

High Elevation Bryophyte Surveys

Willamette National Forest

Final Report

March 2013

Project Objectives

Our objective was to survey high priority, high elevation habitat for rocky outcrop and lakeside sensitive and strategic non vascular species on the Willamette National Forest during 2012. Few of these species are documented and most are suspected on the forest. Surveys in this habitat provide information on the range and rarity of these species. All surveys and special status species that were found in surveys (highlighted in red) have been entered into the NRIS TESP Database. Species codes from the USDA PLANTS database are used below for common tree species.

Sweet Home District Surveys

Surveys were conducted at upper Gordon Lake, Riggs Lake, Don Lake, Silver Lake, Crescent Lake, North Peak Lake, Heart Lake and Gordon Meadows. Cliffs adjacent to lakes were also surveyed. Surveys occurred in August and September, 2012. Surveyors were Ryan Murdoff, Alice Smith, Kate Richards and Anna Bonnette. Collections ranged from 0-10 bryophytes per site.

Gordon Meadows

8/20/2012

T14S, R4E, Section 11 - UTM 0555208 4913002

Sphagnum sp., *Potentilla palustris*, *Caltha biflora*, *Drosera rotundifolia*, *Hypericum anagalloides*,
Apargidium boreale, *Kalmia occidentalis*

Collected 9 liverworts ; Alice Smith

Upper Gordon Lake and meadow and cliff southwest of Upper Gordon Lake

9/17/2012

T14S, R5E, Section 18 - UTM 0558382 4911742

Gordon Lake: *Sphagnum* sp., *Potentilla palustris*, *Menyanthes trifoliata*, *Carex lenticularis*, *Calamagrostis canadensis*, *Cicuta douglasii*, *Pedicularis groenlandica*

Meadow/Cliff: *Caltha biflora*, *Rubus pedatus*, *Rubus spectabilis*, *Alnus sinuata*; ABAM, TSHE, ABPR

Collected *Lobaria linata*, *Rhizomnium nudum* plus 4 mosses and 2 liverworts; Alice Smith and Ryan Murdoff

Crescent Lake Meadows

9/20/2012

T13S, R6E, Section 10 - UTM 0572512 4922648

Chamaecyparis nootkatensis, ABAM, ABLA, *Carex* sp., *Pedicularis groenlandica*, *Caltha biflora*, *Dodecatheon jeffreyi*, *Rudbeckia occidentalis*, *Tofieldia glutinosa*, *Calamagrostis canadensis*, *Scenecio triangularis*, *Mimulus guttatus*, *Hypericum anagalloides*, *Polygonum bistoides*, *Veratrum viride*, *Deschampsia cespitosa*, *Boykinia elata*, *Athyrium filix-femina*

Collected *Rhizomnium nudum* plus 1 moss and 3 liverworts; Alice Smith and Ryan Murdoff

Riggs and Don Lakes

9/27/2012

T12S, R6E, Section 4 - UTM 0571998 4933339

ABAM, *Carex vesicaria*, *Vaccinium ovalifolium*, *Spiraea douglasii*, *Acer circinatum*

Collected 2 liverworts at Riggs Lake and *Nephroma occultum* at Don Lake; Alice Smith

North Peak Lake

9/26/2012

T13S, R6E Section 21 UTM 0571720 4918930

ABAM, TSME, ABPR, *Pedicularis groenlandica*, *Spiraea splendens*, *Hypericum anagalloides*, *Vaccinium occidentale*, *Vaccinium membranaceum*, *Scenecio triangularis*, *Xerophyllum tenax*, *Calamagrostis canadensis*, *Rubus lasiococcus*, *Galium oreganum*, *Polygonum bistoides*, *Carex* spp.

Anna Bonnette and Kate Richards

Heart Lake

9/28/2012

T14S, R6E Section 3 UTM 0572691 4914779

ABAM, ABPR, THPL, *Sphagnum capillifolium*, *Boykinia major*, *Veratrum viride*, *Galium oreganum*, *Artemisia ludoviciana*, *Achyles triphylla*, *Ribes lacustre*, *Caltha biflora*, *Vaccinium membranaceum*, *Spiraea splendens*, *Streptopus amplexifolius*, *Aster* sp., *Salix sitchensis*, *Potentilla palustris*, *Pedicularis groenlandica*; Anna Bonnette and Kate Richards



Detroit District Surveys

Areas surveyed included Sentinel Hills Trail #3429 to Jefferson Park in several rocky areas, Park Butte area (above Jefferson Park, along the Breitenbush trail and Pacific Crest Trail in the northern portion of Mount Jefferson Wilderness) and 3 locations in the Halls Ridge area. Surveys took place in late August, 2012. Surveyors included Chris Wagner and her field crew. Approximately 133 bryophytes were collected.

Sentinel Hills Trail #3429

There were several areas of scree rocky slides but only a few interesting rocky outcrops along this trail. Collections were made only these rock gardens (Image 1). There were some rocky outcrop areas that were well shaded with a different group of bryophyte species growing. There were also areas of wetlands and slow flowing streams flowing nearby or through. All these sites were collected. No rare bryophytes were identified from these collections so far. Several crustose lichens were prevalent along with an *Umbilicaria* sp. Liverworts included *Porella bolanderi* and *P. cordaeana*. Typical mosses were *Pseudoleskia patens*, *Grimmia torquata*, *Orthotrichum* sp, *Stegonia hyalinotricha*, *Amphidium lapponicum*, a blue *Bryum* and *Claopodium*.

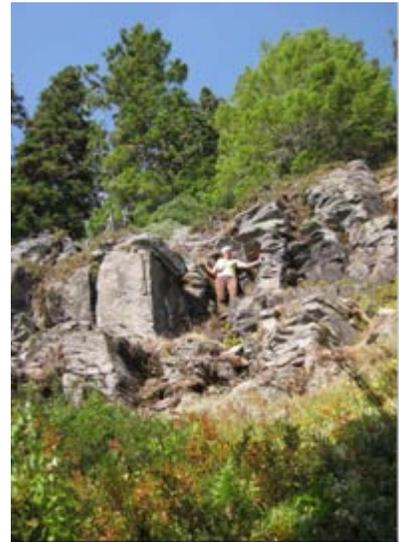


Image 1. Rocky outcrop along Sentinel Hills Trail this was best representative.

Jefferson Park, Mount Jefferson Wilderness

Collections were taken from all over the Jefferson Park, from the intersection of the Whitewater Trail and the Pacific Crest Trail, north around Scout Lake and area, throughout the park to Russell Lake and just north. No rare bryophytes were identified. Liverworts like *Jungermannia cordifolia*, *Jungermannia exertifolia* ssp *cordifolia*, *Lophozia sudetica* and *Scapania irrigua* were collected along with very common mosses like *Bryums*, *Fontinalis*, *Grimmia torquata*, *Rhizomnium*, *Campylopus* and others.

Park Butte, Mount Jefferson Wilderness

North of Russell Lake, the terrain climbs to higher elevations with sections of well shaded forest, small streams going through and glaciers still unfrozen in mid-September. Once you get to the top of this peak you are at Park Butte where it is flat and quite wet from continual glacial melt. In these small mossy melt-off streams we found the submerged lichen *Dermatocarpon meiophyllizum*. Documented liverworts include *Anastrophyllum*, *Cephalozia bicuspidata* and *Calypogia* species. Mosses were common: *Aulacomnium*, *Racomitrium*, *Bryums* and a possible *Conostomun*.



Image 2. Park Butte, collecting specimens from a glacial melt run off

Pacific Crest Trail/Mt Hood National Forest

This small portion of Mount Jefferson Wilderness is actually on the Mt Hood National Forest but is managed by Willamette National Forest. Specimens were collected all along the Pacific Crest Trail from Breitenbush Lake to Park Butte from all rocky outcrops along the way. Two sensitive liverworts were documented along the trail. These liverworts are *Anastrophyllum miniatum* and *Gymnomitrium concinnatum* which seemed to be associated with each other. The 2 liverworts were hanging from the trail cutbank. They are really well hidden and not obvious as they are very tiny. Lichens identified besides several different species of crustose lichens include *Solorina crocea* and *Peltigera*'s. Liverworts documented include *Lophozia ventricosa*, *Cephalozia*, *Cephaloziella*, *Chiloscyphus*, *Diplophyllum taxifolium* and a possible *Radula*. Mosses included the previously listed moss with added *Claopodium crispifolium*, *Oligotrichum hercynicum*, *Campylopodia stenocarpa*, *Pohlia vexans*, *Polytrichum juniperinum* and *Drepanocladus* (wetland).



Image 3. Location of *R gemmipara*.

Breitenbush Trail, Section 10

The most interesting part of this trail is the first 2 miles, leaving the Pacific Crest trail and heading west down the trail. These 2 miles are fairly flat with many vernal wetlands (prime habitat for *Calamagrostis breweri*) meadows, springs, a few rock gardens, and a lot of scree flow. It is along this portion of the trail, at a location that was lush and green meadow, with a very leisurely flowing stream, that I found *Rivulariella gemmipara*. This population makes the 12th documented population in Oregon. Plans are already in the works to revisit this site to

get more accurate population data. The only other bryophytes identified in section 10 are *Marsupella sphacelata*, *Scapania undulata*, *Calypogeia* and a possible *Harpanthus*.

Short Mountain

The last area collected from was the Short Mountain area, just north of the Breitenbush River. Several small rocky outcrops and waterfalls were collected from. There were no rare bryophytes identified. The only bryophytes identified so far are common ones: *Orthotrichum*, *Bryum*, *Dicranum*, and *Polytrichum*.

Middle Fork District Surveys

Surveys on the Middle Fork were completed in the Waldo and Diamond Lake Wildernesses. Seventeen areas were surveyed in the Waldo Lake Wilderness and adjacent high elevation areas (see Appendix A for list of survey areas). Nine areas were surveyed in the Diamond Peak Wilderness and high elevation lakes in the Timpanagos area. Surveys occurred in September 2012. Surveyors were Kate Richards, Adrienne Marble, Lin Kyan, Anna Bonnette and Molly Juillerat. Approximately 300 bryophytes and lichens were collected from these areas. The higher elevation areas and the outlets and inlets of the lakes had the most diverse and interesting habitat and species.

Waldo Lake Region

Bingo Lake: Bryophytes: *Anacolia menziesii*, *Chiloscyphus pallescens*, *Dicranum polysetum*, *Isothecium myosuroides*, *Lophozia ventricosa*, *Pellia neesia*, *Polytrichum commune*, Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia squamous*, *Hypogymnia inactive*, *Platismatia glauca*, *Usnea spp.*

Chetlo Lake: Bryophytes: *Andreaea rupestris*, *Cephalozia cf. plericeps*, *Chiloscyphus polyanthus*, *Gymnocolea c.f. inflata*, *Jungermannia cf. atrovirens*, *Leptobryum pyriforme*, *Nardia insecta*, *Scapania cf. irrigna*

Cupid Mary Lake: Bryophytes: *Phylontis yezoana*, *Sphagnum fimbriatum*, *Sphagnum girgensohnii*, *Sphagnum mendocinum*, Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia spp.*, *Hypogymnia imshaugii*, *Letharia columbiana*, *Platismatia glauca*, *Usnea spp.*

Lower Eddeeleo: Bryophytes: *Dicranum spp.*, *Phylontis capillaris*, *Pseudotoxiphyllum elegans* Lichens: *Cladonia spp.*, *Lophozia spp.*, *Marchantia polymorpha*

Upper Eddeeleo: Bryophytes: *Aulacomnium androgynum*, *Fontinalis antipyretica*, *Orthodicranum tauricum*, Lichens: *Bryoria spp.*, *Brachythecium albicans*, and *Hypogymnia physoides*



Elbow Lake: Bryophytes: none Lichens: *Cladonia squamosa*

Green Lake: *Philontis* spp., *Orthodicranum tauricum*

Lower Island Lake: Bryophytes: *Aulacomnium androgynum*, *Chiloscyphus pallescens*, *Dicranum scoparium* Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Platismatia glauca*

Upper Island Lake: Bryophytes: *Aulacomnium androgynum*, *Dicranum scoparium*, *Isothecium myosuroides*, *Polytrichum commune*, Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Letharia columbiana*, *Platismatia glauca*

Round Lake: Bryophytes: *Fontinalis antipyretica*, *Orthodicranum tauricum*, *Rhytidiopsis robusta*, Lichens: *Alectoria sarmentosa*, *Letharia vulpina*

Lower Salmon Lake: Bryophytes: *Fontinalis antipyretica*

Upper Salmon Lake: *Aulacomnium* spp., *Dicranum scoparium*, *Kindbergia oregano* Lichens: *Platismatia glauca*, *Riccardia latifrons*

Waldo Lake west: *Aulacomnium palustre*, *Aulacomnium* spp., *Jungermannia rubra*, *Polytrichum commune*, *Sanionia uncinata*

Spirit Lake: Bryophytes: *Plagiomnium rostratum*, *Rhizomnium magnifolium*, *Fontinalis antipyretica*

Southern Middle Fork

Corrigan Lake: Bryophytes: *Lophozia ascendens*, *Lophozia ventricosa*, *Orthodicranum tauricum*, *Polytrichum commune*

Indigo Lake: *Aulacomnium palustre*, *Bauxbamia viridis*, *Hypnum subimponens*, *Isopterygiopsis* spp., *Plagiothecium* spp., *Pseudotoxiphyllum elegans*

Diamond Peak



Rockpile Lake: Bryophytes: *Dicranum pallidisetum*, *Lophozia ventricosa*, *Polytrichum* spp., *Racomitrium* sp. Lichens: *Cladonia* spp.

Rock outcrop: Bryophytes: *Blepharostoma trichophyllum*, *Calypogeia neesiana*, *Isopterygiopsis pulchella*, *Leskea polycorpa*, *Plagiomnium* spp., *Pohlia vexans*, *Racomitrium* spp.

June Lake: Bryophytes: *Cephaloziella* spp., *Lophozia* spp., *Sanionia uncinata*, *Aulacomnium palustre*, *Polytrichum commune*, *Sphagnum* spp.

Happy Bog: Bryophytes: *Aulacomnium androgynum*, *Fontinalis antipyretica*, *Pohlia amptotrachela*, *Polytrichum juniperum*

Happy Creek: Bryophytes: *Blepharostoma trichophyllum*, *Calypogeia neesiana*, *Cephalozia* spp., *Dicranum scoparium*, *Isopterygiopsis pulchella*, *Lepidozia reptans*, *Pohlia vexans*, *Ptilidium californicum*, *Rhizomnium magnifolium*, *Sanionia uncinata*, *Scapania bolanderi* Lichens: none

McKenzie District Surveys

Surveys on McKenzie District were done in the Mink Lake Basin in the Three Sister's Wilderness. Two lakes on the Deschutes were surveyed because we traveled by them on the way into the Willamette. Twelve areas were surveyed on the McKenzie District. Habitat ranged from poor to very good for non-vascular species. Approximately 150 specimens were collected from these sites. Surveys were done by Kate Richards, Anna Bonnette, Adrienne Marble, Lin Kyan and Molly Juillerat. Surveys were done in September of 2012.

3 Sisters Wilderness

Badger Meadow: Bryophytes: *Polytrichum juniperum* Lichens: *Cladonia chlorophaea*, *Hypogymnia inactive*, *Platismatia glauca*, *Usnea* spp.

Bear claw Lake: Bryophytes: none Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia fimbriata*, *Platismatia glauca*

Blow Lake: *Aulacomnium* spp., *Fontinalis antipyretica*, *Niphotrichum elongatum*, *Peltigera* spp., *Racomitrium* spp., *Sphagnum* spp. Lichens: *Alectoria sarmentosa*, *Bartamia ithyphylla*, *Bryoria* spp., *Letharia vulpine*, *Sanionia uncinata*

Cliff Lake: *Andreaea rupestris*, *Aulacomnium androgynum*, *Fontinalis antipyretica*, *Orthodicranum tauricum*, *Polytrichum juniperum*, *Racomitrium* spp., *Rhizomnium glabrescens* Lichens: *Alectoria sarmentosa*, *Letharia vulpine*

Don's Meadow: Bryophytes: *Polytrichum juniperum* Lichens: *Cladonia chlorophaea*, *Hypogymnia inactive*, *Platismatia glauca*, *Usnea* spp.

Doris Lake: Bryophytes: *Dicranum scoparium*, *Polytrichum juniperum*, *Rhytidiadelphus loreus*, and *Sphagnum* spp. Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cetraria ericetorum*, *Cladonia squamosa*, *Hypogymnia imshaugii*, *Letharia columbiana*, *Platismatia glauca*, *Tuckermanniopsis orbata*, *Usnea* spp.

Dumbell Lake: Bryophytes: *Dermatocarpon reticulatum*, *Polytrichum commune*, *Sphagnum* spp., Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia fimbriata*, *Lactarius* spp., and *Letharia Columbiana*.

Krag Lake: Bryophytes: Bryophytes: none Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia fimbriata*, *Platismatia glauca*

Island Lake: Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia fimbriata*

Porky Lake: Bryophytes: *Bartramia ithyphylla*, *Marchantia polymorpha*, *Rhizomnium magnifolium*
Lichens: *Alectoria sarmentosa*, *Brachythecium albicans*, *Bryoria fuscenscens*, *Bryoria* spp., *Cladonia fimbriata*, *Cladonia ochrochlora*

Questionmark Lake: Bryophytes: *Brynum miniatum*, *Phylontis Fontana*, *Polytrichum juniperum*, Lichens: *Hypogymnia inactive*, *Platismatia glauca*, *Usnea* spp.

Senoj Lake: Bryophytes: *Polytrichum juniperum* Lichens: *Alectoria sarmentosa*, *Bryoria fuscenscens*, *Cladonia chlorophaea*, *Hypogymnia inactive*, *Platismatia glauca*, *Usnea* spp.

Vera Lake: Bryophytes: *Phylontis Fontana*, *Polytrichum juniperum*, *Rhtidiadelphus loreus* Lichens: *Alectoria sarmentosa*, *Hypogymnia inactive*, *Peltigera* spp., *Platismatia glauca*, *Usnea* spp.

Conclusion

All special status or survey and manage species that were found in surveys (red) as well as surveys themselves have been entered into NRIS TESP.

We found that higher elevation sites were more diverse than lower and had more rare target species. The liverworts *Anastrophyllum miniatum* and *Gymnomitrium concinnatum* were found along the Pacific Crest Trail in Mt. Jefferson Wilderness on the Mt Hood NF side, hanging from the trail cutbank. There are 2 *Anastrophyllum* populations on the Willamette and they are both on the McKenzie Ranger District in the High Cascades. This species is historically found on Mt. Hood NF, so this population is in the middle of the range. *Gymnomitrium* is documented from the Columbia River Gorge and Mt. Hood, so this is the most southern population and a range extension.

Rivulariella gemmipara was located in a wet meadow, with a stream flowing through it along Breitenbush Trail in the Mt. Jefferson Wilderness. This is the third population on the Willamette; the other 2 are in the McKenzie Ranger District, in Three Sister's Wilderness. This species is also found on the Deschutes and Rogue River-Siskiyou National Forest. It makes, as previously stated, the 12th population in Oregon.

No target bryophytes were found south of Detroit Ranger District, despite the fact that botanists surveyed areas in Waldo, southern Three Sisters and Diamond Peak Wildernesses. Species diversity in these southern areas was much lower, presumably due to the dryness of the areas.

In the future, we suggest surveying the middle Three Sister's Wilderness for bryophytes (which we will be surveying for *Calamagrostis breweri* in FY13) which is wetter and more like Mt. Jefferson sites where

we saw higher diversity. There are also several documented rare bryophytes in this basin which would be good to relocate and document whether populations are still extant.

Appendix A. Location of Non-vascular Plant Surveys on Middle Fork and McKenzie Ranger Districts, Willamette NF, 2012 (and a few lakes on the Deschutes, too, because we couldn't resist)

<u>Location</u>	<u>District/National Forest</u>
Happy Lake, Diamond Peak	Middle Fork
Corrigan Lake, Diamond Peak	Middle Fork
Blow Lake, Three Sisters	Deschutes N.F.
Cliff Lake, Three Sisters	McKenzie
Upper Eddeleo Lake, Waldo Lake	Middle Fork
Round Lake, Waldo Lake	Middle Fork
Elbow Lake, Waldo Lake	Middle Fork
Waldo Lake, Waldo Lake	Middle Fork
Lake Chetlo, Waldo Lake	Middle Fork
Green Lake, Waldo Lake	Middle Fork
Vera Lake, Three Sisters	McKenzie
Questionmark Lake, Three Sisters	McKenzie
Doris Lake, Three Sisters	McKenzie
Doris Meadow, Three Sisters	McKenzie
Badger Meadow, Three Sisters	McKenzie
Senoj Lake, Three Sisters	McKenzie
Island Lake, Three Sisters	McKenzie
Pothole Lake "Bear Claw", Three Sisters	McKenzie
Krag Lake, Waldo Lake	Middle Fork
Dumbell Lake, Three Sisters	McKenzie
Porky Lake, Three Sisters	McKenzie
Cupit Mary Lakes, Waldo Lake	Middle Fork
Upper Island Lake, Waldo Lake	Middle Fork
Spirit Lake, Diamond Peak	Middle Fork
Indigo Lake	Middle Fork
June Lake	Middle Fork
Long Lake, Waldo Lake	Middle Fork
Lower Island Lake, Waldo Lake	Middle Fork
Bingo Lake, Waldo Lake	Middle Fork
Lower Eddeleo Lake, Waldo Lake	Middle Fork
Upper Salmon Lake, Waldo Lake	Middle Fork

Appendix 2: List of Species Found on Detroit Surveys and Their Locations

Species		collection #	Pacific Crest T. Mt Hood WNF mngd	Whitewater t.	Jeff park	Park Butte, Mt Jeff	Breitenbush T. Section 10	Sardine mtn area	Short Mtn
Cheilanthes gracillima	fern			x	x				
Pteridium aquilinum	Fern							x	
Achillea millefolium	forb			x					
Artemesia douglasiana	Forb			x					
Aster alpinus	forb		x		x	x			
Chamerion angustifolium	forb		x						
Cirsium remotifolium	forb			x					
Dodecatheon sp	forb					x			
Eriogonum sp.	forb			x	x				
Eriophyllum sp.	forb			x					
Eriophyllum lanatum	forb				x				
Heracleum lanatum	forb			x					
Ligusticum grayi	forb		x						
Luetkea pectinata	forb		x						
Lupinus sp	forb		x	x					
Penstimon sp.	forb			x	x				
Saxafraga sp	forb		x	x	x				
Sedum sp.	forb	JD86712.16		x				x	
Silene sp.	forb			x	x				
Xerophyllum tenax	forb		x	x					
Carex nigricans	gram		x						
Carex scopulorum	gram		x						

Species		collection #	Pacific Crest T. Mt Hood WNF mngd	Whitewater t.	Jeff park	Park Butte, Mt Jeff	Breitenbush T. Section 10	Sardine mtn area	Short Mtn
Carex spectabilis	gram		x						
Erigeron peregrinus ssp. callianthemus	gram		x						
Dermatocarpon meiophyllizum	lichen					x			
Leptogium	lichen	2087		x				x	
Leptogium aquale (sp?)	lichen	2093				x			
Peltigera sp	lichen		x						
Rhizocarpon geographicum	lichen			x					
Solarina crocea	lichen		x						
Umbellicaria sp	lichen			x	x				
Anastrophyllum miniatum	liverwort	2099	x						
Anastrophyllum sp.	liverwort	2057				x			
Calypogeia sp.	liverwort					x	x		
Cephalozia bicuspidata	liverwort	2068				x			
Cephalozia pleniceps	liverwort	2074							
Cephalozia sp	liverwort	2108	x		x				
Cephalozia	liverwort		x	x	x				
Chiloscyphus sp.	liverwort		x						
Diplophyllum	liverwort		x						
Diplophyllum cf. obtusifolium	liverwort	JD80712.9						x	
Diplophyllum taxifolium	liverwort	2099	x						
Gymnomitrium concinnatum	liverwort	2099	x						
Harpanthus ?	liverwort						x		

Species		collection #	Pacific Crest T. Mt Hood WNF mngd	Whitewater t.	Jeff park	Park Butte, Mt Jeff	Breitenbusch T. Section 10	Sardine mtn area	Short Mtn
Jungermania cf atrovirens	liverwort	JD80712.9							
Jungermania cordifolia	liverwort	2064			x				
Jungermania exertifolia ssp cordifolia	liverwort	2080			x				
Jungermania exertifolia subsp cordifolia?	liverwort	2065							
Jungermannii polaris	liverwort	JD80712.17						x	
Lophozia sudetica	liverwort	2074			x				
Lophozia ventricosa	liverwort	2043	x						
Marsupella sphacelata	liverwort	2061					x		
Porella bolanderi	liverwort	2060		x					
Porella cordaeana	liverwort	2067		x					
Radula?	liverwort		x						
Rivulariella gemmipara	liverwort	2063					x		
Scapania americana	liverwort	JD80712.19						x	
Scapania irrigua	Liverwort	2076			x				
Scapania undulata	liverwort	2062					x		
Sphaerocarpa sp	liverwort	2074							
Amphidium lapponicum	moss	2114		x					
Atrichum sp.	moss		x						
Aulocomnium sp	moss					x			
Bartramia sp.	moss							x	
Brachythecium sp.	moss							x	
Bryum sp	moss		x		x	x			x

Species		collection #	Pacific Crest T. Mt Hood WNF mngd	Whitewater t.	Jeff park	Park Butte, Mt Jeff	Breitenbush T. Section 10	Sardine mtn area	Short Mtn
Bryum sp (blue)	moss			x	x				
Claopodium crispifolium	moss	2097	x						
Claopodium sp.	moss	2067	x	x					
Conostomun?	moss					x			
Dicranum sp.	moss		x						x
Drepanocladus	moss		x						
Fissidens sp	moss	JD80712.9 , 2108	x						
Fontinalis	moss				x				
Grimmia ramondii	moss	JD86712.16, 17						x	
Grimmia ramondii	moss	2005							
Grimmia torquata	moss	2001, 2005	x	x	x				
Hypnum subimpimans	moss							x	
Oligotrichum hercynicum	moss	2099b	x						
Oligotrichum parallelum	moss	JD80712.9							
Orthotrichum sp	moss	2060	x	x					x
Plagiomnium sp	moss		x						
Plagiothecium sp	moss							x	
Pohlia sp	moss	JD80712.9	x						
Polytrichum sp	moss	2005	x	x	x				x
Pseudoleskea patens	moss	2060		x					
Racomitrium sp.	moss		x			x		x	
Rhyzomnium sp.	moss				x				

Species		collection #	Pacific Crest T. Mt Hood WNF mngd	Whitewater t.	Jeff park	Park Butte, Mt Jeff	Breitenbush T. Section 10	Sardine mtn area	Short Mtn
Scouleria aquatica	moss	JD80712.19						x	
Stegonia hyalinotricha	moss	2067		x					
Campylopodia stenocarpa	moss	2108	x						
Campylopus sp.	moss	2018			x				
Pohlia vexans	moss	2108	x						
Polytrichum juniperinum	moss	2108	x						
Juniperus sp.	shrub			x	x				
Mahonia aquifolium	shrub			x	x				
Phyllodoce empetrifomis	shrub		x		x	x			
Vaccinium sp.	shrub		x	x				x	
Abies amabilis	tree								x
Acer glabrum	tree			x	x				
Chamaecyparis nootkatensis	tree		x						
Chrysolepis chrysophylla	tree								x
Pseudotsuga menziesii	tree							x	x
Rhamnus alnifolia	tree								x
Tsuga heterophylla	tree		x	x				x	x
Tsuga mertensiana	tree				x	x			