

**FHM LICHEN COMMUNITIES INDICATOR
RESULTS FROM IDAHO, 1996**

*Forest Health Monitoring Program
Detection Monitoring*

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TABLE OF CONTENTS

INTRODUCTION	2
PREVIOUS WORK IN IDAHO	2
SUMMARY OF FHM LICHEN COMMUNITY METHODS	3
DATA SOURCES	4
QUALITY ASSURANCE	4
SUMMARIES BY ASSESSMENT TOPICS	5
BIODIVERSITY.....	5
AIR QUALITY	12
EPIPHYTIC LICHEN STATUS AND TRENDS RELATIVE TO FOREST DYNAMICS.....	13
<i>Increase in Douglas-fir stands and stand density</i>	13
<i>Decline in mature larch</i>	13
<i>Increase in orange lichens due to excess nitrogen</i>	13
<i>Decline in large riparian hardwoods</i>	13
FURTHER RESEARCH NEEDED	15
ACKNOWLEDGEMENTS	15
REFERENCES	15
APPENDIX 1. EPIPHYTIC MACROLICHEN SPECIES RICHNESS AND PLOT LOCATIONS FOR 141 ON-FRAME PLOTS	18
APPENDIX 2. LIST OF MACROLICHEN SPECIES BY PLOT	21

INTRODUCTION

The Forest Health Monitoring (FHM) program seeks to assess the condition and trend of the forests of the United States (Riitters et al. 1992; NAPAP 1993). FHM is linked with the national sampling grid established by the Environmental Monitoring and Assessment Program (EMAP) of the Environmental Protection Agency. Epiphytic lichen communities were included in FHM because they help to answer several key assessment questions. These questions concern the contamination of natural resources, biodiversity, forest health, and sustainability of forest resources.

Hundreds of papers worldwide (chronicled in the series "Literature on air pollution and lichens" in the Lichenologist) and dozens of review papers and books (e.g., Nash & Wirth 1988; Richardson 1992; Seaward 1993; Smith et al. 1993; van Dobben 1993) published during the last century have documented the close relationship between lichen communities and air pollution, especially SO₂ and acidifying or fertilizing nitrogen and sulfur-based pollutants. In a comparison of biological responses between nearby and remote areas surrounding a coal-fired power plant, lichens gave a much clearer response (in terms of diversity, total abundance, and community composition) than either foliar symptoms or tree growth (Muir & McCune 1988). Lichens were one of the few components of terrestrial ecosystems to show a clear relationship to gradients of acidic deposition in the eastern United States (Showman 1992; NAPAP 1991). Much of the sensitivity of epiphytic lichens to air quality apparently results from their lack of a cuticle and their reliance on atmospheric sources of nutrition. Although trees may respond to moderate and chronic levels of airborne pollutant deposition, all of the other influences on tree growth (e.g., variation in soils, moisture regimes) make the responses of trees to pollutants difficult to measure in the field. Lichen communities not only provide a direct measure of air pollution impacts upon lichens, but also suggest air pollution impacts on aspects of forest health that are difficult to measure directly.

In addition to their utility as indicators of air quality, epiphytic lichens are an important component of many forests. Lichens often comprise a large portion of the diversity of macrophytic species in a forest. Lichens have numerous functional roles in temperate forests, including nutrient cycling (especially nitrogen fixation in moist forests; Pike 1978) and as components of food webs (Dawson et al. 1987; Maser et al. 1986; Rominger & Oldemeyer 1989; Servheen & Lyon 1989).

PREVIOUS WORK IN IDAHO

There have been numerous lichen studies in Idaho, including several using lichens as biomonitors of air pollution. Hoffman (1974) documented the influence of a paper pulp mill on the epiphytic lichens in the vicinity of Lewiston. Dillman (1996) studied the use of *Rhizoplaca melanophthalma* as a bimonitor of phosphate pollution near Pocatello. Rope and Pearson (1990) studied the use of lichens as air quality biomonitors in the semiarid areas of Idaho. Rosentreter (1990) correlated increasing lichen cover on desert shrubs with increased dust and excess nitrogen in the air. In Northern Idaho, McCune and Rosentreter (1998) examined lichen species richness by forest cover types over an elevational gradient. They found greater species richness in the moist low elevation forest cover types than in the subalpine forest cover. There have also been several inventory efforts in Idaho. Schroeder et al. (1973, 1975), Anderregg et al. (1973) and Schoeder and Schroeder (1972) have compiled a catalog of the lichens of Idaho as well as several species lists.

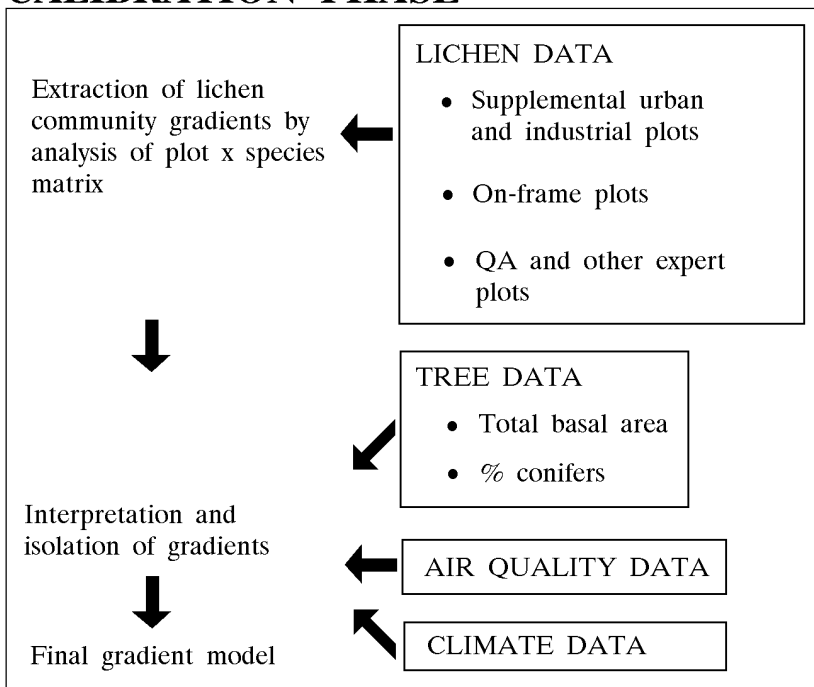
Wildlife uses of lichen have received particular attention in Idaho. Rominger et al. (1994) examined the impacts of timber harvesting on woodland caribou habitat, of which epiphytic lichens were a major component. Rosentreter et al. (1997) and Hayward and Rosentreter (1994) examined the seasonal food habits of the northern flying squirrel in the interior conifer forests of central Idaho, finding that the epiphytic lichen *Bryoria* constituted a principle winter food source.

Atkins et al. (1999) provide an overview of forest resources, forest change and forest health issues generally in Idaho. Many of these issues (e.g., the changing distribution of grand fir, western larch and ponderosa pine) are likely to exert a great influence on future lichen communities.

SUMMARY OF FHM LICHEN COMMUNITY METHODS

The lichen community indicator is implemented in two phases (Figure 1). In the calibration phase, a gradient model of lichen communities is constructed to isolate and describe climatic and air quality gradients. In the application phase, this gradient model is applied to calculate gradient scores for additional plots. Scores for these plots are then used to describe the regional condition and geographic variation in lichen communities. Repeated sampling of these permanent plots allows for the documentation of changes in the condition of lichen communities over time. All lichen data are archived with the Information Management group for the Forest Health Monitoring Program in Las Vegas, Nevada.

CALIBRATION PHASE



APPLICATION PHASE

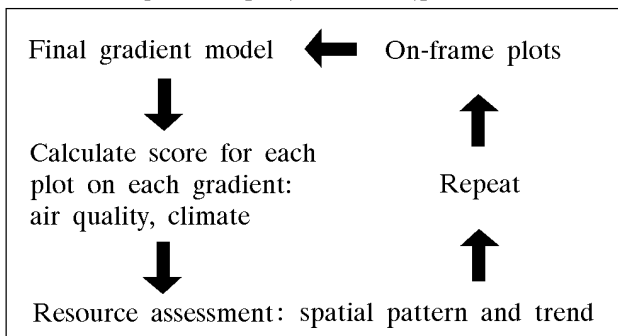


Figure 1. Implementation of the lichen communities as an indicator in the Forest Health Monitoring Program.

Field procedures were designed to be conducted by non-lichenologists for practical reasons of staffing field crews. In FHM's Interior West region, field crews have typically received 2-3 days of intensive training in lichen community methods. To be certified, crews must attain the required measurement quality objective (MQO) of collecting 65% of an expert's species capture on the same plot. Only crews who become certified at the end of training are allowed to conduct plots. The method has two parts that are performed simultaneously. (1) In each standard 0.38 ha Forest Health Monitoring plot (Tallent-Halsell 1994) the field crew searches for macrolichens on woody plants and collects a sample of each lichen believed to be distinct species. Tree and shrub bases below 0.5 m are excluded from sampling. The collection represents the species diversity of macrolichens in the plot as fully as possible. Lichens on fallen branches and other lichen litter may be included. Given the large plot area, fallen branches typically provide an excellent sample of the canopy lichens. (2) The field crew estimates the abundance of each species using a four-step scale: 1 = rare (< 3 individuals in plot); 2 = uncommon (4-10 individuals in plot); 3 = common (> 10 individuals in plot but less than half of the boles and branches have that species present); and 4 = abundant (more than half of boles and branches in the plot have the subject species present). As plots are finished, specimens are sent to specialists for identification. Note that the field crew need not accurately assign species names to the lichens, but must be able to distinguish among species, and be able to estimate abundances accurately.

Field methods are described in detail in Tallent-Halsell (1994). Quality assurance (QA) procedures and results are described in Cline (1995) and McCune et al. (1997). Vouchers were deposited in the Snake River Plains herbarium (SRP) at Boise State University. The lichen indicator's methods have been closely scrutinized and documented for repeatability (McCune et al. 1997).

DATA SOURCES

This report summarizes results from 155 plots as described below.

On-frame 1996 data. Lichen community data were collected by summer field crews in 141 on-frame permanent plots in 1996. "On frame" plots are located on a formal sampling framework, according to standard sampling protocols for the EMAP hexagonal grid (Messer et al. 1991). The strict sampling criteria applied to the on-frame data allow regional estimates of lichen community parameters. On-frame data can be used for assessment of regional status and trends because it consists of an unbiased sample (Messer et al. 1991). In contrast, off-frame data, while useful in building a gradient model, cannot be used to answer such questions as, "Is lichen diversity in Idaho decreasing through time?"

Reference plots. In 1996, one reference plot in Cache County, UT was sampled twice by each crew member. The purpose of the reference plots was to establish consistency between crews and to assess changes in crew performance over the season. These plots are for QA assessment only and are not included in the Idaho dataset.

Supplemental urban/industrial plots. None have yet been conducted. These are necessary for establishment of a gradient model as described in the calibration phase above. Plans are underway to establish such plots at state and/or subregional levels.

QUALITY ASSURANCE

Quality assurance for the 1996 Idaho dataset included reference plots but no hot or cold checks (i.e., independent audits by specialists, either with or without crew knowledge). Each reference plot (located near Logan, Utah close to Idaho) was sampled twice by each crew member. Although expert plot scores were not available for this year, the high score of 8 species was consistent with expert scores from other years in Logan Canyon and was used for calculation of the MQO (measurement quality objective). Crews improved in species capture by 9% over the season (Table 1), starting the season with 68% of expert scores and ending at 73%.

Between-crew variability represented by the coefficient of variation ($CV=[\text{standard deviation}/\text{mean}]*100$) for the two measurements was 9% and 28% for the first and second visits, respectively. It appears that the rise in the CV in the second visit occurred as some crews gained in skills over the season while others did not. The mean CV over all reference plots was 19%. A high rate of attainment of MQO's was achieved (93% overall) for reference plots, which lends good credibility to the on-frame dataset.

Table 1. Summary of QA reference plots, Idaho, 1996. "S" is mean species richness followed in parentheses by the standard deviation. Bias represents the signed mean deviation from the expert score. The MQO (measurement quality objective) represented 65% of 8 species, or 5 species.

Reference Plot Type	N	S (Std.)	% of Expert ¹	Bias	% Improvement from 1 st to 2 nd sampling	CV (%) Between Crews ²	% of Crews Achieving MQO
All	14	5.6 (1.2)	71	-2.4	9	19	93
Sample 1 (June)	7	5.4 (0.5)	68	-2.6	-	9	100
Sample 2 (August)	7	5.9 (1.7)	73	-2.2	-	28	86

1. As expert scores were not available, the high species count of 8 was used. This was consistent with true expert scores in this same location for other years.
2. Coefficient of variation. See text for calculation.

SUMMARIES BY ASSESSMENT TOPIC

Biodiversity and Community Structure

Seventy-five macrolichen species were found on FHM plots in Idaho in 1996 (Table 2, Table 3). The five most common lichen species in Idaho's forests were *Letharia vulpina* (70% frequency), *Bryoria fuscescens* (60%), *Hypogymnia imshaugii* (56%), *Melanelia exasperatula* (59%), and *Parmeliopsis ambigua* (48%; Table 3). Four species, *Hypogymnia austerodes*, *Hypogymnia bitteri*, *Ramalina dilacerata*, and *Usnea hirta* are newly reported for Idaho. The mean species richness per plot was 9.2 species (Table 2, Appendix 1) and species richness varied significantly by ecoregion province ($p < 10^{-16}$ in ANOVA), from 12.2 in the oceanically- influenced Northern Rocky Mountain Province to 7.1 in the dry Intermountain Semi-Desert Province (Table 7, Fig 2). Patterns in species richness across the state may be attributed largely to moisture regime and temperatures accompanying each ecoregion's physical geography.

Table 2. Alpha (st. dev.), beta and gamma diversity of epiphytic lichens in 141 on-frame plots in Idaho. Alpha diversity is mean species richness per plot. Beta diversity is gamma/alpha and is a rough estimate of "community turnover". Gamma diversity is the total number of species found in all plots.

Plot Type	Number	a (st. dev.) ¹	b	g
On Frame	141	9.2 (4.3)	8.2	75

A variety of preliminary (i.e., pre-gradient model) community analyses via NMS ordination (nonmetric multidimensional scaling, Kruskal 1964) were tested. For these trials, plots and species with two or fewer occurrences and those for which key secondary measurements were absent were excluded from the starting community matrix (141 plots x 75 species) resulting in a reduced community matrix of 135 plots x 57

species. The ordination explaining the greatest amount of variance (79%) yielded a three dimensional solution with an extremely strong and similar correlation of two of the three the primary community gradients with species, latitude, elevation, species richness, and longitude. A two dimensional solution explaining 70% of the variance was chosen for increased interpretability, better correlations of environmental variables and elimination strong species and environmental variable correlation along more than one axis (Table 4). Plots clustered strongly in species space by ecoregion province (Fig. 3) and provinces maintained strongly distinct regions of n-dimensional species space (MRPP, $\delta < 1 \times 10^{-8}$). This statistic is complemented additionally by the high beta diversity (8.3) in the original unreduced community matrix, suggesting that there is more than one distinct lichen community present in the dataset. Northern Rocky Mountain province plots appeared to cluster more tightly than any other province's plots in both two and three dimensional solutions.

Axis 1 was strongly associated with subregional climates with the northern Rocky Mountain plots defining the strongly positive end of this gradient (Fig. 3). Latitude, longitude, and species richness were strongly positively correlated with Axis 1, while elevation was strongly negatively correlated (Table 4). Species richness was highest in the oceanically influenced, lower elevation mountains of northern Idaho (Northern Rocky Mountain Province) than in the higher and drier central and southern mountain regions (Middle and Southern Rocky Mountain Provinces). Species such as *Alectoria sarmentosa*, *Platismatia glauca*, *Cetraria chlorophylla* and several *Hypogymnia* species were strongly correlated with Axis 1, and most of these were strongly associated indicator species for the Northern Rocky Mountain Province (Table 3). These and several other species occurred exclusively or primarily in the wet conifer forests of northern Idaho. Species such as *Xanthoria fallax* and *Letharia columbiana* were negatively correlated with Axis 1 and were associated with the drier Intermountain Semi-Desert and/or Southern and Middle Rocky Mountain Provinces. A species cluster including such taxa as *Melanelia elegantula*, *Melanelia subolivacea*, *Melanelia exasperatula*, *Physcia dimidiata*, and *Physcia adscendens* joined the latter two species on the dry end of this gradient. The negative correlation of elevation with the primary climatic axis owes primarily to the lower mean elevation status of northern Rocky Mountain plots (3600 ft) than of other regions (5300 – 7200 ft). It should be stressed that in interpreting broad patterns in species richness across the state, primary correlation is likely to fall to climate rather than air quality.

Axis 2 explained only 21% of the variance in the species by plots matrix. This axis was most strongly correlated with percentage of subplots forested ($r=0.43$) and mean basal area of live conifers ($r=0.28$) and was most negatively correlated with mean basal area of live hardwoods ($r=-0.23$). Provinces with a high mean percentage forested (96% -98% for 3 northern provinces) also had the highest mean basal area of conifers, therefore these two variables were closely related. Species strongly positively associated with this axis were conifer forest dwellers (e.g., *Hypogymnia imshaugii*, *Letharia vulpina*, *Nodobryoria abbreviata*), while those negatively associated tended to occur on hardwoods or conifer woodlands in N-enriched areas (e.g., *Xanthoria fallax*, *X. polycarpa*, *Physcia* spp.) As forest cover and basal area were lowest in the dry southern regions, many of the species most strongly negatively correlated with axis 2 also had negative correlations with axis 1.

The correlation of hardwood basal area with axis 2 was based on a very limited set of plots with hardwoods present. The hardwood correlation was likely to have been reduced in addition because the few plots containing hardwoods in the northern Rockies differed both in tree and lichen species from the hardwood plots in southern areas. As the hardwood lichen flora is dramatically different from that of conifers analysis of these trends would require targeted sampling of hardwoods. Analysis of hardwoods separately within northern and southern provinces would also be likely to give a stronger signal. For the construction of a gradient model, it is likely that the semi-desert province will be grouped with other Great Basin provinces, while the montane provinces will be grouped with others in Montana and eastern Oregon.

Ecoregional analysis provided several insights into the floristics of Idaho's lichens. Two ecoregion provinces stood out most prominently in hosting a large number of indicator species strongly associated with that province (Table 6). The Northern Rocky Mountain Province hosted seven indicator species all of which represented common species west of the Cascade crest in the Pacific Northwest. The Great Plains-Palouse Dry Steppe Province also hosted seven indicator species dominant in eastern Oregon and Washington including *Nodobryoria abbreviata*, *Letharia vulpina*, and *Cetraria merrillii*. Because of the

small number of plots in this province, however, the high indicator values in these cases should be treated with caution—these species occurred reliably in the few plots in this particular province but most of these species are widespread throughout at least 1-2 other provinces. The Southern and Middle Rocky Mountain Provinces tended to be more transitional in species composition between the Northern Rockies and the Semi-Desert. *Letharia columbiana* and *L. vulpina*, which overlap in much of their range, showed divergent occurrence in Idaho. *L. columbiana* occurred predominantly in drier forests, while *L. vulpina* proved widespread.

Overall, 68% of the plots fell in the 6-15 species class, with 32% in the 1-5 species class and 10% divided between 0 species and >15 species.

Table 3. Epiphytic macrolichen species found on 141 On Frame plots in Idaho, 1996. Matrix contents: 141 plots by 75 species. % Frequency = no. of occurrences/total number of plots. Relative abundance = sum total abundance/total possible abundance sum for all plots. Status was assessed using % Frequency values as follows: 0-1 =uncommon; 2-10 = occasional; 11-25= common; >25=abundant. Axis 1 and Axis 2 r values are correlations of species with ordination axes (see Fig. 3 for ordination). Only r values > 0.2 or < -0.2 are shown. Indicator values: *= $p < 0.05$; **= $p < 0.01$ (see Table 7 for explanation of ecoregion province codes). Ecological distribution notes classify the lichens in one of five categories: oceanic influence, moist interior, cosmopolitan, subalpine and continental. These reflect a gradient from moist to dry sites.

SPECIES	% Freq	Relative Abundance (%)	Status	Axis 1 r	Axis 2 r	Ecoregion Province and/or Section Indicator		Ecological Distribution Notes
						Values		
<i>Ahtiana sphaerosporella</i>	1	0.9	Uncommon					Subalpine
<i>Alectoria imshaugii</i>	12	8.9	Common	0.36				Moist interior
<i>Alectoria sarmentosa</i>	31	26.2	Abundant	0.65		**M333, *M333D		Oceanic influence
<i>Bryoria capillaris</i>	13	11.7	Common	0.42		*M333, *M333A		Oceanic influence
<i>Bryoria fremontii</i>	16	13.1	Common					Moist interior, open sites
<i>Bryoria furcellata</i>	1	0.5	Uncommon					Oceanic influence
<i>Bryoria fuscescens</i>	60	46.8	Abundant	0.23				Cosmopolitan
<i>Bryoria pseudofuscescens</i>	16	14.5	Common	0.33	0.22	*331		Moist interior
<i>Bryoria simplicior</i>	1	0.2	Uncommon					Moist interior
<i>Candelaria concolor</i>	4	2.5	Occasional					Cosmopolitan, excess N indicator
<i>Cetraria canadensis</i>	9	6.6	Occasional	0.28				Moist interior
<i>Cetraria chlorophylla</i>	30	22.7	Abundant	0.61		**M333, *M333A		Cosmopolitan
<i>Cetraria merrillii</i>	9	5.3	Occasional			*331		Continental
<i>Cetraria orbata</i>	21	17.4	Common	0.41		*M333		Oceanic influence
<i>Cetraria pallidula</i>	1	0.5	Uncommon					Moist interior
<i>Cetraria pinastri</i>	1	0.2	Uncommon					Cosmopolitan, boreal
<i>Cetraria platyphylla</i>	29	23.8	Abundant	0.42	0.20			Continental
<i>Cladonia sp.</i>	9	5.7	Occasional	0.32				Cosmopolitan
<i>Cladonia chlorophaea</i>	1	0.7	Uncommon					Cosmopolitan
<i>Esslingeriana idahoensis</i>	9	6.0	Occasional	0.31				Moist interior; predominantly M333
<i>Evernia prunastri</i>	13	8.0	Common	0.29				Oceanic influence; predominantly M333
<i>Hypocenyce scalaris</i>	1	0.2	Uncommon					Cosmopolitan
<i>Hypogymnia apinnata</i>	1	0.5	Uncommon					Oceanic influence
<i>Hypogymnia austerodes</i>	4	2.0	Occasional					Subalpine, new record for Idaho; M332 only.
<i>Hypogymnia bitteri</i>	1	0.5	Uncommon					Subalpine, new record for Idaho
<i>Hypogymnia</i>	1	1.2	Uncommon					Oceanic influence

SPECIES	% Freq	Relative Abundance (%)	Status	Ecoregion Province and/or Section Indicator			Ecological Distribution Notes
				Axis 1 r	Axis 2 r	Values	
<i>enteromorpha</i>							
<i>Hypogymnia imshaugii</i>	56	47.3	Abundant	0.52	0.42		Moist interior
<i>Hypogymnia inactiva</i>	2	2.0	Occasional				Oceanic influence, M333 only
<i>Hypogymnia metaphysodes</i>	12	9.8	Common			*331	Oceanic influence
<i>Hypogymnia occidentalis</i>	12	11.2	Common	0.44			Oceanic influence; predominantly M333
<i>Hypogymnia physodes</i>	21	18.6	Common	0.52		*M333	Cosmopolitan
<i>Hypogymnia rugosa</i>	1	0.5	Uncommon				
<i>Hypogymnia tubulosa</i>	13	11.5	Common	0.40		*M333	Cosmopolitan with Northern Rocky affinity
<i>Letharia columbiana</i>	30	23.0	Abundant	-0.35	0.29		Continental
<i>Letharia vulpina</i>	70	55.1	Abundant		0.41	*331	Continental
<i>Lobaria pulmonaria</i>	6	5.5	Occasional	0.37			Oceanic influence; predominantly M333
<i>Melanelia elegantula</i>	6	4.8	Occasional	-0.20			Continental
<i>Melanelia exasperatula</i>	59	45.4	Abundant	-0.27			Continental
<i>Melanelia glabra</i>	2	1.1	Occasional		-0.33	**342	Continental; 342 only.
<i>Melanelia multispora</i>	15	11.2	Common				Continental
<i>Melanelia subaurifera</i>	4	3.0	Occasional		-0.23	*342	Continental; mostly 342.
<i>Melanelia subelegantula</i>	10	7.6	Occasional				Continental
<i>Melanelia subolivacea</i>	15	11.5	Common	-0.24			Continental
<i>Nephroma helveticum</i>	1	0.4	Uncommon				Oceanic influence
<i>Nephroma parile</i>	1	0.7	Uncommon				Oceanic influence
<i>Nephroma resupinatum</i>	4	2.5	Occasional	0.23			Oceanic influence
<i>Nodobryoria abbreviata</i>	30	22.9	Abundant		0.52	**331, *331A	Continental coniferous forest
<i>Nodobryoria oregana</i>	1	1.1	Uncommon				Moist interior
<i>Parmelia hygrophila</i>	19	15.2	Common	0.34			Oceanic influence
<i>Parmelia sulcata</i>	26	20.7	Abundant	0.38			Cosmopolitan
<i>Parmeliopsis ambigua</i>	48	35.1	Abundant	0.39			Cosmopolitan
<i>Parmeliopsis hyperopta</i>	13	10.1	Common	0.30			Oceanic influence
<i>Peltigera collina</i>	1	1.2	Uncommon				Oceanic influence as epiphyte
<i>Physcia adscendens</i>	11	7.6	Common	-0.24	-0.33	*342D	Cosmopolitan, excess N indicator
<i>Physcia aipolia</i>	4	1.6					Cosmopolitan on hardwoods
<i>Physcia biziana</i>	2	0.9		-0.20			Cosmopolitan on hardwoods
<i>Physcia callosa</i>	1	0.2	Uncommon				Moist interior, rare
<i>Physcia dimidiata</i>	3	2.0	Occasional	-0.26	-0.31		Juniper
<i>Physcia tenella</i>	2	1.1	Occasional	-0.20	-0.30		Excess N indicator
<i>Physconia detersa</i> ¹	1	0.9	Uncommon				Cosmopolitan, apparently uncommon in Idaho
<i>Physconia distorta</i>	1	0.4	Uncommon				
<i>Platismatia glauca</i>	33	29.3	Abundant	0.76		**M333, **M333A	Cosmopolitan, predominantly M333, moist areas
<i>Platismatia stenophylla</i>	2	2.0	Occasional				Oceanic influence, M333 only
<i>Pseudocyphellaria anthraxis</i>	1	0.9	Uncommon				Oceanic influence; M332 only in these data.
<i>c.f. Punctelia rudecta</i>	1	0.4	Uncommon				Needs further study
<i>Ramalina dilacerata</i>	1	0.5	Uncommon				Cosmopolitan on hardwoods; new record for Idaho
<i>Ramalina farinacea</i>	1	0.5	Uncommon				Cosmopolitan on hardwoods

SPECIES	% Freq	Relative Abundance (%)	Status	Ecoregion Province and/or Section Indicator			Ecological Distribution Notes
				Axis 1 r	Axis 2 r	Values	
<i>Usnea</i> sp.	1	0.7	Uncommon				Cosmopolitan
<i>Usnea hirta</i>	1	0.2	Uncommon				New record for Idaho
<i>Usnea lapponica</i>	26	18.6	Abundant		-0.20	**M331	Southern Rocky Mountains and semi-desert, Pacific Northwest
<i>Usnea plicata</i> agg. ²	3	2.5	Occasional				Cosmopolitan
<i>Usnea scabrata</i>	1	0.7	Uncommon				Widespread
<i>Usnea subfloridana</i>	6	4.8	Occasional				Cosmopolitan
<i>Xanthoria fallax</i> ³	22	14.7	Common	-0.49	-0.48	**342	Cosmopolitan, excess N indicator
<i>Xanthoria polycarpa</i> ⁴	19	13.5	Common		-0.43		Cosmopolitan, excess N indicator

1. This taxon has now been divided into several others including *Physconia enteroxantha*, *P. isidiigera* and *P. perisidiosa*.

2. Recent taxonomic changes may place this aggregate within the *Usnea filipendula* group.

3. It is likely that these records may have included specimens of this species as well as *X. fulva* and *X. oregana*.

4. It is likely that these records may have included specimens of this species as well as *X. hasseana* and/or *X. montana*.

Table 4. Correlations of moderately to highly correlated environmental variables in 1996 on-frame Idaho dataset with 2 ordination axes in NMS ordination (McCune 1999). Environmental variable values where $r > 0.2$ or < -0.2 are shown.

Variable	Axis 1	Axis 2
Proportion of Variance Explained	0.48	0.22
Latitude	0.85	
Longitude	0.54	0.33
Elevation	-0.67	
Species Richness	0.67	
Basal Area (Total)	0.34	0.21
Basal Area Hardwoods		-0.22
Basal Area Live Hardwoods		-0.23
Basal Area Conifers	0.34	0.27
Basal Area Live Conifers	0.32	0.28
Percent of Subplots Forested		0.43

Table 5. Environmental attributes of 135 FHM plots for which secondary data exist, Idaho, 1996. Standard deviation of the mean is provided in parentheses after the mean value.

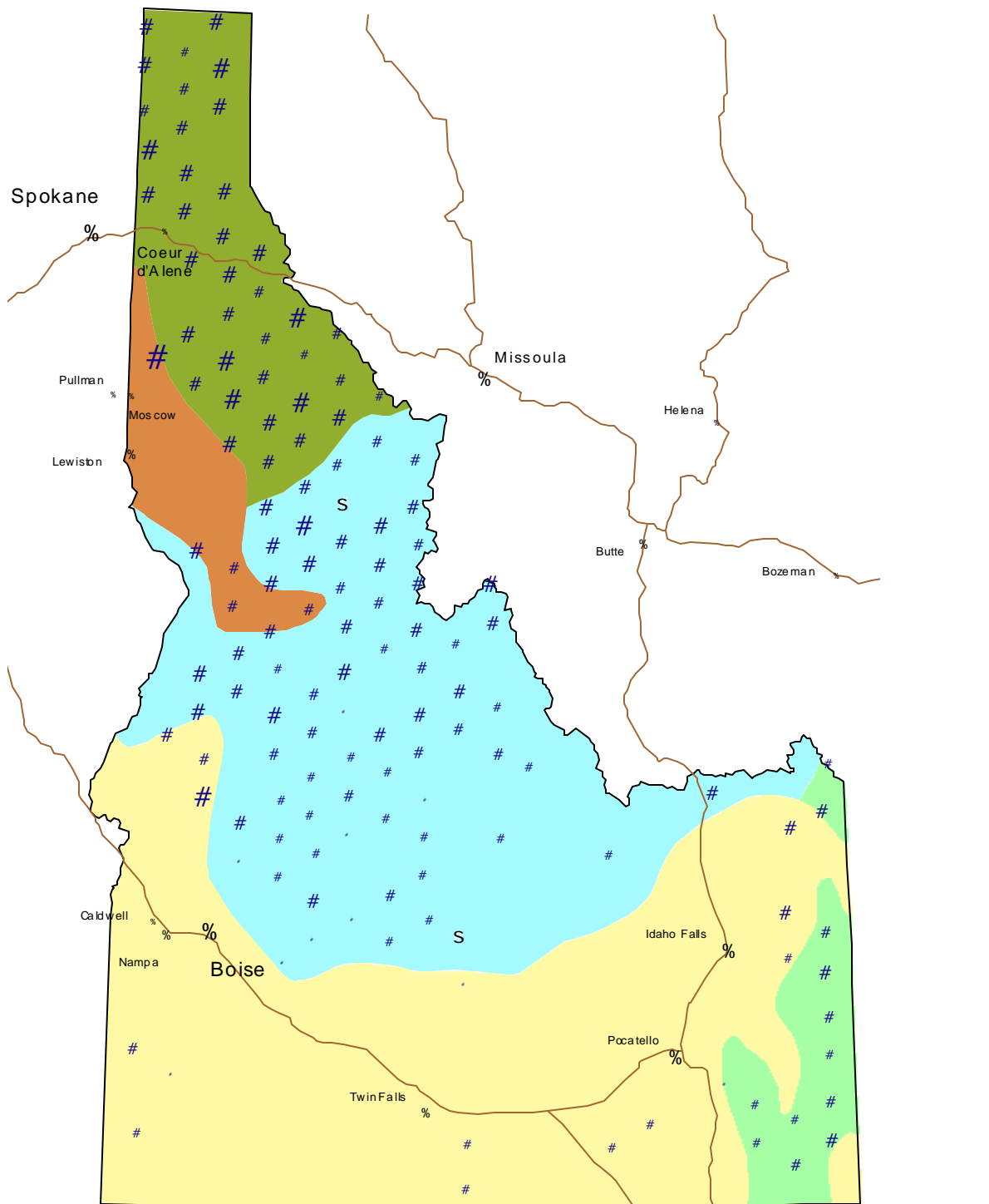
Variable	ECOREGION PROVINCE				
	331. Great Plains-Palouse Dry Steppe	342. Inter-mountain Semi-Desert	M332. Middle Rocky Mountain Steppe-Coniferous Forest-Alpine Meadow	M333. Northern Rocky Mountain Forest-Steppe-Coniferous Forest-Alpine Meadow	M331. Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow
N	5	15	66	37	12
Mean elevation	5300 (1315)	5960 (884)	6381 (1473)	3659 (1070)	7108 (931)
Mean Basal Area (ft ² /ac)	12 (7)	11 (7)	18 (11)	21 (11)	15 (11)
Mean Basal Area Hardwoods (ft ² /ac)	0.2 (0.4)	2.4 (6.0)	0.5 (1.3)	1.1 (2.9)	0.6 (1.4)
Mean Basal Area Live Hardwoods (ft ² /ac)	0.2 (0.4)	2.2 (5.5)	0.4 (1.3)	1.1 (2.8)	0.5 (1.2)
Mean Basal Area Conifers (ft ² /ac)	12 (8)	8 (7)	18 (11)	20 (11)	14 (12)
Mean Basal Area Live Conifers (ft ² /ac)	12 (7)	8 (7)	16 (10)	17 (10)	12 (10)
Mean % of Plot Forested	98 (4)	86 (27)	98 (11)	96 (14)	85 (25)

Table 6. Number of plots by species richness classes, 1996, Idaho.

Lichen Species Richness Class	Number of Plots
0 (0 spp.)	2
1 (1-5 spp.)	32
2 (6-15 spp.)	97
3 (>15 spp.)	9

Table 7. Lichen species richness (with standard deviation) according to Bailey's Ecoregion Provinces, with highly associated lichen species at province and section levels, Idaho, 1996. Associated species were determined with Indicator Species Analysis (Dufrene and Legendre 1997). Indicator values: *= $p < 0.05$; **= $p < 0.01$. Gamma diversity (total species number) was 75 and is not presented by province because of unequal sample sizes.

Ecoregion Province	N	Species Richness	Highly Associated Species
331. Great Plains-Palouse Dry Steppe	6	11.8 (4.4)	<i>Nodobryoria abbreviata</i> ** [*] , <i>Bryoria pseudofuscescens</i> * [*] , <i>Cetraria merrellii</i> * [*] , <i>Hypogymnia metaphysodes</i> * [*] , <i>Letharia vulpina</i> * [*]
M331. Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow	12	7.3 (2.4)	<i>Physcia adscendens</i> * [*] , <i>Usnea lapponica</i> ** [*]
M332. Middle Rocky Mountain Steppe-Coniferous Forest-Alpine Meadow	71	8.1 (4.1)	
M333. Northern Rocky Mountain Forest-Steppe-Coniferous Forest-Alpine Meadow	37	12.2 (3.3)	<i>Alectoria sarmentosa</i> ** [*] , <i>Bryoria capillaris</i> * [*] , <i>Cetraria chlorophylla</i> ** [*] , <i>C. orbata</i> * [*] , <i>Hypogymnia physodes</i> * [*] , <i>H. tubulosa</i> ** [*] , <i>Platismatia glauca</i> ** [*]
342. Intermountain Semi-Desert	15	7.1 (4.0)	<i>Melanelia glabra</i> ** [*] , <i>Melanelia subaurifera</i> * [*] , <i>Xanthoria fallax</i> ** [*]
Total for State	141	9.2 (4.3)	



Lichen Species Richness

0
 . 1 - 3
 # 4 - 6
 # 7 - 9
 # 10 - 12
 # 13 - 15
 # 16 - 18
 # 19 - 20

Cities (Pop.)

% 18,000 - 25,000
 % 25,001 - 33,000
 % 33,001 - 46,000
 % 46,001 - 178,000

Highways

Ecoregion Provinces

- Northern Rocky Mountain Forest-Steppe-Coniferous Forest-Alpine Meadow
- Middle Rocky Mountain Steppe-Coniferous Forest-Alpine Meadow
- Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow
- Great Plains-Palouse Dry Steppe
- Intermountain Semi-Desert

Fig. 2. FHM lichen species richness in 141 on-frame plots in Bailey's Ecoregion Provinces, Idaho, 1996. Major cities with populations of over 18,000 are shown. Boundaries from Bailey et al. 1994.

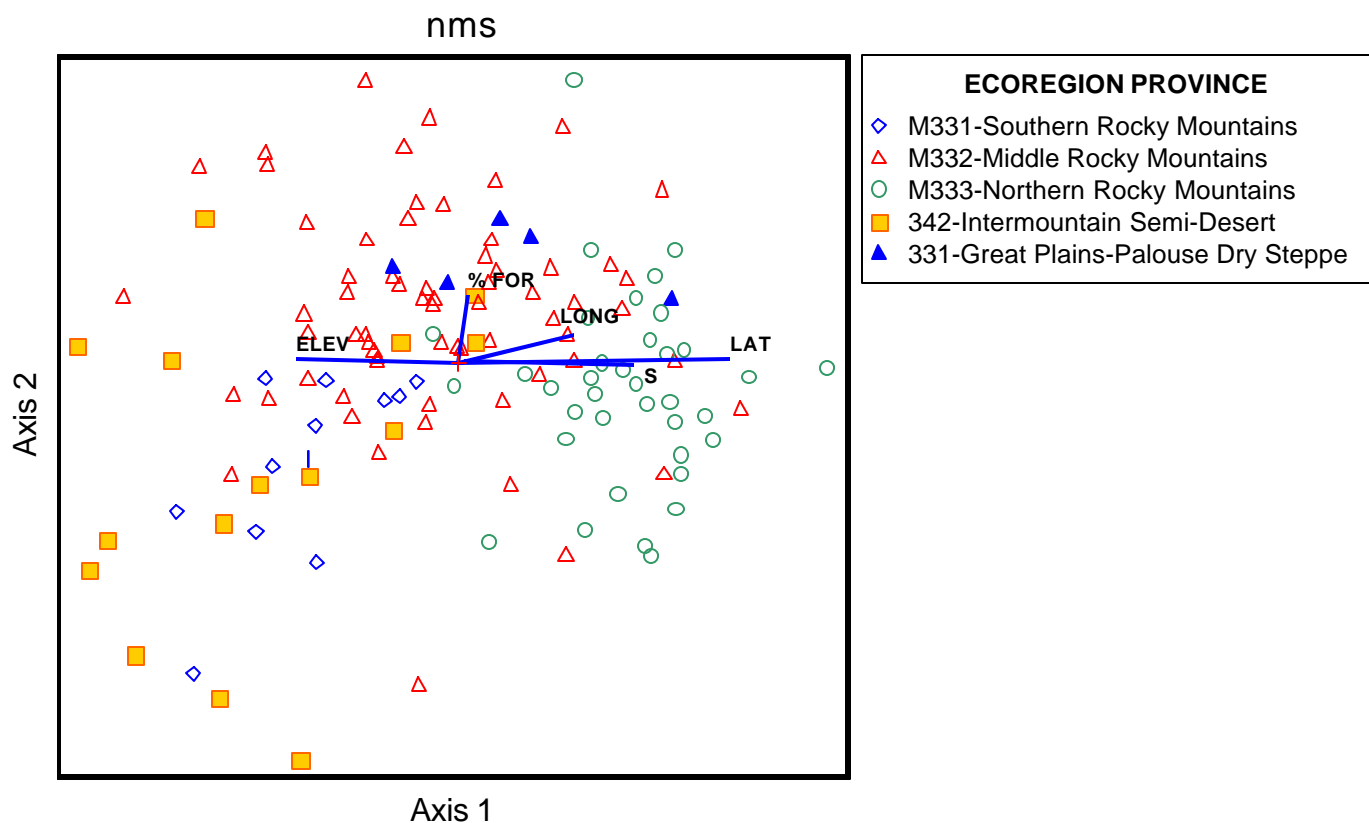


Fig. 3. Ordination of a reduced community matrix of 135 Idaho plots by 57 species with NMS (nonmetric multidimensional scaling, Kruskal 1964). Vectors from centroid are proportional to strength of correlation (Table 4). Vector values: LAT = Latitude; S = Species richness; LON=longitude; % FOR=percent of plot forested; ELEV=elevation.

Air Quality

Air pollution impacts on lichens have been documented from a variety of sources in Idaho (Hoffman 1974, Dillman 1996, Rope and Pearson 1990). Pollution is likely to be having effects in the Boise and Pocatello area, but determination of the nature and severity of these effects will need to await a gradient model. As in other western states (e.g., Colorado: McCune 1998) pollution is likely to have the greatest influence at low to mid-elevations, where the climate is driest and lichen flora naturally most impoverished. Low species richness in Boise area plots (Intermountain Semi Desert Province) should not be attributed to pollution without a gradient model. Pollution impacts on lichens has been documented in Lewiston (Hoffman 1974), and is likely to produce patterns of a different nature as diversity is naturally higher in this wetter zone.

In developing gradient models for the northern Interior West region, we plan to stratify the study area by ecoregion provinces. Idaho will likely fall in two different models, one in the Great Basin and high desert and another in the Rocky Mountains. These models will be regional, spanning much of the northern area of the intermountain west.

Table 8 presents some of the common macrolichen genera growing on trees in Idaho. Based on the pollution sensitivity of species in these genera in the Pacific Northwest (McCune and Geiser 1998) and Colorado (McCune 1998), we have listed their likely indicator values in Idaho. In constructing gradient models for Idaho's ecoregions, we will sample intensively using off-frame plots around urban/industrial areas and known clean air sites. This targeted sampling will help us determine which lichen species performs best in Idaho as indicators of both climate and air pollution.

Epiphytic lichen status and trends relative to forest dynamics

Increase in Douglas-fir stands and stand density

The Boise National Forest has documented a major shift in forest cover from mature open growth ponderosa pine to denser, smaller diameter Douglas-fir (O'Laughlin 1994). This shift is attributed to forest harvesting practices and fire control. Historic ratios of approximately 80% -to-20% ponderosa pine to Douglas-fir have changed to a ratio of 20% to-80% cover of the forested portions of the landscape (O'Laughlin 1994). Forage lichens in the genus *Bryoria* are more abundant in open mature ponderosa pine forests than in dense closed Douglas-fir forests.

Decline in mature larch

Western larch (*Larix occidentalis*) can live 600 years and is affected less by insects and disease than other conifer species. Larch is associated with the upper range of moisture in the state of Idaho and has fire-resistant characteristics. Harvest practices, lack of natural fires and artificial regeneration that has selected against this tree species has caused a decline in mature larch in Idaho and Montana. Historically this tree was held sacred to the native Americans who collected forage lichens from its branches to be cooked and added it to their pemican for use as food for the winter (Turner 1977). This tree species supports large populations of forage lichens and produces large amounts of biomass that are utilized by wildlife (Rosso and Rosentreter 1999). The decline of this tree species contributes to a decline in the abundance of the forage lichens in the northern part of the State.

Increase in orange lichens due to excess nitrogen

The increase of orange lichens (*Xanthoria* spp. and others) on desert shrubs and due to excess nitrogen is documented in Idaho (Rosentreter 1994) and may be affecting forests and woodlands near sources of nitrogen pollution. In FHM monitoring, nitrophilous species such as *Xanthoria fallax* and *X. polycarpa* (*sensu lato*) were highly associated with plots in the Intermountain Semi-Desert Province. This association is due in part to the naturally high deposition of soil nitrogen via dust in semi-arid areas, although the extent to which anthropogenic sources have contributed to a bloom of these taxa is unknown. While a small group of lichen taxa respond positively to nitrogen enrichment, a much larger group exhibits deleterious effects including dieback, deformities, cancer-like growths, and dissociation of the algal and fungal partners of the lichen (Kauppi 1980). Many dairy and large animal feed lots and farms are moving to Idaho due to the limited regulations on agriculture and permissive environmental regulations in the State. Nitrogen pollution may increase in the future and lichen community monitoring may be able to detect and track its areas of impacts.

Decline in large riparian hardwoods

Due to the easy accessibility, regulated stream flows from dams, splash dams for logs, and road building along the stream channels, riparian areas with large hardwoods in the State have declined (USDA 1997). These large hardwood trees support a diverse and occasionally rare lichen flora. Since no on-frame plots occurred in riparian areas, gradient model plots will examine several such areas in assessing trends in landscape-level diversity.

Table 8. Characteristics of some common macrolichen genera growing on trees in Idaho.

Genus	Appearance	Indicator value and functional roles
<i>Alectoria</i>	Yellow, hairlike	Pollution-sensitive; strong indicator of wet-montane climate
<i>Bryoria</i>	Brown, hairlike	Pollution-sensitive; forage lichen; many uses by animals. Some species strong climate indicators
<i>Candelaria</i>	Yellow, very small foliose	Pollution and dust tolerant, mainly on hardwoods
<i>Cetraria</i>	Greenish, broad-lobed foliose	Generally intermediate in pollution sensitivity and in climate indication
<i>Cladonia</i>	Grey-green stalks or cups with small frills	Forest floor, tree bases and rotting wood. Intermediate to sensitive to air pollution; most common in wetter climates
<i>Hypogymnia</i>	Grey or brown, foliose, hollow lobes	Mainly on conifers, some species pollution tolerant
<i>Letharia</i>	Yellow to chartreuse shrubby	Widespread in continental conifer forests; somewhat pollution sensitive.
<i>Melanelia</i>	Brown to olive, foliose, medium size	Nearly ubiquitous; some species pollution tolerant; on both hardwoods and conifers
<i>Nephroma</i>	Brown, foliose, small	A nitrogen-fixing lichen with oceanic affinities, pollution-sensitive
<i>Parmelia</i>	Grey, foliose, medium size, black below	Widespread, pollution tolerant, on both hardwoods and conifers
<i>Parmeliopsis</i>	Grey or green-grey narrow lobed foliose	Mid to upper elevation conifers; intermediate in pollution sensitivity.
<i>Phaeophyscia</i>	Small, cryptic, grey or brownish, foliose	Usually on hardwoods; most species pollution tolerant
<i>Physcia</i>	Small, white, foliose	Some species nitrogen-loving; some species almost restricted to hardwoods
<i>Physconia</i>	Small, frosty-coated, foliose, often forming neat rosettes; brown, grey or white	Usually on hardwoods; pollution tolerant, nitrogen-loving
<i>Platismatia</i>	White, foliose, large	On conifers in wet climates, pollution-tolerant to intermediate
<i>Usnea</i>	Greenish fruticose, tufted or hanging, branches have a central cord	Abundant in the mountains, somewhat pollution sensitive but persisting in polluted areas as dwarf, compact forms
<i>Xanthoria</i>	Orange or yellow, foliose	Widespread but more abundant in areas of elevated nitrogen, somewhat pollution tolerant

FURTHER RESEARCH NEEDED

The main research needed to place these findings in perspective is regional gradient modeling. By sampling intensively around the most polluted urban/industrial areas in Idaho, we will be able to model the changes in lichen communities from clean air to polluted air in a variety of ecoregions and elevations. This gradient model will be constructed using an aggregate of the most similar northern continental ecoregions.

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Appendix 1. Epiphytic macrolichen species richness and plot locations for 141 on-frame FHM plots in Idaho, 1996.

The general coordinates of the plots are: Latitude (first 2 digits), Longitude (digits 3-5).

HEX_ID	Species Richness	Species Richness Class*
4211125	8	2
4211133	10	2
4211137	5	1
4211145	5	1
4211153	8	2
4211157	5	1
4211173	4	1
4211238	5	1
4211246	6	2
4211262	3	1
4211412	5	1
4211432	4	1
4211647	5	1
4211675	3	1
4211687	9	2
4311112	7	2
4311132	11	2
4311145	6	2
4311152	7	2
4311165	11	2
4311432	2	1
4311452	0	0
4311457	5	1
4311464	6	2
4311477	8	2
4311484	5	1
4311546	3	1
4311553	3	1
4311561	3	1
4311574	11	2
4311586	4	1
4411125	12	2
4411132	11	2
4411152	6	2
4411241	10	2
4411311	5	1
4411328	5	1
4411355	6	2
4411368	9	2
4411388	5	1
4411425	5	1
4411437	4	1
4411445	2	1
4411457	6	2
4411465	9	2

HEX_ID	Species Richness	Species Richness Class*
4411472	9	2
4411477	11	2
4411485	11	2
4411514	5	1
4411518	2	1
4411521	1	1
4411526	5	1
4411534	5	1
4411541	8	2
4411546	5	1
4411554	4	1
4411561	6	2
4411566	8	2
4411574	7	2
4411582	2	1
4411586	15	2
4411631	11	2
4411643	16	3
4411663	9	2
4411666	11	2
4411673	14	2
4511348	11	2
4511368	15	2
4511412	10	2
4511425	7	2
4511432	5	1
4511437	6	2
4511445	11	2
4511457	9	2
4511465	10	2
4511478	10	2
4511485	9	2
4511514	7	2
4511522	13	2
4511527	6	2
4511542	11	2
4511547	10	2
4511554	9	2
4511557	13	2
4511562	7	2
4511574	14	2
4511577	15	2
4511582	12	2
4511585	18	3
4511611	10	2
4511613	14	2
4511621	12	2
4511641	9	2
4511661	9	2
4511674	14	2

HEX_ID	Species Richness	Species Richness Class*
4611418	15	2
4611425	12	2
4611445	8	2
4611458	8	2
4611468	6	2
4611517	15	2
4611522	0	0
4611525	11	2
4611532	8	2
4611537	10	2
4611545	12	2
4611552	13	2
4611557	13	2
4611565	17	3
4611572	7	2
4611577	12	2
4611585	6	2
4611642	15	2
4611662	16	3
4611674	11	2
4611682	16	3
4611687	20	3
4711513	9	2
4711518	7	2
4711525	17	3
4711538	7	2
4711558	14	2
4711578	No data	
4711615	14	2
4711622	10	2
4711642	15	2
4711655	14	2
4711663	15	2
4711675	13	2
4711683	14	2
4711688	13	2
4811615	15	2
4811628	16	3
4811636	11	2
4811643	14	2
4811648	9	2
4811656	9	2
4811663	16	3
4811668	13	2
4811676	6	2
4811683	13	2
4811781	13	2
Mean	12.2	2

*Class 0 = 0 species; Class 1= 1-5 species; Class 2 = 6-15 species; Class 3 >15 species.

Appendix 2. List of macrolichen species by plot found in 155 FHM plots in Idaho, 1996. Raw data files available on-line from FHM Information Management Group (http://willow.ncfes.umn.edu/fhm/fhm_hp.htm) and from the lichen indicator advisor.

Compact format data file:
 ID96RAW.TXT
 Species file:
 EPIPHYTE.SPP

Matrix size: 155 plots (rows)
 76 species (columns)

Group: QA-REF
Sample unit: 00231611

Value	Code	Species	Code Name
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
4.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00231612

Value	Code	Species	Code Name
1.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5724	Physcia tenella	Phyten
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00241611

Value	Code	Species	Code Name
3.00	4004	Melanelia exasperatula	Melexl
2.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00241612

Value	Code	Species	Code Name
2.00	610	Bryoria fuscescens	Bryfus
2.00	4002	Melanelia elegantula	Melele
2.00	4004	Melanelia exasperatula	Melexl
2.00	4010	Melanelia multisporea	Melmul
3.00	5701	Physcia adscendens	Phyads
2.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00251611

Value	Code	Species	Code Name
4.00	4004	Melanelia exasperatula	Melexl
3.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00251612

Value	Code	Species	Code Name
4.00	4017	Melanelia subolivacea	Melsol
4.00	5701	Physcia adscendens	Phyads
4.00	8203	Xanthoria fallax	Xanfal

Group: QA-REF
Sample unit: 00261611

Value	Code	Species	Code Name
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
3.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
2.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00261612

Value	Code	Species	Code Name
3.00	4017	Melanelia subolivacea	Melsol
3.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00271611

Value	Code	Species	Code Name
1.00	610	Bryoria fuscescens	Bryfus
3.00	4004	Melanelia exasperatula	Melexl
1.00	5724	Physcia tenella	Phyten
1.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal

Group: QA-REF
Sample unit: 00271612

Value	Code	Species	Code Name
2.00	610	Bryoria fuscescens	Bryfus
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal

Group: QA-REF
Sample unit: 00291611

Value	Code	Species	Code Name
1.00	610	Bryoria fuscescens	Bryfus
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-REF
Sample unit: 00291612

Value	Code	Species	Code Name
2.00	610	Bryoria fuscescens	Bryfus
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-AUDIT
Sample unit: 00931611

Value	Code	Species	Code Name
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	5701	Physcia adscendens	Phyads
4.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: QA-AUDIT
Sample unit: 00931612

Value	Code	Species	Code Name
1.00	610	Bryoria fuscescens	Bryfus
3.00	4015	Melanelia subaurifera	Melsub
3.00	4017	Melanelia subolivacea	Melsol
4.00	5701	Physcia adscendens	Phyads
1.00	8044	Usnea lapponica	Usnlap
4.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211125

Value	Code	Species	Code Name
2.00	601	Bryoria abbreviata	Bryabb
1.00	610	Bryoria fuscescens	Bryfus
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
3.00	5710	Physcia dimidiata	Phydim
1.00	5705	Physcia biziana	Phybiz
3.00	8044	Usnea lapponica	Usnlap
2.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211133

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
1.00	1005	Cetraria chlorophylla	Cetchl
1.00	3108	Hypogymnia imshaugii	Hypims
3.00	3701	Letharia columbiana	Letccl
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211137

Value	Code	Species	Code Name
3.00	4017	Melanelia subolivacea	Melsol
1.00	5705	Physcia biziana	Phybiz
3.00	5710	Physcia dimidiata	Phydim
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211145

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	3701	Letharia columbiana	Letccl
3.00	4004	Melanelia exasperatula	Melexl
3.00	8044	Usnea lapponica	Usnlap
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211153

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus

3.00	3701	Letharia columbiana	Letcol
3.00	4002	Melanelia elegantula	Melele
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4211157

Value	Code	Species	Code Name
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	5701	Physcia adscendens	Phyads
3.00	5724	Physcia tenella	Phyten
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4211173

Value	Code	Species	Code Name
3.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
1.00	8044	Usnea lapponica	Usnlap
2.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211238

Value	Code	Species	Code Name
3.00	4017	Melanelia subolivacea	Melsol
3.00	4006	Melanelia glabra	Melgla
2.00	5724	Physcia tenella	Phyten
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211246

Value	Code	Species	Code Name
2.00	3701	Letharia columbiana	Letcol
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5701	Physcia adscendens	Phyads
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211262

Value	Code	Species	Code Name
1.00	4004	Melanelia exasperatula	Melexl

4.00	4017	Melanelia subolivacea	Melsol
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211412

Value	Code	Species	Code Name
2.00	4006	Melanelia glabra	Melgla
3.00	4015	Melanelia subaurifera	Melsub
1.00	5724	Physcia tenella	Phyten
1.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4211432

Value	Code	Species	Code Name
3.00	4002	Melanelia elegantula	Melele
3.00	5710	Physcia dimidiata	Phydim
3.00	5901	Physconia detersa	Phodet
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4211647

Value	Code	Species	Code Name
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
1.00	4006	Melanelia glabra	Melgla
3.00	4015	Melanelia subaurifera	Melsub
3.00	4017	Melanelia subolivacea	Melsol

Group: ON FRAME
Sample unit: 4211675

Value	Code	Species	Code Name
1.00	3702	Letharia vulpina	Letvul
2.00	4015	Melanelia subaurifera	Melsub
2.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4211687

Value	Code	Species	Code Name
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
2.00	4002	Melanelia elegantula	Melele
3.00	4015	Melanelia subaurifera	Melsub
3.00	4017	Melanelia subolivacea	Melsol
3.00	5705	Physcia biziana	Phybiz
1.00	5707	Physcia callosa	Phycal
3.00	8203	Xanthoria fallax	Xanfal
2.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4311112

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	8301	Candelaria concolor	Cndcon
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
1.00	5701	Physcia adscendens	Phyads
4.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4311132

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
2.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5701	Physcia adscendens	Phyads
1.00	5702	Physcia aipolia	Phyaip
3.00	8044	Usnea lapponica	Usnlap
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4311145

Value	Code	Species	Code Name
2.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4311152

Value	Code	Species	Code Name
1.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4311165

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
1.00	3108	Hypogymnia imshaugii	Hypims
3.00	3701	Letharia columbiana	Letcol
3.00	4002	Melanelia elegantula	Melele
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
2.00	4806	Parmelia sulcata	Parsul
3.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4311432

Value	Code	Species	Code Name
3.00	5701	Physcia adscendens	Phyads
4.00	8203	Xanthoria fallax	Xanfal

Sample unit: 4311452

No species encountered in this sample unit.

Group: ON FRAME
Sample unit: 4311457

Value	Code	Species	Code Name
1.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4311464

Value	Code	Species	Code Name
2.00	610	Bryoria fuscescens	Bryfus
3.00	3702	Letharia vulpina	Letvul
2.00	4004	Melanelia exasperatula	Melexl
2.00	5201	Parmeliopsis ambigua	Popamb
2.00	8044	Usnea lapponica	Usnlap
1.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4311477

Value	Code	Species	Code Name
3.00	609	Bryoria furcellata	Bryfur
3.00	610	Bryoria fuscescens	Bryfus

2.00	8301	Candelaria concolor	Cndcon
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
1.00	4010	Melanelia multispora	Melmul
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4311484

Value	Code	Species	Code Name
3.00	8301	Candelaria concolor	Cndcon
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4311546

Value	Code	Species	Code Name
3.00	8301	Candelaria concolor	Cndcon
3.00	4017	Melanelia subolivacea	Melsol
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4311553

Value	Code	Species	Code Name
2.00	610	Bryoria fuscescens	Bryfus
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl

Group: ON FRAME
Sample unit: 4311561

Value	Code	Species	Code Name
1.00	607	Bryoria fremontii	Bryfre
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul

Group: ON FRAME
Sample unit: 4311574

Value	Code	Species	Code Name
1.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
3.00	1013	Cetraria orbata	Cetorb
2.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
2.00	4806	Parmelia sulcata	Parsul

2.00	5201	Parmeliopsis ambigua	Popamb
3.00	5702	Physcia aipolia	Phyaip
2.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4311586

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
3.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3701	Letharia columbiana	Letcol
4.00	4004	Melanelia exasperatula	Melexl

Group: ON FRAME
Sample unit: 4411125

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
1.00	4010	Melanelia multispora	Melmul
3.00	4016	Melanelia subelegantula	Melsel
2.00	4802	Parmelia hygrophila	Parhyg
1.00	5201	Parmeliopsis ambigua	Popamb
2.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4411132

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
1.00	1015	Cetraria pinastri	Cetpin
3.00	3108	Hypogymnia imshaugii	Hypims
1.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8044	Usnea lapponica	Usnlap
2.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411152

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
2.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	8044	Usnea lapponica	Usnlap

2.00 8203 Xanthoria fallax Xanfal

Group: ON FRAME
Sample unit: 4411241

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
2.00	3701	Letharia columbiana	Letcol
2.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
3.00	5201	Parmeliopsis ambigua	Popamb
2.00	5902	Physconia distorta	Phodis
2.00	6402	Pseudocyphellaria anthraspis	Pcyant
3.00	8044	Usnea lapponica	Usnlap
2.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411311

Value	Code	Species	Code Name
2.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4010	Melanelia multispora	Melmul
4.00	5701	Physcia adscendens	Phyads
4.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411328

Value	Code	Species	Code Name
2.00	8301	Candelaria concolor	Cndcon
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
2.00	5710	Physcia dimidiata	Phydim
2.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411355

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
1.00	1011	Cetraria merrillii	Cetmer
2.00	3102	Hypogymnia austerodes	Hypaus
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411368

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus

2.00	3116	Hypogymnia physodes	Hypphy
4.00	3701	Letharia columbiana	Letcol
3.00	4004	Melanelia exasperatula	Melexl
2.00	4017	Melanelia subolivacea	Melsol
3.00	4806	Parmelia sulcata	Parsul
2.00	5201	Parmeliopsis ambigua	Popamb
2.00	5901	Physconia detersa	Phodet
2.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4411388

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
1.00	620	Bryoria simplicior	Brysim
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
2.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411425

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
1.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411437

Value	Code	Species	Code Name
1.00	610	Bryoria fuscescens	Bryfus
4.00	3701	Letharia columbiana	Letcol
3.00	4017	Melanelia subolivacea	Melsol
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411445

Value	Code	Species	Code Name
4.00	3702	Letharia vulpina	Letvul
4.00	4002	Melanelia elegantula	Melele

Group: ON FRAME
Sample unit: 4411457

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
2.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl

3.00	4017	Melanelia subolivacea	Melsol
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411465

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	3102	Hypogymnia austerodes	Hypaus
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
2.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5202	Parmeliopsis hyperopta	Pophyp
2.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4411472

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3701	Letharia columbiana	Letcol
1.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
2.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8072	Usnea subfloridana	Usnsub

Group: ON FRAME
Sample unit: 4411477

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
4.00	610	Bryoria fuscescens	Bryfus
3.00	1013	Cetraria orbata	Cetorb
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4002	Melanelia elegantula	Melele
3.00	4004	Melanelia exasperatula	Melexl
2.00	4806	Parmelia sulcata	Parsul
2.00	5201	Parmeliopsis ambigua	Popamb
2.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4411485

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
2.00	1016	Cetraria platyphylla	Cetpla
2.00	3102	Hypogymnia austerodes	Hypaus

3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
1.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
1.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4411514

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3701	Letharia columbiana	Letcol
4.00	4004	Melanelia exasperatula	Melexl

Group: ON FRAME
Sample unit: 4411518

Value	Code	Species	Code Name
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul

Group: ON FRAME
Sample unit: 4411521

Value	Code	Species	Code Name
3.00	3701	Letharia columbiana	Letcol

Group: ON FRAME
Sample unit: 4411526

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3701	Letharia columbiana	Letcol
3.00	4017	Melanelia subolivacea	Melsol

Group: ON FRAME
Sample unit: 4411534

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
4.00	610	Bryoria fuscescens	Bryfus
3.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl

Group: ON FRAME

Sample unit: 4411541

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4002	Melanelia elegantula	Melele
4.00	4004	Melanelia exasperatula	Melexl
2.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411546

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol

Group: ON FRAME
Sample unit: 4411554

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411561

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
4.00	607	Bryoria fremontii	Bryfre
4.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul

Group: ON FRAME
Sample unit: 4411566

Value	Code	Species	Code Name
1.00	205	Alectoria sarmentosa	Alesar
1.00	601	Bryoria abbreviata	Bryabb
4.00	610	Bryoria fuscescens	Bryfus
3.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol

Group: ON FRAME
Sample unit: 4411574

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
1.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
3.00	4004	Melanelia exasperatula	Melexl
1.00	5201	Parmeliopsis ambigua	Popamb
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411582

Value	Code	Species	Code Name
3.00	3701	Letharia columbiana	Letcol
2.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411586

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
3.00	205	Alectoria sarmentosa	Alesar
3.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
3.00	1004	Cetraria canadensis	Cetcan
3.00	1016	Cetraria platyphylla	Cetpla
3.00	1200	Cladonia	Cla
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3114	Hypogymnia occidentalis	Hypocc
3.00	3702	Letharia vulpina	Letvul
1.00	4802	Parmelia hygrophila	Parhyg
2.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
2.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4411631

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
3.00	1013	Cetraria orbata	Cetorb
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	6101	Platismatia glauca	Plagla
3.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4411643

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
3.00	1004	Cetraria canadensis	Cetcan
2.00	1016	Cetraria platyphylla	Cetpla
1.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	4806	Parmelia sulcata	Parsul
2.00	5202	Parmeliopsis hyperopta	Pophyp
2.00	5701	Physcia adscendens	Phyads
3.00	8044	Usnea lapponica	Usnlap
2.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411663

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1013	Cetraria orbata	Cetorb
4.00	3108	Hypogymnia imshaugii	Hypims
2.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4411666

Value	Code	Species	Code Name
2.00	601	Bryoria abbreviata	Bryabb
3.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
1.00	2404	Evernia prunastri	Evepru
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8044	Usnea lapponica	Usnlap
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4411673

Value	Code	Species	Code Name
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3.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
1.00	8301	Candelaria concolor	Cndcon
3.00	1013	Cetraria orbata	Cetorb
3.00	1016	Cetraria platyphylla	Cetpla
1.00	1011	Cetraria merrillii	Cetmer
2.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
1.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
2.00	5201	Parmeliopsis ambigua	Popamb
3.00	8058	Usnea plicata agg.	Usnpli

Group: ON FRAME
Sample unit: 4511348

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
1.00	607	Bryoria fremontii	Bryfre
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1011	Cetraria merrillii	Cetmer
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol
3.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8072	Usnea subfloridana	Usnsub

Group: ON FRAME
Sample unit: 4511368

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
3.00	601	Bryoria abbreviata	Bryabb
3.00	607	Bryoria fremontii	Bryfre
3.00	1013	Cetraria orbata	Cetorb
1.00	1016	Cetraria platyphylla	Cetpla
1.00	1200	Cladonia	Cla
3.00	3108	Hypogymnia imshaugii	Hypims
1.00	3116	Hypogymnia physodes	Hypphy
3.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
2.00	4004	Melanelia exasperatula	Melexl
1.00	4802	Parmelia hygrophila	Parhyg
2.00	5201	Parmeliopsis ambigua	Popamb
3.00	5202	Parmeliopsis hyperopta	Pophyp
1.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4511412

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus

3.00	1005	Cetraria chlorophylla	Cetchl
1.00	3102	Hypogymnia austerodes	Hypaus
1.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
2.00	5201	Parmeliopsis ambigua	Popamb
2.00	8072	Usnea subfloridana	Usnsub
2.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4511425

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	3102	Hypogymnia austerodes	Hypaus
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4511432

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4017	Melanelia subolivacea	Melsol

Group: ON FRAME
Sample unit: 4511437

Value	Code	Species	Code Name
1.00	205	Alectoria sarmentosa	Alesar
4.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
3.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl

Group: ON FRAME
Sample unit: 4511445

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
4.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4016	Melanelia subelegantula	Melsel

3.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511457

Value	Code	Species	Code Name
2.00	5201	Parmeliopsis ambigua	Popamb
2.00	101	Ahtiana sphaerosporella	Ahtsph
2.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3702	Letharia vulpina	Letvul
3.00	4551	Nodobryoria abbreviata	Nodabb
3.00	610	Bryoria fuscescens	Bryfus
1.00	205	Alectoria sarmentosa	Alesar
3.00	4004	Melanelia exasperatula	Melexl
4.00	607	Bryoria fremontii	Bryfre

Group: ON FRAME
Sample unit: 4511465

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
3.00	601	Bryoria abbreviata	Bryabb
4.00	607	Bryoria fremontii	Bryfre
3.00	1013	Cetraria orbata	Cetorb
3.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4511478

Value	Code	Species	Code Name
3.00	101	Ahtiana sphaerosporella	Ahtsph
4.00	601	Bryoria abbreviata	Bryabb
4.00	607	Bryoria fremontii	Bryfre
4.00	1016	Cetraria platyphylla	Cetpla
2.00	1200	Cladonia	Cla
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5202	Parmeliopsis hyperopta	Pophyp

Group: ON FRAME
Sample unit: 4511485

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
1.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse

4.00	1016	Cetraria platyphylla	Cetpla
4.00	3105	Hypogymnia enteromorpha	Hypent
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4511514

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl

Group: ON FRAME
Sample unit: 4511522

Value	Code	Species	Code Name
1.00	202	Alectoria imshaugii	Aleims
4.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1014	Cetraria pallidula	Cetpal
3.00	1016	Cetraria platyphylla	Cetpla
2.00	1200	Cladonia	Clad
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4002	Melanelia elegantula	Melele
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
1.00	8072	Usnea subfloridana	Usnsub

Group: ON FRAME
Sample unit: 4511527

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
4.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4511542

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
1.00	1004	Cetraria canadensis	Cetcan

3.00	1005	Cetraria chlorophylla	Cetchl
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3121	Hypogymnia tubulosa	Hyptub
3.00	3702	Letharia vulpina	Letvul
3.00	4016	Melanelia subelegantula	Melsel
3.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8072	Usnea subfloridana	Usnsub

Group: ON FRAME
Sample unit: 4511547

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
3.00	618	Bryoria pseudofuscescens	Brypse
1.00	1016	Cetraria platyphylla	Cetpla
3.00	3701	Letharia columbiana	Letcol
1.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
2.00	4806	Parmelia sulcata	Parsul
2.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4511554

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
4.00	601	Bryoria abbreviata	Bryabb
4.00	618	Bryoria pseudofuscescens	Brypse
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	5202	Parmeliopsis hyperopta	Pophyp

Group: ON FRAME
Sample unit: 4511557

Value	Code	Species	Code Name
2.00	205	Alectoria sarmentosa	Alesar
4.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
3.00	1016	Cetraria platyphylla	Cetpla
4.00	1011	Cetraria merrillii	Cetmer
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3116	Hypogymnia physodes	Hypphy
3.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
1.00	6101	Platismatia glauca	Plagla
2.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511562

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3702	Letharia vulpina	Letvul
3.00	5201	Parmeliopsis ambigua	Popamb
2.00	5202	Parmeliopsis hyperopta	Pophyp

Group: ON FRAME
Sample unit: 4511574

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
4.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
1.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
4.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
4.00	5201	Parmeliopsis ambigua	Popamb
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4511577

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	601	Bryoria abbreviata	Bryabb
4.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
3.00	1004	Cetraria canadensis	Cetcan
4.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
4.00	4806	Parmelia sulcata	Parsul
4.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511582

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar

1.00	601	Bryoria abbreviata	Bryabb
4.00	618	Bryoria pseudofuscescens	Brypse
4.00	1016	Cetraria platyphylla	Cetpla
4.00	1011	Cetraria merrillii	Cetmer
4.00	2301	Esslingeriana idahoensis	Essida
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
4.00	4802	Parmelia hygrophila	Parhyg
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4511585

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	603	Bryoria capillaris	Brycap
3.00	610	Bryoria fuscescens	Bryfus
1.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
4.00	2301	Esslingeriana idahoensis	Essida
3.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	3702	Letharia vulpina	Letvul
4.00	3905	Lobaria pulmonaria	Lobpul
4.00	4408	Nephroma resupinatum	Nepres
4.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
4.00	6101	Platismatia glauca	Plagla
4.00	8065	Usnea scabrata	Usnsca

Group: ON FRAME
Sample unit: 4511611

Value	Code	Species	Code Name
4.00	618	Bryoria pseudofuscescens	Brypse
1.00	1005	Cetraria chlorophylla	Cetchl
3.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3119	Hypogymnia rugosa	Hyprug
4.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4802	Parmelia hygrophila	Parhyg
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511613

Value	Code	Species	Code Name
1.00	601	Bryoria abbreviata	Bryabb
4.00	618	Bryoria pseudofuscescens	Brypse
4.00	1013	Cetraria orbata	Cetorb

4.00	1016	Cetraria platyphylla	Cetpla
3.00	1011	Cetraria merrillii	Cetmer
1.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8044	Usnea lapponica	Usnlap
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4511621

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	618	Bryoria pseudofuscescens	Brypse
3.00	1013	Cetraria orbata	Cetorb
1.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3701	Letharia columbiana	Letcol
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
3.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511641

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
4.00	618	Bryoria pseudofuscescens	Brypse
4.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
4.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511661

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
3.00	610	Bryoria fuscescens	Bryfus
4.00	1016	Cetraria platyphylla	Cetpla
3.00	1011	Cetraria merrillii	Cetmer
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
3.00	4802	Parmelia hygrophila	Parhyg
3.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4511674

Value	Code	Species	Code Name
2.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
1.00	2404	Evernia prunastri	Evepru
3.00	3116	Hypogymnia physodes	Hypphy
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
4.00	4010	Melanelia multispora	Melmul
4.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
1.00	5702	Physcia aipolia	Phyaip
3.00	6101	Platismatia glauca	Plagla
1.00	8041	Usnea hirta	Usnhir
4.00	8072	Usnea subfloridana	Usnsub
4.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4611418

Value	Code	Species	Code Name
4.00	202	Alectoria imshaugii	Aleims
3.00	205	Alectoria sarmentosa	Alesar
2.00	615	Bryoria oregana	Bryore
2.00	618	Bryoria pseudofuscescens	Brypse
4.00	1005	Cetraria chlorophylla	Cetchl
3.00	1200	Cladonia	Cla
4.00	1210	Cladonia chlorophaea	Clachl
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3116	Hypogymnia physodes	Hypphy
2.00	3121	Hypogymnia tubulosa	Hyptub
4.00	3905	Lobaria pulmonaria	Lobpul
2.00	4403	Nephroma helveticum	Nephel
3.00	4806	Parmelia sulcata	Parsul
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611425

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
4.00	603	Bryoria capillaris	Brycap
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
3.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
4.00	5201	Parmeliopsis ambigua	Popamb
3.00	5503	Peltigera collina	Pelcol
4.00	6101	Platismatia glauca	Plagla
4.00	8000	Usnea	Usn

Group: ON FRAME
Sample unit: 4611445

Value	Code	Species	Code Name
1.00	202	Alectoria imshaugii	Aleims
2.00	205	Alectoria sarmentosa	Alesar
1.00	601	Bryoria abbreviata	Bryabb
4.00	618	Bryoria pseudofuscescens	Brypse
1.00	1013	Cetraria orbata	Cetorb
3.00	3105	Hypogymnia enteromorpha	Hypent
3.00	3702	Letharia vulpina	Letvul
2.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4611458

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	615	Bryoria oregana	Bryore
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	3114	Hypogymnia occidentalis	Hypocc
3.00	3702	Letharia vulpina	Letvul
4.00	4806	Parmelia sulcata	Parsul
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611468

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
4.00	603	Bryoria capillaris	Brycap
4.00	1013	Cetraria orbata	Cetorb
4.00	3116	Hypogymnia physodes	Hypphy
3.00	3702	Letharia vulpina	Letvul
2.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4611517

Value	Code	Species	Code Name
3.00	607	Bryoria fremontii	Bryfre
3.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	2404	Evernia prunastri	Evepru
4.00	3121	Hypogymnia tubulosa	Hyptub
3.00	3905	Lobaria pulmonaria	Lobpul
3.00	4002	Melanelia elegantula	Melele
3.00	4004	Melanelia exasperatula	Melexl
3.00	4408	Nephroma resupinatum	Nepres
3.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
1.00	5702	Physcia aipolia	Phyaip
4.00	6101	Platismatia glauca	Plagla
2.00	6708	Punctelia rudecta	Punrud
4.00	8044	Usnea lapponica	Usnlap

Sample unit: 4611522

No species encountered in this sample unit.

Group: ON FRAME
Sample unit: 4611525

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
2.00	610	Bryoria fuscescens	Bryfus
3.00	1013	Cetraria orbata	Cetorb
1.00	2301	Esslingeriana idahoensis	Essida
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3905	Lobaria pulmonaria	Lobpul
1.00	4408	Nephroma resupinatum	Nepres
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	6101	Platismatia glauca	Plagla
3.00	6402	Pseudocyphellaria anthraspis	Pcyant

Group: ON FRAME
Sample unit: 4611532

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	1013	Cetraria orbata	Cetorb
2.00	2404	Evernia prunastri	Evepru
3.00	3108	Hypogymnia imshaugii	Hypims
2.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4806	Parmelia sulcata	Parsul
3.00	8058	Usnea plicata agg.	Usnpli

Group: ON FRAME
Sample unit: 4611537

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
3.00	610	Bryoria fuscescens	Bryfus
3.00	1004	Cetraria canadensis	Cetcan
3.00	1011	Cetraria merrillii	Cetmer
3.00	1200	Cladonia	Cla
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611545

Value	Code	Species	Code Name
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3.00	202	Alectoria imshaugii	Aleims
4.00	205	Alectoria sarmentosa	Alesar
3.00	601	Bryoria abbreviata	Bryabb
4.00	610	Bryoria fuscescens	Bryfus
3.00	1016	Cetraria platyphylla	Cetpla
1.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	4004	Melanelia exasperatula	Melexl
3.00	4016	Melanelia subelegantula	Melsel
3.00	4806	Parmelia sulcata	Parsul
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611552

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	601	Bryoria abbreviata	Bryabb
4.00	603	Bryoria capillaris	Brycap
4.00	610	Bryoria fuscescens	Bryfus
4.00	1016	Cetraria platyphylla	Cetpla
1.00	1011	Cetraria merrillii	Cetmer
4.00	2301	Esslingeriana idahoensis	Essida
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3701	Letharia columbiana	Letcol
4.00	3702	Letharia vulpina	Letvul
4.00	5202	Parmeliopsis hyperopta	Pophyp
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611557

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
3.00	603	Bryoria capillaris	Brycap
3.00	610	Bryoria fuscescens	Bryfus
3.00	1004	Cetraria canadensis	Cetcan
2.00	1005	Cetraria chlorophylla	Cetchl
3.00	1016	Cetraria platyphylla	Cetpla
3.00	1011	Cetraria merrillii	Cetmer
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3112	Hypogymnia metaphysodes	Hypmet
2.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
3.00	6101	Platismatia glauca	Plagla
1.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4611565

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb

4.00	2301	Esslingeriana idahoensis	Essida
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
3.00	3702	Letharia vulpina	Letvul
3.00	3905	Lobaria pulmonaria	Lobpul
4.00	4010	Melanelia multisporea	Melmul
3.00	4408	Nephroma resupinatum	Nepres
4.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
4.00	6101	Platismatia glauca	Plagla
4.00	8058	Usnea plicata agg.	Usnpli

Group: ON FRAME
Sample unit: 4611572

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
1.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	4004	Melanelia exasperatula	Melexl
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611577

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	607	Bryoria fremontii	Bryfre
4.00	610	Bryoria fuscescens	Bryfus
4.00	1013	Cetraria orbata	Cetorb
4.00	2301	Esslingeriana idahoensis	Essida
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
2.00	3702	Letharia vulpina	Letvul
4.00	3905	Lobaria pulmonaria	Lobpul
4.00	4802	Parmelia hygrophila	Parhyg
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611585

Value	Code	Species	Code Name
3.00	601	Bryoria abbreviata	Bryabb
3.00	603	Bryoria capillaris	Brycap
3.00	607	Bryoria fremontii	Bryfre
4.00	1013	Cetraria orbata	Cetorb
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	4010	Melanelia multisporea	Melmul

Group: ON FRAME
Sample unit: 4611642

Value	Code	Species	Code Name
4.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
4.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	3702	Letharia vulpina	Letvul
4.00	4004	Melanelia exasperatula	Melexl
4.00	4010	Melanelia multispora	Melmul
4.00	4802	Parmelia hygrophila	Parhyg
4.00	6101	Platismatia glauca	Plagla
4.00	8072	Usnea subfloridana	Usnsub
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4611662

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	603	Bryoria capillaris	Brycap
4.00	607	Bryoria fremontii	Bryfre
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3109	Hypogymnia inactiva	Hypina
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	3702	Letharia vulpina	Letvul
4.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
4.00	6101	Platismatia glauca	Plagla
4.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4611674

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
1.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1200	Cladonia	Cla
3.00	2301	Esslingeriana idahoensis	Essida
3.00	3101	Hypogymnia apinnata	Hypapi
4.00	3109	Hypogymnia inactiva	Hypina
3.00	3103	Hypogymnia bitteri	Hypbit
3.00	4010	Melanelia multispora	Melmul
4.00	5202	Parmeliopsis hyperopta	Pophyp
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4611682

Value	Code	Species	Code Name
4.00	202	Alectoria imshaugii	Aleims
4.00	205	Alectoria sarmentosa	Alesar
4.00	603	Bryoria capillaris	Brycap
4.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3702	Letharia vulpina	Letvul
4.00	4802	Parmelia hygrophila	Parhyg
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla
3.00	6105	Platismatia stenophylla	Plaste

Group: ON FRAME
Sample unit: 4611687

Value	Code	Species	Code Name
4.00	601	Bryoria abbreviata	Bryabb
4.00	603	Bryoria capillaris	Brycap
4.00	610	Bryoria fuscescens	Bryfus
2.00	1005	Cetraria chlorophylla	Cetchl
4.00	1004	Cetraria canadensis	Cetcan
4.00	1013	Cetraria orbata	Cetorb
1.00	1011	Cetraria merrillii	Cetmer
1.00	2301	Esslingeriana idahoensis	Essida
3.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3116	Hypogymnia physodes	Hypphy
1.00	3702	Letharia vulpina	Letvul
4.00	4017	Melanelia subolivacea	Melsol
2.00	4806	Parmelia sulcata	Parsul
3.00	5701	Physcia adscendens	Phyads
4.00	6101	Platismatia glauca	Plagla
4.00	8058	Usnea plicata agg.	Usnpli
1.00	8203	Xanthoria fallax	Xanfal
4.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4711513

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
4.00	205	Alectoria sarmentosa	Alesar
4.00	603	Bryoria capillaris	Brycap
4.00	618	Bryoria pseudofuscescens	Brypse
3.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3702	Letharia vulpina	Letvul
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4711518

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
4.00	618	Bryoria pseudofuscescens	Brypse
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1200	Cladonia	Cla
3.00	3121	Hypogymnia tubulosa	Hyptub
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4711525

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
3.00	205	Alectoria sarmentosa	Alesar
3.00	610	Bryoria fuscescens	Bryfus
3.00	618	Bryoria pseudofuscescens	Brypse
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1200	Cladonia	Cla
3.00	3114	Hypogymnia occidentalis	Hypocc
3.00	3116	Hypogymnia physodes	Hypphy
3.00	3905	Lobaria pulmonaria	Lobpul
3.00	4010	Melanelia multisporea	Melmul
3.00	4016	Melanelia subelegantula	Melsel
3.00	4408	Nephroma resupinatum	Nepres
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5702	Physcia aipolia	Phyaip
3.00	6101	Platismatia glauca	Plagla
3.00	6910	Ramalina dilacerata	Ramdil
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4711538

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	1016	Cetraria platyphylla	Cetpla
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3121	Hypogymnia tubulosa	Hyptub
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
1.00	8044	Usnea lapponica	Usnlap

Group: ON FRAME
Sample unit: 4711558

Value	Code	Species	Code Name
4.00	202	Alectoria imshaugii	Aleims
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1016	Cetraria platyphylla	Cetpla

1.00	1011	Cetraria merrillii	Cetmer
4.00	3108	Hypogymnia imshaugii	Hypims
2.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3116	Hypogymnia physodes	Hypphy
1.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla
1.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4711615

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
3.00	610	Bryoria fuscescens	Bryfus
2.00	1004	Cetraria canadensis	Cetcan
4.00	1005	Cetraria chlorophylla	Cetchl
3.00	1016	Cetraria platyphylla	Cetpla
1.00	2301	Esslingeriana idahoensis	Essida
3.00	3109	Hypogymnia inactiva	Hypina
4.00	3114	Hypogymnia occidentalis	Hypocc
3.00	3116	Hypogymnia physodes	Hypphy
3.00	3905	Lobaria pulmonaria	Lobpul
3.00	4004	Melanelia exasperatula	Melexl
3.00	5202	Parmeliopsis hyperopta	Pophyp
4.00	6101	Platismatia glauca	Plagla
3.00	8072	Usnea subfloridana	Usnsub

Group: ON FRAME
Sample unit: 4711622

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	607	Bryoria fremontii	Bryfre
3.00	1004	Cetraria canadensis	Cetcan
3.00	1013	Cetraria orbata	Cetorb
3.00	1200	Cladonia	Cla
4.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3116	Hypogymnia physodes	Hypphy
3.00	4004	Melanelia exasperatula	Melexl
3.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4711642

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
3.00	607	Bryoria fremontii	Bryfre
4.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub

3.00	3702	Letharia vulpina	Letvul
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	5202	Parmeliopsis hyperopta	Pophyp
4.00	6101	Platismatia glauca	Plagla
4.00	6105	Platismatia stenophylla	Plaste
3.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME
Sample unit: 4711655

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
3.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
3.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	4004	Melanelia exasperatula	Melexl
4.00	4806	Parmelia sulcata	Parsul
4.00	5201	Parmeliopsis ambigua	Popamb
3.00	6101	Platismatia glauca	Plagla
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4711663

Value	Code	Species	Code Name
4.00	202	Alectoria imshaugii	Aleims
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
3.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3114	Hypogymnia occidentalis	Hypocc
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	3702	Letharia vulpina	Letvul
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla
4.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4711675

Value	Code	Species	Code Name
3.00	202	Alectoria imshaugii	Aleims
3.00	601	Bryoria abbreviata	Bryabb
3.00	603	Bryoria capillaris	Brycap
3.00	618	Bryoria pseudofuscescens	Brypse
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1013	Cetraria orbata	Cetorb
3.00	1016	Cetraria platyphylla	Cetpla

4.00	3108	Hypogymnia imshaugii	Hypims
3.00	3114	Hypogymnia occidentalis	Hypocc
3.00	3702	Letharia vulpina	Letvul
3.00	4016	Melanelia subelegantula	Melsel
3.00	4806	Parmelia sulcata	Parsul
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4711683

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
3.00	601	Bryoria abbreviata	Bryabb
4.00	603	Bryoria capillaris	Brycap
4.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
4.00	1004	Cetraria canadensis	Cetcan
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1016	Cetraria platyphylla	Cetpla
3.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3114	Hypogymnia occidentalis	Hypocc
3.00	3702	Letharia vulpina	Letvul
3.00	4017	Melanelia subolivacea	Melsol
4.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4711688

Value	Code	Species	Code Name
4.00	603	Bryoria capillaris	Brycap
1.00	1005	Cetraria chlorophylla	Cetchl
4.00	1016	Cetraria platyphylla	Cetpla
4.00	2404	Evernia prunastri	Evepru
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
4.00	3702	Letharia vulpina	Letvul
4.00	4010	Melanelia multispora	Melmul
3.00	4016	Melanelia subelegantula	Melsel
4.00	4806	Parmelia sulcata	Parsul
4.00	6101	Platismatia glauca	Plagla
4.00	8072	Usnea subfloridana	Usnsub
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4811615

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	610	Bryoria fuscescens	Bryfus
4.00	618	Bryoria pseudofuscescens	Brypse
4.00	1005	Cetraria chlorophylla	Cetchl
4.00	1013	Cetraria orbata	Cetorb
4.00	1016	Cetraria platyphylla	Cetpla
4.00	2301	Esslingeriana idahoensis	Essida
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet

4.00	3116	Hypogymnia physodes	Hypphy
3.00	3702	Letharia vulpina	Letvul
4.00	4017	Melanelia subolivacea	Melsol
4.00	4802	Parmelia hygrophila	Parhyg
4.00	6101	Platismatia glauca	Plagla
4.00	6105	Platismatia stenophylla	Plaste

Group: ON FRAME
Sample unit: 4811628

Value	Code	Species	Code Name
3.00	603	Bryoria capillaris	Brycap
3.00	618	Bryoria pseudofuscescens	Brypse
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	2404	Evernia prunastri	Evepru
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3112	Hypogymnia metaphysodes	Hypmet
4.00	3114	Hypogymnia occidentalis	Hypocc
1.00	3116	Hypogymnia physodes	Hypphy
4.00	3121	Hypogymnia tubulosa	Hyptub
4.00	4016	Melanelia subelegantula	Melsel
4.00	4802	Parmelia hygrophila	Parhyg
4.00	4806	Parmelia sulcata	Parsul
3.00	5701	Physcia adscendens	Phyads
4.00	6101	Platismatia glauca	Plagla
3.00	8044	Usnea lapponica	Usnlap
4.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4811636

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
3.00	603	Bryoria capillaris	Brycap
3.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	3108	Hypogymnia imshaugii	Hypims
3.00	3116	Hypogymnia physodes	Hypphy
3.00	3702	Letharia vulpina	Letvul
2.00	4010	Melanelia multispora	Melmul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4811643

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
3.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
2.00	1011	Cetraria merrillii	Cetmer
3.00	1200	Cladonia	Clad
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3121	Hypogymnia tubulosa	Hyptub
3.00	3702	Letharia vulpina	Letvul
3.00	4010	Melanelia multispora	Melmul

3.00	4017	Melanelia subolivacea	Melsol
1.00	4407	Nephroma parile	Neppar
2.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4811648

Value	Code	Species	Code Name
3.00	205	Alectoria sarmentosa	Alesar
3.00	603	Bryoria capillaris	Brycap
3.00	610	Bryoria fuscescens	Bryfus
3.00	1013	Cetraria orbata	Cetorb
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	4016	Melanelia subelegantula	Melsel
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4811656

Value	Code	Species	Code Name
2.00	202	Alectoria imshaugii	Aleims
2.00	603	Bryoria capillaris	Brycap
1.00	618	Bryoria pseudofuscescens	Brypse
2.00	1005	Cetraria chlorophylla	Cetchl
2.00	1013	Cetraria orbata	Cetorb
1.00	3006	Hypocenomyce scalaris	Hcesca
3.00	3116	Hypogymnia physodes	Hypphy
2.00	3702	Letharia vulpina	Letvul
3.00	5201	Parmeliopsis ambigua	Popamb

Group: ON FRAME
Sample unit: 4811663

Value	Code	Species	Code Name
4.00	607	Bryoria fremontii	Bryfre
2.00	1004	Cetraria canadensis	Cetcan
1.00	1005	Cetraria chlorophylla	Cetchl
3.00	1016	Cetraria platyphylla	Cetpla
1.00	2301	Esslingeriana idahoensis	Essida
3.00	2404	Evernia prunastri	Evepru
3.00	3108	Hypogymnia imshaugii	Hypims
4.00	3116	Hypogymnia physodes	Hypphy
1.00	3121	Hypogymnia tubulosa	Hyptub
1.00	4004	Melanelia exasperatula	Melexl
3.00	4015	Melanelia subaurifera	Melsub
4.00	4802	Parmelia hygrophila	Parhyg
3.00	5201	Parmeliopsis ambigua	Popamb
4.00	6101	Platismatia glauca	Plagla
4.00	8044	Usnea lapponica	Usnlap
4.00	8203	Xanthoria fallax	Xanfal

Group: ON FRAME

Sample unit: 4811668

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
3.00	603	Bryoria capillaris	Brycap
3.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	1200	Cladonia	Cla
3.00	2301	Esslingeriana idahoensis	Essida
3.00	3114	Hypogymnia occidentalis	Hypocc
1.00	3121	Hypogymnia tubulosa	Hyptub
3.00	3702	Letharia vulpina	Letvul
3.00	4802	Parmelia hygrophila	Parhyg
3.00	4806	Parmelia sulcata	Parsul
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4811676

Value	Code	Species	Code Name
3.00	610	Bryoria fuscescens	Bryfus
3.00	1005	Cetraria chlorophylla	Cetchl
3.00	3114	Hypogymnia occidentalis	Hypocc
3.00	5201	Parmeliopsis ambigua	Popamb
3.00	5202	Parmeliopsis hyperopta	Pophyp
3.00	6101	Platismatia glauca	Plagla

Group: ON FRAME
Sample unit: 4811683

Value	Code	Species	Code Name
3.00	603	Bryoria capillaris	Brycap
3.00	1004	Cetraria canadensis	Cetcan
3.00	1005	Cetraria chlorophylla	Cetchl
2.00	2404	Evernia prunastri	Evepru
3.00	3702	Letharia vulpina	Letvul
3.00	4004	Melanelia exasperatula	Melexl
3.00	4015	Melanelia subaurifera	Melsub
4.00	4802	Parmelia hygrophila	Parhyg
1.00	5701	Physcia adscendens	Phyads
3.00	6101	Platismatia glauca	Plagla
3.00	6912	Ramalina farinacea	Ramfar
3.00	8044	Usnea lapponica	Usnlap
3.00	8207	Xanthoria polycarpa	Xanpol

Group: ON FRAME
Sample unit: 4811781

Value	Code	Species	Code Name
4.00	205	Alectoria sarmentosa	Alesar
4.00	607	Bryoria fremontii	Bryfre
3.00	1004	Cetraria canadensis	Cetcan
3.00	1005	Cetraria chlorophylla	Cetchl
4.00	3108	Hypogymnia imshaugii	Hypims
4.00	3114	Hypogymnia occidentalis	Hypocc

4.00	3905	Lobaria pulmonaria	Lobpul
3.00	4407	Nephroma parile	Neppar
4.00	4806	Parmelia sulcata	Parsul
4.00	5201	Parmeliopsis ambigua	Popamb
4.00	5202	Parmeliopsis hyperopta	Pophyp
4.00	5503	Peltigera collina	Pelcol
4.00	6101	Platismatia glauca	Plagla

Total number of species occurrences in data = 1370