, and occurs as a primary vegetation type on denuded peat or in degraded sites once dominated by *Ledum* associations. Trees are absent, and no reproducing trees were observed. The herb layer is not particularly diverse, with only 9 species. *Sphagnum angustifolium* is the primary moss, occurring in 61 percent of the plots, with cover ranging from 0-95 percent. A network of elk trails in the peatland facilitate flows of mineral-rich water and may have long-term effect on vegetation by influencing the location and configuration of hummock-hollow topography. The abundance of *Spiraea douglasii,* the relatively poor development of hummocks, and a depauperate herb layer may indicate past or ongoing disturbance to groundwater flows or water quality. *Spiraea douglasii* tends to increase cover in disturbed peatlands, where the abundance, density, and size of the shrubs may indicate past or ongoing perturbation. This association is most frequent where human development, particularly roads, have impacted peatlands, and may be enhanced by eutrophic runoff from agricultural or urbanized areas.

Spiraea douglasii/Sphagnum

Douglas spiraea/sphagnum

Plots sampled: 7 (macro)

Environment:
Elevation (ft): 130
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Fraxinus latifolia	14	Tr	0	1
Shrub layer				
Spiraea douglasii	100	51	10	75
Rubus ursinus	29	2	0	12
Herb layer				
Carex cusickii	86	45	0	85
Menyanthes trifoliata	86	1	0	1
Lycopus americanus	71	5	0	20
Agrostis capillaris	57	1	0	1
Lemna minor	29	Tr	0	1
Moss layer				
Sphagnum	100	57	20	90

Vegetation and ecology: Habitat is edges of lakes and ponds, or on floating lake-fill mats in fens. The association is primarily shrub swamp and is known from only one site in Oregon, but is thought to be representative of similar stands in western Washington that have not been well studied. The moss layer is dominated by a saturated lawn of *Sphagnum squarrosum* with up to 90 percent cover beneath the shrubs. A small portion of the mat has well-developed hummocks of *Sphagnum palustre* 1-2 feet tall, and such hummocks are unknown elsewhere in Oregon except in coastal peatlands. The association may have been more widespread in Oregon historically, as large expanses of swamp vegetation once occurred on organic soils in the northern Willamette and Tualatin valleys. Similar sites on Sauvie Island (Multnomah County) and Lake Labish (Marion County) were destroyed by agricultural development as early as 1912. *Spiraea douglasii* is very common in western Oregon, but no examples are known to occur on floating mats of peat, and none with *Sphagnum*. The closest similar occurrences may be in the northern Puget Trough.

Vaccinium caespitosum/Sanguisorba officinalis - Carex obnupta

Dwarf huckleberry/ burnet - slough sedge

Plots sampled: 9 (micro)

Environment:
Elevation (ft): 2800
Slope (deg): 0
Landform position: flats, basins
Hydrology: seasonally flooded to perennially moist
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium caespitosum	100	19	1	70
Herb layer				
Sanguisorba officinalis	78	59	0	95
Carex obnupta	67	15	0	50
Caltha leptosepala ssp. *howellii*	67	8	0	25
Camassia quamash	44	5	0	25
Gentiana sceptrum	44	1	0	3
Senecio pseudaureus	33	1	0	2
Carex cusickii	22	1	0	10
Agrostis	22	Tr	0	2
Moss layer				
Moss	67	31	0	95
Sphagnum	11	6	0	50

Vegetation and ecology: Habitat is montane fen. The association consists of low hummocks of *Vaccinium caespitosum* interspersed around seasonally-flooded openings with a variable cover of stunted *Carex obnupta* and the tiny black liverwort *Cephaloziella*. *Vaccinium caespitosum* typically covers 30-70 percent of the stands but is sometimes sparse, and *Sanguisorba officinalis* may cover up to 95 percent of the herb layer. Stunted *Spiraea douglasii* and *Camassia quamash* suggest that the soil has low nutrient status. *Thuja plicata, Rhododendron macrophyllum*, and *Gaultheria shallon* occur on logs and elevated areas. The mosses *Sphagnum mendocinum* and *Aulacomnium palustre* occur among the *Vaccinium* hummocks and may cover 50-95 percent of the moss layer. *Anemone oregana* var. *felix*, a rare plant, is present in these stands. This association is known from three or four sites within a few miles of each other in the Coast Range, and is distinct from occurrences of *Vaccinium caespitosum* in remnants of Willamette Valley prairie.

Vaccinium caespitosum/Xerophyllum tenax - Sanguisorba officinalis

Dwarf huckleberry/beargrass - burnet

Plots sampled: 8 (micro)

Environment:
Elevation (ft): 2800
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially moist
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium caespitosum	88	12	0	40
Herb layer				
Xerophyllum tenax	100	56	25	80
Sanguisorba officinalis	100	35	2	50
Carex cusickii	25	Tr	0	1
Moss layer				
Moss	50	24	0	90
Sphagnum	38	8	0	50

Vegetation and ecology: Habitat is montane fen. The association is characterized by hummocks of *Xerophyllum tenax* interspersed with pockets of *Sanguisorba officinalis*, throughout which are distributed tightly-packed mats and hummocks of red *Sphagnum capillifolium* and *Sphagnum mendocinum*. *Vaccinium caespitosum*, *Pteridium aquilinum,* and *Carex obnupta* are occasional to frequent associates. The juxtaposition of the typically upland *Xerophyllum* with typically wetland *Sanguisorba* and *Sphagnum* is peculiar, although *Xerophyllum* occasionally occurs in seasonal wetlands. Occasional rocks and the presence of dead *Thuja plicata* nearby with *Xerophyllum* suggest that this association occurs in a long-term hydrologic tension zone between upland and wetland. Changes in water levels may be mediated by beavers, humans, climatic variability, or combinations of these variables. Long-lived elements of both upland and wetland have commingled to form a plant association with a limited distribution. The hummocks of *Sphagnum capillifolium* are in part elevated above groundwater influence, lowering the nutrient status of this association. This association is known from three or four sites within a few miles of each other in the Coast Range.

Vaccinium uliginosum/Carex obnupta

Bog blueberry/slough sedge

Plots sampled: 13 (7 macro, 6 micro)

Environment:
Elevation (ft): 40-100
Slope (deg): 0
Landform position: deflation plains and marine terraces
Hydrology: seasonally flooded to perennially moist
Soils: mostly organic, some sand underlain by duripan

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	85	4	0	20
Picea sitchensis	8	Tr	0	2
Frangula purshiana	8	Tr	0	1
Shrub layer				
Vaccinium uliginosum	85	45	0	80
Salix hookeriana	85	10	0	35
Gaultheria shallon	46	1	0	3
Malus fusca	38	1	0	3
Spiraea douglasii	31	2	0	10
Myrica californica	31	1	0	15
Vaccinium ovatum	31	1	0	5
Herb layer				
Carex obnupta	100	22	1	60
Veronica scutellata	85	1	0	5
Argentina egedii	77	7	0	40
Juncus lesueurii	54	2	0	10
Ranunculus flammula	46	1	0	5
Deschampsia caespitosa	31	9	0	60
Aster chilensis	31	2	0	20
Hypochaeris radicata	31	1	0	5
Lycopus uniflorus	31	Tr	0	2

Vegetation and ecology:
Habitat is marsh flooded seasonally to a depth of 12 inches and usually moist throughout the growing season. Stands are remote from saltwater intrusion but may be subject to salt spray. The herb layer has a significant component of seasonally wet deflation plain species. *Vaccinium macrocarpon* occurs in some stands and probably originated from nearby cranberry beds where it has been grown commercially since 1885. Active and abandoned cranberry bogs are located in Clatsop County and along the southern coast of Oregon, and cranberry is readily dispersed into native wetlands by birds and vegetative fragmentation.

Vaccinium uliginosum/Deschampsia caespitosa - Carex obnupta

Bog blueberry/tufted hairgrass - slough sedge

Plots sampled: 73 (micro)

Environment:

Elevation (ft): ave. 130 (50-160)

Slope (deg): 0

Landscape position: old deflation plains and marine terraces

Hydrology: seasonally flooded, moist to dry in summer

Soils: sand underlain by duripan

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	11	Tr	0	15
Shrub layer				
Vaccinium uliginosum	70	24	0	90
Herb layer				
Deschampsia caespitosa	85	32	0	80
Carex obnupta	71	10	0	50
Sanguisorba officinalis	49	2	0	15
Moss layer				
Sphagnum	81	29	0	95
Moss	73	11	0	50

Vegetation and ecology: Habitat is seasonally wet openings in coastal *Pinus contorta* var. *contorta* forest. Stands are flooded seasonally to a depth of 12 inches and are dry by midsummer. Substrate is sand or a thin organic layer over sand, often with iron-cemented hardpan. *Pinus contorta* var. *contorta* is sparse and mostly restricted to the periphery of stands. *Sanguisorba officinalis*, *Gentiana sceptrum,* and *Pteridium aquilinum* may be present in the herb layer in small amounts. *Sphagnum mendocinum* and the lichen *Cladina portentosa* ssp. *pacifica* are very conspicuous at some sites. The association appears to be declining because of successional changes caused by dune stabilization and possibly by cessation of stand-replacing fires. It is also vulnerable to recreational and residential development, and construction of commercial cranberry bogs. Threats from development are greatest between the Siuslaw River and Heceta Head. Some stands are adjacent to areas favored for mushroom picking and can be damaged by off-road vehicles used for mushroom harvest or general recreation.

Vaccinium uliginosum/Dodecatheon jeffreyi - Caltha leptosepala ssp*. howellii*

Bog blueberry/Howell's marsh marigold

Plots sampled: 42 (18 macro, 24 micro)

Environment:
Elevation (ft): ave. 4363 (1900-5410)
Slope (deg): ave. 0 (0-2)
Landform position: toe slopes, floodplains, basins
Hydrology: perennially moist to perennially saturated
Soils: mostly organic, some loam.

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *latifolia*	17	2	0	35
Picea engelmannii	14	3	0	60
Reproducing trees				
Picea engelmannii	17	1	0	40
Pinus contorta var. *latifolia*	17	1	0	7
Abies amabilis	12	1	0	15
Abies lasiocarpa	10	1	0	50
Shrub layer				
Vaccinium uliginosum	100	41	5	85
Spiraea douglasii	33	3	0	55
Kalmia microphylla	26	1	0	25
Herb layer				
Dodecatheon jeffreyi	81	7	0	25
Caltha leptosepala ssp. *howellii*	64	11	0	55
Carex aquatilis var. *dives*	57	10	0	85
Ligusticum grayi	43	6	0	75
Deschampsia caespitosa	40	2	0	20
Platanthera dilatata	38	Tr	0	5
Senecio triangularis	31	1	0	11
Moss layer				
Moss	62	42	0	100
Unvegetated				
Litter	14	2	0	40

Vegetation and ecology: Habitat is montane fens. *Vaccinium uliginosum* plots are highly variable and indicate that numerous phases are present and need further study. Trees and shrubs are confined to hummocks or "tree islands" and the rest of the plot is a wet lawn with a large diversity of herbaceous species. Hummocks with very low shrub cover are composed mostly of the mosses *Sphagnum capillifolium* and *Aulacomnium palustre*.

III. HERBACEOUS ASSOCIATIONS

Athyrium filix-femina

Lady fern

Plots sampled: 1 (macro)

Environment:
Elevation (ft): 10
Slope (deg): 0
Landform position: floodplains
Hydrology: perennially saturated
Soils: organic or silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Rosa nutkana	100	2	2	2
Spiraea douglasii	100	2	2	2
Salix hookeriana	100	2	2	2
Lonicera involucrata	100	2	2	2
Herb layer				
Athyrium filix-femina	100	60	60	60
Scirpus microcarpus	100	25	25	25
Agrostis stolonifera	100	5	5	5
Lotus corniculatus	100	5	5	5
Aster subspicatus	100	4	4	4
Typha latifolia	100	2	2	2
Lysimachia terrestris	100	2	2	2
Argentina egedii	100	2	2	2
Oenanthe sarmentosa	100	2	2	2
Iris pseudacorus	100	2	2	2
Schoenoplectus acutus var. *occidentalis*	100	2	2	2
Juncus effusus	100	1	1	1
Carex obnupta	100	1	1	1

Vegetation and ecology:
Habitat is marsh just above the freshwater intertidal zone along larger coastal rivers. The association is undersampled but has been observed in a number of sites along the lower Columbia River and is also known from similar habitats in Washington. *Picea sitchensis* or *Tsuga heterophylla* may occur on logs or stumps, and the shrub layer is patchy. These floodplains are extremely diverse and also contain a number of weedy species such as *Agrostis stolonifera, Lysimachia terrestris, Juncus effusus,* and *Iris pseudacorus*. Stands are just above the reach of daily freshwater tidal flooding, but soils are saturated year-round. The tidally-influenced hydration, species composition, and rank growth of *Athyrium filix-femina* sets this apart from other associations containing considerable amounts of *Athyrium.*

Azolla (filiculoides, mexicana)

Mosquitofern

Plots sampled: 1 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Azolla mexicana	100	99	99	99

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: seasonally to perennially flooded
Soils: loam, silt loam

Vegetation and ecology: Habitat is low-elevation eutrophic ponds, lakes, and sloughs with little water movement. Species of *Azolla* occur throughout northwestern Oregon, but stands extensive enough to be considered occurrences of this association are most common in low-elevation areas in the Coast Range and Willamette Valley. They typically form nearly monotypic green or reddish mats that float on the surface of lakes and ponds, often growing so dense that no open water is visible. *Azolla* needs open water to proliferate in winter and spring but it tolerates being stranded on mudflats when shallow pools dry out in summer. Mudflat sites are not uncommon, particularly on large floodplains, and in this habitat the *Azolla* mat develops a peculiar lumpy surface with varied microtopography. Elements of the *Lemna minor* association (*Lemna, Spirodela, Ricciocarpos*) may often be intermixed with *Azolla* but are always subordinate to *Azolla.* Eutrophic conditions favored by this association may be enhanced by enriched runoff in agricultural or urban landscapes.

Bidens cernua

Nodding beggartick

Plots sampled: 9 (macro)

Environment:

Elevation (ft): ave. 282 (8-500)
Slope (deg): ave. 0 (0-1)
Landform position: floodplains, flats
Hydrology: seasonally flooded to perennially saturated
Soils: silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Bidens cernua	100	56	20	90
Polygonum hydropiperoides	56	14	0	80
Sagittaria latifolia	44	5	0	20
Eleocharis palustris	44	3	0	20
Ludwigia palustris	33	3	0	15
Leersia oryzoides	22	3	0	20
Alisma triviale	22	1	0	3
Callitriche	22	1	0	3
Sparganium angustifolium	22	Tr	0	2
Polygonum persicaria	22	Tr	0	3
Schoenoplectus americanus	11	4	0	40
Panicum capillare	11	1	0	10
Schoenoplectus tabernaemontani	11	1	0	5

Vegetation and ecology: Habitat is low-elevation eutrophic marsh and mudflats along low-gradient streams and around shallow ponds. The association is strictly herbaceous and dominated by *Bidens cernua* and a variety of other marsh species that tolerate early-season flooding and summer drying that exposes mudflats with subirrigation. Other typical species present in lesser amounts include *Polygonum hydropiperoides, Sagittaria latifolia, Eleocharis palustris, Ludwigia palustris,* and *Leersia oryzoides,* but more than 15 other species are recorded. This association was probably fairly widespread in the Willamette Valley prior to flood control, but is now mostly restricted to the Columbia River floodplain in the Vancouver Basin. Prolonged pooling in depressions and freshwater tidal flooding along streams helps to keep invasive *Phalaris arundinacea* from invading stands.

Bidens frondosa

Devil's beggartick

Plots sampled: 2 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Bidens frondosa	100	95	90	100
Nuphar lutea ssp. *polysepala*	50	5	0	10
Poaceae	50	2	0	4
Rorippa curvisiliqua	50	Tr	0	Tr
Polygonum persicaria	50	Tr	0	Tr
Lemna minor	50	Tr	0	Tr

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position:
floodplains, flats
Hydrology: seasonally flooded to moist
Soils: silt loam

Vegetation and ecology: Habitat is low-elevation marsh and mudflats along low-gradient streams and around shallow ponds. The association typically forms nearly monotypic stands of *Bidens frondosa* that can have up to 100 percent cover. *Nuphar lutea* ssp. *polysepala* is the second most abundant species reported from plots, with traces of other aquatic or mudflat species. This association was probably fairly widespread in the Willamette Valley prior to flood control, but is now mostly restricted to the Columbia River floodplain in the Vancouver Basin. Prolonged pooling in depressions and freshwater tidal flooding along streams helps to keep invasive *Phalaris arundinacea* from invading stands.

Boykinia major

Large boykinia

Plots sampled: 2 (macro)

Environment:
Elevation (ft): ave. 1663 (40-3285)
Slope (deg): 0
Landform position: depressions, flats
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Spiraea douglasii	50	1	0	1
Herb layer				
Boykinia major	100	60	50	70
Lysichiton americanus	100	12	4	20
Carex echinata ssp. *echinata*	100	3	Tr	5
Hypericum anagalloides	100	1	Tr	1
Carex utriculata	50	15	0	30
Blechnum spicant	50	8	0	15
Juncus ensifolius	50	5	0	10
Cicuta douglasii	50	5	0	10
Calamagrostis canadensis	50	5	0	10
Viola	50	3	0	5
Carex obnupta	50	1	0	2
Juncus	50	1	0	1
Moss layer				
Moss	100	20	20	20

Vegetation and ecology:
Habitat is coastal and montane fens, particularly sphagnum mires. The association needs more plot data, but a variety of occurrences have been observed in the field. It occurs in both open peatlands and under a partial canopy of *Thuja plicata*. *Boykinia major* is the primary species and forms a wet lawn with lesser amounts of *Lysichiton americanus, Carex echinata* ssp. *echinata, Carex utriculata, Blechnum spicant, Juncus ensifolius, Cicuta douglasii,* and *Calamagrostis canadensis*, depending on elevation. The moss layer is almost entirely *Sphagnum*.

Brasenia schreberi

Watershield

Plots sampled: 0

Environment:
Elevation (ft): 10-2000
Slope (deg): 0
Landform position: basins
Hydrology: perennially flooded
Soils: organic

Vegetation and ecology: Habitat is low-elevation ponds, lakes, and sloughs. This is a rooted aquatic bed association that is widespread in western Oregon but has not been sampled and little information is available. *Brasenia schreberi* forms mats of floating leaves on the surface of the water and the network of submerged stems and undersides of leaves provide important habitat for aquatic invertebrates and fish. The association is not as common in northwestern Oregon as the *Nuphar* association. This association favors oligotrophic or mesotrophic waters and may be outcompeted by more aggressive species in eutrophic waters enhanced by enriched runoff in agricultural or urban landscapes.

Calamagrostis canadensis

Bluejoint

Plots sampled: 10 (4 macro, 6 micro)

Environment:
Elevation (ft): ave. 4821 (3100-5410)
Slope (deg): ave. 1 (0-5)
Landform position: floodplains, flats
Hydrology: moist to perennially saturated
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	50	22	0	90
Abies lasiocarpa	20	1	0	8
Pinus contorta var. *latifolia*	20	1	0	10
Reproducing trees				
Abies lasiocarpa	30	5	0	45
Abies amabilis	30	Tr	0	3
Pinus contorta var. *latifolia*	20	Tr	0	3
Picea engelmannii	20	Tr	0	3
Shrub layer				
Vaccinium uliginosum	50	2	0	15
Spiraea densiflora	30	2	0	10
Herb layer				
Calamagrostis canadensis	100	46	12	95
Caltha leptosepala ssp. *howellii*	50	3	0	13
Senecio triangularis	50	1	0	5
Carex aquatilis var. *dives*	40	5	0	25
Dodecatheon jeffreyi	40	2	0	5
Ligusticum grayi	40	1	0	8
Platanthera dilatata	40	Tr	0	4
Moss layer				
Moss	40	18	0	100
Unvegetated				
Litter	30	11	0	70
Bare ground	10	1	0	10

Vegetation and ecology:
Habitat is edges of montane fens. The association is extremely diverse. The shrub layer contains 14 different species, and more than 60 species are present in the herb layer, indicating that the association occurs in a transition zone between montane fen and upland forest and contains components of both systems. The remaining mass of species occur only in small amounts.

Calamagrostis nutkaensis

Pacific reedgrass

Plots sampled: 0

Environment:
Elevation (ft): 50-100
Slope (deg): 0
Landform position: floodplains, basins, flats
Hydrology: perennially saturated
Soils: organic

Vegetation and ecology: Habitat is coastal fens. The association has not been sampled but is present in small amounts on the north coast and in larger amounts on the south coast. It forms nearly monotypic stands of *Calamagrostis nutkaensis* with a few other species with low constancy and cover but not documented here. The moss layer may contain high cover of *Sphagnum* or may largely be concealed by litter. Some stands have expanses of mud between hummocks of *Calamagrostis* and open water is lacking. Large tussocks of *Calamagrostis nutkaensis* are slightly elevated above the surface of the mire and are used extensively by elk for bedding. The association is uncommon and the best occurrences are located along the coast in southern Oregon and northern California.

Callitriche heterophylla

Different-leaved water-starwort

Plots sampled: 6 (macro)

Environment:

Elevation (ft): ave. 733 (500-1900)
Slope (deg): 0
Landform position: bottoms
Hydrology: seasonally to perennially flooded
Soils: organic or silty loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Fraxinus latifolia	17	17	0	100
Herb layer				
Callitriche heterophylla	100	86	75	99
Oenanthe sarmentosa	67	10	0	40
Veronica scutellata	33	Tr	0	1
Lysichiton americanus	17	3	0	20
Torreyochloa pallida var. *pauciflora*	17	1	0	5
Moss layer				
Moss	17	Tr	0	1

Vegetation and ecology: Habitat is low-elevation shallow pools, ponds, slow-moving streams, and flooded shrub swamps. *Fraxinus latifolia, Salix hookeriana, Salix lucida* ssp. *lasiandra, Salix sitchensis,* and *Spiraea douglasii* are typical associates in this habitat, but woody vegetation may also be entirely absent. *Callitriche heterophylla* is the primary species and is usually immersed with the topmost leaves floating on the surface of the water. Emergent species present may include *Oenanthe sarmentosa, Veronica scutellata, Cicuta douglasii, Torreyochloa pallida* var. *pauciflora,* and *Glyceria*.

Caltha leptosepala* ssp. *howellii

Howell's marsh marigold

Plots sampled: 7 (macro)

Environment:
Elevation (ft): ave. 4319 (2800-5300)
Slope (deg): ave. 4 (0-15)
Landform position: seepage slopes to floodplains and flats
Hydrology: moist to perennially saturated
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	29	2	0	15
Abies amabilis	29	Tr	0	3
Tsuga mertensiana	29	Tr	0	1
Larix occidentalis	29	Tr	0	Tr
Reproducing trees				
Picea engelmannii	43	1	0	5
Abies amabilis	29	Tr	0	1
Pinus contorta var. *latifolia*	29	Tr	0	1
Shrub layer				
Vaccinium caespitosum	14	1	0	10
Vaccinium uliginosum	14	1	0	8
Herb layer				
Caltha leptosepala ssp. *howellii*	100	50	15	80
Dodecatheon jeffreyi	86	8	0	20
Senecio triangularis	71	1	0	5
Hypericum anagalloides	57	5	0	30
Carex luzulina	57	1	0	2
Platanthera stricta	57	1	0	5
Tofieldia glutinosa	43	1	0	3
Equisetum arvense	43	Tr	0	1
Moss layer				
Moss	29	19	0	95

Vegetation and ecology: Habitat is montane fens, forming lawns or flushes on gentle to moderate slopes below springs. Slopes are laced with rivulets or rills and irrigated by sheet flow. A number of phases are present that need further study. Woody plants have scanty cover and are primarily restricted to hummocks or "tree islands" within an herbaceous matrix, or they are peripheral to the wetland. The herb layer is extremely rich with almost 60 different species present from both wet flushes and drier hummocks or forest ecotones around the edges of these wetlands. *Senecio triangularis, Trifolium longipes, Trautvetteria caroliniensis,* and *Veratrum californicum* are conspicuous on hummocks. Rills are often filled with the aquatic moss *Fontinalis neomexicana*, and *Polygonum bistortoides* and the large leafy liverwort *Scapania paludosa* are also characteristic of these rills.

Caltha leptosepala* ssp. *howellii* - *Carex obnupta

Howell's marsh marigold - slough sedge

Plots sampled: 30 microplots

Environment:
Elevation (ft): 2800
Slope (deg): ave. 5 (3-5)
Landform position: floodplains, flats, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Caltha leptosepala ssp. *howellii*	87	35	0	90
Sanguisorba officinalis	60	41	0	95
Gentiana sceptrum	50	1	0	5
Carex obnupta	37	9	0	45
Carex cusickii	37	6	0	30
Equisetum arvense	30	1	0	10
Juncus ensifolius	27	1	0	8
Lysichiton americanus	23	1	0	18
Agrostis	23	Tr	0	2
Juncus balticus	20	3	0	40
Angelica genuflexa	20	1	0	6
Hypericum anagalloides	20	1	0	5
Moss layer				
Moss	80	53	0	95
Unvegetated				
Litter	3	1	0	15

Vegetation and ecology:
Habitat is montane fens, forming lawns or flushes on gentle to moderate slopes below springs and seeps. Slopes are laced with rivulets or rills and irrigated by sheet flow. Stands lack hummocks or "tree islands." The primary herbs may not be present in all plots but are conspicuous adjacent to plots. Use of *Carex obnupta* in the name separates this association from *Caltha* vegetation of the Cascades and indicates an affinity to low-elevation coastal peatlands. *Juncus balticus, Carex echinata* ssp. *phyllomanica, Scirpus microcarpus, Carex exsiccata,* and *Carex utriculata* occur in patches with low constancy and average cover but sometimes with cover up to 70 percent. Rills are characteristically filled with the aquatic moss *Fontinalis neomexicana* that becomes hidden by sedge growth as the season progresses. *Polygonum bistortoides* and the large leafy liverwort *Scapania paludosa* are also characteristic of these rills. The moss layer may have up to 95 percent cover, mostly consisting of *Sphagnum mendocinum* and *Aulacomnium palustre*.

Camassia quamash

Small camas

Plots sampled: 5 (1 macro, 4 micro)

Environment:
Elevation (ft): ave. 220 (150-500)
Slope (deg): ave. 2 (0-2)
Landform position: floodplains, flats, benches
Hydrology: seasonally flooded to seasonally moist
Soils: clay loam and shallow soil over bedrock

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Camassia quamash	100	25	20	40
Saxifraga oregana	40	8	0	30
Ranunculus occidentalis	20	6	0	30
Triteleia hyacinthina	20	2	0	10
Hypochaeris radicata	20	2	0	10
Stellaria	20	1	0	4
Mimulus guttatus	20	1	0	3
Juncus bufonius	20	Tr	0	1
Aira caryophyllea	20	Tr	0	1
Galium aparine	20	Tr	0	1
Moss layer				
Moss	80	76	0	100

Vegetation and ecology: Habitat is clay prairie and basalt scabland with a seasonally perched water table. *Camassia* is conspicuous in spring and forms dense stands of gorgeous blue flowers, but it all but disappears with summer drought. Because of its seasonal presence, low elevation, and proximity to agriculture, many exotic species are present. Weeds such as *Hypochaeris radicata, Stellaria, Aira caryophyllea,* and *Galium aparine* may be inconspicuous when *Camassia* is at its peak but may dominate sites once it has disappeared. Both white and blue forms of *Camassia quamash* may be present, as well as *Camassia leichtlinii.* Camas was one of the most important staple foods for the original native peoples of the Willamette Valley and wet prairies were intensively managed for food production. Arable prairies were converted to agriculture and those on scabland sites were grazed by livestock, so that most surviving remnants are degraded with exotic species. This association may intergrade with the *Triteleia hyacinthina* association in areas of shallow soil over bedrock that have a perched water table or seasonal seepage.

Carex amplifolia

Bigleaf sedge

Plots sampled: 1 (macro)

Environment:
Elevation (ft): 3450
Slope (deg): 7
Landform position: seepage slopes, flats
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Carex amplifolia	100	40	40	40
Lotus	100	25	25	25
Lysichiton americanus	100	15	15	15
Scirpus microcarpus	100	10	10	10
Mimulus guttatus	100	5	5	5
Moss layer				
Moss	100	30	30	30

Vegetation and ecology: Habitat is seepage slopes, rivulets, or sheet flow associated with springs. The association is represented by only one plot but it has been well documented by other researchers. *Carex amplifolia* is the primary species with an average cover of 40 percent, with lesser amounts of an unidentified *Lotus*, *Lysichiton americanus,* and *Scirpus microcarpus*. Twelve other species are present in the herb layer. Most occurrences are east of the Cascade Range, but these plots appear to be similar to others reported.

Carex angustata

Widefruit sedge

Plots sampled: 4 (2 macro, 2 micro)

Environment:
Elevation (ft): 4400
Slope (deg): ave. 2 (1-2)
Landform position: floodplains, basins
Hydrology: seasonally flooded to moist
Soils: loam or organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Spiraea douglasii	50	2	0	5
Rosa pisocarpa	25	5	0	20
Vaccinium uliginosum	25	5	0	20
Lonicera	25	3	0	12
Herb layer				
Carex angustata	100	43	20	70
Juncus balticus	75	5	0	10
Veratrum californicum	50	11	0	35
Deschampsia caespitosa	50	10	0	30
Dodecatheon jeffreyi	50	9	0	20
Solidago canadensis	50	7	0	25
Polygonum bistortoides	50	1	0	1

Vegetation and ecology:
Habitat is seasonally moist montane meadows. *Spiraea douglasii* is present in half the plots but with very low cover. *Carex angustata* is the principal species in the herb layer, with an average cover of 43 percent and ranging up to 70 percent, with lesser amounts of *Juncus balticus, Veratrum californicum, Deschampsia caespitosa, Dodecatheon jeffreyi,* and *Solidago canadensis.* More than 30 other species present in trace amounts represent a mix of drier meadow and forest ecotone. Presence of *Danthonia intermedia*, *Achillea millefolium, Potentilla gracilis, Stellaria crispa,* and *Poa pratensis* strongly suggest that some sites were once grazed by livestock.

Carex aperta

Columbia sedge

Plots sampled: 10 (macro)

Environment:

Elevation (ft): ave. 510 (10-3150)

Slope (deg): ave. 0 (0-3)

Landform position: floodplains, toe slopes

Hydrology: seasonally flooded to seasonally moist

Soils: mostly silt loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Rubus armeniacus	30	2	0	8
Spiraea douglasii	10	1	0	5
Herb layer				
Carex aperta	100	88	62	98
Phalaris arundinacea	70	37	0	97
Epilobium ciliatum ssp. *watsonii*	40	4	0	13
Vicia	30	4	0	19
Cirsium arvense	30	3	0	13
Dipsacus fullonum	30	3	0	19

Vegetation and ecology: Habitat is mostly low-elevation floodplains, but one site is known from a montane fen. Stands are seasonally flooded but dry by mid to late summer. The association was more widespread historically before diking and farming of the Columbia River lowlands, and the advent of exotic cultivars of *Phalaris arundinacea.* The few known stands that remain are either nearly monotypic *Carex aperta* in depressions too wet for *Phalaris arundinacea*, or in mixed stands dominated by *Phalaris arundinacea.* Elsewhere, it has been completely displaced by *Phalaris arundinacea*. The sedge itself is not rare but it is never plentiful. Most of the ten plots sampled here represent the monotypic expression, which may represent only the wettest end of the historic moisture gradient occupied by the association. Trees are absent or peripheral, but would include *Salix lucida* ssp. *lasiandra* and *Fraxinus latifolia.* Shrubs have low constancy and cover. Ten species are reported from the herb layer, including *Polygonum amphibium, Bidens cernua, Bidens frondosa*, and *Ludwigia palustris* that were not recorded in plots. *Carex aperta* once covered extensive areas of bottomland along the Columbia River and its tributaries between Longview and Skamania and into the Willamette Valley.

Carex aquatilis* var. *aquatilis

Aquatic sedge

Plots sampled: 10 (macro)

Environment:

Elevation (ft): ave. 4385 (3320-5097)
Slope (deg): ave. 1 (0-3)
Landform position: slopes, benches, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Abies lasiocarpa	10	Tr	0	Tr
Abies amabilis	10	Tr	0	Tr
Shrub layer				
Salix hookeriana	10	1	0	10
Spiraea douglasii	10	1	0	8
Alnus incana	10	1	0	7
Herb layer				
Carex aquatilis var. *aquatilis*	100	61	30	99
Hypericum anagalloides	40	Tr	0	2
Platanthera stricta	30	Tr	0	Tr
Moss layer				
Moss	40	17	0	70

Vegetation and ecology:

Habitat is usually montane fens. The association includes a heterogeneous mix of species that do not segregate in any meaningful way. Trees and shrubs are scarce. More than 50 species occur in the herb layer, but *Carex aquatilis* var. *aquatilis* is the most abundant and averages 61 percent cover and may have up to 99 percent cover. Many stands occur as monotypic reedswamp. Patches of other wetland species having low constancy but up to 50 percent cover include *Eleocharis quinqueflora, Carex luzulina, Boykinia major, Parnassia fimbriata, Carex aquatilis* var*. dives,* and *Caltha leptosepala* ssp. *howellii. Senecio triangularis* and *Aconitum columbianum* indicate some forest ecotone. Stands may occur on old beaver terraces on seepage slopes, and also in sag ponds on slopes prone to slumping. The *Carex aquatilis* var. *aquatilis* association is more common east of the Cascade Range and is mostly replaced by the *Carex aquatilis* var. *dives* association in and west of the Cascades.

Carex aquatilis* var*. dives

Sitka sedge

Plots sampled: 71 (46 macro, 25 micro)

Environment:

Elevation (ft): ave. 4378 (2000-5428)
Slope (deg): ave. 1 (0-17)
Landform position: slopes, benches, basins
Hydrology: seasonally flooded to perennially saturated
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	3	Tr	0	10
Pinus contorta var. *latifolia*	3	Tr	0	6
Reproducing trees				
Pinus contorta var. *latifolia*	4	Tr	0	2
Tsuga heterophylla	3	Tr	0	10
Picea engelmannii	3	Tr	0	3
Shrub layer				
Vaccinium uliginosum	14	1	0	20
Spiraea douglasii	14	1	0	15
Herb layer				
Carex aquatilis var. *dives*	100	54	5	99
Dodecatheon jeffreyi	37	3	0	20
Carex utriculata	24	4	0	40
Hypericum anagalloides	21	1	0	25
Moss layer				
Moss	23	4	0	95
Unvegetated				
Litter	31	4	0	40
Bare ground	23	11	0	95

Vegetation and ecology:

Habitat is usually montane fens. The association is widespread and important in the Cascade Range and includes a heterogeneous mix of species that do not segregate in any meaningful way. Trees and shrubs are scarce, although many different species are present. The herb layer is astonishingly diverse with more than 120 species recorded, but most of these have relatively low constancy and reflect the patchy distribution of many different taxa. Many stands occur as monotypic reedswamp with cover ranging from 5 to 99 percent, and some intergrade with the *Carex utriculata* association in seasonally flooded depressions. Stands may occur on old beaver terraces on seepage slopes, and also in sag ponds on slopes prone to slumping. *Carex aquatilis* var*. dives* can intermix with forest ecotone or meadow taxa as long as enough soil moisture is present. Plants become progressively dwarfed as conditions become drier.

Carex aquatilis* var*. dives* - *Comarum palustre

Sitka sedge - marsh cinquefoil

Plots sampled: 54 (micro)

Environment:
Elevation (ft): ave. 35 (20-40)
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *contorta*	2	Tr	0	2
Reproducing trees				
Picea sitchensis	2	Tr	0	1
Shrub layer				
Ledum glandulosum	37	6	0	35
Vaccinium uliginosum	33	6	0	40
Herb layer				
Carex aquatilis var. *dives*	100	47	5	90
Comarum palustre	83	17	0	55
Nuphar lutea ssp. *polysepala*	43	11	0	65
Athyrium filix-femina	31	3	0	30
Unvegetated				
Litter	24	5	0	40
Water	7	1	0	20

Vegetation and ecology: Habitat is coastal fens, floating lake-fill mats, and low-gradient drainages. The association is primarily minerotrophic reedswamp. The surface usually has several inches of standing water and the vegetation is typified by vegetation requiring very wet to flooded conditions. Trees are rarely present, and shrubs are present in about half the plots and may also include *Spiraea douglasii, Lonicera involucrata,* and *Salix hookeriana*. The herb layer is diverse and may also include *Hypericum anagalloides*, *Oenanthe sarmentosa,* and *Lycopus uniflorus*. *Darlingtonia californica* is present along the mid-coast. *Carex obnupta* occurred only in trace amounts in the plots sampled, but may be more abundant than indicated in the stand table. *Sphagnum* and other mosses are absent except in hummocks of *Ledum* and *Spiraea*. The association is a transitional vegetation type between aquatic bed and open fen or shrub swamp.

Carex buxbaumii

Buxbaum's sedge

Plots sampled: 5 (macro)

Environment:
Elevation (ft): 4730
Slope (deg): 0
Landform position: floodplains, flats, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium uliginosum	40	Tr	0	Tr
Spiraea douglasii	20	Tr	0	Tr
Herb layer				
Carex buxbaumii	100	49	35	70
Lycopus uniflorus	80	6	0	20
Deschampsia caespitosa	80	6	0	25
Moss layer				
Moss	20	Tr	0	1

Vegetation and ecology: Habitat is montane fens. The association occurs in open fens and around the edges of wet meadows, where it intergrades with slightly drier *Deschampsia caespitosa* associations. Trees are absent from these plots but may be present in some stands on elevated hummocks or "tree islands." *Vaccinium uliginosum* and *Spiraea douglasii* occur in trace amounts only, also on hummocks. *Carex buxbaumii* is the primary species, averaging 49 percent cover but ranging up to 70 percent cover in some stands. *Lycopus uniflorus* and *Deschampsia caespitosa* are present in lesser amounts, along with 17 other fen species in trace amounts.

Carex cusickii

Cusick's sedge

Plots sampled: 3 (macro)

Environment:
Elevation (ft): ave. 2057 (1970-2200)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Mahonia aquifolium	33	Tr	0	Tr
Herb layer				
Carex cusickii	100	80	60	95
Potentilla	33	2	0	5
Carex aquatilis var. *aquatilis*	33	2	0	5
Hypericum anagalloides	33	1	0	3
Dulichium arundinaceum	33	1	0	2
Carex leptalea	33	Tr	0	1
Carex utriculata	33	Tr	0	1
Poaceae	33	Tr	0	1
Viola	33	Tr	0	Tr
Lycopus uniflorus	33	Tr	0	Tr
Drosera rotundifolia	33	Tr	0	Tr
Carex echinata ssp. *echinata*	33	Tr	0	Tr
Moss layer				
Moss	67	40	0	100

Vegetation and ecology: Habitat is low to mid-elevation fen and marsh. The association is composed of nearly monotypic stands of *Carex cusickii,* with an average cover of 80 percent and with cover up to 90 percent. Eleven other species are recorded from the herb layer, but all occur only in trace amounts. No trees are recorded and one plot records *Mahonia aquifolium*, probably from an elevated position as this is not a wetland species. The moss layer is conspicuous with an average cover of 40 percent but some plots have cover of up to 100 percent. One or two phases need more sampling. One is a sphagnum fen habitat with *Comarum palustre, Lysichiton americanus, Menyanthes trifoliata, Drosera rotundifolia, and Eriophorum chamissonis*. The other occurs in marsh around shallow lakes, ponds, and sloughs where *Carex cusickii* forms pedestals among expanses of water and deep muck, with *Comarum palustre, Cicuta douglasii,* and *Oenanthe sarmentosa*.

Carex deweyana* ssp. *leptopoda

Dewey sedge

Plots sampled: 2 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: seasonally flooded to moist
Soils: clay loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Carex deweyana ssp. *leptopoda*	100	73	65	80
Myosotis laxa	100	23	15	30
Deschampsia caespitosa	100	11	2	20
Carex pellita	100	7	4	10
Carex unilateralis	100	7	4	10
Juncus tenuis	100	4	3	5
Eleocharis acicularis	100	1	Tr	1
Epilobium ciliatum	100	Tr	Tr	Tr
Galium parisiense	100	Tr	Tr	Tr
Veronica scutellata	50	10	0	20
Carex feta	50	8	0	15
Callitriche heterophylla	50	1	0	1
Beckmannia syzigachne	50	Tr	0	Tr
Eleocharis palustris	50	Tr	0	Tr
Rumex crispus	50	Tr	0	Tr
Moss layer				
Moss	50	4	0	8

Vegetation and ecology:
Habitat is clay prairie with perched water table. This association is presumably a relic component of native Willamette Valley wet prairie. Although it occurs at low elevation, has a history of grazing, and is surrounded by agriculture, relatively few exotic species are recorded in the plots. It is classified here as an association because of the significant cover of *Carex deweyana* ssp. *leptopoda* in prairie rather than its more common occurrence in *Fraxinus latifolia* woodland. A significant amount of *Deschampsia caespitosa*, *Carex pellita*, and *Carex unilateralis* are also present, which are indicators of prairie remnants in the Willamette Valley. The association may represent one of a number of poorly-described native prairie types now mostly decimated by settlement. Hopefully other stands can be found and documented.

Carex exsiccata

Western inflated sedge

Plots sampled: 33 (31 macro, 2 micro)

Environment:

Elevation (ft): ave. 2490 (100-5000)

Slope (deg): ave. 0 (0-3)

Landform position: floodplains, flats, benches

Hydrology: seasonally flooded to perennially saturated

Soils: organic, silt loam, or sand

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Thuja plicata	3	Tr	0	1
Pseudotsuga menziesii	3	Tr	0	1
Reproducing trees				
Thuja plicata	3	Tr	0	1
Pseudotsuga menziesii	3	Tr	0	1
Shrub layer				
Spiraea douglasii	18	Tr	0	5
Herb layer				
Carex exsiccata	100	69	20	100
Veronica scutellata	21	2	0	35
Nuphar lutea ssp. *polysepala*	15	2	0	20
Carex obnupta	15	1	0	10
Moss layer				
Moss	12	3	0	45
Unvegetated				
Bare ground	9	3	0	60
Litter	9	1	0	25

Vegetation and ecology: Habitat is small to large shallow basins. Composition is diverse with no obvious segregate types. Stands are usually flooded seasonally to a depth of one to three feet and may dry out by midsummer with the water table just below the soil surface. Stands are usually nearly monotypic reedswamp in standing water or bare mud, but sometimes *Carex exsiccata* occurs in wet lawns with combinations of more than 90 other herbaceous species. The diversity is due mainly to the variety of elevations at which the association occurs, but most of these species occur only in trace amounts. The association is present but uncommon at lower elevations along the coast and in interior valleys of western Oregon, and becomes more common at higher elevations in the Coast and Cascade Range.

Carex feta
Greensheath sedge

Plots sampled: 3 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: seasonally flooded to wet
Soils: clay loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Carex feta	100	42	35	50
Carex deweyana ssp. *leptopoda*	100	24	20	27
Epilobium ciliatum	100	1	Tr	1
Galium parisiense	100	Tr	Tr	1
Deschampsia caespitosa	67	15	0	30
Oenanthe sarmentosa	67	12	0	25
Myosotis laxa	67	11	0	25
Eleocharis palustris	67	7	0	20
Veronica scutellata	67	4	0	10
Carex unilateralis	33	2	0	6
Carex pellita	33	2	0	5
Holcus lanatus	33	1	0	4
Rumex crispus	33	1	0	3
Callitriche heterophylla	33	Tr	0	1
Mentha arvensis	33	Tr	0	1
Ranunculus alismifolius	33	Tr	0	Tr
Beckmannia syzigachne	33	Tr	0	Tr
Juncus tenuis	33	Tr	0	Tr
Danthonia californica	33	Tr	0	Tr
Moss layer				
Moss	33	3	0	10

Vegetation and ecology:
Habitat is clay prairie with perched water table. The association is presumably a relic component of native Willamette Valley wet prairie. Although it occurs at low elevation, has a history of grazing, and is surrounded by agriculture, there are relatively few exotic species recorded in the plots. It is documented here as an association because of the significant cover of *Carex feta* and *Carex deweyana* ssp. *leptopoda* in prairie with a significant amount of *Deschampsia caespitosa*. It may represent one of a number of poorly-described native prairie types now mostly decimated by settlement. Hopefully other stands can be found and documented.

Carex lasiocarpa

Slender sedge

Plots sampled: 25 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium uliginosum	4	Tr	0	Tr
Herb layer				
Carex lasiocarpa	100	49	15	90
Deschampsia caespitosa	48	1	0	10
Aster occidentalis	32	1	0	10
Juncus balticus	28	1	0	25
Carex utriculata	24	3	0	30
Galium trifidum	24	Tr	0	1
Potamogeton gramineus	16	Tr	0	6
Epilobium ciliatum	16	Tr	0	Tr
Calamagrostis stricta ssp. *inexpansa*	12	1	0	15
Carex aquatilis var. *dives*	12	1	0	20
Utricularia intermedia	12	Tr	0	12
Veronica scutellata	12	Tr	0	10
Moss layer				
Moss	8	1	0	15

Environment:
Elevation (ft): ave. 4680 (4100-4730)
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: perennially flooded to perennially saturated
Soils: organic

Vegetation and ecology: Habitat is montane marshes and fens. This association occurs at the eastern edge of the study area and is rare in Oregon. It occurs as nearly monotypic and sometimes extensive stands of *Carex lasiocarpa* with up to 90 percent cover, with lesser amounts of *Deschampsia caespitosa, Aster occidentalis, Juncus balticus, Carex utriculata, Calamagrostis stricta* ssp. *inexpansa,* and *Carex aquatilis* var. *dives*. Stands seen by the author are flooded 1-6 inches throughout the growing season.

Carex lenticularis

Lakeshore sedge

Plots sampled: 14 (13 macro, 1 micro)

Environment:

Elevation (ft): ave. 4151 (3240-5146)
Slope (deg): ave. 1 (0-2)
Landform position: floodplains, basins, benches
Hydrology: perennially saturated
Soils: mostly organic, some sandy

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix scouleriana	7	Tr	0	1
Picea engelmannii	7	Tr	0	Tr
Reproducing trees				
Picea engelmannii	7	Tr	0	5
Abies amabilis	7	Tr	0	2
Shrub layer				
Salix	14	1	0	8
Cornus sericea	14	1	0	5
Spiraea douglasii	14	Tr	0	3
Herb layer				
Carex lenticularis	100	47	20	75
Senecio triangularis	50	1	0	10
Polygonum bistortoides	43	1	0	3
Viola	29	4	0	30
Carex luzulina	29	2	0	15
Carex exsiccata	29	1	0	7
Agrostis thurberiana	29	1	0	5
Veronica americana	29	1	0	7
Moss layer				
Moss	21	8	0	95

Vegetation and ecology:

Habitat is montane wet meadows interspersed with forest edge. Trees and shrubs are mostly peripheral, occuring with low constancy and in trace amounts. The herb layer is astonishingly diverse, with over 100 species, all from a fairly narrow elevational zone. *Carex lenticularis* may occur as nearly monotypic stands or with other wet meadow species. *Senecio triangularis* and *Polygonum bistortoides* occur in about half the plots but at very low cover. Other species with significant intermixed patches include an unidentified *Viola*, *Carex luzulina, Carex aquatilis* var*. dives,* and *Carex utriculata.* About one-fourth of the rest of the species occur in peripheral forest ecotone, where the substrate is elevated somewhat above the water table.

Carex limosa

Mud sedge

Plots sampled: 9 (micro)

Environment:
Elevation (ft): 3360
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: perennially flooded to perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Tsuga heterophylla	11	Tr	0	1
Herb layer				
Carex limosa	100	25	5	75
Menyanthes trifoliata	89	16	0	30
Drosera rotundifolia	44	2	0	10
Dulichium arundinaceum	33	1	0	4
Carex utriculata	22	1	0	5
Spiranthes romanzoffiana	11	Tr	0	1
Moss layer				
Moss	78	75	0	100
Unvegetated				
Bare ground	22	7	0	40

Vegetation and ecology: Habitat is montane fens and poor fens. This association is typically species-poor, with low species cover and with considerable expanses of water 1-3 inches deep, mud, or *Sphagnum* between sparsely-distributed plants. *Tsuga heterophylla* is the only tree recorded but is restricted to low hummocks where it may be chlorotic and stunted. *Carex limosa* is the primary species in the herb layer with cover ranging from 5-75 percent but averaging only 25 percent. *Menyanthes trifoliata* is the second most abundant herb, with lesser amounts of *Drosera rotundifolia, Dulichium arundinaceum,* and *Carex utriculata,* the last two species indicative of conditions bordering on reedswamp. Although not reflected in these plots, *Utricularia intermedia*, *Drosera anglica*, and algae are frequent in the shallow pools. The moss mat is conspicuous, with an average cover of 75 percent and ranging to 100 percent, and is usually composed of *Sphagnum*. Stands may intergrade with the *Eleocharis quinqueflora* and *Carex simulata* associations that often have similar sparse vegetation and sloppy substrate.

Carex luzulina

Woodrush sedge

Plots sampled: 8 (6 macro, 2 micro)

Environment:

Elevation (ft): ave. 4378 (3460-4760)
Slope (deg): ave. 1 (0-3)
Landform position: floodplains, flats, basins
Hydrology: seasonally to perennially moist
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium uliginosum	63	6	0	30
Spiraea douglasii	25	4	0	30
Herb layer				
Carex luzulina	100	34	8	75
Hypericum anagalloides	75	8	0	30
Deschampsia caespitosa	75	7	0	35
Dodecatheon jeffreyi	63	8	0	40
Caltha leptosepala ssp. *howellii*	63	4	0	17
Carex aquatilis var. *dives*	63	3	0	10
Eleocharis quinqueflora	63	3	0	7
Pedicularis groenlandica	63	1	0	3
Ranunculus gormanii	38	4	0	25
Microseris borealis	38	4	0	25
Drosera anglica	38	2	0	10
Trifolium longipes	38	2	0	10
Moss layer				
Moss	63	29	0	90
Unvegetated				
Water	25	9	0	40

Vegetation and ecology:

Habitat is mostly montane fens. While not recorded in these plots, *Pinus contorta* var. *latifolia, Picea engelmannii,* or *Abies lasiocarpa* may be present with shrubs on hummocks or "tree islands." The herb layer is a wet lawn with some 65 species reported from a fairly narrow elevational zone. *Carex luzulina* does not form dense monotypic stands like so many other sedges. Its cover ranges from sparse stands to dense, but averages only 34 percent. Other abundant lawn-forming species present include *Hypericum anagalloides, Deschampsia caespitosa, Dodecatheon jeffreyi, Caltha leptosepala* ssp. *howellii,* and *Carex aquatilis* var. *dives*. *Ranunculus gormanii, Microseris borealis,* and *Muhlenbergia filiformis* form large patches but occur at much lower constancy. The moss mat is conspicuous with an average cover of 29 percent but may range up to 90 percent.

Carex nebrascensis

Nebraska sedge

Plots sampled: 3 (macro)

Environment:

Elevation (ft): ave. 5415 (5200-5700)
Slope (deg): 1
Landform position: floodplains, flats
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Picea engelmannii	33	Tr	0	1
Pinus contorta var. *latifolia*	33	Tr	0	1
Shrub layer				
Vaccinium uliginosum	33	5	0	15
Lonicera involucrata	33	1	0	2
Salix sitchensis	33	Tr	0	1
Herb layer				
Carex nebrascensis	100	29	26	34
Polygonum bistortoides	67	1	0	2
Dodecatheon alpinum	67	1	0	1
Eleocharis quinqueflora	33	3	0	8
Carex atrata var. *atrosquama*	33	1	0	3
Carex microptera	33	1	0	3
Equisetum arvense	33	1	0	2
Epilobium brachycarpum	33	Tr	0	1
Carex brunnescens	33	Tr	0	1
Deschampsia caespitosa	33	Tr	0	1
Ranunculus populago	33	Tr	0	1
Viola orbiculata	33	Tr	0	1

Vegetation and ecology:

Habitat is montane fens and wet meadows. The association is very common in montane meadows of the intermountain west and is barely present along the eastern edge of the Cascade Range. *Picea engelmannii* and *Pinus contorta* var. *latifolia* are present in trace amounts and are probably peripheral, while *Vaccinium uliginosum* has a cover of 15 percent in one plot. *Carex nebrascensis* is the primary species in the herb layer, with very small amounts of *Polygonum bistortoides, Dodecatheon alpinum, Eleocharis quinqueflora* and 8 other species. The hydroperiod for the plots reported here is wetter than the norm for this association and the species composition suggests that conditions are at the wet end of the spectrum.

Carex nigricans

Black alpine sedge

Plots sampled: 14 (3 macro, 11 micro)

Environment:

Elevation (ft): ave. 5747 (5175-6557)

Slope (deg): ave. 9 (0-25)

Landform position: various slope positions, floodplains, basins

Hydrology: seasonally moist to perennially saturated

Soils: organic or loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix commutata	100	10	1	20
Kalmia microphylla	43	3	0	25
Phyllodoce empetriformis	36	1	0	5
Gaultheria humifusa	36	1	0	6
Vaccinium uliginosum	7	Tr	0	1
Spiraea densiflora	7	Tr	0	1
Salix	7	Tr	0	1
Salix planifolia	7	Tr	0	1
Herb layer				
Carex nigricans	100	33	5	95
Carex scopulorum	64	9	0	40
Pedicularis attollens	50	1	0	3
Eleocharis quinqueflora	36	4	0	20
Ligusticum grayi	29	2	0	26
Tofieldia glutinosa ssp. *occidentalis*	29	1	0	6
Packera cymbalarioides	29	1	0	5

Vegetation and ecology: Habitat is depressions and seepy alluvial fans in subalpine heath. This association is somewhat drier than the *Salix commutata* association but intergrades with it. It also intergrades with the *Carex scopulorum* association and upland *Phyllodoce empetriformis* heath. Stands on alluvial fans occur below springs and seeps and may be laced with rivulets or irrigated by sheet flow. Trees are absent and shrubs are confined to hummocks. The herb layer has over 35 different species present, but most occur at low constancy and cover. About half of the remaining herbs are wet lawn species and half are drier meadow species. This is not a productive habitat and considerable bare ground may be present in plots.

Phases: *Eleocharis quinqueflora*. It occurs at the wet end of the *Carex nigricans* association, containing more *Eleocharis quinqueflora* than *Carex*., and may intergrade with the *Eleocharis quinqueflora* association.

Carex obnupta

Slough sedge

Plots sampled: 57 (15 macro, 42 micro)

Environment:

Elevation (ft): ave. 394 (20-2800)

Slope (deg): ave. 0 (0-4)

Landform position: floodplains, flats, benches

Hydrology: seasonally moist or flooded to perennially saturated

Soils: organic, muck, or loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	5	Tr	0	7
Fraxinus latifolia	4	Tr	0	12
Calocedrus decurrens	2	Tr	0	6
Reproducing trees				
Alnus rubra	5	Tr	0	7
Acer macrophyllum	2	Tr	0	Tr
Shrub layer				
Rubus ursinus	11	1	0	20
Herb layer				
Carex obnupta	100	66	20	99
Athyrium filix-femina	28	4	0	95
Rorippa nasturtium-aquaticum	23	3	0	40
Moss layer				
Moss	42	34	0	95

Vegetation and ecology: Habitats include isolated depressions with internal drainage, peatlands, shrub swamps, ancient marine terraces, and deflation plains. The *Carex obnupta* association is heterogeneous and difficult to segregate into meaningful types. Stands range from species-rich assemblages to monotypes, and dense to depauperate stands, the latter with only bare mud or sphagnum between the plants. Tussocks may be six inches in diameter, closely spaced and 1-3 feet tall, or 3 feet in diameter, 3-6 feet apart and growing up to 6 feet tall. Trees are mostly peripheral and 14 species of shrubs are reported, including *Rosa pisocarpa, Rosa gymnocarpa,* and *Corylus cornuta.* More than 80 species have been recorded from the herb layer, including *Oenanthe sarmentosa, Lysichiton americanus, Veronica americana, Carex exsiccata, Myosotis laxa,* and *Carex cusickii.* Common species in the moss layer include *Eurhynchium praelongum* and *Sphagnum mendocinum*. Some sites are old beaver swamps cleared for pasture and then abandoned because they were too wet for livestock. Beaver subsequently reclaimed most of these sites. Elk and beaver use may be heavy.

Carex pachystachya

Chamisso sedge

Plots sampled: 3 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: seasonally wet to moist
Soils: clay loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Carex pachystachya	100	62	25	95
Agrostis stolonifera	100	38	10	75
Hordeum brachyantherum	100	6	5	8
Poa pratensis	100	3	1	5
Cirsium arvense	67	2	0	5
Vicia tetrasperma	67	1	0	1
Agrostis capillaris	33	1	0	4
Phalaris arundinacea	33	Tr	0	1
Rumex acetosella	33	Tr	0	1

Vegetation and ecology: Habitat is clay prairie with perched water table. This association is presumably a relic component of native Willamette Valley wet prairie. Because of its low elevation, history of grazing, and proximity to agriculture, it is full of exotic species. It is documented here because of the significant cover of native *Carex pachystachya* and *Hordeum brachyantherum,* and it may represent one of a number of poorly-described native prairie types now mostly decimated by settlement. Hopefully stands in better condition can be found and documented.

Carex scopulorum

Mountain sedge

Plots sampled: 8 (macro)

Environment:
Elevation (ft): ave. 5747 (5175-6557)
Slope (deg): ave. 9 (0-25)
Landform position: various slope positions, floodplains, basins
Hydrology: seasonally moist to perennially saturated
Soils: organic or loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix commutata	25	1	0	4
Salix sitchensis	13	1	0	10
Salix myrtillifolia	13	Tr	0	1
Kalmia microphylla	13	Tr	0	1
Spiraea densiflora	13	Tr	0	1
Phyllodoce empetriformis	13	Tr	0	1
Herb layer				
Carex scopulorum	100	49	10	90
Deschampsia caespitosa	50	9	0	70
Ligusticum grayi	50	2	0	7
Dodecatheon jeffreyi	50	1	0	2
Packera cymbalarioides	50	1	0	2
Muhlenbergia filiformis	38	4	0	25
Tofieldia glutinosa	38	3	0	15
Aster alpigenus	38	2	0	10
Carex nigricans	38	2	0	5
Epilobium alpinum	38	Tr	0	1
Equisetum arvense	38	Tr	0	1
Moss layer				
Moss	25	6	0	30

Vegetation and ecology: Habitat is depressions and seepy alluvial fans in subalpine heath. Stands of this association occur in transitional areas between the slightly wetter *Carex nigricans* association and slightly drier associations of *Carex spectabilis* and upland *Phyllodoce* heath, and intergrade with both. Stands on alluvial fans occur below springs and seeps and may be laced with rivulets and or irrigated by sheet flow. Trees are absent, and shrubs are sparse. Other herbaceous species with significant patches include *Eleocharis quinqueflora, Eleocharis palustris,* and *Juncus balticus*.

Phases: *Eleocharis quinqueflora.* It occurs at the wet end of the *Carex scopulorum* association and intergrades with the *Carex nigricans* association. Stands contain more *Eleocharis quinqueflora* than *Carex. Carex nigricans* and *Carex brunnescens* may form significant patches.

Carex simulata

Analogue sedge

Plots sampled: 5 (4 macro, 1 micro)

Environment:
Elevation (ft): ave. 4736 (4730-4760)
Slope (deg): 0
Landform position: floodplains, flats, basins
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Carex simulata	100	47	25	65
Juncus balticus	60	3	0	10
Deschampsia caespitosa	60	Tr	0	Tr
Carex utriculata	40	6	0	30
Ranunculus flammula	40	Tr	0	Tr
Veronica scutellata	40	Tr	0	Tr
Eleocharis quinqueflora	20	2	0	10
Utricularia intermedia	20	1	0	3
Aster occidentalis	20	Tr	0	1
Mimulus primuloides	20	Tr	0	Tr
Moss layer				
Moss	60	1	0	1
Unvegetated				
Water	20	12	0	60

Vegetation and ecology: Habitat is montane fens. This association is better known from east of the Cascade Range, and is not common in the study area. The hydroperiod for the plots reported here is much wetter than the norm for this association and they must be considered at the wet end of the spectrum. No trees or shrubs are present, and only ten species are reported from the herb layer. Stands may have considerable expanses of water 1-3 inches deep, mud, or *Sphagnum* between sparsely-distributed plants. *Carex simulata* is the most abundant herb, ranging from 25-65 percent cover and averaging 47 percent. *Juncus balticus* and *Deschampsia caespitosa* occur in about half the plots but with very low cover. *Carex utriculata* may have patches with up to 30 percent cover, indicating some conditions similar to reedswamp. Other species occur mostly in trace amounts. Stands may intergrade with the *Eleocharis quinqueflora* and *Carex limosa* associations that often have similar sparse vegetation and sloppy substrate. Because it is so wet, this association probably should be separated from other concepts of the *Carex simulata* association, but more study is needed.

Carex utriculata

Beaked sedge

Plots sampled: 53 (30 macro, 23 micro)

Environment:

Elevation (ft): ave. 4475 (1080-5428)
Slope (deg): ave. 0 (0-2)
Landform position: floodplains, flats, basins, benches
Hydrology: seasonally flooded to moist
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus contorta var. *latifolia*	2	1	0	38
Reproducing trees				
Thuja plicata	2	Tr	0	Tr
Tsuga heterophylla	2	Tr	0	Tr
Shrub layer				
Spiraea douglasii	6	Tr	0	2
Alnus viridis ssp. *sinuata*	4	1	0	60
Lonicera caerulea	4	1	0	50
Vaccinium uliginosum	4	Tr	0	1
Vaccinium oxycoccos	2	2	0	98
Spiraea densiflora	2	Tr	0	20
Kalmia microphylla	2	Tr	0	10
Herb layer				
Carex utriculata	100	52	5	100
Deschampsia caespitosa	21	3	0	50
Carex aquatilis var. *dives*	15	3	0	50
Hypericum anagalloides	13	3	0	60
Calamagrostis canadensis	11	2	0	45
Moss layer				
Moss	45	9	0	100
Unvegetated				
Litter	51	10	0	100
Bare ground	34	18	0	95
Water	4	1	0	50

Vegetation and ecology:

Habitat is montane fens. This is a common and important association in the Cascade Range. Stands are usually seasonally flooded to a depth of 1-2 feet, or may dry out by midsummer with the water table just below the soil surface. Trees are restricted to elevated hummocks or "tree islands." *Alnus viridis* ssp. *sinuata* occurs on peaty flats or in depressions, while other shrub species are restricted to hummocks. The herb layer occurs as either a nearly monotypic reedswamp of *Carex utriculata* in standing water or bare mud, or as a component of wet lawn with more than 80 other species. The association has not been reported from lower elevations. Some stands were no doubt grazed by livestock in the past, and use by elk and deer may be heavy.

Ceratophyllum demersum

Coontail

Plots sampled: 0

Environment:
Elevation (ft): 10-1000
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: aquatic, perennially flooded
Soils: organic

Vegetation and ecology: Habitat is low-elevation, low-gradient, eutrophic streams and rivers, ponds, lakes, and sloughs. This is a non-rooted aquatic association that is widespread in western Oregon, but it has not been sampled and little information is available. *Ceratophyllum demersum* forms dense, monotypic submerged beds that do not emerge above the surface of the water. Eutrophic conditions favored by this association may be enhanced by enriched runoff in agricultural or urban landscapes. Though a native species, *Ceratophyllum demersum* is a well-known pest in many lakes where rank aquatic vegetation interferes with recreation.

***Deschampsia caespitosa* montane "wet meadow" complex**

Tufted hairgrass

Deschampsia caespitosa probably has the widest ecological amplitude of any native wetland species in Oregon and historically has been one of our most important grasses. It occurs from coastal salt marsh to subalpine wetlands on a variety of environmental gradients. It forms a myriad of intergrading vegetation types that are often difficult to separate into meaningful entities. Added to this mix is the central role that *Deschampsia* played in farming and livestock grazing between 1850 and 1960, and the effect that these uses had on condition and species composition. At low elevations, some stands of *Deschampsia* survive as degraded relics of coastal or Willamette Valley prairie, while others are known to have developed on land previously plowed by farmers. Most stands at middle and high elevations were grazed by sheep and cattle during this period and the relative intensity of historic grazing continues to be mirrored in a wide variety of intergrading combinations of species. There are also at least three subspecies of *Deschampsia caespitosa* in the study area but it is not clear that any correlation exists between the distribution of subspecies and the different *Deschampsia* associations. Many stands of *Deschampsia caespitosa* have been sampled by many workers over the last 40 years, resulting in a huge species matrix representing various disturbance histories. Because of the difficulty of separating the myriad *Deschampsia* vegetation types, many workers have chosen to refer to these simply as "wet meadow", "mountain meadow", "moist meadow", or "tufted hairgrass meadow."

Phases of *Deschampsia caespitosa* Association. Most of the 13 phases listed below occur in montane fens or at the edges of wet meadows between 3300 and 6635 feet elevation. Unless noted otherwise, they form flushes on slopes below springs, or wet lawns on peaty flats, and are perennially saturated or flooded. Trees and shrubs are limited to hummocks, and the herb layer contains components from both wet lawn and hummocks. Many of these phases have very similar habitat conditions and probably simply represent different patch dynamics.

(1) Monotypic *Deschampsia caespitosa*. This vegetation is not the same as the much more widespread occurrence in relatively drier meadows on mineral soils that has a different species composition.

(2) *Caltha leptosepala* ssp. *howellii*.

(3) *Carex aquatilis* var. *dives*.

(4) Carex buxbaumii phase:

(5) *Carex exsiccata*.

(6) Dodecatheon jeffreyi.

(7) *Eleocharis quinqueflora*. Similar in habitat and elevational range as the *Eleocharis quinqueflora* association, but not as flooded and is more species-rich.

(8) *Hypericum anagalloides*.

(9) *Microseris borealis*.

(10) *Muhlenbergia filiformis*.

(11) *Ranunculus gormanii*. Restricted to the central Cascade Range in Lane, Deschutes, Douglas, and northwestern Klamath counties, coinciding with the primary range of *Ranunculus gormanii.*

(12) *Scirpus congdonii*.

(13) *Trifolium logipes*. Habitat is montane meadows and fringes of fens, transitional between wet *Deschampsia* fen on organic soils and the more widespread but drier *Deschampsia* "meadow" vegetation on seasonally moist loam or pumice. It contains elements of both habitats, but is closer to meadow than fen. Trees and shrubs are less likely to be confined to hummocks but still may be clumped.

Deschampsia caespitosa - Artemisia lindleyana

Tufted hairgrass - Columbia River wormwood

Plots sampled: 2 (macro)

Environment:
Elevation (ft): 40
Slope (deg): 0
Landform position: floodplains
Hydrology: seasonally flooded to moist
Soils: river cobbles, silt

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix lucida ssp. *lasiandra*	50	1	0	1
Reproducing trees				
Fraxinus latifolia	50	1	0	2
Shrub layer				
Salix fluviatilis	100	4	2	5
Amorpha fruticosa	50	1	0	2
Herb layer				
Artemisia lindleyana	100	23	20	25
Coreopsis tinctoria var. *atkinsoniana*	100	3	1	5
Trifolium arvense	100	2	1	3
Aster	100	2	1	2
Medicago lupulina	100	2	1	2
Xanthium strumarium	100	1	1	1
Deschampsia caespitosa	50	18	0	35

Vegetation and ecology: Habitat is cobble beds and silt along the Columbia River at the western end of the Columbia River Gorge. The cobble beds are inundated when Bonneville Dam releases surplus water, usually in spring, and may be 1-2 feet above low summer flows. *Deschampsia caespitosa* was not recorded from one of the two plots sampled here but was present nearby and is also present in the Oregon site, and so is considered to be the principal species in the herb layer with at least 35 percent cover. The cobbles are coated with silt and covered with the lichen *Dermatocarpon.* More plots are needed to adequately describe this association, but it may be difficult to find remnants in good condition. Both *Artemisia lindleyana* and *Coreopsis tinctoria* var. *atkinsoniana* are more typical of riparian areas of eastern Oregon and Washington. It is probable that this association extended much further upriver, possibly throughout the Columbia River Gorge and into eastern Oregon and Washington, but all these areas are now drowned behind a series of dams.

Deschampsia caespitosa - Danthonia californica

Tufted hairgrass - California oatgrass

Plots sampled: 3 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, flats
Hydrology: seasonally wet
Soils: clay loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Rosa eglanteria	33	Tr	0	Tr
Herb layer				
Deschampsia caespitosa	100	47	30	60
Galium parisiense	100	Tr	Tr	Tr
Leucanthemum vulgare	67	11	0	20
Carex unilateralis	67	5	0	15
Epilobium ciliatum	67	5	0	12
Plantago lanceolata	67	3	0	8
Holcus lanatus	67	Tr	0	1
Hypochaeris radicata	67	Tr	0	1
Plagiobothrys figuratus	33	7	0	20
Potentilla gracilis	33	5	0	16
Mentha arvensis	33	3	0	10
Camassia quamash	33	3	0	9
Alopecurus saccatus	33	1	0	3
Moss layer				
Moss	67	13	0	25

Vegetation and ecology: Habitat is clay prairie with perched water table. This association is one of the better-known components of relic native Willamette Valley wet prairie. Stands sampled or observed elsewhere often have a higher component of *Danthonia californica*, and this has traditionally been used to identify the association. Because it occurs at low elevation, has a history of grazing, and is surrounded by agriculture, there are a variety of few exotic species recorded in the plots. The only woody plant, *Rosa eglanteria*, is exotic. *Deschampsia caespitosa* is the primary species in the herb layer with an average cover of 47 percent and cover up to 60 percent. Other native species with significant cover are *Carex unilateralis* and *Plagiobothrys figuratus*, species typical of shallow depressions and suggesting that these stands are a little wetter or contain more depressions than sites with more *Danthonia californica.* Of the other 22 species, only six are exotic. This association may be one of a number of poorly-described native prairie types now mostly decimated by settlement. Hopefully other stands can be found and documented.

Deschampsia caespitosa - Juncus balticus

Tufted hairgrass - Baltic rush

Plots sampled: 7 (macro)

Environment:
Elevation (ft): 5167 (4618-6317)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially moist
Soils: organic and loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix geyeriana	14	Tr	0	1
Herb layer				
Deschampsia caespitosa	100	61	40	80
Juncus balticus	100	26	10	50
Muhlenbergia filiformis	71	4	0	15
Trifolium longipes	57	2	0	15
Aster foliaceus	43	4	0	25
Antennaria rosea	43	3	0	10
Gentiana newberryi	29	8	0	30
Potentilla drummondii	29	2	0	10
Ranunculus alismifolius	29	1	0	7
Dodecatheon jeffreyi	29	1	0	6
Aster alpigenus	29	1	0	2
Carex pachystachya	29	Tr	0	2
Fragaria virginiana	29	Tr	0	1
Moss layer				
Moss	29	11	0	60

Vegetation and ecology:
Habitat is wet to moist montane meadows and fens, and the association is more typical of meadows than fens. Trees are not well represented but would include *Picea engelmannii* and *Abies lasiocarpa*. The shrub layer contains only *Salix geyeriana* at low constancy and low cover, which in many areas provides elevated substrate for seedlings of *Picea engelmannii* and *Abies lasiocarpa*. The herb layer contains about 40 species, *Deschampsia caespitosa* and *Juncus balticus* being the primary species, the former with average cover of 61 percent and ranging to 80 percent, and the latter about half that. Lesser species include *Muhlenbergia filiformis* and *Trifolium longipes.* The remaining species reflect a mix of wetland and drier meadow types. The rich mix of herbs, particularly *Antennaria rosea, Potentilla drummondii, Ranunculus alismifolius,* and *Fragaria virginiana,* suggest a history of grazing.

Dulichium arundinaceum

Threeway sedge

Plots sampled: 9 (2 macro, 7 micro)

Environment:
Elevation (ft): ave. 2406 (80-4730)
Slope (deg): 0
Landform position: basins, benches
Hydrology: perennially flooded to saturated
Soils: mostly organic, some sand

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Dulichium arundinaceum	100	56	10	90
Menyanthes trifoliata	67	7	0	30
Drosera rotundifolia	11	1	0	10
Potamogeton gramineus	11	Tr	0	4
Lysichiton americanus	11	Tr	0	2
Carex aquatilis	11	Tr	0	1
Utricularia macrorhiza	11	Tr	0	1
Carex utriculata	11	Tr	0	Tr
Carex lasiocarpa	11	Tr	0	Tr
Moss layer				
Moss	11	11	0	100

Vegetation and ecology: Habitat is fens and marshes. The association forms emergent stands around the edges of shallow lakes and in perennially or seasonally flooded shallow depressions. Most stands are monotypes of *Dulichium arundinaceum* with an average cover 56 percent and ranging from 10-90 percent. *Menyanthes trifoliata* is present in more than half the plots but with low average cover. The remaining seven species reported are very sparse, and much of the space between plants is open water or exposed mud in seasonally-flooded stands. The moss layer can be nonexistent or 100 percent cover of *Sphagnum*. At one time *Dulichium arundinaceum* was thought to be rare in Oregon but is more common than originally thought. There are a few limited occurrences of this association in the Willamette Valley and it may once have been more widespread before drainage and conversion to agriculture.

Eleocharis acicularis

Needle spikerush

Plots sampled: 1 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Eleocharis acicularis	100	60	60	60
Elodea canadensis	100	15	15	15
Callitriche heterophylla	100	10	10	10
Sparganium angustifolium	100	1	1	1
Moss layer				
Moss	100	10	10	10

Environment:
Elevation (ft): 4730
Slope (deg): 0
Landform position:
floodplains, basins
Hydrology: seasonally flooded to perennially saturated
Soils: organic or loam

Vegetation and ecology: Habitat is montane fens and seasonal pools in meadows. Plants may be relatively sparse with considerable open water or mud. This association is more common east of the Cascade Range. It is mostly a monotype of *Eleocharis acicularis* with lesser amounts of *Elodea canadensis, Callitriche heterophylla,* and *Sparganium angustifolium* recorded in this single plot. Pools may dry out in summer but the soil remains moist.

Eleocharis ovata - Ludwigia palustris

Ovate spikerush - water purslane

Plots sampled: 5 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Eleocharis ovata	100	54	35	98
Ludwigia palustris	80	34	0	50
Lamiaceae	40	4	0	10
Bidens cernua	20	6	0	30
Agrostis exarata	20	Tr	0	Tr
Epilobium ciliatum ssp. *watsonii*	20	Tr	0	Tr

Environment:
Elevation (ft): ave. 800 (500-2000)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially moist to perennially saturated
Soils: silt loam

Vegetation and ecology: Habitat is edges and mudflats of shallow seasonal lakes, pools, and in freshwater tidal flats along larger coastal rivers. Stands are either monotypes of *Eleocharis ovata* or mixed in lawns with *Ludwigia palustris,* submerged early in the season but exposed on mudflats as water levels drop. Considerable amounts of open water or bare mud may be present. A few other emergent or mudflat species may be present but in low amounts. There may also be some admixture of the *Lilaeopsis occidentalis* association on mudflats.

Eleocharis palustris

Creeping spikerush

Plots sampled: 8 (7 macro, 1 micro)

Environment:
Elevation (ft): ave. 1201 (8-4730)
Slope (deg): ave. 0 (0-1)
Landform position: floodplains, basins
Hydrology: seasonally wet to perennially flooded
Soils: organic, sand, loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Salix hookeriana	25	1	0	3
Spiraea douglasii	13	Tr	0	1
Herb layer				
Eleocharis palustris	100	59	30	100
Deschampsia caespitosa	38	3	0	10
Carex obnupta	38	1	0	5
Phalaris arundinacea	38	1	0	2
Juncus nevadensis	25	4	0	20
Schoenoplectus americanus	25	1	0	5
Myosotis laxa	25	Tr	0	2

Vegetation and ecology: Habitat is shallow depressions in meadows, fens, and marshes. Stands are predominantly herbaceous. The shrub layer is sparse, dominated by *Salix hookeriana* or *Spiraea douglasii* with low constancy and very low percent cover. *Eleocharis palustris* is the primary species in the herb layer, with average cover of 59 percent and cover ranging from 30-100 percent. About 40 other species are present in fairly low constancy, but with some have significant patches of *Juncus nevadensis, Polygonum hydropiperoides,* or *Juncus acuminatus,* depending on elevation. The diversity of species is due largely to the wide range of elevation and location for this association, which could not be separated satisfactorily into more coherent units.

Eleocharis quinqueflora

Few-flowered spikerush

Plots sampled: 34 (9 macro, 25 micro)

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Picea engelmannii	3	Tr	0	1
Pinus contorta var. *latifolia*	3	Tr	0	Tr
Tsuga mertensiana	3	Tr	0	Tr
Abies lasiocarpa	3	Tr	0	Tr
Shrub layer				
Vaccinium uliginosum	18	1	0	35
Vaccinium oxycoccos	15	1	0	15
Herb layer				
Eleocharis quinqueflora	100	27	3	90
Drosera anglica	59	7	0	30
Carex simulata	44	5	0	30
Carex aquatilis var. *dives*	35	4	0	25
Mimulus primuloides	32	2	0	20
Dodecatheon jeffreyi	32	2	0	25
Hypericum anagalloides	32	1	0	15
Moss layer				
Moss	62	33	0	95
Unvegetated				
Water	32	11	0	90
Litter	6	2	0	60

Environment:
Elevation (ft): ave. 4190 (3120-5410)
Slope (deg): ave. 0 (0-2)
Landform position: basins, benches
Hydrology: perennially moist to perennially saturated
Soils: mostly organic, some loam

Vegetation and ecology:
Habitat is montane fens, wet edges of meadows, and sometimes on floating lake-fill mats. The association is primarily a wet lawn with woody vegetation confined to hummocks or "tree islands." Stands may be perennially flooded with 1-3 inches of water, and these have fewer species than saturated stands. The herb layer has over 80 different species, and may include *Carex limosa, Utricularia intermedia, Eriophorum gracile,* and *Carex echinata* ssp. *echinata.* These wetlands were assumed to be *Sphagnum* mires until the late 1970s, when it was discovered that they were dominated by "brown mosses" such as *Hamatocaulis vernicosus, Tomentypnum nitens,* and *Meesia triquetra*, all well-known indicators of medium to rich fens.

Elodea canadensis
Canadian waterweed

Plots sampled: 0

Environment:
Elevation (ft): 10-5000
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: aquatic, submerged
Soils: organic

Vegetation and ecology: Habitat is lakes, ponds, and low-gradient rivers. This is a rooted or free-floating aquatic bed association that is widespread in western Oregon. It has not been sampled and little information is available. *Elodea canadensis* forms dense mats beneath the surface of the water and may provide important habitat for aquatic invertebrates and fish. This association may favor eutrophic conditions and may be enhanced by enriched runoff in agricultural or urban landscapes.

Equisetum arvense

Field horsetail

Plots sampled: 2 (macro)

Environment:

Elevation (ft): ave. 2115 (1900-2329)
Slope (deg): ave. 7 (0-13)
Landform position: various slope positions, basins
Hydrology: perennially moist to saturated
Soils: mostly loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pseudotsuga menziesii	50	6	0	12
Pinus ponderosa	50	5	0	10
Reproducing trees				
Quercus garryana	50	Tr	0	Tr
Shrub layer				
Rosa nutkana	50	3	0	5
Alnus incana	50	1	0	1
Symphoricarpos albus	50	Tr	0	Tr
Rubus ursinus	50	Tr	0	Tr
Herb layer				
Equisetum arvense	100	88	80	95
Hypericum anagalloides	50	8	0	15
Mimulus guttatus	50	5	0	10

Vegetation and ecology:

Habitat is seepy alluvial fans, slopes, wet meadows, and fens. This is mostly a low to mid-elevation association, often occurring in sites with some groundwater movement. It is often small-patch size in water tracks, and the plots suggest considerable inclusions of upland species that may be an artifact of plot size or configuration in a sinuous wetland configuration. Discounting the trees and shrubs that are mostly peripheral to the stand, the primary species in the herb layer is *Equisetum arvense*, with average cover of 88 percent and cover ranging from 80-95 percent. Other wetland associates with lesser cover include *Hypericum anagalloides* and *Mimulus guttatus.* Of the other 25 species, nearly half are upland taxa and should not be part of this association. This is a widespread and well-known association in other regions and obviously undersampled locally.

Eragrostis hypnoides - Gnaphalium palustre

Teal lovegrass - western marsh cudweed

Plots sampled: 4 (macro)

Environment:
Elevation (ft): ave. 385 (40-500)
Slope (deg): 0
Landform position: floodplains
Hydrology: seasonally flooded to saturated
Soils: silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix lucida ssp. *lasiandra*	50	Tr	0	Tr
Herb layer				
Eragrostis hypnoides	100	37	3	85
Gnaphalium palustre	75	27	0	90
Rorippa curvisiliqua	75	1	0	4
Bidens frondosa	50	2	0	6
Polygonum hydropiperoides	50	1	0	3
Bidens cernua	50	1	0	2
Solanum dulcamara	50	Tr	0	Tr
Cirsium arvense	50	Tr	0	Tr
Lindernia dubia	25	10	0	40
Eleocharis ovata	25	1	0	2
Ludwigia palustris	25	1	0	2
Echinochloa crusgalli	25	Tr	0	Tr
Limosella aquatica	25	Tr	0	Tr
Polygonum amphibium	25	Tr	0	Tr
Panicum capillare	25	Tr	0	Tr
Rumex crispus	25	Tr	0	Tr
Scutellaria lateriflora	25	Tr	0	Tr
Senecio vulgaris	25	Tr	0	Tr
Epilobium ciliatum	25	Tr	0	Tr
Moss layer				
Moss	25	3	0	10

Vegetation and ecology:
Habitat is low-elevation beds of dried shallow seasonal pools and lakes. Trees are peripheral but may include *Fraxinus latifolia*, *Populus balsamifera* ssp. *trichocarpa*, and *Salix fluviatilis*. The herb layer contains species adapted to early-season inundation and subsequent exposure as lakes and ponds dry up. Most exotic species are excluded by inundation extending into the growing season. *Eragrostis hypnoides* forms a loose and patchy sod with *Gnaphalium* and considerable bare ground may be present. These sites appear to be drier than those occupied by the mudflat vegetation of the *Lilaeopsis occidentalis* or *Azolla* associations, the mud often cracking deeply and the top layer losing most of its moisture.

Euthamia occidentalis

Western goldentop

Plots sampled: 2 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Salix fluviatilis	50	2	0	3
Herb layer				
Euthamia occidentalis	100	38	30	45
Artemisia vulgaris	100	1	1	1
Cyperus erythrorhizos	50	10	0	20

Environment:
Elevation (ft): 20
Slope (deg): 2
Landform position: floodplains
Hydrology: moist
Soils: silt loam

Vegetation and ecology: Habitat is gently sloping, silty river shores exposed at seasonal low flows, between the high water cutbank and the water line. No trees are present below the high water cutbank, but *Salix fluviatilis* and *Salix lucida* ssp*. lasiandra* are frequently present at the toe of the cutbank and sometimes form extensive stands along the flat shore adjacent to this association. The exotic *Amorpha fruticosa* is rapidly spreading along the riverbanks in this habitat. The herb layer contains over 20 different species, some exotics and some opportunists on seasonally scoured and inundated shorelines. *Euthamia occidentalis* is the principal species and forms tall stands with an average cover of 38 percent and ranging from 30-45 percent. Most of the other species are incidental and have low cover values, but are of interest because some are uncommon except in this habitat.

Glyceria striata

Fowl mannagrass

Plots sampled: 5 (3 macro, 2 micro)

Environment:
Elevation (ft): ave. 3818 (2800-4720)
Slope (deg): ave. 2 (0-3)
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic, loam, or sand

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	20	4	0	22
Tsuga mertensiana	20	Tr	0	1
Reproducing trees				
Tsuga mertensiana	20	1	0	4
Shrub layer				
Ribes	20	3	0	16
Alnus viridis ssp. *sinuata*	20	1	0	5
Spiraea douglasii	20	Tr	0	1
Vaccinium	20	Tr	0	Tr
Herb layer				
Glyceria striata	100	48	13	80
Viola	60	10	0	35
Veratrum viride	40	15	0	40
Deschampsia caespitosa	40	5	0	15
Caltha leptosepala ssp. *howellii*	40	4	0	20
Veronica americana	40	4	0	12
Epilobium ciliatum ssp. *watsonii*	40	3	0	10

Vegetation and ecology:
Habitat is montane marshes, fens, and edges of wet meadows. *Glyceria striata* forms tall and often nearly monotypic stands, and some standing water may be present into the growing season. The plots reported here document occurrences of this association in fens. Most woody vegetation is peripheral to the wetland or confined to hummocks or "tree islands," and most herbaceous vegetation forms wet lawns. The herb layer contains almost 40 different species, including sometimes large patches of *Polygonum bistortoides*. Hummock or edge species such as *Veratrum viride, Rudbeckia occidentalis,* and *Senecio triangularis* may be conspicuous. This association is more common east of the Cascades. *Glyceria elata* is now considered a synonym of *Glyceria striata.*

Hippuris vulgaris

Common mare's-tail

Plots sampled: 5 (micro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Hippuris vulgaris	100	37	25	50
Cicuta douglasii	20	1	0	5
Unvegetated				
Water	100	62	50	75

Environment:
Elevation (ft): 20
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially saturated
Soils: organic

Vegetation and ecology: Habitat is shallow depressions and pools in marshes and fens. This association is widespread but uncommon locally. The plots reported here are from the coast and probably don't reflect the range of subordinate species that may be present elsewhere. Stands are often extensive monotypes of *Hippuris vulgaris* with an average cover of 37 percent and ranging from 25 to 50 percent. Most of the remaining cover is open water or mud if water levels drop. These plots report *Cicuta douglasii* as an associate, and other species such as *Schoenoplectus acutus*, *Schoenoplectus tabernaemontani*, or *Potamogeton* may be present. Where pools dry up, the substrate remains moist to saturated, and *Hippuris* cannot survive complete desiccation.

Hydrocotyle ranunculoides
Floating marshpennywort

Plots sampled: 0

Environment:
Elevation (ft): 0-5000
Slope (deg): 0
Landform position: floodplains, flats, basins
Hydrology: seasonally flooded to perennially saturated
Soils: organic

Vegetation and ecology: Habitat is shallow lakes, ponds, pools, or low-gradient streams, sometimes in fens. This is a rooted aquatic bed association that is widespread in western Oregon but uncommon locally. It has not been sampled and little information is available. It forms nearly monotypic emergent stands that may cover the entire surface of shallow lakes, ponds, and pools in peatlands. Cover ranges from 60-95 percent. It is not clear if this association favors eutrophic conditions or may be enhanced by enriched runoff in agricultural or urban landscapes.

Isoetes nuttallii

Nuttall's quillwort

Plots sampled: 5 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially moist
Soils: silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Isoetes nuttallii	100	57	40	85
Lotus pinnatus	60	12	0	50
Poaceae	60	7	0	25
Veronica scutellata	40	4	0	10
Mimulus guttatus	40	2	0	8
Triteleia hyacinthina	20	Tr	0	1
Camassia quamash	20	Tr	0	1
Gratiola	20	Tr	0	1
Epilobium ciliatum	20	Tr	0	1
Juncus tenuis	20	Tr	0	1

Vegetation and ecology: Habitat is beds of intermittent streams and seasonally-flooded pools in clay prairie, riparian woodland, or on shallow-soiled basalt scabland. This association forms linear bands of vegetation in ephemeral streams and pools. Trees and shrubs were absent from the plots described here that were sampled in open prairie. Of the ten species in the herb layer, *Isoetes nuttallii* is the principal species with average cover of 57 percent and ranging from 40-85 percent. *Lotus pinnatus* and an unidentified grass had 60 percent constancy and cover of 50 and 25 percent, respectively. Most of the remaining herbs occur only in trace amounts. A number of these species, including *Isoetes nuttallii*, dry up and disappear by midsummer. Other stands have been observed in mixed *Fraxinus latifolia - Quercus garryana* riparian forest.

Juncus balticus

Baltic rush

Plots sampled: 6 (macro)

Environment:

Elevation (ft): ave. 5070 (4400-6300)

Slope (deg): ave. 2 (0-9)

Landform position: floodplains, basins, benches

Hydrology: seasonally moist to perennially flooded

Soils: mostly loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	33	2	0	13
Abies lasiocarpa	33	1	0	2
Reproducing trees				
Abies lasiocarpa	17	1	0	3
Picea engelmannii	17	Tr	0	2
Shrub layer				
Rubus lasiococcus	33	Tr	0	Tr
Vaccinium membranaceum	33	Tr	0	Tr
Vaccinium scoparium	33	Tr	0	Tr
Herb layer				
Juncus balticus	100	48	25	80
Polygonum bistortoides	50	10	0	50
Carex scopulorum	50	4	0	12
Pedicularis groenlandica	50	1	0	6
Caltha leptosepala ssp. *howellii*	33	2	0	9
Deschampsia caespitosa	33	2	0	10
Senecio triangularis	33	2	0	10
Mimulus guttatus	33	2	0	10
Moss layer				
Moss	17	Tr	0	Tr

Vegetation and ecology: Habitat is montane meadows and fens. This association occurs in both seasonally moist meadows as well as perennially wet fens. Species composition is diverset. Trees and shrubs are usually clumped in meadows and confined to hummocks in fens. The herb layer contains more than 60 different species, and *Trifolium longipes, Carex lenticularis,* and *Aster occidentalis* may form conspicuous patches. The species diversity in some stands no doubt reflects a history of grazing, and *Juncus balticus* itself is an increaser under moderate grazing. This association is widespread at higher elevations and is most common east of the Cascades Range.

Juncus effusus

Soft rush

Plots sampled: 6 (macro)

Environment:

Elevation (ft): ave. 1848 (0-3450)
Slope (deg): ave. 2 (0-7)
Landform position: slopes, floodplains, basins
Hydrology: seaonally moist to perennially saturated
Soils: mostly loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	17	Tr	0	Tr
Reproducing trees				
Pseudotsuga menziesii	17	1	0	3
Shrub layer				
Salix sitchensis	33	Tr	0	1
Herb layer				
Juncus effusus	100	52	20	85
Juncus ensifolius	100	2	Tr	5
Hypericum anagalloides	83	43	0	75
Galium trifidum	67	Tr	0	1
Scirpus microcarpus	50	5	0	25
Equisetum arvense	50	3	0	20
Oenanthe sarmentosa	50	3	0	20
Carex obnupta	50	1	0	5
Mimulus moschatus	50	Tr	0	1
Lotus corniculatus	33	4	0	20
Athyrium filix-femina	33	4	0	20
Moss layer				
Moss	83	11	0	49

Vegetation and ecology:

Habitat is meadows, fens, and old pastures. This association is generally thought of as a disturbance type resulting from grazing, but some occurrences suggest that it is native in some places because they are unlikely to have ever been heavily grazed. It is widespread at a variety of elevations but is especially abundant at low elevations in western Oregon. The plots here are from the Coast Range and Cascade Range. Trees are nearly absent but may include *Alnus rubra, Fraxinus latifolia, Quercus garryana,* or conifers peripheral to the wetland. The herb layer includes about 60 different species. Old pastures at low elevations may also have large amounts of *Ranunculus repens* but this species wasn't recorded in these plots.

Juncus nevadensis

Nevada rush

Plots sampled: 2 (macro)

Environment:

Elevation (ft): ave. 4560 (4389-4730)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: perennially saturated
Soils: organic or loam

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Picea engelmannii	50	Tr	0	Tr
Pinus contorta var. *latifolia*	50	Tr	0	Tr
Shrub layer				
Vaccinium uliginosum	50	2	0	4
Salix geyeriana	50	Tr	0	Tr
Alnus incana	50	Tr	0	Tr
Herb layer				
Juncus nevadensis	100	38	35	40
Mimulus primuloides	50	10	0	20
Carex utriculata	50	5	0	10
Hypericum anagalloides	50	5	0	10
Triantha occidentalis	50	4	0	7
Carex simulata	50	3	0	5
Menyanthes trifoliata	50	3	0	5
Poa palustris	50	3	0	5
Carex aquatilis var. *dives*	50	2	0	3
Deschampsia caespitosa	50	2	0	3
Muhlenbergia filiformis	50	1	0	2
Lysichiton americanus	50	1	0	1
Sanguisorba occidentalis	50	1	0	1
Carex lasiocarpa	50	1	0	1
Moss layer				
Moss	50	50	0	99

Vegetation and ecology:

Habitat is montane marshes and fens. *Juncus nevadensis* usually forms nearly monotypic stands in seasonally or perennially flooded shallow depressions and requires more water than *Juncus balticus*. It is widespread but most common east of the Cascade Range. The two plots reported here occur in fens, where trees and shrubs are mostly confined to hummocks or "tree islands" and the herb layer is mostly a wet lawn. This occurrence appears to be at the wet end of the spectrum for this association and needs more sampling. The moss layer in one plot is nearly 100 percent *Sphagnum*.

Lemna minor

Common duckweed

Plots sampled: 2 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Lemna minor	100	90	80	100
Carex obnupta	50	35	0	70
Lysichiton americanus	50	5	0	10
Callitriche heterophylla	50	1	0	1

Environment:
Elevation (ft): ave. 650
(sea level-800)
Slope (deg): 0
Landform position:
floodplains, basins
Hydrology: seasonally to perennially flooded
Soils: silt loam

Vegetation and ecology: Habitat is seasonal to perennial pools, ponds, lakes, and sloughs, usually at lower elevations. This association forms bright green floating mats on the surface of the water, usually growing so dense that no open water is visible. *Lemna* needs open water to proliferate in winter and spring but it tolerates being stranded on mudflats when ponds and pools dry out in summer. Although not included in these two plots, other small floating species are common components of this association, particularly *Spirodela polyrrhiza, Azolla, Wolffia*, and the aquatic liverworts *Ricciocarpos natans* and *Riccia fluitans*, but they are always subordinate to *Lemna.* All of these species can survive stranding on mud, but cannot survive complete desiccation. It is not clear if this association is enhanced by eutrophic conditions caused by enriched runoff in agricultural or urban landscapes.

Lilaeopsis occidentalis

Western grasswort

Plots sampled: 3 (macro)

Environment:
Elevation (ft): ave. 5 (1-10)
Slope (deg): 0
Landform position: floodplains
Hydrology: perennially moist
Soils: silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Lilaeopsis occidentalis	100	28	20	35
Crassula aquatica	100	13	1	35
Limosella aquatica	100	7	1	10
Eleocharis palustris	67	15	0	40
Eleocharis acicularis	67	7	0	10
Callitriche	67	2	0	5
Schoenoplectus americanus	33	3	0	10
Bidens cernua	33	1	0	3
Sium suave	33	1	0	3
Polygonum hydropiperoides	33	1	0	3
Juncus oxymeris	33	1	0	2
Elodea canadensis	33	Tr	0	1
Equisetum arvense	33	Tr	0	1
Myriophyllum spicatum	33	Tr	0	1
Alisma triviale	33	Tr	0	1
Gratiola neglecta	33	Tr	0	1
Sagittaria latifolia	33	Tr	0	1
Myriophyllum ussuriense	33	Tr	0	1
Ceratophyllum demersum	33	Tr	0	1
Juncus nevadensis	33	Tr	0	1

Vegetation and ecology:
Habitat is mudflats in seasonal ponds and within or just above freshwater tidal zone of larger coastal rivers. This peculiar association is made up primarily of small, annual species on mud with a scattering of perennial species near the upper edge of the mudflats. *Lilaeopsis occidentalis, Crassula aquatica*, and *Limosella aquatica* are always present but with diminishing percent cover. They form clumps or mats that may migrate with receding moisture on seasonal lakebeds, or stay in place in perennially-irrigated muds within the freshwater tidal zone. *Eleocharis palustris, Eleocharis acicularis,* and an unidentified *Callitriche* are present in about half the plots, sometimes with cover up to 40 percent. *Lilaeopsis occidentalis* is more commonly seen in brackish estuaries but is also not infrequent in freshwater systems.

Ludwigia palustris - Polygonum hydropiperoides

Water-purslane - swamp smartweed

Plots sampled: 16 (12 macro, 4 micro)

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix lucida ssp. *lasiandra*	6	Tr	0	3
Herb layer				
Polygonum hydropiperoides	94	57	0	99
Ludwigia palustris	63	34	0	90
Bidens cernua	38	5	0	40
Eleocharis palustris	25	1	0	15

Environment:
Elevation (ft): ave. 288 (10-500)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to moist
Soils: mostly silt loam, some organic

Vegetation and ecology: Habitat is shallow, seasonally flooded eutrophic lakes, ponds, and sloughs at low elevations, subject to drying in summer. It is more common in interior valleys on *Fraxinus* latifolia floodplains, but occurs sporadically along the coast. *Salix lucida* ssp. *lasiandra* is the only tree or shrub present but it has low constancy and cover because of extensive seasonal ponding. *Polygonum hydropiperoides* is the primary species with an average cover of 57 percent and ranges to 99 percent. It is not always present, and when absent the associated *Ludwigia palustris* is conspicuous. *Ludwigia* has a constancy of 63 percent, an average cover of 34 percent, and may range to 90 percent. Eighteen other species in the herb layer occur at low constancy and cover, except for significant patches of *Bidens cernua, Sagittaria latifolia*, or *Leersia oryzoides*. *Phalaris arundinacea* may also form patches but is inhibited by seasonal ponding. The association tolerates eutrophic conditions and flashy hydroperiods associated with urban and agricultural landscapes.

Menyanthes trifoliata

Bogbean

Plots sampled: 5 (macro)

Environment:

Elevation (ft): ave. 3664 (sea level-4580)
Slope (deg): 0
Landform position: floodplains, benches, basins
Hydrology: perennially flooded or saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Menyanthes trifoliata	100	32	10	60
Cicuta douglasii	40	1	0	5
Carex limosa	40	1	0	5
Lysichiton americanus	40	1	0	5
Carex echinata ssp. *echinata*	40	Tr	0	Tr
Carex arcta	20	2	0	12
Carex utriculata	20	2	0	10
Carex aquatilis var. *dives*	20	1	0	5
Drosera rotundifolia	20	1	0	5
Carex aquatilis	20	1	0	5
Cinna latifolia	20	1	0	5
Poa palustris	20	1	0	4
Moss layer				
Moss	80	70	0	98

Vegetation and ecology:

Habitat is in perennially flooded or saturated depressions, the edges of ponds, and in wet lawns in peatlands. This association is usually composed of nearly monotypic stands of *Menyanthes trifoliata,* with an average cover of 32 percent and ranging from 10-60 percent. Most of the remaining space between plants is open water, mud, or *Sphagnum*. About 10 other herbaceous species are recorded from these plots but all occur at low constancy and cover. Water levels may drop in summer but the substrate remains moist to saturated. The association is most common between 2,000 and 6,000 feet elevation throughout western Oregon. Several historic occurrences were known from the Willamette Valley but only two are currently known. *Menyanthes* is fairly common in coastal peatlands but its occurrence as a plant association is limited. Here it may occur in wet lawns with more typical coastal peatland species such as *Carex cusickii, Comarum palustre, Carex obnupta,* and *Eriophorum chamissonis.*

Nephrophyllidium crista-galli

Deer cabbage

Plots sampled: 2 (macro)

Environment:
Elevation (ft): ave. 3585 (3550-3620)
Slope (deg): ave. 4 (2-6)
Landform position: slopes
Hydrology: perennially saturated
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Nephrophyllidium crista-galli	100	75	60	90
Carex aquatilis var. *aquatilis*	100	12	3	20
Boykinia major	100	9	3	15
Tofieldia glutinosa	100	4	2	5
Polygonum bistortoides	100	3	1	5
Parnassia fimbriata	100	1	1	1
Agrostis thurberiana	100	Tr	Tr	Tr
Senecio triangularis	100	Tr	Tr	Tr
Carex laeviculmis	50	3	0	5
Poaceae	50	Tr	0	Tr
Platanthera stricta	50	Tr	0	Tr
Luzula campestris	50	Tr	0	Tr
Platanthera dilatata	50	Tr	0	Tr
Epilobium ciliatum ssp. watsonii	50	Tr	0	Tr
Hypericum anagalloides	50	Tr	0	Tr
Moss layer				
Moss	50	45	0	90

Vegetation and ecology:
Habitat is montane fens, forming extensive wet lawns or flushes on gentle to moderate slopes below springs and seeps. The slopes are laced with rivulets and are also irrigated by sheet flow. *Nephrophyllidium crista-galli* resembles *Caltha leptosepala ssp. howellii* and forms similar but denser stands in similar sloping, seepy habitats. Woody plants have scanty cover and are primarily restricted to hummocks or "tree islands" within a matrix of wet lawn, or they are peripheral to the wetland. *Nephrophyllidium* is the primary species in the herb layer, with average cover of 75 percent and ranging from 60-90 percent. *Carex aquatilis* var. *aquatilis* and *Boykinia major* may form significant patches. The twelve other species occur at very low cover values. *Nephrophyllidium* is rare in Oregon and was only recently discovered on the Salem BLM District. It has also been called *Fauria crista-galli.* These are probably the southernmost occurrences of this species in North America.

Nuphar lutea ssp. polysepala

Pond lily

Plots sampled: 5 (macro)

Environment:
Elevation (ft): ave. 2732, range 100-5010
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally to perennially flooded
Soils: mostly loam, some organic

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Spiraea douglasii	20	Tr	0	1
Herb layer				
Nuphar lutea ssp. *polysepala*	100	34	2	60
Potamogeton natans	60	4	0	20
Sparganium angustifolium	20	6	0	30
Myriophyllum sibiricum	20	4	0	20
Lemna minor	20	3	0	15

Vegetation and ecology: Habitat is eutrophic ponds, lakes, and sloughs. *Nuphar lutea* ssp. *polysepala* forms rooted aquatic beds in ponds and lakes. It tolerates seasonal drying that may reveal its enormous, prehistoric-looking fleshy rhizomes at the bottom of mud cracks. Trees and shrubs are peripheral to the wetland. The herb layer in these plots contains 18 species, dominated by *Nuphar* with an average of 34 percent cover and ranging from 2-60 percent. *Potamogeton natans, Sparganium angustifolium,* and *Myriophyllum sibiricum* form significant patches in these plots, and other commonly associated species include species of *Glyceria*, *Brasenia schreberi, Dulichium arundinaceum, Menyanthes trifoliata, Utricularia macrorhiza,* and *Carex exsiccata.* The leaves of *Nuphar* float on the surface of the water or protrude 1-2 feet above it. Stands may cover extensive areas or be relatively sparse.

Oenanthe sarmentosa

Water parsley

Plots sampled: 7 (macro)

Environment:

Elevation (ft): ave. 820 (500-2340)
Slope (deg): ave. 0 (0-1)
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially saturated
Soils: loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Alnus rubra	29	3	0	20
Fraxinus latifolia	14	11	0	80
Thuja plicata	14	Tr	0	Tr
Frangula purshiana	14	Tr	0	Tr
Shrub layer				
Salix sitchensis	29	1	0	5
Herb layer				
Oenanthe sarmentosa	100	68	40	99
Carex deweyana ssp. *leptopoda*	43	Tr	0	1
Callitriche heterophylla	29	10	0	70
Typha latifolia	29	6	0	40
Eleocharis palustris	29	5	0	25
Poa trivialis	29	3	0	20
Moss layer				
Moss	29	4	0	25

Vegetation and ecology:

Habitat is muddy openings in forested wetland (swamp), marsh, or shrub-swamp. *Oenanthe sarmentosa* typically forms stands in muddy openings in both deciduous and coniferous swamp and is most common at lower elevations. *Alnus rubra* and *Fraxinus latifolia* are the primary deciduous species, and *Thuja plicata* and *Picea sitchensis* are the primary conifers, but none of these occur with much constancy or cover and are mostly peripheral to the wetland. Shrubs are also scarce, with *Salix sitchensis* being the most common one in the plots. The herb layer may be diverse and over 40 species are recorded here, but most of them occur with low constancy and cover. *Oenanthe sarmentosa* is the primary species with average cover of 68 percent and a range of 40-99 percent. Other species with significant patches include *Callitriche heterophylla, Typha latifolia, Eleocharis palustris*, *Ranunculus uncinatus,* and *Lysichiton americanus*. Stands are usually flooded early in the season and dry down in summer, but the soil usually remains moist.

Paspalum distichum

Knotgrass

Plots sampled: 3 (macro)

Environment:

Elevation (ft): ave. 33 (20-40)
Slope (deg): ave. 2 (0-5)
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially moist
Soils: silt loam, sand

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Salix lucida ssp. *lasiandra*	67	1	0	2
Reproducing trees				
Salix lucida ssp. *lasiandra*	33	2	0	5
Shrub layer				
Salix fluviatilis	33	1	0	3
Salix sitchensis	33	Tr	0	1
Herb layer				
Paspalum distichum	100	57	40	70
Equisetum arvense	67	14	0	40
Eleocharis palustris	67	7	0	15
Phalaris arundinacea	67	6	0	15
Carex vulpinoidea	67	5	0	10
Helenium autumnale	67	4	0	8
Juncus effusus	67	3	0	8
Mentha pulegium	67	2	0	5
Polygonum hydropiperoides	67	2	0	4
Schoenoplectus tabernaemontani	67	1	0	2
Carex interrupta	33	3	0	10
Carex feta	33	3	0	10
Carex aperta	33	2	0	5
Lindernia dubia	33	2	0	5

Vegetation and ecology:

Habitat is shallow depressions in floodplains and wet prairie. This association forms dense, nearly monotypic stands on mud or sand flats. Stands are flooded seasonally but dry out in summer, although the water table is never far below the soil surface. Most occurrences are in the Willamette Valley and on the Columbia River floodplain in the Vancouver Basin. Eighteen species are recorded from the herb layer. *Paspalum distichum* may not be native to the Pacific Northwest, but it is included here until some convincing evidence can be found. It provides good forage for waterfowl but some managers consider it a nuisance in irrigation projects because it obstructs ditches.

Polygonum amphibium
Water smartweed

Plots sampled: 0

Environment:
Elevation (ft): 10-1000
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: submerged aquatic
Soils: organic

Vegetation and ecology: Habitat is low-elevation eutrophic ponds, lakes, and sloughs. This is a rooted aquatic bed association that is widespread in western Oregon but has not been sampled and little information is available. *Polygonum amphibium* may form extensive floating mats on the surface of lakes and ponds but it also tolerates seasonal drying. Stands sampled elsewhere are usually monotypic, with 30-95 percent cover. This association provides important habitat for aquatic invertebrates and fish. It is likely that it is enhanced by enriched runoff in agricultural or urban landscapes.

Potamogeton natans

Floating-leaved pondweed

Plots sampled: 3 (2 macro, 1 micro)

Environment:

Elevation (ft): ave. 633 (100-1200)
Slope (deg): 0
Landform position: floodplains, benches, basins
Hydrology: seasonally to perennially flooded
Soils: silt loam, sand, organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Potamogeton natans	100	70	60	85
Utricularia	33	20	0	60
Sparganium angustifolium	33	12	0	35
Spirodela polyrrhiza	33	7	0	20
Polygonum	33	2	0	5
Eleocharis palustris	33	2	0	5
Argentina egedii	33	Tr	0	1
Myosotis laxa	33	Tr	0	1
Veronica scutellata	33	Tr	0	1
Polygonum hydropiperoides	33	Tr	0	Tr

Vegetation and ecology: Habitat is ponds, pools, lakes, and sloughs. This association forms rooted aquatic beds with mats of leaves that float on the surface of the water, and can tolerate seasonal drying if the substrate remains wet. *Potamogeton natans* is the primary species with an average cover of 70 percent and ranging from 60-85 percent. Other species present with significant patches include *Utricularia macrorhiza*, *Nuphar lutea* ssp. *polysepala,* and *Brasenia schreberi. Potamogeton* frequently intermixes with adjoining associations and many ecologists sample these mixed stands rather than the monotypic stands.

Ranunculus aquatilis

Water crowfoot

Plots sampled: 3 (2 macro, 1 micro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Ranunculus aquatilis	100	88	75	98
Alopecurus aequalis	67	4	0	6
Veronica scutellata	67	3	0	6
Callitriche	33	18	0	55
Eleocharis acicularis	33	10	0	30
Mentha arvensis	33	4	0	12
Moss layer				
Moss	33	1	0	2

Environment:
Elevation (ft): ave. 1483 (500-2800)
Slope (deg): 0
Landform position: floodplains, benches
Hydrology: seasonally to perennially flooded
Soils: organic or loam

Vegetation and ecology: Habitat is shallow pools or ponds in open or wooded situations. *Ranunculus aquatilis* forms beds of rooted aquatic vegetation, usually in nearly monotypic stands. It occurs in both hardwood forests of *Fraxinus latifolia, Alnus rubra,* and *Acer* macrophyllum, and also in forests of *Pseudotsuga menziesii* and *Thuja plicata.* No woody vegetation is recorded from these plots. Twelve species are repored from the herb layer, *Ranunculus aquatilis* being the most abundant with an average cover of 88 percent and ranging from 75-98 percent. *Alopecurus aequalis* and *Veronica scutellata* occur in slightly over half the plots but at very low cover. An unidentified *Callitriche* and *Eleocharis acicularis* form some significant patches, but the rest of the species occur only in very small amounts. Smaller pools containing this association often dry up in summer and the plants die and disappear when desiccated. These seasonal pools are favored egg-laying sites for amphibians.

Ranunculus flammula

Creeping buttercup

Plots sampled: 8 (1 macro, 7 micro)

Environment:
Elevation (ft): ave. 3886 (2800-5410)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially moist
Soils: organic or loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Ranunculus flammula	100	51	15	70
Carex aquatilis var. *dives*	25	3	0	13
Potamogeton	13	6	0	45
Carex utriculata	13	3	0	20
Dodecatheon jeffreyi	13	Tr	0	1
Carex lenticularis	13	Tr	0	Tr
Moss layer				
Moss	25	1	0	5

Vegetation and ecology: Habitat is seasonally flooded depressions where peat or mud are exposed at low water. *Ranunculus flammula* forms sparse to dense aquatic mats in shallow depressions that dry out as summer progresses, when plants persist and flower in stoloniferous mats over the mud. Woody vegetation is peripheral to the wetland and may include various species of *Salix, Vaccinium uliginosum*, and *Spiraea douglasii*. *Ranunculus flammula* is the principal herbaceous species with an average cover of 51 percent and ranging from 15 to 90 percent. Five other species of herbs are recorded, all with low constancy and cover, except for patches of an unidentified *Potamogeton* and *Carex utriculata*. Occurrences can become quite dry late in the season and *Ranunculus flammula* disappears under heavy trampling by elk. These seasonal pools are favored egg-laying sites for amphibians.

Sagittaria latifolia

Broadleaf arrowhead

Plots sampled: 14 (8 macro, 6 micro)

Environment:

Elevation (ft): ave. 121 (6-500)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally or perennially flooded to perennially saturated
Soils: silt loam

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Salix lucida ssp. *lasiandra*	7	1	0	10
Herb layer				
Sagittaria latifolia	100	52	25	85
Eleocharis palustris	64	4	0	15
Bidens cernua	36	7	0	35
Schoenoplectus tabernaemontani	36	3	0	35
Lindernia dubia	36	2	0	20
Eleocharis ovata	29	4	0	25
Elatine	21	2	0	20
Ludwigia palustris	21	Tr	0	2

Vegetation and ecology: Habitat is seasonal pools, ponds, sloughs, and freshwater tidal mudflats. This association forms emergent marsh and is primarily a low-elevation wetland type in western Oregon. Stands are flooded early in the season and may dry out as summer progresses, or may remain flooded throughout the growing season. Some are irrigated by daily freshwater tides along the lower Columbia River. They typically occur in floodplain openings ringed by often extensive stands of the *Salix lucida* ssp. *lasiandra* association and are generally too wet for *Fraxinus latifolia* or *Spiraea douglasii*. Twenty-nine herbaceous species are recorded from these plots, including *Sparganium angustifolium*, *Potamogeton natans,* and *Leersia oryzoides.* Conditions are usually too wet for *Phalaris arundinacea* except around the edges of ponds and sloughs where competition is intense. *Sagittaria latifolia* was a well-documented staple food of the Kalapuya and Chinook people and intensively managed. It was probably widespread on floodplains in the Willamette Valley but has become rare because of loss of pond and slough habitat to flood control, agriculture, urban development, and *Phalaris arundinacea.* The largest populations remaining in the region occur on Sauvie Island.

Sanguisorba officinalis - Carex aquatilis* var*. dives

Burnet - Sitka sedge

Plots sampled: 13 (8 macro, 5 micro)

Environment:

Elevation (ft): ave. 3148 (1650-3800)
Slope (deg): ave. 1 (0-3)
Landform position: slopes, basins
Hydrology: perennially saturated
Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium uliginosum	23	5	0	60
Salix commutata	23	1	0	6
Herb layer				
Sanguisorba officinalis	100	48	10	85
Carex aquatilis var. *dives*	77	20	0	70
Caltha leptosepala ssp. *howellii*	38	8	0	70
Hypericum anagalloides	31	2	0	25
Parnassia fimbriata	31	2	0	10
Trientalis europaea ssp. *arctica*	31	1	0	10
Tofieldia glutinosa	31	1	0	7
Equisetum arvense	31	Tr	0	1
Platanthera dilatata	31	Tr	0	Tr
Moss layer				
Moss	54	12	0	50

Vegetation and ecology:

Habitat is montane fens. This association forms sloping to level wet lawn vegetation interspersed with scattered hummocks or "tree islands." Stands are irrigated by sheet flow from springs and seeps. Some stands occur in aapamire or "string fen," a distinctive boreal peatland formation where clusters of small elliptical or elongated pools 3-15 feet in diameter form on gentle slopes of peat, their long axes oriented parallel to the contour much like a series of small rice paddies on a hillside. A few sites containing aapamire are known from the Oregon Cascades and these may be the southernmost occurrence of this formation in North America. Woody vegetation is confined to hummocks. Almost 50 different species are reported from the herb layer. The primary species in the moss layer is *Sphagnum.*

Schoenoplectus acutus

Hardstem bulrush

Plots sampled: 7 (4 macro, 3 micro)

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Vaccinium uliginosum	14	Tr	0	1
Spiraea douglasii	14	Tr	0	1
Herb layer				
Schoenoplectus acutus	100	43	20	80
Athyrium filix-femina	29	4	0	25
Iris pseudacorus	29	4	0	15
Oenanthe sarmentosa	29	1	0	5
Aster subspicatus	29	1	0	4
Lotus corniculatus	29	Tr	0	1

Environment:
Elevation (ft): ave. 26 (5-100)
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially flooded
Soils: mostly organic, some loam

Vegetation and ecology: Habitat is emergent marsh around the margins of lakes and ponds. *Schoenoplectus acutus* typically forms extensive, nearly monotypic stands that may tolerate summer drying as long as the substrate remains damp. Total herb cover is lowest in permanently-flooded stands. *Potamogeton natans* and *Brasenia schreberi* are frequent associates in flooded sites, but much of the remaining area is open water or litter between stems of *Schoenoplectus.* Other herbs in slightly drier sites may include *Typha latifolia*, and *Scirpus microcarpus.* The ground is typically covered with dense litter from the previous year's stand of *Schoenoplectus* unless the site has been burned. Although *Schoenoplectus acutus* thrives under perennially-flooded conditions, a deepening of water levels caused by new beaver dams or water control structures can completely kill extensive stands. This association appears to be most common along the coast and east of the Cascade Range, particularly in alkaline areas, while the *Schoenoplectus tabernaemontani* association appears to be more common in the interior valleys of western Oregon. This difference in distribution, if real, has been obscured to some extent in the Willamette Valley by plantings of *Schoenoplectus acutus* for wildlife habitat. Mixed stands are frequent in the Columbia River estuary. No plot data were available for the *Schoenoplectus tabernaemontani* association, but structure and associated species are quite similar.

Scirpus microcarpus
Small-fruited bulrush

Plots sampled: 20 (15 macro, 5 micro)

Environment:
Elevation (ft): ave. 2732 (560-4100)
Slope (deg): ave. 2 (0-25)
Landform position: slopes, basins
Hydrology: seasonally moist to perennially saturated
Soils: organic, loam, sand

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Alnus incana	4	Tr	0	5
Rosa pisocarpa	4	Tr	0	2
Salix	4	Tr	0	1
Salix commutata	4	Tr	0	Tr
Rubus laciniatus	4	Tr	0	Tr
Spiraea douglasii	4	Tr	0	Tr
Rubus spectabilis	4	Tr	0	Tr
Rubus ursinus	4	Tr	0	Tr
Herb layer				
Scirpus microcarpus	100	75	15	98
Glyceria striata	39	2	0	15
Mimulus guttatus	35	1	0	10
Lysichiton americanus	30	4	0	35
Athyrium filix-femina	30	3	0	60
Oenanthe sarmentosa	26	6	0	80
Stachys ajugoides var. *rigida*	26	6	0	40
Moss layer				
Moss	30	4	0	49

Vegetation and ecology:
Habitat is marshes, fens, or springs. Stands are highly variable and a number of different phases could be segregated with further study. Stands are usually monotypic and may reach heights of 3 feet. Trees are peripheral to the wetlands and can be both deciduous or conifers. Eight shrubs are reported from these stands but all have negligible constancy and cover. Almost 80 species are reported from the herb layer, presumably because of the great variety of habitats and elevations in which the association occurs. *Scirpus microcarpus* is the primary species, with average cover of 75 percent and ranging from 15-98 percent. Most other species have much lower constancy and cover. Associated species with significant patches include *Lysichiton americanus*, *Athyrium filix-femina, Oenanthe sarmentosa, Stachys ajugoides* var. *rigida, Carex aquatilis* var. *dives*, and *Senecio triangularis*.

Senecio triangularis

Arrowleaf groundsel

Plots sampled: 21 (16 macro, 5 micro)

Environment:
Elevation (ft): ave. 3805, range 3120-5150
Slope (deg): ave. 17, range 0-70
Landform position: floodplains, basins, slopes
Hydrology: seasonally moist to perennially saturated
Soils: organic, loam, or rocky

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Picea engelmannii	24	8	0	100
Abies lasiocarpa	10	1	0	15
Reproducing trees				
Picea engelmannii	33	1	0	7
Tsuga heterophylla	24	Tr	0	4
Shrub layer				
Vaccinium ovalifolium	29	1	0	7
Alnus incana	24	1	0	15
Herb layer				
Senecio triangularis	90	13	0	35
Aconitum columbianum	52	4	0	25
Platanthera stricta	48	Tr	0	3
Trautvetteria caroliniensis	43	6	0	60
Stachys ciliata	43	1	0	6
Valeriana sitchensis	43	Tr	0	3
Tiarella trifoliata var. *unifoliata*	38	Tr	0	2

Vegetation and ecology: Habitat is hummocks or "tree islands" in peatlands, forest ecotone at edges of wetlands, or in openings on seepy slopes. It is best described as forest ecotone with at least seasonally wet soil. Floristically it is extremely diverse because it contains elements of both wetlands and uplands, and it is difficult to segregate into types that are meaningful. Twelve different species of trees are present, 20 species of shrubs, and an astonishing 130 species of herbs, but most of these occur at very low constancy and cover. Associated indicator species include *Aconitum columbianum, Veratrum viride, Veratrum californicum,* and *Rudbeckia occidentalis*. Other species with significant patches include *Trautvetteria caroliniensis, Trifolium longipes, Deschampsia caespitosa*, *Solidago canadensis,* and *Elymus glaucus.*

Sparganium angustifolium

Simplestem bur-reed

Plots sampled: 11 (6 macro, 5 micro)

Environment:
Elevation (ft): ave. 1810 (100-2800)t
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally flooded to perennially flooded
Soils: organic or loam

Species	Const	Percent cover		
		Ave	Min	Max
Shrub layer				
Spiraea douglasii	9	1	0	12
Herb layer				
Sparganium angustifolium	100	60	20	80
Callitriche heterophylla	55	6	0	50
Veronica scutellata	45	1	0	4
Oenanthe sarmentosa	18	4	0	40
Juncus effusus	18	1	0	12
Callitriche	18	1	0	5
Torreyochloa pallida var. *pauciflora*	18	Tr	0	2

Vegetation and ecology: Habitat is seasonally or perennially-flooded shallow pools, ponds, and freshwater tidal flats. *Sparganium angustifolium* forms nearly monotypic stands and can fill entire basins. It tolerates draw-down of water levels in summer but the substrate must remain moist. Trees are absent from these plots and shrubs are scarce and usually peripheral to stands sampled. *Salix hookeriana* and *Spiraea douglasii* are typical associates. About 25 species are reported from the herb layer, but most occur only in trace amounts. *Sparganium angustifolium* is the primary species with average cover of 60 percent and ranging from 20-80 percent. *Callitriche heterophylla* is present in about half the plots, with cover up to 50 percent. Other species with significant patches include *Oenanthe sarmentosa, Potamogeton natans, Juncus effusus,* and *Carex obnupta*. Most of the area between plants is open water or bare mud. Growth is clonal, the plants spreading by rhizomes. These sites are favored feeding areas for beaver.

Sparganium eurycarpum

Broadfruit bur-reed

Plots sampled: 5 (micro)

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Sparganium eurycarpum	100	34	20	45
Cicuta douglasii	20	2	0	10
Unvegetated				
Litter	100	45	15	70
Water	80	19	0	35

Environment:
Elevation (ft): 20-200
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: seasonally to perennially flooded
Soils: organic, loam

Vegetation and ecology: Habitat is shallow lakes, ponds, and sloughs. *Sparganium eurycarpum* forms nearly monotypic emergent stands with most of the space between plants occupied by litter or open water. *Sparganium* has an average cover of 34 percent and ranges from 20-45 percent cover. No other vegetation is reported here except for *Cicuta douglasii,* but almost any common emergent species could be present in small amounts. The association appears to be limited to low elevations.

Torreyochloa pallida* var. *pauciflora

Pale false mannagrass

Plots sampled: 6 (macro)

Environment:

Elevation (ft): ave. 1848 (880-3825)

Slope (deg): ave. 0 (0-2)

Landform position: floodplains, basins, benches

Hydrology: perennially moist to flooded

Soils: mostly loam, some sand or organic

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Alnus rubra	17	Tr	0	Tr
Shrub layer				
Salix sitchensis	33	Tr	0	Tr
Rubus ursinus	17	Tr	0	Tr
Herb layer				
Torreyochloa pallida var. *pauciflora*	100	56	30	80
Veronica americana	67	1	0	3
Scirpus microcarpus	67	1	0	1
Juncus effusus	50	9	0	30
Typha latifolia	50	5	0	25
Oenanthe sarmentosa	50	1	0	5
Lysichiton americanus	33	9	0	50
Callitriche	33	2	0	6
Sparganium angustifolium	33	2	0	6
Carex obnupta	33	1	0	3
Myosotis laxa	33	Tr	0	2
Phalaris arundinacea	33	Tr	0	Tr
Stellaria calycantha	33	Tr	0	Tr
Moss layer				
Moss	17	Tr	0	Tr

Vegetation and ecology:

Habitat is sodden edges of fens, meadows, and marshes, including beaver marshes. *Torreyochloa pallida* var. *pauciflora* forms sparse to dense stands of low to moderate diversity. Most trees and shrubs are peripheral but *Alnus rubra* may be present in small amounts. More than 35 species are reported from the herb layer, but most occur at very low constancy and cover. Most of the surface between plants is mud or open water.

Trichophorum caespitosum

Tufted clubrush

Plots sampled: 9 (macro)

Environment:

Elevation (ft): ave. 3442 (2650-4240)

Slope (deg): ave. 5 (0-15)

Landform position: floodplains, basins

Hydrology: perennially moist to perennially saturated

Soils: mostly organic, some loam

Species	Const	Percent cover		
		Ave	Min	Max
Mature trees				
Pinus monticola	11	Tr	0	2
Reproducing trees				
Thuja plicata	33	3	0	22
Shrub layer				
Vaccinium uliginosum	67	3	0	7
Gaultheria ovatifolia	33	Tr	0	1
Herb layer				
Trichophorum caespitosum	100	44	20	75
Tofieldia glutinosa	100	5	Tr	15
Hypericum anagalloides	89	29	0	65
Caltha leptosepala ssp. *howellii*	89	9	0	20
Sanguisorba officinalis	67	11	0	25
Eriophorum gracile	67	4	0	30
Dodecatheon jeffreyi	56	3	0	15
Drosera rotundifolia	56	2	0	6
Agrostis thurberiana	56	1	0	7
Parnassia fimbriata	56	1	0	5
Gentiana sceptrum	56	Tr	0	Tr
Carex aquatilis var. *dives*	44	7	0	30
Moss layer				
Moss	67	2	0	7

Vegetation and ecology:

Habitat is montane fens, forming wet lawns on flats or gentle to moderate slopes below springs and seeps. *Trichophorum caespitosum* forms conspicuous tussocks. Trees and shrubs have scanty cover and are primarily restricted to hummocks or "tree islands" within a matrix of wet lawn, or they are peripheral to the wetland. Over 40 species are reported from the herb layer, most of them typical of wet lawns in fens. *Trichophorum caespitosum* is uncommon in Oregon and occurrences of this association are limited to the northern part of the Cascade Range.

Triteleia hyacinthina

White brodiaea

Plots sampled: 12 (macro)

Environment:
Elevation (ft): 500
Slope (deg): 0
Landform position: floodplains
Hydrology: seasonally moist
Soils: loam

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Triteleia hyacinthina	100	62	35	95
Hypochaeris radicata	92	12	0	40
Camassia quamash	75	11	0	30
Danthonia californica	50	1	0	3
Prunella vulgaris	33	8	0	45
Lotus pinnatus	33	1	0	8
Centaurium erythraea	33	Tr	0	2
Hypericum anagalloides	25	Tr	0	1
Eleocharis acicularis	25	Tr	0	1
Moss layer				
Moss	58	15	0	60

Vegetation and ecology: Habitat is seasonally wet prairie on shallow soil over basalt bedrock, with a perched water table. Woody species are absent from these plots but may include *Quercus garryana*, *Symphoricarpos albus,* or *Spiraea douglasii*. A shallow mantle of soil supports a mix of dry upland prairie species (e.g., *Poa scabrella, Festuca roemeri, Danthonia californica, Lomatium utriculatum, Plectritis congesta*) on convex surfaces and wet prairie species in concave surfaces. The concave surfaces pool water in winter and spring and support at least 25 herbaceous species recorded in these plots, about one-third of which are exotics. The moss layer may contain *Polytrichum piliferum* and *Racomitrium ericoides* that indicate severe drying later in the summer. Conspicuous sheets of algae turn white when they dry and delineate areas of seasonally pooled water, a good secondary indicator of hydric conditions in sites that don't otherwise meet wetland criteria because they lack hydric soils. A challenging aspect of this association is that most of the *Triteleia* is sterile, showing only short terete shoots, and because of this some researchers have called this the "unknown *Brodiaea* association." Stands intergrade with the *Camassia quamash* association where deeper pockets of soil occur.

Typha latifolia

Broadleaf cattail

Plots sampled: 4 (macro)

Environment:

Elevation (ft): ave. 1299 (500-1950)
Slope (deg): 0-1
Landform position: floodplains, basins, flats
Hydrology: seasonally moist to perennially saturated
Soils: loam

Species	Const	Percent cover		
		Ave	Min	Max
Reproducing trees				
Frangula purshiana	25	Tr	0	Tr
Shrub layer				
Salix hookeriana	25	1	0	2
Herb layer				
Typha latifolia	100	54	40	65
Myosotis laxa	25	9	0	35
Mentha	25	8	0	30
Scirpus microcarpus	25	8	0	30
Equisetum arvense	25	3	0	13
Carex stipata	25	3	0	10
Cirsium arvense	25	2	0	9
Glyceria striata	25	2	0	7
Stachys ciliata	25	1	0	5
Veronica scutellata	25	1	0	5
Cicuta douglasii	25	1	0	3
Elymus glaucus	25	1	0	2
Moss layer				
Moss	25	24	0	95

Vegetation and ecology:

Habitat is shallow depressions, marshes, edges of lakes, and freshwater tidal flats. This is a common association but is overlooked and undersampled. The general aspect is usually a monotype of *Typha latifolia,* but closer inspection shows some differentiation based on patches of other vegetation. The only woody species recorded in these four plots are *Frangula purshiana* and *Salix hookeriana* with 25 percent constancy but with only trace cover. About twenty species are recorded from the herb layer. Some exotics are evident and indicate low elevation and proximity to settlement. Although this association is native, it appears to respond positively to eutrophic conditions caused by agricultural and urban runoff. Changes in surface and groundwater flows associated with road construction also appear to have a strong influence on this association.

Utricularia macrorhiza

Common bladderwort

Plots sampled: 0

Environment:
Elevation (ft): 10-2000
Slope (deg): 0
Landform position: floodplains, basins
Hydrology: submerged aquatic
Soils: organic

Vegetation and ecology: Habitat is lakes and ponds, usually with perennial water. This is an unrooted aquatic bed association that is widespread in western Oregon but it has not been sampled and little information is available. *Utricularia macrorhiza* is insectivorous and characterized by its large bladders blackened with the remains of aquatic invertebrates. It forms sparse to dense masses of nearly monotypic submerged vegetation with cover ranging from 40-95 percent. It provides important habitat for aquatic invertebrates and fish. It is the most common *Utricularia* at lower elevations and the only one to form extensive stands, but it is not as common as some other aquatic bed associations. It is not clear if this association favors eutrophic conditions or may be enhanced by enriched runoff in agricultural or urban landscapes.

Fontinalis antipyretica

Fountain moss

Plots sampled: 1 (macro)

Species	Const	Percent cover		
		Ave	Min	Max
Moss layer				
Moss	100	10	10	10

Environment:
Elevation (ft): 3800
Slope (deg): 0
Landform position: floodplains, basins, benches
Hydrology: seasonally flooded to perennially flooded
Soils: organic or loam

Vegetation and ecology: Habitat is seasonally or perennially flooded pools, ponds, and sloughs. *Fontinalis antipyretica* usually forms extensive submerged beds that tolerate both perennial submergence or seasonal exposure. Beds may be 2-3 feet thick when submerged, and dry down to a 6-inch thick turf if the pool loses all its water in summer. Although this association is represented by only one plot and is obviously undersampled, it is widespread in the region. The plot data here represent a perennially flooded pool with a cover of only 10 percent, but covers of 80-100 are the norm. There is no evidence that this association increases under eutrophic conditions, and only a few stands have been observed that would approach these conditions. Most occur in clean, cold, slow or non-flowing water. Pearsons (1989) and Markle et al. (1991) found that this association provides important cover for the federally-listed Oregon chub. *Fontinalis neomexicana* is a related species that occurs in cold flowing water in both streams and fen or flush rivulets.

Polytrichum commune

Haircap moss

Plots sampled: 5 (micro)

Environment:
Elevation (ft): 5410
Slope (deg): 0
Landform position: basins
Hydrology: perennially to seasonally moist
Soils: organic

Species	Const	Percent cover		
		Ave	Min	Max
Herb layer				
Carex utriculata	20	Tr	0	1
Moss layer				
Moss	100	64	5	100
Unvegetated				
Litter	100	21	1	95
Bare ground	20	17	0	85

Vegetation and ecology: This association is most common in seasonally-flooded depressions in the *Tsuga mertensiana* zone. Stands may occur in small depressions among trees, but most occur in larger seasonal ponds with no forest canopy. Heavy snow accumulations persist longer into the growing season and together with subsequent meltwater suppress most other vegetation. Stands are usually monotypic mats composed entirely of the moss *Polytrichum commune* up to 6 inches thick. Where slopes around depressions are steep enough, *Polytrichum* occupies a seasonally-flooded zone between upland and late-season ponded water often occupied by *Carex utriculata*, *Nuphar lutea* ssp. *polysepala*, or *Glyceria. Deschampsia caespitosa* is often present at the upper margin of this zone. In shallow depressions with less perceptible slopes, *Polytrichum* may completely carpet the bottom of the depression, forming extensive lawns. Thick mats act as insulating blankets and retain moisture throughout the growing season. The 1996 Torrey Lake fire in Lane County scorched or killed 60-99 percent of *Polytrichum* mats in some transects, but regeneration from uninjured tissue below the surface was evident within two years and is ongoing. Dead stands were replaced by *Glyceria* or *Calamagrostis*.

Appendix I: Species list
Alphabetized by scientific name

Scientific name	Common name	Wetland	Origin	PLANTS code
Abies amabilis	Silver fir	FACU	native	ABAM
Abies grandis	Grand fir	FACU	native	ABGR
Abies lasiocarpa	Subalpine fir	FACU	native	ABLA
Abies procera	Noble fir	UPL	native	ABPR
Acer circinatum	Vine maple	FAC-	native	ACCI
Acer glabrum var. douglasii	Rocky Mountain maple	FAC	native	ACGLD4
Acer macrophyllum	Big leaf maple	FACU	native	ACMA3
Achillea millefolium	Yarrow	FACU	native	ACMI2
Achlys triphylla	Vanilla leaf	UPL	native	ACTR
Aconitum columbianum	Columbian monkshood	FACW	native	ACCO4
Aconitum columbianum ssp. columbianum	Columbian monkshood	FACW	native	ACCOC2
Aconitum columbianum ssp. viviparum	Columbian monkshood	FACW	native	ACCOV2
Actaea rubra	Red baneberry	UPL	native	ACRU2
Adenocaulon bicolor	Pathfinder	UPL	native	ADBI
Adiantum pedatum	Maidenhair fern	FAC	native	ADPE
Ageratina occidentalis	Western snakeroot	UPL	native	AGOC2
Agoseris elata	Tall agoseris	FAC	native	AGEL
Agrostis capillaris	*Colonial bentgrass*	FACU	exotic	AGCA5
Agrostis exarata	Spike bentgrass	FACW	native	AGEX
Agrostis humilis	Alpine bentgrass	FACW	native	AGHU
Agrostis oregonensis	Oregon bentgrass	FAC	native	AGOR
Agrostis pallens	Dune bentgrass	FACU	native	AGPA8
Agrostis stolonifera	*Creeping bentgrass*	FAC+	exotic	AGST2
Alnus incana	Mountain alder	FACW	native	ALIN2
Alnus rubra	Red alder	FAC	native	ALRU2
Alnus viridis	Sitka alder	FACW	native	ALVI5
Amaranthus	Pigweed species	UNK	unknown	AMARA
Amelanchier alnifolia	Saskatoon serviceberry	FACU	native	AMAL2
Anaphalis margaritacea	Pearly everlasting	UPL	native	ANMA
Anemone deltoidea	Three-leaved anemone	UPL	native	ANDE3
Anemone lyallii	Lyall's anemone	UPL	native	ANLY
Anemone oregana	Blue windflower	FACU	native	ANOR
Angelica arguta	Sharptooth angelica	FACW	native	ANAR3

Scientific name	Common name	Wetland	Origin	PLANTS code
Angelica genuflexa	Kneeling angelica	FACW	native	ANGE2
Antennaria argentea	Silver pussytoes	FACU	native	ANAR5
Anthoxanthum odoratum	*Sweet vernalgrass*	FACU	exotic	ANOD
Aquilegia formosa	Sitka columbine	FAC	native	AQFO
Aralia californica	California spikenard	FAC+	native	ARCA2
Arenaria	Sandwort species	UNK	unknown	ARENA
Arnica amplexicaulis	Streambank arnica	FACW	native	ARAM2
Arnica latifolia	Broadleaf arnica	FAC-	native	ARLA8
Artemisia douglasiana	Douglas' sagewort	FACW	native	ARDO3
Aruncus dioicus	Nettle	FACU	native	ARDI8
Asarum caudatum	Wild ginger	FACU	native	ASCA2
Aster alpigenus	Alpine aster	FAC	native	ASAL2
Aster modestus	Great northern aster	FACW	native	ASMO3
Athyrium filix-femina	Lady fern	FAC+	native	ATFI
Berberis aquifolium	Tall Oregon grape	UPL	native	BEAQ
Berberis nervosa	Dwarf Oregon grape	UPL	native	BENE2
Blechnum spicant	Deer fern	FAC+	native	BLSP
Borago	Borage species	UNK	unknown	BORAG
Botrychium multifidum	Leathery grapefern	FAC	native	BOMU
Boykinia major	Large boykinia	FACW	native	BOMA3
Boykinia occidentalis	Coastal boykinia	FACW	native	BOOC2
Bromus inermis	*Smooth brome*	FAC	exotic	BRIN2
Bromus pacificus	Pacific brome	UPL	native	BRPA3
Bromus rigidus	*Ripgut brome*	UPL	exotic	BRDI3
Bromus sitchensis	Alaska brome	FACU	native	BRSI
Bromus vulgaris	Colombian brome	UPL	native	BRVU
Calamagrostis canadensis	Bluejoint	FACW	native	CACA4
Calocedrus decurrens	Incense cedar	UPL	native	CADE27
Caltha leptosepala	Broad-leaved marsh-marigold	OBL	native	CALE4
Camassia quamash	Common camas	FACW	native	CAQU2
Campanula scouleri	Scouler's bluebell	UPL	native	CASC7
Cardamine angulata	Angled bittercress	FACW	native	CAAN5
Cardamine breweri	Brewer's bittercress	FACW	native	CABR6
Cardamine cordifolia	Heartleaf bittercress	FACW	native	CACO6
Cardamine occidentalis	Western bittercress	FACW	native	CAOC
Cardamine oligosperma	Few-sided bittercress	FAC	native	CAOL
Carex aquatilis	Water sedge	OBL	native	CAAQ
Carex aquatilis var. dives	Sitka sedge	OBL	native	CAAQD

Scientific name	Common name	Wetland	Origin	PLANTS code
Carex athrostachya	Slenderbeak sedge	FACW	native	CAAT3
Carex deweyana	Dewey's sedge	FACU	native	CADE9
Carex echinata	Prickly sedge	FACW	native	CAEC
Carex hendersonii	Henderson's sedge	FAC	native	CAHE7
Carex integra	Smoothbeak sedge	FACU	native	CAIN10
Carex interrupta	Greenfruit sedge	OBL	native	CAIN17
Carex laeviculmis	Smoothstem sedge	FACW	native	CALA13
Carex lenticularis	Tufted sedge	FACW	native	CALE8
Carex luzulina	Woodrush sedge	OBL	native	CALU7
Carex mertensii	Merten's sedge	FAC	native	CAME6
Carex multicostata	Manyrib sedge	FACU	native	CAMU6
Carex obnupta	Slough sedge	OBL	native	CAOB3
Carex pachystachya	Thick-headed sedge	FAC	native	CAPA14
Carex saxatilis	Russet sedge	FACW	native	CASA10
Carex spectabilis	Showy sedge	FACW	native	CASP5
Castilleja miniata	Common red paintbrush	FAC	native	CAMI12
Ceanothus velutinus	Snowbrush ceanothus	UPL	native	CEVE
Cerastium fontanum ssp. vulgare	*Big chickweed*	FACU	exotic	CEFOV2
Cerastium glomeratum	*Sticky chickweed*	UPL	exotic	CEGL2
Chamaecyparis nootkatensis	Alaska yellow-cedar	FAC	native	CHNO
Chamerion angustifolium var. canescens	Fireweed	FACU	native	EPAN2
Chimaphila umbellata	Prince's pine	UPL	native	CHUM
Chrysolepis chrysophylla	Chinquapin	UPL	native	CHCH7
Chrysosplenium glechomifolium	Water-carpet	OBL	native	CHGL5
Cicuta douglasii	Douglas' water-hemlock	OBL	native	CIDO
Cimicifuga laciniata	Mount Hood bugbane	FACW	native	CILA
Cinna latifolia	Wood reedgrass	FACW	native	CILA2
Circaea alpina	Enchanter's-nightshade	FAC	native	CIAL
Cirsium arvense	*Canada thistle*	FAC-	exotic	CIAR4
Cirsium vulgare	*Bull thistle*	FACU	exotic	CIVU
Claytonia cordifolia	Heart-leaved springbeauty	FACW	native	CLCO3
Claytonia perfoliata	Miner's lettuce	FAC	native	CLPE
Claytonia sibirica	Siberian miner's lettuce	FAC	native	CLSI2
Clintonia uniflora	Queencup beadlily	UPL	native	CLUN2

Scientific name	Common name	Wetland	Origin	PLANTS code
Collinsia parviflora	Small-flowered blue-eyed Mary	UPL	native	COPA3
Collomia heterophylla	Varied leaf collomia	FACU	native	COHE2
Coptis laciniata	Gold thread	FAC	native	COLA3
Corallorhiza maculata	Western coral root	UPL	native	COMA4
Cornus nuttallii	Pacific dogwood	UPL	native	CONU4
Cornus sericea	Red osier dogwood	FACW	native	COSE16
Cornus unalaschkensis	Dogwood bunchberry	FAC-	native	COUN
Corydalis aquae-gelidae	Cold-water corydalis	OBL	native	COAQ
Corydalis scouleri	Scouler's corydalis	FAC+	native	COSC4
Corylus cornuta	California hazel	FACU	native	COCO6
Crataegus douglasii	Black hawthorn	FAC	native	CRDO2
Cynoglossum	Hound's-tongue species	UNK	unknown	CYNOG
Cytisus scoparius	*Scotch broom*	UPL	exotic	CYSC4
Dactylis glomerata	*Orchard grass*	FACU	exotic	DAGL
Delphinium glareosum	Olumpic larkspur	UPL	native	DEGL
Delphinium nuttallianum	Two-lobe larkspur	FAC	native	DENU2
Delphinium occidentale	*Western larkspur*	FACU	exotic	DEOC
Delphinium trolliifolium	Trollius-leaved larkspur	UPL	native	DETR2
Deschampsia cespitosa	Tufted hairgrass	FACW	native	DECE
Deschampsia elongata	Slender hairgrass	FACW	native	DEEL
Dicentra formosa	Pacific bleedingheart	UPL	native	DIFO
Digitalis purpurea	*Common foxglove*	FACU	exotic	DIPU
Distichlis spicata	Seashore saltgrass	FACW	native	DISP
Dodecatheon dentatum	Dentate shooting star	FACW	native	DODE
Dryopteris carthusiana	Wood fern	FAC+	native	DRCA11
Eleocharis palustris	Creeping spike-rush	OBL	native	ELPA3
Elymus glaucus	Blue wildrye	FACU	native	ELGL
Enemion hallii	Willamette false rue anemone	UPL	native	ENHA
Epilobium anagallidifolium	Alpine willowherb	FACW	native	EPAN4
Epilobium ciliatum ssp. glandulosum	Purple-leaved willowherb	FACW	native	EPCIG
Epilobium ciliatum ssp. watsonii	Purple-leaved willowherb	FACW	native	EPCIW
Epilobium glaberrimum	Smooth willowherb	FACW	native	EPGL
Epilobium luteum	Yellow willowherb	FACW	native	EPLU
Epilobium minutum	Small-flowered willowherb	UPL	native	EPMI
Equisetum arvense	Common horsetail	FAC	native	EQAR

Scientific name	Common name	Wetland	Origin	PLANTS code
Equisetum hyemale	Scouring-rush	FACW	native	EQHY
Equisetum telmateia	Giant horsetail	FACW	native	EQTE
Erechtites minima	*Coastal burnweed*	FACU	exotic	ERMI6
Erigeron peregrinus	Subalpine daisy	UPL	native	ERPE3
Festuca idahoensis	Idaho fescue	FACU	native	FEID
Festuca occidentalis	Western fescue	UPL	native	FEOC
Festuca subulata	Bearded fescue	FACU	native	FESU
Festuca trachyphylla	*Krajina hard fescue*	UPL	exotic	FEOV
Fragaria vesca	Woodland strawberry	FACU	native	FRVE
Fragaria virginiana	Wild strawberry	FACU	native	FRVI
Fraxinus latifolia	Oregon ash	FACW	native	FRLA
Fritillaria	Fritillaria species	UNK	native	FRITI
Galium aparine	Cleaver	FACU	native	GAAP2
Galium oreganum	Oregon bedstraw	FACU	native	GAOR
Galium trifidum	Small bedstraw	FACW	native	GATR2
Galium triflorum	Sweetscented bedstraw	FACU	native	GATR3
Gaultheria ovatifolia	Oregon wintergreen	FAC	native	GAOV2
Gaultheria shallon	Salal	FACU	native	GASH
Geranium columbinum	*Longstalk cranesbill*	UPL	exotic	GECO
Geum macrophyllum	Large-leaved avens	FAC+	native	GEMA4
Glechoma hederacea	*Ground-ivy*	FACU	exotic	GLHE2
Glyceria grandis	Reed mannagrass	OBL	native	GLGR
Glyceria striata	Tall mannagrass	FACW	native	GLST
Goodyera oblongifolia	Rattlesnake plantain	FACU	native	GOOB2
Gymnocarpium dryopteris	Western oakfern	FAC	native	GYDR
Hedera helix	*English ivy*	UPL	exotic	HEHE
Heracleum lanatum	Cow-parsnip	FAC	native	HELA4
Heuchera cylindrica var. glabella	Beautiful alumroot	UPL	native	HECYG
Heuchera micrantha	Small-flowered alumroot	UPL	native	HEMI7
Hieracium albiflorum	White hawkweed	UPL	native	HIAL2
Hieracium gracile	Slender hawkweed	UPL	native	HIGR
Hieracium scouleri	Woolly-weed	UPL	native	HISC2
Holcus lanatus	*Common velvet-grass*	FAC	exotic	HOLA
Holodiscus discolor	Oceanspray	UPL	native	HODI
Huperzia chinensis	Star mustard	FACU	native	HUCH
Hydrophyllum tenuipes	Pacific waterleaf	FACU	native	HYTE
Hypericum anagalloides	Bog St.John's-wort	OBL	native	HYAN2

Scientific name	Common name	Wetland	Origin	PLANTS code
Hypericum formosum	Western St. John's-wort	FAC	native	HYFO4
Hypericum perforatum	*Common St.John's-wort*	UPL	exotic	HYPE
Hypochaeris radicata	*Hairy cat's ear*	FACU	exotic	HYRA3
Impatiens capensis	Jewelweed	FACW	native	IMCA
Juncus arcticus var. balticus	Arctic rush	FACW	native	JUBA
Juncus bufonius	Toad rush	FACW	native	JUBU
Juncus covillei	Coville's rush	FACW	native	JUCO5
Juncus effusus	Common rush	FACW	native	JUEF
Juncus ensifolius	Dagger-leaved rush	FACW	native	JUEN
Juncus parryi	Parry's rush	FAC+	native	JUPA
Juncus patens	Spreading rush	FACW	native	JUPA2
Juncus regelii	Regel's rush	FACW	native	JURE
Lactuca biennis	Tall blue lettuce	FAC	native	LABI
Lactuca muralis	*Wall-lettuce*	UPL	exotic	MYMU
Lactuca serriola	*Prickly lettuce*	FACU	exotic	LASE
Lapsana communis	*Common nipplewort*	UPL	exotic	LACO3
Lathyrus nevadensis	Purple peavine	UPL	native	LANEP
Leucanthemum vulgare	*Oxeye daisy*	UPL	exotic	LEVU
Ligusticum grayi	Gray's lovage	UPL	native	LIGR
Lilium columbianum	Columbian lily	FAC	native	LICO
Linnaea borealis	Twinflower	FACU	native	LIBO3
Listera borealis	Northern twayblade	FACW	native	LIBO4
Listera caurina	Northwestern twayblade	FACU	native	LICA10
Listera convallarioides	Broad-leaved twayblade	FAC	native	LICO5
Listera cordata	Heartleaf twayblade	FAC	native	LICO6
Lolium arundinaceum	*Tall fescue*	FAC-	exotic	LOAR10
Lonicera ciliosa	Orange honeysuckle	UPL	native	LOCI3
Lonicera involucrata	Black twinberry	FAC+	native	LOIN5
Lotus corniculatus	*Bird's-foot trefoil*	FAC	exotic	LOCO6
Lotus crassifolius	Big deervetch	UPL	native	LOCR
Lotus denticulatus	Meadow birds-foot trefoil	UPL	native	LODE
Lupinus	Lupine species	UNK	unknown	LUPIN
Luzula multiflora	*Many-flowered wood-rush*	FACU	exotic	LUCA2
Luzula multiflora ssp. multiflora	*Many-flowered wood-rush*	FACU	exotic	LUCAM3
Luzula parviflora	Small-flowered wood-rush	FAC-	native	LUPA4

Scientific name	Common name	Wetland	Origin	PLANTS code
Lysichiton americanum	Skunk cabbage	OBL	native	LYAM3
Maianthemum dilatatum	False lily of the valley	FAC	native	MADI
Maianthemum racemosum	False Solomon's-seal	FAC-	native	MARA7
Maianthemum stellatum	Starry false Solomon's-seal	FAC-	native	MAST4
Marah oreganus	Manroot	UPL	native	MAOR3
Melica subulata	Alaska oniongrass	UPL	native	MESU
Mentha spicata	*Spearmint*	OBL	exotic	MESP3
Mentha Xpiperita	*Peppermint*	FACW	exotic	MEPI
Menziesia ferruginea	Fool's huckleberry	FACU	native	MEFE
Mertensia ciliata	Ciliate bluebells	FACW	native	MECI3
Mertensia paniculata	Tall bluebells	FACW	native	MEPA
Mimulus alsinoides	Chickweed monkey-flower	OBL	native	MIAL3
Mimulus dentatus	Tooth-leaved monkeyflower	OBL	native	MIDE3
Mimulus guttatus	Yellow monkeyflower	OBL	native	MIGU
Mimulus lewisii	Pink monkeyflower	FACW	native	MILE2
Mimulus moschatus	Musk-flower	FACW	native	MIMO3
Mitella breweri	Brewer's miterwort	FAC	native	MIBR6
Mitella caulescens	Leafy mitrewort	UPL	native	MICA5
Mitella ovalis	Oval-leaved mitrewort	OBL	native	MIOV
Mitella pentandra	Five=stamen mitrewort	FAC	native	MIPE
Moehringia macrophylla	Big-leaved sandwort	UPL	native	MOMA3
Montia linearis	Narrow-leaved Montia	UPL	native	MOLI4
Montia parvifolia	Streambank springbeauty	FACW	native	MOPA2
Muhlenbergia filiformis	Slender muhlenbergia	FACW	native	MUFI2
Myosotis laxa	Small-flowered forget-me-not	OBL	native	MYLA
Nemophila parviflora	Smallflower nemophila	UPL	native	NEPA
Nothochelone nemorosa	Woodland penstemon	UPL	native	NONE3
Oemleria cerasiformis	Indian plum	FACU	native	OECE
Oenanthe sarmentosa	Waterparsley	OBL	native	OESA
Oplopanax horridum	Devil's club	FAC+	native	OPHO
Orthilia secunda	Sidebells wintergreen	FACU	native	ORSE
Osmorhiza berteroi	Sweet cecily	FAC	native	OSBE
Oxalis oregana	Oregon oxalis	UPL	native	OXOR
Oxalis suksdorfii	Suksdorf woodsorrel	UPL	native	OXSU
Oxalis trilliifolia	Trillium-leaved sorrel	FAC+	native	OXTR

Scientific name	Common name	Wetland	Origin	PLANTS code
Parnassia californica	California grass-of-Parnassus	OBL	native	PACA18
Parnassia fimbriata	Fringed grass-of-Parnassus	OBL	native	PAFI3
Paxistima myrsinites	Oregon boxwood	UPL	native	PAMY
Pedicularis bracteosa	Bracted lousewort	UPL	native	PEBR
Penstemon serrulatus	Coast penstemon	FACU	native	PESE5
Perideridia montana	Common yampah	FAC	native	PEMO7
Petasites frigidus	Coltsfoot	FACW	native	PEFR5
Phacelia hastata	Silverleaf phacelia	UPL	native	PHHA
Phacelia nemoralis	Shade phacelia	UPL	native	PHNE2
Phalaris arundinacea	*Reed canarygrass*	FACW	exotic	PHAR3
Phlox gracilis	Pink phlox	FACU	native	PHGRG
Physocarpus capitatus	Ninebark	FACW	native	PHCA11
Picea engelmannii	Engelmann's spruce	FAC	native	PIEN
Picea sitchensis	Sitka spruce	FAC	native	PISI
Pinus contorta	Lodgepole pine	FAC	native	PICO
Pinus monticola	Western white pine	FACU	native	PIMO3
Plantago lanceolata	*Ribwort*	FACU	exotic	PLLA
Platanthera stricta	Slender bog-orchid	FACW	native	PLST4
Pleuropogon refractus	Nodding semaphore grass	OBL	native	PLRE2
Poa laxiflora	Lax-flowered bluegrass	OBL	native	POLA3
Poa palustris	*Fowl bluegrass*	FAC	exotic	POPA2
Poa trivialis	*Rough bluegrass*	FACW	exotic	POTR2
Polemonium carneum	Great Jacob's-ladder	OBL	native	POCA4
Polemonium occidentale	Western polemonium	FACW	native	POOC2
Polygonum bistortoides	American bistort	FACW	native	POBI6
Polygonum hydropiper	*Marshpepper smartweed*	OBL	exotic	POHY
Polygonum punctatum	Dotted smartweed	OBL	native	POPU5
Polygonum sachalinense	*Giant knotweed*	FACU	exotic	POSA4
Polypodium glycyrrhiza	Licorice fern	OBL	native	POGL8
Polystichum munitum	Sword fern	FACU	native	POMU
Populus trichocarpa	Black cottonwood	FAC	native	POBAT
Prosartes hookeri	Hooker's fairybells	OBL	native	PRHO2
Prosartes smithii	Smith's fairybells	OBL	native	DISM2
Prunella vulgaris	Selfheal	FACU	native	PRVU
Pseudotsuga menziesii	Douglas-fir	FACU	native	PSME
Pteridium aquilinum	Western brackenfern	FACU	native	PTAQ

Scientific name	Common name	Wetland	Origin	PLANTS code
Pyrola asarifolia	Pink wintergreen	FACU	native	PYAS
Pyrrocoma uniflora	Plantain goldenweed	FAC+	native	PYUN2
Quercus garryana	Oregon white oak	UPL	native	QUGA4
Ranunculus flammula	Lesser spearwort	OBL	native	RAFL2
Ranunculus muricatus	*Spinyfruit buttercup*	FACW	exotic	RAMU2
Ranunculus repens	*Creeping buttercup*	FACW	exotic	RARE3
Ranunculus repens var. repens	*Creeping buttercup*	FACW	exotic	RARER
Ranunculus uncinatus	Little buttercup	FAC	native	RAUN
Rhamnus purshiana	Cascara buckthorn	FACU	native	FRPU7
Rhododendron albiflorum	Cascade azalea	FACU	native	RHAL2
Rhododendron macrophyllum	Pacific rhododendron	UPL	native	RHMA3
Ribes bracteosum	Stink currant	FAC	native	RIBR
Ribes divaricatum	Wild gooseberry	FAC	native	RIDI
Ribes lacustre	Black gooseberry	FAC+	native	RILA
Ribes sanguineum	Red-flowering currant	UPL	native	RISA
Rosa eglanteria	*Sweetbriar rose*	FACW	exotic	ROEG
Rosa gymnocarpa	Baldhip rose	FACU	native	ROGY
Rosa nutkana	Nootka rose	FAC-	native	RONU
Rosa pisocarpa	Clustered wild rose	FAC	native	ROPI2
Rubus armeniacus	*Himalayan blackberry*	FACU	exotic	RUDI2
Rubus lasiococcus	Dwarf bramble	UPL	native	RULA2
Rubus leucodermis	Black raspberry	UPL	native	RULE
Rubus parviflorus	Thimbleberry	FAC-	native	RUPA
Rubus pedatus	Five-leaved bramble	FACU	native	RUPE
Rubus spectabilis	Salmonberry	FAC+	native	RUSP
Rubus ursinus	Trailing blackberry	FACU	native	RUUR
Rudbeckia occidentalis	Western coneflower	FAC-	native	RUOC2
Rumex crispus	*Curled dock*	FAC+	exotic	RUCR
Rumex obtusifolius	*Bitter dock*	FAC	exotic	RUOB
Rumex salicifolius	Willow dock	FACW	native	RUSA
Sagina procumbens	*Bird-eye pearlwort*	FAC	exotic	SAPR
Salix lucida	Pacific willow	FACW	native	SALUL
Salix scouleriana	Scouler's willow	FAC	native	SASC
Salix sitchensis	Sitka willow	FACW	native	SASI2
Sambucus mexicana	Blue elderberry	FACU	native	SAMEC2
Sambucus racemosa	Red elderberry	FACU	native	SARA2
Satureja douglasii	Yerba buena	UPL	native	SADO5
Saxifraga mertensiana	Wood saxifrage	FACW	native	SAME7

Scientific name	Common name	Wetland	Origin	PLANTS code
Saxifraga nuttallii	Nuttall's saxifrage	OBL	native	SANU3
Saxifraga odontoloma	Stream saxifrage	FAC+	native	SAOD2
Saxifraga odontoloma	Stream saxifrage	FACW	native	SAOD2
Saxifraga oregana	Oregon saxifrage	FACW	native	SAOR2
Scirpus congdonii	Congdon's bulrush	FACW	native	SCCO
Scirpus microcarpus	Small-flowered bullrush	OBL	native	SCMI2
Scoliopus hallii	Slink lily	FACU	native	SCHA2
Scrophularia californica	California figwort	FACW	native	SCCA2
Sedum	Sedum species	UNK	unknown	SEDUM
Senecio jacobaea	*Tansy ragwort*	FACU	exotic	SEJA
Senecio pseudaureus	Streambank groundsel	FACW	native	SEPS2
Senecio triangularis	Arrowleaf groundsel	FACW	native	SETR
Senecio vulgaris	*Common groundsel*	FACU	exotic	SEVU
Solanum dulcamara	*Bittersweet*	FAC+	exotic	SODU
Sorbus scopulina	Western mountain-ash	FACU	native	SOSC2
Sorbus sitchensis	Sitka mountain ash	UPL	native	SOSI2
Spiraea douglasii	Douglas spiraea	FACW	native	SPDO
Stachys cooleyae	Cooley's betony	FACW	native	STCO14
Stachys mexicana	Mexican betony	FACW	native	STAJR
Stellaria calycantha	Northern starwort	FACW	native	STCA
Stellaria crispa	Crisp sandwort	FAC+	native	STCR2
Stellaria media	*Chickweed*	FACU	exotic	STME2
Stellaria umbellata	Umbellate starwort	FACW	native	STUM
Stenanthium occidentale	Mountainbells	FAC	native	STOC
Streptopus amplexifolius	Clasping twistedstalk	FAC-	native	STAM2
Streptopus lanceolatus var. curvipes	Rosy twistedstalk	UPL	native	STLAC
Streptopus streptopoides	Small twistedstalk	UPL	native	STST3
Symphoricarpos albus	Common snowberry	FACU	native	SYAL
Symphoricarpos mollis	Trailing snowberry	FACU	native	SYHE
Synthyris reniformis	Snowqueen	UPL	native	SYRE
Taraxacum officinale	*Common dandelion*	FACU	exotic	TAOF
Taxus brevifolia	Pacific yew	FACU	native	TABR2
Tellima grandiflora	Fringecup	UPL	native	TEGR2
Thalictrum occidentale	Western meadowrue	FACU	native	THOC
Thalictrum polycarpum	Tall western meadowrue	UPL	native	THFEP2
Thuja plicata	Western redcedar	FAC	native	THPL

Scientific name	Common name	Wetland	Origin	PLANTS code
Tiarella trifoliata	Coolwort foamflower	FAC-	native	TITR
Tiarella trifoliata var. trifoliata	Coolwort foamflower	FAC-	native	TITR
Tiarella trifoliata var. unifoliata	Coolwort foamflower	UPL	native	TITRU
Tolmiea menziesii	Piggyback plant	FAC	native	TOME
Torilis	*Hedgeparsley*	UNK	exotic	TORIL
Torreyochloa pallida var. pauciflora	Weak alkali grass	OBL	native	TOPAP3
Toxicodendron diversilobum	Poison oak	UPL	native	TODI
Trautvetteria caroliniensis	False bugbane	FAC	native	TRCA
Trientalis arctica	Northern starflower	OBL	native	TREUA2
Trientalis latifolia	Western starflower	FAC-	native	TRLA6
Trifolium howellii	Howell's clover	FACW	native	TRHO
Trifolium longipes	Long-stalked clover	FAC-	native	TRLO
Trillium ovatum	Pacific trillium	FACU	native	TROV2
Trisetum canescens	Tall trisetum	FACU	native	TRCEC
Trisetum cernuum	Nodding trisetum	FACU	native	TRCE2
Tsuga heterophylla	Western hemlock	FACU	native	TSHE
Tsuga mertensiana	Mountain hemlock	FACU	native	TSME
Urtica dioica ssp. gracilis	Nettle	FAC+	native	URDI
Vaccinium alaskaense	Oval-leaf huckleberry	FACU	native	VAOV
Vaccinium deliciosum	Blueleaf huckleberry	UPL	native	VADE
Vaccinium membranaceum	Big huckleberry	FACU	native	VAME
Vaccinium ovalifolium	Oval-leaf huckleberry	UPL	native	VAOV
Vaccinium ovatum	Evergreen huckleberry	UPL	native	VAOV2
Vaccinium parvifolium	Red huckleberry	FACU	native	VAPA
Vaccinium scoparium	Grouse whortleberry	FACU	native	VASC
Valeriana occidentalis	Western valerian	FAC	native	VAOC2
Valeriana scouleri	Scouler's valerian	FAC	native	VASC2
Valeriana sitchensis	Sitka valerian	FAC	native	VASI
Vancouveria hexandra	Insideout flower	UPL	native	VAHE
Veratrum californicum	California false hellebore	FACW	native	VECA2
Veratrum viride	False hellebore	FACW	native	VEVI
Veronica americana	American brooklime	OBL	native	VEAM2
Veronica officinalis	*Common gypsyweed*	UPL	exotic	VEOF2
Viburnum edule	High-bush cranberry	FACW	native	VIED
Viburnum ellipticum	Oval-leaved viburnum	FACU	native	VIEL
Vicia americana	American vetch	FAC	native	VIAM

Scientific name	Common name	Wetland	Origin	PLANTS code
Vicia sativa	*Garden vetch*	UPL	exotic	VISA
Vinca	Periwinkle	UNK	unknown	VINCA
Viola canadensis	Canada violet	UPL	native	VICA4
Viola glabella	Stream violet	FAC	native	VIGL
Viola orbiculata	Round-leaved violet	UPL	native	VIOR
Viola palustris	Marsh violet	OBL	native	VIPA4
Viola sempervirens	Evergreen violet	UPL	native	VISE3
Whipplea modesta	Whipple vine	UPL	native	WHMO
Xerophyllum tenax	Beargrass	FACU	native	XETE

Appendix I (continued): Species list
Alphabetized by common name

Common name	Scientific name	Wetland	Origin	PLANTS code
Alaska brome	Bromus sitchensis	FACU	native	BRSI
Alaska oniongrass	Melica subulata	UPL	native	MESU
Alaska yellow-cedar	Chamaecyparis nootkatensis	FAC	native	CHNO
Alpine aster	Aster alpigenus	FAC	native	ASAL2
Alpine bentgrass	Agrostis humilis	FACW	native	AGHU
Alpine willowherb	Epilobium anagallidifolium	FACW	native	EPAN4
American bistort	Polygonum bistortoides	FACW	native	POBI6
American brooklime	Veronica americana	OBL	native	VEAM2
American vetch	Vicia americana	FAC	native	VIAM
Angled bittercress	Cardamine angulata	FACW	native	CAAN5
Arctic rush	Juncus arcticus var. balticus	FACW	native	JUBA
Arrowleaf groundsel	Senecio triangularis	FACW	native	SETR
Baldhip rose	Rosa gymnocarpa	FACU	native	ROGY
Bearded fescue	Festuca subulata	FACU	native	FESU
Beargrass	Xerophyllum tenax	FACU	native	XETE
Beautiful alumroot	Heuchera cylindrica var. glabella	UPL	native	HECYG
Big chickweed	Cerastium fontanum ssp. vulgare	FACU	exotic	CEFOV2
Big deervetch	Lotus crassifolius	UPL	native	LOCR
Big huckleberry	Vaccinium membranaceum	FACU	native	VAME
Big leaf maple	Acer macrophyllum	FACU	native	ACMA3
Big-leaved sandwort	Moehringia macrophylla	UPL	native	MOMA3
Bird-eye pearlwort	Sagina procumbens	FAC	exotic	SAPR
Bird's-foot trefoil	Lotus corniculatus	FAC	exotic	LOCO6
Bitter dock	Rumex obtusifolius	FAC	exotic	RUOB
Bittersweet	Solanum dulcamara	FAC+	exotic	SODU
Black cottonwood	Populus trichocarpa	FAC	native	POBAT
Black gooseberry	Ribes lacustre	FAC+	native	RILA
Black hawthorn	Crataegus douglasii	FAC	native	CRDO2
Black raspberry	Rubus leucodermis	UPL	native	RULE
Black twinberry	Lonicera involucrata	FAC+	native	LOIN5
Blue elderberry	Sambucus mexicana	FACU	native	SAMEC2
Blue wildrye	Elymus glaucus	FACU	native	ELGL
Blue windflower	Anemone oregana	FACU	native	ANOR
Bluejoint	Calamagrostis canadensis	FACW	native	CACA4

Common name	Scientific name	Wetland	Origin	PLANTS code
Blueleaf huckleberry	Vaccinium deliciosum	UPL	native	VADE
Bog St.John's-wort	Hypericum anagalloides	OBL	native	HYAN2
Borage species	Borago	UNK	unknown	BORAG
Bracted lousewort	Pedicularis bracteosa	UPL	native	PEBR
Brewer's bittercress	Cardamine breweri	FACW	native	CABR6
Brewer's miterwort	Mitella breweri	FAC	native	MIBR6
Broadleaf arnica	Arnica latifolia	FAC-	native	ARLA8
Broad-leaved marsh-marigold	Caltha leptosepala	OBL	native	CALE4
Broad-leaved twayblade	Listera convallarioides	FAC	native	LICO5
Bull thistle	Cirsium vulgare	FACU	exotic	CIVU
California false hellebore	Veratrum californicum	FACW	native	VECA2
California figwort	Scrophularia californica	FACW	native	SCCA2
California grass-of-Parnassus	Parnassia californica	OBL	native	PACA18
California hazel	Corylus cornuta	FACU	native	COCO6
California spikenard	Aralia californica	FAC+	native	ARCA2
Canada thistle	Cirsium arvense	FAC-	exotic	CIAR4
Canada violet	Viola canadensis	UPL	native	VICA4
Cascade azalea	Rhododendron albiflorum	FACU	native	RHAL2
Cascara buckthorn	Rhamnus purshiana	FACU	native	FRPU7
Chickweed	Stellaria media	FACU	exotic	STME2
Chickweed monkey-flower	Mimulus alsinoides	OBL	native	MIAL3
Chinquapin	Chrysolepis chrysophylla	UPL	native	CHCH7
Ciliate bluebells	Mertensia ciliata	FACW	native	MECI3
Clasping twistedstalk	Streptopus amplexifolius	FAC-	native	STAM2
Cleaver	Galium aparine	FACU	native	GAAP2
Clustered wild rose	Rosa pisocarpa	FAC	native	ROPI2
Coast penstemon	Penstemon serrulatus	FACU	native	PESE5
Coastal boykinia	Boykinia occidentalis	FACW	native	BOOC2
Coastal burnweed	Erechtites minima	FACU	exotic	ERMI6
Cold-water corydalis	Corydalis aquae-gelidae	OBL	native	COAQ
Colombian brome	Bromus vulgaris	UPL	native	BRVU
Colonial bentgrass	Agrostis capillaris	FACU	exotic	AGCA5
Coltsfoot	Petasites frigidus	FACW	native	PEFR5
Columbian lily	Lilium columbianum	FAC	native	LICO
Columbian monkshood	Aconitum columbianum	FACW	native	ACCO4

Common name	Scientific name	Wetland	Origin	PLANTS code
Columbian monkshood	Aconitum columbianum ssp. columbianum	FACW	native	ACCOC2
Columbian monkshood	Aconitum columbianum ssp. viviparum	FACW	native	ACCOV2
Common camas	Camassia quamash	FACW	native	CAQU2
Common dandelion	Taraxacum officinale	FACU	exotic	TAOF
Common foxglove	Digitalis purpurea	FACU	exotic	DIPU
Common groundsel	Senecio vulgaris	FACU	exotic	SEVU
Common gypsyweed	Veronica officinalis	UPL	exotic	VEOF2
Common horsetail	Equisetum arvense	FAC	native	EQAR
Common nipplewort	Lapsana communis	UPL	exotic	LACO3
Common red paintbrush	Castilleja miniata	FAC	native	CAMI12
Common rush	Juncus effusus	FACW	native	JUEF
Common snowberry	Symphoricarpos albus	FACU	native	SYAL
Common St.John's-wort	Hypericum perforatum	UPL	exotic	HYPE
Common velvet-grass	Holcus lanatus	FAC	exotic	HOLA
Common yampah	Perideridia montana	FAC	native	PEMO7
Congdon's bulrush	Scirpus congdonii	FACW	native	SCCO
Cooley's betony	Stachys cooleyae	FACW	native	STCO14
Coolwort foamflower	Tiarella trifoliata	FAC-	native	TITR
Coolwort foamflower	Tiarella trifoliata var. trifoliata	FAC-	native	TITR
Coolwort foamflower	Tiarella trifoliata var. unifoliata	UPL	native	TITRU
Coville's rush	Juncus covillei	FACW	native	JUCO5
Cow-parsnip	Heracleum lanatum	FAC	native	HELA4
Creeping bentgrass	Agrostis stolonifera	FAC+	exotic	AGST2
Creeping buttercup	Ranunculus repens	FACW	exotic	RARE3
Creeping buttercup	Ranunculus repens var. repens	FACW	exotic	RARER
Creeping spike-rush	Eleocharis palustris	OBL	native	ELPA3
Crisp sandwort	Stellaria crispa	FAC+	native	STCR2
Curled dock	Rumex crispus	FAC+	exotic	RUCR
Dagger-leaved rush	Juncus ensifolius	FACW	native	JUEN
Deer fern	Blechnum spicant	FAC+	native	BLSP
Dentate shooting star	Dodecatheon dentatum	FACW	native	DODE
Devil's club	Oplopanax horridum	FAC+	native	OPHO
Dewey's sedge	Carex deweyana	FACU	native	CADE9

Common name	Scientific name	Wetland	Origin	PLANTS code
Dogwood bunchberry	Cornus unalaschkensis	FAC-	native	COUN
Dotted smartweed	Polygonum punctatum	OBL	native	POPU5
Douglas' sagewort	Artemisia douglasiana	FACW	native	ARDO3
Douglas spiraea	Spiraea douglasii	FACW	native	SPDO
Douglas' water-hemlock	Cicuta douglasii	OBL	native	CIDO
Douglas-fir	Pseudotsuga menziesii	FACU	native	PSME
Dune bentgrass	Agrostis pallens	FACU	native	AGPA8
Dwarf bramble	Rubus lasiococcus	UPL	native	RULA2
Dwarf Oregon grape	Berberis nervosa	UPL	native	BENE2
Enchanter's-nightshade	Circaea alpina	FAC	native	CIAL
Engelmann's spruce	Picea engelmannii	FAC	native	PIEN
English ivy	Hedera helix	UPL	exotic	HEHE
Evergreen huckleberry	Vaccinium ovatum	UPL	native	VAOV2
Evergreen violet	Viola sempervirens	UPL	native	VISE3
False bugbane	Trautvetteria caroliniensis	FAC	native	TRCA
False hellebore	Veratrum viride	FACW	native	VEVI
False lily of the valley	Maianthemum dilatatum	FAC	native	MADI
False Solomon's-seal	Maianthemum racemosum	FAC-	native	MARA7
Few-sided bittercress	Cardamine oligosperma	FAC	native	CAOL
Fireweed	Chamerion angustifolium var. canescens	FACU	native	EPAN2
Five=stamen mitrewort	Mitella pentandra	FAC	native	MIPE
Five-leaved bramble	Rubus pedatus	FACU	native	RUPE
Fool's huckleberry	Menziesia ferruginea	FACU	native	MEFE
Fowl bluegrass	Poa palustris	FAC	exotic	POPA2
Fringecup	Tellima grandiflora	UPL	native	TEGR2
Fringed grass-of-Parnassus	Parnassia fimbriata	OBL	native	PAFI3
Fritillaria species	Fritillaria	UNK	native	FRITI
Garden vetch	Vicia sativa	UPL	exotic	VISA
Giant horsetail	Equisetum telmateia	FACW	native	EQTE
Giant knotweed	Polygonum sachalinense	FACU	exotic	POSA4
Gold thread	Coptis laciniata	FAC	native	COLA3
Grand fir	Abies grandis	FACU	native	ABGR
Gray's lovage	Ligusticum grayi	UPL	native	LIGR

Common name	Scientific name	Wetland	Origin	PLANTS code
Great Jacob's-ladder	Polemonium carneum	OBL	native	POCA4
Great northern aster	Aster modestus	FACW	native	ASMO3
Greenfruit sedge	Carex interrupta	OBL	native	CAIN17
Ground-ivy	Glechoma hederacea	FACU	exotic	GLHE2
Grouse whortleberry	Vaccinium scoparium	FACU	native	VASC
Hairy cat's ear	Hypochaeris radicata	FACU	exotic	HYRA3
Heartleaf bittercress	Cardamine cordifolia	FACW	native	CACO6
Heartleaf twayblade	Listera cordata	FAC	native	LICO6
Heart-leaved springbeauty	Claytonia cordifolia	FACW	native	CLCO3
Hedgeparsley	Torilis	UNK	exotic	TORIL
Henderson's sedge	Carex hendersonii	FAC	native	CAHE7
High-bush cranberry	Viburnum edule	FACW	native	VIED
Himalayan blackberry	Rubus armeniacus	FACU	exotic	RUDI2
Hooker's fairybells	Prosartes hookeri	OBL	native	PRHO2
Hound's-tongue species	Cynoglossum	UNK	unknown	CYNOG
Howell's clover	Trifolium howellii	FACW	native	TRHO
Idaho fescue	Festuca idahoensis	FACU	native	FEID
Incense cedar	Calocedrus decurrens	UPL	native	CADE27
Indian plum	Oemleria cerasiformis	FACU	native	OECE
Insideout flower	Vancouveria hexandra	UPL	native	VAHE
Jewelweed	Impatiens capensis	FACW	native	IMCA
Kneeling angelica	Angelica genuflexa	FACW	native	ANGE2
Krajina hard fescue	Festuca trachyphylla	UPL	exotic	FEOV
Lady fern	Athyrium filix-femina	FAC+	native	ATFI
Large boykinia	Boykinia major	FACW	native	BOMA3
Large-leaved avens	Geum macrophyllum	FAC+	native	GEMA4
Lax-flowered bluegrass	Poa laxiflora	OBL	native	POLA3
Leafy mitrewort	Mitella caulescens	UPL	native	MICA5
Leathery grapefern	Botrychium multifidum	FAC	native	BOMU
Lesser spearwort	Ranunculus flammula	OBL	native	RAFL2
Licorice fern	Polypodium glycyrrhiza	OBL	native	POGL8
Little buttercup	Ranunculus uncinatus	FAC	native	RAUN
Lodgepole pine	Pinus contorta	FAC	native	PICO
Longstalk cranesbill	Geranium columbinum	UPL	exotic	GECO
Long-stalked clover	Trifolium longipes	FAC-	native	TRLO

Common name	Scientific name	Wetland	Origin	PLANTS code
Lupine species	Lupinus	UNK	unknown	LUPIN
Lyall's anemone	Anemone lyallii	UPL	native	ANLY
Maidenhair fern	Adiantum pedatum	FAC	native	ADPE
Manroot	Marah oreganus	UPL	native	MAOR3
Many-flowered wood-rush	Luzula multiflora	FACU	exotic	LUCA2
Many-flowered wood-rush	Luzula multiflora ssp. multiflora	FACU	exotic	LUCAM3
Manyrib sedge	Carex multicostata	FACU	native	CAMU6
Marsh violet	Viola palustris	OBL	native	VIPA4
Marshpepper smartweed	Polygonum hydropiper	OBL	exotic	POHY
Meadow birds-foot trefoil	Lotus denticulatus	UPL	native	LODE
Merten's sedge	Carex mertensii	FAC	native	CAME6
Mexican betony	Stachys mexicana	FACW	native	STAJR
Miner's lettuce	Claytonia perfoliata	FAC	native	CLPE
Mount Hood bugbane	Cimicifuga laciniata	FACW	native	CILA
Mountain alder	Alnus incana	FACW	native	ALIN2
Mountain hemlock	Tsuga mertensiana	FACU	native	TSME
Mountainbells	Stenanthium occidentale	FAC	native	STOC
Musk-flower	Mimulus moschatus	FACW	native	MIMO3
Narrow-leaved Montia	Montia linearis	UPL	native	MOLI4
Nettle	Aruncus dioicus	FACU	native	ARDI8
Nettle	Urtica dioica ssp. gracilis	FAC+	native	URDI
Ninebark	Physocarpus capitatus	FACW	native	PHCA11
Noble fir	Abies procera	UPL	native	ABPR
Nodding semaphore grass	Pleuropogon refractus	OBL	native	PLRE2
Nodding trisetum	Trisetum cernuum	FACU	native	TRCE2
Nootka rose	Rosa nutkana	FAC-	native	RONU
Northern starflower	Trientalis arctica	OBL	native	TREUA2
Northern starwort	Stellaria calycantha	FACW	native	STCA
Northern twayblade	Listera borealis	FACW	native	LIBO4
Northwestern twayblade	Listera caurina	FACU	native	LICA10
Nuttall's saxifrage	Saxifraga nuttallii	OBL	native	SANU3
Oceanspray	Holodiscus discolor	UPL	native	HODI
Olumpic larkspur	Delphinium glareosum	UPL	native	DEGL
Orange honeysuckle	Lonicera ciliosa	UPL	native	LOCI3
Orchard grass	Dactylis glomerata	FACU	exotic	DAGL

Common name	Scientific name	Wetland	Origin	PLANTS code
Oregon ash	Fraxinus latifolia	FACW	native	FRLA
Oregon bedstraw	Galium oreganum	FACU	native	GAOR
Oregon bentgrass	Agrostis oregonensis	FAC	native	AGOR
Oregon boxwood	Paxistima myrsinites	UPL	native	PAMY
Oregon oxalis	Oxalis oregana	UPL	native	OXOR
Oregon saxifrage	Saxifraga oregana	FACW	native	SAOR2
Oregon white oak	Quercus garryana	UPL	native	QUGA4
Oregon wintergreen	Gaultheria ovatifolia	FAC	native	GAOV2
Oval-leaf huckleberry	Vaccinium alaskaense	FACU	native	VAOV
Oval-leaf huckleberry	Vaccinium ovalifolium	UPL	native	VAOV
Oval-leaved mitrewort	Mitella ovalis	OBL	native	MIOV
Oval-leaved viburnum	Viburnum ellipticum	FACU	native	VIEL
Oxeye daisy	Leucanthemum vulgare	UPL	exotic	LEVU
Pacific bleedingheart	Dicentra formosa	UPL	native	DIFO
Pacific brome	Bromus pacificus	UPL	native	BRPA3
Pacific dogwood	Cornus nuttallii	UPL	native	CONU4
Pacific rhododendron	Rhododendron macrophyllum	UPL	native	RHMA3
Pacific trillium	Trillium ovatum	FACU	native	TROV2
Pacific waterleaf	Hydrophyllum tenuipes	FACU	native	HYTE
Pacific willow	Salix lucida	FACW	native	SALUL
Pacific yew	Taxus brevifolia	FACU	native	TABR2
Parry's rush	Juncus parryi	FAC+	native	JUPA
Pathfinder	Adenocaulon bicolor	UPL	native	ADBI
Pearly everlasting	Anaphalis margaritacea	UPL	native	ANMA
Peppermint	Mentha Xpiperita	FACW	exotic	MEPI
Periwinkle	Vinca	UNK	unknown	VINCA
Piggyback plant	Tolmiea menziesii	FAC	native	TOME
Pigweed species	Amaranthus	UNK	unknown	AMARA
Pink monkeyflower	Mimulus lewisii	FACW	native	MILE2
Pink phlox	Phlox gracilis	FACU	native	PHGRG
Pink wintergreen	Pyrola asarifolia	FACU	native	PYAS
Plantain goldenweed	Pyrrocoma uniflora	FAC+	native	PYUN2
Poison oak	Toxicodendron diversilobum	UPL	native	TODI
Prickly lettuce	Lactuca serriola	FACU	exotic	LASE
Prickly sedge	Carex echinata	FACW	native	CAEC

Common name	Scientific name	Wetland	Origin	PLANTS code
Prince's pine	Chimaphila umbellata	UPL	native	CHUM
Purple peavine	Lathyrus nevadensis	UPL	native	LANEP
Purple-leaved willowherb	Epilobium ciliatum ssp. glandulosum	FACW	native	EPCIG
Purple-leaved willowherb	Epilobium ciliatum ssp. watsonii	FACW	native	EPCIW
Queencup beadlily	Clintonia uniflora	UPL	native	CLUN2
Rattlesnake plantain	Goodyera oblongifolia	FACU	native	GOOB2
Red alder	Alnus rubra	FAC	native	ALRU2
Red baneberry	Actaea rubra	UPL	native	ACRU2
Red elderberry	Sambucus racemosa	FACU	native	SARA2
Red huckleberry	Vaccinium parvifolium	FACU	native	VAPA
Red osier dogwood	Cornus sericea	FACW	native	COSE16
Red-flowering currant	Ribes sanguineum	UPL	native	RISA
Reed canarygrass	Phalaris arundinacea	FACW	exotic	PHAR3
Reed mannagrass	Glyceria grandis	OBL	native	GLGR
Regel's rush	Juncus regelii	FACW	native	JURE
Ribwort	Plantago lanceolata	FACU	exotic	PLLA
Ripgut brome	Bromus rigidus	UPL	exotic	BRDI3
Rocky Mountain maple	Acer glabrum var. douglasii	FAC	native	ACGLD4
Rosy twistedstalk	Streptopus lanceolatus var. curvipes	UPL	native	STLAC
Rough bluegrass	Poa trivialis	FACW	exotic	POTR2
Round-leaved violet	Viola orbiculata	UPL	native	VIOR
Russet sedge	Carex saxatilis	FACW	native	CASA10
Salal	Gaultheria shallon	FACU	native	GASH
Salmonberry	Rubus spectabilis	FAC+	native	RUSP
Sandwort species	Arenaria	UNK	unknown	ARENA
Saskatoon serviceberry	Amelanchier alnifolia	FACU	native	AMAL2
Scotch broom	Cytisus scoparius	UPL	exotic	CYSC4
Scouler's bluebell	Campanula scouleri	UPL	native	CASC7
Scouler's corydalis	Corydalis scouleri	FAC+	native	COSC4
Scouler's valerian	Valeriana scouleri	FAC	native	VASC2
Scouler's willow	Salix scouleriana	FAC	native	SASC
Scouring-rush	Equisetum hyemale	FACW	native	EQHY
Seashore saltgrass	Distichlis spicata	FACW	native	DISP
Sedum species	Sedum	UNK	unknown	SEDUM
Selfheal	Prunella vulgaris	FACU	native	PRVU

Common name	Scientific name	Wetland	Origin	PLANTS code
Shade phacelia	Phacelia nemoralis	UPL	native	PHNE2
Sharptooth angelica	Angelica arguta	FACW	native	ANAR3
Showy sedge	Carex spectabilis	FACW	native	CASP5
Siberian miner's lettuce	Claytonia sibirica	FAC	native	CLSI2
Sidebells wintergreen	Orthilia secunda	FACU	native	ORSE
Silver fir	Abies amabilis	FACU	native	ABAM
Silver pussytoes	Antennaria argentea	FACU	native	ANAR5
Silverleaf phacelia	Phacelia hastata	UPL	native	PHHA
Sitka alder	Alnus viridis	FACW	native	ALVI5
Sitka columbine	Aquilegia formosa	FAC	native	AQFO
Sitka mountain ash	Sorbus sitchensis	UPL	native	SOSI2
Sitka sedge	Carex aquatilis var. dives	OBL	native	CAAQD
Sitka spruce	Picea sitchensis	FAC	native	PISI
Sitka valerian	Valeriana sitchensis	FAC	native	VASI
Sitka willow	Salix sitchensis	FACW	native	SASI2
Skunk cabbage	Lysichiton americanum	OBL	native	LYAM3
Slender bog-orchid	Platanthera stricta	FACW	native	PLST4
Slender hairgrass	Deschampsia elongata	FACW	native	DEEL
Slender hawkweed	Hieracium gracile	UPL	native	HIGR
Slender muhlenbergia	Muhlenbergia filiformis	FACW	native	MUFI2
Slenderbeak sedge	Carex athrostachya	FACW	native	CAAT3
Slink lily	Scoliopus hallii	FACU	native	SCHA2
Slough sedge	Carex obnupta	OBL	native	CAOB3
Small bedstraw	Galium trifidum	FACW	native	GATR2
Small twistedstalk	Streptopus streptopoides	UPL	native	STST3
Smallflower nemophila	Nemophila parviflora	UPL	native	NEPA
Small-flowered alumroot	Heuchera micrantha	UPL	native	HEMI7
Small-flowered blue-eyed Mary	Collinsia parviflora	UPL	native	COPA3
Small-flowered bullrush	Scirpus microcarpus	OBL	native	SCMI2
Small-flowered forget-me-not	Myosotis laxa	OBL	native	MYLA
Small-flowered willowherb	Epilobium minutum	UPL	native	EPMI
Small-flowered wood-rush	Luzula parviflora	FAC-	native	LUPA4
Small-flowered wood-rush	Luzula parviflora	FAC-	native	LUPA4
Smith's fairybells	Prosartes smithii	OBL	native	DISM2

Common name	Scientific name	Wetland	Origin	PLANTS code
Smooth brome	Bromus inermis	FAC	exotic	BRIN2
Smooth willowherb	Epilobium glaberrimum	FACW	native	EPGL
Smoothbeak sedge	Carex integra	FACU	native	CAIN10
Smoothstem sedge	Carex laeviculmis	FACW	native	CALA13
Snowbrush ceanothus	Ceanothus velutinus	UPL	native	CEVE
Snowqueen	Synthyris reniformis	UPL	native	SYRE
Spearmint	Mentha spicata	OBL	exotic	MESP3
Spike bentgrass	Agrostis exarata	FACW	native	AGEX
Spinyfruit buttercup	Ranunculus muricatus	FACW	exotic	RAMU2
Spreading rush	Juncus patens	FACW	native	JUPA2
Star mustard	Huperzia chinensis	FACU	native	HUCH
Starry false Solomon's-seal	Maianthemum stellatum	FAC-	native	MAST4
Sticky chickweed	Cerastium glomeratum	UPL	exotic	CEGL2
Stink currant	Ribes bracteosum	FAC	native	RIBR
Stream saxifrage	Saxifraga odontoloma	FAC+	native	SAOD2
Stream saxifrage	Saxifraga odontoloma	FACW	native	SAOD2
Stream violet	Viola glabella	FAC	native	VIGL
Streambank arnica	Arnica amplexicaulis	FACW	native	ARAM2
Streambank groundsel	Senecio pseudaureus	FACW	native	SEPS2
Streambank springbeauty	Montia parvifolia	FACW	native	MOPA2
Subalpine daisy	Erigeron peregrinus	UPL	native	ERPE3
Subalpine fir	Abies lasiocarpa	FACU	native	ABLA
Suksdorf woodsorrel	Oxalis suksdorfii	UPL	native	OXSU
Sweet cecily	Osmorhiza berteroi	FAC	native	OSBE
Sweet vernalgrass	Anthoxanthum odoratum	FACU	exotic	ANOD
Sweetbriar rose	Rosa eglanteria	FACW	exotic	ROEG
Sweetscented bedstraw	Galium triflorum	FACU	native	GATR3
Sword fern	Polystichum munitum	FACU	native	POMU
Tall agoseris	Agoseris elata	FAC	native	AGEL
Tall blue lettuce	Lactuca biennis	FAC	native	LABI
Tall bluebells	Mertensia paniculata	FACW	native	MEPA
Tall fescue	Lolium arundinaceum	FAC-	exotic	LOAR10
Tall mannagrass	Glyceria striata	FACW	native	GLST
Tall Oregon grape	Berberis aquifolium	UPL	native	BEAQ
Tall trisetum	Trisetum canescens	FACU	native	TRCEC

Common name	Scientific name	Wetland	Origin	PLANTS code
Tall western meadowrue	Thalictrum polycarpum	UPL	native	THFEP2
Tansy ragwort	Senecio jacobaea	FACU	exotic	SEJA
Thick-headed sedge	Carex pachystachya	FAC	native	CAPA14
Thimbleberry	Rubus parviflorus	FAC-	native	RUPA
Three-leaved anemone	Anemone deltoidea	UPL	native	ANDE3
Toad rush	Juncus bufonius	FACW	native	JUBU
Tooth-leaved monkeyflower	Mimulus dentatus	OBL	native	MIDE3
Trailing blackberry	Rubus ursinus	FACU	native	RUUR
Trailing snowberry	Symphoricarpos mollis	FACU	native	SYHE
Trillium-leaved sorrel	Oxalis trilliifolia	FAC+	native	OXTR
Trollius-leaved larkspur	Delphinium trolliifolium	UPL	native	DETR2
Tufted hairgrass	Deschampsia cespitosa	FACW	native	DECE
Tufted sedge	Carex lenticularis	FACW	native	CALE8
Twinflower	Linnaea borealis	FACU	native	LIBO3
Two-lobe larkspur	Delphinium nuttallianum	FAC	native	DENU2
Umbellate starwort	Stellaria umbellata	FACW	native	STUM
Vanilla leaf	Achlys triphylla	UPL	native	ACTR
Varied leaf collomia	Collomia heterophylla	FACU	native	COHE2
Vine maple	Acer circinatum	FAC-	native	ACCI
Wall-lettuce	Lactuca muralis	UPL	exotic	MYMU
Water sedge	Carex aquatilis	OBL	native	CAAQ
Water-carpet	Chrysosplenium glechomifolium	OBL	native	CHGL5
Waterparsley	Oenanthe sarmentosa	OBL	native	OESA
Weak alkali grass	Torreyochloa pallida var. pauciflora	OBL	native	TOPAP3
Western bittercress	Cardamine occidentalis	FACW	native	CAOC
Western brackenfern	Pteridium aquilinum	FACU	native	PTAQ
Western coneflower	Rudbeckia occidentalis	FAC-	native	RUOC2
Western coral root	Corallorhiza maculata	UPL	native	COMA4
Western fescue	Festuca occidentalis	UPL	native	FEOC
Western hemlock	Tsuga heterophylla	FACU	native	TSHE
Western larkspur	Delphinium occidentale	FACU	exotic	DEOC
Western meadowrue	Thalictrum occidentale	FACU	native	THOC
Western mountain-ash	Sorbus scopulina	FACU	native	SOSC2
Western oakfern	Gymnocarpium dryopteris	FAC	native	GYDR

Common name	Scientific name	Wetland	Origin	PLANTS code
Western polemonium	Polemonium occidentale	FACW	native	POOC2
Western redcedar	Thuja plicata	FAC	native	THPL
Western snakeroot	Ageratina occidentalis	UPL	native	AGOC2
Western St. John's-wort	Hypericum formosum	FAC	native	HYFO4
Western starflower	Trientalis latifolia	FAC-	native	TRLA6
Western valerian	Valeriana occidentalis	FAC	native	VAOC2
Western white pine	Pinus monticola	FACU	native	PIMO3
Whipple vine	Whipplea modesta	UPL	native	WHMO
White hawkweed	Hieracium albiflorum	UPL	native	HIAL2
Wild ginger	Asarum caudatum	FACU	native	ASCA2
Wild gooseberry	Ribes divaricatum	FAC	native	RIDI
Wild strawberry	Fragaria virginiana	FACU	native	FRVI
Willamette false rue anemone	Enemion hallii	UPL	native	ENHA
Willow dock	Rumex salicifolius	FACW	native	RUSA
Wood fern	Dryopteris carthusiana	FAC+	native	DRCA11
Wood reedgrass	Cinna latifolia	FACW	native	CILA2
Wood saxifrage	Saxifraga mertensiana	FACW	native	SAME7
Woodland penstemon	Nothochelone nemorosa	UPL	native	NONE3
Woodland strawberry	Fragaria vesca	FACU	native	FRVE
Woodrush sedge	Carex luzulina	OBL	native	CALU7
Woolly-weed	Hieracium scouleri	UPL	native	HISC2
Yarrow	Achillea millefolium	FACU	native	ACMI2
Yellow monkeyflower	Mimulus guttatus	OBL	native	MIGU
Yellow willowherb	Epilobium luteum	FACW	native	EPLU
Yerba buena	Satureja douglasii	UPL	native	SADO5

Appendix II: References

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