

# Lichen and Bryophyte Inventory

## Umatilla and Wallowa-Whitman National Forests

April 2007

Contacts: Jean Wood, Umatilla NF  
Gene Yates, Wallowa-Whitman NF

### Introduction

The goal of this project was to inventory high potential habitat for sensitive non-vascular species on the Umatilla and Wallowa-Whitman National Forests and to create a biodiversity list of species for the forests. Very little systematic non-vascular inventory had occurred prior to this work.

The selected areas (Table 1) were thought to provide the best habitat for target ISSSSP lichens and bryophytes (Table 2) and consisted of the wetter forest stands and meadows. A brief description of each is located farther below.

**Table 1. Survey Areas**

Item	Lichen (acres)	Bryophyte (acres)	
South Fork Umatilla River	13	12	
South Fork Walla Walla River west	29	42	
Haiku Meadow		20	
Farr Meadow		4	
South Fork Walla Walla River east	22	22	
Jubilee Lake		22	
Charlie Creek	15		
Sheep Creek	6		
North Fork Umatilla River	22		
Minam River	16	16	
Mt. Fanny	16.1	39.5	
Lostine River	10	10	
Powder River	8	8	
<b>total</b>	<b>157.1</b>	<b>195.5</b>	<b>352.6</b>

**Table 2. Target Sensitive Species**

- Dermatocarpon luridum* (lichen) [determined to be *D. meiophyllizum* in the PNW]
- Leptogium burnetiae* var. *hirsutum* (lichen)
- Leptogium cyanescens* (lichen)
- Nephroma bellum* (lichen)
- Peltigera neckeri* (lichen)

*Peltigera pacifica* (lichen)  
*Rhizomnium nudum* (moss)  
*Schistostega pennata* (moss)  
*Scouleria marginata* (moss)  
*Tetraphis geniculata* (moss)

## **Methods**

A contract was let to Daphne Stone of Eugene, Oregon to survey 352 acres for macrolichens and/or bryophytes. The contract specifications required a complete inventory of all macrolichens and bryophytes present in the contract item areas. All work under this contract was to be completed by December 31, 2006. Inventories were conducted during the summer of 2006.

## **I. Bryophyte Survey Areas**

### **A. Umatilla NF:**

- 1. South Fork Umatilla River corridor:** Umatilla Co. Oregon. T3N R37E Section 5. – South Fork of the Umatilla up stream from FS Road 32 just over 1 mile to the confluence with Shimmiehorn Creek.
- 2. South Fork Walla Walla River corridor west:** Umatilla Co. Oregon. T4N R38E Sections 7, 8 & 9. – South Fork of the Walla Walla up stream from FS boundary approximately 1 3/4 miles to the confluence with Kees Canyon.
- 3. Haiku Meadow:** Grant Co. Oregon. T9S R34E Sections 28 SE1/4 & 33 NE1/4. – A small, wet subalpine meadow and surrounding forest edge and granite cirque at approximately 6500 feet elevation. (Note: The associated stream is mis-mapped on the USGS quad, and actually runs right through the meadow.)
- 4. Farr's Meadow:** Union Co. Oregon. T3N R38E Sections 27 & 34. – Marshy meadow at 5100 ft. elevation. Includes numerous root wads. The meadow borders State Highway 204.
- 5. South Fork Walla Walla River corridor east:** Umatilla Co. Oregon. T4N R38E Sections 10 & 11 and T5N R38 E Section 2. – South Fork of the Walla Walla up stream from the fire boundary near the River's confluence with Deadman Gulch approximately 1 3/4 miles to the mouth of Skiphorton Creek.
- 6. Jubilee Lake:** Union Co. Oregon. T4N R39E Sections 8 & 17. – The perimeter and associated inlet and outlet wetlands of a large lake at 4800 ft. elevation.

### **B. Wallowa-Whitman NF:**

- 1. Minam River Corridor:** Union County, Oregon. T02S R41E Sections 3 & 10. – The west streambank of the Minam River from the confluence of the Little Minam River north (downriver) approximately 2 miles to the northern extent of Section 3.

2. **Mount Fanny Vicinity:** Union County, Oregon. T03S, R41E, Section 8. – Two stands within a mountain hemlock plant association (16.1 acres) plus adjacent meadow (23.4 acres).
3. **Lostine River Corridor:** Wallowa County, Oregon. T02S R43E Section 15. – The Lostine River corridor from the Forest boundary at the northern extent of section 15 to the first bridge crossing at the Pole Bridge Picnic Area approximately  $\frac{3}{4}$  mile upriver.
4. **Powder River Corridor:** Baker County, Oregon, T10S R39E Sections 29 & 30. – The southern streambank of the Powder river beginning at the foot bridge that crosses the river at the Power River Recreation Area, then proceeding down river for approximately 1 mile to a point where a power transmission line crosses the river canyon.

## II. **Lichen** Survey Item area

### A. Umatilla NF:

1. **Charlie Creek:** Garfield Co. Washington. T9N R42E Section 13 and T9N R43E Section 18. – Charlie Creek upstream from the junction of FS roads 4206 and 4206060 about 1 mile to its confluence with an unnamed tributary from Horseshoe Spring, and then up that tributary approximately  $\frac{1}{4}$  mile.
2. **South Fork Umatilla River corridor:** Umatilla Co. Oregon. T3N R37E Section 5. – South Fork of the Umatilla up stream from FS Road 32 just over 1 mile to the confluence with Shimmiehorn Creek.
3. **South Fork Walla Walla River corridor west:** Umatilla Co. Oregon. T4N R38E Sections 7 & 8. – South Fork of the Walla Walla up stream from FS boundary for just over a mile to the confluence with Rodgers Creek.
4. **South Fork Walla Walla River corridor east:** Umatilla Co. Oregon. T4N R38E Sections 10 & 11 and T5N R38 E Section 2. – South Fork of the Walla Walla up stream from the fire boundary near the River's confluence with Deadman Gulch about 1  $\frac{3}{4}$  miles to the mouth of Skiphorton Creek.
5. **North Fork Umatilla River corridor:** Umatilla Co. Oregon. T3N R37E Sections 14, 22 & 23. – Survey along the river upstream from the Forks of the Umatilla trailhead (FS road 32) approximately 1  $\frac{1}{4}$  miles to the confluence with an unnamed stream that starts at Dick Spring.

**B. Wallowa-Whitman NF:** Perform field surveys and provide complete lichen species inventories for the following specified areas:

1. **Minam River Corridor:** Union County, Oregon. T02S R41E Sections 3 & 10. – The west streambank of the Minam River from the confluence of the Little Minam River north (downriver) approximately 2 miles to the northern extent of Section 3.
2. **Mount Fanny Vicinity:** Union County, Oregon. T03S, R41E, Section 8. Two stands within a mountain hemlock plant association.
3. **Lostine River Corridor:** Wallowa County, Oregon. T02S R43E Section 15. – The Lostine River corridor from the Forest boundary at the northern extent of section 15 to the first bridge crossing at the Pole Bridge Picnic.
4. **Powder River Corridor:** Baker County, Oregon, T10S R39E Sections 29 & 30. – South streambank plus adjacent 66-foot wide belt on the south side of the Powder river beginning at the foot bridge that crosses the river at the Powder River Recreation Area , then proceeding down river for approximately 1 mile to a point where an power transmission line crosses the river canyon.

## Results

Inventory results are shown in appendix A and B with a comprehensive bryophyte and lichen species list for all sites on each Forest. For all sites on both Forests, 346 nonvascular species were found.

Hepatic species – 52

Moss species – 146

Hornwort species – 1

Lichen species – 148

Species occurrences that are new to Oregon include *Dichodontium olympicum*, *Fontinalis hypnoides*, and *Syntrichia bartramii*.

## Discussion

Several non-vascular hot spots were found. The large cliff on the south side of Powder River had lots of species and many unusual species. When people come down off the top there could be some damage to these, and also people trying to pass around it along the river could cause damage. Haiku, Mt Fanny and Jubilee Meadows all contain lots of the special high elevation liverworts, as well as some neat mosses. Jubilee is probably the one most exposed to traffic.

## Appendix A - Umatilla National Forest species results

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk 1	West WW	East WW
anthoc	Anthoceros fusiformis							
hepatic	Aneura pinguis	1		1				
hepatic	Apometzgeria pubescens							1
hepatic	Asterella gracilis							
hepatic	Barbilophozia hatcheri							
hepatic	Blepharostoma trichophyllum		1					
hepatic	Calypogeia fissa		1			1		
hepatic	Calypogeia muelleriana		1					
hepatic	Cephalozia ambigua							
hepatic	Cephalozia bicuspidata		1					
hepatic	Cephalozia lunulifolia	1						
hepatic	Cephalozia pleniceps							
hepatic	Cephalozia rubella							
hepatic	Cephaloziella divaricata	1	1	1				
hepatic	Chiloscyphus coadunatus	1						
hepatic	Chiloscyphus pallescens	1		1				
hepatic	Chiloscyphus polyanthos	1	1	1		1		1
hepatic	Chiloscyphus profundus			1				
hepatic	Conocephalum "conicum"	1	1	1		1		
hepatic	Frullania bolanderi	1						
hepatic	Harpanthus flotovians		1					
hepatic	Jungermannia hyalina							
hepatic	Jungermannia leiantha		1					
hepatic	Jungermannia sphaerocarpa		1				1	
hepatic	Lepidozia reptans	1		1			1	
hepatic	Lophocolea cuspidata						1	
hepatic	Lophozia bantriensis		1					
hepatic	Lophozia gillmanii		1					
hepatic	Lophozia incisa	1	1					
hepatic	Lophozia longiflora		1			1		
hepatic	Lophozia sudetica			1				
hepatic	Lophozia ventricosa		1			1		
hepatic	Marchantia polymorpha	1	1	1	1	1	1	
hepatic	Nardia scalaris					1		
hepatic	Pellia endiviifolia							
hepatic	Pellia neesiana		1			1	1	
hepatic	Plagiochila porelloides	1		1				
hepatic	Porella cordaeana	1		1		1	1	
hepatic	Porella navicularis	1						
hepatic	Radula complanata			1			1	
hepatic	Riccardia multifida			1				
hepatic	Riccardia palmata	1						
hepatic	Riccardia sp.					1	1	
hepatic	Riccia beyrichiana		1		1			
hepatic	Riccia cavernosa				1			
hepatic	Riccia sorocarpa							

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
hepatic	<i>Riccia trichocarpa</i>					1		
hepatic	<i>Scapania bolanderi</i>	1		1				
hepatic	<i>Scapania curta</i>							
hepatic	<i>Scapania irrigua</i>		1					
hepatic	<i>Scapania subalpina</i>		1					
hepatic	<i>Scapania umbrosa</i>	1				1	1	
hepatic	<i>Scapania undulata</i>		1	1		1		
lichen	<i>Acarospora fuscata</i>							
lichen	<i>Ahtiana pallidula</i>							
lichen	<i>Alectoria imshaugii</i>					1	1	1
lichen	<i>Alectoria sarmentosa</i>	1	1	1		1	1	1
lichen	<i>Bryoria capillaris</i>	1		1	1			
lichen	<i>Bryoria fremontii</i>	1	1	1	1	1		
lichen	<i>Bryoria fuscescens</i>	1		1		1	1	1
lichen	<i>Bryoria pseudofuscescens</i>	1	1	1	1	1		
lichen	<i>Bryoria simplicior</i>		1			1		
lichen	<i>Bryoria unknown #1</i>							
lichen	<i>Caliciopsis</i> sp.							
lichen	<i>Calicium "mccunei"</i>	1						
lichen	<i>Calicium adaequatum</i>							
lichen	<i>Calicium glaucellum</i>	1						
lichen	<i>Calicium viride</i>	1		1				
lichen	<i>Caloplaca jungermanniae</i>							
lichen	<i>Caloplaca stillicidorum</i>							
lichen	<i>Candelaria pacifica</i>	1		1				
lichen	<i>Candelaria</i> sp sorediate							
lichen	<i>Candelariella vitellina</i> (spec. not subm.)							
lichen	<i>Cetraria chlorophylla</i>	1		1			1	1
lichen	<i>Cetraria merrillii</i>					1		
lichen	<i>Cetraria orbata</i>	1		1				1
lichen	<i>Cetraria platyphylla</i>	1	1			1		
lichen	<i>Chaenotheca furfuracea</i>	1	1				1	
lichen	<i>Chaenotheca subroscida?</i>	1						
lichen	<i>Chaenotheca trichialis</i> (spec. not subm.)	1						
lichen	<i>Chaenothecopsis ussuriensis?</i>	1						
lichen	<i>Cladonia bacillaris</i>	1						
lichen	<i>Cladonia cariosa</i>		1					
lichen	<i>Cladonia carneola</i>		1					
lichen	<i>Cladonia cenotea</i>							
lichen	<i>Cladonia chlorophaea</i> group	1	1	1		1		
lichen	<i>Cladonia fimbriata</i>	1	1	1				
lichen	<i>Cladonia multiformis</i>							
lichen	<i>Cladonia norvegica</i>							
lichen	<i>Cladonia ochrochlora</i>	1		1				
lichen	<i>Cladonia pyxidata</i>			1				

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
lichen	Cladonia sulphurina	1	1					
lichen	Cladonia transcendens			1				
lichen	Cladonia verruculosa	1		1				
lichen	Collema crispum	1						
lichen	Collema curtisporum	1						
lichen	Collema furfuraceum							
lichen	Collema fuscovirens							
lichen	Dermatocarpon miniatum							
lichen	Esslingeriana idahoensis	1		1			1	1
lichen	Evernia prunastri	1				1	1	1
lichen	Fellhanera bouteillei			1				
lichen	Fuscopannaria cyanolepra	1						
lichen	Hypocenomyce scalaris							
lichen	Hypogymnia enteromorpha			1	1			
lichen	Hypogymnia imshaugii	1	1	1		1		
lichen	Hypogymnia metaphysodes	1				1		
lichen	Hypogymnia occidentalis	1		1		1		
lichen	Hypogymnia physodes	1		1			1	1
lichen	Hypogymnia tubulosa	1		1		1		
lichen	Lecanora carpinea (spec not sub.)							
lichen	Lecanora circumborealis (not subm)							
lichen	Lecanora muralis							
lichen	Leptochidium albociliatum	1						
lichen	Leptogium gelatinosum	1		1				
lichen	Leptogium lichenoides group	1		1				
lichen	Leptogium palmatum	1						
lichen	Leptogium rivale			1		1		
lichen	Leptogium saturninum	1		1				1
lichen	Leptogium sp. ?undescribed	1						
lichen	Leptogium subaridum?	1						
lichen	Leptogium teretiusculum	1						
lichen	Letharia columbiana	1	1		1	1		
lichen	Letharia vulpina	1	1	1		1	1	
lichen	Lobaria hallii	1		1				
lichen	Lobaria pulmonaria	1		1			1	1
lichen	Lobaria scrobiculata			1				
lichen	Melanelia elegantula							
lichen	Melanelia exasperatula	1	1	1	1	1		1
lichen	Melanelia fuliginosa	1		1			1	1
lichen	Melanelia multispora	1		1			1	1
lichen	Melanelia panniformis							
lichen	Melanelia sorediata							
lichen	Melanelia subargentifera							
lichen	Melanelia subaurifera	1		1				
lichen	Melanelia subelegantula		1	1				
lichen	Melanelia subolivacea		1					
lichen	Microcalicium disseminatum	1						

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
lichen	Multiclavula corynoides							
lichen	Neofuscelia loxodes							
lichen	Nephroma helveticum	1		1			1	1
lichen	Nephroma parile	1		1			1	1
lichen	Nephroma resupinatum	1		1			1	1
lichen	Nodobryoria abbreviata	1	1			1		
lichen	Nodobryoria oregana		1	1	1	1		
lichen	Parmelia hygrophila	1		1		1		
lichen	Parmelia saxatilis							
lichen	Parmelia sulcata	1	1	1		1	1	1
lichen	Parmeliopsis ambigua	1	1		1	1		
lichen	Parmeliopsis hyperopta	1	1			1		
lichen	Peltigera britannica	1					1	
lichen	Peltigera canina							
lichen	Peltigera collina	1		1			1	1
lichen	Peltigera degenii					1		
lichen	Peltigera didactyla					1	1	
lichen	Peltigera elizabethae							
lichen	Peltigera kristinssonii							
lichen	Peltigera membranacea	1		1				
lichen	Peltigera ponojensis	1				1		
lichen	Peltigera praetextata			1				
lichen	Peltigera venosa		1	1		1		
lichen	Phaeocalicium tibeticum?	1						
lichen	Phaeophyscia ciliata							
lichen	Phaeophyscia decolor			1				
lichen	Physcia adscendens	1						
lichen	Physcia aipolia	1		1			1	1
lichen	Physcia caesia							
lichen	Physcia dimidiata							
lichen	Physcia dubia							
lichen	Physcia phaea							
lichen	Physconia americana	1					1	1
lichen	Physconia enteroxantha	1					1	1
lichen	Physconia perisidiosa	1		1			1	
lichen	Pilophorus acicularis	1						
lichen	Platismatia glauca	1		1		1	1	1
lichen	Platismatia herrei	1					1	1
lichen	Polychidium muscicola	1						
lichen	Pseudocyphellaria anomala	1						
lichen	Psora nipponica							
lichen	Ramalina dilacerata	1		1				1
lichen	Ramalina farinacea	1		1			1	1
lichen	Ramalina obtusata							
lichen	Ramalina subleptocarpha							
lichen	Rhizoplaca melanophthalma							
lichen	Rinodina oregana			1				



group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
lichen	<i>Umbilicaria americana</i>							
lichen	<i>Umbilicaria hyperborea</i>							
lichen	<i>Umbilicaria phaea</i>	1						
lichen	<i>Usnea cavernosa</i>	1						
lichen	<i>Usnea lapponica</i>	1		1			1	
lichen	<i>Usnea scabrata</i>	1		1			1	
lichen	<i>Usnea subfloridana</i>			1				
lichen	<i>Usnea wasmuthii</i>	1		1				
lichen	<i>Vulpicida canadensis</i>	1					1	1
lichen	<i>Xanthomendoza fulva</i>	1						
lichen	<i>Xanthomendoza galericulata?</i>							
lichen	<i>Xanthomendoza hasseana</i>	1		1			1	1
lichen	<i>Xanthoparmelia</i> sp.							
lichen	<i>Xanthoria candelaria</i>			1				
lichen	<i>Xanthoria elegans</i>							
lichen	<i>Xanthoria polycarpa</i>	1					1	1
moss	<i>Amblystegium serpens</i>	1						
moss	<i>Amblystegium serpens</i> v. <i>juratzkanum</i>							
moss	<i>Antitrichia californica</i>	1					1	
moss	<i>Antitrichia curtispindula</i>			1			1	
moss	<i>Atrichum altecristatum</i> (selwynii)	1	1	1	1			
moss	<i>Aulacomnium androgynum</i>	1		1			1	1
moss	<i>Aulacomnium palustre</i>		1			1		
moss	<i>Bartramia pomiformis</i>	1		1			1	
moss	<i>Brachythecium albicans</i>	1		1				
moss	<i>Brachythecium asperrimum</i>	1				1		
moss	<i>Brachythecium collinum</i>		1					
moss	<i>Brachythecium erythrorrhizon</i>					1		
moss	<i>Brachythecium frigidum</i>	1	1	1				
moss	<i>Brachythecium hylotapetum</i>					1		
moss	<i>Brachythecium rivulare</i>							
moss	<i>Brachythecium salebrosus</i>							
moss	<i>Bruchia bolanderi</i>		1					
moss	<i>Bryoerythrophyllum recurvirostre</i>		1			1		
moss	<i>Bryum argenteum</i> var <i>lanatum</i>							
moss	<i>Bryum caespiticium</i>		1		1		1	1
moss	<i>Bryum muehlenbeckii</i>							1
moss	<i>Bryum pseudotriquetrum</i>	1	1			1		
moss	<i>Buxbaumia aphylla</i>					1		
moss	<i>Buxbaumia viridis</i>					1		
moss	<i>Calliergon giganteum</i>					1		
moss	<i>Campylium stellatum</i>		1					
moss	<i>Ceratodon purpureus</i>	1	1		1	1	1	1
moss	<i>Claopodium bolanderi</i>	1		1			1	
moss	<i>Claopodium crispifolium</i>	1		1				
moss	<i>Climacium dendroides</i>							

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
moss	Dichodontium olympicum		1					
moss	Dichodontium pellucidum			1				
moss	Dicranella crispa							
moss	Dicranella palustris		1					
moss	Dicranoweisia cirrata	1						
moss	Dicranoweisia crispula	1	1			1		
moss	Dicranum fuscescens	1						
moss	Dicranum howellii	1		1		1		
moss	Dicranum pallidisetum					1		
moss	Dicranum tauricum	1		1				1
moss	Didymodon vinealis	1		1				
moss	Distichium capillaceum							
moss	Drepanocladus aduncus		1	1	1	1		
moss	Encalypta rhapdocarpa	1						
moss	Eurhynchium oreganum	1					1	1
moss	Eurhynchium praelongum							1
moss	Eurhynchium pulchellum	1		1				1
moss	Fissidens bryoides	1	1					
moss	Fontinalis hypnoides							
moss	Fontinalis neomexicana		1			1		1
moss	Funaria hygrometrica	1			1		1	
moss	Grimmia caespiticia		1			1		
moss	Grimmia laevigata	1		1				
moss	Grimmia montana	1	1			1		
moss	Grimmia pulvinata	1						
moss	Grimmia ramondii					1		
moss	Herzogiella seligeri	1						
moss	Homalothecium fulgescens	1	1	1	1			
moss	Homalothecium nevadense							
moss	Homalothecium nuttallii							
moss	Homalothecium pinnatifidum	1					1	
moss	Homalothecium sp."A"	1						
moss	Hygroamblystegium tenax	1						
moss	Hygrohypnum bestii	1		1				
moss	Hygrohypnum luridum		1					
moss	Hygrohypnum ochraceum		1	1	1	1		
moss	Hylocomium splendens	1					1	
moss	Hypnum circinale	1					1	1
moss	Hypnum subimponens	1		1			1	1
moss	Isoetecium stoloniferum	1		1			1	1
moss	Leptobryum pyriforme							
moss	Lescurea saviana		1	1				
moss	Lescurea stenophylla			1				
moss	Leucolepis acanthoneuron	1					1	1
moss	Metaneckera menziesii	1		1				1
moss	Mnium blyttii		1					
moss	Mnium marginatum							

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
moss	Mnium spinulosum	1					1	
moss	Neckera douglasii	1		1			1	
moss	Oncophorus virens		1					
moss	Orthotrichum affine							
moss	Orthotrichum consimile	1						
moss	Orthotrichum cupulatum							
moss	Orthotrichum laevigatum							
moss	Orthotrichum lyellii	1		1			1	1
moss	Orthotrichum obtusifolium	1		1				
moss	Orthotrichum pellucidum							
moss	Orthotrichum rivulare	1		1				
moss	Orthotrichum rupestre	1						
moss	Orthotrichum speciosum	1					1	
moss	Orthotrichum striatum	1		1				
moss	Palustriella falcata		1					
moss	Philonotis fontana	1	1			1		
moss	Philonotis tomentella		1	1	1	1		1
moss	Plagiomnium ellipticum	1	1	1			1	
moss	Plagiomnium insigne	1		1		1	1	1
moss	Plagiomnium venustum							
moss	Plagiothecium denticulatum	1				1		
moss	Plagiothecium laetum			1				
moss	Platydictia jungermannioides		1					
moss	Platyhypnidium riparioides	1						
moss	Pleuridium subulatum				1			
moss	Pogonatum contortum							
moss	Pohlia cruda	1				1		
moss	Pohlia drummondii					1		
moss	Pohlia nutans		1		1	1		
moss	Pohlia prolifera		1					
moss	Pohlia wahlenbergii		1					
moss	Polytrichastrum alpinum		1			1		
moss	Polytrichum commune					1		
moss	Polytrichum juniperinum	1	1	1	1	1	1	
moss	Polytrichum lyallii		1					
moss	Polytrichum piliferum			1		1		
moss	Pseudoleskea patens	1				1		
moss	Pseudoleskea radicata		1					
moss	Pterigynandrum filiforme	1		1				
moss	Ptychomitrium gardneri	1						
moss	Racomitrium aciculare			1		1		
moss	Racomitrium elongatum	1		1		1	1	1
moss	Racomitrium heterostichum							
moss	Racomitrium occidentale	1						
moss	Racomitrium varium	1		1				
moss	Rhizomnium magnifolium		1			1		
moss	Rhizomnium nudum					1		

group	species	N Fk Uma	Haiku	S Fk Uma	Farr	Jubilee Lk	West WW	East WW
moss	Rhizomnium pseudopunctatum		1	1				1
moss	Rhytiadelphus triquetris	1		1			1	1
moss	Rhytidiopsis robusta					1		
moss	Roellia roellii		1			1		
moss	Sanionia uncinata	1	1			1		
moss	Schistidium "apocarpum" misappl	1		1		1		
moss	Schistidium agassizii							
moss	Schistidium apocarpum var strictum	1				1		
moss	Schistidium occidentale		1					
moss	Schistidium rivulare	1	1	1	1	1		
moss	Scleropodium obtusifolium	1		1			1	1
moss	Scouleria aquatica		1	1				
moss	Sphagnum teres				1	1		
moss	Syntrichia bartramii							
moss	Syntrichia laevipila	1						
moss	Syntrichia norvegica							
moss	Syntrichia ruralis	1		1		1	1	1
moss	Tetraphis pellucida						1	
moss	Timmia austriaca		1					1
moss	Timmiella crassinervis	1		1				
moss	Trichodon cylindricus		1					
moss	Tripterocladium leucocladulum	1		1			1	1

**Appendix B – Wallowa-Whitman National Forest Species Results**

<b>Group</b>	<b>Species</b>	<b>Powder River</b>	<b>Minam River</b>	<b>Mt Fanny meadow</b>	<b>Mt Fanny forest</b>	<b>Lostine River</b>
anthoc	<i>Anthoceros fusiformis</i>					
hepatic	<i>Aneura pinguis</i>					
hepatic	<i>Apometzgeria pubescens</i>					
hepatic	<i>Asterella gracilis</i>			1		
hepatic	<i>Barbilophozia hatcheri</i>		1			
hepatic	<i>Blepharostoma trichophyllum</i>					1
hepatic	<i>Calyptogeia fissa</i>			1		
hepatic	<i>Calyptogeia muelleriana</i>					
hepatic	<i>Cephalozia ambigua</i>			1		
hepatic	<i>Cephalozia bicuspidata</i>					
hepatic	<i>Cephalozia lunulifolia</i>			1		1
hepatic	<i>Cephalozia pleniceps</i>			1		
hepatic	<i>Cephalozia rubella</i>	1		1		
hepatic	<i>Cephaloziella divaricata</i>					
hepatic	<i>Chiloscyphus coadunatus</i>					
hepatic	<i>Chiloscyphus pallescens</i>					
hepatic	<i>Chiloscyphus polyanthos</i>	1	1	1	1	1
hepatic	<i>Chiloscyphus profundus</i>					
hepatic	<i>Conocephalum conicum</i>					
hepatic	<i>Frullania bolanderi</i>					
hepatic	<i>Harpanthus flotovians</i>					
hepatic	<i>Jungermannia hyalina</i>			1		
hepatic	<i>Jungermannia leiantha</i>					
hepatic	<i>Jungermannia sphaerocarpa</i>					
hepatic	<i>Lepidozia reptans</i>					
hepatic	<i>Lophocolea cuspidata</i>					
hepatic	<i>Lophozia bantriensis</i>					
hepatic	<i>Lophozia gillmanii</i>					
hepatic	<i>Lophozia incisa</i>					
hepatic	<i>Lophozia longiflora</i>					
hepatic	<i>Lophozia sudetica</i>					
hepatic	<i>Lophozia ventricosa</i>					1
hepatic	<i>Marchantia polymorpha</i>	1	1			
hepatic	<i>Nardia scalaris</i>					
hepatic	<i>Pellia endiviifolia</i>			1		
hepatic	<i>Pellia neesiana</i>					
hepatic	<i>Plagiochila porelloides</i>					1
hepatic	<i>Porella cordaeana</i>	1	1			1
hepatic	<i>Porella navicularis</i>					
hepatic	<i>Radula complanata</i>		1			
hepatic	<i>Riccardia multifida</i>					
hepatic	<i>Riccardia palmata</i>					
hepatic	<i>Riccardia sp.</i>					
hepatic	<i>Riccia beyrichiana</i>					
hepatic	<i>Riccia cavernosa</i>					

<b>Group</b>	<b>Species</b>	<b>Powder River</b>	<b>Minam River</b>	<b>Mt Fanny meadow</b>	<b>Mt Fanny forest</b>	<b>Lostine River</b>
hepatic	<i>Riccia sorocarpa</i>			1		
hepatic	<i>Riccia trichocarpa</i>					
hepatic	<i>Scapania bolanderi</i>					
hepatic	<i>Scapania curta</i>			1		
hepatic	<i>Scapania irrigua</i>			1		
hepatic	<i>Scapania subalpina</i>			1		
hepatic	<i>Scapania umbrosa</i>					1
hepatic	<i>Scapania undulata</i>		1			1
lichen	<i>Acarospora fuscata</i>	1				
lichen	<i>Ahtiana pallidula</i>				1	
lichen	<i>Alectoria imshaugii</i>		1		1	
lichen	<i>Alectoria sarmentosa</i>		1		1	1
lichen	<i>Bryoria capillaris</i>		1		1	
lichen	<i>Bryoria fremontii</i>	1	1			1
lichen	<i>Bryoria fuscescens</i>	1	1		1	
lichen	<i>Bryoria pseudofuscescens</i>	1				1
lichen	<i>Bryoria simplicior</i>	1				
lichen	<i>Bryoria unknown #1</i>		1			
lichen	<i>Caliciopsis</i> sp.					1
lichen	<i>Calicium "mccunei"</i>					
lichen	<i>Calicium adaequatum</i>	1				
lichen	<i>Calicium glaucellum</i>					
lichen	<i>Calicium viride</i>	1	1		1	1
lichen	<i>Caloplaca jungermanniae</i>	1				
lichen	<i>Caloplaca stillicidorum</i>	1				
lichen	<i>Candelaria pacifica</i>	1				
lichen	<i>Candelaria</i> sp sorediate	1				
lichen	<i>Candelariella vitellina</i>					1
lichen	<i>Cetraria chlorophylla</i>	1	1		1	1
lichen	<i>Cetraria merrillii</i>	1				
lichen	<i>Cetraria orbata</i>	1	1			
lichen	<i>Cetraria platyphylla</i>	1	1		1	
lichen	<i>Chaenotheca furfuracea</i>					
lichen	<i>Chaenotheca subroscida?</i>					
lichen	<i>Chaenotheca trichialis</i>					1
lichen	<i>Chaenothecopsis ussuriensis</i>					
lichen	<i>Cladonia bacillaris</i>					
lichen	<i>Cladonia cariosa</i>					
lichen	<i>Cladonia carneola</i>					1
lichen	<i>Cladonia cenotea</i>		1			
lichen	<i>Cladonia chlorophaea</i> group	1		1		1
lichen	<i>Cladonia fimbriata</i>	1				
lichen	<i>Cladonia multiformis</i>		1			
lichen	<i>Cladonia norvegica</i>		1			
lichen	<i>Cladonia ochrochlora</i>	1	1			1
lichen	<i>Cladonia pyxidata</i>	1	1			1

Group	Species	Powder River	Minam River	Mt Fanny meadow	Mt Fanny forest	Lostine River
lichen	Cladonia sulphurina	1				
lichen	Cladonia transcendens					
lichen	Cladonia verruculosa	1				
lichen	Collema crispum					
lichen	Collema curtisporum		1			1
lichen	Collema furfuraceum					1
lichen	Collema fuscovirens					1
lichen	Dermatocarpon miniatum	1	1		1	1
lichen	Esslingeriana idahoensis		1		1	1
lichen	Evernia prunastri	1	1			1
lichen	Fellhanera bouteillei					
lichen	Fuscopannaria cyanolepra					
lichen	Hypocenomyce scalaris	1				
lichen	Hypogymnia enteromorpha					
lichen	Hypogymnia imshaugii	1	1		1	1
lichen	Hypogymnia metaphysodes		1		1	
lichen	Hypogymnia occidentalis		1			1
lichen	Hypogymnia physodes	1	1		1	1
lichen	Hypogymnia tubulosa		1		1	1
lichen	Lecanora carpinea					1
lichen	Lecanora circumborealis					1
lichen	Lecanora muralis	1				1
lichen	Leptochidium albociliatum	1				1
lichen	Leptogium gelationosum					
lichen	Leptogium lichenoides group	1	1	1		1
lichen	Leptogium palmatum					
lichen	Leptogium rivale					
lichen	Leptogium saturninum	1	1			1
lichen	Leptogium sp. ?undescribed					
lichen	Leptogium sp. prob. subaridum					
lichen	Leptogium teretiusculum					
lichen	Letharia columbiana	1				
lichen	Letharia vulpina	1			1	1
lichen	Lobaria hallii					
lichen	Lobaria pulmonaria		1			
lichen	Lobaria scrobiculata					
lichen	Melanelia elegantula	1				
lichen	Melanelia exasperatula	1				1
lichen	Melanelia fuliginosa	1				1
lichen	Melanelia multispora	1	1			1
lichen	Melanelia panniformis					1
lichen	Melanelia sorediata	1				
lichen	Melanelia subargentifera	1				
lichen	Melanelia subaurifera					
lichen	Melanelia subelegantula					
lichen	Melanelia subolivacea					

<b>Group</b>	<b>Species</b>	<b>Powder River</b>	<b>Minam River</b>	<b>Mt Fanny meadow</b>	<b>Mt Fanny forest</b>	<b>Lostine River</b>
lichen	<i>Microcalicium disseminatum</i>					
lichen	<i>Multiclavula corynoides</i>			1		
lichen	<i>Neofuscelia loxodes</i>					1
lichen	<i>Nephroma helveticum</i>		1			
lichen	<i>Nephroma parile</i>	1	1			1
lichen	<i>Nephroma resupinatum</i>		1			
lichen	<i>Nodobryoria abbreviata</i>	1			1	
lichen	<i>Nodobryoria oregana</i>					1
lichen	<i>Parmelia hygrophila</i>		1			1
lichen	<i>Parmelia saxatilis</i>	1	1		1	1
lichen	<i>Parmelia sulcata</i>	1	1			1
lichen	<i>Parmeliopsis ambigua</i>	1	1		1	
lichen	<i>Parmeliopsis hyperopta</i>		1		1	
lichen	<i>Peltigera britannica</i>		1			1
lichen	<i>Peltigera canina</i>					1
lichen	<i>Peltigera collina</i>	1	1			1
lichen	<i>Peltigera degenii</i>					
lichen	<i>Peltigera didactyla</i>	1			1	
lichen	<i>Peltigera elizabethae</i>					1
lichen	<i>Peltigera kristinssonii</i>	1				
lichen	<i>Peltigera membranacea</i>					
lichen	<i>Peltigera ponojensis</i>	1		1		1
lichen	<i>Peltigera praetextata</i>	1		1	1	1
lichen	<i>Peltigera venosa</i>	1	1			1
lichen	<i>Phaeocalicium tibeticum</i>					
lichen	<i>Phaeophyscia ciliata</i>					1
lichen	<i>Phaeophyscia decolor</i>	1				
lichen	<i>Physcia adscendens</i>	1				
lichen	<i>Physcia aipolia</i>		1			1
lichen	<i>Physcia caesia</i>	1				1
lichen	<i>Physcia dimidiata</i>	1				
lichen	<i>Physcia dubia</i>	1				
lichen	<i>Physcia phaea</i>					1
lichen	<i>Physconia americana</i>		1			
lichen	<i>Physconia enteroxantha</i>	1	1			1
lichen	<i>Physconia perisidiosa</i>	1	1			1
lichen	<i>Pilophorus acicularis</i>					
lichen	<i>Platismatia glauca</i>	1	1			
lichen	<i>Platismatia herrei</i>					
lichen	<i>Polychidium muscicola</i>		1			1
lichen	<i>Pseudocyphellaria anomala</i>		1			
lichen	<i>Psora nipponica</i>	1				
lichen	<i>Ramalina dilacerata</i>					
lichen	<i>Ramalina farinacea</i>		1			1
lichen	<i>Ramalina obtusata</i>					1
lichen	<i>Ramalina subleptocarpa</i>					1



Group	Species	Powder River	Minam River	Mt Fanny meadow	Mt Fanny forest	Lostine River
lichen	<i>Rhizoplaca melanophthalma</i>	1				
lichen	<i>Rinodina oregana</i>					
lichen	<i>Umbilicaria americana</i>	1				
lichen	<i>Umbilicaria hyperborea</i>	1				1
lichen	<i>Umbilicaria phaea</i>	1				1
lichen	<i>Usnea cavernosa</i>					
lichen	<i>Usnea lapponica</i>	1	1			1
lichen	<i>Usnea scabrata</i>					1
lichen	<i>Usnea subfloridana</i>					
lichen	<i>Usnea wasmuthii</i>					
lichen	<i>Vulpicida canadensis</i>	1	1			
lichen	<i>Xanthomendoza fulva</i>	1	1			1
lichen	<i>Xanthomendoza galericulata?</i>	1				
lichen	<i>Xanthomendoza hasseana</i>	1	1			1
lichen	<i>Xanthoparmelia</i> sp.	1				
lichen	<i>Xanthoria candelaria</i>	1	1			
lichen	<i>Xanthoria elegans</i>					1
lichen	<i>Xanthoria polycarpa</i>	1	1			1
moss	<i>Amblystegium serpens</i>	1				1
moss	<i>Amblystegium serpens</i> v. <i>juratzkanum</i>	1				
moss	<i>Antitrichia californica</i>	1	1			
moss	<i>Antitrichia curtispindula</i>					1
moss	<i>Atrichum altecristatum</i> ( <i>selwynii</i> )	1				1
moss	<i>Aulacomnium androgynum</i>	1	1			1
moss	<i>Aulacomnium palustre</i>			1	1	1
moss	<i>Bartramia pomiformis</i>					
moss	<i>Brachythecium albicans</i>	1	1			1
moss	<i>Brachythecium asperrimum</i>	1				
moss	<i>Brachythecium collinum</i>					
moss	<i>Brachythecium erythrorrhizon</i>	1		1		
moss	<i>Brachythecium frigidum</i>	1				
moss	<i>Brachythecium hylotapetum</i>					
moss	<i>Brachythecium rivulare</i>					1
moss	<i>Brachythecium salebrosum</i>	1				1
moss	<i>Bruchia bolanderi</i>					
moss	<i>Bryoerythrophyllum recurvirostre</i>	1				1
moss	<i>Bryum argenteum</i> var <i>lanatum</i>					1
moss	<i>Bryum caespiticium</i>			1		1
moss	<i>Bryum muehlenbeckii</i>			1		
moss	<i>Bryum pseudotriquetrum</i>	1		1		1
moss	<i>Buxbaumia aphylla</i>					
moss	<i>Buxbaumia viridis</i>					
moss	<i>Calliergon giganteum</i>					
moss	<i>Campylium stellatum</i>					
moss	<i>Ceratodon purpureus</i>	1	1			

<b>Group</b>	<b>Species</b>	<b>Powder River</b>	<b>Minam River</b>	<b>Mt Fanny meadow</b>	<b>Mt Fanny forest</b>	<b>Lostine River</b>
moss	<i>Claopodium bolanderi</i>		1			1
moss	<i>Claopodium crispifolium</i>				1	
moss	<i>Climacium dendroides</i>	1	1			
moss	<i>Dichodontium olympicum</i>					
moss	<i>Dichodontium pellucidum</i>					1
moss	<i>Dicranella crispa</i>			1	1	
moss	<i>Dicranella palustris</i>					
moss	<i>Dicranoweisia cirrata</i>					
moss	<i>Dicranoweisia crispula</i>				1	
moss	<i>Dicranum fuscescens</i>					
moss	<i>Dicranum howellii</i>	1	1			1
moss	<i>Dicranum pallidisetum</i>					
moss	<i>Dicranum tauricum</i>	1	1			1
moss	<i>Didymodon vinealis</i>	1				
moss	<i>Distichium capillaceum</i>	1				1
moss	<i>Drepanocladus aduncus</i>	1				
moss	<i>Encalypta rhapsocarpa</i>	1				
moss	<i>Eurhynchium oreganum</i>		1			1
moss	<i>Eurhynchium praelongum</i>					
moss	<i>Eurhynchium pulchellum</i>	1	1			1
moss	<i>Fissidens bryoides</i>					1
moss	<i>Fontinalis hypnoides</i>	1				
moss	<i>Fontinalis neomexicana</i>		1			
moss	<i>Funaria hygrometrica</i>					1
moss	<i>Grimmia caespiticia</i>				1	
moss	<i>Grimmia laevigata</i>					
moss	<i>Grimmia montana</i>	1				1
moss	<i>Grimmia pulvinata</i>					
moss	<i>Grimmia ramondii</i>					
moss	<i>Herzogiella seligeri</i>					
moss	<i>Homalothecium fulgescens</i>		1			
moss	<i>Homalothecium nevadense</i>	1	1			1
moss	<i>Homalothecium nuttallii</i>		1			
moss	<i>Homalothecium pinnatifidum</i>	1				
moss	<i>Homalothecium sp."A"</i>	1				1
moss	<i>Hygroamblystegium tenax</i>					
moss	<i>Hygrohypnum bestii</i>					
moss	<i>Hygrohypnum luridum</i>					1
moss	<i>Hygrohypnum ochraceum</i>			1		
moss	<i>Hylocomium splendens</i>		1			
moss	<i>Hypnum circinale</i>		1			1
moss	<i>Hypnum subimponens</i>		1			
moss	<i>Isothecium stoloniferum</i>		1			
moss	<i>Leptobryum pyriforme</i>	1				
moss	<i>Lescuraea saviana</i>					
moss	<i>Lescuraea stenophylla</i>					

<b>Group</b>	<b>Species</b>	<b>Powder River</b>	<b>Minam River</b>	<b>Mt Fanny meadow</b>	<b>Mt Fanny forest</b>	<b>Lostine River</b>
moss	Leucolepis acanthoneuron					
moss	Metaneckera menziesii	1				
moss	Mnium blyttii					
moss	Mnium marginatum		1			1
moss	Mnium spinulosum					1
moss	Neckera douglasii		1			
moss	Oncophorus virens					
moss	Orthotrichum affine	1				1
moss	Orthotrichum consimile					
moss	Orthotrichum cupulatum					1
moss	Orthotrichum laevigatum	1				1
moss	Orthotrichum lyellii		1			
moss	Orthotrichum obtusifolium		1			1
moss	Orthotrichum pellucidum					1
moss	Orthotrichum rivulare		1			
moss	Orthotrichum rupestre	1				
moss	Orthotrichum speciosum		1			1
moss	Orthotrichum striatum					
moss	Palustriella falcata					
moss	Philonotis fontana		1	1		1
moss	Philonotis tomentella				1	1
moss	Plagiomnium ellipticum	1				
moss	Plagiomnium insigne		1			
moss	Plagiomnium venustum	1				
moss	Plagiothecium denticulatum					
moss	Plagiothecium laetum					
moss	Platydictia jungermannioides					
moss	Platyhypnidium riparioides					
moss	Pleuridium subulatum					
moss	Pogonatum contortum			1		
moss	Pohlia cruda	1				1
moss	Pohlia drummondii					
moss	Pohlia nutans	1		1	1	
moss	Pohlia prolifera					
moss	Pohlia wahlenbergii					
moss	Polytrichastrum alpinum	1				
moss	Polytrichum commune					
moss	Polytrichum juniperinum	1	1	1	1	
moss	Polytrichum lyallii					
moss	Polytrichum piliferum			1		
moss	Pseudoleskea patens				1	
moss	Lescuraea radicata					
moss	Pterigynandrum filiforme	1	1			1
moss	Ptychomitrium gardneri					
moss	Racomitrium aciculare					1
moss	Racomitrium elongatum		1			1

<b>Group</b>	<b>Species</b>	<b>Powder River</b>	<b>Minam River</b>	<b>Mt Fanny meadow</b>	<b>Mt Fanny forest</b>	<b>Lostine River</b>
moss	Racomitrium heterostichum		1			
moss	Racomitrium occidentale					
moss	Racomitrium varium					
moss	Rhizomnium magnifolium					1
moss	Rhizomnium nudum					
moss	Rhizomnium pseudopunctatum	1		1	1	
moss	Rhytidiadelphus triquetris	1	1			1
moss	Rhytidiopsis robusta					
moss	Roellia roellii			1		
moss	Sanionia uncinata	1		1		1
moss	Schistidium apocarpum misappl	1				
moss	Schistidium agassizii	1				
moss	Schistidium apocarpum var strictum		1			1
moss	Schistidium occidentale					
moss	Schistidium rivulare	1	1	1		1
moss	Scleropodium obtusifolium	1	1			1
moss	Scouleria aquatica	1	1			1
moss	Sphagnum teres					
moss	Syntrichia bartramii	1				1
moss	Syntrichia laevipila					
moss	Syntrichia norvegica	1			1	
moss	Syntrichia ruralis	1			1	1
moss	Tetraphis pellucida					1
moss	Timmia austriaca	1	1			1
moss	Timmiella crassinervis					
moss	Trichodon cylindricus	1				
moss	Tripterocladium leucocladulum					