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# National Atlas of Epiphytic Lichens in Forested Habitats of the United States

Sarah Jovan, Michael Haldeman, Susan Will-Wolf, Karen Dillman, Linda Geiser, Joel Thompson, Daphne Stone, and Jason Hollinger



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Cover (clockwise from upper left): *Letharia vulpina*, by Jason Hollinger; *Parmotrema arnoldii*, by Bruce McCune; *Usnea longissima*, by Richard Droker; and *Cladonia chlorophaea* group, by Jason Hollinger.

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## Abstract

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Between 1989 and 2012, three Forest Service programs collected more than 8,300 surveys of epiphytic lichen communities, providing a baseline for tracking lichen responses to air quality, climate, and other changes on forest land in the United States. This national atlas of lichen species combines these datasets into distribution maps for more than 400 taxa and 6,000 forested locations across the country. All 115,500 lichen records presented in the maps link to voucher specimens, most of which can be accessed from herbaria. Unlike mapped herbarium records, most surveys were collected on a systematic national grid. Therefore, the absence of a species at a particular location can indicate meaningful information about its geographic distribution. Facets of the survey protocol, however, likely lead to the underrepresentation of rare, cryptic, and otherwise easily overlooked species in the dataset. Each species search lasted 2 hours, covering a nearly 1-a area in which surveyors aimed to capture all epiphytic macrolichens. Surveyors possessed various skill levels but underwent annual training, certification, and field audits by professional lichenologists. During the 23 years of data collection, many lichen names and species concepts have changed. This atlas dataset is the first to unite all records across the three parent programs by using a consistent taxonomic treatment. In some cases, maps represent “lumped” taxa or show only records from restricted timeframes. The species distribution maps, Atlas dataset, and tools for designing custom datasets are published online at <https://www.fia.fs.fed.us/program-features/indicators/lichen>.

Keywords: Air pollution, air quality, Air Resources Management Program, bioindicators, biomonitoring, climate change, epiphytic lichens, Forest Health Monitoring program, Forest Inventory and Analysis program, inventory, lichen, lichen distributions, macrolichens.

## **Contents**

|           |   |
|-----------|---|
| <b>1</b>  | <b>Introduction</b>   |
| <b>3</b>  | <b>Lichen Survey Method</b>                                       |
| <b>9</b>  | <b>Inventory Design</b>   |
| <b>10</b> | <b>Taxonomy and Identification</b>                                |
| <b>12</b> | <b>Data Use and Acquisition</b>                                   |
| <b>12</b> | <b>Obtaining Data</b>   |
| <b>13</b> | <b>Acknowledgments</b>  |
| <b>16</b> | <b>Metric Equivalents</b>   |
| <b>16</b> | <b>Literature Cited</b>   |
| <b>26</b> | <b>National Atlas Map Set</b>                                     |
| <b>26</b> | <b>Gallery of Lichen Species Depicted in Atlas Maps</b>           |
| <b>63</b> | <b>Lichen Photography Credits</b>                                 |
| <b>66</b> | <b>Appendix 1: Reconciliation of Lichen Names</b>                 |
| <b>96</b> | <b>Appendix 2: Lichen Species Distribution Maps (Online Only)</b> |

## **Introduction**

Lichens are a significant part of the biodiversity in North America. To date, 5,561 species of lichens and allied fungi are known to inhabit the continental United States and Canada (Esslinger 2018). Lichens are formed by multiple organisms that live symbiotically—the main partners being a fungus and one or more photosynthetic organisms known as “photobionts.” Photobionts may be green algae, a cyanobacterium, or both. The photobiont captures sunlight, providing sustenance in the form of carbohydrates, while the bulk of the lichen thallus (“body”) is made up of fungal cells that surround the photobiont and provide protection from the environment.

Lichenologists have recently identified a variety of additional organisms occurring in some lichens, such as yeasts, bacterial microbiomes, and lichenicolous (i.e. parasitic) fungi, leading to the reconceptualization of lichens as “intricate metacommunities” rather than as simple two or three-partner symbioses (Lendemer et al. 2019). Depending upon which partners come together, lichens take on a wide variety of forms, ranging from large hair-like beards and leaf-like lobes to flat crusts and tiny pin-like bodies (fig. 1). Clearly, there is still much to discover about these unique assemblages of organisms.

In 1993, the USDA Forest Service’s (Forest Service) national forest inventory began large-scale monitoring of epiphytic (“tree dwelling”) lichen communities under the agency’s Forest Health Monitoring (FHM) program (Stolte et al. 1993). Administration of the lichen inventory was later transferred to the Forest Service’s Forest Inventory and Analysis (FIA) program, where it remains today. A third Forest Service program, the Air Resources Management (ARM) program administered by the National Forest System (NFS), uses a compatible protocol to provide air quality recommendations to Forest Service managers. The ARM program began monitoring lichens in southeast Alaska in 1989, expanding over time to include NFS and other lands in Oregon and Washington, and increasingly elsewhere in the United States.

The purpose of lichen surveys is to evaluate environmental health on forest lands using lichens as bioindicators (McCune 2000, McCune et al. 1997), with detection of air quality and climate change as the core goals. Lichens are some of the most pollution- and climate-sensitive organisms on Earth because they lack roots and are unable to store water, making them dependent on atmospheric sources of moisture and nutrients. The thallus lacks a protective covering and so moisture, nutrients, and air pollutants are absorbed over the lichen’s entire surface. To date, the Forest Service and its partners have used the lichen surveys in more than 90 research and monitoring studies (Jovan et al. 2020).



Figure 1—Lichens grow in a wide variety of forms. (Top) *Hypogymnia apinnata*; (left center) *Graphis scripta*; (right center) *Calicium viride*; (bottom) *Ramalina menziesii*.

This national atlas (hereafter, the Atlas) is the culmination of 23 years of surveys (1989–2012) and many years of effort merging data across the three parent programs in a user-friendly, consistent format. In the United States, 437 taxa were encountered in the 8,342 surveys conducted across 6,156 forested locations (figs. 2 and 3). The resulting lichen database is a vast resource of more than 115,500 records. Because most surveys were conducted on a national systematic grid, we expect the records for many species to be more geographically representative than herbarium records. Extenuating circumstances that potentially bias Atlas maps are discussed in the remaining subsections and also are noted in map captions. The 425 maps are available online as appendix 2 and can be downloaded at [https://www.fs.usda.gov/pnw/pubs/pnw\\_gtr986-appendix2.pdf](https://www.fs.usda.gov/pnw/pubs/pnw_gtr986-appendix2.pdf). The Atlas dataset is included in the national FIA lichen database (NFLD), which is available at the same website. All of the following topics are covered more extensively in the User Guide for the National FIA Lichen Database (Jovan et al. 2020).

## **Lichen Survey Method**

The survey protocol was designed to employ non-expert crews for fieldwork. The goal is to capture all epiphytic macrolichen species (i.e., foliose and fruticose forms) within a 0.94-a circular area. The exceptions to this rule are ARM sites in Alaska, which are limited by their difficult terrain to a 0.12-a circular area. All surveys are timed, lasting a minimum of 30 minutes and a maximum of 2 hours, during which the surveyor collects a voucher specimen of each species occurring above 1.5 ft on natural woody substrates or in recent litterfall. Professional lichenologists train and certify surveyors, identify voucher specimens, and conduct most quality assurance (QA) measures, including resurveying some plots in each active region. These procedures are archived in full in the online appendixes of Jovan et al. (2020).

Surveyor expertise ranged from that of novice to professional lichenologist, although nearly all participants had at least some background in lichens or botany. Many participants surveyed lichens for 5 years or more. Each attended an annual 2- to 4-day training session that included both field forays and laboratory time to study lichen morphology using hand lenses and dissecting microscopes (fig. 4). Training focused on teaching the diagnostic features for differentiating species in the field with a 10 to 15× powered hand lens. For example, participants studied reproductive structural characteristics (size, shape, location, and type), lobe shape and branching patterns, and rhizine characteristics. Surveyors were encouraged to collect unusual and distinctive specimens. This helps boost the diversity of species captured and often results in multiple vouchers per species that show its morphological variability within a given plot. It also helps to capture small,



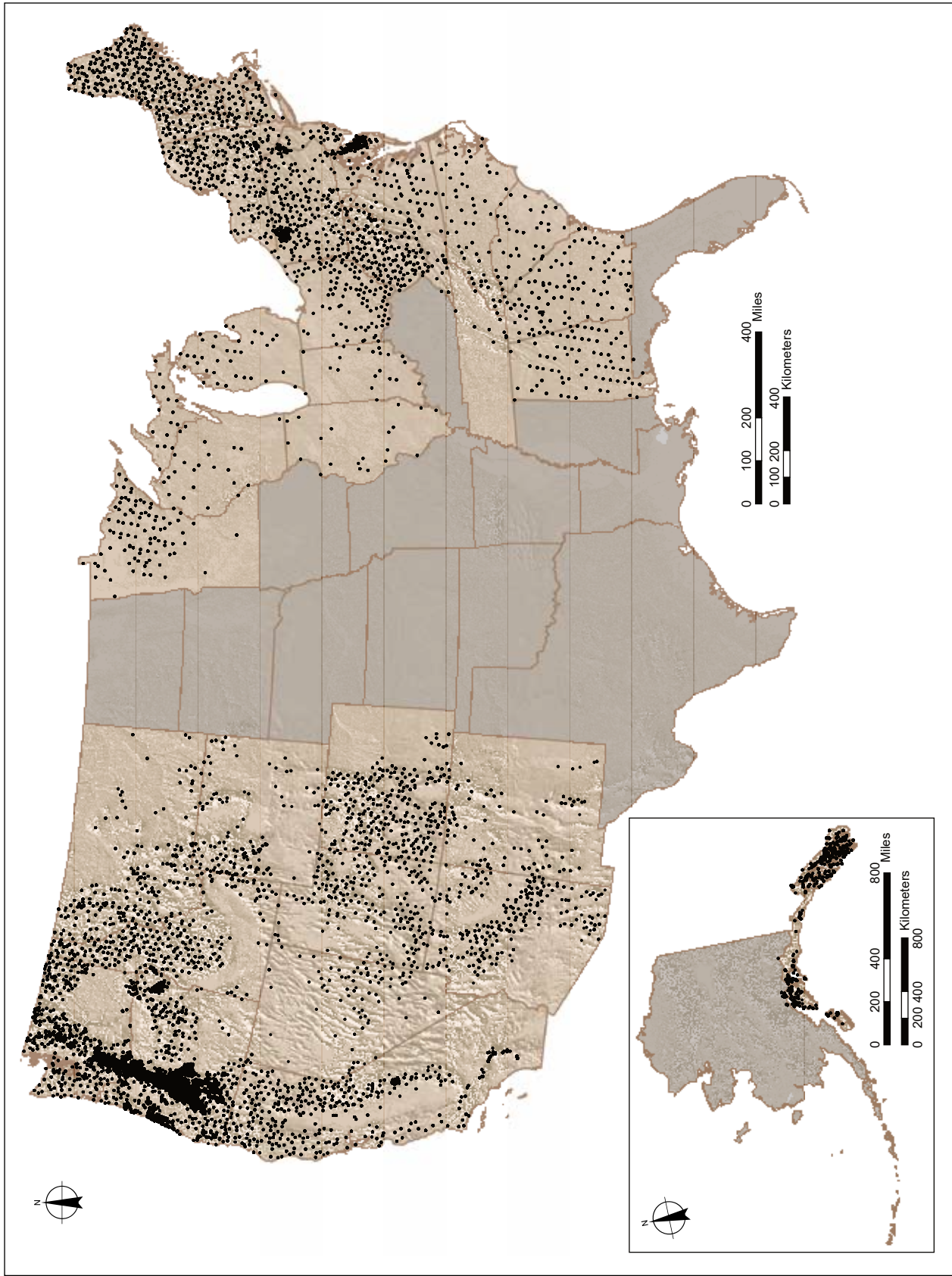


Figure 2—All lichen survey sites shown in the maps in the Atlas. Sites were visited up to four times, mostly on a systematic grid. States with low forest distributions (dominated by grass and shrub lands) do not have widespread or established Forest Inventory and Analysis surveys, and therefore remain unsampled for lichen. Other areas lacked sufficient funding to complete lichen surveys.



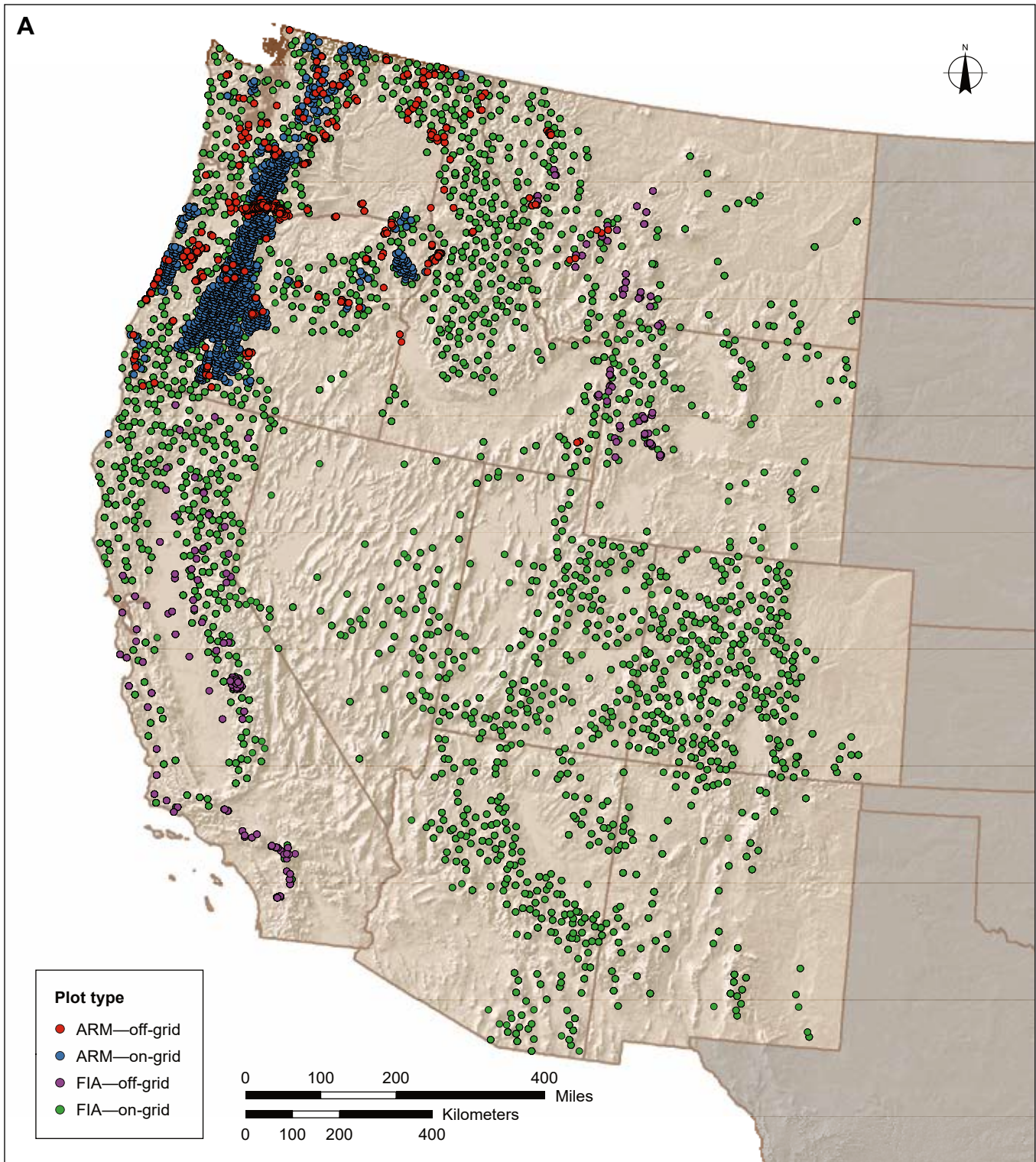


Figure 3—Lichen survey sites coded by plot type for (A) the western lower 48 States, (B) Alaska, and (C) the eastern lower 48 States. Forest Inventory and Analysis (FIA) plots include historical surveys conducted under the Forest Health Monitoring program. On-grid and off-grid refer to lichen survey sites located on and off the FIA national inventory grid, respectively. ARM = Air Resources Management.

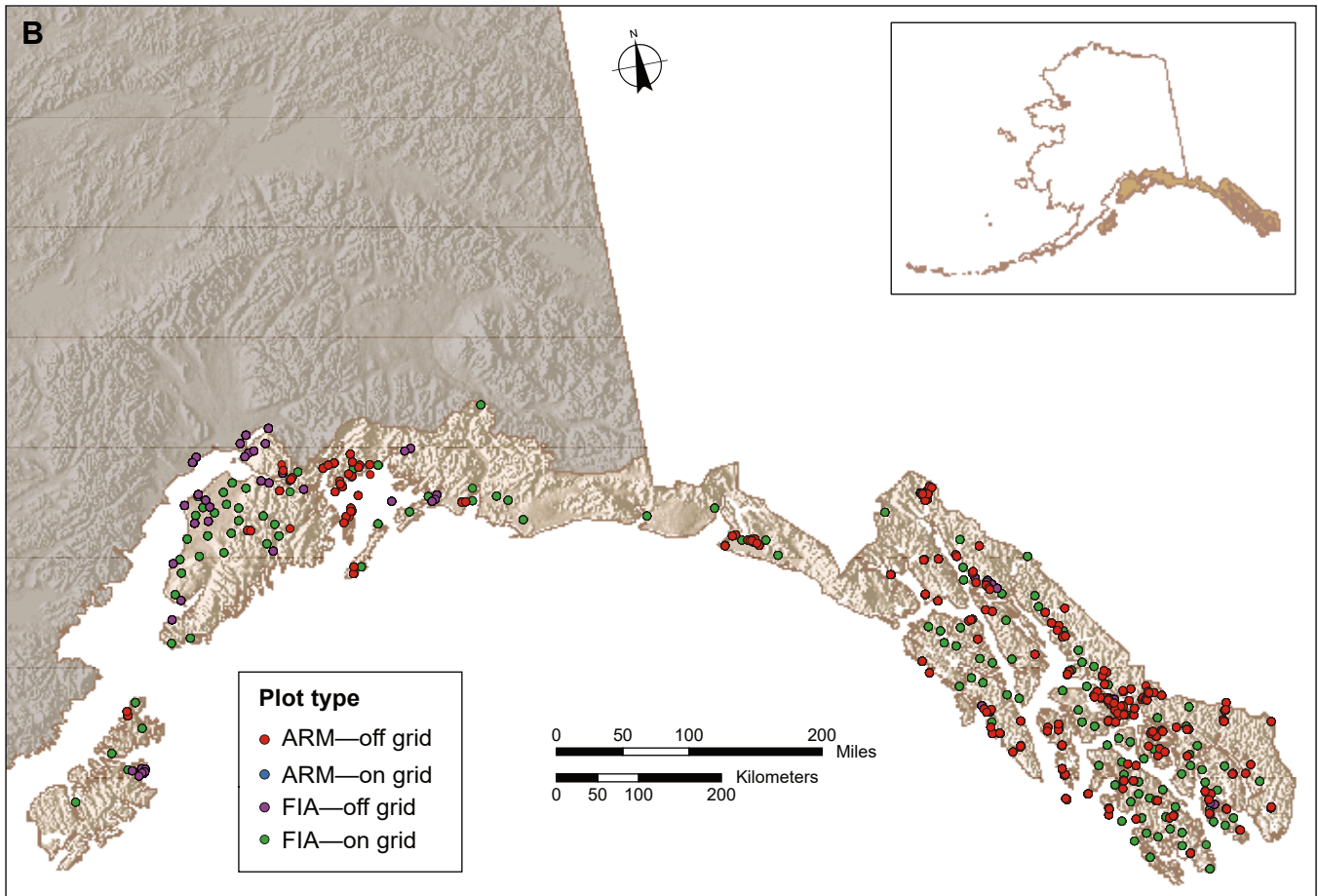


Figure 3—Continued.

inconspicuous species that were not noticed in the field but are nevertheless recorded by the lichenologist identifying the samples.

Training sessions for participants conducting lichen surveys concludes with a certification confirming that trainees successfully captured 65 percent of the species found by the expert lichenologist present. Species missed in practice surveys and field audits tend to be rare, diminutive, and difficult to distinguish from others; please be aware of this when viewing distribution maps. McCune et al. (1997) found that the 65 percent threshold gives repeatable results in studies relating lichen community responses to air quality and climate. Depending on region and program, 5 to 10 percent of lichen surveys are resurveyed to ensure the 65 percent diversity criterion is met (Patterson et al. 2009). Surveyors failing QA checks are given more training and then reevaluated. In the case of multiple failures, the surveyor abstains from further fieldwork but may attempt to recertify in future years.



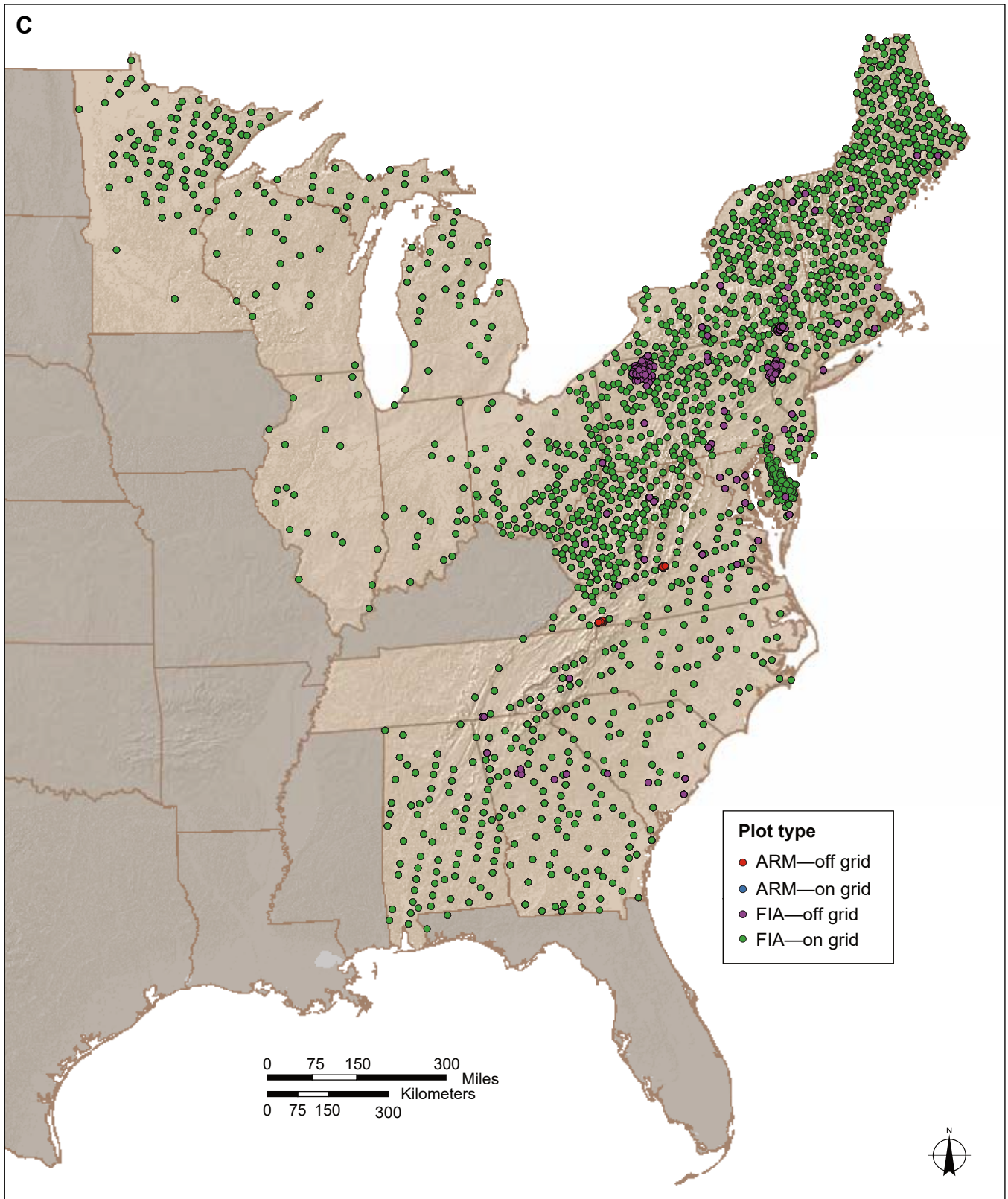


Figure 3—Continued.





Figure 4—Lichen experts and Forest Service field crews in the process of learning survey protocols and collecting lichen vouchers.

## Inventory Design

The Atlas brings together surveys on a national sampling grid with several hundred “off-grid” plots that were part of special studies by FIA and its partners (figs. 2 and 3). Not all States have been inventoried for lichens, and the number of surveys varies widely by State and by year (fig. 5). Because of shifting budgets, the number of revisits to each site ranges from zero to three across varied time intervals.

In 2012, field activity was reduced and the focus narrowed to specific research questions or management needs. Thus, the large-scale Atlas dataset serves as a valuable baseline for ongoing research. Since the 2012 field season, FIA’s partners have conducted an increasingly larger proportion of surveys. Partners who certify in the FIA method and follow the field and identification procedures described in Jovan et al. (2020) are encouraged to submit surveys to the NFLD. These more recent data will be included in future releases.

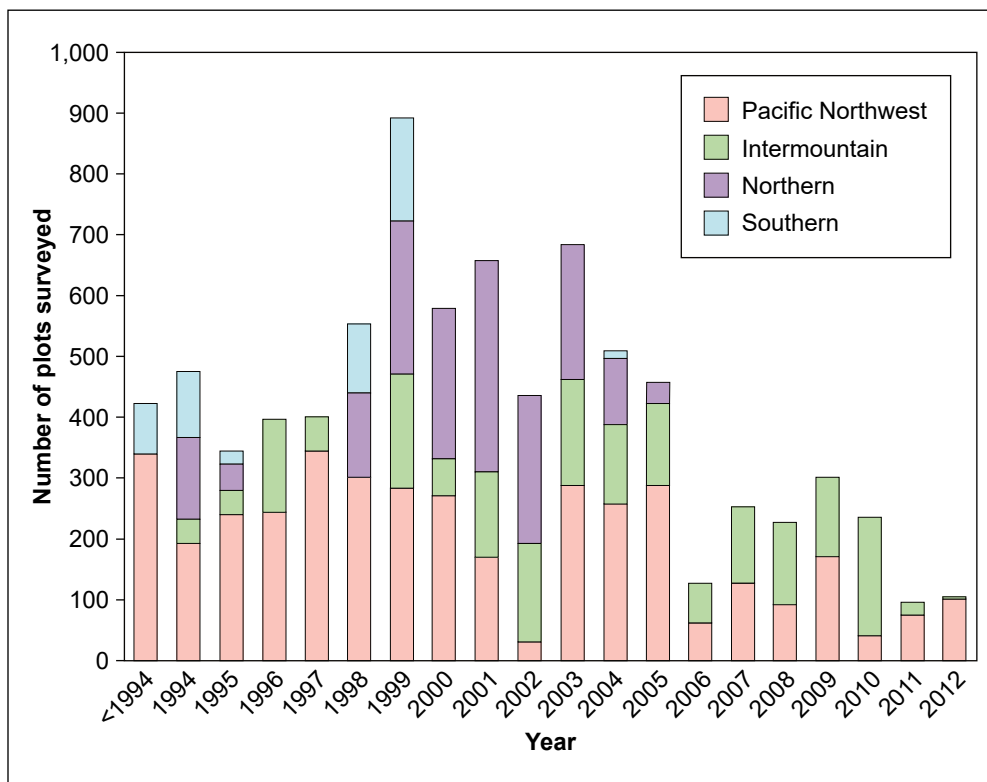


Figure 5—Number of standardized lichen surveys collected by the Forest Service by year and region.

The FIA program collects detailed measurements of forest structure on a systematic 2.1-mi (3.4-km) permanent sampling grid. Plots on the grid span all land ownerships and occur at a frequency of 1 plot per 6,000 a (Bechtold and Patterson 2005). Lichen surveys under FHM and FIA were typically conducted on every 16<sup>th</sup> plot on the FIA grid. All surveys on the grid can be linked to hundreds of other inventory measurements on trees, understory vegetation, soils, down woody debris, disturbance, and land ownership. As the FIA program's definition of forest requires the presence of at least a 10-percent canopy cover of live trees, certain habitats with characteristically low cover, such as oak woodlands, chaparral, and dryland scrub, are undersampled on the FIA grid. Thus, lichen species associated with these habitats (e.g., *Ramalina menziesii*) are underrepresented in the Atlas.

The ARM program primarily conducts lichen surveys in Oregon, Washington, and southeast Alaska, with revisits every 10 years to wilderness sites. Nonwilderness sites are also revisited periodically. Most ARM sites are on the FIA grid on national forest land and thus link to FIA's co-located forest measurements. The ARM program uses a separate sampling grid in Alaska (Geiser et al. 1994). Almost all ARM surveys link to measurements of heavy metals, nitrogen, and sulfur accumulated in lichen thalli, a valuable addition to air quality studies that use these lichen data.

## **Taxonomy and Identification**

Professional lichenologists used dissecting microscopes, chemical spot tests, and ultraviolet lamps for species identification. The ARM program uses thin-layer chromatography (TLC) where appropriate, whereas FHM and FIA use TLC only occasionally. Thallus cross sections and examination of spores are not required for the identification of FHM and FIA specimens, although experts often do these anyway. In the Atlas maps, cryptic species requiring these extra steps or TLC for identification are often mapped together. Differences in species concepts used by the FHM, FIA, and ARM programs are noted in map captions and can be used for customizing datasets that combine records across programs.

More than 300 changes in species names or concepts occurred during the 23 years of data collection, each introducing discontinuity into the Atlas dataset. The FIA program maintains a list of accepted names, including instructions for how to reconcile them across different timeframes (see app. 1). Any divergence from those instructions, such as lumping taxa in different ways, mapping only records from a limited timeframe, or mapping only annotated specimens, is noted in the map captions. In a handful of cases (e.g., some *Xanthomendoza* species), distributions are inaccurate because of unfortunate timing between field work activities and major



taxonomic revisions. This problem occurs because the timing of plot visits is not distributed evenly by State and over time. Extreme cases are noted in the map caption.

The Atlas dataset as provided in the NFLD does include original determinations for each specimen so that users can apply their own taxonomic rules. Our list of accepted lichen names largely agrees with the latest North American lichen checklist (version 23) (Esslinger 2018).<sup>1</sup> The most notable divergence is our adoption of Divakar et al.'s (2017) phylogeny for cetrarioid species, a group that has been in controversy for some time. We updated the Atlas dataset using the table in appendix 1 unless it was noted otherwise in map captions. Acceptance of new names to the list may lag a couple of years to ensure that new names gain wide acceptance. Longer lag periods are common because names are not always updated until the taxon is encountered in the field or data analysis. Accepted common names are mostly from Brodo et al. (2001).

For publication in the Atlas, we reexamined a large sample of vouchers for a few taxa (sorediate *Xanthomendoza*, *Platismatia glauca/wheeleri*, *Parmelia barrenoae/sulcata*) and, when possible, for species appearing far outside their known ranges. Generally, the three Forest Service parent programs do not systematically revisit all specimens. Many vouchers recently became available for public use because the National Science Foundation funded the transfer of tens of thousands of collections to the Oregon State University herbarium. Other herbaria housing significant vouchers include those at the Duke University Herbarium, University of Alaska Fairbanks, University of Alaska Anchorage, and Wisconsin State University, as well as a large collection of ARM specimens hosted by the Siuslaw National Forest. Annotations by lichenologists who are not affiliated with this project are not yet tracked in the NFLD but could be compiled for future data releases depending on interest. For now, annotations by experts are written on the specimens themselves and can be viewed through the relevant herbarium's Web portal. Often, multiple specimens are available for the same species at a plot, a prerequisite of using nonspecialist surveyors. The morphological variation captured may be valuable in taxonomic studies, although Forest Service specimens tend to be smaller than the typical field collections of experts.

<sup>1</sup> <https://www.ndsu.edu/pubweb/~esslinge/chcklst/chcklst7.htm>.

## Data Use and Acquisition

A variety of studies use the Atlas dataset for air quality biomonitoring, such as mapping nitrogen pollution and effects (e.g., Jovan and McCune 2005; Jovan et al. 2012; Root et al. 2015; Will-Wolf et al. 2015, 2018), developing management guidelines for assessing threats to protected areas (e.g., critical loads) (Fenn et al. 2010; Geiser et al. 2010, 2019; Pardo et al. 2011; Root et al. 2015), and detecting effects of sulfur and acidic deposition (Geiser et al. 2019; Will-Wolf et al. 2006, 2015, 2018). The lichen data are increasingly used in policy development such as in the review of the national ambient air quality secondary standards for nitrogen and sulfur oxides (USEPA 2008) and as a tool for meeting Federal land monitoring mandates like the former Wilderness Challenge Program and more recent Wilderness Stewardship initiatives and regional monitoring plans. Their use in climate change research, such as in identifying vulnerable species (Root et al. 2014; Smith et al. 2017, 2019) and monitoring trends in survey data (Smith et al. 2017) is also under development. Other applications include habitat and species distribution modeling (Edwards et al. 2005, 2006; Glavich et al. 2005), floristics studies (Brodo 2016, Brodo et al. 2001, Hinds and Hinds 2007, McCune and Geiser 2009), and providing specimens for taxonomic revisions (e.g., Lindblom 2006, McCune et al. 2011, Velmala et al. 2014).

## Obtaining Data

The Atlas dataset can be downloaded from a dedicated web page<sup>2</sup> serving as a hub for lichen inventory data as well as related publications and Forest Service websites. The Atlas, list of accepted lichen names, and recommendations for taxonomic reconciliation are all tables in the NFLD and are described in the User Guide (Jovan et al. 2020). The guide also provides information needed to build custom datasets and access the other forest inventory measurements collected at lichen survey locations. The hub for accessing more recent ARM data is the Forest Service Lichens and Air Quality website,<sup>3</sup> a work in progress that includes tools for on-the-fly mapping and houses several sources of data found nowhere else, including elemental data (nitrogen, sulfur, and heavy metals measured in lichens) as well as more than 4,000 other FS lichen surveys conducted using different survey protocols.

<sup>2</sup> <https://www.fia.fs.fed.us/program-features/indicators/lichen>.

<sup>3</sup> <http://gis.nacse.org/lichenair>.

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The FHM, FIA, and ARM lichen programs have relied on the dedication and hard work of more than 300 lichenologists, trainers, identification specialists, and surveyors.

Special thanks go to the founding scientists who established the program's objectives, methods, and procedures for implementation within the U.S. Forest Service: Bruce McCune, Linda Geiser, Jonathan Dey, Ken Stolte, Roger Rosentreter, and Karen Dillman; followed soon thereafter by Peter Neitlich and Susan Will-Wolf as lichen indicator advisors.

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## Metric Equivalents

| When you know: | Multiply by: | To get:    |
|----------------|--------------|------------|
| Feet (ft)      | 0.305        | Meters     |
| Miles (mi)     | 1.609        | Kilometers |
| Acres (a)      | .405         | Hectares   |

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## National Atlas Map Set

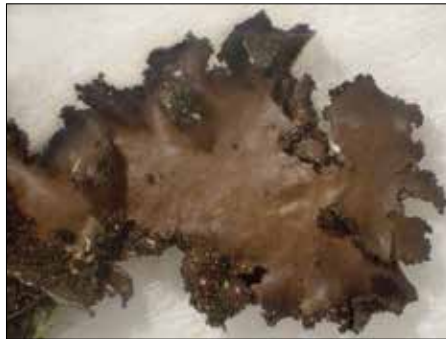
Maps for each lichen species, as depicted in figure 3, are available in appendix 2 at [https://www.fs.usda.gov/pnw/pubs/pnw\\_gtr986-appendix2.pdf](https://www.fs.usda.gov/pnw/pubs/pnw_gtr986-appendix2.pdf).

### Gallery of Lichen Species Depicted in Atlas Maps

Note: A gray box indicates that no photo was available. Help us enhance our lichen photo collection by e-mailing your photos of these species to [sarah.jovan@usda.gov](mailto:sarah.jovan@usda.gov).



*“Leptogium hirsutum”* C.W. Dodge  
Burnet’s Jellyskin Lichen



*“Sticta weigelii”* (Ach.) Vainio  
Spotted Felt Lichen



*Alectoria imshaugii* Brodo &  
D. Hawksw.  
Spiny Witches Hair Lichen



*Alectoria lata* (Taylor) Lindsay  
Flowering Witches Hair Lichen



*Alectoria sarmentosa* (Ach.) Ach.  
Witches Hair Lichen



*Alectoria vancouverensis* (Gyelnik)  
Gyelnik ex Brodo & D. Hawksw.  
Vancouver Witches Hair Lichen



*Anaptychia palmulata* (Michaux)  
Vainio  
Shaggy-Fringed Lichen

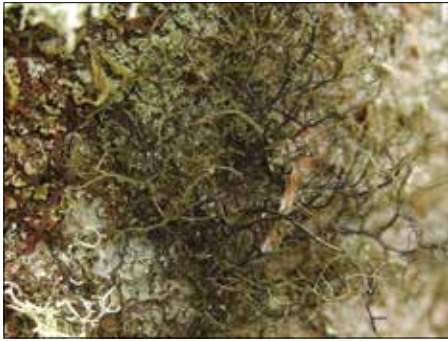


*Anzia colpodes* (Ach.) Stizenb.  
Black-Foam Lichen



*Bryocaulon pseudosatoanum*  
(Asahina) Kärnefelt  
Long Foxhair Lichen





***Bryoria bicolor* (Ehrh.) Brodo & D. Hawksw.**  
Twocolor Horsehair Lichen



***Bryoria capillaris/pikei* (Ach.) Brodo & D. Hawksw./Brodo & D. Hawksw.**  
Gray Horsehair Lichen



***Bryoria carlottae* Brodo & D. Hawksw.**  
Carlott's Horsehair Lichen



***Bryoria cervinula* Motyka ex Brodo & D. Hawksw.**  
Horsehair Lichen



***Bryoria fremontii* (Tuck.) Brodo & D. Hawksw.**  
Black Horsehair Lichen



***Bryoria friabilis* Brodo & D. Hawksw.**  
Horsehair Lichen



***Bryoria furcellata* (Fr.) Brodo & D. Hawksw.**  
Burred Horsehair Lichen



***Bryoria fuscescens* (Gyelnik) Brodo & D. Hawksw.**  
Pale-Footed Horsehair Lichen



***Bryoria implexa* (Hoffm.) Brodo & D. Hawksw.**  
Horsehair Lichen



***Bryoria nadvornikiana* (Gyelnik) Brodo & D. Hawksw.**  
Spiny Gray Horsehair Lichen



***Bryoria pseudofuscescens* (Gyelnik) Brodo & D. Hawksw.**  
Mountain Horsehair Lichen



***Bryoria simplicior* (Vainio) Brodo & D. Hawksw.**  
Horsehair Lichen



Photo Wanted!



*Bryoria tenuis* (E. Dahl) Brodo & D. Hawksw.

Horsehair Lichen



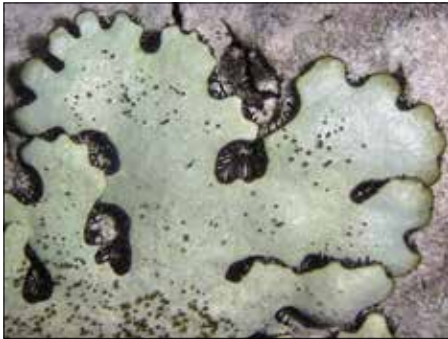
*Bryoria trichodes* (Michaux) Brodo & D. Hawksw.

Horsehair Lichen



*Bulbothrix confederata* (Culb.) Hale

Smooth Eyelash Lichen



*Bulbothrix isidiza* (Nyl.) Hale

Eyelash Lichen



*Bulbothrix laevigatula* (Nyl.) Hale

Matted Eyelash Lichen



*Bulbothrix scortella* (Zenker) Hale

Eyelash Lichen



*Bunodophoron melanocarpum* (Sw.) Wedin

Bunodophoron Lichen



*Candelaria concolor/pacifica* (Dicks.) Stein/M. Westb. & Arup

Lemon Lichen



*Candelaria fibrosa* (Fr.) Müll. Arg.

Lemon Lichen

Photo Wanted!



*Canoparmelia amazonica* (Nyl.) Elix & Hale

Amazon Shield Lichen



*Canoparmelia caroliniana* (Nyl.) Elix & Hale

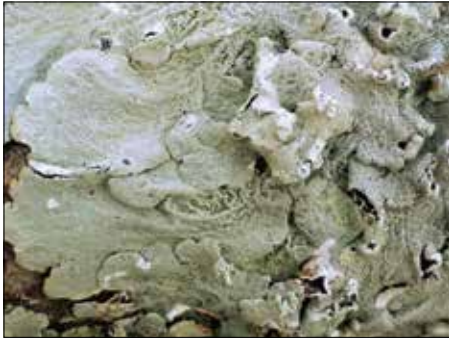
Carolina Shield Lichen



*Canoparmelia crozalsiana* (de Lesd.) Elix & Hale

Sorediate Shield Lichen





*Canoparmelia cryptochlorophaea*  
(Hale) Elix & Hale  
Sorediate Shield Lichen



*Canoparmelia salacinifera* (Hale)  
Elix & Hale  
Isidiate Shield Lichen



*Canoparmelia texana* (Tuck.)  
Elix & Hale  
Texas Shield Lichen



*Cetraria canadensis* (Räsänen)  
Räsänen  
Brown-Eyed Sunshine Lichen



*Cetraria ciliaris* Ach.  
Fringed Wrinkle-Lichen



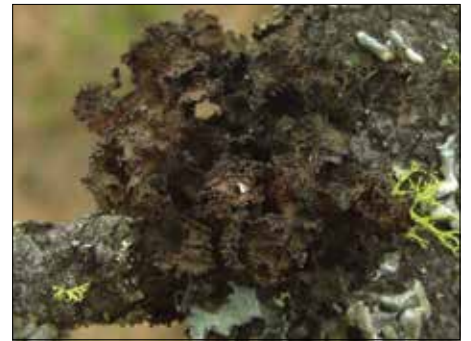
*Cetraria oakesiana* Tuck.  
Yellow Ribbon Lichen



*Cetraria pallidula* Tuck. ex Riddle  
Pallid Candlewax Lichen



*Cetraria pinastri* (Scop.) Ach.  
Powdered Sunshine Lichen



*Cetraria platyphylla* Tuck.  
Broad Wrinkle-Lichen



*Cetraria sepincola* (Ehrh.) Ach.  
Brown Dwarf Wrinkle-Lichen



*Cetraria viridis* Schwein  
Hidden Sunshine Lichen



*Cetraria cetrarioides* (Duby)  
W.L. Culb. & C.F. Culb.  
Giant Shield Lichen





*Cetrelia chicitae* (W.L. Culb.)  
W.L. Culb. & C.F. Culb.  
Chicita's Giant Shield Lichen



*Cetrelia olivetorum* (Nyl.) W.L. Culb.  
& C.F. Culb.  
Giant Shield Lichen



*Cladonia albonigra* Brodo & Ahti  
Cladonia Lichen



*Cladonia bellidiflora* (Ach.) Schaerer  
Toy Soldiers Lichen



*Cladonia caespiticia* (Pers.) Flörke  
Stubby-Stalked Cladonia Lichen



*Cladonia carneola* (Fr.) Fr.  
Crowned Pixie-Cup Lichen



*Cladonia cenotea* (Ach.) Schaerer  
Powdered Funnel Lichen



*Cladonia chlorophaea* group  
(Flörke ex Sommerf.) Sprengel  
Mealy Pixie-Cup Lichen



*Cladonia coniocraea/ochrochlora*  
(Flörke) Sprengel/Flörke  
Common Powderhorn Lichen



*Cladonia cristatella* Tuck.  
British Soldiers Lichen



*Cladonia cylindrica* (A. Evans)  
A. Evans  
Cylinder Cladonia Lichen



*Cladonia deformis* (L.) Hoffm.  
Lesser Sulphur-Cup Lichen





*Cladonia didyma* (Fée) Vainio  
Southern Soldiers Lichen



*Cladonia fimbriata* (L.) Fr.  
Trumpet Lichen



*Cladonia furcata* (Hudson) Schrader  
Many-Forked Cladonia Lichen



*Cladonia grayi* G. Merr. ex Sandst.  
Gray's Cladonia Lichen



*Cladonia macilenta* Hoffm.  
Lipstick Powderhorn Lichen



*Cladonia macilenta* var. *bacillaris*  
(Ach) Schaerer  
Lipstick Powderhorn Lichen



*Cladonia norvegica* Tønsberg & Holien  
Cladonia Lichen



*Cladonia parasitica* (Hoffm.) Hoffm.  
Fence-Rail Cladonia Lichen



*Cladonia peziziformis* (With.) J.R.  
Laundon Turban Cladonia Lichen



*Cladonia pleurota* (Flörke) Schaerer  
Red-Fruited Pixie-Cup Lichen



*Cladonia pyxidata* (L.) Hoffm.  
Pebbled Pixie-Cup Lichen



*Cladonia ramulosa* (With.) J.R.  
Laundon Cladonia Lichen





*Cladonia rei* Schaerer  
Wand Cladonia Lichen



*Cladonia squamosa* Hoffm.  
Dragon Cladonia Lichen



*Cladonia sulphurina* (Michaux) Fr.  
Greater Sulphur-Cup Lichen



*Cladonia transcendens* (Vainio) Vainio  
Vainio Cladonia Lichen



*Cladonia umbricola* Tønsberg & Ahti  
Shaded Cladonia Lichen



*Cladonia verruculosa* (Vainio) Ahti  
Wand Cladonia Lichen



*Coccocarpia erythroxyli* (Sprengel)  
Swinscow & Krog  
Fruiting Shell Lichen



*Coccocarpia palmicola* (Sprengel)  
Arv. & D. J. Galloway  
Galloway Salted Shell Lichen



*Collema curtisporum* Degel.  
Blistered Jelly Lichen



*Collema furfuraceum* (Arnold)  
Du Rietz  
Blistered Jelly Lichen



*Collema nigrescens* (Hudson) DC.  
Blistered Jelly Lichen

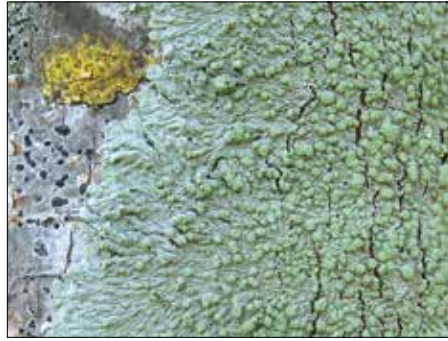


*Collema subflaccidum* Degel.  
Tree Jelly Lichen





*Dendriscoaulon intricatum*  
(Nyl.) Henssen  
Olive-Thorn Lichen



*Dirinaria applanata* (Fée) D.D. Awasthi  
Powdery Medallion Lichen



*Dirinaria confusa* D.D. Awasthi  
Medallion Lichen



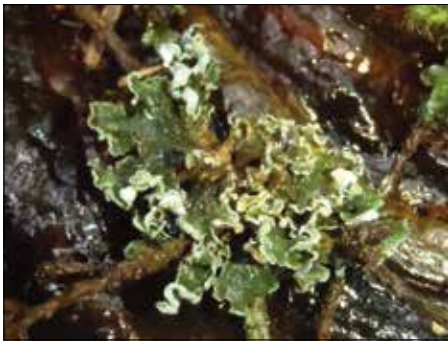
*Dirinaria confusa* D.D. Awasthi  
Medallion Lichen



*Dirinaria picta* (Sw.) Clem. & Shear  
Powdery Medallion Lichen



*Enchylium conglomeratum* Hoffm.  
Conglomerate Jelly Lichen



*Erioderma sorediatum* D.J. Galloway  
& P.M. Jørg.  
Mouse-Ears Lichen



*Esslingeriana idahoensis* (Essl.)  
Hale & M.J. Lai  
Tinted Rag Lichen



*Evernia divaricata* (L.) Ach.  
Mountain Oakmoss Lichen



*Evernia mesomorpha* Nyl.  
Boreal Oakmoss Lichen



*Evernia prunastri* (L.) Ach.  
Oakmoss Lichen



*Flavoparmelia baltimorensis*  
(Gyelnik & Föriss) Hale  
Rock Greenshield Lichen





*Flavoparmelia caperata* (L.) Hale  
Common Greenshield Lichen



*Flavopunctelia darrowi*  
(J.W. Thomson) Hale Darrow's  
Speckled Greenshield Lichen



*Flavopunctelia flaventior* (Stirton) Hale  
Speckled Greenshield Lichen



*Flavopunctelia praesignis* (Nyl.) Hale  
Fruiting Speckled Greenshield Lichen



*Flavopunctelia soledica* (Nyl.) Hale  
Powder-Edged Speckled  
Greenshield Lichen



*Fuscopannaria ahlneri* (P.M. Jørg.)  
P.M. Jørg.  
Shingle Lichen



*Fuscopannaria laceratula* (Hue)  
P.M. Jørg.  
Shingle Lichen



*Fuscopannaria leucosticta* (Tuck.)  
P.M. Jørg.  
Rimmed Shingle Lichen



*Fuscopannaria leucostictoides*  
(Ohlsson) P.M. Jørg.  
Petaled Shingle Lichen



*Fuscopannaria mediterranea* (Tav.)  
P.M. Jørg.  
Shingle Lichen



*Fuscopannaria pacifica* P.M. Jørg.  
Shingle Lichen



*Fuscopannaria ramulina*  
P.M. Jørg. & Tønsberg  
Shingle Lichen





*Heterodermia albicans* (Pers.)  
Swinscow & Krog  
White Fringe Lichen



*Heterodermia appalachensis* (Kurok.)  
W.L. Culb.  
Appalachian Fringe Lichen



*Heterodermia casarettiana* (A. Massal.)  
Trevisan  
Purple-Bottomed Fringe Lichen



*Heterodermia echinata* (Taylor)  
W. L. Culb.  
Flowering Fringe Lichen



*Heterodermia galactophylla* (Tuck.)  
W. L. Culb.  
Fringe Lichen



*Heterodermia granulifera* (Ach.)  
W. L. Culb.  
Fingered Fringe Lichen



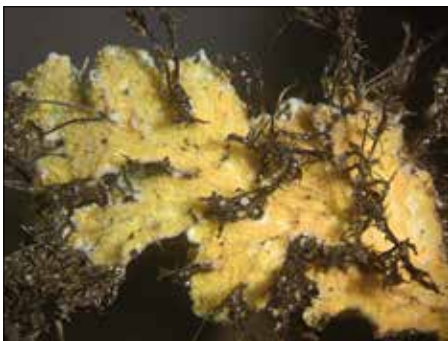
*Heterodermia hypoleuca* (Ach.)  
Trevisan  
Cupped Fringe Lichen



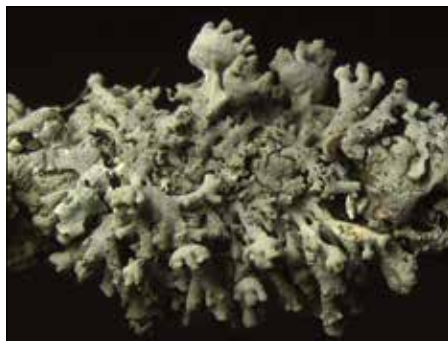
*Heterodermia japonica* (M. Satô)  
Swinscow & Krog  
Fringe Lichen



*Heterodermia leucomela* (L.) Poelt  
Elegant Fringe Lichen



*Heterodermia obscurata* (Nyl.)  
Trevisan  
Orange-Tinted Fringe Lichen



*Heterodermia podocarpa* (Bél.) Awasthi  
Fringe Lichen



*Heterodermia rugulosa* (Kurok.)  
Wetmore  
Dusted Cupped Fringe Lichen





*Heterodermia speciosa* (Wulfen)  
Trevisan  
Powdered Fringe Lichen



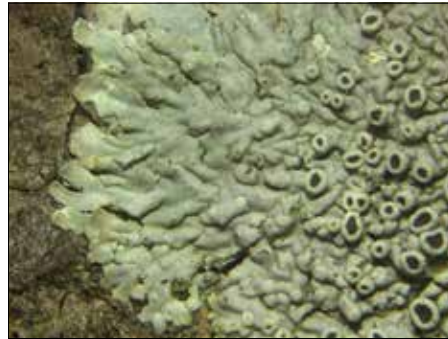
*Heterodermia squamulosa* (Degel.)  
W.L. Culb.  
Scaly Fringe Lichen



*Heterodermia tropica* (Kurok.)  
Sipman  
Tropic Fringe Lichen



*Hyperphyscia adglutinata/confusa*  
(Flörke) H. Mayrhofer & Poelt/Essl. et al.  
Grainy Shadow-Crust Lichen



*Hyperphyscia syncolla* (Tuck.  
ex Nyl.) Kalb  
Smooth Shadow-Crust Lichen



*Hypogymnia apinnata* Goward  
& McCune  
Beaded Tube Lichen



*Hypogymnia austerodes* (Nyl.) Räsänen  
Varnished Tube Lichen



*Hypogymnia bitteri* (Lynge) Ahti  
Powdered Tube Lichen



*Hypogymnia canadensis* Goward  
& McCune  
Tube Lichen



*Hypogymnia duplicata* (Ach.) Rass.  
Ticker-Tape Tube Lichen



*Hypogymnia enteromorpha* (Ach.) Nyl.  
Budding Tube Lichen



*Hypogymnia farinacea* Zopf  
Tube Lichen





*Hypogymnia heterophylla* L. Pike  
Seaside Tube Lichen



*Hypogymnia hultenii* (Degel.) Krog  
Hulten's Pitted Lichen



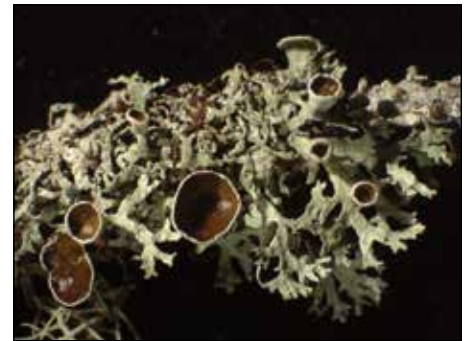
*Hypogymnia imshaugii* Krog  
Forked Tube Lichen



*Hypogymnia inactiva* (Krog) Ohlsson  
Mottled Tube Lichen



*Hypogymnia krogiae* Ohlsson  
Freckled Tube Lichen



*Hypogymnia lophyrea* (Ach.) Krog  
Pitted Tube Lichen



*Hypogymnia occidentalis* L. Pike  
Lattice Tube Lichen



*Hypogymnia oceanica* Goward  
Seaside Tube Lichen



*Hypogymnia physodes* (L.) Nyl.  
Hooded Tube Lichen



*Hypogymnia pulverata* (Nyl. ex  
Crombie) Elix  
Solid Tube Lichen



*Hypogymnia rugosa* (G. Merr.) L. Pike  
Wrinkled Tube Lichen



*Hypogymnia tubulosa* (Schaerer) Hav.  
Powder-Headed Tube Lichen





*Hypogymnia vittata* (Ach.) Parrique  
Brownish Monk's-Hood Tube Lichen



*Hypogymnia wilfiana* Goward,  
T. Spribille & Ahti  
Tube Lichen



*Hypotrachyna afrorevoluta* (Krog  
& Swinscow) Krog & Swinscow  
Loop Lichen



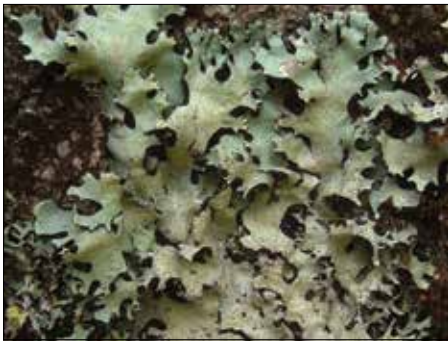
*Hypotrachyna catawbiensis* (Degel.)  
Hale ex Sipman  
Powder-Tipped Loop Lichen



*Hypotrachyna croceopustulata*  
(Kurok.) Hale  
Yellow-Cored Loop Lichen



*Hypotrachyna horrescens* (Taylor)  
Elix & Hale  
Hairy-Spined Loop Lichen



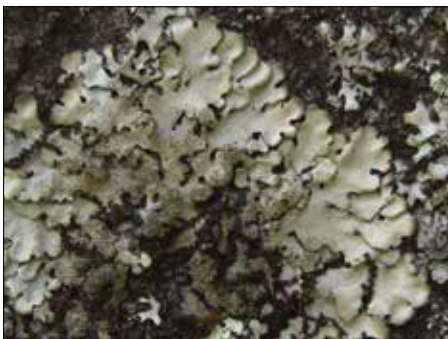
*Hypotrachyna imbricatula*  
(Zahlbr.) Hale  
Loop Lichen



*Hypotrachyna laevigata* (Sm.) Hale  
Grainy Loop Lichen



*Hypotrachyna livida* (Taylor) Hale  
Wrinkled Loop Lichen



*Hypotrachyna minarum* (Vainio)  
Elix & Hale  
Hairless-Spined Loop Lichen



*Hypotrachyna osseoalba* (Vainio)  
Park & Hale  
Grainy Loop Lichen



*Hypotrachyna pseudosinuosa*  
(Asahina) Hale  
Loop Lichen





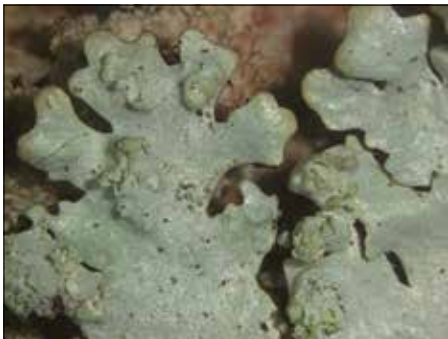
*Hypotrachyna pulvinata* (Fée) Hale  
Smooth Loop Lichen



*Hypotrachyna pustulifera* (Hale)  
Skorepa  
Grainy Loop Lichen



*Hypotrachyna revoluta* (Flörke) Hale  
Powdered Loop Lichen



*Hypotrachyna showmanii* Hale  
Loop Lichen



*Hypotrachyna sinuosa* (Sm.) Hale  
Green Loop Lichen



*Hypotrachyna spumosa* (Asahina)  
Elix & Hale  
Pustuled Loop Lichen



*Hypotrachyna swinscowii* (Hale)  
Elix & Hale  
Loop Lichen



*Hypotrachyna taylorensis*  
(M.E. Mitch.) Hale  
Powdered Loop Lichen



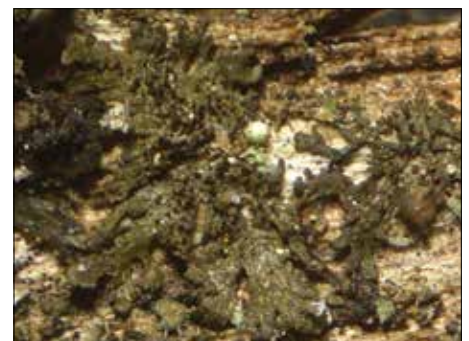
*Hypotrachyna virginica* (Hale) Hale  
Virginia Loop Lichen



*Imshaugia aleurites* (Ach.) S.F. Meyer  
Salted Starburst Lichen

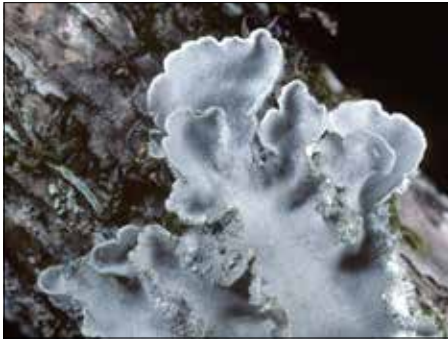


*Imshaugia placorodia* (Ach.)  
S.F. Meyer  
American Starburst Lichen



*Koerberia biformis* A. Massal.  
Bark Brownette Lichen





*Leioderma soreliatum* D.J. Galloway & P.M. Jørg.

Treepelt Mouse-Ears Lichen



*Leptochidium albociliatum* (Desm.) M. Choisy

Whiskered Jelly Lichen



*Leptogidium contortum* (Henssen) T. Sprib. & Muggia

Jelly Lichen



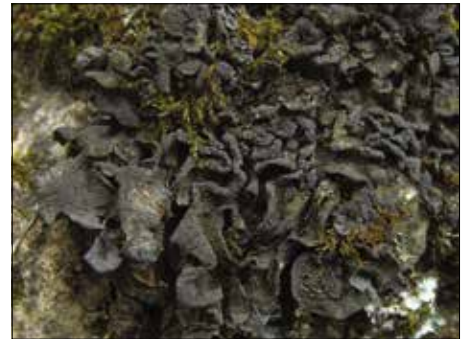
*Leptogidium dendriscum* (Nyl.) Nyl.

Jelly Lichen



*Leptogidium acadiense* J.W. Hinds, F.L. Anderson & Lendemer

Jellyskin Lichen



*Leptogidium arsenei* Sierk

Ruffled Jellyskin Lichen



*Leptogidium austroamericanum* (Malme) C.W. Dodge

Dixie Jellyskin Lichen



*Leptogidium corticola* (Taylor) Tuck.

Blistered Jellyskin Lichen



*Leptogidium cyanescens* (Rabenh.) Körber

Blue Jellyskin Lichen



*Leptogidium hirsutum* Sierk

Hairy Jellyskin Lichen



*Leptogidium insigne* P.M. Jørg. & Tønsberg

Jellyskin Lichen



*Leptogidium laceroides* (B. de Lesd.) P.M. Jørg.

Dimpled Jellyskin Lichen





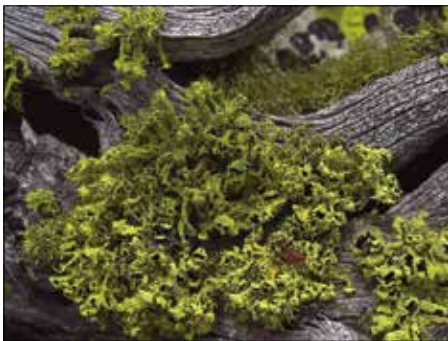
*Leptogium milligranum* Sierk  
Stretched Jellyskin Lichen



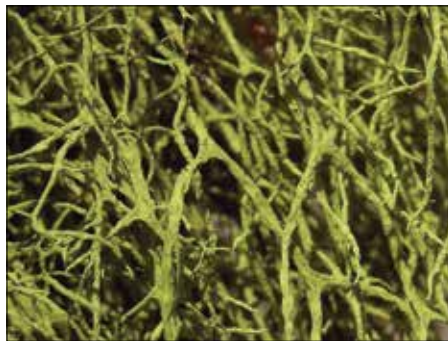
*Leptogium pseudofurfuraceum*  
P.M. Jørg. & Wallace  
Dimpled Jellyskin Lichen



*Leptogium saturninum* (Dickson) Nyl.  
Bearded Jellyskin Lichen



*Letharia columbiana* (Nutt.)  
J.W. Thomson  
Brown-Eyed Wolf Lichen



*Letharia vulpina* (L.) Hue  
Wolf Lichen



*Lobaria amplissima* (Scop.) Forssell  
Lung Lichen



*Lobaria anomala* (Brodo & Ahti)  
T. Spribille & McCune  
Netted Lung Lichen



*Lobaria anthraspis* (Ach.) T. Sprib.  
& McCune  
Dimpled Lung Lichen



*Lobaria hallii* (Tuck.) Zahlbr.  
Gray Lung Lichen



*Lobaria linita* (Ach.) Rabenh.  
Cabbage Lung Lichen



*Lobaria oregana* (Tuck.) Müll. Arg.  
Lettuce Lung Lichen



*Lobaria pulmonaria* (L.) Hoffm.  
Lung Lichen





*Lobaria quercizans* Michaux  
Smooth Lung Lichen



*Lobaria ravenelii* (Tuck.) Yoshim. Dixie  
Lung Lichen



*Lobaria retigera* (Bory) Trevisan  
Lung Lichen



*Lobaria scrobiculata* (Scop.) DC.  
Textured Lung Lichen



*Melanelixia albertana* (Ahti)  
O. Blanco et al.  
Powder-Rimmed Camouflage Lichen



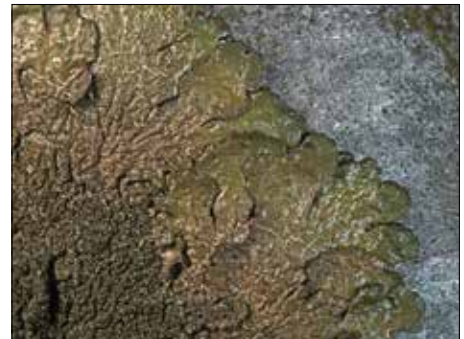
*Melanelixia californica* (Schaerer)  
O. Blanco et al.  
Camouflage Lichen



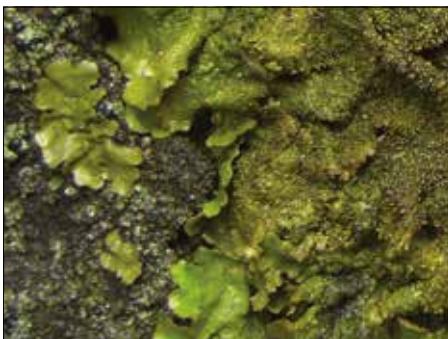
*Melanelixia glabrata* (Fr. ex Duby)  
O. Blanco et al.  
Shiny Camouflage Lichen



*Melanelixia subargentifera* (Nyl.)  
O. Blanco et al.  
Whiskered Camouflage Lichen



*Melanelixia subaurifera* (Nyl.)  
O. Blanco et al.  
Abraded Camouflage Lichen



*Melanohalea elegantula* (Zahlbr.)  
O. Blanco et al.  
Elegant Brown Lichen

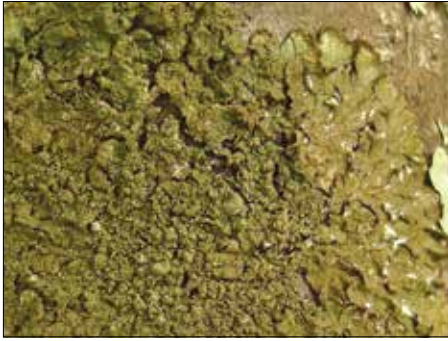


*Melanohalea exasperata* (De Not.)  
O. Blanco et al.  
Brown-Eyed Brown Lichen



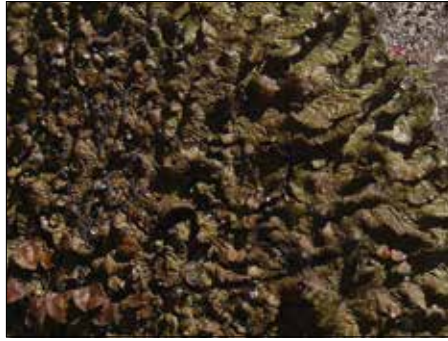
*Melanohalea exasperatulai* (Nyl.)  
O. Blanco et al.  
Lustrous Brown Lichen





*Melanohalea halei* (Ahti)  
O. Blanco et al.

Brown Lichen



*Melanohalea multispora* (A. Schneider)  
O. Blanco et al.

Many-Spored Brown Lichen



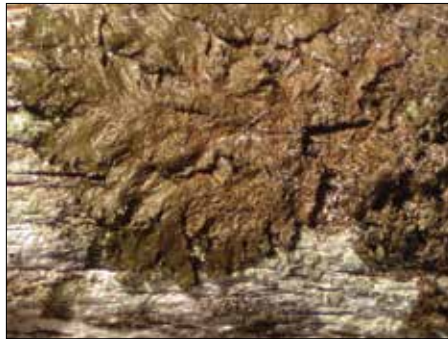
*Melanohalea olivacea* (L.)  
O. Blanco et al.

Spotted Brown Lichen



*Melanohalea septentrionalis* (Lynge)  
O. Blanco et al.

Northern Brown Lichen



*Melanohalea subelegantula* (Essl.)  
O. Blanco et al.

Lattice Brown Lichen



*Melanohalea subolivacea/multispora* (Nyl.)  
O. Blanco et al./ (A. Schneider) O. Blanco et al.

Brown-Eyed Brown Lichen



*Melanohalea trabeculata* (Ahti)  
O. Blanco et al.

Brown Lichen



*Menegazzia subsimilis/terebrata*  
(H. Magn.) R. Sant. / (Hoffm.) A. Massal

Honeycombed Lichen



*Myelochroa aurulenta* (Tuck.)  
Elix & Hale

Powdery Axil-Bristle Lichen



*Myelochroa galbina* (Ach.) Elix & Hale

Smooth Axil-Bristle Lichen



*Myelochroa metarevoluta* (Asahina)  
Elix & Hale

Axil-Bristle Lichen



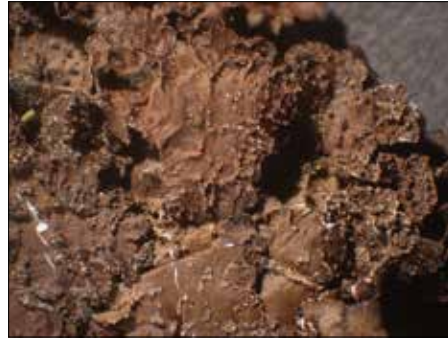
*Nephroma bellum* (Sprengel) Tuck.

Naked Kidney Lichen





*Nephroma helveticum* Ach.  
Fringed Kidney Lichen



*Nephroma isidiosum* (Nyl.) Gyelnik  
Peppered Kidney Lichen



*Nephroma laevigatum* Ach.  
Mustard Kidney Lichen



*Nephroma occultum* Wetmore  
Cryptic Kidney Lichen



*Nephroma parile* (Ach.) Ach.  
Powdery Kidney Lichen



*Nephroma resupinatum* (L.) Ach.  
Pimpled Kidney Lichen



*Nephromopsis americana* (Nyl.)  
Divakar, A. Crespo & Lumbsch  
Fringed Wrinkle-Lichen



*Nephromopsis arizonica* (Essl.)  
Divakar, A. Crespo & Lumbsch  
Arizona Wrinkle-Lichen



*Nephromopsis aurescens* (Tuck.)  
Divakar, A. Crespo & Lumbsch  
Eastern Candlewax Lichen



*Nephromopsis chlorophylla* (Willd.)  
Divakar, A. Crespo & Lumbsch  
Greenleaf (or Powdered) Wrinkle-Lichen



*Nephromopsis coralligera* (W.A. Weber)  
Divakar, A. Crespo & Lumbsch  
Coral-Edged Wrinkle-Lichen



*Nephromopsis fendleri* (Nyl.) Divakar,  
A. Crespo & Lumbsch  
Dwarf Wrinkle-Lichen





*Nephromopsis merrillii* (Du Rietz)  
Divakar, A. Crespo & Lumbsch  
Flattened Thornbush Lichen



*Nephromopsis orbata* (Nyl.) Divakar,  
A. Crespo & Lumbsch  
Variable Wrinkle-Lichen



*Nephromopsis sphaerosporella* (Müll.  
Arg.) Divakar, Crespo & Lumbsch  
Mountain Candlewax Lichen



*Nephromopsis subalpina* (Imshaug)  
Divakar, A. Crespo & Lumbsch  
Chestnut Wrinkle-Lichen



*Nephromopsis tuckermanii* (Tuck.)  
Divakar, A. Crespo & Lumbsch  
Coastal Thornbush Lichen



*Nephromopsis weberi* (Essl.) Divakar,  
A. Crespo & Lumbsch  
Dwarf Wrinkle-Lichen



*Niebla cephalota* (Tuck.) Rundel  
& Bowler  
Powdery Fog Lichen



*Nodobryoria abbreviata* (Müll. Arg.)  
Common & Brodo  
Tufted Foxtail Lichen



*Nodobryoria oregana* (Tuck.)  
Common & Brodo  
Pendant Foxtail Lichen



*Pannaria conoplea* (Ach.) Bory  
Many-Rimmed Matted Lichen



*Pannaria rubiginosa* (Thunb.) Delise  
Brown-Eyed Matted Lichen



*Pannaria tavaresii* P.M. Jørg.  
Coral-Rimmed Matted Lichen





*Parmelia barrenoae* Divakar, M.C.  
Molina & A. Crespo  
Hammered Shield Lichen



*Parmelia fertilis* Müll. Arg.  
Black-Eyed Shield Lichen



*Parmelia hygrophila* Goward & Ahti  
Western Shield Lichen



*Parmelia pseudosulcata* Gyelnik  
Salted Shield Lichen



*Parmelia saxatilis* (L.) Ach.  
Salted Shield Lichen



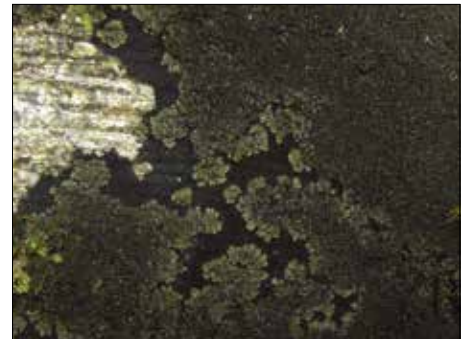
*Parmelia squarrosa* Hale  
Bottlebrush Shield Lichen



*Parmelia sulcata* Taylor  
Hammered Shield Lichen



*Parmeliella parvula* P.M. Jørg.  
Shingle Lichen



*Parmeliella triptophylla* (Ach.)  
Müll. Arg.  
Black-Bordered Shingle Lichen



*Parmelina coleae* Arguello & A. Crespo  
Fringed Shield Lichen



*Parmeliopsis ambigua* (Wulfen) Nyl.  
Green Starburst Lichen



*Parmeliopsis capitata* R.C. Harris  
ex. J.W. Hinds & P.L. Hinds  
Green-Eyed Starburst Lichen

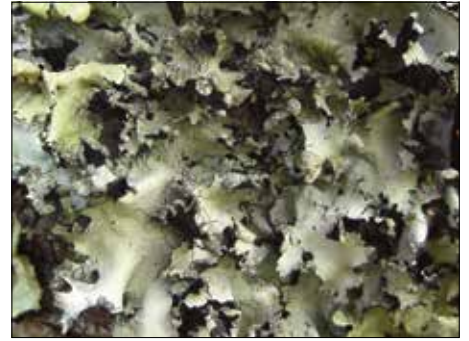




*Parmeliopsis hyperopta* (Ach.) Arnold  
Gray Starburst Lichen



*Parmeliopsis subambigua* Gyelnik  
Green Starburst Lichen



*Parmotrema arnoldii* (Du Rietz) Hale  
Powdered Ruffle Lichen



*Parmotrema austrosinense*  
(Zahlbr.) Hale  
Unwhiskered Ruffle Lichen



*Parmotrema cetratum* (Ach.) Hale  
Cracked Ruffle Lichen



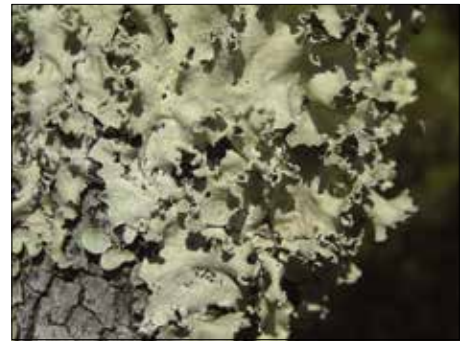
*Parmotrema crinitum* (Ach.) M. Choisy  
Salted Ruffle Lichen



*Parmotrema cristiferum* (Taylor) Hale  
Unwhiskered Ruffle Lichen



*Parmotrema diffractaicum* (Essl.) Hale  
Cracked Ruffle Lichen



*Parmotrema dilatatum* (Vainio) Hale  
Cracked Ruffle Lichen



*Parmotrema endosulphureum*  
(Hillm.) Hale  
Yellow-Cored Ruffle Lichen



*Parmotrema eurysacum* (Hue) Hale  
Perforated Ruffle Lichen



*Parmotrema gardneri* (C.W. Dodge)  
Sérus.  
Cracked Ruffle Lichen



Photo Wanted!



*Parmotrema haitiense* (Hale) Hale  
Ruffle Lichen



*Parmotrema hypoleucinum*  
(J. Steiner) Hale  
White-Dotted Ruffle Lichen



*Parmotrema hypotropum* (Nyl.) Hale  
Powdered Ruffle Lichen

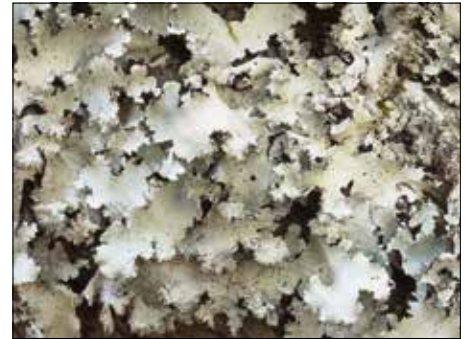
Photo Wanted!



*Parmotrema louisianae* (Hale) Hale  
Louisiana Ruffle Lichen



*Parmotrema margaritatum* (Hue) Hale  
Margarite Ruffle Lichen



*Parmotrema mellissii* (C.W. Dodge)  
Hale Melliss'  
Ruffle Lichen



*Parmotrema perforatum* (Jacq.)  
A. Massal.  
Perforated Ruffle Lichen



*Parmotrema perlatum* (Hudson)  
M. Choisy  
Powdered Ruffle Lichen



*Parmotrema praesorediosum* (Nyl.) Hale  
Powder-Crown Ruffle Lichen



*Parmotrema rampoddense* (Nyl.) Hale  
Long-Whiskered Ruffle Lichen



*Parmotrema reticulatum* (Taylor)  
M. Choisy  
Cracked Ruffle Lichen



*Parmotrema stuppeum* (Taylor) Hale  
Powder-Edged Ruffle Lichen





*Parmotrema subsidiosum* (Müll. Arg.)  
Hale Cracked Ruffle Lichen



*Parmotrema submarginale* (Michx.)  
DePriest & B. Hale  
Ruffle Lichen



*Parmotrema subrigidum* Egan  
Ruffle Lichen



*Parmotrema subtinctorium*  
(Zahlbr.) Hale  
Mottled Ruffle Lichen



*Parmotrema sulphuratum*  
(Nees & Flotow) Hale  
Sulphur Ruffle Lichen



*Parmotrema tinctorum* (Delise ex Nyl.)  
Hale Palm Ruffle Lichen



*Parmotrema ultralucens* (Krog) Hale  
Spotted Ruffle Lichen



*Parmotrema xanthinum* (Müll. Arg.)  
Hale  
Green Ruffle Lichen



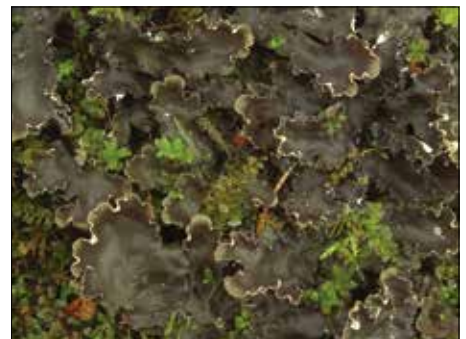
*Parmotrema zollingeri* (Hepp) Hale  
Ruffle Lichen



*Peltigera britannica* (Gyelnik) Holt-  
Hartw. & Tønsberg  
Flaky Freckle Pelt Lichen



*Peltigera collina* (Ach.) Schrader  
Tree Pelt Lichen



*Peltigera elisabethae* Gyelnik  
Concentric Pelt Lichen





*Peltigera membranacea* (Ach.) Nyl.  
Membranous Dog-Lichen



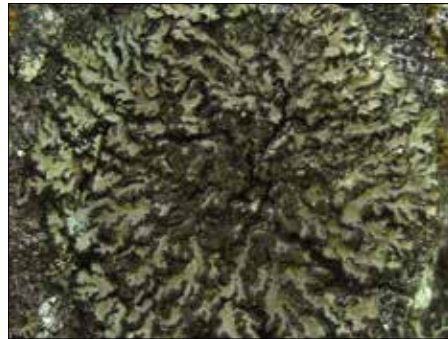
*Peltigera neopolydactyla* (Gyelnik) Gyelnik  
Carpet Pelt Lichen



*Peltigera polydactylon* (Necker) Hoffm.  
Many-Fruited Pelt Lichen



*Peltigera praetextata* (Flörke ex Sommerf.) Zopf  
Scaly Dog-Lichen



*Phaeophyscia adiastrata* (Essl.) Essl.  
Powder-Tipped Shadow Lichen



*Phaeophyscia ciliata* (Hoffm.) Moberg  
Smooth Shadow Lichen



*Phaeophyscia erythrocardia* (Tuck.) Essl.  
Shadow Lichen



*Phaeophyscia hirsuta* (Mereschk.) Essl.  
Hairy Shadow Lichen



*Phaeophyscia hirtella* Essl.  
Hairy Shadow Lichen



*Phaeophyscia hispidula* (Ach.) Essl.  
Whiskered Shadow Lichen



*Phaeophyscia insignis* (Mereschk.) Moberg  
Moberg Mealy Dot Shadow Lichen



*Phaeophyscia kairamoi* (Vainio) Moberg  
Hairy-Tipped Shadow Lichen





***Phaeophyscia nigricans* (Flörke)  
Moberg**  
Shadow Lichen



***Phaeophyscia orbicularis* (Necker)**  
Moberg Mealy Shadow Lichen



***Phaeophyscia pusilloides* (Zahlbr.) Essl.**  
Pompon Shadow Lichen



***Phaeophyscia rubropulchra*  
(Degel.) Essl.**  
Orange-Cored Shadow Lichen



***Physcia adscendens* (Fr.) H. Olivier**  
Hooded Rosette Lichen



***Physcia aipolia/alnophila* (Ehrh. ex  
Humb.) Fűrnr./ (Vainio) Loht. et al.**  
Hoary Spotted Rosette Lichen



***Physcia americana* G. Merr.**  
Powdery Rosette Lichen



***Physcia biziana* (A. Massal.) Zahlbr.**  
Frosted Rosette Lichen



***Physcia caesia* (Hoffm.) Fűrnr.**  
Blue-Gray Rosette Lichen



***Physcia crispa* Nyl.**  
Mealy-Edged Rosette Lichen



***Physcia dimidiata* (Arnold) Nyl.**  
Mealy-Edged Rosette Lichen



***Physcia dubia* (Hoffm.) Lettau**  
Powder-Tipped Rosette Lichen





*Physcia leptalea* (Ach.) DC.  
Hairy-Edged Rosette Lichen



*Physcia millegrana* Degel.  
Mealy Rosette Lichen



*Physcia neogaea* R.C. Harris  
Dwarf Rosette Lichen



*Physcia solediosa* (Vainio) Lynge  
Black-Bottomed Rosette Lichen



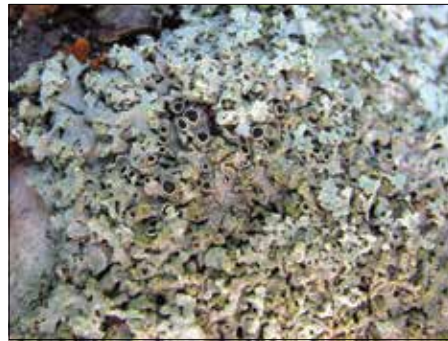
*Physcia stellaris* (L.) Nyl.  
Star Rosette Lichen



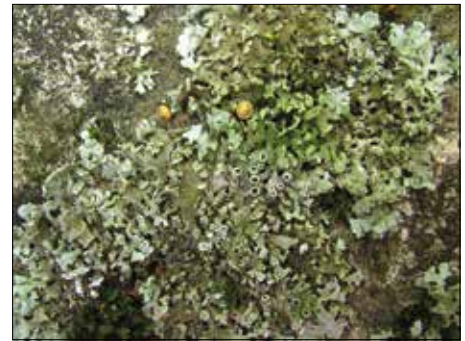
*Physcia tenella* (Scop.) DC.  
Fringed Rosette Lichen



*Physcia undulata* Moberg  
Mealy-Edged Rosette Lichen



*Physciella chloantha* (Ach.) Essl.  
Cryptic Rosette Lichen



*Physciella melanchra* (Hue) Essl.  
Grainy Cryptic Rosette Lichen



*Physciella nepalensis* (Poelt) Essl.  
Cryptic Rosette Lichen



*Physconia americana* Essl.  
Fancy Frost Lichen

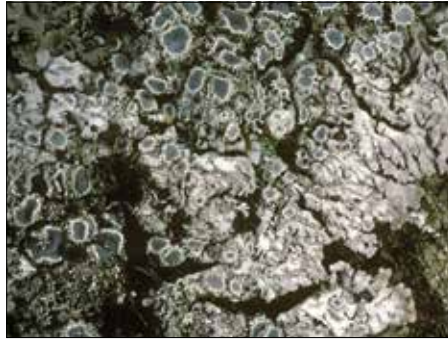


*Physconia californica* Essl.  
California Frost Lichen





*Physconia detersa* (Nyl.) Poelt  
Bottlebrush Frost Lichen



*Physconia elegantula* Essl.  
Elegant Frost Lichen



*Physconia enteroxantha* (Nyl.) Poelt  
Yellow-Edged Frost Lichen



*Physconia fallax* Essl.  
Frost Lichen



*Physconia isidiigera* (Zahlbr.) Essl.  
Bottlebrush Frost Lichen



*Physconia leucoleiptes* (Tuck.) Essl.  
Yellowish Crescent Frost Lichen



*Physconia perisidiosa* (Erichsen)  
Moberg  
Crescent Frost Lichen



*Platismatia glauca* (L.) W.L. Culb.  
& C.F. Culb.  
Varied Rag Lichen



*Platismatia herrei* (Imshaug)  
W.L. Culb. & C.F. Culb.  
Tattered Rag Lichen



*Platismatia lacunosa*  
(Ach.) W.L. Culb. & C.F. Culb.  
Crinkled Rag Lichen



*Platismatia norvegica*  
(Lyngé) W.L. Culb. & C.F. Culb.  
Oldgrowth Rag Lichen



*Platismatia stenophylla*  
(Tuck.) W.L. Culb. & C.F. Culb.  
Ribbon Rag Lichen





*Platismatia tuckermanii* (Oakes)  
W.L. Culb. & C.F. Culb.

Crumpled Rag Lichen



*Platismatia wheeleri* Goward,  
Altermann, C.R. Björk

Rag Lichen



*Pseudevernia cladonia*  
(Tuck.) Hale & W.L. Culb.

Ghost Antler Lichen



*Pseudevernia consocians* (Vainio)  
Hale & W.L. Culb.

Common Antler Lichen



*Pseudevernia intensa* (Nyl.) Hale  
& W.L. Culb.

Western Antler Lichen



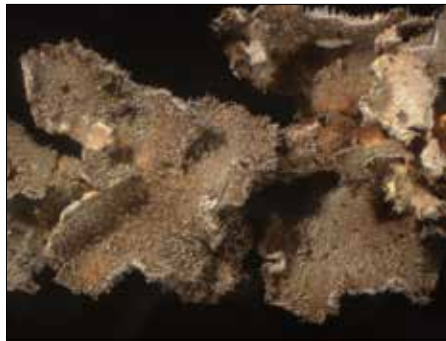
*Pseudocyphellaria aurata* (Ach.) Vainio

Yellow Specklebelly Lichen



*Pseudocyphellaria citrina* group (Gyeln.)  
Lücking, Moncada & S.Stenroos

Specklebelly Lichen



*Pseudocyphellaria mallota* (Tuck.)  
H. Magn.

Specklebelly Lichen



*Pseudocyphellaria rainierensis* Imshaug

Oldgrowth Specklebelly Lichen



*Pseudoparmelia uleana* (Müll. Arg.)  
Elix & T.H. Nash

Lemon-Lime Lichen



*Punctelia appalachensis* (W.L. Culb.)  
Krog

Appalachian Speckled Shield Lichen



*Punctelia bolliana* (Müll. Arg.) Krog

Eastern Speckled Shield Lichen





*Punctelia borreri* (Sm.) Krog  
Speckled Shield Lichen



*Punctelia caseana* Lendemer  
& Hodkinson  
Eastern Powdered Speckled Shield Lichen



*Punctelia graminicola* (B. de Lesd.)  
Egan  
Speckled Shield Lichen



*Punctelia jeckeri* (Roum.) Kalb  
Western Powdered Speckled  
Shield Lichen



*Punctelia missouriensis* G. Wilh.  
& Ladd  
Mealy Speckled Shield Lichen



*Punctelia reddenda* (Stirton) Krog  
Speckled Shield Lichen



*Punctelia hypoleucites* (Nyl.) Krog  
Southwestern Speckled Shield Lichen



*Punctelia rudecta* (Ach.) Krog  
Rough Speckled Shield Lichen



*Pyxine berteriana* (Fée) Imshaug  
Buttoned Rosette Lichen



*Pyxine caesiopruinosa* (Nyl.) Imshaug  
Buttoned Rosette Lichen



*Pyxine eschweileri* (Tuck.) Vainio  
Buttoned Rosette Lichen



*Pyxine soreliata* (Ach.) Mont.  
Mustard Buttoned Rosette Lichen





*Pyxine subcinerea* Stirton  
Buttoned Rosette Lichen



*Ramalina americana/culbersoniorum*  
Hale/LaGreca  
Sinewed Cartilage Lichen



*Ramalina complanata* (Sw.) Ach.  
Bumpy Cartilage Lichen



*Ramalina denticulata* Nyl.  
Southern Bumpy Cartilage Lichen



*Ramalina dilacerata* (Hoffm.) Hoffm.  
Punctured Cartilage Lichen



*Ramalina farinacea* (L.) Ach.  
Dotted Cartilage Lichen



*Ramalina leptocarpha* Tuck.  
Western Strap Cartilage Lichen



*Ramalina menziesii* Taylor  
Lacy/Fishnet Cartilage Lichen



*Ramalina obtusata* (Arnold) Bitter  
Hooded Cartilage Lichen



*Ramalina pollinaria* (Westr.) Ach.  
Chalky Cartilage Lichen



*Ramalina roesleri*  
(Hochst. ex Schaerer) Hue  
Frayed Cartilage Lichen

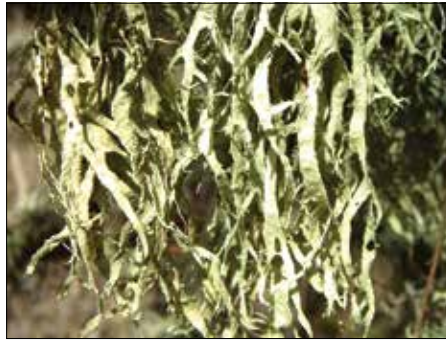


*Ramalina sinensis* Jatta  
Fan Cartilage Lichen





*Ramalina stenospora* Müll. Arg.  
Southern Strap Cartilage Lichen



*Ramalina subleptocarpha* Rundel  
& Bowler  
Slit-Rimmed Cartilage Lichen



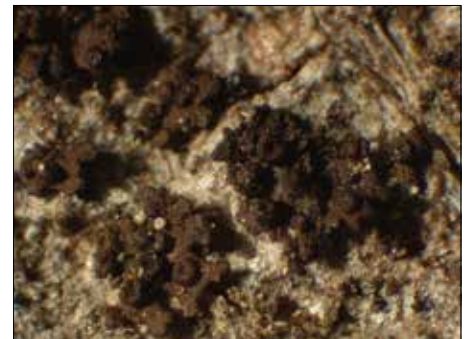
*Ramalina thrausta* (Ach.) Nyl.  
Angel's Hair Cartilage Lichen



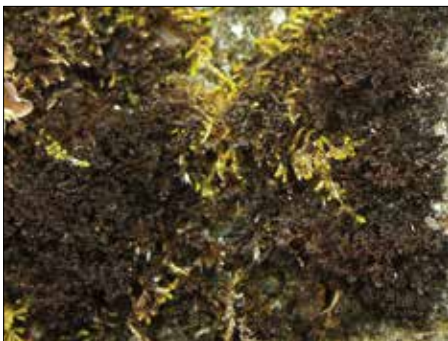
*Ramalina willeyi* R. Howe  
Thorny Cartilage Lichen



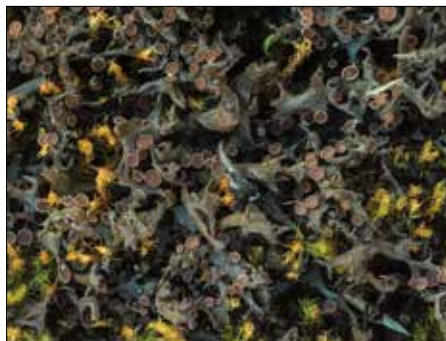
*Rostania occultata* Bagl.  
Occult Jelly Lichen



*Scytinium cellulosum* P.M. Jørg.  
& Tønsberg  
Jellyskin Lichen



*Scytinium lichenoides* (L.) Zahlbr.  
Tattered Jellyskin Lichen



*Scytinium palmatum* (Hudson) Mont.  
Jellyskin Lichen



*Scytinium polycarpum* P.M. Jørg.  
& Goward  
Four-Spored Jellyskin Lichen



*Scytinium teretiusculum* (Wallr.)  
Arnold Terete  
Jellyskin Lichen



*Sphaerophorus tuckermanii* Räsänen  
Coral Lichen



*Sphaerophorus tuckermanii/venerabilis*  
Räsänen/Wedin et al.  
Coral Lichen





*Sphaerophorus venerabilis* Wedin,  
Högnabba & Goward  
Coral Lichen



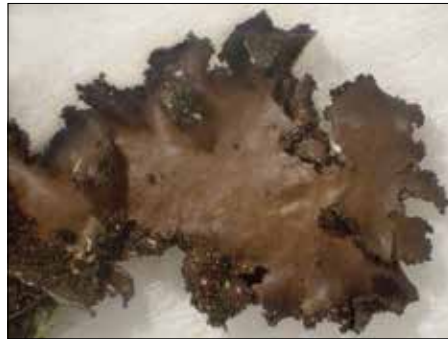
*Sticta beauvoisii* Delise  
Fringed Spotted Felt Lichen



*Sticta fuliginosa* (Hoffm.) Ach.  
Peppered Spotted Felt Lichen



*Sticta limbata* (Sm.) Ach.  
Powdered Spotted Felt Lichen



*Sticta wrightii* Tuck.  
Spotted Felt Lichen



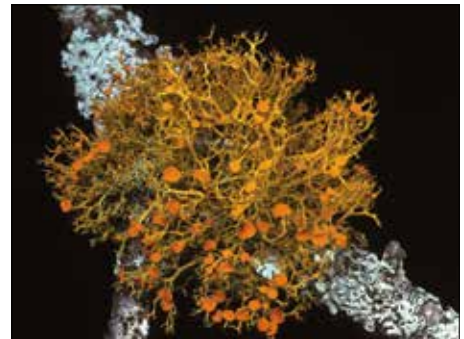
*Sulcaria badia* Brodo & D. Hawksw.  
Bay Horsehair Lichen



*Sulcaria spiralifera* (Brodo & D.  
Hawksw.) Myllys, Velmala & Goward  
Grooved Horsehair Lichen



*Teloschistes chrysophthalmus*  
(L.) Th. Fr.  
Gold-Eye Orange Bush Lichen



*Teloschistes exilis* (Michaux) Vainio  
Slender Orange Bush Lichen



*Teloschistes flavicans* (Sw.) Norman  
Powdered Orange Bush Lichen



*Tholurna dissimilis* (Norman) Norman  
Urn Lichen



*Usnea cavernosa* Tuck.  
Pitted Beard Lichen





*Usnea ceratina* Ach.  
Warty Beard Lichen



*Usnea cornuta* Körber  
Inflated Beard Lichen



*Usnea cylindrica* P. Clerc  
Beard Lichen



*Usnea dasaea* Stirton  
Beard Lichen



*Usnea esperantiana* Clerc  
Beard Lichen



*Usnea filipendula* group Stirton  
Fishbone Beard Lichen



*Usnea flavocardia* Räsänen  
Beard Lichen



*Usnea fragilescens* Hav. ex Lynge  
Inflated Beard Lichen



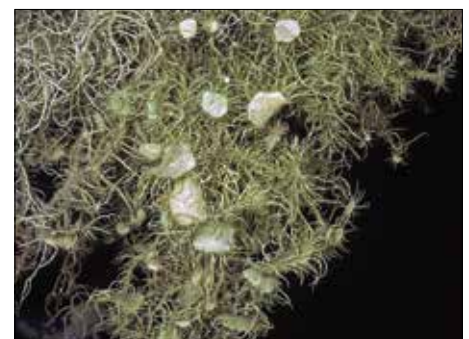
*Usnea glabrata* (Ach.) Vainio  
Lustrous Beard Lichen



*Usnea glabrescens/fulvovireagens* (Nyl. ex Vainio) Vainio/(Räsänen) Räsänen  
Beard Lichen



*Usnea hirta* (L.) F.H. Wigg.  
Bristly Beard Lichen



*Usnea intermedia* (A. Massal.) Jatta  
Beard Lichen





*Usnea lapponica* Vainio  
Powdered Beard Lichen



*Usnea longissima* Ach.  
Methuselah's Beard Lichen



*Usnea merrillii* Motyka  
Beard Lichen



*Usnea mutabilis* Stirton  
Bloody Beard Lichen



*Usnea nidulans* Motyka  
Beard Lichen



*Usnea occidentalis* Motyka  
Western Beard Lichen



*Usnea pacificana* P. Halonen  
Beard Lichen



*Usnea parvula* Motyka  
Beard Lichen



*Usnea rubicunda* Stirton  
Red Beard Lichen



*Usnea scabrata* Nyl.  
Beard Lichen



*Usnea silesiaca* Motyka  
Beard Lichen



*Usnea strigosa* (Ach.) Eaton  
Bushy Beard Lichen





*Usnea subfloridana* Stirton  
Shrubby Beard Lichen



*Usnea subfusca* Stirton  
Beard Lichen



*Usnea subgracilis* Göpp. & Stein  
Beard Lichen



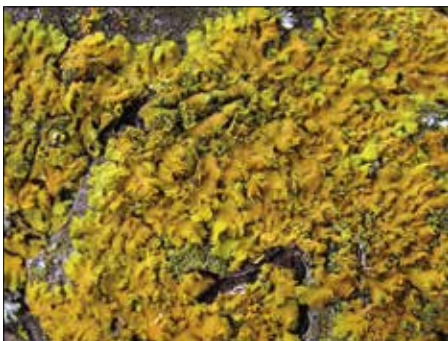
*Usnea subscabrosa* Nyl. ex Motyka  
Horny Beard Lichen



*Usnea trichodea* Ach.  
Bony Beard Lichen



*Usnea wasmuthii* Räsänen  
Beard Lichen



*Xanthomendoza fallax*  
(Hepp ex Arnold) Söchting et al.  
Hooded Sunburst Lichen



*Xanthomendoza fulva* (Hoffm.)  
Söchting et al.  
Bare-Bottomed Sunburst Lichen



*Xanthomendoza galericulata*  
L. Lindblom  
Sunburst Lichen



*Xanthomendoza hasseana* (Räsänen)  
Söchting et al.  
Poplar Sunburst Lichen



*Xanthomendoza montana*  
(L. Lindblom) Söchting et al.  
Sunburst Lichen



*Xanthomendoza oregana* (Gyelnik)  
Söchting, Kärnefelt & S. Kondr.  
Sunburst Lichen



*Xanthomendoza ulophyllodes*  
(Räsänen) Søchting et al.  
Powdery Sunburst Lichen



*Xanthoria candelaria* (L.) Th. Fr.  
Shrubby Orange Wall Lichen



*Xanthoria parietina* (L.) Th. Fr.  
Maritime Orange Wall Lichen



*Xanthoria polycarpa* (Hoffm.) Th. Fr.  
Pin-Cushion Orange Wall Lichen



*Xanthoria tenax* L. Lindblom  
Orange Wall Lichen



## Lichen Photography Credits

- Alectoria imshaugii*, Jason Hollinger  
*Alectoria lata*, Stephen Sharnoff  
*Alectoria sarmentosa*, Jason Hollinger  
*Alectoria vancouverensis*, Troy McMullin  
*Anaptychia palmulata*, Jason Hollinger  
*Anzia colpodes*, Jason Hollinger  
*Bryoria bicolor*, Jason Hollinger  
*Bryoria capillaris/pikei*, Jason Hollinger  
*Bryoria carlottae*, Troy McMullin  
*Bryoria cervinula*, Troy McMullin  
*Bryoria fremontii*, Jason Hollinger  
*Bryoria friabilis*, Bruce McCune  
*Bryoria furcellata*, Jason Hollinger  
*Bryoria fuscescens*, Jason Hollinger  
*Bryoria nadvornikiana*, Jason Hollinger  
*Bryoria pseudofuscescens*, Bruce McCune  
*Bryoria simplicior*, Stephen Sharnoff  
*Bryoria trichodes*, Troy McMullin  
*Bulbothrix confoederata*, Jason Hollinger  
*Bulbothrix isidiza*, Jason Hollinger  
*Bulbothrix laevigatula*, Stephen Sharnoff  
*Bulbothrix scortella*, Jason Hollinger  
*Bunodophoron melanocarpum*, Tab Tannery  
*Candelaria concolor/pacifica*,  
 Jason Hollinger  
*Candelaria fibrosa*, Jason Hollinger  
*Canoparmelia caroliniana*, Jason Hollinger  
*Canoparmelia crozalsiana*, Jason Hollinger  
*Canoparmelia cryptochlorophaea*,  
 Jason Hollinger  
*Canoparmelia texana*, Chris Parrish  
*Cetraria canadensis*, Jason Hollinger  
*Cetraria ciliaris*, Jason Hollinger  
*Cetraria oakesiana*, Jason Hollinger  
*Cetraria pallidula*, Jason Hollinger  
*Cetraria pinastri*, Jason Hollinger  
*Cetraria platyphylla*, Jason Hollinger  
*Cetraria sepincola*, Jason Hollinger  
*Cetraria viridis*, Stephen Sharnoff  
*Cetrelia cetrarioides*, Stephen Sharnoff  
*Cetrelia chicitae*, Jason Hollinger  
*Cetrelia olivetorum*, Jason Hollinger  
*Cladonia albonigra*, Bruce McCune  
*Cladonia bellidiflora*, Jason Hollinger  
*Cladonia caespiticia*, Vitaly Charny  
*Cladonia carneola*, Jim Riley  
*Cladonia cenotea*, Jason Hollinger  
*Cladonia chlorophaea group*, Richard Droker  
*Cladonia coniocraea/ochrochlora*,  
 Jason Hollinger  
*Cladonia cristatella*, Jason Hollinger  
*Cladonia deformis*, Jason Hollinger  
*Cladonia didyma*, Jason Hollinger  
*Cladonia fimbriata*, Jason Hollinger  
*Cladonia grayi*, Jason Hollinger  
*Cladonia macilentata*, Jason Hollinger  
*Cladonia macilentata* var. *bacillaris*,  
 Jason Hollinger  
*Cladonia parasitica*, Chris Parrish  
*Cladonia peziziformis*, Jason Hollinger  
*Cladonia pleurota*, Jason Hollinger  
*Cladonia pyxidata*, Jason Hollinger  
*Cladonia ramulosa*, Jason Hollinger  
*Cladonia rei*, Jason Hollinger  
*Cladonia squamosa*, Jason Hollinger  
*Cladonia squamosa* var. *subsquamosa*,  
 Jason Hollinger  
*Cladonia sulphurina*, Stephen Sharnoff  
*Cladonia transcendens*, Stephen Sharnoff  
*Cladonia umbricola*, Jason Hollinger  
*Cladonia verruculosa*, Jason Hollinger  
*Coccocarpia erythroxyli*, Bruce McCune  
*Coccocarpia palmicola*, Jason Hollinger  
*Collema curtisporum*, Vitaly Charny  
*Collema furfuraceum*, Jim Riley  
*Collema nigrescens*, Jason Hollinger  
*Collema subflaccidum*, Richard Droker  
*Dendriscoaulon intricatum*,  
 Jason Hollinger  
*Dirinaria applanata*, Jason Hollinger  
*Dirinaria picta*, Jason Hollinger  
*Enchylium conglomeratum*, Jason Hollinger  
*Erioderma solediatum*, Jason Hollinger  
*Esslingeriana idahoensis*, Jason Hollinger  
*Evernia divaricata*, Jason Hollinger  
*Evernia mesomorpha*, Jason Hollinger  
*Evernia prunastri*, Jason Hollinger  
*Flavoparmelia baltimorensis*, Jason Hollinger  
*Flavopunctelia darrowi*, Jason Hollinger  
*Flavopunctelia flaventior*, Chris Parrish  
*Flavopunctelia praesignis*, Jason Hollinger  
*Flavopunctelia soledica*, Bruce McCune  
*Fuscopannaria ahlneri*, Karen Dillman  
*Fuscopannaria laceratula*, Jason Hollinger  
*Fuscopannaria leucosticta*, Jim Riley  
*Fuscopannaria leucostictoides*,  
 Jason Hollinger  
*Fuscopannaria mediterranea*,  
 Jason Hollinger  
*Fuscopannaria pacifica*, Bruce McCune  
*Fuscopannaria ramulina*, Jason Hollinger  
*Heterodermia albicans*, Jason Hollinger  
*Heterodermia appalachensis*, Jason Hollinger  
*Heterodermia casarettiana*, Jason Hollinger  
*Heterodermia echinata*, Troy McMullin  
*Heterodermia galactophylla*, Jason Hollinger  
*Heterodermia granulifera*, Jason Hollinger  
*Heterodermia hypoleuca*, Jason Hollinger  
*Heterodermia japonica*, Jason Hollinger  
*Heterodermia leucomela*, Jason Hollinger  
*Heterodermia obscurata*, Jason Hollinger  
*Heterodermia podocarpa*, Jason Hollinger  
*Heterodermia rugulosa*, Jason Hollinger  
*Heterodermia speciosa*, Jason Hollinger  
*Heterodermia squamulosa*, Jason Hollinger  
*Hyperphyscia adglutinata/confusa*,  
 Annelie Burghause  
*Hyperphyscia syncolla*, Jason Hollinger  
*Hypogymnia apinnata*, Jason Hollinger  
*Hypogymnia austerodes*, Jason Hollinger  
*Hypogymnia bitteri*, Troy McMullin  
*Hypogymnia canadensis*, Bruce McCune  
*Hypogymnia duplicata*, Ryan Batten  
*Hypogymnia enteromorpha*, Bruce McCune  
*Hypogymnia farinacea*, Zaca Lepista  
*Hypogymnia heterophylla*, Drew Henderson  
*Hypogymnia hultenii*, Bruce McCune  
*Hypogymnia imshaugii*, Bruce McCune  
*Hypogymnia inactiva*, Bruce McCune  
*Hypogymnia krogiae*, Jason Hollinger  
*Hypogymnia lophyrea*, Bruce McCune  
*Hypogymnia occidentalis*, Jason Hollinger  
*Hypogymnia oceanica*, Bruce McCune  
*Hypogymnia physodes*, Jason Hollinger  
*Hypogymnia pulverata*, Bruce McCune  
*Hypogymnia rugosa*, Jason Hollinger  
*Hypogymnia tubulosa*, Ryan Batten  
*Hypogymnia vittata*, Jason Hollinger  
*Hypogymnia wilfiana*, Jason Hollinger  
*Hypotrachyna afrorevoluta*, Jason Hollinger  
*Hypotrachyna catawbiensis*, Jason Hollinger  
*Hypotrachyna croceopustulata*,  
 Jason Hollinger  
*Hypotrachyna horrescens*, Jason Hollinger  
*Hypotrachyna imbricatula*, Jason Hollinger  
*Hypotrachyna laevigata*, Jason Hollinger  
*Hypotrachyna livida*, Jason Hollinger  
*Hypotrachyna minarum*, Jason Hollinger  
*Hypotrachyna osseoalba*, Jason Hollinger

*Hypotrachyna pseudosinuosa*, Jason Hollinger  
*Hypotrachyna pulvinata*, Stephen Sharnoff  
*Hypotrachyna pustulifera*, Stephen Sharnoff  
*Hypotrachyna revoluta*, Jason Hollinger  
*Hypotrachyna showmanii*, Jason Hollinger  
*Hypotrachyna sinuosa*, Jim Riley  
*Hypotrachyna spumosa*, Jason Hollinger  
*Hypotrachyna taylorensis*, Jason Hollinger  
*Hypotrachyna virginica*, Jason Hollinger  
*Imshaugia aleurites*, Jason Hollinger  
*Imshaugia placorodia*, Jason Hollinger  
*Koerberia biformis*, Jason Hollinger  
*Leioderma soreliatum*, Stephen Sharnoff  
*Leptochidium albociliatum*, Jason Hollinger  
*Leptogidium contortum*, Bruce McCune  
*Leptogidium dendriscum*, Bruce McCune  
*Leptogium arsenei*, Jason Hollinger  
*Leptogium austroamericanum*, Jason Hollinger  
*Leptogium corticola*, Jason Hollinger  
*Leptogium cyanescens*, Jason Hollinger  
*Leptogium hirsutum*, Jason Hollinger  
*Leptogium insigne*, Bruce McCune  
*Leptogium laceroides*, Jason Hollinger  
*Leptogium milligranum*, Jason Hollinger  
*Leptogium pseudofurfuraceum*, Jason Hollinger  
*Leptogium saturninum*, Jason Hollinger  
*Letharia columbiana*, Jason Hollinger  
*Letharia vulpina*, Jason Hollinger  
*Lobaria amplissima*, Karen Dillman  
*Lobaria anomala*, Jason Hollinger  
*Lobaria anthraspis*, Jason Hollinger  
*Lobaria hallii*, Jason Hollinger  
*Lobaria linita*, Jason Hollinger  
*Lobaria oregana*, Jim Riley  
*Lobaria pulmonaria*, Jason Hollinger  
*Lobaria quercizans*, Jason Hollinger  
*Lobaria ravenelii*, Vitaly Charny  
*Lobaria retigera*, Sarah Jovan  
*Lobaria scrobiculata*, Jason Hollinger  
*Melanelixia albertana*, Jason Hollinger  
*Melanelixia californica*, Jason Hollinger  
*Melanelixia glabratula*, Bruce McCune  
*Melanelixia subargentifera*, Stephen Sharnoff  
*Melanelixia subaurifera*, Stephen Sharnoff  
*Melanohalea elegantula*, Jason Hollinger  
*Melanohalea exasperata*, Christopher Quintin  
*Melanohalea exasperatula*, Jason Hollinger  
*Melanohalea halei*, Jason Hollinger  
*Melanohalea olivacea*, Kari Pihlaviita  
*Melanohalea septentrionalis*, Jim Riley  
*Melanohalea subelegantula*, Bruce McCune  
*Melanohalea subolivacea/multispora*, Jason Hollinger  
*Melanohalea trabeculata*, Sarah Friedrich  
*Menegazzia subsimilis/terebrata*, Richard Droker  
*Myelochroa aurulenta*, Jason Hollinger  
*Myelochroa galbina*, Stephen Sharnoff  
*Nephroma bellum*, Troy McMullin  
*Nephroma helveticum*, Jason Hollinger  
*Nephroma isidiosum*, Bruce McCune  
*Nephroma laevigatum*, Bruce McCune  
*Nephroma occultum*, Jim Riley  
*Nephroma parile*, Jason Hollinger  
*Nephroma resupinatum*, Jason Hollinger  
*Nephromopsis americana*, Jason Hollinger  
*Nephromopsis aurescens*, Jason Hollinger  
*Nephromopsis chlorophylla*, Jason Hollinger  
*Nephromopsis coralligera*, Jason Hollinger  
*Nephromopsis fendleri*, Jason Hollinger  
*Nephromopsis merrillii*, Jason Hollinger  
*Nephromopsis orbata*, Jason Hollinger  
*Nephromopsis sphaerosporella*, Jason Hollinger  
*Nephromopsis subalpina*, Jason Hollinger  
*Nephromopsis tuckermanii*, Stephen Sharnoff  
*Nephromopsis weberi*, Jason Hollinger  
*Niebla cephalota*, Tab Tannery  
*Nodobryoria abbreviata*, Jason Hollinger  
*Nodobryoria oregana*, Jason Hollinger  
*Pannaria conoplea*, Troy McMullin  
*Pannaria rubiginosa*, Troy McMullin  
*Pannaria tavaresii*, Jason Hollinger  
*Parmelia barrenoae*, Jason Hollinger  
*Parmelia hygrophila*, Jason Hollinger  
*Parmelia pseudosulcata*, Bruce McCune  
*Parmelia saxatilis*, Jason Hollinger  
*Parmelia squarrosa*, Jason Hollinger  
*Parmelia sulcata*, Bruce McCune  
*Parmeliella parvula*, Bruce McCune  
*Parmeliella triptophylla*, Jason Hollinger  
*Parmelina coleae*, Jason Hollinger  
*Parmeliopsis ambigua*, Jason Hollinger  
*Parmeliopsis hyperopta*, Jason Hollinger  
*Parmeliopsis subambigua*, Jason Hollinger  
*Parmotrema arnoldii*, Jason Hollinger  
*Parmotrema austrosinense*, Chris Parrish  
*Parmotrema cetratum*, Stephen Sharnoff  
*Parmotrema crinitum*, Jason Hollinger  
*Parmotrema cristiferum*, Jason Hollinger  
*Parmotrema dilatatum*, Jason Hollinger  
*Parmotrema endosulphureum*, Stephen Sharnoff  
*Parmotrema eurysacum*, Jason Hollinger  
*Parmotrema gardneri*, Jason Hollinger  
*Parmotrema hypoleucinum*, Gary Perlmutter  
*Parmotrema hypotropum*, Jim Riley  
*Parmotrema margaritatum*, Stephen Sharnoff  
*Parmotrema mellissii*, Jason Hollinger  
*Parmotrema perforatum*, Jason Hollinger  
*Parmotrema perlatum*, Bruce McCune  
*Parmotrema praesorediosum*, Troy McMullin  
*Parmotrema rampoddense*, Jason Hollinger  
*Parmotrema reticulatum*, Jason Hollinger  
*Parmotrema stuppeum*, Jason Hollinger  
*Parmotrema subsidiosum*, Jason Hollinger  
*Parmotrema submarginale*, Jason Hollinger  
*Parmotrema subrigidum*, Troy McMullin  
*Parmotrema subtinctorium*, Jason Hollinger  
*Parmotrema sulphuratum*, Jason Hollinger  
*Parmotrema tinctorum*, Jason Hollinger  
*Parmotrema ultralucens*, Vitaly Charny  
*Parmotrema xanthinum*, Jason Hollinger  
*Parmotrema zollingeri*, Jason Hollinger  
*Peltigera britannica*, Jason Hollinger  
*Peltigera collina*, Richard Droker  
*Peltigera elisabethae*, Jason Hollinger  
*Peltigera membranacea*, Jim Riley  
*Peltigera neopolydactyla*, Jason Hollinger  
*Peltigera polydactylon*, Jason Hollinger  
*Peltigera praetextata*, Jason Hollinger  
*Phaeophyscia adiastrata*, Jason Hollinger  
*Phaeophyscia ciliata*, Jason Hollinger  
*Phaeophyscia hirsuta*, Jason Hollinger  
*Phaeophyscia hirtella*, Troy McMullin  
*Phaeophyscia hispidula*, Jason Hollinger  
*Phaeophyscia insignis*, Stephen Sharnoff  
*Phaeophyscia kairamoi*, Jason Hollinger  
*Phaeophyscia nigricans*, Jason Hollinger  
*Phaeophyscia orbicularis*, Jason Hollinger  
*Phaeophyscia pusilloides*, Stephen Sharnoff  
*Phaeophyscia rubropulchra*, Jason Hollinger  
*Physcia adscendens*, Jim Riley  
*Physcia aipolia/alnophila*, Richard Droker  
*Physcia americana*, Jason Hollinger  
*Physcia biziana*, Jason Hollinger  
*Physcia caesia*, Richard Droker  
*Physcia crispa*, Jason Hollinger  
*Physcia dimidiata*, Jason Hollinger



- Physcia dubia*, Jason Hollinger  
*Physcia leptalea*, Zaca Lepista  
*Physcia millegrana*, Jason Hollinger  
*Physcia neogaea*, Jason Hollinger  
*Physcia solediosa*, Stephen Sharnoff  
*Physcia stellaris*, Jason Hollinger  
*Physcia tenella*, Richard Droker  
*Physcia undulata*, Jason Hollinger  
*Physciella chloantha*, Andrew Khitsun  
*Physciella melanchra*, Andrew Khitsun  
*Physconia americana*, Stephen Sharnoff  
*Physconia californica*, Jason Hollinger  
*Physconia detersa*, Chris Parrish  
*Physconia elegantula*, Stephen Sharnoff  
*Physconia enteroxantha*, Jason Hollinger  
*Physconia fallax*, Jason Hollinger  
*Physconia isidiigera*, Jason Hollinger  
*Physconia leucoleiptes*, Andrew Khitsun  
*Physconia perisidiosa*, Jason Hollinger  
*Platismatia glauca*, Jason Hollinger  
*Platismatia herrei*, Jason Hollinger  
*Platismatia lacunosa*, Bruce McCune  
*Platismatia norvegica*, Jason Hollinger  
*Platismatia stenophylla*, Jason Hollinger  
*Platismatia tuckermanii*, Jason Hollinger  
*Platismatia wheeleri*, Tim Wheeler  
*Pseudevernia cladonia*, Jason Hollinger  
*Pseudevernia consocians*, Jason Hollinger  
*Pseudevernia intensa*, Jason Hollinger  
*Pseudocyphellaria aurata*, Jason Hollinger  
*Pseudocyphellaria citrina group*,  
 Jason Hollinger  
*Pseudocyphellaria mallota*, Bruce McCune  
*Pseudocyphellaria rainierensis*, Jim Riley  
*Pseudoparmelia uleana*, Jason Hollinger  
*Punctelia appalachensis*, Jason Hollinger  
*Punctelia bolliana*, Andrew Khitsun  
*Punctelia borreri*, Zaca Lepista  
*Punctelia caseana*, Jason Hollinger  
*Punctelia graminicola*, Jason Hollinger  
*Punctelia hypoleucites*, Chris Parrish  
*Punctelia jeckeri*, Jason Hollinger  
*Punctelia missouriensis*, Jason Hollinger  
*Punctelia reddenda*, Jason Hollinger  
*Punctelia rudecta*, Jason Hollinger  
*Pyxine berteriana*, Jason Hollinger  
*Pyxine caesiopruinosa*, Vitaly Charny  
*Pyxine eschweileri*, Jason Hollinger  
*Pyxine solediata*, Jason Hollinger  
*Pyxine subcinerea*, Vitaly Charny  
*Ramalina americana/culbersonianorum*,  
 Jason Hollinger  
*Ramalina complanata*, Jason Hollinger  
*Ramalina dilacerata*, Jason Hollinger  
*Ramalina farinacea*, Jason Hollinger  
*Ramalina leptocarpha*, Jason Hollinger  
*Ramalina menziesii*, Jason Hollinger  
*Ramalina obtusata*, Bruce McCune  
*Ramalina pollinaria*, Jason Hollinger  
*Ramalina roesleri*, Jason Hollinger  
*Ramalina sinensis*, Sarah Jovan  
*Ramalina stenospora*, Jason Hollinger  
*Ramalina subleptocarpha*, Jason Hollinger  
*Ramalina thrausta*, Jason Hollinger  
*Ramalina willeyi*, Jason Hollinger  
*Rostania occultata*, Matthias Schultz  
*Scytinium cellulorum*, Bruce McCune  
*Scytinium lichenoides*, Jason Hollinger  
*Scytinium palmatum*, Richard Droker  
*Scytinium polycarpum*, Bruce McCune  
*Scytinium teretiusculum*, Dennis Waters  
*Sphaerophorus tuckermanii*, Jason Hollinger  
*Sphaerophorus venerabilis*, Jason Hollinger  
*Sticta beauvoisii*, Jason Hollinger  
*Sticta fuliginosa*, Richard Droker  
*Sticta limbata*, Richard Droker  
*“Sticta weigeli,”* Bruce McCune  
*Sulcaria badia*, Jim Riley  
*Sulcaria spiralifera*, Bruce McCune  
*Teloschistes chrysophthalmus*,  
 Jason Hollinger  
*Teloschistes exilis*, Stephen Sharnoff  
*Teloschistes flavicans*, Stephen Sharnoff  
*Tholurna dissimilis*, Jason Hollinger  
*Usnea cavernosa*, Jason Hollinger  
*Usnea ceratina*, Jason Hollinger  
*Usnea cornuta*, Jason Hollinger  
*Usnea dasaea*, Jason Hollinger  
*Usnea esperantiana*, Stephen Sharnoff  
*Usnea filipendula group*, Jim Riley  
*Usnea flavocardia*, Bruce McCune  
*Usnea fragilesceus*, Stephen Sharnoff  
*Usnea glabrata*, Bruce McCune  
*Usnea glabrescens/fulvoreagens*,  
 Andrew Khitsun  
*Usnea hirta*, Jason Hollinger  
*Usnea intermedia*, Stephen Sharnoff  
*Usnea lapponica*, Jason Hollinger  
*Usnea longissima*, Noah Siegel  
*Usnea merrillii*, Jason Hollinger  
*Usnea nidulans*, Bruce McCune  
*Usnea pacificana*, Bruce McCune  
*Usnea parvula*, Jason Hollinger  
*Usnea rubicunda*, Jason Hollinger  
*Usnea scabrata*, Jason Hollinger  
*Usnea silesiaca*, Stephen Sharnoff  
*Usnea strigosa*, Jason Hollinger  
*Usnea subfloridana*, Stephen Sharnoff  
*Usnea subgracilis*, Bruce McCune  
*Usnea subscabrosa*, Jason Hollinger  
*Usnea trichodea*, Jason Hollinger  
*Xanthomendoza fallax*, Andrew Khitsun  
*Xanthomendoza fulva*, Jason Hollinger  
*Xanthomendoza galericulata*, Jason Hollinger  
*Xanthomendoza hasseana*, Jason Hollinger  
*Xanthomendoza montana*, Jason Hollinger  
*Xanthomendoza oregana*, Jason Hollinger  
*Xanthomendoza ulophyllodes*,  
 Andrew Khitsun  
*Xanthoria candelaria*, Jason Hollinger  
*Xanthoria parietina*, Daryl Thompson  
*Xanthoria polycarpa*, Stephen Sharnoff  
*Xanthoria tenax*, Jason Dart

## Appendix 1: Reconciliation of Lichen Names

### Copy of the [REF\_LICHEN\_SPP\_COMMENTS] Table From the National FIA Lichens Database (Version 1.0) That Was Used to Reconcile Lichen Names for the Atlas

All applicable steps were followed unless noted otherwise in the Atlas map captions. Please note that the acceptance of new names or species concepts may lag a couple of years to ensure the new names gain wide acceptance. Longer lags are common because names are not always updated until the taxon is encountered in the field or in data analysis.

LICH\_SPPCD = Lichen species code, a unique numerical code for each lichen species name used in the program.

SPP\_ACRONYM = Species acronym, a unique three- to six-letter acronym for each lichen species used in the program.

SPP\_NAME = This field includes the full species name corresponding to LICH\_SPPCD.

YEARSTART = The year a particular SPP\_NAME was put into use.

YEAREND = The year use of that SPP\_NAME ended.

SPP\_COMMENTS = Informational comments, explanations of changes in taxonomic nomenclature between years, and actions to perform before analyzing data.

Actions are defined as:

0 = No action,

1 = Exclude for most analyses,

2 = Always combine,

3 = crossing [YEAR]' conditional combine,

4 = Subset before or after [YEAR] conditional combine,

5 = Regional conditional combine,

6 = Unique complicated combination of actions 1–5,

7 = Complicated action not definable as a combination of other action codes.

For more information on using this table, please see Jovan et. al (2020).



| LICH_SPPCD | SPP_ACRONYM | GENUS               | SPECIES                 | YEAR START | YEAR END | SPP_COMMENTS   |
|------------|-------------|---------------------|-------------------------|------------|----------|--|
| 100        | Aht         | <i>Ahitiana</i>     |                         | 1993       | 2019     | ACTION 0: 100 <i>Ahitiana</i> was renamed to 100 <i>Nephromopsis</i> (Divakar et al. 2017).  |
| 100        | Aht         | <i>Nephromopsis</i> |                         | 2019       |          | ACTION 0: 100 <i>Ahitiana</i> was renamed to 100 <i>Nephromopsis</i> (Divakar et al. 2017).  |
| 101        | Ahtsph      | <i>Ahitiana</i>     | <i>sphaerosporella</i>  | 1993       | 2019     | ACTION 0: 101 <i>Ahitiana sphaerosporella</i> was renamed to 101 <i>Nephromopsis sphaerosporella</i> (Divakar et al. 2017)   |
| 101        | Ahtsph      | <i>Nephromopsis</i> | <i>sphaerosporella</i>  | 2019       |          | ACTION 0: 101 <i>Ahitiana sphaerosporella</i> was renamed to 101 <i>Nephromopsis sphaerosporella</i> (Divakar et al. 2017)   |
| 601        | Bryabb      | <i>Bryoria</i>      | <i>abbreviata</i>       | 1993       | 1995     | ACTION 2: 601 <i>Bryoria abbreviata</i> is a synonym and should be combined with 4551 <i>Nodobryoria abbreviata</i> for all analyses.  |
| 603        | Brycap      | <i>Bryoria</i>      | <i>capillaris</i>       | 1993       |          | ACTION 0: 603 <i>Bryoria capillaris</i> includes the K- chemotype described as <i>B. pikei</i> .   |
| 606        | Brycha      | <i>Bryoria</i>      | <i>chalybeiformis</i>   | 1993       |          | ACTION 0: The name 610 <i>Bryoria fuscescens</i> was used in a broad sense for most specimens in the <i>B. fuscescens</i> complex. Only specimens which clearly fit the morphology of 606 <i>B. chalybeiformis</i> were assigned the latter name. It is debatable whether these species can be reliably differentiated, so for most studies we recommend mapping all 606 <i>B. chalybeiformis</i> under 610 <i>B. fuscescens</i> .   |
| 607        | Bryfre      | <i>Bryoria</i>      | <i>fremontii</i>        | 1993       |          | ACTION 0: 624 <i>Bryoria tortuosa</i> is considered a synonym and should be combined into 607 <i>B. fremontii</i> for all analyses (Velmala et al. 2009).  |
| 610        | Bryfus      | <i>Bryoria</i>      | <i>fuscescens</i>       | 1993       |          | ACTION 0: Western United States: The name <i>Bryoria fuscescens</i> was used in a broad sense for most specimens in the <i>B. fuscescens</i> complex. Only specimens which clearly fit the morphology of <i>B. chalybeiformis</i> or <i>B. glabra</i> were assigned one of these names. It is debatable whether these three species can be reliably differentiated, so for most studies we recommend mapping them all under 610 <i>B. fuscescens</i> . ACTION 0: All 622 <i>B. subcana</i> is considered a synonym and should be combined into 610 <i>B. fuscescens</i> for all analyses (Velmala et al. 2014). ACTION 0: All 613 <i>B. lanestris</i> is considered a synonym and should be combined into 610 <i>B. fuscescens</i> for all analyses. |
| 611        | Brygla      | <i>Bryoria</i>      | <i>glabra</i>           | 1993       |          | ACTION 0: The name <i>Bryoria fuscescens</i> was used in a broad sense for most specimens in the <i>B. fuscescens</i> complex. Only specimens which clearly fit the morphology of <i>B. glabra</i> were assigned the latter name. It is debatable whether these species can be reliably differentiated, so for most studies we recommend mapping all 611 <i>B. glabra</i> under 610 <i>B. fuscescens</i> .   |
| 613        | Brylan      | <i>Bryoria</i>      | <i>lanestris</i>        | 1993       | 2019     | ACTION 2: 613 <i>Bryoria lanestris</i> is considered a synonym and should be combined into 610 <i>B. fuscescens</i> for all analyses.  |
| 615        | Bryore      | <i>Bryoria</i>      | <i>oregana</i>          | 1993       | 1995     | ACTION 2: 615 <i>Bryoria oregana</i> is a synonym and should be combined with 4552 <i>Nodobryoria oregana</i> for all analyses.  |
| 617        | Brypcc      | <i>Bryoria</i>      | <i>pseudocapillaris</i> | 1993       | 2017     | ACTION 2: 617 <i>Bryoria pseudocapillaris</i> was renamed to 617 <i>Sulcaria spiralifera</i> (Myllys et al. 2014).   |
| 617        | Brypcc      | <i>Sulcaria</i>     | <i>spiralifera</i>      | 2017       |          | ACTION 0: 617 <i>Bryoria pseudocapillaris</i> and 621 <i>Bryoria spiralifera</i> were renamed to 617 <i>Sulcaria spiralifera</i> (Myllys et al. 2014).   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS               | SPECIES                  | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|---------------------|--------------------------|---------------|-------------|---|
| 621          | Bryspi         | <i>Bryoria</i>      | <i>spiralifera</i>       | 1993          | 2017        | ACTION 2: 621 <i>Bryoria spiralifera</i> was renamed to 617 <i>Sulcaria spiralifera</i> (Myllys et al. 2014).   |
| 622          | Brysub         | <i>Bryoria</i>      | <i>subcana</i>           | 1993          | 2017        | ACTION 2: 622 <i>Bryoria subcana</i> is considered a synonym and should be combined into 610 <i>B. fuscescens</i> for all analyses (Velmala et al. 2014).   |
| 624          | Brytor         | <i>Bryoria</i>      | <i>tortuosa</i>          | 1993          | 2014        | ACTION 2: 624 <i>Bryoria tortuosa</i> is considered a synonym and should be combined into 607 <i>B. fremontii</i> for all analyses (Velmala et al. 2009).   |
| 627          | Bryoli         | <i>Bryoria</i>      | <i>mystery olive sp.</i> | 1997          | 2010        | ACTION 1: Exclude for all analyses. Starting 2010, this species code was dropped; only a small number of records are affected. Specimens collected after 2010 are called either 608 <i>Bryoria friabilis</i> or 618 <i>B. pseudofuscescens</i> (McCune and Geiser 2009). Older specimens have not been revisited to update names. |
| 703          | Bulgoe         | <i>Bulbothrix</i>   | <i>goebelii</i>          | 1993          | 2014        | ACTION 0: 703 <i>Bulbothrix goebelii</i> was renamed to 703 <i>B. scortella</i> (Benatti & Elix 2012).  |
| 703          | Bulgoe         | <i>Bulbothrix</i>   | <i>scortella</i>         | 2014          |             | ACTION 0: 703 <i>Bulbothrix goebelii</i> was renamed to 703 <i>B. scortella</i> (Benatti & Elix 2012).  |
| 770          | Cnm            | <i>Canomaculina</i> |                          | 2002          | 2014        | ACTION 2: 770 <i>Canomaculina</i> should be combined into 5300 <i>Parmotrema</i> .  |
| 808          | Canamb         | <i>Canoparmelia</i> | <i>amabilis</i>          | 1999          | 2017        | <i>Canomaculina</i> was renamed to <i>Parmotrema</i> (Blanco et al. 2005).  |
| 850          | Cat            | <i>Catapyrenium</i> |                          | 2002          |             | ACTION 2: 808 <i>Canoparmelia amabilis</i> is considered a synonym and should be combined 802 <i>C. caroliniana</i> for all analyses (Lendemer & Ruiz 2015).  |
| 851          | Cattuc         | <i>Catapyrenium</i> | <i>tuckermanii</i>       | 2002          |             | ACTION 1: Exclude for most analyses. Squamulose growth forms were not consistently collected.   |
| 900          | Cav            | <i>Cavernularia</i> |                          | 1993          | 2014        | ACTION 1: Exclude for most analyses. Squamulose growth forms were not consistently collected.   |
| 901          | Cavhul         | <i>Cavernularia</i> | <i>hultenii</i>          | 1993          | 2014        | ACTION 2: 900 <i>Cavernularia</i> should be combined into 3100 <i>Hypogymnia</i> . <i>Cavernularia</i> was renamed to <i>Hypogymnia</i> (Miadlikowska et al. 2011).   |
| 901          | Cavhul         | <i>Hypogymnia</i>   | <i>hultenii</i>          | 2014          |             | ACTION 0: 901 <i>Cavernularia hultenii</i> was renamed to 901 <i>Hypogymnia hultenii</i> (Miadlikowska et al. 2011).  |
| 902          | Cavlop         | <i>Cavernularia</i> | <i>lophyrea</i>          | 1993          | 2014        | ACTION 0: 902 <i>Cavernularia lophyrea</i> was renamed to 902 <i>Hypogymnia lophyrea</i> (Miadlikowska et al. 2011).  |
| 902          | Cavlop         | <i>Hypogymnia</i>   | <i>lophyrea</i>          | 2014          |             | ACTION 0: 902 <i>Cavernularia lophyrea</i> was renamed to 902 <i>Hypogymnia lophyrea</i> (Miadlikowska et al. 2011).  |
| 1001         | Cetame         | <i>Cetraria</i>     | <i>americana</i>         | 1993          | 2019        | ACTION 0: 1001 <i>Cetraria americana</i> is a synonym of <i>Tuckermannopsis americana</i> . FIA never adopted the latter name due to lack of scientific consensus. This species is now named 1001 <i>Nephromopsis americana</i> (Divakar et al. 2017).  |



| LICH_SPCD | SPP_ACRONYM | GENUS               | SPECIES             | YEAR START | YEAR END | SPP_COMMENTS  |
|-----------|-------------|---------------------|---------------------|------------|----------|---|
| 1001      | Cetame      | <i>Nephromopsis</i> | <i>americana</i>    | 2019       |          | ACTION 0: 1001 <i>Cetraria americana</i> is a synonym of <i>Tuckermannopsis americana</i> . FIA never adopted the latter name due to lack of scientific consensus. This species is now named 1001 <i>Nephromopsis americana</i> (Divakar et al. 2017).  |
| 1002      | Cetaur      | <i>Cetraria</i>     | <i>aurescens</i>    | 1993       | 2019     | ACTION 0: 1002 <i>Cetraria aurescens</i> is a synonym of <i>Tuckermannopsis aurescens</i> . FIA never adopted the latter name due to lack of scientific consensus. This species is now named 1002 <i>Nephromopsis aurescens</i> (Divakar et al. 2017).  |
| 1002      | Cetaur      | <i>Nephromopsis</i> | <i>aurescens</i>    | 2019       |          | ACTION 0: 1002 <i>Cetraria aurescens</i> is a synonym of <i>Tuckermannopsis aurescens</i> . FIA never adopted the latter name due to lack of scientific consensus. This species is now named 1002 <i>Nephromopsis aurescens</i> (Divakar et al. 2017).  |
| 1003      | Cetcal      | <i>Cetraria</i>     | <i>californica</i>  | 1993       | 2019     | ACTION 0: 1003 <i>Cetraria californica</i> , <i>Kaernefeltia californica</i> , and <i>Tuckermannopsis californica</i> are all synonyms. FIA data used <i>C. californica</i> due to lack of scientific consensus. This species is newly named 1003 <i>Nephromopsis tuckermanii</i> as per taxonomic rules (Divakar et al. 2017). |
| 1003      | Cetcal      | <i>Nephromopsis</i> | <i>tuckermanii</i>  | 2019       |          | ACTION 0: 1003 <i>Cetraria californica</i> , <i>Kaernefeltia californica</i> , and <i>Tuckermannopsis californica</i> are all synonyms. FIA data used <i>C. californica</i> due to lack of scientific consensus. This species is newly named 1003 <i>Nephromopsis tuckermanii</i> as per taxonomic rules (Divakar et al. 2017). |
| 1004      | Cetcan      | <i>Cetraria</i>     | <i>canadensis</i>   | 1993       |          | ACTION 0: 8151 <i>Vulpicida canadensis</i> is a synonym (Divakar et al. 2017) and should be combined into 1004 <i>Cetraria canadensis</i> for all analyses.   |
| 1005      | Cetchl      | <i>Cetraria</i>     | <i>chlorophylla</i> | 1993       | 2019     | ACTION 0: 1005 <i>Cetraria chlorophylla</i> and <i>Tuckermannopsis chlorophylla</i> are synonyms. FIA data used <i>C. chlorophylla</i> due to lack of scientific consensus. This species is now named 1005 <i>Nephromopsis chlorophylla</i> (Divakar et al. 2017).  |
| 1005      | Cetchl      | <i>Nephromopsis</i> | <i>chlorophylla</i> | 2019       |          | ACTION 0: 1005 <i>Cetraria chlorophylla</i> and <i>Tuckermannopsis chlorophylla</i> are synonyms. FIA data used <i>C. chlorophylla</i> due to lack of scientific consensus. This species is now named 1005 <i>Nephromopsis chlorophylla</i> (Divakar et al. 2017).  |
| 1007      | Cetcor      | <i>Cetraria</i>     | <i>coralligera</i>  | 1993       | 2019     | ACTION 0: 1007 <i>Cetraria coralligera</i> and <i>Tuckermanella coralligera</i> are synonyms. FIA data used the former name due to lack of scientific consensus. This species is now named 1007 <i>Nephromopsis coralligera</i> (Divakar et al. 2017).  |
| 1007      | Cetcor      | <i>Nephromopsis</i> | <i>coralligera</i>  | 2019       |          | ACTION 0: 1007 <i>Cetraria coralligera</i> and <i>Tuckermanella coralligera</i> are synonyms. FIA data used the former name due to lack of scientific consensus. This species is now named 1007 <i>Nephromopsis coralligera</i> (Divakar et al. 2017).  |
| 1008      | Cetfen      | <i>Cetraria</i>     | <i>fendleri</i>     | 1993       | 2019     | ACTION 0: 1008 <i>Cetraria fendleri</i> and <i>Tuckermanella fendleri</i> are synonyms. FIA data used the former name due to lack of scientific consensus. This species is now named 1008 <i>Nephromopsis fendleri</i> (Divakar et al. 2017).   |
| 1008      | Cetfen      | <i>Nephromopsis</i> | <i>fendleri</i>     | 2019       |          | ACTION 0: 1008 <i>Cetraria fendleri</i> and <i>Tuckermanella fendleri</i> are synonyms. FIA data used the former name due to lack of scientific consensus. This species is now named 1008 <i>Nephromopsis fendleri</i> (Divakar et al. 2017).   |
| 1009      | Cetine      | <i>Cetraria</i>     | <i>inermis</i>      | 1993       | 2019     | ACTION 0: 1009 <i>Cetraria inermis</i> was renamed to 1009 <i>Nephromopsis inermis</i> (Divakar et al. 2017).   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS               | SPECIES            | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|---------------------|--------------------|---------------|-------------|---|
| 1009         | Cetine         | <i>Nephromopsis</i> | <i>inermis</i>     | 2019          |             | ACTION 0: 1009 <i>Cetraria inermis</i> was renamed to 1009 <i>Nephromopsis inermis</i> (Divakar et al. 2017).   |
| 1010         | Cetjun         | <i>Cetraria</i>     | <i>juniperina</i>  | 1993          |             | ACTION 0: <i>Tuckermanopsis juniperina</i> is a synonym of 1010 <i>Cetraria juniperina</i> (Divakar et al. 2017) that was never adopted by FIA due to lack of scientific consensus.   |
| 1011         | Cetmer         | <i>Cetraria</i>     | <i>merrillii</i>   | 1993          | 2019        | ACTION 0: 1011 <i>Cetraria merrillii</i> , <i>Kaernefeltia merrillii</i> , and <i>Tuckermanopsis merrillii</i> are synonyms. FIA data used <i>C. merrillii</i> due to lack of scientific consensus. This species is now named 1011 <i>Nephromopsis merrillii</i> (Divakar et al. 2017). |
| 1011         | Cetmer         | <i>Nephromopsis</i> | <i>merrillii</i>   | 2019          |             | ACTION 0: 1011 <i>Cetraria merrillii</i> , <i>Kaernefeltia merrillii</i> , and <i>Tuckermanopsis merrillii</i> are synonyms. FIA data used <i>C. merrillii</i> due to lack of scientific consensus. This species is now named 1011 <i>Nephromopsis merrillii</i> (Divakar et al. 2017). |
| 1012         | Cetoak         | <i>Cetraria</i>     | <i>oakesiana</i>   | 1993          |             | ACTION 0: 1012 <i>Cetraria oakesiana</i> was renamed to 1012 <i>Usnocetraria oakesiana</i> (Thell et al. 2009), then renamed back to <i>Cetraria oakesiana</i> (Divakar et al. 2017).   |
| 1012         | Cetoak         | <i>Usnocetraria</i> | <i>oakesiana</i>   | 2014          | 2019        | ACTION 0: 1012 <i>Cetraria oakesiana</i> was renamed to 1012 <i>Usnocetraria oakesiana</i> (Thell et al. 2009), then renamed back to <i>Cetraria oakesiana</i> (Divakar et al. 2017).   |
| 1013         | Cetorb         | <i>Cetraria</i>     | <i>orbata</i>      | 1993          | 2019        | ACTION 0: 1013 <i>Cetraria orbata</i> is a synonym of <i>Tuckermanopsis orbata</i> . FIA data used <i>C. orbata</i> due to lack of scientific consensus. This species is now named 1013 <i>Nephromopsis orbata</i> (Divakar et al. 2017).   |
| 1013         | Cetorb         | <i>Nephromopsis</i> | <i>orbata</i>      | 2019          |             | ACTION 0: 1013 <i>Cetraria orbata</i> is a synonym of <i>Tuckermanopsis orbata</i> . FIA data used <i>C. orbata</i> due to lack of scientific consensus. This species is now named 1013 <i>Nephromopsis orbata</i> (Divakar et al. 2017).   |
| 1014         | Cetpal         | <i>Cetraria</i>     | <i>pallidula</i>   | 1993          |             | ACTION 0: <i>Ahitiana pallidula</i> is a synonym of 1014 <i>Cetraria pallidula</i> (Divakar et al. 2017).   |
| 1015         | Cetpin         | <i>Cetraria</i>     | <i>pinastri</i>    | 1993          |             | ACTION 0: 8152 <i>Vulpicida pinastri</i> is a synonym (Divakar et al. 2017) and should be combined into 1015 <i>Cetraria pinastri</i> for all analyses.   |
| 1016         | Cetpla         | <i>Cetraria</i>     | <i>platyphylla</i> | 1993          |             | ACTION 0: <i>Tuckermanopsis platyphylla</i> is a synonym of 1016 <i>Cetraria platyphylla</i> (Divakar et al. 2017) that was never adopted by FIA due to lack of scientific consensus.   |
| 1017         | Cetsep         | <i>Cetraria</i>     | <i>sepincola</i>   | 1993          |             | ACTION 0: <i>Tuckermanopsis sepincola</i> is a synonym of 1017 <i>Cetraria sepincola</i> (Divakar et al. 2017) that was never adopted by FIA due to lack of scientific consensus.   |
| 1019         | Cetsub         | <i>Cetraria</i>     | <i>subalpina</i>   | 1993          | 2019        | ACTION 0: 1019 <i>Cetraria subalpina</i> was renamed to 1019 <i>Nephromopsis subalpina</i> (Divakar et al. 2017).   |
| 1019         | Cetsub         | <i>Nephromopsis</i> | <i>subalpina</i>   | 2019          |             | ACTION 0: 1019 <i>Cetraria subalpina</i> was renamed to 1019 <i>Nephromopsis subalpina</i> (Divakar et al. 2017).   |
| 1020         | Cetvir         | <i>Cetraria</i>     | <i>viridis</i>     | 1993          |             | ACTION 0: 8153 <i>Vulpicida viridis</i> is a synonym (Divakar et al. 2017) and should be combined into 1020 <i>Cetraria viridis</i> for all analyses.   |
| 1021         | Cetweb         | <i>Cetraria</i>     | <i>weberi</i>      | 1993          | 2019        | ACTION 0: <i>Tuckermanella weberi</i> is a synonym of 1021 <i>Cetraria weberi</i> that was never adopted by FIA due to lack of scientific consensus. This species is now named 1021 <i>Nephromopsis weberi</i> (Divakar et al. 2017).   |



| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                 | SPECIES              | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|-----------------------|----------------------|---------------|-------------|---|
| 1021         | Cetweb         | <i>Nephromopsis</i>   | <i>weberi</i>        | 2019          |             | ACTION 0: <i>Tuckermanella weberi</i> is a synonym of 1021 <i>Cetraria weberi</i> that was never adopted by FIA due to lack of scientific consensus. This species is now named 1021 <i>Nephromopsis weberi</i> (Divakar et al. 2017).   |
| 1180         | Cld            | <i>Cladonia</i>       |                      | 2000          | 2004        | ACTION 0: Ahti and DePriest (2001) shifted all <i>Cladonia</i> species to <i>Cladonia</i> . All specimens identified as 1180 <i>Cladonia</i> were renamed to 1180 <i>Cladonia</i> -form.  |
| 1180         | Cld            | <i>Cladonia</i> -form |                      | 2004          |             | ACTION 0: If a specialist finds a small <i>Cladonia</i> -like specimen unidentifiable to species, it is placed in the 1180 <i>Cladonia</i> -form category. Ahti and DePriest (2001) shifted all <i>Cladonia</i> species to <i>Cladonia</i> .  |
| 1181         | Cldran         | <i>Cladonia</i>       | <i>rangiferina</i>   | 2000          | 2004        | ACTION 0: 1181 <i>Cladonia rangiferina</i> was renamed to 1182 <i>Cladonia rangiferina</i> (Ahti and DePriest 2001).  |
| 1181         | Cldran         | <i>Cladonia</i>       | <i>rangiferina</i>   | 2004          |             | ACTION 0: 1181 <i>Cladonia rangiferina</i> was renamed to 1181 <i>Cladonia rangiferina</i> (Ahti and DePriest 2001).  |
| 1182         | Cldarb         | <i>Cladonia</i>       | <i>arbuscula</i>     | 2003          | 2004        | ACTION 0: 1182 <i>Cladonia arbuscula</i> was renamed to 1182 <i>Cladonia arbuscula</i> (Ahti and DePriest 2001).  |
| 1182         | Cldarb         | <i>Cladonia</i>       | <i>arbuscula</i>     | 2004          |             | ACTION 0: 1182 <i>Cladonia arbuscula</i> was renamed to 1182 <i>Cladonia arbuscula</i> (Ahti and DePriest 2001).  |
| 1183         | Cldsub         | <i>Cladonia</i>       | <i>subtenuis</i>     | 2003          | 2004        | ACTION 0: 1183 <i>Cladonia subtenuis</i> was renamed to 1183 <i>Cladonia subtenuis</i> (Ahti and DePriest 2001).  |
| 1183         | Cldsub         | <i>Cladonia</i>       | <i>subtenuis</i>     | 2004          |             | ACTION 0: 1183 <i>Cladonia subtenuis</i> was renamed to 1183 <i>Cladonia subtenuis</i> (Ahti and DePriest 2001).  |
| 1200         | Cla            | <i>Cladonia</i>       |                      | 1993          |             | ACTION 0: If a specialist finds a small <i>Cladonia</i> -like specimen unidentifiable to species, it is placed in the 1180 <i>Cladonia</i> -form category. Ahti and DePriest (2001) shifted all <i>Cladonia</i> species to <i>Cladonia</i> .  |
| 1203         | Clabac         | <i>Cladonia</i>       | <i>bacillaris</i>    | 1993          |             | ACTION 0: <i>Cladonia bacillaris</i> = <i>Cladonia macilenta</i> var. <i>bacillaris</i> . The former name is retained for brevity.  |
| 1210         | Clachl         | <i>Cladonia</i>       | <i>chlorophaea</i>   | 1993          |             | ACTION 0: Species in the <i>C. chlorophaea</i> morphological group that can't be distinguished without TLC are recorded as 1210 <i>C. chlorophaea</i> .   |
| 1211         | Clacon         | <i>Cladonia</i>       | <i>coniocraea</i>    | 1993          |             | ACTION 5/ACTION 2: WEST—1211 <i>Cladonia coniocraea</i> should be combined into 1228 <i>C. ochrochlora</i> . EAST—1228 <i>C. ochrochlora</i> should be combined into 1211 <i>C. coniocraea</i> , which is the more common taxon in the East. See (Pino-Bodas et al. 2011)— <i>C. ochrochlora</i> and <i>C. coniocraea</i> may be conspecific. |
| 1220         | Clagra         | <i>Cladonia</i>       | <i>grayi</i>         | 1993          |             | ACTION 0: This name was assigned when UV testing or TLC distinguished it from the rest of the <i>C. chlorophaea</i> morphological group.  |
| 1228         | Claoch         | <i>Cladonia</i>       | <i>ochrochlora</i>   | 1993          |             | ACTION 5/ACTION 2: WEST—1211 <i>Cladonia coniocraea</i> should be combined into 1228 <i>C. ochrochlora</i> . EAST—1228 <i>C. ochrochlora</i> should be combined into 1211 <i>C. coniocraea</i> , which is the more common taxon in the East. See (Pino-Bodas et al. 2011)— <i>C. ochrochlora</i> and <i>C. coniocraea</i> may be conspecific. |
| 1403         | Colcon         | <i>Collema</i>        | <i>conglomeratum</i> | 1993          | 2014        | ACTION 0: 1403 <i>Collema conglomeratum</i> has been renamed to 1403 <i>Enchylium conglomeratum</i> (Otálora et al. 2014).  |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                 | SPECIES              | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|-----------------------|----------------------|---------------|-------------|---|
| 1403         | Colcon         | <i>Enchylium</i>      | <i>conglomeratum</i> | 2014          |             | ACTION 0: 1403 <i>Collema conglomeratum</i> was renamed to 1403 <i>Enchylium conglomeratum</i> (Otálora et al. 2014).   |
| 1404         | Colcur         | <i>Collema</i>        | <i>curtisporum</i>   | 1993          |             | ACTION 0: <i>Collema curtisporum</i> and <i>C. nigrescens</i> are reliably separated only by observing spores in thin sections. As their geographic overlap is minimal, Pacific Northwest specimens west of the Cascades crest and in California are usually called <i>C. nigrescens</i> (McCune and Geiser 2009, Sharnoff 2014). Specimens from east of the crest, including Idaho and Montana, are called <i>C. curtisporum</i> . |
| 1412         | Colnig         | <i>Collema</i>        | <i>nigrescens</i>    | 1993          |             | ACTION 0: <i>Collema curtisporum</i> and <i>C. nigrescens</i> are reliably separated only by observing spores in thin sections. As their geographic overlap is minimal, Pacific Northwest specimens west of the Cascades crest and in California are usually called <i>C. nigrescens</i> (McCune and Geiser 2009, Sharnoff 2014). Specimens from east of the crest, including Idaho and Montana, are called <i>C. curtisporum</i> . |
| 1413         | Colocc         | <i>Collema</i>        | <i>occultatum</i>    | 1993          | 2014        | ACTION 0: 1413 <i>Collema occultatum</i> was renamed to 1413 <i>Rostania occultata</i> (Otálora et al. 2014).   |
| 1413         | Colocc         | <i>Rostania</i>       | <i>occultata</i>     | 2014          |             | ACTION 0: 1413 <i>Collema occultatum</i> was renamed to 1413 <i>Rostania occultata</i> (Otálora et al. 2014).   |
| 1600         | Deg            | <i>Degelia</i>        |                      | 1993          |             | ACTION 1: Exclude for most analyses. Placodioid growth forms were not consistently collected.   |
| 1601         | Degplu         | <i>Degelia</i>        | <i>plumbea</i>       | 1993          |             | ACTION 1: Exclude for most analyses. Placodioid growth forms were not consistently collected.   |
| 2501         | Evsat          | <i>Everniastrum</i>   | <i>catawbiense</i>   | 1993          | 2014        | ACTION 0: 2501 <i>Everniastrum catawbiense</i> was renamed to 2501 <i>Hypotrachyna catawbiensis</i> (Divakar et al. 2013).  |
| 2501         | Evsat          | <i>Hypotrachyna</i>   | <i>catawbiensis</i>  | 2014          |             | ACTION 0: 2501 <i>Everniastrum catawbiense</i> was renamed to 2501 <i>Hypotrachyna catawbiensis</i> (Divakar et al. 2013).  |
| 2650         | Fus            | <i>Fuscopannaria</i>  |                      | 2001          |             | ACTION 0: Crews are trained to collect this group including <i>Fuscopannaria</i> species considered squamulose to subcrustose.  |
| 2658         | Pampac         | <i>Fuscopannaria</i>  | <i>pacifica</i>      | 2001          |             | ACTION 0: Before 2001, 2658 <i>Fuscopannaria pacifica</i> in the Pacific Northwest was misidentified as 4712 <i>F. saubinetii</i> . <i>F. saubinetii</i> does not occur in the Pacific Northwest (McCune & Geiser 2009). Records of <i>F. saubinetii</i> should be changed to <i>F. pacifica</i> .  |
| 2702         | Fpufia         | <i>Flavopunctelia</i> | <i>flaventior</i>    | 1993          |             | ACTION 0: Some material is intermediate between <i>Flavopunctelia flaventior</i> and <i>F. soledica</i> (i.e. with only marginal soralia but also numerous pseudocyphellae). Starting with 1998 data, we follow Hale's heavier weighting of pseudocyphellae and class these intermediates with <i>F. flaventior</i> . For pre-1998 data, species names were assigned with heavier weighting on soralia characteristics.             |
| 2704         | Fpusor         | <i>Flavopunctelia</i> | <i>soledica</i>      | 1993          |             | ACTION 0: Some material is intermediate between <i>Flavopunctelia flaventior</i> and <i>F. soledica</i> (i.e. with only marginal soralia but also numerous pseudocyphellae). Starting with 1998 data, we follow Hale's heavier weighting of pseudocyphellae and class these intermediates with <i>F. flaventior</i> . For pre-1998 data, species names were assigned with heavier weighting on soralia characteristics.             |



| LICH_SPCD | SPP_ACRONYM | GENUS               | SPECIES                | YEAR START | YEAR END | SPP_COMMENTS  |
|-----------|-------------|---------------------|------------------------|------------|----------|---|
| 2803      | Hetbar      | <i>Heterodermia</i> | <i>barbifera</i>       | 1993       | 2009     | ACTION 2: 2803 <i>Heterodermia barbifera</i> is considered a synonym and should be combined into 2817 <i>H. podocarpa</i> (Lendemer 2009, Nash and Moberg 2002).  |
| 2817      | Hetpod      | <i>Heterodermia</i> | <i>podocarpa</i>       | 1993       |          | ACTION 0: 2803 <i>Heterodermia barbifera</i> is considered a synonym and should be combined into 2817 <i>H. podocarpa</i> (Lendemer 2009, Nash and Moberg 2002).  |
| 2901      | Hphadg      | <i>Hyperphyscia</i> | <i>adglutinata</i>     | 1993       |          | ACTION 0: For analyzing data from multiple years crossing 2012, 2904 <i>H. confusa</i> should be combined into 2901 <i>H. adglutinata</i> . 2901 <i>H. adglutinata</i> s. lat. has been shown to include two distinct species with broad overlap— <i>H. adglutinata</i> s. str. and <i>H. confusa</i> (Esslinger et al. 2012). Records for <i>H. adglutinata</i> from 2012 and prior may include some <i>H. confusa</i> .   |
| 2904      | Hphcon      | <i>Hyperphyscia</i> | <i>confusa</i>         | 2012       |          | ACTION 3: For analyzing data from multiple years crossing 2012, 2904 <i>H. confusa</i> should be combined into 2901 <i>H. adglutinata</i> . 2901 <i>H. adglutinata</i> s. lat. has been shown to include two distinct species with broad overlap— <i>H. adglutinata</i> s. str. and <i>H. confusa</i> (Esslinger et al. 2012.). Records for <i>H. adglutinata</i> from 2012 and prior may include some <i>H. confusa</i> .  |
| 3000      | Hce         | <i>Hypocenomyce</i> |                        | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3001      | Hceant      | <i>Hypocenomyce</i> | <i>anthracophila</i>   | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3002      | Hcecas      | <i>Hypocenomyce</i> | <i>castaneocinerea</i> | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3003      | Hcefri      | <i>Hypocenomyce</i> | <i>friesii</i>         | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3004      | Hceleu      | <i>Hypocenomyce</i> | <i>leucococca</i>      | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3005      | Hcepra      | <i>Hypocenomyce</i> | <i>praestabilis</i>    | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3006      | Hcesca      | <i>Hypocenomyce</i> | <i>scalaris</i>        | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3007      | Hcesor      | <i>Hypocenomyce</i> | <i>sorophora</i>       | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3008      | Hcexan      | <i>Hypocenomyce</i> | <i>xanthococca</i>     | 1993       |          | ACTION 1: Exclude for most analyses. Squamulose/crustose growth forms were not consistently collected.  |
| 3112      | Hypmet      | <i>Hypogymnia</i>   | <i>metaphysodes</i>    | 1993       |          | ACTION 5/ACTION 2: WEST outside of AK—3112 <i>Hypogymnia metaphysodes</i> should be combined into 3126 <i>H. wilfiana</i> . <i>H. metaphysodes</i> from the lower 48 are probably <i>H. wilfiana</i> but may contain some <i>H. canadensis</i> . ACTION 5/ACTION 2: ALASKA—3112 <i>H. metaphysodes</i> from Alaska should be combined into 3125 <i>H. canadensis</i> . Alaska records for <i>H. metaphysodes</i> are likely <i>H. canadensis</i> but may contain some <i>H. wilfiana</i> . True <i>H. metaphysodes</i> has not been recorded in North America (Goward et al. 2010) although the name is retained because detection in Alaska is possible. |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS               | SPECIES             | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|---------------------|---------------------|---------------|-------------|--|
| 3125         | Hypean         | <i>Hypogymnia</i>   | <i>canadensis</i>   | 2014          |             | ACTION 0: 3112 <i>Hypogymnia metaphysodes</i> from Alaska should be combined into 3125 <i>H. canadensis</i> . Alaska records for <i>H. metaphysodes</i> are likely <i>H. canadensis</i> but may contain some <i>H. wil iana</i> . True <i>H. metaphysodes</i> has not been recorded in North America (Goward et al. 2012) although the name is retained because detection in Alaska is possible. ACTION 0: 3112 <i>Hypogymnia metaphysodes</i> should be combined into 3126 <i>H. wilfiana</i> . <i>H. metaphysodes</i> from the lower 48 are probably <i>H. wilfiana</i> but may contain <i>H. canadensis</i> . |
| 3126         | Hypwil         | <i>Hypogymnia</i>   | <i>wilfiana</i>     | 2014          |             | ACTION 0: 3112 <i>H. metaphysodes</i> from Alaska should be combined into 3125 <i>H. canadensis</i> . Alaska records for <i>H. metaphysodes</i> are likely <i>H. canadensis</i> but may contain some <i>H. wil iana</i> . True <i>H. metaphysodes</i> has not been recorded in North America (Goward et al. 2012) although the name is retained because detection in Alaska is possible. ACTION 0: 3112 <i>Hypogymnia metaphysodes</i> should be combined into 3126 <i>H. wil iana</i> . <i>H. metaphysodes</i> from the lower 48 are probably <i>H. wil iana</i> but may contain <i>H. canadensis</i> .         |
| 3217         | Htrroc         | <i>Hypotrachyna</i> | <i>rockii</i>       | 1993          | 2002        | ACTION 2. Code 3217 was reassigned from <i>Hypotrachyna rockii</i> to 3217 <i>H. taylorensis</i> . All FIA specimens were reexamined and verified as <i>H. taylorensis</i> according to the treatment of Groner & Dietrich (1996) and Brodo et al. (2001).   |
| 3217         | Htrroc         | <i>Hypotrachyna</i> | <i>taylorensis</i>  | 2002          |             | ACTION 0. Code 3217 was reassigned from <i>Hypotrachyna rockii</i> to 3217 <i>H. taylorensis</i> . All FIA specimens were reexamined and verified as <i>H. taylorensis</i> according to the treatment of Groner & Dietrich (1996) and Brodo et al. (2001).   |
| 3218         | Htrsho         | <i>Hypotrachyna</i> | <i>showmanii</i>    | 1993          |             | ACTION 0: The species concept for <i>Hypotrachyna showmanii</i> changed in 2006 (Lendemer and Harris, 2006). Older specimens identified as 5103 <i>Parmelinopsis spumosa</i> were reexamined in 2006–07 and reassigned to <i>H. showmanii</i> as appropriate.  |
| 3224         | Htrafr         | <i>Hypotrachyna</i> | <i>afrorevoluta</i> | 2005          |             | ACTION 0: 3224 <i>Hypotrachyna afrorevoluta</i> was first reported in the US in 2005 by Knudsen and Lendemer. All specimens for similar species were reexamined in 2005–06. Only the few <i>H. afrorevoluta</i> specimens confirmed by Lendemer have this name.  |
| 3575         | Led            | <i>Leptogidium</i>  |                     | 2014          |             | ACTION 0: Two species in the genus 6200 <i>Polychidium</i> have been renamed to the genus 3575 <i>Leptogidium</i> (Muggia et al. 2011). Older genus-level records for <i>Polychidium</i> might include <i>Leptogidium</i> .  |
| 3606         | Lepbur         | <i>Leptogium</i>    | <i>burnetiae</i>    | 1993          | 2016        | ACTION 5/ACTION 2: EAST—3606 <i>Leptogium burnetiae</i> does not occur in North America; specimens from the East should be combined into 3619 <i>L. hirsutum</i> (Stone et al. 2016). ACTION 0: WEST—specimens are provisionally called 3606 “ <i>Leptogium hirsutum</i> ” until the correct name can be determined.   |
| 3608         | Lepcor         | <i>Leptogium</i>    | <i>corniculatum</i> | 1993          | 2014        | ACTION 0: 3608 <i>Leptogium corniculatum</i> was renamed to 3608 <i>Scytinium palmatum</i> (Ottalora et al. 2014).   |
| 3608         | Lepcor         | <i>Leptogium</i>    | <i>palmatum</i>     | 2011          | 2014        | ACTION 0: 3608 <i>Leptogium palmatum</i> was renamed to 3608 <i>Scytinium palmatum</i> (Ottalora et al. 2014).   |
| 3608         | Lepcor         | <i>Scytinium</i>    | <i>palmatum</i>     | 2014          |             | ACTION 0: 3608 <i>Leptogium corniculatum</i> was renamed to 3608 <i>Leptogium palmatum</i> which was renamed to 3608 <i>Scytinium palmatum</i> (Ottalora et al. 2014).   |



| LICH_SPCD | SPP_ACRONYM | GENUS            | SPECIES              | YEAR START | YEAR END | SPP_COMMENTS   |
|-----------|-------------|------------------|----------------------|------------|----------|--|
| 3619      | Lephir      | <i>Leptogium</i> | <i>hirsutum</i>      | 1993       |          | ACTION 0: 3606 <i>Leptogium burnetiae</i> specimens from the East should be combined into 3619 <i>L. hirsutum</i> (Stone et al. 2016).   |
| 3606      | Lepbur      | <i>Leptogium</i> | “ <i>hirsutum</i> ”  | 2016       |          | ACTION 0: WEST—3606 <i>Leptogium burnetiae</i> does not occur in North America (Stone et al. 2016). Specimens are provisionally called 3606 “ <i>Leptogium hirsutum</i> ” until the correct name can be determined.  |
| 3625      | Leplic      | <i>Leptogium</i> | <i>lichenoides</i>   | 1993       | 2014     | ACTION 0: 3625 <i>Leptogium lichenoides</i> was renamed to 3625 <i>Scytinium lichenoides</i> (Otálora et al. 2014). ACTION 0: This name is used in the broad sense and may include <i>S. californicum</i> , <i>S. pulvinatum</i> , and <i>S. intermedium</i> (McCune et al. 2014). |
| 3625      | Leplic      | <i>Scytinium</i> | <i>lichenoides</i>   | 2014       |          | ACTION 0: 3625 <i>Leptogium lichenoides</i> was renamed to 3625 <i>Scytinium lichenoides</i> (Otálora et al. 2014). ACTION 0: This name is used in the broad sense and may include <i>S. californicum</i> , <i>S. pulvinatum</i> , and <i>S. intermedium</i> (McCune et al. 2014). |
| 3631      | Lepsat      | <i>Leptogium</i> | <i>saturninum</i>    | 1993       |          | ACTION 5/ACTION 2: NORTHEAST—3631 <i>Leptogium saturninum</i> was renamed to 3645 <i>L. acadense</i> (Stone et al. 2016).  |
| 3634      | Lepten      | <i>Leptogium</i> | <i>tenuissimum</i>   | 1993       | 2014     | ACTION 0: 3634 <i>Leptogium tenuissimum</i> was renamed to 3634 <i>Scytinium tenuissimum</i> (Otálora et al. 2014).  |
| 3634      | Lepten      | <i>Scytinium</i> | <i>tenuissimum</i>   | 2014       |          | ACTION 0: 3634 <i>Leptogium tenuissimum</i> was renamed to 3634 <i>Scytinium tenuissimum</i> (Otálora et al. 2014).  |
| 3635      | Lepter      | <i>Leptogium</i> | <i>teretiusculum</i> | 1993       | 2014     | ACTION 0: 3635 <i>Leptogium teretiusculum</i> was renamed to 3635 <i>Scytinium teretiusculum</i> (Otálora et al. 2014).  |
| 3635      | Lepter      | <i>Scytinium</i> | <i>teretiusculum</i> | 2014       |          | ACTION 0: 3635 <i>Leptogium teretiusculum</i> was renamed to 3635 <i>Scytinium teretiusculum</i> (Otálora et al. 2014).  |
| 3636      | Leppol      | <i>Leptogium</i> | <i>polycarpum</i>    | 1993       | 2014     | ACTION 0: 3636 <i>Leptogium polycarpum</i> has been renamed to 3636 <i>Scytinium polycarpum</i> (Otálora et al. 2014).   |
| 3636      | Leppol      | <i>Scytinium</i> | <i>polycarpum</i>    | 2014       |          | ACTION 0: 3636 <i>Leptogium polycarpum</i> was renamed to 3636 <i>Scytinium polycarpum</i> (Otálora et al. 2014).  |
| 3638      | Lepcel      | <i>Leptogium</i> | <i>cellulosum</i>    | 1998       | 2014     | ACTION 0: 3638 <i>Leptogium cellulosum</i> was renamed to 3638 <i>Scytinium cellulosum</i> (Otálora et al. 2014).  |
| 3638      | Lepcel      | <i>Scytinium</i> | <i>cellulosum</i>    | 2014       |          | ACTION 0: 3638 <i>Leptogium cellulosum</i> was renamed to 3638 <i>Scytinium cellulosum</i> (Otálora et al. 2014).  |
| 3644      | Lepbre      | <i>Leptogium</i> | <i>brebissonii</i>   | 2006       | 2014     | ACTION 0: 3644 <i>Leptogium brebissonii</i> was renamed to 3644 <i>L. insigne</i> (Jørgensen & Tønsberg 2010).   |
| 3645      | Lepaca      | <i>Leptogium</i> | <i>acadense</i>      | 2017       |          | ACTION 5/ACTION 0: NORTHEAST—3631 <i>Leptogium saturninum</i> was renamed to 3645 <i>L. acadense</i> (Stone et al. 2016).  |
| 3701      | Letcol      | <i>Letharia</i>  | <i>columbiana</i>    | 1993       |          | ACTION 0: 3703 <i>Letharia gracilis</i> was recognized as a distinct species in 2009 by McCune and Altermann. However, <i>L. gracilis</i> is rare, making it unlikely that <i>L. columbiana</i> and <i>L. vulpina</i> collections prior to 2009 contain <i>L. gracilis</i> .       |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS              | SPECIES             | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|--------------------|---------------------|---------------|-------------|--|
| 3702         | Letvul         | <i>Letharia</i>    | <i>vulpina</i>      | 1993          |             | ACTION 0: 3703 <i>Letharia gracilis</i> was recognized as a distinct species in 2009 by McCune and Altermann. However, <i>L. gracilis</i> is rare, making it unlikely that <i>L. columbiana</i> and <i>L. vulpina</i> collections prior to 2009 contain <i>L. gracilis</i> . ACTION 0: This name is used in the broad sense and likely includes <i>L. lupina</i> (Altermann et al. 2016), which is not chemically or morphologically distinct. |
| 3703         | Letgra         | <i>Letharia</i>    | <i>gracilis</i>     | 2009          |             | ACTION 0: 3703 <i>Letharia gracilis</i> was recognized as a distinct species in 2009 by McCune and Altermann. However, <i>L. gracilis</i> is rare, making it unlikely that <i>L. columbiana</i> and <i>L. vulpina</i> collections prior to 2009 contain <i>L. gracilis</i> .   |
| 4000         | Mel            | <i>Melanelia</i>   |                     | 1993          |             | ACTION 0: Starting in 2005, specimens identified to species were assigned to either <i>Melanoelixia</i> or <i>Melanohalea</i> (Blanco et al. 2004). All specimens too small to identify to species will remain 4000 <i>Melanelia</i> sp.   |
| 4001         | Melalb         | <i>Melanelia</i>   | <i>albertana</i>    | 1993          | 2005        | ACTION 0: 4001 <i>Melanelia albertana</i> was renamed to 4001 <i>Melanelixia albertana</i> (Blanco et al. 2004).   |
| 4001         | Melalb         | <i>Melanelixia</i> | <i>albertana</i>    | 2005          |             | ACTION 0: 4001 <i>Melanelia albertana</i> was renamed to 4001 <i>Melanelixia albertana</i> (Blanco et al. 2004).   |
| 4002         | Melele         | <i>Melanelia</i>   | <i>elegantula</i>   | 1993          | 2005        | ACTION 0: 4002 <i>Melanelia elegantula</i> was renamed to 4002 <i>Melanohalea elegantula</i> (Blanco et al. 2004).   |
| 4002         | Melele         | <i>Melanohalea</i> | <i>elegantula</i>   | 2005          |             | ACTION 0: 4002 <i>Melanelia elegantula</i> was renamed to 4002 <i>Melanohalea elegantula</i> (Blanco et al. 2004).   |
| 4003         | Melexa         | <i>Melanelia</i>   | <i>exasperata</i>   | 1993          | 2005        | ACTION 0: 4003 <i>Melanelia exasperata</i> was renamed to 4003 <i>Melanohalea exasperata</i> (Blanco et al. 2004).   |
| 4003         | Melexa         | <i>Melanohalea</i> | <i>exasperata</i>   | 2005          |             | ACTION 0: 4003 <i>Melanelia exasperata</i> was renamed to 4003 <i>Melanohalea exasperata</i> (Blanco et al. 2004).   |
| 4004         | Melexl         | <i>Melanelia</i>   | <i>exasperatula</i> | 1993          | 2005        | ACTION 0: 4004 <i>Melanelia exasperatula</i> was renamed to 4004 <i>Melanohalea exasperatula</i> (Blanco et al. 2004).   |
| 4004         | Melexl         | <i>Melanohalea</i> | <i>exasperatula</i> | 2005          |             | ACTION 0: 4004 <i>Melanelia exasperatula</i> was renamed to 4004 <i>Melanohalea exasperatula</i> (Blanco et al. 2004).   |
| 4005         | Melful         | <i>Melanelia</i>   | <i>fuliginosa</i>   | 1993          | 2005        | ACTION 0: 4005 <i>Melanelia fuliginosa</i> was renamed to 4005 <i>Melanelixia fuliginosa</i> in 2005, then renamed to 4005 <i>Melanelixia glabratula</i> in 2014 (Leavitt et al. 2012).  |
| 4005         | Melful         | <i>Melanelixia</i> | <i>fuliginosa</i>   | 2005          | 2014        | ACTION 0: 4005 <i>Melanelia fuliginosa</i> was renamed to 4005 <i>Melanelixia fuliginosa</i> in 2005, then renamed to 4005 <i>Melanelixia glabratula</i> in 2014 (Leavitt et al. 2012).  |
| 4005         | Melful         | <i>Melanelixia</i> | <i>glabratula</i>   | 2014          |             | ACTION 0: 4005 <i>Melanelia fuliginosa</i> was renamed to 4005 <i>Melanelixia fuliginosa</i> in 2005, then renamed to 4005 <i>Melanelixia glabratula</i> in 2014 (Leavitt et al. 2012).  |
| 4006         | Melgla         | <i>Melanelia</i>   | <i>glabra</i>       | 1993          | 2005        | ACTION 0: 4006 <i>Melanelia glabra</i> was renamed to 4006 <i>Melanelixia glabra</i> in 2005, then renamed to 4006 <i>Melanelixia californica</i> in 2014 (Divakar et al. 2010).   |
| 4006         | Melgla         | <i>Melanelixia</i> | <i>glabra</i>       | 2005          | 2014        | ACTION 0: 4006 <i>Melanelia glabra</i> was renamed to 4006 <i>Melanelixia glabra</i> in 2005, then renamed to 4006 <i>Melanelixia californica</i> in 2014 (Divakar et al. 2010).   |
| 4006         | Melgla         | <i>Melanelixia</i> | <i>californica</i>  | 2014          |             | ACTION 0: 4006 <i>Melanelia glabra</i> was renamed to 4006 <i>Melanelixia glabra</i> in 2005, then renamed to 4006 <i>Melanelixia californica</i> in 2014 (Divakar et al. 2010).   |



| LICH_SPCD | SPP_ACRONYM | GENUS              | SPECIES                | YEAR START | YEAR END | SPP_COMMENTS  |
|-----------|-------------|--------------------|------------------------|------------|----------|---|
| 4007      | Melgld      | <i>Melanelia</i>   | <i>glabroides</i>      | 1993       | 2005     | ACTION 0: 4007 <i>Melanelia glabroides</i> was renamed to 4007 <i>Melanelixia glabroides</i> (Blanco et al. 2004).  |
| 4007      | Melgld      | <i>Melanelixia</i> | <i>glabroides</i>      | 2005       |          | ACTION 0: 4007 <i>Melanelia glabroides</i> was renamed to 4007 <i>Melanelixia glabroides</i> (Blanco et al. 2004).  |
| 4008      | Melhal      | <i>Melanelia</i>   | <i>halei</i>           | 1993       | 2005     | ACTION 0: 4008 <i>Melanelia halei</i> was renamed to 4008 <i>Melanohalea halei</i> (Blanco et al. 2004).  |
| 4008      | Melhal      | <i>Melanohalea</i> | <i>halei</i>           | 2005       |          | ACTION 0: 4008 <i>Melanelia halei</i> was renamed to 4008 <i>Melanohalea halei</i> (Blanco et al. 2004).  |
| 4009      | Melinf      | <i>Melanelia</i>   | <i>infumata</i>        | 1993       | 2005     | ACTION 0: 4009 <i>Melanelia infumata</i> was renamed to 4009 <i>Melanohalea infumata</i> (Blanco et al. 2004).  |
| 4009      | Melinf      | <i>Melanohalea</i> | <i>infumata</i>        | 2005       |          | ACTION 0: 4009 <i>Melanelia infumata</i> was renamed to 4009 <i>Melanohalea infumata</i> (Blanco et al. 2004).  |
| 4010      | Melmul      | <i>Melanelia</i>   | <i>multispora</i>      | 1993       | 2005     | ACTION 0: 4010 <i>Melanelia multispora</i> was renamed to 4010 <i>Melanohalea multispora</i> (Blanco et al. 2004).  |
| 4010      | Melmul      | <i>Melanohalea</i> | <i>multispora</i>      | 2005       |          | ACTION 0: 4010 <i>Melanelia multispora</i> was renamed to 4010 <i>Melanohalea multispora</i> (Blanco et al. 2004). ACTION 2: 4010 <i>M. multispora</i> should be combined into 4017 <i>M. subolivacea</i> for all analyses; examination of spores is not required by the FIA program. |
| 4011      | Meloli      | <i>Melanelia</i>   | <i>olivacea</i>        | 1993       | 2005     | ACTION 0: 4011 <i>Melanelia olivacea</i> was renamed to 4011 <i>Melanohalea olivacea</i> (Blanco et al. 2004).  |
| 4011      | Meloli      | <i>Melanohalea</i> | <i>olivacea</i>        | 2005       |          | ACTION 0: 4011 <i>Melanelia olivacea</i> was renamed to 4011 <i>Melanohalea olivacea</i> (Blanco et al. 2004).  |
| 4012      | Melold      | <i>Melanelia</i>   | <i>olivaceoides</i>    | 1993       | 2005     | ACTION 0: 4012 <i>Melanelia olivaceoides</i> was renamed to 4012 <i>Melanohalea olivaceoides</i> (Blanco et al. 2004).  |
| 4012      | Melold      | <i>Melanohalea</i> | <i>olivaceoides</i>    | 2005       |          | ACTION 0: 4012 <i>Melanelia olivaceoides</i> was renamed to 4012 <i>Melanohalea olivaceoides</i> (Blanco et al. 2004).  |
| 4013      | Melsep      | <i>Melanelia</i>   | <i>septentrionalis</i> | 1993       | 2005     | ACTION 0: 4013 <i>Melanelia septentrionalis</i> was renamed to 4013 <i>Melanohalea septentrionalis</i> (Blanco et al. 2004).  |
| 4013      | Melsep      | <i>Melanohalea</i> | <i>septentrionalis</i> | 2005       |          | ACTION 0: 4013 <i>Melanelia septentrionalis</i> was renamed to 4013 <i>Melanohalea septentrionalis</i> (Blanco et al. 2004).  |
| 4014      | Melsar      | <i>Melanelia</i>   | <i>subargentifera</i>  | 1993       | 2005     | ACTION 0: 4014 <i>Melanelia subargentifera</i> was renamed to 4014 <i>Melanelixia subargentifera</i> (Blanco et al. 2004).  |
| 4014      | Melsar      | <i>Melanelixia</i> | <i>subargentifera</i>  | 2005       |          | ACTION 0: 4014 <i>Melanelia subargentifera</i> was renamed to 4014 <i>Melanelixia subargentifera</i> (Blanco et al. 2004).  |
| 4015      | Melsub      | <i>Melanelia</i>   | <i>subaurifera</i>     | 1993       | 2005     | ACTION 0: 4015 <i>Melanelia subaurifera</i> was renamed to 4015 <i>Melanelixia subaurifera</i> (Blanco et al. 2004).  |
| 4015      | Melsub      | <i>Melanelixia</i> | <i>subaurifera</i>     | 2005       |          | ACTION 0: 4015 <i>Melanelia subaurifera</i> was renamed to 4015 <i>Melanelixia subaurifera</i> (Blanco et al. 2004).  |
| 4016      | Melse1      | <i>Melanelia</i>   | <i>subelegantula</i>   | 1993       | 2005     | ACTION 0: 4016 <i>Melanelia subelegantula</i> was renamed to 4016 <i>Melanohalea subelegantula</i> (Blanco et al. 2004).  |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                | SPECIES              | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|----------------------|----------------------|---------------|-------------|--|
| 4016         | Melsel         | <i>Melanohalea</i>   | <i>subelegantula</i> | 2005          |             | ACTION 0: 4016 <i>Melanetia subelegantula</i> was renamed to 4016 <i>Melanohalea subelegantula</i> (Blanco et al. 2004).   |
| 4017         | Melsol         | <i>Melanetia</i>     | <i>subolivacea</i>   | 1993          | 2005        | ACTION 0: 4017 <i>Melanetia subolivacea</i> was renamed to 4017 <i>Melanohalea subolivacea</i> (Blanco et al. 2004).   |
| 4017         | Melsol         | <i>Melanohalea</i>   | <i>subolivacea</i>   | 2005          |             | ACTION 0: 4017 <i>Melanetia subolivacea</i> was renamed to 4017 <i>Melanohalea subolivacea</i> (Blanco et al. 2004). ACTION 2: 4010 <i>Melanohalea multispora</i> should be combined into 4017 <i>M. subolivacea</i> for all analyses; examination of spores is not required by the FIA program.                 |
| 4018         | Meltra         | <i>Melanetia</i>     | <i>trabeculata</i>   | 1993          | 2005        | ACTION 0: 4018 <i>Melanetia trabeculata</i> was renamed to 4018 <i>Melanohalea trabeculata</i> (Blanco et al. 2004).   |
| 4018         | Meltra         | <i>Melanohalea</i>   | <i>trabeculata</i>   | 2005          |             | ACTION 0: 4018 <i>Melanetia trabeculata</i> was renamed to 4018 <i>Melanohalea trabeculata</i> (Blanco et al. 2004).   |
| 4101         | Menter         | <i>Menegazzia</i>    | <i>terebrata</i>     | 1993          |             | ACTION 3: For analyzing data for multiple years crossing 2009, 4101 <i>Menegazzia terebrata</i> should be combined into 4102 <i>M. subsimilis</i> . Specimens identified as <i>M. terebrata</i> before 2009 were most likely <i>M. subsimilis</i> , which is the more common species (Bjerke 2003).              |
| 4102         | Mensub         | <i>Menegazzia</i>    | <i>subsimilis</i>    | 2004          |             | ACTION 0: For analyzing data for multiple years crossing 2004, 4101 <i>Menegazzia terebrata</i> should be combined into 4102 <i>M. subsimilis</i> . Specimens identified as <i>M. terebrata</i> before 2004 were most likely <i>M. subsimilis</i> , which is the more common species (Bjerke 2003).              |
| 4551         | Nodabb         | <i>Nodobryoria</i>   | <i>abbreviata</i>    | 1995          |             | ACTION 0: 601 <i>Bryoria abbreviata</i> is a synonym and should be combined with 4551 <i>Nodobryoria abbreviata</i> for all analyses.  |
| 4552         | Nodore         | <i>Nodobryoria</i>   | <i>oregana</i>       | 1995          |             | ACTION 0: 615 <i>Bryoria oregana</i> is a synonym and should be combined with 4552 <i>Nodobryoria oregana</i> for all analyses.  |
| 4600         | Nor            | <i>Normandina</i>    |                      | 1993          |             | ACTION 1: Exclude for most analyses. Squamulose growth forms were not consistently collected.  |
| 4601         | Norpul         | <i>Normandina</i>    | <i>pulchella</i>     | 1993          |             | ACTION 1: Exclude for most analyses. Squamulose growth forms were not consistently collected.  |
| 4700         | Pan            | <i>Pannaria</i>      |                      | 1993          |             | ACTION 0: Crews are trained to collect this group, including <i>Pannaria</i> species with a squamulose growth form.  |
| 4712         | Pansau         | <i>Fuscopannaria</i> | <i>saubinetii</i>    | 2000          |             | ACTION 5/ACTION 2: WEST—Before 2001, 2658 <i>Fuscopannaria pacifica</i> in the Pacific Northwest was misidentified as 4712 <i>F. saubinetii</i> . <i>F. saubinetii</i> does not occur in the Pacific Northwest (McCune & Geiser 2009). Records of <i>F. saubinetii</i> should be changed to <i>F. pacifica</i> . |
| 4806         | Parsul         | <i>Parmelia</i>      | <i>sulcata</i>       | 1993          |             | ACTION 3: For analyzing data from multiple years crossing 2010, 4808 <i>Parmelia barrenoae</i> should be combined into 4806 <i>P. sulcata</i> . In 2010, <i>P. barrenoae</i> was split from <i>P. sulcata</i> (Hodkinson et al. 2010).   |
| 4808         | Parbar         | <i>Parmelia</i>      | <i>barrenoae</i>     | 2010          |             | ACTION 3: For analyzing data from multiple years crossing 2010, 4808 <i>Parmelia barrenoae</i> should be combined into 4806 <i>P. sulcata</i> . In 2010, <i>P. barrenoae</i> was split from <i>P. sulcata</i> (Hodkinson et al. 2010).   |



| LICH_SPCD | SPP_ACRONYM | GENUS                | SPECIES            | YEAR START | YEAR END | SPP_COMMENTS  |
|-----------|-------------|----------------------|--------------------|------------|----------|---|
| 4900      | Pil         | <i>Parmeliella</i>   |                    | 1993       |          | ACTION 0: Crews are trained to collect this group, including <i>Parmeliella</i> species with a squamulose growth form.  |
| 5001      | Pnaque      | <i>Parmelina</i>     | <i>quercina</i>    | 1993       | 2014     | ACTION 0: 5001 <i>Parmelina quercina</i> was renamed to 5001 <i>Parmelina coleae</i> (Argiello et al. 2007).  |
| 5001      | Pnaque      | <i>Parmelina</i>     | <i>coleae</i>      | 2014       |          | ACTION 0: 5001 <i>Parmelina quercina</i> was renamed to 5001 <i>Parmelina coleae</i> (Argiello et al. 2007).  |
| 5100      | Pps         | <i>Parmelinopsis</i> |                    | 1993       | 2014     | ACTION 2: The genus 5100 <i>Parmelinopsis</i> should be combined into 3299 <i>Hypotrachyna</i> (Divakar et al. 2013).   |
| 5101      | Ppshor      | <i>Parmelinopsis</i> | <i>horrescens</i>  | 1993       | 2014     | ACTION 0: 5101 <i>Parmelinopsis horrescens</i> was renamed to 5101 <i>Hypotrachyna horrescens</i> (Divakar et al. 2013).  |
| 5101      | Ppshor      | <i>Hypotrachyna</i>  | <i>horrescens</i>  | 2014       |          | ACTION 0: 5101 <i>Parmelinopsis horrescens</i> was renamed to 5101 <i>Hypotrachyna horrescens</i> (Divakar et al. 2013).  |
| 5102      | Ppsmin      | <i>Parmelinopsis</i> | <i>minarum</i>     | 1993       | 2014     | ACTION 0: 5102 <i>Parmelinopsis minarum</i> was renamed to 5102 <i>Hypotrachyna minarum</i> (Divakar et al. 2013).  |
| 5102      | Ppsmin      | <i>Hypotrachyna</i>  | <i>minarum</i>     | 2014       |          | ACTION 0: 5102 <i>Parmelinopsis minarum</i> was renamed to 5102 <i>Hypotrachyna minarum</i> (Divakar et al. 2013).  |
| 5103      | Ppsspu      | <i>Parmelinopsis</i> | <i>spumosa</i>     | 1993       | 2014     | ACTION 0: 5103 <i>Parmelinopsis spumosa</i> was renamed to 5103 <i>Hypotrachyna spumosa</i> (Divakar et al. 2013). ACTION 0: The species concept for <i>Hypotrachyna showmanii</i> changed in 2006 (Lendemer and Harris, 2006). Older specimens identified as 5103 <i>Parmelinopsis spumosa</i> were reexamined in 2006–2007 and reassigned to <i>H. showmanii</i> where appropriate. |
| 5103      | Ppsspu      | <i>Hypotrachyna</i>  | <i>spumosa</i>     | 2014       |          | ACTION 0: 5103 <i>Parmelinopsis spumosa</i> was renamed to 5103 <i>Hypotrachyna spumosa</i> (Divakar et al. 2013). ACTION 0: The species concept for <i>Hypotrachyna showmanii</i> changed in 2006 (Lendemer and Harris, 2006). Older specimens identified as 5103 <i>P. spumosa</i> were reexamined in 2006–2007 and reassigned to 3218 <i>H. showmanii</i> where appropriate.       |
| 5104      | Ppsswi      | <i>Parmelinopsis</i> | <i>swinscowii</i>  | 1993       | 2014     | ACTION 0: 5104 <i>Parmelinopsis swinscowii</i> has been renamed to 5104 <i>Hypotrachyna swinscowii</i> (Divakar et al. 2013).   |
| 5104      | Ppsswi      | <i>Hypotrachyna</i>  | <i>swinscowii</i>  | 2014       |          | ACTION 0: 5104 <i>Parmelinopsis swinscowii</i> was renamed to 5104 <i>Hypotrachyna swinscowii</i> (Divakar et al. 2013).  |
| 5300      | Pmo         | <i>Parmotrema</i>    |                    | 1993       |          | ACTION 0: 770 <i>Canomaculina</i> should be combined into 5300 <i>Parmotrema</i> . <i>Canomaculina</i> was renamed to <i>Parmotrema</i> (Blanco et al. 2005).   |
| 5303      | Pmochi      | <i>Parmotrema</i>    | <i>chinense</i>    | 1993       | 2014     | ACTION 0: 5303 <i>Parmotrema chinense</i> was renamed to 5303 <i>Parmotrema perlatum</i> (Hawksworth 2004).   |
| 5303      | Pmochi      | <i>Parmotrema</i>    | <i>perlatum</i>    | 2014       |          | ACTION 0: 5303 <i>Parmotrema chinense</i> was renamed to 5303 <i>Parmotrema perlatum</i> (Hawksworth 2004).   |
| 5304      | Pmocon      | <i>Parmotrema</i>    | <i>conferendum</i> | 1993       |          | ACTION 0: 5304 <i>Parmotrema conferendum</i> was renamed to 5304 <i>Canomaculina conferenda</i> in 2002 but was moved back to 5304 <i>Parmotrema conferendum</i> based on Blanco et al. (2005).   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS               | SPECIES              | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|---------------------|----------------------|---------------|-------------|--|
| 5304         | Pmocon         | <i>Canomaculina</i> | <i>conferenda</i>    | 2002          | 2014        | ACTION 0: 5304 <i>Parmotrema conferendum</i> was renamed to 5304 <i>Canomaculina conferenda</i> in 2002 but was moved back to 5304 <i>Parmotrema conferendum</i> based on Blanco et al. (2005).  |
| 5320         | Pmomic         | <i>Parmotrema</i>   | <i>michauxianum</i>  | 1993          | 2014        | ACTION 0: 5320 <i>Parmotrema michauxianum</i> was renamed to 5320 <i>Parmotrema submarginale</i> (Esslinger 2016).   |
| 5320         | Pmomic         | <i>Parmotrema</i>   | <i>submarginale</i>  | 2014          |             | ACTION 0: 5320 <i>Parmotrema michauxianum</i> was renamed to 5320 <i>Parmotrema submarginale</i> (Esslinger 2016).   |
| 5322         | Pmoneo         | <i>Parmotrema</i>   | <i>neotropicum</i>   | 1993          |             | ACTION 0: 5322 <i>Parmotrema neotropicum</i> was renamed to 5322 <i>Canomaculina neotropica</i> in 2002 but was moved back to 5322 <i>Parmotrema neotropicum</i> based on Blanco et al. (2005).  |
| 5322         | Pmoneo         | <i>Canomaculina</i> | <i>neotropica</i>    | 2002          | 2014        | ACTION 0: 5322 <i>Parmotrema neotropicum</i> was renamed to 5322 <i>Canomaculina neotropica</i> in 2002 but was moved back to 5322 <i>Parmotrema neotropicum</i> based on Blanco et al. (2005).  |
| 5327         | Pmorig         | <i>Parmotrema</i>   | <i>rigidum</i>       | 1993          | 2014        | ACTION 0: 5327 <i>Parmotrema rigidum</i> was renamed to 5327 <i>Parmotrema subrigidum</i> (Egan et al. 2005).  |
| 5327         | Pmorig         | <i>Parmotrema</i>   | <i>subrigidum</i>    | 2014          |             | ACTION 0: 5327 <i>Parmotrema rigidum</i> was renamed to 5327 <i>Parmotrema subrigidum</i> (Egan et al. 2005).  |
| 5330         | Pmosus         | <i>Parmotrema</i>   | <i>subsumptum</i>    | 1993          |             | ACTION 0: 5330 <i>Parmotrema subsumptum</i> was renamed to 5330 <i>Canomaculina subsumpta</i> in 2002 but was moved back to 5330 <i>Parmotrema subsumptum</i> based on Blanco et al. (2005).   |
| 5330         | Pmosus         | <i>Canomaculina</i> | <i>subsumpta</i>     | 2002          | 2014        | ACTION 0: 5330 <i>Parmotrema subsumptum</i> was renamed to 5330 <i>Canomaculina subsumpta</i> in 2002 but was moved back to 5330 <i>Parmotrema subsumptum</i> based on Blanco et al. (2005).   |
| 5331         | Pmosub         | <i>Parmotrema</i>   | <i>subtinctorium</i> | 1993          |             | ACTION 0: 5331 <i>Parmotrema subtinctorium</i> was renamed to 5331 <i>Canomaculina subtinctoria</i> in 2002 but was moved back to 5331 <i>Parmotrema subtinctorium</i> based on Blanco et al. (2005).  |
| 5331         | Pmosub         | <i>Canomaculina</i> | <i>subtinctoria</i>  | 2002          | 2014        | ACTION 0: 5331 <i>Parmotrema subtinctorium</i> was renamed to 5331 <i>Canomaculina subtinctoria</i> in 2002 but was moved back to 5331 <i>Parmotrema subtinctorium</i> based on Blanco et al. (2005).  |
| 5337         | Pmosui         | <i>Parmotrema</i>   | <i>subsidiosum</i>   | 1994          |             | ACTION 0: 7106 <i>Rimelia subsidiosa</i> should be combined into 5337 <i>Parmotrema subsidiosum</i> (Blanco et al. 2005).  |
| 5338         | Pmocet         | <i>Parmoterma</i>   | <i>ceptratum</i>     | 1994          | 2005        | ACTION 2: The name 5338 <i>Parmoterma ceptatum</i> is misspelled and should be corrected to 5338 <i>Parmotrema ceptatum</i> .  |
| 5338         | Pmocet         | <i>Parmotrema</i>   | <i>ceptratum</i>     | 2005          |             | ACTION 0: 7101 <i>Rimelia ceptata</i> should be combined into 5338 <i>Parmotrema ceptatum</i> (Blanco et al. 2005). ACTION 0: The name 5338 <i>Parmoterma ceptatum</i> has a spelling error and was corrected to 5338 <i>Parmotrema ceptatum</i> . |



| LICH<br>SPPCD | SPP<br>ACRONYM | GENUS               | SPECIES               | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|---------------|----------------|---------------------|-----------------------|---------------|-------------|---|
| 5602          | Phacer         | <i>Phaeophyscia</i> | <i>cernohorskyi</i>   | 1993          | 2003        | ACTION 2: 5602 <i>P. cernohorskyi</i> is considered a synonym and should be combined into 5605 <i>P. hirsuta</i> for all analyses (Esslinger 2004).   |
| 5605          | Phahir         | <i>Phaeophyscia</i> | <i>hirsuta</i>        | 1993          |             | ACTION 0: In arid western habitats, small specimens of 5605 <i>Phaeophyscia hirsuta</i> , 5611 <i>P. nigricans</i> , 5711 <i>Physcia dubia</i> , and 5801 <i>Physciella chloantha</i> may be morphologically indistinguishable. FIA does examine cells of the lower cortex to a limited extent in order to assign accurate abundance codes. ACTION 0: 5602 <i>P. cernohorskyi</i> is considered a synonym and should be combined into 5605 <i>P. hirsuta</i> for all analyses (Esslinger 2004). |
| 5607          | Phahis         | <i>Phaeophyscia</i> | <i>hispidula</i>      | 1993          |             | ACTION 0: 5608 <i>Phaeophyscia imbricata</i> should be combined into 5607 <i>P. hispidula</i> for all analyses (Moberg 1995).   |
| 5608          | Phaimb         | <i>Phaeophyscia</i> | <i>imbricata</i>      | 1993          | 2004        | ACTION 2: 5608 <i>Phaeophyscia imbricata</i> should be combined into 5607 <i>P. hispidula</i> for all analyses (Moberg 1995).   |
| 5611          | Phanig         | <i>Phaeophyscia</i> | <i>nigricans</i>      | 1993          |             | ACTION 0: In arid western habitats, small specimens of 5605 <i>Phaeophyscia hirsuta</i> , 5611 <i>P. nigricans</i> , 5711 <i>Physcia dubia</i> , and 5801 <i>Physciella chloantha</i> may be morphologically indistinguishable. FIA does examine cells of the lower cortex to a limited extent in order to assign accurate abundance codes.   |
| 5616          | Phaend         | <i>Phaeophyscia</i> | <i>endococcinea</i>   | 1997          | 2005        | ACTION 0: The name 5616 <i>Phaeophyscia endococcinea</i> is misspelled and should be corrected to 5616 <i>Phaeophyscia endococcina</i> .  |
| 5616          | Phaend         | <i>Phaeophyscia</i> | <i>endococcina</i>    | 2005          |             | ACTION 5/ACTION 3: WEST—for analyzing data from multiple years crossing 2005, 5616 <i>Phaeophyscia endococcina</i> should be combined into 5618 <i>P. endococcinodes</i> ; <i>P. endococcina</i> is considered different from <i>P. endococcinodes</i> but is rare in North America (Esslinger 2004). ACTION 5/ACTION 4: WEST—for analyzing data collected before 2005, 5616 <i>P. endococcina</i> should be combined into 5618 <i>P. endococcinodes</i> .                                      |
| 5618          | Phaedd         | <i>Phaeophyscia</i> | <i>endococcinodes</i> | 2005          |             | ACTION 5/ACTION 0: WEST—for analyzing data from multiple years crossing 2005, 5616 <i>Phaeophyscia endococcina</i> should be combined into 5618 <i>P. endococcinodes</i> ; <i>P. endococcina</i> is considered different from <i>P. endococcinodes</i> but is rare in North America (Esslinger 2004). ACTION 5/ACTION 0: WEST—for analyzing data collected before 2005, 5616 <i>P. endococcina</i> should be combined into 5618 <i>P. endococcinodes</i> .                                      |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS          | SPECIES            | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|----------------|--------------------|---------------|-------------|--|
| 5702         | Phyaip         | <i>Physcia</i> | <i>aipolia</i>     | 1993          |             | ACTION 0: The name <i>Physcia aipolia</i> is applied sensu lato. ACTION 0: For analyzing data for multiple years crossing 2014, 5728 <i>P. alnophila</i> should be combined into 5702 <i>P. aipolia</i> . Molecular data justify recognition of <i>P. aipolia</i> var. <i>alnophila</i> as a distinct species, <i>P. alnophila</i> (Lohlander et al. 2009). ACTION 5/ACTION 0: ALASKA—the name <i>P. alnophila</i> is applied for FIA data from Alaska without requiring TLC. ACTION 5/ACTION 0: OUTSIDE ALASKA— <i>P. alnophila</i> is applied only if identified using TLC, not normally done for FIA specimens. <i>P. alnophila</i> has a more northerly distribution than <i>P. aipolia</i> although there is consider geographic overlap in the lower 48 States and intermediate forms of these species can not be reliably separated without TLC (Brodo et al. 2013). ACTION 0: <i>P. aipolia</i> and <i>P. stellaris</i> are distinguished solely on the K reaction of the medulla; other characters are not reliably correlated with the K reaction. ACTION 0: Southeastern United States—Based on New York Botanical Garden herbarium records ( <a href="http://sweetgum.nybg.org/science/vh">http://sweetgum.nybg.org/science/vh</a> ), <i>Physcia aipolia</i> may not occur in the most Southeastern U.S. States. Reevaluation of specimens in other herbaria will be required to confirm this. See comment for <i>Physcia pumilior</i> . |
| 5705         | Phybiz         | <i>Physcia</i> | <i>biziana</i>     | 1993          |             | ACTION 0: <i>Physcia biziana</i> intergrades with <i>P. stellaris</i> , both having K- medulla. Moderately to heavily pruinose specimens with short, rounded, scalloped lobes were named <i>P. biziana</i> ; moderately pruinose specimens with narrower lobes of <i>P. aipolia</i> type were named <i>P. stellaris</i> . Specimens with little or no pruinosity were named <i>P. stellaris</i> regardless of lobe size.   |
| 5710         | Phydim         | <i>Physcia</i> | <i>dimidiata</i>   | 1993          |             | ACTION 0: For Utah and Nevada in 1999, reports of 5711 <i>Physcia dubia</i> were judged by T. Esslinger (1999) to be intermediate between <i>P. dimidiata</i> and <i>P. dubia</i> . Because the mean elevational distribution of this “species” was >1000 ft different than of <i>P. dimidiata</i> , we have retained the name <i>P. dubia</i> for these specimens pending further study.  |
| 5711         | Phydub         | <i>Physcia</i> | <i>dubia</i>       | 1993          |             | ACTION 0: For Utah and Nevada in 1999, reports of 5711 <i>Physcia dubia</i> were judged by T. Esslinger (1999) to be intermediate between <i>P. dimidiata</i> and <i>P. dubia</i> . Because the mean elevational distribution of this “species” was >1000 ft different than of <i>P. dimidiata</i> , we have retained the name <i>P. dubia</i> for these specimens pending further study. ACTION 0: In arid West habitats, small specimens of 5605 <i>Phaeophyscia hirsuta</i> , 5611 <i>P. nigricans</i> , 5711 <i>Physcia dubia</i> , and 5801 <i>Physciella chloantha</i> may be morphologically indistinguishable. FIA examines cells of the lower cortex to a limited extent in order to assign accurate abundance codes.   |
| 5720         | Phypum         | <i>Physcia</i> | <i>pumilior</i>    | 1993          |             | ACTION 0: Based on New York Botanical Garden herbarium records ( <a href="http://sweetgum.nybg.org/science/vh">http://sweetgum.nybg.org/science/vh</a> ), <i>Physcia aipolia</i> records for the most Southeastern U.S. States may actually be <i>Physcia pumilior</i> . Reevaluation of specimens in other herbaria are required to confirm this. See comment for <i>Physcia aipolia</i> .  |
| 5721         | Physe          | <i>Physcia</i> | <i>semipinnata</i> | 1993          | 2003        | ACTION 0: 5721 <i>Physcia semipinnata</i> was renamed to 5721 <i>P. leptalea</i> (Esslinger 2016).   |
| 5721         | Physe          | <i>Physcia</i> | <i>leptalea</i>    | 2003          |             | ACTION 0: 5721 <i>Physcia semipinnata</i> was renamed to 5721 <i>P. leptalea</i> (Esslinger 2016).   |



| LICH<br>SPCD | SPP<br>ACRONYM | GENUS             | SPECIES             | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|-------------------|---------------------|---------------|-------------|---|
| 5723         | Physte         | <i>Physcia</i>    | <i>stellaris</i>    | 1993          |             | ACTION 0: <i>Physcia aipolia</i> and <i>P. stellaris</i> are distinguished solely on the K reaction of the medulla; other characters are not reliably correlated with the K reaction. <i>P. biziana</i> intergrades with <i>P. stellaris</i> , both having K- medulla. Moderately pruinose specimens with short, rounded, scalloped lobes were named <i>P. biziana</i> ; moderately pruinose specimens with narrower lobes of <i>P. aipolia</i> type were named <i>P. stellaris</i> . Specimens with little or no pruinosity were named <i>P. stellaris</i> regardless of lobe size.  |
| 5728         | Phyaln         | <i>Physcia</i>    | <i>alnophila</i>    | 2014          |             | ACTION 3: For analyzing data for multiple years crossing 2014, 5728 <i>Physcia alnophila</i> should be combined into 5702 <i>P. aipolia</i> . Molecular data justify recognition of <i>P. aipolia</i> var. <i>alnophila</i> as a distinct species, <i>P. alnophila</i> (Lohlander et al. 2009). ACTION 5/<br>ACTION 0: ALASKA—the name <i>P. alnophila</i> is applied for FIA data from Alaska without requiring TLC. ACTION 5/ACTION 0: OUTSIDE ALASKA— <i>P. alnophila</i> is applied only if identified using TLC, not normally done for FIA specimens. <i>P. alnophila</i> has a more northerly distribution than <i>P. aipolia</i> although there is consider geographic overlap in the lower 48 States and intermediate forms of these species can not be reliably separated without TLC (Brodo et al. 2013). |
| 5801         | Pelchl         | <i>Physciella</i> | <i>chloantha</i>    | 1993          |             | ACTION 0: In arid West habitats, small specimens of 5605 <i>Phaeophyscia hirsuta</i> , 5611 <i>P. nigricans</i> , 5711 <i>Physcia dubia</i> , and 5801 <i>Physciella chloantha</i> may be morphologically indistinguishable. FIA examines cells of the lower cortex to a limited extent in order to assign accurate abundance codes.  |
| 5901         | Phodet         | <i>Physconia</i>  | <i>detersa</i>      | 1993          |             | ACTION 5/ACTION 3: WEST—5907 <i>Physconia isidiigera</i> , 5906 <i>P. perisidiosa</i> , and 5911 <i>P. leucoleiptes</i> were recognized for the West starting in 1998. Prior to the split these species were identified as 5901 <i>P. detersa</i> , which is rare in the West (Brodo et al. 2016). For analysis of data crossing 1998, 5901 <i>P. detersa</i> should be combined into 5906 <i>P. perisidiosa</i> , the most common species in the group. ACTION 5/ACTION 0: EAST— <i>P. detersa</i> , <i>P. isidiigera</i> , <i>P. leucoleiptes</i> , and <i>P. perisidiosa</i> have been distinguished in all inventory years.   |
| 5906         | Phoper         | <i>Physconia</i>  | <i>perisidiosa</i>  | 1993          |             | ACTION 5/ACTION 3: WEST—for analyzing data from multiple years crossing 1998, 5907 <i>Physconia isidiigera</i> and 5911 <i>P. leucoleiptes</i> should be combined into 5906 <i>P. perisidiosa</i> . See additional notes under 5901 <i>P. detersa</i> . In boreal forests, this taxon may include the rarer, similar-looking species 5920 <i>Physconia labrata</i> (Esslinger et al. 2017). See noted under <i>P. labrata</i> .   |
| 5907         | Phoisi         | <i>Physconia</i>  | <i>isidiigera</i>   | 1993          |             | ACTION 5/ACTION 3: WEST—for analyzing data from multiple years crossing 1998, 5907 <i>Physconia isidiigera</i> and 5911 <i>P. leucoleiptes</i> should be combined into 5906 <i>P. perisidiosa</i> . See additional notes under 5901 <i>P. detersa</i> .   |
| 5911         | Pholeu         | <i>Physconia</i>  | <i>leucoleiptes</i> | 1997          |             | ACTION 5/ACTION 3: WEST—for analyzing data from multiple years crossing 1998, 5907 <i>Physconia isidiigera</i> and 5911 <i>P. leucoleiptes</i> should be combined into 5906 <i>P. perisidiosa</i> . See additional notes under 5901 <i>P. detersa</i> .   |
| 5920         | Pholab         | <i>Physconia</i>  | <i>labrata</i>      | 2019          |             | ACTION 3: For all analyses crossing 2019, 5920 <i>Physconia labrata</i> should be combined into 5906 <i>P. perisidiosa</i> (Esslinger et al. 2017). ACTION 0: It's unknown whether 5920 <i>Physconia labrata</i> can be consistently differentiated by FIA crews and ID specialists. Lumping with 5906 <i>P. perisidiosa</i> should be considered for most datasets until more is known about this species.   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                    | SPECIES           | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|--------------------------|-------------------|---------------|-------------|--|
| 6101         | Plagla         | <i>Platismatia</i>       | <i>glauca</i>     | 1993          |             | ACTION 0: For analyzing data for multiple years crossing 2014, 6107 <i>Platismatia wheeleri</i> should be combined into 6101 <i>P. glauca</i> . <i>Platismatia wheeleri</i> was recognized as a distinct species by Lumbsch et al. (2011).   |
| 6107         | Plawhe         | <i>Platismatia</i>       | <i>wheeleri</i>   | 2014          |             | ACTION 3: For analyzing data for multiple years crossing 2014, 6107 <i>Platismatia wheeleri</i> should be combined into 6101 <i>P. glauca</i> . <i>Platismatia wheeleri</i> was recognized as a distinct species by Lumbsch et al. (2011).   |
| 6200         | Pol            | <i>Polychidium</i>       |                   | 1993          |             | ACTION 0: Two species in the genus 6200 <i>Polychidium</i> have been renamed to the genus 3575 <i>Leptogidium</i> (Muggia et al. 2011). Older genus-level records for <i>Polychidium</i> might include <i>Leptogidium</i> .  |
| 6201         | Polden         | <i>Polychidium</i>       | <i>dendriscum</i> | 1993          | 2014        | ACTION 0: 6201 <i>Polychidium dendriscum</i> was renamed to 6201 <i>Leptogidium dendriscum</i> (Muggia et al. 2011).   |
| 6201         | Polden         | <i>Leptogidium</i>       | <i>dendriscum</i> | 2014          |             | ACTION 0: 6201 <i>Polychidium dendriscum</i> was renamed to 6201 <i>Leptogidium dendriscum</i> (Muggia et al. 2011).   |
| 6203         | Polcon         | <i>Polychidium</i>       | <i>contortum</i>  | 1999          | 2014        | ACTION 0: 6203 <i>Polychidium contortum</i> was renamed to 6203 <i>Leptogidium contortum</i> (Muggia et al. 2011).   |
| 6203         | Polcon         | <i>Leptogidium</i>       | <i>contortum</i>  | 2014          |             | ACTION 0: 6203 <i>Polychidium contortum</i> was renamed to 6203 <i>Leptogidium contortum</i> (Muggia et al. 2011).   |
| 6250         | Pro            | <i>Protopannaria</i>     |                   | 2000          |             | ACTION 0: Crews are trained to collect this group, including <i>Protopannaria</i> species with a squamulose growth form.   |
| 6401         | Peyano         | <i>Pseudocyphellaria</i> | <i>anomala</i>    | 1993          | 2017        | ACTION 0: 6401 <i>Pseudocyphellaria anomala</i> was renamed to 6401 <i>Lobaria anomala</i> (McCune et al. 2014).   |
| 6401         | Peyano         | <i>Lobaria</i>           | <i>anomala</i>    | 2017          |             | ACTION 0: 6401 <i>Pseudocyphellaria anomala</i> was renamed to 6401 <i>Lobaria anomala</i> (McCune et al. 2014).   |
| 6402         | Peyant         | <i>Pseudocyphellaria</i> | <i>anthraspis</i> | 1993          | 2017        | ACTION 0: 6402 <i>Pseudocyphellaria anthraspis</i> was renamed to 6402 <i>Lobaria anthraspis</i> (McCune et al. 2014).   |
| 6402         | Peyant         | <i>Lobaria</i>           | <i>anthraspis</i> | 2017          |             | ACTION 0: 6402 <i>Pseudocyphellaria anthraspis</i> was renamed to 6402 <i>Lobaria anthraspis</i> (McCune et al. 2014).   |
| 6404         | Peycro         | <i>Pseudocyphellaria</i> | <i>crocata</i>    | 1993          | 2019        | ACTION 0: 6404 <i>Pseudocyphellaria crocata</i> is now recognized as a complex of several species (Lücking et al. 2017), which we renamed to 6404 <i>Pseudocyphellaria citrina</i> , the most common and widely distributed of the species. <i>P. crocata</i> is not found in North America. For records prior to 2019, the name <i>P. citrina</i> (formerly <i>P. crocata</i> ) may also include several newly described, but less common <i>Pseudocyphellaria</i> species: <i>P. holarctica</i> , <i>P. hawaiiensis</i> , <i>P. deyi</i> , <i>P. epiflavoides</i> , and <i>P. punctata</i> . |
| 6404         | Peycro         | <i>Pseudocyphellaria</i> | <i>citrina</i>    | 2019          |             | ACTION 0: 6404 <i>Pseudocyphellaria crocata</i> is now recognized as a complex of several species (Lücking et al. 2017), which we renamed to 6404 <i>Pseudocyphellaria citrina</i> , the most common and widely distributed of the species. <i>P. crocata</i> is not found in North America. For records prior to 2019, the name <i>P. citrina</i> (formerly <i>P. crocata</i> ) may also include several newly described, but less common <i>Pseudocyphellaria</i> species: <i>P. holarctica</i> , <i>P. hawaiiensis</i> , <i>P. deyi</i> , <i>P. epiflavoides</i> , and <i>P. punctata</i> . |



| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                    | SPECIES              | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|--------------------------|----------------------|---------------|-------------|---|
| 6408         | Peyper         | <i>Pseudocyphellaria</i> | <i>perpetua</i>      | 2004          | 2017        | ACTION 0: 6408 <i>Pseudocyphellaria perpetua</i> was renamed to 6408 <i>P. hawaiiensis</i> (Moncada et al. 2014). ACTION 3: For analyzing data from multiple years crossing 2019, 6408 <i>P. perpetua</i> or <i>P. hawaiiensis</i> should be combined into 6404 <i>P. citrina</i> .   |
| 6408         | Peyper         | <i>Pseudocyphellaria</i> | <i>hawaiiensis</i>   | 2017          |             | ACTION 0: 6408 <i>Pseudocyphellaria perpetua</i> was renamed to 6408 <i>P. hawaiiensis</i> (Moncada et al. 2014). ACTION 3: For analyzing data from multiple years crossing 2019, 6408 <i>P. perpetua</i> or <i>P. hawaiiensis</i> should be combined into 6404 <i>P. citrina</i> .   |
| 6409         | Peydey         | <i>Pseudocyphellaria</i> | <i>deyi</i>          | 2019          |             | ACTION 3: For analyzing data from multiple years crossing 2019, 6409 <i>Pseudocyphellaria deyi</i> should be combined with 6404 <i>P. citrina</i> .   |
| 6410         | Peyepi         | <i>Pseudocyphellaria</i> | <i>epiflavoides</i>  | 2019          |             | ACTION 3: For analyzing data from multiple years crossing 2019, 6410 <i>Pseudocyphellaria epiflavoides</i> should be combined with 6404 <i>P. citrina</i> .   |
| 6411         | Peyhol         | <i>Pseudocyphellaria</i> | <i>holarctica</i>    | 2019          |             | ACTION 3: For analyzing data from multiple years crossing 2019, 6411 <i>Pseudocyphellaria holarctica</i> should be combined with 6404 <i>P. citrina</i> .   |
| 6412         | Peypun         | <i>Pseudocyphellaria</i> | <i>punctata</i>      | 2019          |             | ACTION 3: For analyzing data from multiple years crossing 2019, 6412 <i>Pseudocyphellaria punctata</i> should be combined with 6404 <i>P. citrina</i> .   |
| 6501         | Ppasph         | <i>Pseudoparmelia</i>    | <i>sphaerospora</i>  | 1993          | 2006        | ACTION 0: 6501 <i>Pseudoparmelia sphaerospora</i> was renamed to 6501 <i>Pseudoparmelia uleana</i> (Esslinger 2016).  |
| 6501         | Ppasph         | <i>Pseudoparmelia</i>    | <i>uleana</i>        | 2006          |             | ACTION 0: 6501 <i>Pseudoparmelia sphaerospora</i> was renamed to 6501 <i>Pseudoparmelia uleana</i> (Esslinger 2016).  |
| 6600         | Pso            | <i>Psoroma</i>           |                      | 1993          |             | ACTION 1: Exclude for most analyses. Squamulose and crustose growth forms were not consistently collected.  |
| 6601         | Psohyp         | <i>Psoroma</i>           | <i>hypnorum</i>      | 1993          |             | ACTION 1: Exclude for most analyses. Squamulose and crustose growth forms were not consistently collected.  |
| 6705         | Punmis         | <i>Punctelia</i>         | <i>missouriensis</i> | 1993          |             | ACTION 0: 6712 <i>Punctelia punctilla</i> should be combined into 6705 <i>P. missouriensis</i> for all analyses. <i>P. missouriensis</i> is the correct name for this taxon (Aptroot 2003, Lendemer & Hodgkinson 2010).   |
| 6706         | Punper         | <i>Punctelia</i>         | <i>perreticulata</i> | 1993          |             | ACTION 0: Lendemer & Hodgkinson (2010) narrowed the species concept for <i>P. perreticulata</i> . ACTION 5/ACTION 2: WEST—6706 <i>P. perreticulata</i> should be combined into 6714 <i>P. jeckeri</i> for all analyses. ACTION 5/ACTION 4: EAST—for data collected before 2010, combine 6706 <i>P. perreticulata</i> into 6713 <i>P. caseana</i> for all analyses. It is likely that eastern specimens collected outside the Ozarks are <i>P. caseana</i> . |
| 6709         | Punsem         | <i>Punctelia</i>         | <i>semansiana</i>    | 1993          | 2014        | ACTION 0: 6709 <i>Punctelia semansiana</i> was renamed to 6709 <i>Punctelia graminicola</i> (Egan 2003).  |
| 6709         | Punsem         | <i>Punctelia</i>         | <i>graminicola</i>   | 2014          |             | ACTION 0: 6709 <i>Punctelia semansiana</i> was renamed to 6709 <i>Punctelia graminicola</i> (Egan 2003).  |
| 6711         | Punsub         | <i>Punctelia</i>         | <i>subrudecta</i>    | 1993          | 2010        | ACTION 0: <i>Punctelia subrudecta</i> is no longer a valid name for U.S. specimens (Lendemer & Hodgkinson 2010). ACTION 5/ACTION 2: EAST—6711 <i>Punctelia subrudecta</i> should be combined into 6712 <i>P. caseana</i> for all analyses. ACTION 5/ACTION 2: WEST—6711 <i>P. subrudecta</i> should be combined into 6713 <i>P. jeckeri</i> for all analyses.   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS            | SPECIES               | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|------------------|-----------------------|---------------|-------------|--|
| 6712         | Punpun         | <i>Punctelia</i> | <i>punctilla</i>      | 2000          | 2003        | ACTION 2: 6712 <i>Punctelia punctilla</i> should be combined into 6705 <i>P. missouriensis</i> for all analyses. <i>P. missouriensis</i> is the correct name for this taxon (Aprout 2003, Lendemer & Hodgkinson 2010).   |
| 6713         | Puncas         | <i>Punctelia</i> | <i>caseana</i>        | 2010          |             | ACTION 5/ACTION 0: EAST—6711 <i>Punctelia subrudecta</i> should be combined into 6713 <i>P. caseana</i> for all analyses. This treatment follows Lendemer & Hodgkinson (2010). ACTION 5/ACTION 0: EAST—for data collected before 2010, combine 6706 <i>P. perreticulata</i> into 6713 <i>P. caseana</i> for all analyses. Lendemer & Hodgkinson (2010) narrowed the species concept for <i>P. perreticulata</i> , making it likely that specimens collected outside the Ozarks are <i>P. caseana</i> . |
| 6714         | Punjec         | <i>Punctelia</i> | <i>jeckeri</i>        | 2010          |             | ACTION 5/ACTION 0: WEST—6711 <i>Punctelia subrudecta</i> is no longer a valid name for U.S. specimens (Lendemer & Hodgkinson 2010). Records should be combined into 6714 <i>P. jeckeri</i> for all analyses. ACTION 5/ACTION 0: WEST—6706 <i>P. perreticulata</i> has a narrow distribution in the West. It should be combined into 6713 <i>P. jeckeri</i> for all analyses (Lendemer & Hodgkinson 2010).  |
| 6801         | Pyxalb         | <i>Pyxine</i>    | <i>albovirens</i>     | 1993          |             | ACTION 5/ACTION 0: Southern (S) FIA Region—The names 6801 <i>Pyxine albovirens</i> , 6803 <i>P. caesiopruinosa</i> , and 6809 <i>P. subcinerea</i> may have been misapplied in early years in the Southeast. ACTION 5/ACTION 4: For any analysis including Southern data collected in 1999 or prior, <i>P. albovirens</i> and <i>P. caesiopruinosa</i> should be combined into <i>P. subcinerea</i> .  |
| 6803         | Pyxcae         | <i>Pyxine</i>    | <i>caesiopruinosa</i> | 1993          |             | ACTION 5/ACTION 0: Southern (S) FIA Region—The names 6801 <i>Pyxine albovirens</i> , 6803 <i>P. caesiopruinosa</i> , and 6809 <i>P. subcinerea</i> may have been misapplied in early years in the Southeast. ACTION 5/ACTION 4: For any analysis including Southern data collected in 1999 or prior, <i>P. albovirens</i> and <i>P. caesiopruinosa</i> should be combined into <i>P. subcinerea</i> .  |
| 6809         | Pyxsub         | <i>Pyxine</i>    | <i>subcinerea</i>     | 1993          |             | ACTION 5/ACTION 0: Southern (S) FIA Region—The names 6801 <i>Pyxine albovirens</i> , 6803 <i>P. caesiopruinosa</i> , and 6809 <i>P. subcinerea</i> may have been misapplied in early years in the Southeast. ACTION 5/ACTION 0: For any analysis including Southern data collected in 1999 or prior, <i>P. albovirens</i> and <i>P. caesiopruinosa</i> should be combined into <i>P. subcinerea</i> .  |
| 6901         | Ramame         | <i>Ramalina</i>  | <i>americana</i>      | 1993          |             | ACTION 0: LaGreca (1999) segregated 6941 <i>Ramalina culbersoniorum</i> from 6901 <i>R. americana</i> . It does not appear possible to distinguish the two taxa without TLC; specimens were only called <i>R. culbersoniorum</i> if TLC was used to confirm identification.  |
| 6912         | Ramfar         | <i>Ramalina</i>  | <i>farinacea</i>      | 1993          |             | ACTION 0: The name 6912 <i>Ramalina farinacea</i> may be occasionally misapplied to pollution-stunted or tiny specimens of 6934 <i>R. subleptocarpha</i> as their morphology becomes convergent when stressed.   |
| 6934         | Ramsle         | <i>Ramalina</i>  | <i>subleptocarpha</i> | 1993          |             | ACTION 0: The name 6912 <i>Ramalina farinacea</i> may be occasionally misapplied to pollution-stunted or tiny specimens of 6934 <i>R. subleptocarpha</i> as their morphology becomes convergent when stressed.   |



| LICH_SPCD | SPP_ACRONYM | GENUS                | SPECIES               | YEAR START | YEAR END | SPP_COMMENTS  |
|-----------|-------------|----------------------|-----------------------|------------|----------|---|
| 6941      | Ramcul      | <i>Ramalina</i>      | <i>culbersoniorum</i> | 1999       |          | ACTION 0: LaGreca (1999) segregated 6941 <i>Ramalina culbersoniorum</i> from 6901 <i>R. americana</i> . It does not appear possible to distinguish the two taxa without TLC; specimens were only called <i>R. culbersoniorum</i> if TLC was used to confirm identification.   |
| 7100      | Rim         | <i>Rimelia</i>       |                       | 1993       | 2014     | ACTION 0: 7100 <i>Rimelia</i> was renamed to 5300 <i>Parmotrema</i> (Blanco et al. 2005).   |
| 7101      | Rimcet      | <i>Rimelia</i>       | <i>ceptrata</i>       | 1993       | 2014     | ACTION 2: 7101 <i>Rimelia ceptrata</i> should be combined into 5338 <i>Parmotrema ceptratum</i> (Blanco et al. 2005).   |
| 7102      | Rimcom      | <i>Rimelia</i>       | <i>commensurata</i>   | 1993       | 2014     | ACTION 0: 7102 <i>Rimelia commensurata</i> was renamed to 7102 <i>Parmotrema commensuratum</i> (Blanco et al. 2005).  |
| 7102      | Rimcom      | <i>Parmotrema</i>    | <i>commensuratum</i>  | 2014       |          | ACTION 0: 7102 <i>Rimelia commensurata</i> was renamed to 7102 <i>Parmotrema commensuratum</i> (Blanco et al. 2005).  |
| 7103      | Rimdif      | <i>Rimelia</i>       | <i>diffractaica</i>   | 1993       | 2014     | ACTION 0: 7103 <i>Rimelia diffractaica</i> was renamed to 7103 <i>Parmotrema diffractaicum</i> (Blanco et al. 2005).  |
| 7103      | Rimdif      | <i>Parmotrema</i>    | <i>diffractaicum</i>  | 2014       |          | ACTION 0: 7103 <i>Rimelia diffractaica</i> was renamed to 7103 <i>Parmotrema diffractaicum</i> (Blanco et al. 2005).  |
| 7104      | Rimret      | <i>Rimelia</i>       | <i>reticulata</i>     | 1993       | 2014     | ACTION 0: 7104 <i>Rimelia reticulata</i> was renamed to 7104 <i>Parmotrema reticulatum</i> (Blanco et al. 2005).  |
| 7104      | Rimret      | <i>Parmotrema</i>    | <i>reticulatum</i>    | 2014       |          | ACTION 0: 7104 <i>Rimelia reticulata</i> was renamed to 7104 <i>Parmotrema reticulatum</i> (Blanco et al. 2005).  |
| 7105      | Rimsim      | <i>Rimelia</i>       | <i>simulans</i>       | 1993       | 2014     | ACTION 0: 7105 <i>Rimelia simulans</i> was renamed to 7105 <i>Parmotrema simulans</i> (Blanco et al. 2005).   |
| 7105      | Rimsim      | <i>Parmotrema</i>    | <i>simulans</i>       | 2014       |          | ACTION 0: 7105 <i>Rimelia simulans</i> was renamed to 7105 <i>Parmotrema simulans</i> (Blanco et al. 2005).   |
| 7106      | Rimsub      | <i>Rimelia</i>       | <i>subisidiosa</i>    | 1993       | 2014     | ACTION 2: 7106 <i>Rimelia subisidiosa</i> should be combined into 5337 <i>Parmotrema subisidiosum</i> (Blanco et al. 2005).   |
| 7400      | Sph         | <i>Sphaerophorus</i> |                       | 1993       |          | ACTION 0: <i>Sphaerophorus globosus</i> was split into <i>S. tuckermanii</i> and <i>S. venerabilis</i> by Wedin et al. (2009) and <i>S. globosus</i> is no longer considered a valid name for epiphytic <i>Sphaerophorus</i> in North America. ACTION 0: For analyses crossing 2009 combine 7402 <i>S. globosus</i> , 7405 <i>S. tuckermanii</i> , and 7406 <i>S. venerabilis</i> into 7400 <i>Sphaerophorus</i> . ACTION 4: For analysis of data before 2009 combine all records of 7402 <i>S. globosus</i> into 7400 <i>Sphaerophorus</i> sp. |
| 7402      | Sphglo      | <i>Sphaerophorus</i> | <i>globosus</i>       | 1993       | 2009     | ACTION 2: Always combine 7402 <i>S. globosus</i> into 7400 <i>Sphaerophorus</i> . <i>Sphaerophorus globosus</i> was split into <i>S. tuckermanii</i> and <i>S. venerabilis</i> by Wedin et al. (2009). <i>Sphaerophorus globosus</i> is no longer considered a valid name for epiphytic <i>Sphaerophorus</i> in North America.  |
| 7403      | Sphmel      | <i>Sphaerophorus</i> | <i>melanocarpus</i>   | 1993       | 2006     | ACTION 0: 7403 <i>Sphaerophorus melanocarpus</i> was renamed to 7403 <i>Bunodophoron melanocarpum</i> (Wedin 1995).   |
| 7403      | Sphmel      | <i>Bunodophoron</i>  | <i>melanocarpum</i>   | 2006       |          | ACTION 0: 7403 <i>Sphaerophorus melanocarpus</i> was renamed to 7403 <i>Bunodophoron melanocarpum</i> (Wedin 1995).   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                | SPECIES             | YEAR<br>START | YEAR<br>END | SPP_COMMENTS  |
|--------------|----------------|----------------------|---------------------|---------------|-------------|---|
| 7405         | Sptuc          | <i>Sphaerophorus</i> | <i>tuckermanii</i>  | 2009          |             | ACTION 3: For analyses crossing 2009 combine 7402 <i>Sphaerophorus globosus</i> , 7405 <i>S. tuckermanii</i> , and 7406 <i>S. venerabilis</i> into 7400 <i>Sphaerophorus</i> . <i>Sphaerophorus globosus</i> was split into <i>S. tuckermanii</i> and <i>S. venerabilis</i> in 2009 (Wedin et al.).   |
| 7406         | Sphven         | <i>Sphaerophorus</i> | <i>venerabilis</i>  | 2009          |             | ACTION 3: For analyses crossing 2009 combine 7402 <i>Sphaerophorus globosus</i> , 7405 <i>S. tuckermanii</i> , and 7406 <i>S. venerabilis</i> into 7400 <i>Sphaerophorus</i> . <i>Sphaerophorus globosus</i> was split into <i>S. tuckermanii</i> and <i>S. venerabilis</i> in 2009 (Wedin et al.).   |
| 7450         | Ste            | <i>Stereocaulon</i>  |                     | 2007          |             | ACTION 0: Most <i>Stereocaulon</i> species need TLC to confirm identification, so specimens are recorded by genus only.   |
| 7501         | Stibea         | <i>Sticta</i>        | <i>beauvoisii</i>   | 1993          |             | ACTION 5/ACTION 0: EAST—7505 <i>Sticta weigeltii</i> should be combined into 7501 <i>S. beauvoisii</i> . <i>S. weigeltii</i> is considered a misidentification for North America (Brodo et al. 2001). ACTION 5/ACTION 0: EAST—For analyzing data from multiple years crossing 2004, 7505 <i>S. carolinensis</i> and 7508 <i>S. fragilinata</i> should be combined into 7501 <i>S. beauvoisii</i> . The latter two species were described in 2003 by McDonald et al.                 |
| 7505         | Stiwei         | <i>Sticta</i>        | <i>weigeltii</i>    | 1993          |             | ACTION 5/ACTION 2: EAST—7505 <i>Sticta weigeltii</i> should be combined into 7501 <i>S. beauvoisii</i> . <i>S. weigeltii</i> is considered a misidentification for the United States. (Brodo et al. 2001). ACTION 5/ACTION 0: WEST—7505 <i>S. weigeltii</i> is undergoing taxonomic revision; for now we use the name for western specimens in a broad sense (McCune and Geiser 2009).  |
| 7507         | Sticar         | <i>Sticta</i>        | <i>carolinensis</i> | 2004          |             | ACTION 3: For analyzing data from multiple years crossing 2004, 7505 <i>Sticta carolinensis</i> and 7508 <i>S. fragilinata</i> should be combined into 7501 <i>S. beauvoisii</i> . These species were first described in 2003 by McDonald et al.  |
| 7508         | Stifra         | <i>Sticta</i>        | <i>fragilinata</i>  | 2004          |             | ACTION 3: For analyzing data from multiple years crossing 2004, 7505 <i>Sticta carolinensis</i> and 7508 <i>S. fragilinata</i> should be combined into 7501 <i>S. beauvoisii</i> . These species were first described in 2003 by McDonald et al.  |
| 7921         | Tucari         | <i>Tuckermanella</i> | <i>arizonica</i>    | 2003          | 2019        | ACTION 0: Although FIA did not adopt several genus names split from <i>Cetraria</i> ( <i>Kaernefeltia</i> , <i>Tuckermanella</i> , <i>Tuckermannopsis</i> ), the names 7921 <i>Tuckermanella arizonica</i> and 7922 <i>T. pseudoweberi</i> were special cases because these species had only been described in <i>Tuckermanella</i> (Esslinger 2003). 7921 <i>Tuckermanella arizonica</i> has since been renamed to 7921 <i>Nephromopsis arizonica</i> (Divakar et al. 2017).       |
| 7921         | Tucari         | <i>Nephromopsis</i>  | <i>arizonica</i>    | 2019          |             | ACTION 0: Although FIA did not adopt several genus names split from <i>Cetraria</i> ( <i>Kaernefeltia</i> , <i>Tuckermanella</i> , <i>Tuckermannopsis</i> ), the names 7921 <i>Tuckermanella arizonica</i> and 7922 <i>T. pseudoweberi</i> were special cases because these species had only been described in <i>Tuckermanella</i> (Esslinger 2003). 7921 <i>Tuckermanella arizonica</i> has since been renamed to 7921 <i>Nephromopsis arizonica</i> .                            |
| 7922         | Tucpse         | <i>Tuckermanella</i> | <i>pseudoweberi</i> | 2003          | 2019        | ACTION 0: Although FIA did not adopt several genus names split from <i>Cetraria</i> ( <i>Kaernefeltia</i> , <i>Tuckermanella</i> , <i>Tuckermannopsis</i> ), the names 7921 <i>Tuckermanella arizonica</i> and 7922 <i>T. pseudoweberi</i> were special cases because these species had only been described in <i>Tuckermanella</i> (Esslinger 2003). 7922 <i>Tuckermanella pseudoweberi</i> has since been renamed to 7922 <i>Nephromopsis pseudoweberi</i> (Divakar et al. 2017). |



| LICH<br>SPPCD | SPP<br>ACRONYM | GENUS               | SPECIES             | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|---------------|----------------|---------------------|---------------------|---------------|-------------|--|
| 7922          | Tucpse         | <i>Nephromopsis</i> | <i>pseudoweberi</i> | 2019          |             | ACTION 0: Although FIA did not adopt several genus names split from <i>Cetraria</i> ( <i>Kaernefeltia</i> , <i>Tuckermanella</i> , <i>Tuckermannopsis</i> ), the names 7921 <i>Tuckermanella arizonica</i> and 7922 <i>T. pseudoweberi</i> were special cases because these species had only been described in <i>Tuckermanella</i> (Esslinger 2003). 7922 <i>Tuckermanella pseudoweberi</i> has since been renamed to 7922 <i>Nephromopsis pseudoweberi</i> (Divakar et al. 2017).  |
| 8000          | Usn            | <i>Usnea</i>        |                     | 1993          |             | ACTION 0: <i>Usnea</i> is a difficult genus that is continually undergoing taxonomic change. Over time, the FIA strategy has shifted towards lumping poorly resolved or cryptic “species” into groups (e.g. <i>Usnea filipendula</i> group) with common ranges and morphological characteristics. ACTION 0: For analyzing any data collected before 2000, 8023 <i>Usnea diplotypus</i> should be combined into 8000 <i>Usnea</i> . The name <i>U. diplotypus</i> was applied widely in the Pacific Northwest and California in 1998–1999 as per concepts in McCune and Geiser (1997). In 2000, based on considerable progress in <i>Usnea</i> , this name was considered to be incorrectly applied in previous years. In 2000 and beyond, the name <i>U. diplotypus</i> is only used for specimens identified with TLC. ACTION 5/<br>ACTION 0: WEST—For analyzing data from multiple years crossing 2000, 8014 <i>U. ceratina</i> should be combined into 8000 <i>Usnea</i> . This name was first applied in the West in 2000 data where it was most likely classified in previous years as <i>Usnea</i> sp. ACTION5/<br>ACTION 0: EAST—This taxon was used broadly to include all specimens that could not be positively identified to species. |
| 8007          | Usnari         | <i>Usnea</i>        | <i>arizonica</i>    | 1993          | 2010        | ACTION 2: 8007 <i>Usnea arizonica</i> should be combined into 8042 <i>U. intermedia</i> for all analyses. These species were synonymized by Clerc (2007). ACTION 0: According to Marks et al. (2016), <i>U. intermedia</i> is likely a fertile form of 8044 <i>U. lapponica</i> , although we retain the former name until further work confirms this.   |
| 8014          | Usnceer        | <i>Usnea</i>        | <i>ceratina</i>     | 1993          |             | ACTION 5/ACTION 3: WEST—For analyzing data from multiple years crossing 2000, 8014 <i>Usnea ceratina</i> should be combined into 8000 <i>Usnea</i> . This name was first applied in the West in 2000 data where it was most likely classified in previous years as <i>Usnea</i> sp.  |
| 8016          | Usncir         | <i>Usnea</i>        | <i>cirrosa</i>      | 1993          |             | ACTION 3: For analyzing data from multiple years crossing 2010, 8016 <i>Usnea cirrosa</i> should be combined into 8061 <i>U. parvula</i> . 8095 <i>U. parvula</i> was segregated from 8016 <i>U. cirrosa</i> by Clerc (2007).  |
| 8019          | Usncor         | <i>Usnea</i>        | <i>cornuta</i>      | 1993          |             | ACTION 0: The name 8032 <i>Usnea fragilesceus</i> was first applied in the West in 2000. It is very close to 8019 <i>U. cornuta</i> in some material, and some specimens classified as that taxon in prior years may actually be this species.   |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS        | SPECIES              | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|--------------|----------------------|---------------|-------------|--|
| 8023         | Usndip         | <i>Usnea</i> | <i>diplotypus</i>    | 1993          |             | ACTION 4: For any analysis including pre-2000 data, 8023 <i>U. diplotypus</i> should be combined into 8000 <i>Usnea</i> . This species name was applied widely in the Pacific Northwest and California 1998–1999 as per concepts in McCune and Geiser (1997). In 2000, based on considerable progress in <i>Usnea</i> , this name was considered to be incorrectly applied in previous years. In 2000 and beyond, the name and code 8023 <i>U. diplotypus</i> are only used for specimens identified with TLC. ACTION 3: <i>Usnea diplotypus</i> is likely in the <i>U. filipendula</i> group (Marks et al. 2016). Until further work is done on this taxon, we recommend combining 8023 <i>U. diplotypus</i> collected in 2000 or after into 8029 <i>U. filipendula</i> for all analyses.   |
| 8029         | Usnfil         | <i>Usnea</i> | <i>filipendula</i>   | 1993          |             | ACTION 0: FIA uses the name 8029 <i>U. filipendula</i> to represent the <i>U. filipendula</i> group in the Western United States, which includes <i>U. plicata</i> , <i>U. chaetophora</i> , <i>U. diplotypus</i> , and several others. ACTION 0: 8058 <i>Usnea plicata</i> should be combined into 8029 <i>U. filipendula</i> for analysis. Starting in 1998, this aggregate (mostly West) has been included in the broader aggregate <i>U. filipendula</i> ; the name <i>U. plicata</i> is no longer used in FIA as it is nomenclaturally ambiguous. ACTION 0: For analyzing data from multiple years crossing 1998, 8087 <i>U. chaetophora</i> should be combined into 8029 <i>U. filipendula</i> . ACTION 0: WEST—Only specimens which clearly fit the morphology of 8065 <i>U. scabrata</i> were assigned the latter name. Less typical forms may be identified as 8029 <i>U. filipendula</i> . |
| 8032         | Usnfra         | <i>Usnea</i> | <i>fragilescens</i>  | 1993          |             | ACTION 0: The name 8032 <i>Usnea fragilescens</i> was first applied in the West in 2000. It is very close to 8019 <i>U. cornuta</i> in some material, and some specimens classified as that taxon in prior years may actually be this species.   |
| 8034         | Usnful         | <i>Usnea</i> | <i>fulvoviregens</i> | 1993          |             | ACTION 2: 8034 <i>Usnea fulvoviregens</i> should be combined into 8037 <i>U. glabrescens</i> for analysis. This taxon is impossible to distinguish from <i>U. glabrescens</i> without TLC and should be considered a synonym.  |
| 8036         | Usngla         | <i>Usnea</i> | <i>glabrata</i>      | 1993          |             | ACTION 3: For analyzing data from multiple years crossing 2000, 8088 <i>Usnea esperantiana</i> should be combined into 8036 <i>U. glabrata</i> . <i>U. esperantiana</i> possibly intergrades with <i>U. glabrata</i> .   |
| 8037         | Usngls         | <i>Usnea</i> | <i>glabrescens</i>   | 1993          |             | ACTION 0: 8034 <i>Usnea fulvoviregens</i> should be combined into 8037 <i>U. glabrescens</i> for analysis. This taxon is impossible to distinguish from <i>U. glabrescens</i> without TLC and should be considered a synonym. ACTION 0: The name <i>U. glabrescens</i> was first used in 1999 in the West. Previous material identified as 8000 <i>Usnea</i> sp. may include this taxon.   |
| 8040         | Usnhes         | <i>Usnea</i> | <i>hesperina</i>     | 1993          | 2014        | ACTION 0: 8040 <i>Usnea hesperina</i> was renamed to 8040 <i>U. subgracilis</i> .  |
| 8040         | Usnhes         | <i>Usnea</i> | <i>subgracilis</i>   | 2014          |             | ACTION 0: 8040 <i>U. hesperina</i> has been renamed to 8040 <i>Usnea subgracilis</i> .   |



| LICH_SPCD | SPP_ACRONYM | GENUS        | SPECIES             | YEAR START | YEAR END | SPP_COMMENTS   |
|-----------|-------------|--------------|---------------------|------------|----------|--|
| 8042      | Usnint      | <i>Usnea</i> | <i>intermedia</i>   | 1993       |          | ACTION 0: 8007 <i>Usnea arizonica</i> should be combined into 8042 <i>U. intermedia</i> for all analyses. These two species were synonymized by Clerc (2007). ACTION 0: According to Marks et al. (2016), <i>U. intermedia</i> is likely a fertile form of 8044 <i>U. lapponica</i> although we retain the former name until further work confirms this.   |
| 8044      | Usnlap      | <i>Usnea</i> | <i>lapponica</i>    | 1993       |          | ACTION 0: In the Western United States, this name is used in the broad sense, including all specimens that were papillate, tufted, and had soredia erupting through concave craters in the cortex, with reflexed edges, and soralia often surrounding the central cord. ACTION 0: 8077 <i>Usnea substerilis</i> , a synonym, should be combined into 8044 <i>U. lapponica</i> (Marks et al. 2016). |
| 8047      | Usnmad      | <i>Usnea</i> | <i>madeirensis</i>  | 1993       | 2005     | ACTION 0: 8047 <i>Usnea madeirensis</i> was renamed to 8047 <i>U. silesiaca</i> .  |
| 8047      | Usnmad      | <i>Usnea</i> | <i>silesiaca</i>    | 2005       |          | ACTION 0: 8047 <i>Usnea madeirensis</i> was renamed to 8047 <i>U. silesiaca</i> . ACTION 0: Newly described <i>U. parafloridana</i> (Marks et al. 2016) likely has a broader distribution than northern Wisconsin. Eastern records of <i>U. silesiaca</i> in northern or montane habitats might be this species.   |
| 8050      | Usnmir      | <i>Usnea</i> | <i>mirabilis</i>    | 1993       | 2014     | ACTION 0: The name 8050 <i>Usnea mirabilis</i> has a spelling error and should be corrected to 8050 <i>U. mirabilis</i> .  |
| 8050      | Usnmir      | <i>Usnea</i> | <i>mirabilis</i>    | 2014       |          | ACTION 0: The name 8050 <i>Usnea mirabilis</i> has a spelling error and should be corrected to 8050 <i>U. mirabilis</i> .  |
| 8058      | Usnpli      | <i>Usnea</i> | <i>plicata</i>      | 1993       |          | ACTION 2: 8058 <i>Usnea plicata</i> should be combined into 8029 <i>U. filipendula</i> for analysis. Starting in 1998, this aggregate (mostly in the West) has been included in the broader aggregate <i>U. filipendula</i> ; the name <i>U. plicata</i> is no longer used in FIA as it is nomenclaturally ambiguous.  |
| 8061      | Usnret      | <i>Usnea</i> | <i>retifera</i>     | 1993       | 2010     | ACTION 2: 8061 <i>Usnea retifera</i> should be combined into 8042 <i>U. intermedia</i> for all analyses. These species were synonymized by Clerc (2007). ACTION 0: According to Marks et al. (2016), <i>U. intermedia</i> is likely a fertile form of 8044 <i>U. lapponica</i> although we retain the former name until further work confirms this.  |
| 8065      | Usnsca      | <i>Usnea</i> | <i>scabrata</i>     | 1993       |          | ACTION 0: WEST—8065 <i>U. scabrata</i> is difficult to differentiate from 8029 <i>U. filipendula</i> . Less typical forms may be misidentified as the latter.  |
| 8072      | Usnsub      | <i>Usnea</i> | <i>subfloridana</i> | 1993       |          | ACTION 0: Before 1998 this name was applied broadly for all specimens that were papillate, tufted, and had both soredia and isidia, with the isidia projecting from the soralia. Starting with 1998 data, this taxon was applied sensu stricto after the concepts of Halonen et al. (1998), to the extent that chemotypes can be distinguished with spot tests alone.                              |
| 8077      | Usnsst      | <i>Usnea</i> | <i>substerilis</i>  | 1993       | 2017     | ACTION 2: 8077 <i>Usnea substerilis</i> , a synonym, should be combined into 8044 <i>U. lapponica</i> (Marks et al. 2016).   |
| 8084      | Usnswir     | <i>Usnea</i> | <i>wirthii</i>      | 1993       | 2006     | ACTION 2: 8084 <i>Usnea wirthii</i> is a synonym and should be combined into 8094 <i>U. flavocardia</i> (Clerc 2004).  |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                | SPECIES             | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|----------------------|---------------------|---------------|-------------|--|
| 8087         | Usncha         | <i>Usnea</i>         | <i>chaetophora</i>  | 1997          |             | ACTION 2: 8087 <i>Usnea chaetophora</i> should be combined into 8029 <i>U. filipendula</i> . In the Western United States, this taxon represents part of the <i>U. filipendula</i> group, which includes <i>U. plicata</i> , <i>U. diplotypus</i> , and several others.  |
| 8088         | Usnesp         | <i>Usnea</i>         | <i>esperantiana</i> | 1997          |             | ACTION 3: For analyzing data from multiple years crossing 2000, 8088 <i>Usnea esperantiana</i> should be combined into 8036 <i>U. glabrata</i> . This taxon was first applied in 2000 in the West. It is a recognizable syndrome, but possibly intergrades with 8036 <i>U. glabrata</i> .  |
| 8091         | Usnrig         | <i>Usnea</i>         | <i>rigida</i>       | 1997          | 2014        | ACTION 0: 8091 <i>Usnea rigida</i> was renamed to 8091 <i>U. quasirigida</i> (Lendemer & Tavares 2003).  |
| 8091         | Usnrig         | <i>Usnea</i>         | <i>quasirigida</i>  | 2014          |             | ACTION 0: 8091 <i>Usnea rigida</i> was renamed to 8091 <i>U. quasirigida</i> (Lendemer & Tavares 2003).  |
| 8094         | Usnfla         | <i>Usnea</i>         | <i>flavocardia</i>  | 2006          |             | ACTION 0: 8084 <i>Usnea wirthii</i> is a synonym and should be combined into 8094 <i>U. flavocardia</i> (Clerc 2004).  |
| 8095         | Usnpar         | <i>Usnea</i>         | <i>parvula</i>      | 2010          |             | ACTION 0: For analyzing data from multiple years crossing 2010, 8016 <i>Usnea cirrosa</i> should be combined into 8095 <i>U. parvula</i> . <i>U. parvula</i> was segregated from <i>U. cirrosa</i> by Clerc (2007).  |
| 8096         | Usn cyl        | <i>Usnea</i>         | <i>cylindrica</i>   | 2014          |             | ACTION 0: <i>Usnea cylindrica</i> has only recently been found to occur in North America (Dillman et al. 2012).  |
| 8100         | Wayne          | <i>Waynea</i>        |                     | 1993          |             | ACTION 1: Exclude for most analyses. Squamulose growth forms were not consistently collected.  |
| 8101         | Waycal         | <i>Waynea</i>        | <i>californica</i>  | 1993          |             | ACTION 1: Exclude for most analyses. Squamulose growth forms were not consistently collected.  |
| 8150         | Vul            | <i>Vulpicida</i>     |                     | 1997          | 2019        | ACTION 2: 8150 <i>Vulpicida</i> is a synonym (Divakar et al. 2017) and should be combined into 1000 <i>Cetraria</i> for all analyses.  |
| 8151         | Vulcan         | <i>Vulpicida</i>     | <i>canadensis</i>   | 1997          | 2019        | ACTION 2: 8151 <i>Vulpicida canadensis</i> is a synonym (Divakar et al. 2017) and should be combined into 1004 <i>Cetraria canadensis</i> for all analyses.  |
| 8152         | Vulpin         | <i>Vulpicida</i>     | <i>pinastri</i>     | 1997          | 2019        | ACTION 2: 8152 <i>Vulpicida pinastri</i> is a synonym (Divakar et al. 2017) and should be combined into 1015 <i>Cetraria pinastri</i> for all analyses.  |
| 8153         | Vulvir         | <i>Vulpicida</i>     | <i>viridis</i>      | 1997          | 2019        | ACTION 2: 8153 <i>Vulpicida viridis</i> is a synonym (Divakar et al. 2017) and should be combined into 1020 <i>Cetraria viridis</i> for all analyses.  |
| 8170         | Xam            | <i>Xanthomendoza</i> |                     | 2004          |             | ACTION 3: For data analysis for multiple years crossing 2004, 8170 <i>Xanthomendoza</i> should be combined into 8200 <i>Xanthoria</i> . Specimens that cannot be identified to species are coded by default to 8200 <i>Xanthoria</i> unless the ID specialist is certain they belong to 8170 <i>Xanthomendoza</i> sp. Most of the <i>Xanthomendoza</i> species listed here were moved from <i>Xanthoria</i> by Søchting et al. (2002). |
| 8200         | Xan            | <i>Xanthoria</i>     |                     | 1993          |             | ACTION 3: For data analysis for multiple years crossing 2004, 8170 <i>Xanthomendoza</i> should be combined into 8200 <i>Xanthoria</i> . Specimens that cannot be identified to species are coded by default to 8200 <i>Xanthoria</i> unless the ID specialist is certain they belong to 8170 <i>Xanthomendoza</i> sp.  |

| LICH<br>SPCD | SPP<br>ACRONYM | GENUS                | SPECIES            | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|--------------|----------------|----------------------|--------------------|---------------|-------------|--|
| 8201         | Xanfan         | <i>Xanthoria</i>     | <i>candelaria</i>  | 1993          |             | ACTION 0: The name <i>Xanthoria candelaria</i> is used in the restricted sense of Lindblom (1997).   |
| 8203         | Xanfal         | <i>Xanthoria</i>     | <i>fallax</i>      | 1993          | 2004        | ACTION 0: 8203 <i>Xanthoria fallax</i> was renamed to 8203 <i>Xanthomendoza fallax</i> . See the latter for additional notes.  |
| 8203         | Xanfal         | <i>Xanthomendoza</i> | <i>fallax</i>      | 2004          |             | ACTION 0: 8203 <i>Xanthoria fallax</i> was renamed to 8203 <i>Xanthomendoza fallax</i> in 2004.<br>ACTION 0: For analyzing data for multiple years crossing 1997, 8210 <i>Xanthomendoza fulva</i> , 8219 <i>X. galericulata</i> , 8213 <i>X. mendozae</i> , 8215 <i>X. oregana</i> , and 8218 <i>X. ulophylloides</i> should be combined into 8203 <i>X. fallax</i> . The name <i>X. fallax</i> was applied broadly prior to Lindblom (1997). ACTION 5/ACTION 0: WEST—In most Western States 8210 <i>X. fulva</i> is common, so pre-1997 <i>X. fallax</i> probably includes many specimens of <i>X. fulva</i> . Colorado specimens (1992–1996) were reexamined and only a few were found to be 8210 <i>X. fulva</i> ; no names were changed in the database. ACTION 5/ACTION 0: EAST—Pre-1997 <i>X. fallax</i> probably includes many specimens of 8210 <i>X. fulva</i> and 8218 <i>X. ulophylloides</i> .   |
| 8204         | Xanhas         | <i>Xanthoria</i>     | <i>hasseana</i>    | 1993          | 2004        | ACTION 0: 8204 <i>Xanthoria hasseana</i> was renamed to 8204 <i>Xanthomendoza hasseana</i> . See the latter for additional notes.  |
| 8204         | Xanhas         | <i>Xanthomendoza</i> | <i>hasseana</i>    | 2004          |             | ACTION 0: 8204 <i>Xanthoria hasseana</i> was renamed to 8204 <i>Xanthomendoza hasseana</i> in 2004. ACTION 0: the name <i>X. polycarpa</i> was applied broadly prior to Lindblom (1997) and included <i>X. hasseana</i> and <i>X. montana</i> . The names <i>X. hasseana</i> and <i>X. montana</i> were applied starting with 1997 data. ACTION 5/ACTION 3: WEST—for analyzing data for multiple years crossing 1997, 8204 <i>X. hasseana</i> and 8214 <i>X. montana</i> should be combined into 8207 <i>X. polycarpa</i> . ACTION 5/ACTION 3: EAST—for data analysis for multiple years crossing 1997, 8207 <i>X. polycarpa</i> should be combined into 8204 <i>X. hasseana</i> . Most pre-1997 specimens were reexamined to confirm <i>X. hasseana</i> but names were not changed in the database. ACTION 5/ACTION 0: WEST—Separation of 8214 <i>X. montana</i> from 8204 <i>X. hasseana</i> requires a spore test via light microscope, not routinely done for FIA. Based on known geographic ranges, all Pacific Northwest specimens are assigned to 8204 <i>X. hasseana</i> and all Interior West specimens assigned to 8214 <i>X. montana</i> . Colorado 1992–1996 specimens were examined to confirm the name <i>X. montana</i> . |
| 8207         | Xanpol         | <i>Xanthoria</i>     | <i>polycarpa</i>   | 1993          |             | ACTION 0: the name <i>Xanthoria polycarpa</i> was applied broadly prior to Lindblom (1997) and included <i>Xanthomendoza hasseana</i> and <i>X. montana</i> . The names <i>X. hasseana</i> and <i>X. montana</i> were applied starting with 1997 data. ACTION 5/ACTION 0: WEST—For analyzing data for multiple years crossing 1997, 8204 <i>X. hasseana</i> and 8214 <i>X. montana</i> should be combined into 8207 <i>X. polycarpa</i> . ACTION 5/ACTION 3: EAST—For data analysis for multiple years crossing 1997, 8207 <i>X. polycarpa</i> should be combined into 8204 <i>X. hasseana</i> . Most pre-1997 specimens were reexamined to confirm <i>X. hasseana</i> but names were not changed in the database. ACTION 5/ACTION 0: WEST—Separation of 8214 <i>X. montana</i> from 8204 <i>X. hasseana</i> requires a spore test via light microscope, not routinely done for FIA. Based on known geographic ranges, all Pacific Northwest specimens are assigned to 8204 <i>X. hasseana</i> and all Interior West specimens assigned to 8214 <i>X. montana</i> . Colorado 1992–1996 specimens were examined to confirm the name <i>X. montana</i> .   |
| 8209         | Xansub         | <i>Xanthoria</i>     | <i>subramulosa</i> | 1993          | 2004        | ACTION 0: 8209 <i>Xanthoria subramulosa</i> was renamed to 8209 <i>Xanthomendoza subramulosa</i> .   |
| 8209         | Xansub         | <i>Xanthomendoza</i> | <i>subramulosa</i> | 2004          |             | ACTION 0: 8209 <i>Xanthoria subramulosa</i> was renamed to 8209 <i>Xanthomendoza subramulosa</i> .   |



| LICH_ SPP<br>SPPCD ACRONYM | GENUS  | SPECIES                       | YEAR<br>START | YEAR<br>END | SPP_COMMENTS   |
|----------------------------|--------|-------------------------------|---------------|-------------|--|
| 8210                       | Xanful | <i>Xanthoria</i>              | 1995          | 2004        | ACTION 0: 8210 <i>Xanthoria fulva</i> was renamed to 8210 <i>Xanthomendoza fulva</i> . See the latter for additional notes.  |
| 8210                       | Xanful | <i>Xanthomendoza fulva</i>    | 2004          |             | ACTION 0: 8210 <i>Xanthoria fulva</i> was renamed to 8210 <i>Xanthomendoza fulva</i> in 2004.<br>ACTION 3: For analyzing data for multiple years crossing 1997, 8210 <i>Xanthomendoza fulva</i> , 8219 <i>X. galericulata</i> , 8213 <i>X. mendozae</i> , 8215 <i>X. oregana</i> , and 8218 <i>X. ulophylodes</i> should be combined into 8203 <i>X. fallax</i> . Before 1997, <i>X. fulva</i> would have been mostly identified as <i>X. fallax</i> . In 1997 and after, Lindblom's much narrower concept of <i>X. fallax</i> was applied and the name <i>X. fulva</i> was used more frequently. ACTION 3: For data analysis for multiple years crossing 2004, 8219 <i>X. galericulata</i> should be combined into 8210 <i>X. fulva</i> ; <i>X. galericulata</i> was recognized as distinct by Lindblom (2004) and Lindblom (2006). ACTION 5/ACTION 0: WEST—In most Western States <i>X. fulva</i> is common, so pre-1997 <i>X. fallax</i> probably includes many specimens of <i>X. fulva</i> . Colorado specimens (1992–1996) were reexamined and only a few were found to be 8210 <i>X. fulva</i> ; no names were changed in the database. ACTION 5/ACTION 0: EAST—Pre-1997 <i>X. fallax</i> probably includes many specimens of <i>X. fulva</i> and <i>X. ulophylodes</i> . |
| 8211                       | Xanbor | <i>Xanthoria borealis</i>     | 1997          | 2004        | ACTION 0: 8211 <i>Xanthoria borealis</i> was renamed to 8211 <i>Xanthomendoza borealis</i> .   |
| 8211                       | Xanbor | <i>Xanthomendoza borealis</i> | 2004          |             | ACTION 0: 8211 <i>Xanthoria borealis</i> has been renamed to 8211 <i>Xanthomendoza borealis</i> .  |
| 8212                       | Xancon | <i>Xanthoria concinna</i>     | 1997          | 2004        | ACTION 0: 8212 <i>Xanthoria concinna</i> was renamed to 8212 <i>Xanthomendoza concinna</i> .   |
| 8212                       | Xancon | <i>Xanthomendoza concinna</i> | 2004          |             | ACTION 0: 8212 <i>Xanthoria concinna</i> was renamed to 8212 <i>Xanthomendoza concinna</i> .   |
| 8213                       | Xanmen | <i>Xanthoria mendozae</i>     | 1997          | 2005        | ACTION 0: 8213 <i>Xanthoria mendozae</i> was renamed to 8213 <i>Xanthomendoza mendozae</i> . See the latter for additional notes.  |
| 8213                       | Xanmen | <i>Xanthomendoza mendozae</i> | 2005          |             | ACTION 0: 8213 <i>Xanthoria mendozae</i> was renamed to 8213 <i>Xanthomendoza mendozae</i> in 2005. ACTION 3: For data analysis for multiple years crossing 1997, 8210 <i>Xanthomendoza fulva</i> , 8219 <i>X. galericulata</i> , 8213 <i>X. mendozae</i> , 8215 <i>X. oregana</i> , and 8218 <i>X. ulophylodes</i> should be combined into 8203 <i>X. fallax</i> .  |
| 8214                       | Xanmon | <i>Xanthoria montana</i>      | 1997          | 2004        | ACTION 0: 8214 <i>Xanthoria montana</i> was renamed to 8214 <i>Xanthomendoza montana</i> . See the latter for additional notes.  |
| 8214                       | Xanmon | <i>Xanthomendoza montana</i>  | 2004          |             | ACTION 0: 8214 <i>Xanthoria montana</i> was renamed to 8214 <i>Xanthomendoza montana</i> in 2004. ACTION 0: The name <i>X. polycarpa</i> was applied broadly prior to Lindblom (1997) and included <i>X. hasseana</i> and <i>X. montana</i> . The names <i>X. hasseana</i> and <i>X. montana</i> were applied starting with 1997 data. ACTION 5/ACTION 3: WEST—for analyzing data for multiple years crossing 1997, 8204 <i>X. hasseana</i> and 8214 <i>X. montana</i> should be combined into 8207 <i>X. polycarpa</i> . ACTION 5/ACTION 0: WEST—Separation of 8214 <i>X. montana</i> from 8204 <i>X. hasseana</i> requires a spore test via light microscope, not routinely done for FIA. Based on known geographic ranges, all Pacific Northwest specimens are assigned to 8204 <i>X. hasseana</i> and all Interior West specimens assigned to 8214 <i>X. montana</i> . Colorado 1992–1996 specimens were examined to confirm the name <i>X. montana</i> .  |
| 8215                       | Xanore | <i>Xanthoria oregana</i>      | 1997          | 2004        | ACTION 0: 8215 <i>Xanthoria oregana</i> was renamed to 8215 <i>Xanthomendoza oregana</i> . See the latter for additional notes.  |

| LICH_SPPCD | SPP_ACRONYM | GENUS                 | SPECIES              | YEAR START | YEAR END | SPP_COMMENTS  |
|------------|-------------|-----------------------|----------------------|------------|----------|---|
| 8215       | Xanore      | <i>Xanthomendoza</i>  | <i>oregana</i>       | 2004       |          | ACTION 0: In 2004, 8215 <i>Xanthoria oregana</i> was renamed to 8215 <i>Xanthomendoza oregana</i> . ACTION 3: For analyzing data for multiple years crossing 1997, 8210 <i>X. fulva</i> , 8219 <i>X. galericulata</i> , 8213 <i>X. mendozae</i> , 8215 <i>X. oregana</i> , and 8218 <i>X. ulophyllodes</i> should be combined into 8203 <i>X. fallax</i> . The name <i>X. fallax</i> was applied broadly prior to Lindblom (1997). ACTION 0: In pre-2004 data, <i>X. oregana</i> data may have included some <i>X. galericulata</i> .   |
| 8218       | Xanulo      | <i>Xanthoria</i>      | <i>ulophyllodes</i>  | 1997       | 2004     | ACTION 0: 8218 <i>Xanthoria ulophyllodes</i> was renamed to 8218 <i>Xanthomendoza ulophyllodes</i> . See the latter for additional notes.   |
| 8218       | Xanulo      | <i>Xanthomendoza</i>  | <i>ulophyllodes</i>  | 2004       |          | ACTION 0: 8218 <i>Xanthoria ulophyllodes</i> was renamed to 8218 <i>Xanthomendoza ulophyllodes</i> in 2004. ACTION 3: For data analysis for multiple years crossing 1997, 8210 <i>X. fulva</i> , 8219 <i>X. galericulata</i> , 8213 <i>X. mendozae</i> , 8215 <i>X. oregana</i> , and 8218 <i>X. ulophyllodes</i> should be combined into 8203 <i>X. fallax</i> . Starting with 1997 data, Lindblom's much narrower concept of <i>X. fallax</i> was applied and the name <i>X. ulophyllodes</i> was used. ACTION 5/ACTION 0: WEST—This species is uncommon; it would have been identified as <i>X. fallax</i> in pre-1997 data, if present. ACTION 5/ACTION 0: EAST— <i>X. ulophyllodes</i> is moderately common, so pre-1997 <i>X. fallax</i> probably includes many <i>X. ulophyllodes</i> specimens. |
| 8219       | Xangal      | <i>Xanthomendoza</i>  | <i>galericulata</i>  | 2005       |          | ACTION 3: For data analysis for multiple years crossing 1997, 8210 <i>Xanthomendoza fulva</i> , 8219 <i>X. galericulata</i> , 8213 <i>X. mendozae</i> , 8215 <i>X. oregana</i> , and 8218 <i>X. ulophyllodes</i> should be combined into 8203 <i>X. fallax</i> . ACTION 3: For data analysis for multiple years starting in 1997 or later and crossing 2004, 8219 <i>X. galericulata</i> should be combined into 8210 <i>X. fulva</i> . This is a distinct species included in Lindblom (2004) and Lindblom (2006). ACTION 0: In pre-2004 data, <i>X. oregana</i> data may include some <i>X. galericulata</i> .  |
| 8301       | Cndcon      | <i>Candelaria</i>     | <i>concolor</i>      | 1993       |          | ACTION 0: When analyzing data from multiple years crossing 2002, 8303 <i>Candelaria pacifica</i> should be combined into 8301 <i>C. concolor</i> . This is a distinct species segregated from 8301 <i>C. concolor</i> in 2002 (Westberg & Nash 2002) but formally described by Westberg & Arup (2011). ACTION 0: <i>C. concolor</i> data collected before 2002 likely includes some <i>C. pacifica</i> .  |
| 8303       | Cndpac      | <i>Candelaria</i>     | <i>pacifica</i>      | 2002       |          | ACTION 5/ACTION 3: WEST—When analyzing data from multiple years crossing 2002, 8303 <i>Candelaria pacifica</i> should be combined into 8301 <i>C. concolor</i> . This is a distinct species segregated from 8301 <i>C. concolor</i> in 2002 (Westberg & Nash 2002) but formally described by Westberg & Arup (2011).  |
| 8600       | Lec         | <i>Lecanora</i>       |                      | 2002       |          | ACTION 1: Exclude for most analyses. Crustose growth forms were not consistently collected.   |
| 8601       | Lecmur      | <i>Lecanora</i>       | <i>muratis</i>       | 2002       |          | ACTION 1: Exclude for most analyses. Crustose growth forms were not consistently collected.   |
| 9003       | Xpmcol      | <i>Xanthoparmelia</i> | <i>coloradensis</i>  | 1993       | 2014     | ACTION 0: The name 9003 <i>Xanthoparmelia coloradensis</i> has a spelling error and should be corrected to 9003 <i>Xanthoparmelia coloradoensis</i> .   |
| 9003       | Xpmcol      | <i>Xanthoparmelia</i> | <i>coloradoensis</i> | 2014       |          | ACTION 0: The name 9003 <i>Xanthoparmelia coloradensis</i> has a spelling error and should be corrected to 9003 <i>Xanthoparmelia coloradoensis</i> .   |

## **Appendix 2: Lichen Species Distribution Maps (Online Only)**

Maps for 425 lichen species are available as a PDF file (9.25 MB) on the Web at [https://www.fs.usda.gov/pnw/pubs/pnw\\_gtr986-appendix2.pdf](https://www.fs.usda.gov/pnw/pubs/pnw_gtr986-appendix2.pdf).



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