An annotated list of lichens and allied fungi in Oregon's Opal Creek Wilderness and adjacent areas: pre-fire baseline

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***Abstract*. In 2020 the Beachie Creek Fire burned a large, forested area in the northern Oregon Cascade Range that included public and private land and much of the Opal Creek Wilderness. We compiled a pre-fire baseline data set from various sources of the lichens and allied fungi known to occur before the fire within the fire perimeter. These data are presented as an annotated species list documenting two hundred and eighty-three species. *Euopsis pulvinata*, *Lepraria elobata*, *Miriquidica instrata*, *Plectocarpon nephromeum*, *Porpidia flavicunda,* and *Rhizocarpon distinctum* are reported as new for Oregon based on an online search of herbarium records and relevant literature. Near the wilderness area, where populations of listed rare species are known, their occurrences are mapped against a fire severity gradient. Drone-generated images of selected locations before and after the fire are included to help gauge the fire effects on lichen communities. Increased fire activity in the area is potentially causing landscape-level changes in biodiversity, and the data we present represent a historical baseline for future analyses of the effects of the Beachie Creek fire on lichen diversity.**

***Key words*. Fire severity, Willamette National Forest, megafire, climate change, species inventory.**

INTRODUCTION

Wildfires are increasing in frequency and severity in the Pacific Northwest (Halofsky 2020; Higuera and Abatzoglou 2021), and are affecting lichen communities that occur in this region. Most lichens are not adapted to survive high intensity wildfire as individuals, but instead rely on recolonization to occupy areas where they have been eliminated by fire (Longán et al. 1999). In forests, many lichens can survive low-severity fire, but in areas of high-severity fire virtually all lichens may be eliminated across vast areas of the landscape (Miller et al. 2018). Proximity to living trees that can disperse propagules of epiphytic lichens is thought to be important in the reestablishment of lichen communities after wildfire (Romagni and Gries 2000, Berryman and McCune 2006).

Loss of lichen communities due to wildfires can have cascading trophic effects on other organisms that rely on lichens for their life history (Palm et al. 2022). At shorter time scales, post-fire colonization of lichens typically favors early successional lichen species that inhabit dead wood and charcoal, while rare, late successional species are slow to recolonize (Johansson et al. 2006). Even in fast-growing shrub-dominated plant communities, reestablishment of some functional groups (e.g., cyanolichens) can take decades after wildfire (Miller et al. 2020). Research on the long-term effects of climate change on lichen communities has focused on shifting climate

envelopes (Ellis et al. 2007, Ellis 2019, Smith et al. 2020) and microclimate refugia (Di Nuzzo et al. 2022) but short-term effects of today's larger and more severe fires are in need of further study.

The northern Oregon Cascade Range contains diverse and abundant lichen communities with rare and endangered species concentrated in specific habitats such as old-growth forests, riparian areas, rock outcrops, and hardwood gaps (McCune et al. 2002, Peterson and McCune 2003). Fire regimes in low- and mid-elevation forests in this region have historically been characterized by mixed-severity fires with infrequent high-severity fires, often separated by fire-free intervals of a century or longer (Agee 1993, Weisberg and Swanson, 2003, Tepley et al. 2013, Reilly et al. 2021). Recent high-severity, stand-replacing wildfires in this area have burned large expanses of unmanaged old-growth forest stands at unprecedented rates (Abatzoglou et al. 2021, Reilly et al. 2022). Within this region, the Opal Creek Wilderness was the largest contiguous old-growth forest until it burned in the Beachie Creek Fire in September, 2020. The burned area previously supported a diverse lichen community, including a number of rare species. Their fate is unknown, and here we compile a baseline list of the known lichens and related fungi that occurred within the fire perimeter to aid in determining the effects of this fire on regionally important lichen populations.

Management of forest resources and biodiversity can rely on baseline information to determine goals for desired future conditions and to provide benchmarks for comparison with future biodiversity. The Beachie Creek Fire will be of particular interest for future study because it includes large areas of older forest and wilderness in an area that has been relatively heavily explored by lichenologists over the last several decades.

Study Area

The study area encompasses the Beachie Creek Fire footprint in the land of the Kalapuya, Santiam and Molalla peoples in the Northern Cascade mountains of Oregon (Figure 1). This fire was started on August 16, 2020 by a lightning strike in the Opal Creek Wilderness. The wildfire grew slowly in the first days; it burned and reached about 200 hectares (approx. 500 acres) by September 6th. On September 7th, critical fire weather resulting from high temperatures, low humidity and extremely high winds caused the fire to rapidly spread down slope. In one night, the fire burned approximately 52,600 hectares (approx. 130,000 acres) and heavily damaged or completely destroyed the communities of Jawbone Flats, Elkhorn, Gates, Mill City, Mehama, Lyons and parts of Detroit Lake. This fire burned approximately 94% of the Little North Santiam River watershed (FEMA 2020).

There were five other fires in Oregon that burned over one hundred thousand acres each during this time, collectively called the Labor Day Fires of 2020. These fires destroyed thousands of homes and charred over a million acres, making 2020 one of the costliest fire seasons in the history of Oregon (Abatzoglou et al. 2021).

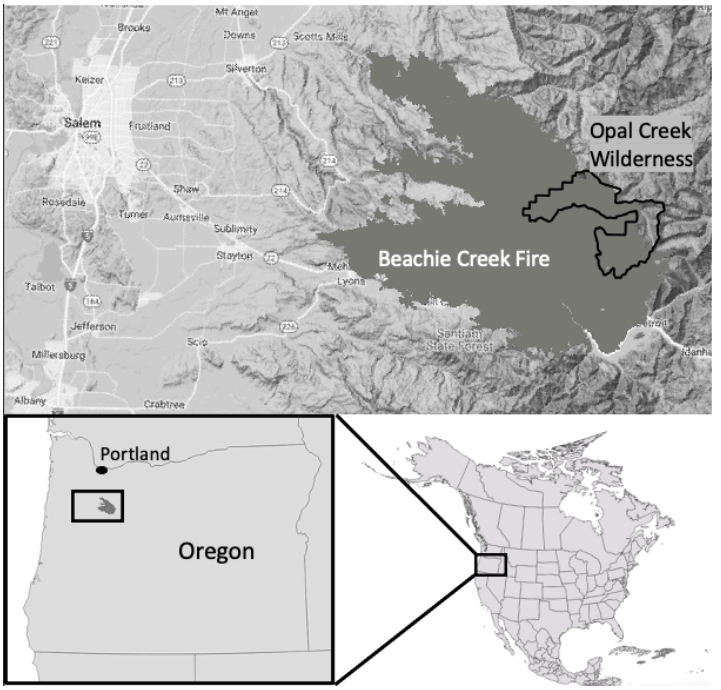

Figure 1. Location of the study area within North America and Oregon. The Opal Creek Wilderness Area is outlined in black and the Beachie Creek Fire perimeter is in gray.

Climate- Precipitation in the study area falls mostly from fall through spring with a pronounced annual drought in the summer. Average annual precipitation values for the Beachie Creek Fire range from the drier lower elevations with an average of 152 cm (60 in.) to 290 cm (114 in.) in the wetter upper elevations in the eastern portion of the fire (FEMA 2020). Elevation ranges from 265 meters (869 ft.) at the Santiam River to 1,460 meters (4,790 ft.) at the top of Whetstone Mountain.

Geology- The study area is composed of igneous rock types from the Western Cascades and the High Cascades geological provinces. Volcanic parent material in this area is composed of basalt, andesite, rhyolite and dacite. Along the foothill toe slopes near the Santiam River valley bottom at the western edge of the fire there are areas underlain with unconsolidated fluvial glacial till as well as debris flow and terrace deposits (FEMA 2020).

Vegetation- The study area is predominately mountainous forested slopes dominated by a mix of conifer species. In the lower to mid-elevations, the predominant conifer species include douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), and western yew (*Taxus brevifolia*). In streamside and seepy areas, some deciduous trees become dominant including vine maple (*Acer circinatum*) big-leaf maple (*Acer macrophyllum*) red alder (*Alnus rubra*), Oregon ash (*Fraxinus latifolia*), and black cottonwood (*Populus trichocarpa*). Upper elevation forests are dominated by pacific silver fir (*Abies amabilis*) with some mountain hemlock (*Tsuga mertensiana*), Alaska yellow cedar (*Callitropsis nootkatensis*) and Engelmann spruce (*Picea engelmannii*).

Understory species are dominated by Oregon grape (*Berberis nervosa*), rhododendron (*Rhododendron macrophyllum*), western sword fern (*Polystichum munitum*), salal (*Gaultheria shallon*), and red huckleberry (*Vaccinium parvifolium*) with beargrass (*Xerophyllum tenax*) becoming more prominent at upper elevations. The following figures depict the area before and after the fire. Figure 2 depicts Henline Mountain, Figure 3 depicts the Little North Santiam River valley, and figure 4 depicts the Little North Fork Santiam River at three pools recreation site.

Figure 2. A view looking northeast to Henline Mountain before and after the Beachie Creek Fire.

Figure 3. View looking to the east up the Little North Fork Canyon towards Elkhorn and the Opal Creek Wilderness before and after the Beachie Creek Fire.

Figure 4. A view looking to the east along the North Fork Santiam River at Three Pools before and after the fire.

MATERIALS AND METHODS

Annotated List

We compiled a list of all known lichens and allied fungi occurring in the Opal Creek Wilderness and other areas within the perimeter of the 78,336-hectare (193,573-acre) Beachie Creek Fire (Figure 1). Samples were collected from throughout the elevation range. Data were compiled from six separate sources detailed below. At least one collection number is provided from every data source where a collection occurs. For the sake of brevity, species with multiple collections are represented by up to two collections from each source. Nomenclature follows Esslinger (2021) except for a few cases where the opinion of the authors differs (McCune and Stone 2022). Quantitative abundance data for species with FIA records are given. Qualitative abundance data are estimated for the other species based on occurrence data from the cited sources and the experience of the authors in the area. Because the pre-fire survey effort compiled here was not comprehensive in taxonomic or geographic scope, and did not use randomized survey methods, these qualitative abundance data should be recognized as somewhat subjective.

Data Sources

Northwest Lichenologists (NWL) – In 2007, a several-day foray was conducted in the Opal Creek area by the Northwest Lichenologist and hosted by the Opal Creek Ancient Forest Center. After the foray, records provided by attendees were compiled. Specimens were deposited in several herbaria and most individual records are in the Consortium of North American Lichen Herbaria (CNALH 2022). Species that were observed and photographed or noted during the foray but not collected are denoted as "obs.".

Bruce McCune's herbarium (BMH) – A geographically constrained search of Bruce McCune's specimen database was conducted and all species identified with a high degree of confidence are included. All numbers in the checklist are Bruce McCune's unless otherwise noted and most specimens are housed at the Oregon State University herbarium (OSC). This source includes visual observations based on surveys conducted in Fisherman's Bend Campground by Sherri Pittam, Bruce McCune and Terry Fennell (Pittam et al. 2019). Visual observations without collection numbers are indicated in the checklist by "obs."

FIA lichen plots (FIA) – A database search of publicly available data was conducted in the National Air Quality and Lichens database (https://gis.nacse.org/lichenair) for lichen plots occurring within the study area. The collection numbers are a combination of the plot number and the packet number.

The Evergreen State College field trip collections (EVE) – Field trips to the Opal Creek area were conducted by The Evergreen State College (TESC) led by Lalita Calabria between 2013 and 2018. Representative specimens cited here are deposited in The Evergreen State College herbarium (EVE).

Jawbone Flats calicioid study (JFC) – An ecological study of the calicioid lichens and fungi occurring on the buildings at Jawbone Flats on the campus of the Opal Creek Ancient Forest Center was conducted by TESC and Portland State University (Petersen et al. 2017). All specimens are deposited in EVE.

Conservation Status

The conservation status of the lichen taxa compiled in this list was determined using the Oregon Biodiversity Information Center (ORBIC) 2019 rankings (Oregon Biodiversity Information Center 2019). These rankings are developed according to NatureServe's guidelines on conservation ranks. Global ranks begin with a "G" and state ranks begin with a "S". Both use the following ranking

system: 1 = critically imperiled; 2 = imperiled; 3 = rare, uncommon, or threatened; 4 = not rare and apparently secure, and 5 = demonstrably widespread.

Results and Discussion

The compiled species list contains 283 taxa including 213 (75%) chlorolichens, 45 (16%) cyanolichens, and including 15 (5%) species that are tripartite lichens. Nineteen (6%) species are calicioids and 6 (2%) species are allied fungi. The numbers for functional groups are as follows: 110 (39%) microlichens, 106 (37%) foliose, and 64 (23%) fruticose. One hundred and sixty-two (57%) are only recorded from one data source, and 10 (4%) are listed as rare species with ORBIC.

From the compiled list of specimens, sixteen occurrences of ORBIC listed rare species were documented from within or in close proximity to the Opal Creek Wilderness (Figure 2). Because survey efforts for this area are confined to a small percentage of the total area of the entire fire footprint, the populations documented here are very likely only a fraction of rare species populations occurring at the time of the fire. Twelve (75%) of these locations are located in areas that were characterized as high burn severity, two (12.5%) occurrences are in moderate burn severity and two (12.5%) are in low burn severity areas. The fate of these populations is currently unknown. Three locations of ORBIC-listed rare species were known from Fisherman's Bend Campground; all three of these locations are in high burn severity locations and all were apparently extirpated in the fire (Daphne Stone, pers. com. 2022).

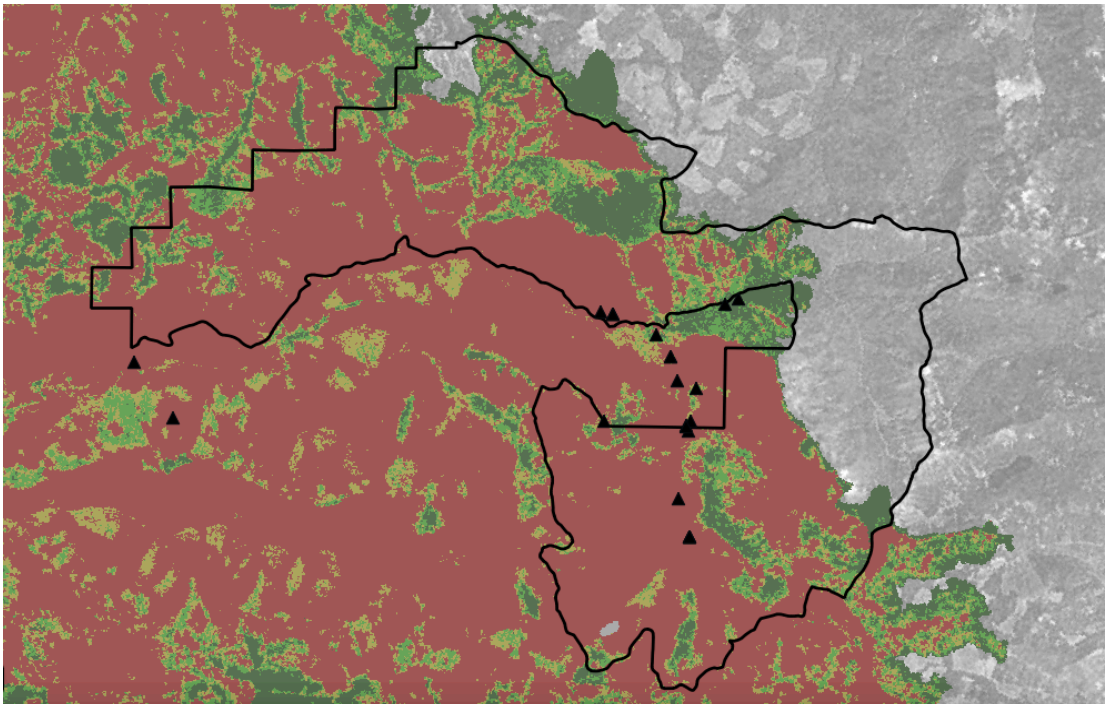

Figure 5. Documented ORBIC listed rare lichen occurrences and fire severity in the proximity of the Opal Creek Wilderness in eastern area of the Beachie Creek fire. Fire severity scale is as follows – red: high, yellow: moderate, green: low. The Opal Creek Wilderness is outlined in black and rare lichen occurrences are indicated by black triangles. Areas of gray are outside of the fire perimeter.

ORBIC Listed Species occurring in the study area

G4/G5, S2, List 3 ***Cetraria subalpina*** (Imshaug) Kärnefelt – This species is widespread in the higher elevations of the northern Oregon Cascades where it occurs at the southern edge of its range in coastal North America.

G3G4, S3, List 4 ***Hypotrachyna afrorevoluta*** (Krog & Swinscow) Krog & Swinscow – Corticolous on hardwoods and conifers in coastal forests and forested riparian zones, and saxicolous on rock or soil in forest habitats (Exeter et al. 2016). *Hypotrachyna afrorevoluta* is known from Africa, Eurasia, North and South America. The western North American range of the species includes Arizona, British Columbia, California, Oregon and Washington. In Oregon, *H. afrorevoluta* occurs at low elevations in coastal wetlands and on headlands and ridges in coastal dunes and marine estuaries; it has also been observed in the Willamette Valley, in the Cascade-Siskiyou National Monument, and more rarely in the west Cascades (Exeter et al. 2016, Glavich et al. 2005, Villella et al. 2018).

G1, S1, List 1 ***Hypotrachyna riparia*** McCune – Corticolous on shrubs and hardwoods in ash swamps and riparian forests. *Hypotrachyna riparia* is endemic to northwestern North America, and found only at low elevations in the west Cascades and Willamette Valley of Oregon (Exeter et al. 2016, McCune 2008). This species is threatened by habitat loss due to development and wildfires and from the potential future loss of Oregon ash habitat due to the recent arrival of the invasive Emerald ash borer (Stone et al. 2022).

G4, S3, List 2 ***Nephroma occultum*** Wetmore – Corticolous, primarily in the mid- to upper-canopy of conifers in old-growth forests and occasionally in mid- to lower-canopy of second growth/seral conifer stands (Exeter et al. 2016, Goward 1995, Rosso et al. 2000). In British Columbia, *N. occultum* has also been observed in the lower canopy of old-growth forests (Goward 1995). The species is a rare endemic to northwestern North America from Alaska to Oregon. *Nephroma occultum* is most abundant west of the Cascade Range between approx. 300 and 1,000 m in elevation with disjunct, interior populations observed in British Columbia (Exeter et al. 2016, Goward 1995, Rosso et al. 2000). The species is threatened by habitat loss and microclimate alteration caused by logging, development, and climate change (Exeter et al. 2016).

G2 (Proposed) ***Pannaria oregonensis*** McCune & M. Schultz – Corticolous on twigs and small branches of trees, including *Salix hookeriana, Fraxinus latifolia, Picea sitchensis, Pseudotsuga menziesii,* and shrubs, including *Cytisus scoparius, Rubus spectabilis,* and *Physocarpus* species. Formerly thought to be two species, *Pannaria rubiginella* P. M. Jørg. & Sipman and *Pannaria rubiginosa* (Thunb.) Delise, recent phylogenetic analyses revealed a third species, *P. oregonensis*—a discrete species endemic to northwestern North America (McCune et al. 2022). The species is rare, with a discontinuous range extending from southern Alaska to northern California. *Pannaria oregonensis* is known from forests, dunes, and woodlands along the Pacific Coast, and occasionally riparian forests of the lower west slope of the Cascade Range. The largest known population of the species was from Fisherman's Bend, a recreation site near Mill City, Oregon occurring on Oregon ash (*Fraxinus latifolia*) in a riparian swamp. This population was likely extirpated by the Beachie Creek Fire. McCune et al. (2022) proposed that this species receive a global conservation status ranking of G2, Imperiled.

G3G4, S2, List 2 ***Pilophorus nigricaulis*** M. Satô – Saxicolous on volcanic rock talus, boulders, and outcrops in exposed and forested sites at elevations ranging from 40 to 1,430 m. *Pilophorus nigricaulis* is known only from Japan and west of the Cascade crest from Alaska to Oregon in the Pacific Northwest, and it is rare in the southern part of its range. In Oregon and Washington, *P. nigricaulis* populations are threatened by habitat loss due to anthropogenic activities that impact the substrate and alter microclimatic conditions (Exeter et al. 2016, Glavich 2013).

G4, S3, List 4 ***Pseudocyphellaria hawaiiensis*** H. Magn. – Corticolous on conifers, hardwoods, and ericaceous shrubs. *Pseudocyphellaria hawaiiensis* is known from Hawaii, Papua New Guinea, and

northwestern North America from Alaska south to northern California (Villella 2021). It is most abundant on the coast and in the Coast Range in Oregon. The species is less common in the foothills of the west Cascades in Oregon and the western Olympic Peninsula in Washington. *Pseudocyphellaria hawaiiensis* is threatened by habitat loss and microclimate alteration caused by logging, development, and climate change (Exeter et al. 2016).

G4, S3, List 2 ***Pseudocyphellaria mallota*** (Tuck.) H. Magn. – Corticolous on conifers, hardwoods, and shrubs. Known from mid- to low elevations in New Zealand, northwestern North American and southwestern South America. *Pseudocyphellaria mallota* is uncommon throughout its range in North America. The species is threatened by habitat loss and microclimate alteration caused by logging, development, and climate change (Exeter et al. 2016).

G3G4, S3, List 4 ***Pseudocyphellaria rainierensis*** Imshaug – Corticolous or growing over moss on the boles and branches of conifers and hardwoods in riparian old-growth forests. This rare species is endemic to northwestern North America occurring from Alaska to Oregon. It is most abundant in the west Cascades of Oregon and Washington, and on the Olympic Peninsula in Washington and Vancouver Island, British Columbia from 90 to 365 m in elevation. This species is threatened by habitat loss and microclimate alteration caused by logging, development, and climate change (Exeter et al. 2016, Glavich 2013).

G3/G4, S2, List 3 ***Scytinium*** cf. ***platynum*** (Tuck.) Otálora, P. M. Jørg. & Wedin – A rarely reported rock and soil dwelling species that occurs in mountainous settings along the west coast of North America from British Columbia to Northern Mexico. It is threatened by logging and other forms of habitat alteration.

Other Noteworthy Species

The species listed below are noteworthy because they are rarely or previously not reported in Oregon according to McCune and Geiser (2009) and McCune (2017). We searched online herbarium records in CNALH (CNALH 2022), and species with no documented records for Oregon are noted as new records for the state.

Cladonia dahliana Kristinsson – This lichen is treated by some authors as the psoromic acid chemotype of *C. symphycarpa* (Ehrh. Ex Schrad.) Fr., but with either status, this is the second report from Oregon.

Cladonia portentosa subsp. ***pacifica*** (Ahti) Ahti – This dichotomously branching reindeer lichen species is pale usnic yellow and is P-, K- and UV+. This species is somewhat common along the Pacific coast but this is the first record from an inland site within the Cascades in Oregon.

Euopsis pulvinata (Schaerer) Nyl. – This *Gloeocapsa*-containing cyanolichen forms small distinctly reddish-brown colonies, usually on rock or growing over rock lichens. This species is widespread but inconspicuous and seldom collected in the Pacific Northwest, new for Oregon.

Lepraria elobata Tønsberg – Within the leprose P+, K- or K+ Y *Lepraria*, this species is recognized by the pale greenish grey or pale greenish thin aggregated thallus. This species is widespread but infrequent, growing on a wide variety of substrates, new for Oregon.

Miriquidica instrata (Nyl.) Hertel & Rambold – Apparently uncommon, found at both high and low elevations, this is the first collection from Oregon. This small species contains miriquidic acid and has an areolate to warty subsquamulose thallus and apothecia that are immersed to emergent with a weakly developed proper exciple. Confident identification requires TLC.

Plectocarpon nephromeum (Norman) Sant. – This unique lichenicolous species forms black, rounded, multi-locular ascomata on species of *Nephroma*. In North America it has been previously reported from Alaska, British Columbia and Washington (Haldeman and Yang 2021), this is the first record from Oregon.

Rhizocarpon distinctum Th. Fr. – This species has an epruinose, brown to brownish grey, areolate thallus with a distinct black prothallus, I+B medulla, and submuriform hyaline spores. Within the Pacific Northwest this species has an uncertain abundance and distribution; this is the first record from Oregon.

ANNOTATED CHECKLIST OF LICHENS AND ALLIED FUNGI OF THE OPAL CREEK WILDERNESS AND ADJACENT AREAS WITHIN THE BEACHIE CREEK FIRE

The data drawn from each source are referenced by a three-letter code as follows: Northwest Lichenologists foray (NWL), Bruce McCune herbarium (BMH), Forest Inventory Analysis lichen plots (FIA), The Evergreen State College herbarium (EVE) and Jawbone Flats calicioid study (JFC). Allied fungi are indicated with (*).

Acolium inquinans (Sm.) A. Massal. – Uncommon on large living conifers and wooden buildings. BMH: *Pittam, Fennel and McCune obs.*; JFC: *D12E, G8*

Alectoria imshaugii Brodo & D. Hawksw. Uncommon epiphyte of conifers. BMH: *29572*; FIA: *A. Mikulin 1122140-1*

Alectoria sarmentosa (Ach.) Ach. – Common epiphyte of conifers. BMH: 28577, *Pittam, Fennel and McCune obs.*; FIA: *R. Ulrich 1120144-1*, *L. Lasselle 1120140-1*; EVE: *T. Linja TL-10.27.15-44*, *R. Sullivan RS-10.27.15-91*

Alectoria vancouverensis (Gyelnik) Gyelnik ex Brodo & D. Hawksw. – Uncommon epiphyte of conifers in lower elevation areas. BMH: *Pittam, Fennel and McCune obs.*

Amandinea punctata (Hoffm.) Coppins & Scheid. – Uncommon over wood on bridge timbers over a creek. BMH: *28376*

Arthonia arthonioides (Ach.) A. L. Sm. – On twigs of *Abies* on the edge of an area of mining disturbance. BMH: *22436*

Arthonia ilicina Taylor – On bark of a streamside *Thuja plicata.* NWL: *N. Hillyard 1311*

Aspicilia aquatica Körber – Saxicolous on large in-stream boulders. NWL: *R. Robertson 9618*

Bacidia arceutina (Ach.) Arnold – On fiberglass rail in *Pseudotsuga menziesii* forest. BMH: *29903*

Bacidina inundata (Fr.) Vězda – On creekside rocks in mixed conifer-deciduous riparian forest. BMH: *28416*

Baeomyces rufus (Hudson) Rebent. – Rare on a wooden structure in Jawbone Flats and on a shaded boulder in an area of historic mining disturbance. NWL: *J. Villella obs.*; BMH: *37655*

Bellemerea sanguinea (Kremp.) Hafellner & Cl. Roux – On siliceous rocks. BMH: *L. H. Pike 2138*

Blastenia ferruginea (Hudson) Th. Fr. – On the bark and twigs of *Acer macrophyllum* in an open area on top of large outcrops. BMH: *28433*

Bryoria fuscescens (Gyelnik) Brodo & D. Hawksw. – Uncommon epiphyte of conifers. FIA: *A. Mikulin 1120140–2*; EVE: *T. Linja 10.27.15-48*, *S. Pierce SP-10.27.15-58*

Bryoria glabra (Motyka) Brodo & D. Hawksw. **–** Uncommon epiphyte of conifers. BMH: *22066*, *Pittam, Fennel and McCune obs.*; FIA: *D. Glavich 1122140-3*

Bryoria pseudofuscescens (Gyelnik) Brodo & D. Hawksw. – Common epiphyte of conifers. NWL: *R. Robertson 9589*; FIA: *A. Ingersoll 1120140*; *D. T. Linja TL 10.27.15-47*, *S. Pierce SP-10.27.15-57*

Bryoria trichodes subsp. ***trichodes*** (Michaux) Brodo & D. Hawksw. – Uncommon epiphyte of conifers. EVE: *Group A #20*

Calicium glaucellum Ach. – Uncommon on bark of older trees and on wooden buildings. NWL: *N. Hillyard 1312*; JFC: *F1, G1*

Calicium lenticulare Ach. – Rare on wooden buildings and bark of conifers. BMH: *E. B. Peterson 2955*

Calicium viride Pers.– Common on the bark of older conifer trees and on wooden buildings. JFC: *D11E-b, D1N*

Candelaria pacifica M. Westb. & Arup – Uncommon epiphyte of deciduous and conifer trees. BMH: *Pittam, Fennel and McCune obs.*

Candelariella vitellina (Hoffm.) Müll. Arg.– Uncommon on large rock outcrops in forest openings. NWL: *Villella obs.*

Carbonicola myrmecina (Ach.) Bendiksby & Timdal – On a charred standing snag on southwest slopes and seepy draws with mixed-age *Pseudotsuga menziesii* forest and plentiful understory of *Acer circinatum* and *Acer macrophyllum.* BMH: *22001*

Cetraria canadensis (Räsänen) J.E. Mattsson & M. J. Lai – Rare epiphyte on *Pseudotsuga menziesii* FIA: *D. Glavich 1122140*; EVE: *E. Fischer EF05*

Cetraria chlorophylla (Willd.) Hale – Common epiphyte on conifers and snags. NWL: *J. Robertson 9620*; BMH: *Pittam, Fennel and McCune obs.*; FIA: *D. Glavich 1120140-24*; EVE: *Lydia-Group A 21*

Cetraria orbata (Nyl.) M. J. Lai – Common epiphyte on conifers and *Rhododendron macrophyllum*. BMH: *Pittam, Fennel and McCune obs.*; FIA: *D. Glavich 1122140-27*, *R. Ulrich 1120144-40*; EVE: *B. Stragier BS-10.26.15-65*

Cetraria pallidula (Tuck. ex Riddle) Goward & Thell – Uncommon epiphyte of upper canopy of conifers. NWL: *J. Villella obs.*

Cetraria platyphylla (Tuck.) Hale – Common epiphyte on *Pseudotsuga menziesii*. FIA: *A. Ingersoll 1120140-26*; EVE: *B. Stragier BS-10.26.15-64*

G4/G5, S2, 3 ***Cetraria subalpina*** Imshaug – Uncommon epiphyte on *Abies amabilis* and *Taxus brevifolia*. FIA: *A. Ingersoll 1120140-27*, *A. Hardman s.n.*

Cetrelia cetrarioides (Duby) W. L. Culb. & C. F. Culb. – Rare on hardwoods near streams. BMH: *37561*, *Pittam, Fennel and McCune obs.*

Chaenotheca brunneola (Ach.) Müll. Arg. – Uncommon on conifer bark and snags and on wooden buildings. NWL: *J. Robertson 9562*; BMH: *22435*; JFC: *A19W, A32W-b*

Chaenotheca chlorella (Ach.) Müll. Arg.– Uncommon on wooden buildings. JFC: *A24W-b*, *B2N*

Chaenotheca chrysocephala (Ach.) Th. Fr. – Uncommon on conifer bark and on wooden buildings. BMH: *Pittam, Fennel and McCune obs.*; JFC: *D18E, H2*

Chaenotheca ferruginea (Turner ex Sm.) Mig. – Uncommon on bark of *Thuja plicata* and other conifers and on wooden buildings. JFC: *D11E, A7N*

Chaenotheca furfuracea (L.) Tibell. – Uncommon on soil in crevices on the downslope side of tree bases and in shaded areas under wooden buildings. EVE: *C. Crossley CDC.10.26.16.02*; JFC: *B1N, A1N*

Chaenotheca hispidula (Ach.) Zahlbr. – Uncommon on wooden buildings. JFC: *D10E-a, D29W*

Chaenotheca laevigata Nádv. – Uncommon on wooden buildings. JFC: *D5N, D22E*

Chaenotheca hygrophila Tibell – Uncommon on conifer bark. NWL: *N. Hillyard 1312b*

Chaenotheca phaeocephala (Turner) Th. Fr. – Uncommon on wooden buildings. JFC: *E18W*, *D13E*

Chaenotheca subroscida (Eitner) Zahlbr. – Rare on wooden buildings. JFC: *D20E*

Chaenotheca trichialis (Ach.) Th. Fr. – Uncommon on wooden buildings. JFC: *A12S-a*, *A13S-a*

****Chaenothecopsis nana*** Tibell – Rare on wooden buildings. JFC: *B4S-b*

****Chaenothecopsis pusiola*** (Ach.) Vainio – Uncommon on wooden buildings. JFC: *A31W-b*, *D10E-b*

Chrysothrix candelaris (L.) J. R. Laundon – NWL: Uncommon on trees in moist settings at lower elevations. NWL: *Villella obs s.n.*

Cladonia bellidiflora (Ach.) Schaerer – Common on rocks, logs and tree bases. NWL: *R. Robertson 9616*; *J. Villella 102404-7*; BMH: *22060*, *27374*; EVE: *H. Stewart-Ahn 10.25.17 L5a*, *J. Dumsha JDL 10*.

Cladonia borealis S. Stenroos – Rare, on a *Pseudotsuga menziesii* stump in old-growth *P. menziesii-Tsuga heterophylla* forest. EVE: *L. M. Calabria 09.2012*, *A. Arnold 9*

Cladonia cariosa (Ach.) Sprengel – Uncommon on decaying wood and stumps in old-growth *Pseudotsuga menziesii-Taxus brevifolia* forest. EVE: *L. M. Calabria 25*

Cladonia carneola (Fr.) Fr.– Uncommon, in the understory on bryophytes and woody debris in forests dominated by *Tsuga heterophylla*. NWL: *J. Villella 102304-s.n.*; BMH: *Pittam, Fennel and McCune obs.* EVE: *A.O. 10.25.17.06*

Cladonia chlorophaea s. lat. (Flörke ex Sommerf.) Sprengel **–** Common on soil, woody debris and bark in lower reaches of the forest and on the forest floor. EVE: *J. Roman JR-10.27.15-07*

Cladonia coniocraea (Flörke) Sprengel – Common on rotten logs. EVE: *L. M. Calabria LC.10.27.15-05*

Cladonia cornuta (L.) Hoffm. subsp. ***cornuta*** – Uncommon on downed wood in old-growth along Battle Ax Creek trail. EVE: *R. Sullivan RS-10.27.15-55*, *J. Roman 10.27.15-12*

Cladonia dahliana Kristinsson – Rare on exposed rock in a steep sloped boulder field behind Jawbone Flats. EVE: *RS-10.28.15-63*

Cladonia ecmocyna Leighton subsp. ***ecmocyna*** – Uncommon, found on mossy rock in exposed, sloping, boulder fields at the base of a cliff. NWL: *J. Villella 102404-9*; BMH: *22061*; EVE: *L. Boizot LB-10.27.15-66*, *R. Sullivan RS-10.27.15-52*

Cladonia fimbriata (L.) Fr. – Common on a variety of substrates including trees and downed woody debris. BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Mikulin 1122140-5*; EVE: *J. Roman JR-10.28.15-08*, *Group A 23*

Cladonia furcata (Hudson) Schrader – Common on soil and wood. NWL: *R. Robertson 9606*; BMH: *27376*, *Pittam, Fennel and McCune obs.*; EVE: *R. Sullivan RS-10.27.15-42*, *RS-2015-47*

Cladonia gracilis (L.) Willd. subsp. ***gracilis*** – Uncommon on volcanic rock outcrops on north facing slope above the Little North Fork River. BMH: *27375*

Cladonia macilenta Hoffm. var. ***macilenta*** D. S. Curtis – On downed wood in a *Taxus brevifolia* grove. BMH: *Pittam, Fennel and McCune obs.* EVE: *S. Coutts 01*

Cladonia mitis Sandst. – Uncommon in areas of thin soil over rock associated with *Xerophyllum tenax*. NWL: *R. Robertson 9583*; BMH: *37790*

Cladonia norvegica Tønsberg & Holien. – Rare on conifer stumps in old-growth forest. EVE: *R. Sullivan RS-10.26.2015-49*

Cladonia ochrochlora Flörke – Common on soil and a wide variety of woody substrates. FIA: *L. Lasselle 1120140-7*, *R. Ulrich 1120144*; EVE: *G. Jackmond 27*, *I. Matsouka 19*

Cladonia phyllophora Hoffm. – Rare on rock, in open rocky slopes along forest edges. EVE: *J. Roman JR-10.28.15-14*

Cladonia portentosa subsp. ***pacifica*** (Ahti) Ahti – Rare on rock and occasionally on late-stage woody debris in volcanic outcrops on north slopes. BMH: *27373*

Cladonia pyxidata (L.) Hoffm. – Common on a variety of woody and non-woody substrates. BMH: *Pittam, Fennel and McCune obs.*; EVE: *R. Sullivan RS-10.27.15-45*, *J. Roman JR-10.27.15-09*

Cladonia rangiferina (L.) F. H. Wigg. – Uncommon in thin soil areas amongst *Xerophyllum tenax* dominated plant communities in openings in mixed conifer old-growth forests. NWL: *R. Robertson 9584*, *J. Villella 102504-38*; BMH: *22059*, *27371*; EVE: *A. Landers 10252016.3*, *A. E. Wiklund A. E.W.24-10-2018-4*

Cladonia squamosa (Scop.) Hoffm. – Common on various woody and non-woody substrates in the lower forest strata. NWL: *J. Villella 102404-5*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *R. Sullivan RS-10.28.15-64*; *J. Roman JR-10.28.15-05*, *Hutten and Villella 5*

Cladonia subulata (L.) F. H. Wigg – Rare on moss over rock or mossy exposed roots of *Tsuga heterophylla* along north-facing side of trail in old-growth conifer forest. EVE: *L. M. Calabria LC10.26.16-05*, *H. Stewart-Ahn 10.24.17. L2.a*

Cladonia transcendens (Vainio) Vainio – Common on various woody substrates. NWL: *J. Villella 102403-33*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *R. Sullivan RS-10.27.15-43*, *Hutten and Villella 33*

Cladonia umbricola Tønsberg & Ahti – Uncommon on the boles of *Pseudotsuga menziesii*. FIA: *D. Glavich 1122140-8*; EVE: *Hutten and Villella 30*

Cladonia verruculosa (Vainio) Ahti **–** Uncommon on rock and moss in a small talus slope. BMH: *22062*, *Pittam, Fennel and McCune obs.*; EVE: *J. Roman JR-10.27.15-13*

Cliostomum flavidulum Hafellner & Kalb **–** Common, on the bark of *Abies* sp. on the edge of an area disturbed by past mining. BMH: *28407*

Coenogonium pineti (Ach.) Lücking & Lumbsch – Rare on large woody debris and stumps in old-growth mixed conifer forest. NWL: *J. Villella obs.*

Cyclohymenia epilithica McCune & M. J. Curtis – Rare on rock in old-growth douglas-fir western hemlock forest near creek. BMH: *22436*

Dermatocarpon meiophyllizum Vainio – Rare, saxicolous in scour sheltered areas of rocks in and on the edge of perennial streams. NWL: *J. Villella obs.*

Ephebe lanata (L.) Vainio – Uncommon saxicolous species on rock outcrops and semi-submerged rocks and near waterfalls in a perennial stream flowing through an old-growth mixed conifer hardwood forest. BMH: *27366*; EVE: *L. M. Calabria LC10.25.16-04*

Epilichen scabrosus (Ach.) Clem. – On *Baeomyces rufus* on a shaded boulder in an area of historic mining disturbance. BMH: *37655*

Esslingeriana idahoensis (Essl.) Hale & M. J. Lai – Uncommon on *Pseudotsuga menziesii* boles and branches. FIA: *A. Mikulin 11221409*

Euopsis pulvinata (Schaerer) Nyl. – Rare on an iron rich boulder in an area of historic mining disturbance. BMH: *28389*

Evernia prunastri (L.) Ach. – Common epiphyte especially on hardwoods such as *Acer* and *Alnus rubra*. BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Ingersoll 1120140-5*; EVE: *E. Fischer EF04*

Fellhanera bouteillei (Desm.) Vězda – Rare on rain sheltered conifer needles along creeks, especially *Thuja plicata*. NWL: *J. Villella obs.*

Fuscopannaria aurita P. M. Jørg. – Rare on rocks in forest openings. BMH: *L. H. Pike 2138*

Fuscopannaria cyanolepra (Tuck.) P. M. Jørg. – Uncommon on soil and moss especially along roadcuts. BMH: *22440*

Fuscopannaria leucostictoides (Ohlsson) P. M. Jørg. – Uncommon epiphyte on trees and shrubs, especially near streams. BMH: *28402, 27370*, *Pittam, Fennel and McCune obs.*; FIA: *A. Mikulin 1122140-6*, *R. Ulrich 1120144-5*

Fuscopannaria pacifica P. M. Jørg. – Common epiphytic species, especially on conifers. NWL: *J. Robertson 9554*, *9560*; BMH: 3*7652*, *Pittam, Fennel and McCune obs*.; FIA: *D. Glavich 1122140-10*; EVE: *D. Wamser DW-L.10.24.18.1*, *E. Greer EG-10.24.17-15*

Graphis scripta (L.) Ach. – Uncommon epiphyte on branches and boles of *Acer circinatum* and *Alnus rubra*. BMH: *22072*

Hertelidea botryosa (Fr.) Printzen & Kantvilas – Rare on wood of a conifer snag in an area of historic mining disturbance. BMH: *28409*

Hypocenomyce scalaris (Ach. ex Lilj.) M. Choisy– Common on charred wood. FIA: *J. Riley s.n.*

Hypogymnia apinnata Goward & McCune – Common epiphyte on conifer trees and wood. NWL: *R. Robertson 9577*; BMH: *28430, 28429*; FIA: *L. Lasselle 1120140-7*, *R. Ulrich 1120144-6*; EVE: *Josh Gurel JG-10.27.15-31*, *R. Pigman RP-10.28.15-01*

Hypogymnia canadensis Goward & McCune – Uncommon epiphyte on *Tsuga heterophylla* twigs at the edge of an area of historic mining disturbance. BMH: *22008*; EVE: *S.Coutts s.n.*

Hypogymnia enteromorpha (Ach.) Nyl. – Common epiphyte of conifers. NWL: *R. Robertson 9607*, *9615*; BMH: *2843*1, *Pittam, Fennel and McCune obs.*; FIA: *A. Ingersoll 1120140-9*, *R. Ulrich 1120144-9*; EVE: *R. North RN25*, *T. Buntain 8*

Hypogymnia hultenii (Degel.) Krog – Uncommon on bark, fine twigs and wood of conifers. NWL: *J. Villella 102504-8*; BMH: 28399; FIA: *D. Glavich 1122140-6*, *R. Ulrich 1120144-2*; EVE: *N. Nelson NILS-10.27.15*, *J. Gurel JG-10.27.15-23*

Hypogymnia imshaugii Krog – Uncommon epiphyte on conifer branches and snags. BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Ingersoll 1120140-11*; EVE: *J. Gurel JG-2015-29*, *R. Pigman RP-10.27.15-04*

Hypogymnia inactiva (Krog) Ohlsson – Common epiphyte found on the branches and twigs of conifers and deciduous trees, and on *Chrysolepis chrysophylla* snags. NWL: *J. Villella 102504-19*; BMH: 28398, *Pittam, Fennel and McCune obs.*; FIA: *A. Ingersoll 1120140-15*, *R. Ulrich 1120144-11*; EVE: *A. Cherwa ADC51*, *K. Baldwin BAC007*

Hypogymnia occidentalis L. Pike – Uncommon conifer epiphyte. FIA: *D. Glavich 891414147-5*

Hypogymnia oceanica Goward – Rare on conifers and *Alnus rubra*. BMH: *28400*, *22439*; FIA: *R. Ulrich 1120144*; EVE: *E. Daugherty ED-10.25.17-06*

Hypogymnia physodes (L.) Nyl. – Common on trees. NWL: *J. Villella 102504-24*; BMH: *28428*; *28937* BMH: *Pittam, Fennel and McCune obs.*; FIA: *L. Lasselle 1120140*, *R. Ulrich 1120144*; EVE: *R. Pigman RP-10.27.15-01*, *J. Gurel JG-10.28.15.33*

Hypogymnia rugosa (G. Merr.) L. Pike – Common epiphyte on *Abies amabilis* snags. FIA: *A. Ingersoll 1120140-17*

Hypogymnia tubulosa (Schaerer) Hav. – Common epiphyte on conifer boles, snags, and twigs. NWL: *J. Villella 102404-7*; BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Mikulin 1122140-18*; EVE: *D. J. Gurel JG-10.27.15-21*

Hypogymnia wilfiana Goward, T. Sprib. B. McCune & Ahti – Uncommon on *Pseudotsuga menziesii* boles, FIA: *A. Hardman s.n.*

G3/G4, S3, 4 ***Hypotrachyna afrorevoluta*** (Krog & Swinscow) Krog & Swinscow – Rare epiphyte on the bark of *Amelanchier alnifolia* in open, mixed hardwood forest and forested shore of a river. BMH: *37563*, *Kofranek 2541*, *Pittam, Fennel and McCune obs.*

G1, S1, 1 ***Hypotrachyna riparia*** McCune – Rare epiphyte on the bark of *Fraxinus* in open mixed hardwood forest. BMH: *37562*, *Pittam, Fennel and McCune obs.*

Hypotrachyna sinuosa (Sm.) Hale – Uncommon epiphyte on hardwood. BMH: *Pittam, Fennel and McCune obs.*

Icmadophila ericetorum (L.) Zahlbr. – Common crust on decaying wood and moss near or along trails in old-growth. NWL: *J. Robertson 9565*, *N. Hillyard 1296*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *C. Kuzis CK-10.26.15-48*, *L. Vadopalas LV-10.28.15-109*

Ionaspis lacustris (With.) Lutzoni– Common on streamside rocks of Opal Creek and Battle Ax Creek. NWL: *Villella obs.*

Japewia tornoënsis (Nyl.) Tonsberg – Corticolous on twig litter in lichen rich conifer forest. NWL: *N. Hillyard 1300*

Koerberiella wimmeriana (Körber) Stein – Saxicolous on non-calcareous creek side rocks in mixed conifer-deciduous riparian forest. BMH: *28417*, *28374*

Lecanora circumborealis Brodo & Vitik. – Uncommon on bark of *Alnus rubra*. NWL: *Villella obs.*

Lecanora impudens Degel. – Common on bark of deciduous trees. BMH: *28380*

Lecanora pacifica Tuck. – Common on *Acer macrophyllum* branches at the edge of an open area on large rock outcrops. NWL: *N. Hillyard 1311*; BMH: *24434*, *28435*

Lecanora polytropa (Ehrh.) Rabenh. – Common on boulders in higher elevation areas. NWL: *Villella obs.*

Lecanora pulicaris (Pers.) Ach. – Uncommon on *Alnus rubra* twigs in the riparian zone of mixed conifer-deciduous forest. BMH: *28418*

Lecidea atrobrunnea (Ramond ex Lam. DC.) Schaerer subsp. ***atrobrunnea*** – Common on rocks and boulders. NWL: *J. Robertson 9549*

Lecidella elaeochroma (Ach.) M. Choisy – Uncommon on bark of *Acer macrophyllum* on edge of openings. BMH: *28439*; *28379*, *Pittam, Fennel and McCune obs.*

Lepra amara (Ach.) Hafellner – Common on conifers. NWL: *J. Robertson 9590*; BMH: *Pittam, Fennel and McCune obs.*

Lepra ophthalmiza (Nyl.) Hafellner – *Common* on the *Alnus rubra* boles in the riparian zone of mixed conifer-deciduous dominant forests and at the edge of an area of historic mining disturbance. BMH: *28408*; *28420*; FIA: *A. Ingersoll 1120140*

Lepraria elobata Tønsberg – Rare, on rock, welded tuff, boulder in at the edge of an area of historic mining disturbance. BMH: *37654*

Lepraria finkii (B. de Lesd.) R. C. Harris – Uncommon on tree bases. EVE: *S. Rogers s.n.*

Lepraria pacifica Lendemer– Bark of *Thuja plicata* in conifer forest between Jawbone Flats and Ruth mine above trail. BMH: *28401*; EVE: *C. Kuzis CK2016.49*

Leptogidium contortum (Henssen) T. Sprib. & Muggia – Uncommon on twigs of *Taxus brevifolia* and *Tsuga heterophylla* BMH: *22074, 28405*; FIA: *R. Ulrich 1120144-15*
EVE: *M. Rozzatti M.R.2018-8A*, *L. Blackwood 07*

Leptogium pseudofurfuraceum P. M. Jørg. & Wallace – Rare on moss over seepy rock near road and creek old-growth *Pseudotsuga - Tsuga* forest. BMH: *22441*

Leptogium saturninum (Dickson) Nyl. – BMH: Rare on black cottonwood, *Acer macrophylla* and white oak. BMH: *Pittam, Fennel and McCune obs.*

Letharia vulpina (L.) Hue – Uncommon on snags and other woody substrates in open forests and on ridges. NWL: *Villella obs.*

Lichenomphalia umbellifera (L.: Fr.) Redhead, Lutzoni, Moncalvo & Vilgalys – Uncommon on downed wood. BMH: *Pittam, Fennel and McCune obs.*

Lobaria anomala (Brodo & Ahti) T. Sprib. & McCune – Uncommon epiphyte on conifer branches and the bark of *Rhododendron macrophyllum*. NWL: *J. P. Dey 27384*, *27425*; BMH: *Pittam, Fennel*

and McCune obs.; FIA: *D. Glavich 1122140-25*, *R. Ulrich 1120144-34*; EVE: *Danielle - Group A11*, *Hutten and Villella 13*

Lobaria anthraspis (Ach.) T. Sprib. & McCune **–** Uncommon epiphyte on conifer bark and *Acer macrophyllum* branches and bark in riparian old-growth. NWL: *J. P. Dey 27435*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *C. Fields CF-10.25.17-11*, *H. Stewart-Ahn HAS-10.25.17-L1*

Lobaria hallii (Tuck.) Zahlbr. – Uncommon epiphyte on hardwoods. BMH: *Pittam, Fennel and McCune obs.*

Lobaria oregana (Tuck.) Müll. – Common epiphyte on conifer boles, branches, and snags. NWL: *N. Hillyard 1303*, *J. Villella 102504-30*; BMH: *Pittam, Fennel and McCune obs.*; FIA: *R. Ulrich 1120144-16*, *A. Mikulin 1122140-14*; EVE: *K. Baldwin BAC001*, *M. Kyle M.K.2016*. *Lobaria oregana* cyanomorph– Rare epiphyte found on *Abies sp.* twigs at the edge of an area of historic mining disturbance. BMH: *28401*

Lobaria pulmonaria (L.) Hoffm. – Common epiphyte on the bark of *Rhododendron macrophyllum*, boles of *Chrysolepis chrysophylla*, and branches of *Pseudotsuga menziesii*. BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Mikulin 1122140-15*, *R. Ulrich 1120144-17*; EVE: *K. Edmonds OC.10.02*

Lobarina scrobiculata (Scop.) Nyl. – Rare epiphyte on the bark of *Rhododendron macrophyllum and Taxus brevifolia*. BMH: *Pittam, Fennel and McCune obs.*; FIA: *D. Glavich 1122140-16*; EVE: *LC10.27.15-03*

Loxospora elatina (Ach.) A. Massal – Common on *Abies amabilis* snags and bark of *Thuja plicata* in open mixed conifer forest. BMH: *28383*; FIA: *L. Lasselle 1120140-16*

Loxosporopsis corallifera Brodo, Henssen & Imshaug – On the bark of *Thuja plicata* in mixed conifer forest with open to partial canopy cover. BMH: *28382*; EVE: *K. Baldwin BAC023*, *Hutten and Villella s. n.*

Massalongia carnosa (Dickson) Körber – Uncommon on moss over andesite rock on shade andesite rock outcrops and talus in mixed conifer forest. NWL: *R. Robertson 9571*, *9601*; BMH: *37795*; EVE: *Villella 052103-01*

Melanelixia glabratula (Lamy) Sandler & Arup – Uncommon epiphyte. BMH: *Pittam, Fennel and McCune obs.*

Melanelixia subaurifera (Nyl.) O. Blanco et al. – Uncommon on branches and boles of *Alnus rubra* adjacent open areas near Jawbone Flats. NWL: J. P. Dey 33430; EVE: *B. Stragier BS-10.28.15-67*, *P. Hamar PH-10.28.15-105*

Melanohalea exasperatula (Nyl.) O. Blanco et al.– Uncommon on the bark of *Alnus rubra* adjacent open areas near Jawbone Flats. EVE: *P. Hamar PH-10.28.15-105*

Menegazzia subsimilis (H. Magn.) R. Sant. – Rare on bark of hardwoods especially *Alnus rubra* at lower elevations. BMH: *Pittam, Fennel and McCune obs.*

Menegazzia terebrata (Hoffm.) A. Massal. – Rare on the boles of *Alnus rubra* among trees and outcrops near a waterfall and in a mixed conifer - deciduous stand adjacent to an open field. BMH: *27365*; *Pittam, Fennel and McCune obs.* EVE: *R. Pigman RP-10.28.15-02*

Micarea peliocarpa (Anzi) Coppins & R. Sant. – Rare on wood and old mine timbers at the edge of an area of historic mining disturbance. BMH: *28394*

****Microcalicium disseminatum*** (Ach.) Vainio – Uncommon on older wooden buildings. JFC: *D33W-b, I12*

Miriquidica instrata (Nyl.) Hertel & Rambold – Uncommon on andesite rock on open ridgetop with andesite rock outcrops and scattered tree cover. BMH: *37776b*

Montanelia panniformis (Nyl.) Divakar, A. Crespo, Wedin & Essl. – Rare on large boulders. NWL: *R. Robertson s. n.*

Mycoblastus affinis (Schaerer) T. Schauer – Common on bark in old-growth *Pseudotsuga menziesii* stands. NWL: *P. Przybylowicz 9606-8*; *J. Robertson 9570*; EVE: *K. Edgington s.n.*

Mycoblastus sanguinarius (L.) Norman **–** Common on the bark *Pseudotsuga menziesii* and decaying log in old-growth. EVE: *C. Kuzis CK2015.54*, *CK2016.39*

****Mycocalicium subtile*** (Pers.) Szatala – Uncommon on wooden buildings JFC: *A11E, A9E*

Nephroma bellum (Sprengel) Tuck. – Uncommon on conifer branches in old-growth. NWL: *J. P. Dey 27443*; FIA: *R. Ulrich 1120144-18*; EVE: *C. Mitchell CM-10.24.17-09*, *Stragier BS-10.26.15-54*

Nephroma laevigatum Ach. – Common on *Acer macrophyllum* and *Thuja plicata t*wigs near Jawbone Flats and in riparian zones. BMH: *Pittam, Fennel and McCune obs.*; EVE: *A. E. Wiklund 22-10-2018-1, P. Hamar PH-10.27.15-99*

G4, S3, 2 ***Nephroma occultum*** Wetmore – Rare as a conifer epiphyte in the mid to upper canopy in cyanolichen rich sites. FIA: *R. Ulrich 1120144-23*; EVE: *Hutten and Villella s.n.*

Nephroma parile s. lat. (Ach.) Ach. – Rare as a conifer epiphyte, occasionally on rock in sheltered settings. NWL: *J. Villella 102504-31*; EVE: *Hutten and Villella 31*

Nephroma resupinatum (L.) Ach. – Common epiphyte. NWL: *J. Robertson 9561*; BMH: *Pittam, Fennel and McCune obs.*

Nephroma tropicum (Müll. Arg.) Zahlbr. – Uncommon on conifer twigs in riparian zones. NWL: *J. P. Dey 27383*, *J. Robertson 9617*; BMH: *Pittam, Fennel and McCune obs.*; FIA: *R. Ulrich 1120144-22*; EVE: *R. Sullivan RS-10.27.15-32*; *W. Weinstock WW.25.10.16-#2*

Nodobryoria oregana (Tuck.) Common & Brodo – Common on conifer branches, boles, and snags. FIA: *D. Glavich 1122140-20*, *R. Ulrich 1120144*; EVE: *S. Pierce SP-10.27.15-59*, *J. Barnhert JB-10.24.17-02*

Normandina pulchella (Borrer) Nyl. – Rare on deciduous trees especially at lower elevations. BMH: *Pittam, Fennel and McCune obs.*

Ochrolechia juvenalis Brodo – Rare on a dead conifer in *Pseudotsuga menziesii* stands with southwest slopes and seepy draws. BMH: *21999*

Ochrolechia laevigata (Räsänen) Verseghy – Uncommon on the bark of deciduous trees in riparian zones and at the edge of an area of historic mining disturbance. NWL: *J. Robertson 9611*, *R. Robertson 9622*; BMH: 22071, 28378; EVE: *L. Vadopalas LV-10.27.15-74*, *D. Tello DT-10.24.17-01*

Ochrolechia oregonensis H. Magn. – Common on conifer bark. BMH: *22068*, *Pittam, Fennel and McCune obs.*; FIA: *D. Glavich 1122140-18*

Ochrolechia subpallescens Verseghy – BMH: *Pittam, Fennel and McCune obs.*

Ophioparma rubricosa (Müll. Arg.) S. Ekman – Rare on the wood of a conifer snag at the edge of an area of historic mining disturbance. BMH: *28410*

G2 (Proposed) ***Pannaria oregonensis*** McCune & M. Schultz – Rare on conifer and *Fraxinus latifolia* branches in low elevation riparian forests. BMH: *37559*, *S. Pittam 1013*

Parmelia hygrophila Goward & Ahti – Common on the boles of *Chrysolepis chrysophylla*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*. NWL: *J. Robertson 9573*, *J. Villella 102404-18*; BMH: *29573*, *Pittam, Fennel and McCune obs.*; FIA: *L. Lasselle 1120140-17*, *R. Ulrich 1120144-25*

Parmelia pseudosulcata Gyelnik – Uncommon epiphyte. BMH: *Pittam, Fennel and McCune obs.*

Parmelia saxatilis (L.) Ach. – On *Pseudotsuga menziesii* bark in a *Pseudotsuga menziesii* stand with southwest slopes and seepy draws. BMH: *22007*

Parmelia sulcata Taylor – Common epiphyte on conifers and *Rhododendron macrophyllum*. NWL: *J. Villella 102504-20*; BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Mikulin 1122140-21*; EVE: *A. Abigail 20, Hutten and Villella 20*

Parmeliella parvula P. M. Jørg. – Rare on *Abies* sp. branches at the edge of an area of historic mining disturbance. BMH: *28403*

Parmeliopsis ambigua (Wulfen) Nyl. – Common on the boles of conifers. EVE: *G. Jackmond 29*, *I. Matsuoka 10*

Parmeliopsis hyperopta (Ach.) Arnold – Common on the boles of conifers, *Alnus rubra* and *Rhododendron macrophyllum*. FIA: *A. Ingersoll 1120140-27*, *R. Ulrich 1120144-28*; EVE: *R. Pigman RP-10.27.15-03*

Parmotrema perlatum (Hudson) M. Choisy – Rare epiphyte in lower elevations. BMH: *Pittam, Fennel and McCune obs.*

Peltigera aphthosa (L.) Willd. – Uncommon on soil and over bryophytes on the forest floor. NWL: *Villella obs.* EVE: *I. Matsuoka 4-11*

Peltigera britannica (Gyelnik) Holt. – Common on moss, soil, and rotten wood along trails and in riparian areas. NWL: *J. Villella 102404-2*; *102404-18 (photomorph)*; EVE: *A. Landers 10252016.5*; *A. E. Wiklund 23-10-2018-2*

Peltigera collina (Ach.) Schrader – Common as an epiphyte, especially on hardwoods. BMH: *Pittam, Fennel and McCune obs.*

Peltigera hydrothyria var. ***aquatica*** (Miadl. & Lendemer) McCune, – Uncommon to locally common, on inundated rocks in streams. NWL: *R. Robertson 9595*; *J. Villella 062303-2*; EVE*: A. E. Wiklund 4-10-2018-1*

Peltigera leucophlebia (Nyl.) Gyelnik – Common on soil and moss along creeks and in disturbed areas adjacent creeks. NWL: *J. Robertson 9588*; *R. Robertson 9593*

Peltigera membranacea (Ach.) Nyl. – Common on soil. NWL: *J. Robertson 9592*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *A. Landers 10252016.4*

Peltigera neopolydactyla (Gyelnik) Gyelnik – uncommon on moss over humus/rock/soil along trails. NWL: *J. Villella 102404-3*; EVE: *K. Thompkins KT102416-1*, *W. Uriu WU10.27.15-83*

Peltigera pacifica Vitik. – Uncommon on moss over rocks along creeks. EVE: *J. Marlor 10.25.16.09*, *LC10.27.15-15*

Peltigera venosa L. Hoffm. – Uncommon on exposed soil and rocks. NWL: *R. Robertson 9558, J. Villella 091002-01*

Pertusaria leioplaca DC. – Rare on the bark of *Acer macrophyllum* branches at the edge of an open area on a large rock outcrop. BMH: *28432*

Pertusaria subambigens Dibben – Uncommon epiphyte. NWL: *N. Hillyard 1295*, *1299*

Phlyctis argena (Ach.) Flotow – Uncommon on a conifer snag at the edge of an area of historic mining disturbance. BMH: *28411*

Phylliscum demangeonii (Moug. & Mont.) Nyl. – Rare on large boulders in north-facing rock outcrop and talus slope. NWL: *G. McHenry-Teller 90606.703*, *J. Robertson 9576*

Physcia adscendens (Fr.) H. Olivier – Common epiphyte. BMH: *Pittam, Fennel and McCune obs*.

Physcia alnophila (Vainio) Loht., Moberg, Myllys & Tehler -Common epiphyte of deciduous trees. BMH: *Pittam, Fennel and McCune obs.*

Physcia tenella (Scop.) DC. subsp**. *tenella*** – Uncommon deciduous tree epiphyte. BMH: Pittam, *Fennel and McCune obs.*

Pilophorus acicularis (Ach.) Th. Fr. – Common on non-calcareous rock in partial to full shade near or along trails. NWL: N. Hillyard 1301, R. Robertson 9608; EVE: *D. DeGeare DD-10.26.15-09*, *R. Balkcom RB-10.25.17-L06*

Pilophorus clavatus Th. Fr. – Uncommon on non-calcareous rock in partial shade near or along trails. EVE: *R. Balkcom RB-10.24.17-L01*, *L. Boizot LB-10.27.15-63*

G3G4, S2, 2 ***Pilophorus nigricaulis*** M. Satô – Rare on volcanic rock outcrops and talus and non-volcanic rock, often near creek. BMH: *27377*, *22076*

Placopsis lambii Hertel & V. Wirth – Common on volcanic rocks. NWL: *R. Robertson 9609*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *M. Kyle M.K. 2016*

Placynthiella icmalea (Ach.) Coppins & P. James – Uncommon on woody substrates. BMH: *Pittam, Fennel and McCune obs.*

Placynthiella uliginosa (Schrader) Coppins & P. James – Uncommon on woody substrates. NWL: *J. Robertson 9548*

Platismatia glauca (L.) W. L. Culb. & C. F. Culb. – Common epiphyte species. BMH: *37781*, *Pittam, Fennel and McCune obs.*; FIA: *A. Ingersoll 1120140-21*, *R. Ulrich 1120144-29*; *D. M. Bernstein MB.10.25.16-3L*, *P. Hamar PH-10.28.15-07*

Platismatia herrei (Imshaug) W. L. Culb. & C. F. Culb. – Common epiphytic species. NWL: *J. Robertson 9569*; BMH: *37783*, *Pittam, Fennel and McCune obs.*; FIA: *D. Glavich 1120144-22*, *R. Ulrich 1120144-30*; EVE: *P. Hamar PH-10.26.15-90*, *T. Linja TL-1.16.15-59*

Platismatia norvegica (Lynge) W. L. Culb. & C. F. Culb. – Uncommon epiphyte on conifers, deciduous trees, and evergreen shrubs. NWL: *J. Robertson 9567*, *9912*; FIA: *A. Mikulin 1122140-23*, *R. Ulrich 1120144-31*; EVE: *P. Hamar PH-10.27.15-94*, *G. Hanson GH.10.23.18-02*

Platismatia stenophylla (Tuck.) W. L. Culb. & C. F. Culb. – Common epiphyte on conifers. NWL: *J. P. Dey 27379*; BMH: *37782*, *Pittam, Fennel and McCune obs.*; FIA: *A. Ingersoll 1120140-22*, *R. Ulrich 1120144-32*; EVE: *T. Buntain 15*, *T. McCallum 10*

****Plectocarpon nephromeum*** (Norman) Sant. – Rare lichenicolous fungi on *Nephroma* species. NWL: *J. Villella 120905-01*

Polycauliona polycarpa (Hoffm.) Frödén, Arup, & Søchting – Uncommon epiphyte. BMH: *Pittam, Fennel and McCune obs.*

Polychidium muscicola (Sw.) Gray – Uncommon on moss over rock in rock outcropping adjacent open field. EVE: *B. Stragier BS-10.26.15-58*

Porpidia carlottiana Gowan – Uncommon on non-calcareous creekside rocks. BMH: *28375*, *22437*

Porpidia crustulata (Ach.) Hertel & Knoph – Common on bridge timbers of bridge over Battle Axe Creek and on rock and andesite rock on shaded andesite rock outcrops and talus in mixed conifer forest and in a *Pseudotsuga menziesii* stand with southwest slopes and seepy draws. NWL: *J. Robertson 9553*, *N. Hillyard 1304*; BMH: *28377*; *22057*

Porpidia flavicunda (Ach.) Gowan – Uncommon on andesite rock in shaded andesite rock outcrops and talus in mixed conifer forest. BMH: *37792*

Porpidia thompsonii Gowan – Common on iron-rich rock at the edge of an area of historic mining disturbance. BMH: *28388*; FIA: L. Lasselle *1120140-23*

Protoparmelia badia (Hoffm.) Hafellner – Rare on large boulders in a talus field. NWL: *J. Villella obs.*

Pseudephebe pubescens (L.) M. Choisy – Uncommon on rock in old-growth. EVE: *R. Balkcom RB-10.25.17.01*

Pseudocyphellaria citrina (Gyeln.) Lücking, Moncada & S. Stenroos **–** Locally common on conifer branches and twigs along roads and trails, and at the edge of an area of historic mining disturbance. BMH: *28404, Pittam, Fennel and McCune obs.*; FIA: *R. Ulrich 1120144-34*; EVE: *J. Villella 14-446*, *C. Kuzis CK2015.52*

G5, S3, List 3 ***Pseudocyphellaria hawaiiensis*** H. Magn. – Rare on conifer branches and twigs along roads and trails. NWL: *T. Wheeler 2164*; EVE: *K. Pepe KP.10.23.18-03*

G4, S3, List 2 ***Pseudocyphellaria mallota*** (Tuck.) H. Magn. – Uncommon on *Tsuga heterophylla* and *Taxus brevifolia* twigs in riparian forest along rivers and in moist settings. EVE: *L. M. Calabria LC.10.24.18.01*, *H. Stewart-Ahn 10.23.18.2a*

G3G4, S3, List 4 ***Pseudocyphellaria rainierensis*** Imshaug – Uncommon on conifer boles, branches, and twigs in riparian areas. NWL: *J. Robertson 9566*; BMH: *22075*; FIA: *R. Ulrich 1120144-35*; EVE: *N. Rosatti NR-10.24.17-05, H. Stewart-Ahn10.24.17*

Psoroma hypnorum (Vahl) Gray – Uncommon on epiphytic bryophytes along creeks and humus over rock on ridgetop with rock outcrops. BMH: *28422*; EVE: *S. Pierce SP-10.27.15-60*, *T. Linja TL-10.27.15-45*, *J. Villella 062303-01*

Ptychographa xylographoides Nyl. – Uncommon on rotten wood in a *Pseudotsuga menziesii* stand with southwest slopes and seepy draws. BMH: *22004*

Pyrenula occidentalis (R. C. Harris) R. C. Harris – Uncommon on deciduous tree trunks. BMH: *Pittam, Fennel and McCune obs.*

Ramalina dilacerata (Hoffm.) Hoffm. – Uncommon on hardwoods especially in moist forests. NWL: *Villella obs.*; BMH: *Pittam, Fennel and McCune obs.*; EVE: *M. Bissonnette OC028*

Ramalina farinacea (L.) Ach. – Common on trees at lower elevations. BMH: *Pittam, Fennel and McCune obs.*

Rhizocarpon cinereonigrum Vainio – Uncommon on talus in rock outcrop near Jawbone Flats. NWL: *J. Robertson 9551*

Rhizocarpon distinctum Th. Fr. – Uncommon on talus in rock outcrop near Jawbone Flats. NWL: *J. Robertson 9551*, *J. Robertson 9587*

Rhizocarpon geographicum (L.) DC. – Common, on rock along a trail to Ruth Mine. EVE: *C. Mitchell CM-2017 1024-06*

Rhizocarpon grande (Flörke ex Flotow) Arnold – Uncommon on talus in rock outcrop near Jawbone Flats. NWL: *J. Robertson 9552*, *R. Robertson 9585*

Rhizocarpon lecanorinum Anders – Uncommon on andesite rock on open ridgetop with andesite rock outcrops and scattered tree cover. NWL: *J. Robertson 9579*, *R. Robertson 9524*; BMH: *37774*

Ricasolia amplissima (Scop.) Forssell (cyanomorph) **–** Rare epiphyte on *Tsuga heterophylla* branches. NWL: *J. P. Dey 33397*; FIA: *R. Ulrich 1120144-4*

Rinodina disjuncta Sheard & Tønsberg – Common on *Alnus rubra* adjacent to creeks in mixed dominance riparian forest. BMH: *28424*

Rinodina hallii Tuck. – Uncommon on *Acer circinatum* in a *Pseudotsuga menziesii* stand with southwest slopes and seepy draws. BMH: *22003*

Rinodina trevisanii (Hepp) Körber – On *Acer macrophyllum* at the edge of an open area on a large rock outcrop. BMH: *28438*

Scutula circumspecta (Vainio) Kistenich, Timdal, Bendiksby & S. Ekman – Rare on pressure-treated wood of a boardwalk in a mixed hardwood-conifer floodplain forest. BMH: *38060*

Scytinium californicum (Tuck.) Otálora, P. M. Jørg. & Wedin – Rare on rocks and moss over rock outcrops along streams and near waterfalls. BMH: *27367*

Scytinium gelatinosum (With.) Otálora, P. M. Jørg. & Wedin – Rare on rocks and moss over rock outcrops along streams and near waterfalls. NWL: *R. Robertson 9614*, J. *Villella 061003-01*; EVE: *A. E. Wiklund A. E.W.23-10-2018-3*

Scytinium cf. ***lichenoides*** (L.) Otálora, P. M. Jørg. & Wedin – Epiphyte in riparian old-growth. NWL: *J. Villella 061003-01*; BMH: *22073*; EVE: *Hutten and Villella s.n.*

Scytinium cf. ***palmatum*** (Hudson) Gray – Common on soil in roadsides and paths in old-growth forest. NWL: *R. Robertson 9603*; EVE: *J. Nannes 33*

G3/G4, S2, List 3 ***Scytinium*** cf. ***platynum*** (Tuck.) Otálora, P. M. Jørg. & Wedin – Rare on bryophyte covered, seepy, riverbed cliff wall. NWL: *J. Villella 061402-01*; B. *Pittam, Fennel and McCune obs.*; EVE: *L. M. Calabria LC 10.27.15-22*, *M. Zirpoli MZ.10.25.16 L3*

Scytinium polycarpum (P. M. Jørg. & Goward) Otálora, P. M. Jørg. & Wedin – Uncommon epiphyte on deciduous trees and shrubs and on moss along creeks. BMH: *22069*, *38059*;

Scytinium cf. ***rivale*** (Tuck.) Otálora, P. M. Jørg. & Wedin – Common on non-calcareous rocks in creek beds of mixed dominance riparian forest. NWL: *R. Robertson 9619*; BMH: *28412*

Scytinium tacomae (P. M. Jørg. & Tønsberg) McCune– Rare epiphyte on mossy *Acer circinatum* branch in cool, moist, old-growth riparian forest. EVE: *L. M. Calabria LC.10.27.15-23*

Solorina crocea (L.) Ach. – Rare on thin soil over rocks on ridge tops. NWL: *J. Villella obs.*

Sphaerophorus tuckermanii Räsänen – Common epiphyte on conifers. BMH: *Pittam, Fennel and McCune obs.* EVE: *J. Gurel JG-10.29.15-34*, *A. Morris AM-10.25.17-02*

Sphaerophorus venerabilis Wedin, Högnabba & Goward – Common epiphyte on conifers. BMH: *Pittam, Fennel and McCune obs*.; EVE: *J. Gurel JG-10.27.15-28*, *A. Morris AM-10.25.17-03*

Staurothele drummondii (Tuck.) Tuck. – Common on dry rocks in shaded forest. NWL: *Villella obs*.

Staurothele fissa (Taylor) Zwackh – Uncommon on shaded moist rocks. NWL: *Villella obs.*

Stereocaulon alpinum Laurer ex Funck – Uncommon on moss mats on rocky, shaded to open ridgetop with andesite outcrops and scattered tree cover. BMH: *37779*

Stereocaulon intermedium (Savicz) H. Magn. – Uncommon on a talus slope of volcanic rock. BMH: *22058*

Stereocaulon sterile (Savicz) I. M. Lamb ex Krog – Uncommon on rock and moss over rock on open ridgetop with andesite outcrops and scattered tree cover. BMH: *37780*; *37651*

Stereocaulon tomentosum Fr. – Common on rock, and moss mats and humus over rock and gravel at the edge of an area disturbed by mining and along stream beds and creeks. NWL: *J. Villella 102404-4*; BMH: *28392*; *37650*; EVE: *H. Stewart-Ahn HAS-10.24.17-L1*, *W. Suda WS1022A3*

Sticta fuliginosa (Hoffm.) Ach. – Uncommon epiphyte on conifers. NWL: *J. P. Dey 27454*, *27429*; BMH: *28396*, *Pittam, Fennel and McCune obs.*

Sticta limbata (Sm.) Ach. – NWL: Uncommon epiphyte on hardwoods. *J. P. Dey 27428*; BMH: *Pittam, Fennel and McCune obs.*

G5, S3, 4 ***Sticta*** cf. ***weigelii*** *s. lat.* (Ach.) Vainio. – Common epiphyte on conifers and deciduous trees in late seral forest. NWL: *Villella 102504-25*, *102504-16*; BMH: *22065*; *27369* FIA: *R. Ulrich 1120144-39*; EVE: *E. Greer EG-10.24.17-13*, *Hutten and Villella 25*

Tephromela atra (Hudson) Hafellner – Uncommon epiphyte on *Acer circinatum* in a *Pseudotsuga menziesii* stand with southwest slopes and seepy draws. BMH: *22002*

Thamnolia subuliformis (Ehrh.) W. L. Culb. – Rare on moss mats and thin soil over rock on open ridgetop with andesite rock outcrops with scattered tree cover. BMH: *37777*; EVE: *R. Balkcom RB-10.25.17-02*

Thelotrema lepadinum (Ach.) Ach. – Common on bark of *Pseudotsuga menziesii* and *Thuja plicata*. NWL: *J. Robertson 9563*; BMH: *Pittam, Fennel and McCune obs.*

Tingiopsidium sonomense (Tuck.) Hafellner & T. Sprib. – Rare on shaded talus and andesite rock outcrops in mixed conifer forest. BMH: *37794*

Trapelia corticola Coppins & P. James – Rare bryophilous on *Ptilidium* sp. over conifer root in an open mixed conifer stand. BMH: *28384*

Trapelia glebulosa (Sm.) J. R. Laundon – Rare on rock. NWL: *N. Hillyard 1298*

Trapeliopsis flexuosa (Fr.) Coppins & P. James – Common on hard dead wood and wooden buildings. NWL: *J. Robertson 9547*

Trapeliopsis granulosa (Hoffm.) Lumbsch – Rare on old mine timbers and rotten wood at the edge of an area of historic mining disturbance. BMH: *28387*; *28440*

Trapeliopsis pseudogranulosa Coppins & P. James – Uncommon on wood and old mine timbers at the edge of an area of historic mining disturbance and flood scarred base of *Pseudotsuga menziesii* near a waterfall. BMH: *28393*, *27368*

Umbilicaria angulata Tuck. – Uncommon on open to shaded ridgetop and talus with andesite rock outcrops in mixed conifer forest. BMH: *37798*, *37788*

Umbilicaria dealbata McCune in. ed. – Uncommon on shaded talus and andesite rock outcrops in mixed conifer forest. BMH: *37797*

Umbilicaria havaasii Llano – Uncommon on rock on open ridgetop with andesite rock outcrops with scattered tree cover. BMH: *37784*; *D. RB-10.25.17-04*

Umbilicaria hyperborea (Ach.) Hoffm. var. ***hyperborea*** – Common on andesite rock on open to shaded ridgetop with andesite rock outcrops BMH: *37786*

Umbilicaria phaea Tuck. var. ***phaea*** – Common on andesite rock on open to shaded ridgetop with andesite rock outcrops with scattered tree cover and in mixed conifer forest. BMH: *37787*; *37799*

Umbilicaria polyphylla (L.) Baumg. – Uncommon on andesite rock on open ridgetop with andesite rock outcrops with scattered tree cover. BMH: *37789*

Umbilicaria torrefacta (Lightf.) Schrader – Uncommon on rock on open ridgetop with andesite rock outcrops with scattered tree cover. BMH: *37785*

Usnea ceratina Ach. – BMH: *Pittam, Fennel and McCune obs.*

Usnea cornuta subsp. ***cornuta*** Körber – Common epiphyte on conifers. EVE: *G. Jackmond 21*

Usnea dasopoga (Ach.) Nyl. – Common epiphyte on conifers, deciduous trees, and snags. FIA: *A. Ingersoll 1120140-35*

Usnea diplotypus Vainio **–** Uncommon on litter under conifers. FIA: *A. Hardman 54651*

Usnea flavocardia Räsänen– uncommon epiphyte. BMH: *Pittam, Fennel and McCune obs.*

Usnea fulvoreagens (Räsänen) Räsänen **–** Uncommon epiphyte. BMH: *Pittam, Fennel and McCune obs.*

Usnea glabrata (Ach.) Vainio – Common epiphyte on *P. menziesii* twigs. FIA: *R. Ulrich s.n.*

Usnea longissima Ach. – Uncommon sporadically occurring epiphyte on conifers and hardwoods especially near major streams and rivers. BMH: 28576, *Pittam, Fennel and McCune obs.*; EVE: *K. Boulden 6*, *W. Weinstock WW.25.10.16-4*; G: *A. Rosso L 664*

Usnea pacificana P. Halonen – Common epiphyte on conifers, deciduous trees, and snags. BMH: *28423*, *29568*; FIA: *A. Hardman s.n.*

Usnea perplexans Stirton – Uncommon epiphyte on trees. FIA: *A. Rosso 54671*

Usnea scabrata Nyl. – Epiphyte on conifers and bare snags. NWL: *J. Robertson 9572*; BMH: *22009*, *29571*; FIA: *A. Mikulin 1122140-30*, *R. Ulrich 1120144-41*; EVE: *T. Linja TL-10.27.15-55*, *T. McCallum 16*

Usnea subfloridana Stirton – Uncommon epiphyte on conifers. BMH: *Pittam, Fennel and McCune obs.*; FIA: *A. Mikulin 1122140*; EVE: *L. Calabria LC10.25.15-13*

Verrucaria hydrela Ach. – Rare on non-calcareous creekside rocks in a mixed dominance riparian forest. BMH: *28414*

Verrucaria margacea (Wahlenb) Wahlenb. – Uncommon on non-calcareous on creekside rocks in mixed dominance riparian forest. BMH: *28413*

Verrucaria muralis Ach. – Common on iron-rich boulder at the edge of an area of historic mining disturbance. BMH: *28390*

Xanthomendoza oregana (Gyelnik) Søchting, Kärnefelt & S. Y. Kondr. – NWL: Rare on outer branches of *Acer macrophyllum* in exposed habitats. NWL: *Villella obs.*

Xanthoparmelia cumberlandia (Gyelnik) Hale – uncommon on rock in mixed forest. BMH: *Pittam, Fennel and McCune obs.*

Xanthoparmelia mougeotii (Schaerer) Hale – Rare on the vertical face of a shaded rock cliff near the Starvation Mill site in Jawbone Flats. NWL: *Villella obs.*

Xylographa hians Tuck. – Rare on wood and old mine timbers at the edge of an area of historic mining disturbance. BMH: *28394*

Xylopsora friesii (Ach.) Bendiksby & Timdal – Uncommon on a charred snag in a *Pseudotsuga menziesii* stand with southwest slopes and seepy draws. BMH: *2200*

CONCLUSION

Baseline, pre-fire data are important to monitor the recovery and change in species composition over time in an era of unprecedented climate change. During the Labor Day fires of 2020, approximately 11% of the western Cascades of Oregon were burned (Abatzoglou et al. 2021). Although large, high severity wildfires are not unprecedented in this ecosystem, a combination of factors including extreme winds, dryness, and unnatural fuel loads resulted in a situation where in one 48-hour period, as much forest burned as had burned in the western Cascades in the previous three decades combined (Reilly et al. 2022). As climate change-driven megafires increase in frequency and severity, it is more important than ever to compile baseline pre-fire species distribution data so that managers can make decisions about restoration and species conservation based on the best available up-to-date scientific data. Stochastic events such as large wildfires locally extirpate rare and sensitive species from large swaths of the landscape (Miller et al. 2018). Unburned, old-growth forests represent source populations for rare lichens that are needed to repopulate nearby burned areas; and when these areas burn in high-severity fires, there is a real concern that rare species may not ever recolonize these forests. On-the-ground surveys are needed to assess the true status of ORBIC listed species both before and after fires, as historic occurrence data likely overestimate the current distribution of rare species.

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LITERATURE CITED

Abatzoglou, J.T., Rupp, D.E., O'Neill, L.W. and M. Sadegh. 2021. Compound extremes drive the western Oregon wildfires of September 2020. Geophysical Research Letters 48(8): p.e2021GL092520.

Agee, J.K. 1996. Fire Ecology of Pacific Northwest Forests. Covelo, CA: Island Press. 505 pages.

Berryman, S. and B. McCune. 2006. Epiphytic lichens along gradients in topography and stand structure in western Oregon, USA. Pacific Northwest Fungi 1(2): 1-37.

Consortium of North American Lichen Herbaria (CNALH). 2022. http//:lichenportal.org/cnalh/index.php. Last accessed on November 5, 2022.

Di Nuzzo, L., Benesperi, R., Nascimbene, J., Papini, A., Malaspina, P., Incerti, G. and P. Giordani. 2022. Little time left. Microrefuges may fail in mitigating the effects of climate change on epiphytic lichens. Science of the Total Environment 825: p.153943.

Ellis, C.J. 2019. Climate change, bioclimatic models and the risk to lichen diversity. Diversity 11(54): 1-23.

Ellis, C.J., Coppins, B.J., Dawson, T.P. and M.R. Seaward. 2007. Response of British lichens to climate change scenarios: trends and uncertainties in the projected impact for contrasting biogeographic groups. Biological Conservation 140(3-4): 217-235.

Esslinger, T.L. 2021. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada, version 24. Opuscula Philolichenum 20: 100-394.

a

Exeter, R., Glade, C. and S. Loring. 2016. Rare Lichens of Oregon. Salem, OR: Salem District, Bureau of Land Management. ISBN-13: 978-0-9791310-6-6. 195 pp.

Federal Emergency Management Agency (FEMA). 2020. Beachie Creek Fire Erosion Threat Assessment/Reduction Team (ETART) Extended Report. Accessed on 21, September 2022.https://gscdn.govshare.site/1aa8ace4addf06592a8d7dcb775413bf10fd1ec6/ETART Report-BeachieCreekFire.pdf

Glavich, D.A., Geiser, L.H. and A.G. Mikulin. 2005. Rare epiphytic coastal lichen habitats, modeling, and management in the Pacific Northwest. The Bryologist, 108: 377-390.

Glavich, D.A. 2013. Conservation Assessments for 5 species of Lichens. USDA Forest Service Region, 6. Accessed on 19, September 2022. https://www.blm.gov/or/plans/surveyandmanage/files/ca-li-5-lichens-2013-04.pdf

Goward, T. 1995. *Nephroma occultum* and the maintenance of lichen diversity in British Columbia. Mitteilungen der Eidgenössischen Forschungsanstalt für Wald, Schnee und Landschaft 70: 93-101.

Haldeman, M. and S. Yang. 2021. Lichenicolous Fungi of the Pacific Northwest. https://lichens.twinferntech.net/lfdb/index.shtml Accessed 22 November 2022.

Halofsky, J.E., Peterson, D.L. and B.J. Harvey. 2020. Changing wildfire, changing forests: the effects of climate change on fire regimes and vegetation in the Pacific Northwest, USA. Fire Ecology, 16: 1-26.

Higuera, P.E. and J.T. Abatzoglou. 2021. Record-setting climate enabled the extraordinary 2020 fire season in the western United States. Global Change Biology 27: 1-2.

Johansson, P., Wetmore, C.M., Carlson, D.J., Reich, P.B. and G. Thor. 2006. Habitat preference, growth form, vegetative dispersal and population size of lichens along a wildfire severity gradient. The Bryologist 109: 527-540.

Longán, A., Gaya, E. and A. Gómez-Bolea. 1999. Post-fire colonization of a Mediterranean forest stand by epiphytic lichens. The Lichenologist 31: 389-395.

Miller, J.E., Root, H.T. and H.D. Safford. 2018. Altered fire regimes cause long-term lichen diversity losses. Global Change Biology 24: 4909-4918.

Miller, J.E., Weill, A.M. and J. Villella. 2022. Epiphytic macrolichen communities take decades to recover after high-severity wildfire in chaparral shrublands. Diversity and Distributions 28: 454-462.

McCune, B. 1998. *Hypotrachyna riparia*, a new lichen from western North America. The Bryologist 101:448-450.

McCune, B. 2017. Microlichens of the Pacific Northwest. Vols. 1 Key to the Genera. Wild Blueberry Media. Corvallis, OR. 215 pgs.

McCune, B. 2017. Microlichens of the Pacific Northwest. Vols. 2 Key to the Species. Wild Blueberry Media. Corvallis, OR. 755 pgs.

McCune, B., and L. Geiser. 2009. Macrolichens of the Pacific Northwest. Second Edition. Corvallis, OR: Oregon State University Press, 448 pgs.

McCune, B., Hutchinson, J. and S. Berryman. 2002. Concentration of rare epiphytic lichens along large streams in a mountainous watershed in Oregon, USA. The Bryologist 105: 439-450.

McCune, B. and D.F. Stone. 2022. Eight new combinations of North American macrolichens. Evansia 39: 123-128.

McCune, B., Hutchinson, J. and S. Berryman. 2002. Concentration of rare epiphytic lichens along large streams in a mountainous watershed in Oregon, USA. The Bryologist 105: 439-450.

McCune, B., Schultz, M., Fennell, T., Passo, A. and J.M. Rodriguez. 2022. A new endemic, *Pannaria oregonensis*, replaces two misapplied names in the Pacific Northwest of North America. The Bryologist 125: 170-185.

Oregon Biodiversity Information Center. 2019. Rare, Threatened and Endangered Species of Oregon. Portland, OR: Institute for Natural Resources, Portland State University. 133 pp.

Palm, E.C., Suitor, M.J., Joly, K., Herriges, J.D., Kelly, A.P., Hervieux, D., Russell, K.L., Bentzen, T.W., Larter, N.C. and M. Hebblewhite. 2022. Increasing fire frequency and severity will increase habitat loss for a boreal forest indicator species. Ecological Applications 32(3): p.e2549.

Petersen, K., Calabria, L.M., Miller, J.E., Brown-Clay, J., Hynson, L., Steen, T., Johnston, K., Ulbrich, A., Chandler, E., Miller, M. and J. Villella. 2017. Substrate age influences species richness and community composition of calicioid lichens and fungi on wooden buildings. The Bryologist 120: 19-24.

Peterson, E.B. and B. McCune. 2003. The importance of hotspots for lichen diversity in forests of western Oregon. The Bryologist 106: 246-256.

Pittam, S., T. Fennell and B. McCune. 2019. Lichens at Fisherman's Bend, North Santiam River. Unpublished report. 1 p.

Reilly, M.J., Halofsky, J.E., Krawchuk, M.A., Donato, D.C., Hessburg, P.F., Johnston, J.D., Merschel, A.G., Swanson, M.E., Halofsky, J.S. and T.A. Spies. 2021. Fire Ecology and Management in Pacific Northwest Forests, pp. 393-435. *In*: Fire Ecology and Management: Past, Present, and Future of US Forested Ecosystems. Edited by: C. H Greenberg and B. Collins. Springer, Cham, Switzerland.

Reilly, M.J., Zuspan, A., Halofsky, J.S., Raymond, C., McEvoy, A., Dye, A.W., Donato, D.C., Kim, J.B., Potter, B.E., Walker, N. and R.J. Davis. 2022. Cascadia Burning: The historic, but not historically unprecedented, 2020 wildfires in the Pacific Northwest, USA. Ecosphere 13(6): p.e4070.

Romagni, J.G., and C. Gries. 2000. Post-fire recolonization of dominant epiphytic lichen species on *Quercus hypoleucoides* (Fagaceae). American Journal of Botany 87: 1815-1820.

Rosso, A.L., McCune, B. and T.R. Rambo. 2000. Ecology and conservation of a rare, old-growth-associated canopy lichen in a silvicultural landscape. The Bryologist 103: 117-127.

Smith, R.J., Jovan, S. and B. McCune. 2020. Climatic niche limits and community-level vulnerability of obligate symbioses. Journal of Biogeography 47: 382-395.

Stone, D.F., Villella, J. and H. Root. 2022. *Hypotrachyna riparia*. The IUCN Red List of Threatened Species 2022: e.T195432681A195432683.

Tepley, A.J., Swanson, F.J. and T.A. Spies. 2013. Fire-mediated pathways of stand development in Douglas-fir/western hemlock forests of the Pacific Northwest, USA. Ecology 94: 1729-1743.

Villella, J., Carlberg T., Stone D.F., Miller, J.E., Nelson, N. and L.M. Calabria. 2018. Diversity and floristic patterns of epiphytic macrolichens on white oak in the Klamath-Siskiyou region. Opuscula Philolichenum 17: 299-318.

Weisberg, P.J. and F.J. Swanson. 2003. Regional synchroneity in fire regimes of western Oregon and Washington, USA. Forest Ecology and Management 172: 17-28.