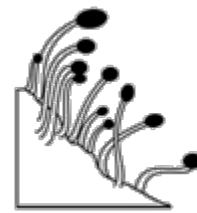


# NORTHWEST LICHENOLOGISTS



## 2019 Newsletter

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Visit our new and improved [website](#)!

Check us out on [Facebook](#)!

## *Upcoming NWL Events*

### **Lewis and Clark National Historical Park Field Trip / Foray**

Where: Lewis and Clark National Historical Park, located in Astoria, OR

When: Sept 17 – Sept 19, 2019

This promises to be a really fun outing, with a spectacular array of lichens. We will camp on the lawn of a Park-owned house, with a kitchen and great room available for cooking and our work. Collecting will be done in the first half of the day, followed by identification time, then with ample time for cooking, eating, and socializing. Please contact Daphne Stone (daphstone@gmail.com) to reserve a spot.



From top to bottom: Fort Clatsop, coastline near the Park, the house we have reserved

## 2019 NWL Certification Exam and Training

The biennial NWL Certification Exam will be held October 4-6 at the Oregon Institute of Marine Biology in Charleston, Oregon. Attendees have the option of participating in the event as a training, with the purpose of teaching newcomers to the field of lichenology how to identify lichens as well as a bit about their ecology and importance. Examiners are Daphne Stone and Adrienne Kovasi. Registration details will soon be posted at our [website](#).

### *What is the certification for?*

Certification demonstrates competency in a particular group of species in a particular region. This includes field and laboratory identification and recognition of rare or listed species. Our initial certification program is for macrolichens in the Pacific Northwest.

### *Why is there a certification program?*

- to promote and encourage professional development, growth, and renewal
- to enhance the visibility of the profession
- to maintain and promote high standards of performance by all members of the profession
- to publicize and exemplify the [Code of Ethics](#)



Photos from the 2017 Certification Exam

## 2019 NWL Annual Meeting

### NW Lichenologists activities at the NWSA meeting, Lewiston, Idaho, March 2019

Here is a draft schedule for lichen events at the upcoming meeting in

Lewiston. Updated 16 March 2019

#### ***SEE THE OFFICIAL PROGRAM FOR TIMES AND PLACES – THIS IS JUST A PREVIEW***

**Lodging:** the hotel for many meeting participants is the Red Lion Hotel, but many of the lichenologists are staying at the **FairBridge Inn and Suites**, 1325 Main St)

Tues. Mar. 26

6:00 – 9:00 pm -- Evening Social (appetizers and drinks) (**Red Lion Hotel**, 621 21st St, Lewiston). Evening social with hors d'oeuvres. This is a NWSA-wide event, but we usually have great lichenologist participation and more than a few appetizers after a long day of driving.

Wed. Mar 27 – **Lewis and Clark State College**

8:00-12:00 – Keynote speaker and plenary talks.

12:00-1:20 – lunch on your own – find another lichenologist!

1:20- 4:00 -- miscellaneous talks at concurrent sessions. Be sure to hear Roger Rosentreter's talk at the sagebrush symposium, because we will have a follow-up discussion on Thursday on biocrust restoration.

4:00 -6:00 --**poster session**. This will include several lichen posters. Again, be sure to check these out – we will have more time for discussing them on Thursday. Poster presenters: please try to attend the end of the lichen session on Thursday for Q/A and discussion.

After 6 -- Dinner at a local restaurant, location and time TBA; ask others at poster session. Possibilities (via Rob):

- Mystic Cafe for American food (1307 Main St)
- Tomato Bros for kinda pricey Italian (200 Bridge St, Clarkston)
- El Sombrero for Mexican (405 Thain Rd Lewiston)
- Thai Taste (1410 21st St

Lewiston). Thurs. Mar 28.

8:50-9:50 – lichen talks

9:50-10:20 – break

10:20-10:40 – Discussion and Q/A: lichen posters from Wednesday. Brief group report from Badger Mountain trip in Richland last fall. Announcement of Fall



Foray. Moderator: Bruce McCune

10:40 – 11:20 -- Discussion Forum: What are the most suitable biocrusts for active restoration projects? (facilitator: Roger Rosentreter)

11:20 –

12:00 – 1:45 -- NWSA Business LUNCH at Williams Conference Center. FREE LUNCH FOR REGISTERED PARTICIPANTS! Be sure to attend this to catch up on NWSA news, see the award winners, and have a great lunch.

2:00 – 5:00 -- Untangling *Usnea*. Northwest Lichenologists Workshop, led by

Daphne Stone 6-?? – Dinner at a local restaurant, location and time TBA.

Fri. Mar 29. Field trip – led by Rob Smith. We will carpool. **Meet at 8 a.m., at the parking area west of Sacajawea Hall at LCSC.** Details below...

Main excursion: Changed because of closure: New site: **Wawawai County Park on the Snake River NW of Lewiston.** The site is perhaps a 40 minute drive from Lewiston.

Wawawai County Park. 46.636387,-117.373627. Whitman County. Washington. Directions from Clarkston WA (30 miles, 40 min.): Westbound on US-12 (Bridge St). Right (north) onto 15th St (WA-128) to cross Snake River on bridge. Left (west) at T-intersection onto WA-193 (Wawawai Rd). Follow Wawawai Rd keeping beside Snake River 35 min (28.4 mi) to Wawawai Grade Rd. Left onto into signed Wawawai County Park just after road departs river and crosses RR tracks. Stay right to day-use parking and restrooms at 46.636387,-117.373627.

Description: Restrooms and picnic shelters available. Discreet incidental collecting allowed. The park is 68 acres bounded by the river and by private land, located at the junction of perennial Wawawai Creek and the slackwater behind Lower Granite Dam three miles down Snake River. Trail uphill from parking lot proceeds through hillside of non-native grasslands to reach drier open ridge with *Festuca*, *Artemisia*, *Eriogonum* on thinner soils over mounded earth and occasional basalt cobble patches. Counter-clockwise loop returns to irrigated park area planted with non-native *Ailanthus*, *Robinia*, and scattered fruit trees, occasional rock walls and cabin foundations. Lowlands riparian trees/shrubs/cattails where creek enters river.

History: area occupied by Nez Perce and Palouse tribes prior to arrival of white settlers who established orchards and ranching before dam construction (<https://www.historylink.org/File/7968>).

**Bonus location on return home: Granite Point** (46.603864, -117.358048) is the only granite outcrop for miles around in a sea of Columbia River basalts. Please do not chisel/chip rocks, no collecting from rock allowed, this area is already heavily

impacted by recreational users. Has open granite faces, thin soil in cracks and pockets, deeper soil over ledges. Administered by US Army Corps of Engineers.

**Bonus location on return home:** Nisqually John Canyon (46.510936, -117.231942) has more exposed basalt rock formations, but much of the area burned in July 2018. Trail ascends along creek and exits burn after several kilometers. Discreet incidental collecting allowed. Administered by US Army Corps of Engineers.



Wawawai County Park

## *Recent NWL Events*

### **The Badger Mountain Lichen Blitz of 2018**

**By Mickie Chamness, Terri Knoke, Janelle Downs, and Jenny von Reis**

Some of the members of the Columbia Basin Chapter, Washington Native Plant Society have been interested in lichens, bryophytes and other non-vascular plant-like organisms for quite a while. Several of them ended up becoming members of Northwest Lichenologists (NWL) to learn more about various lichenizing events, what people are finding, and learn more about how to ID lichens. While enjoying the NWL newsletter a couple years ago, we saw information how to request a lichen blitz. Whoa, we thought, that would be cool to take part in one of those.

Heyyyy, wait a minute. Maybe we could have a blitz here and collect and document the diverse and unique lichen and bryophyte communities in our area. As novices, we weren't aware of many publicly available resources that seemed applicable to our shrub-steppe plant communities and climate. Specimens collected and identified during the blitz would be added to existing herbaria at Columbia Basin College and at University of Washington for use by us and others wanting to understand more about the variety and diversity of organisms that live on plants, rocks or form soil crust in the shrub steppe of the lower Columbia Basin.

Our first thought was to see if we could hold a lichen blitz on the Hanford Site, an area that's been sequestered from public access and grazing since the early 1940's. While some portions have been heavily disturbed in the manufacture of weapons grade nuclear materials and affiliated clean-up, large stands of relatively pristine shrub-steppe plant communities remain in various habitats on the Site. However, the logistics of gaining access was going to be a challenge at the time, so we began to consider more accessible sites in our area that have good quality shrub-steppe habitat.

Badger Mountain Centennial Preserve is a natural area park covering over 647 acres and nearly surrounded by the city of Richland (Figure 1). Badger Mountain is an oblong basaltic ridge approximately 2.5 miles long that stands about 1000 feet higher than the surrounding terrain. One long side of the ridge has a relatively gradual slope with a mostly rocky soil that faces southwest, fully exposed to the weather and wind in our hot dry, summers. The other side is much steeper, faces northeast and is protected from some of the heat and harsh weather.

The Preserve was established in 2005 through a grass roots effort to preserve some of the local ridges natural, open spaces and wonderful views across the area. The Preserve is a Benton County Park, and as such will be protected from development in the future. Trails have been built to provide controlled public access on foot, bike or horseback to the ridge slopes and ridgetop. Off trail use is strongly discouraged. Although large portions of the ridge have burned over past 20 years, Badger Mountain has not been grazed in over 30 years, thus preserving landscape with a succession of plant/lichen communities. Maybe this would be a good place for a lichen blitz! Someplace where the species and habitats will be preserved for future exploration and learning.

We were very curious about the differences that aspect, substrate, and possibly burn history might have on the composition of lichens and bryophytes growing on the soil, rocks and plants across a relatively small area. The blitz sites were chosen based on these variables in hopes that future research into the data collected during the blitz would provide some insight on lichen and bryophyte environmental preferences and their ability to recover from fire.



The surface on the southeast slope consists of loose basalt cobbles and gravel sitting in a matrix of decomposed basalt and windblown sand and silt, with patches of sand and silt brought in by ice age floods along the bottom and a few areas of solid rock near the ridgetop.

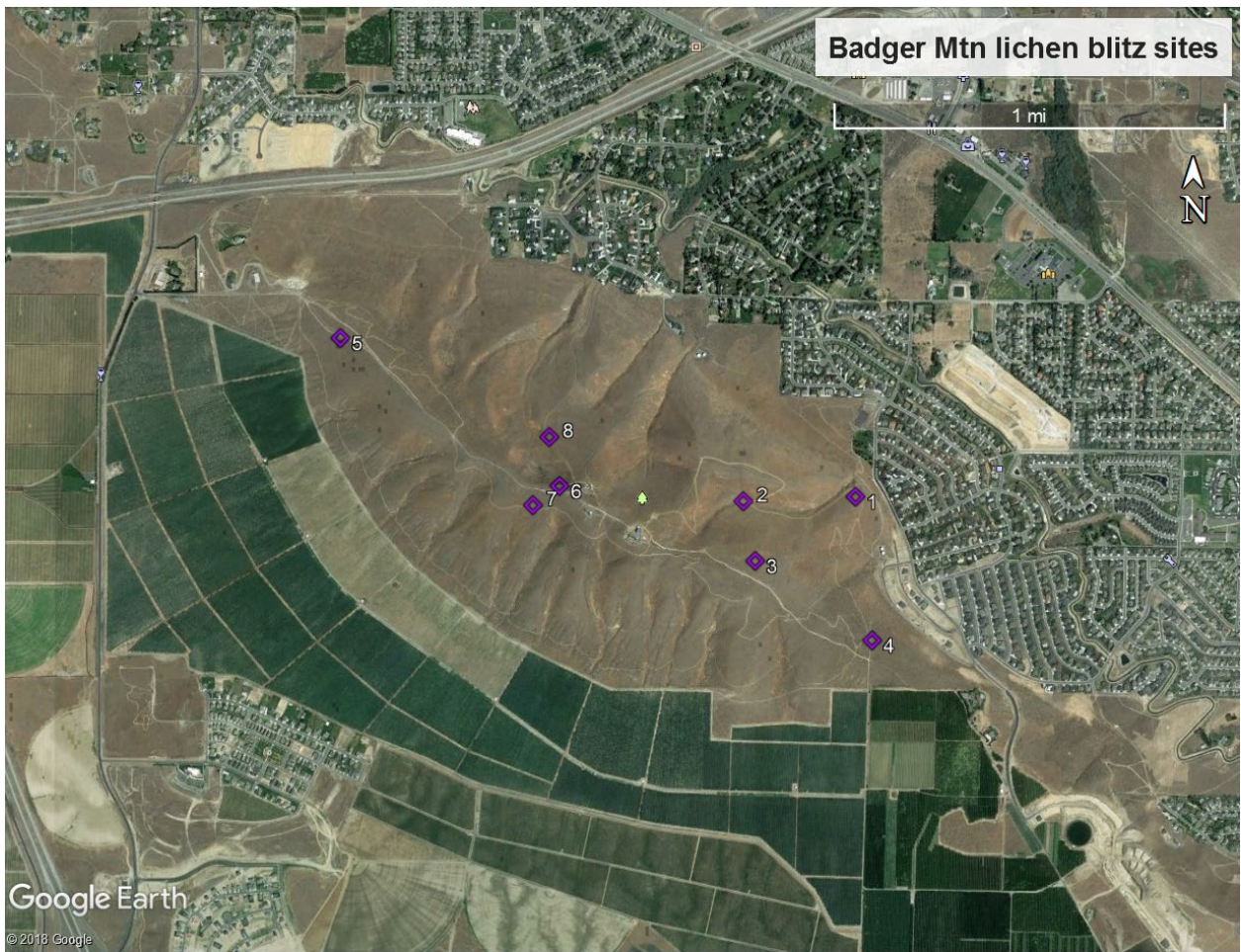


Figure 1. Sample site locations in Badger Mountain Centennial Preserve.

Vegetation on this side of Badger Mountain is dominated by sagebrush (*Artemisia tridentata* subsp. *wyomingensis*) and rock buckwheat (*Eriogonum sphaerocephalum*) with an understory of Sandberg's bluegrass (*Poa secunda*), bluebunch wheatgrass (*Pseudoroegneria spicata*) and in places cheatgrass (*Bromus tectorum*). Winterfat (*Krascheninnikovia lanata*) grows in patches across the southeast, west and eastern slopes where the calcium carbonate content is higher.

The northwest slope has burned at least once within the last 20 years. A layer of windblown fine-grained sediment has accumulated on top of the solid basalt and eroded basaltic gravel that holds moisture longer than soils on the southeast side can. This has allowed a higher percent of vegetation cover, with species dominated by green rabbitbrush (*Chrysothamnus viscidiflorus*), bluebunch wheatgrass, Sandberg's bluegrass, and in places, Cusick's bluegrass (*Poa cusickii*). Cheatgrass is quite dense in some places, mostly on the slopes of drainages that get the most sun and are drier, but some of the lower steep slopes are also dominated by cheatgrass. Sagebrush is slowly beginning to move back into this burned habitat.



We submitted our lichen blitz proposal to NWL, suggesting we spend parts of 2 to 3 days collecting samples from locations across these different aspects, with time each day to work in the microscope laboratory at the nearby Columbia Basin College (CBC). NWL accepted our proposal and the blitz was set for September 7-9, 2018. Permission was obtained through the Benton County Parks Department to take our group off trail to collect specimens in the Preserve and the microscope lab at CBC was reserved for our use all three days.

Around 200 specimens were collected from 8 sites on Badger Mountain (Figure 1) during the 2 half days in the field. By the end of the blitz on September 9, 89 different lichen samples were identified to species and another 10 samples identified to genus; seventeen bryophyte species and 1 fungal species were also identified. Many people took specimens home to finish identifying them as they had time. We've been busy putting the data into spreadsheets and photographing each of the samples and packets (Figure 2).

Because a number of specimens are still being identified, we haven't completed our interpretation of the data or published our summary list for the Preserve. However, here are a few interesting details we can share with you at this point.

At three of the collection sites, 30 or more lichen species were identified. Sites 4 (31 species) and 5 (40 species) are two of the least disturbed sites we visited. Neither has been burned and they consequently support a relatively intact shrub, grass and forb community with less cheatgrass than many of the other sites. Site 6 (30 species) has burned at least once in the past 20 years, but is located on a steep north-facing slope that receives more snow, holds moisture longer, and is shielded from the worst of the Tri-City wind and heat.

Site 7 was specifically selected to look at lichens growing on large in-situ basalt boulders. Habitat around the boulders is degraded by fire and cheatgrass, but the boulders are generally 2-3 feet or more in diameter, extending well above the cheatgrass height. Nine of the 15 lichen species found on these boulders are unique to this site. In the future we would like to collect specimens from large granitic erratics dropped by ice-age flood on the same side of Badger Mountain and compare them to these species. The last ice-age flood occurred approximately 11,000 years ago.

|   |                                     |                       |  |
|---|-------------------------------------|-----------------------|--|
| Species: <i>Aspicilia contorta</i>  |                                     | LICHENS OF WASHINGTON |  |
| U.S.A., Washington, Benton County; Badger Mountain Centennial Preserve  |                                     |                       |  |
| Datum WGS 84 Elevation <u>335</u> m   |                                     | 46.22968 -119.30650   |  |
| Site: unburned ARTR, Site 4   |                                     |                       |  |
| Habitat/Community Type: mixed <i>Artemisia tridentata</i> subsp. <i>wyomingensis</i> , <i>Grayia spinosa</i> , with <i>Pseudoroegneria spicata</i> , <i>Bromus tectorum</i> and <i>Poa secunda</i> . Large flat outcrops of basalt at the surface in places. Gentle slope to nearly flat. |                                     |                       |  |
| Microhabitat:   |                                     |                       |  |
| Aspect: east  | Substrate: <i>caliche fragments</i> |                       |  |
| Collector: <i>McCune</i>  | Collection Date: September 7, 2018  |                       |  |
| Identified By: <i>McCune</i>  | Collection Number: <i>37836</i>     |                       |  |
| Notes:  |                                     |                       |  |



Figure 2. Example of packet and specimen

Site 8 was a rocky knob part way down the north-facing slope below Site 6. Several of our crew thought it looked like likely habitat for *Texosporium sancti-jacobi*, a species listed as a Federal

Species of Concern and considered threatened in Washington State. Unfortunately none was found during their search on Badger Mountain.

One lichen species, *Physconia enteroxantha*, was found at 7 of the 8 sites. Fifty-three species have so far been identified at only 1 of the sites. The rest of the species have been found at two or more of the sites.

Over the next few months we'll be very busy as the rest of the samples are identified and sent to us. Our plans are to:

- Enter all information from the packets into our spreadsheets/database
- Finish photographing all packets and specimens
- Keep one sample of each species in the Columbia Basin herbarium and send any duplicate specimens and associated data and photos to the University of Washington herbarium
- Analyze the data to look for differences in species composition between sites that may be based on aspect, substrates, or different species of shrubs, and if possible burned versus unburned habitats
- Write a report for the blitz sponsors and for public release.

Ultimately, the information and specimens collected during the Badger Mountain lichen blitz will be available to anyone interested in learning more about the lichens and bryophytes occurring in our region. Jenny von Reis also plans to produce an identification booklet containing specimen photos and other information.

#### Acknowledgements:

We wish to thank the following people for their participation and work on this, the 2018 NWL lichen blitz.

Many, many thanks go to the nine NWL members (and one budding lichenologist) who traveled to Tri-Cities to donate their time and expertise: Dr. Bruce McCune and Bailey Rodgers, a student, traveled from Oregon State University; Dr. Daphne Stone, Katy Beck and Dr. Katherine Glew came in from field work in other parts of eastern Washington; and Amanda Hardman, her botanist husband Mike Russell and son Reuben drove in from La Grande Oregon. In addition, Scot Loring drove up from very smoky Ashland Oregon and Dr. Roger Rosentreter arrived from Boise Idaho. And Dr. Jessica Allen came in from Eastern Washington University. It was a pleasure learning from all of them.

Our deep appreciation to Dr. Jenny von Reis, who provided access to CBC labs, equipment, reference books and materials needed to make the blitz a success.

We're grateful for the cash grants we were able to secure from both the Columbia Basin Chapter and the State Chapter of the Washington Native Plant Society, as well as the Friends of Badger Mountain to offset travel, lodging, and other costs incurred by the lichenologists. Mickie Chamness and Terri Knoke donated food and financial support to ensure that the blitz was a positive experience for the participants, especially for those who drove long distances to attend. Janelle Downs, Terri and Mickie supported the field effort collecting GPS points and habitat and vascular plant species information at each collection site.



From left to right

Front row – Katherine Glew, Daphne Stone, Bruce McCune, Roger Rosentreter

Middle row – Terri Knoke, Mike Russell

Back row – Mickie Chamness, Jessica Allen, Amanda Harding and Reuben, Bailey Rodgers, Katy Beck, Scot Loring, Janelle Downs

Not pictured – Jenny von Reis

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## Upcoming Workshops / Courses:

### **Northwest Botanical Institute: Field Bryology Workshop, September 23-28, 2019**

I am offering a three and a half day, intensive bryophyte identification workshop at the Andrews Experimental Forest, Blue River, Oregon (<http://andrewsforest.oregonstate.edu>). This workshop is designed for those with a strong botany background and basic knowledge of bryophyte structure and life cycles. Folks with previous experience studying bryophytes can expect to increase their familiarity with the regional flora. The class involves integrated lectures, field study and lab practice. The classroom has good microscope bench space for 12, which limits the size of the class. Participants must bring their own microscopes, personal dissecting tools, and laptop computers.

The focus is on practice with contemporary identification keys pertinent to the Pacific Northwest:

- Contributions Toward a Bryoflora of California: II A Key to the Mosses (D. Norris and J. Shevock, Madroño 2004) with attention also given to Elva Lawton's 1971 Moss Flora of the Pacific Northwest and the moss volumes (v. 27 & 28) of the Flora of North America.
- Identification of liverworts and hornworts emphasizing Contributions toward a Bryoflora of California: III Keys ...for Liverworts and Hornworts (W. Doyle and R. Stotler, Madroño 2006).
- Using the digital Guide to the Liverworts of Oregon (D.H. Wagner, Northwest Botanical Institute, 2018 version), supplemented by online treatments of the as yet unpublished liverwort volume of Flora of North America.

Participants will receive:

- Practical tips for hand lens identification in the field.
- Supervised training in lab techniques needed to observe the features used in keying.
- A selection of archival and unpublished material (both printed and digital format).
- A comprehensive review of online resources.
- Review of the most useful current literature from other parts of the world.
- A selection of study specimens for microscopy, including prepared slides.

Arrival and microscope set up in the laboratory will take place Monday morning, September 23. The first classroom session begins at 1 pm. The classroom will be available at all times from Monday through Friday. Evening sessions are designed for individual, supervised study.

Lodging check in will take place on Monday, September 23, either during an afternoon break in the class or in the evening after the class session. All participants are expected to use the Andrews Experimental Forest housing. Staying on site allows evening sessions in the classroom and socializing in the apartment common area. Participants fend themselves in a kitchen furnished with pots and pans and utensils. A small grocery is located a few miles away. We'll work together and eat together. The apartments have 4 bedrooms with 2 single beds each and a communal kitchen. The reservation is for four nights; rooms must be vacated Friday morning, September 27.

Tuition is \$400 plus \$132 for lodging, including bed linens, pillow, blanket and towels. Space is limited; early inquiry is recommended. Please contact me directly at [davidwagner@mac.com](mailto:davidwagner@mac.com) for registration instructions.

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## Siskiyou Field Institute

### Intermediate Lichens: The Genus *Usnea*

Instructor: Daphne Stone, Ph.D.

Dates: Wednesday-Friday, April 10-12, 2019

Location: SFI, Selma, OR

Tuition: \$225

Lichens in the genus *Usnea* can be perplexing to identify due to variability within and similarity among species. Yet this lichen group, so prevalent in the Pacific Northwest, is well worth learning, especially because of its sensitivity to air quality. In this field course, we will delve into the genus *Usnea* using a new pamphlet written by instructor Daphne Stone. Classroom sessions will cover aspects of identification, then we'll pursue *Usnea* in the field, traveling in the Illinois Valley and beyond to the Smith River area and the southern Oregon Coast Range. We'll examine various species and learn to decipher what they tell us about local air quality and microhabitat conditions.

### The Art of Lichen Dyeing

Instructor: Rachel Winters

Date: Saturday, March 23, 2019

Location: SFI, Selma, Oregon

Tuition: \$60

Learn how to create luminescent colors from common lichens! The skills you'll acquire from this workshop apply to fiber arts projects including knitting, weaving, felting and basketry. During this day-long course we discuss identification of a dozen different lichen species and their habitats as well as the colors they can provide for dyeing. Dye-creating tools and techniques will be shared in the classroom, then we'll try dyeing in the Deer Creek Center kitchen. Each student will create a lichen sample and corresponding fiber sample reference collection on cards. Expect to walk about a mile total on our outdoor forays, depending on weather. A supply list will be sent with the course letter.



*Usnea rubicunda*

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## Katherine Glew

### Lichens: Mysterious Fungi of the Forest

Date: Sunday, May 26, 2019

Time: 10am to 3pm

Location: Exit 32 from I-90, 17905 Cedar Falls Rd SE, North Bend, WA

Bring: a hand lens/magnifying glass & "Macrolichens of the Pacific Northwest" - McCune & Geiser

Cost: \$25

Registration: *Not yet posted*. Keep a watch on:

<http://www.seattle.gov/util/EnvironmentConservation/OurWatersheds/CedarRiverWatershed/ProgramsTours/index.htm>

Dr. Katherine Glew will lead a lichen tour in the Cedar River Watershed, east of Seattle, to introduce you to the fascinating lichens of the forest. If you have wondered about what a lichen is and why they are in the forest, this will be a great opportunity to view the lichen diversity in the watershed and learn the names of our most common species. There will be a short classroom session, followed by visits in the watershed, identifying and studying specimens collected from various forest habitats.

### Exploring Lichen Species at Goose Rock, Washington

Dates: May 18, 2019

This field trip is part of the 2019 Washington Native Plant Society (WNPS) Study Weekend. You must be a member to participate.

Dr. Kathrine Glew, will guide us through a maritime forest to the summit of Goose Rock (by Deception Pass), viewing lichens along the way. Many lichens will be found in along the trail and forest floor. There are several locations with lichen mats (*Cladonia* sp., reindeer lichen) worth stopping for study. We will find lichens that grow on salal leaves (*Gaultheria shallon*) – folicolous lichens (*Fellhanera* sp.). The exposed summit site includes a number of lichens that are typically associated with alpine habitats. There will be many crustose species on the rocks and others growing amongst the vegetation. Goose Rock summit will provide a fantastic opportunity to see lichen diversity and learn some of the more common species found in the area. The view is spectacular. Bring a camera or use your smart phone to take images of the islands and lichens. A hand lens or magnifying glass will enhance your lichen experience.

Description for WNPS Study Weekend -- <https://www.wnps.org/events/395>

Scroll to the bottom of the posting and click on: 1. SW 2019-field-trip-descriptions.1.2319

This is a pdf. Lichen Field Trip Number 111



*Umbilicarea proboscidea*

## *News and Projects from NW Lichenologists at Home and Abroad* (Generally in the order received)

### **Montana Field Guide and More From Andrea Pipp:**

For the first time Montana has a lichen checklist! You can find it on the Montana Fungi Field Guide created by the Montana Natural Heritage Program (MTNHP): <http://fieldguide.mt.gov/> Montana is home to about 1,045 lichen species which are documented from verified specimens. The Montana Fungi Field Guide is organized by taxonomic classification, but searchable by name, status, and other attributes. Use the Search Field Guide and Advanced Search windows or drill down through the classification to find your lichen of interest. Each lichen has its own profile page containing standardized common name(s), alternate scientific name(s) [synonyms, misapplied scientific name(s), etc.], NatureServe's Global Rank, Montana's State Rank, agency status designations, and links to external source information. We are building the profiles, and those designated as Montana Species of Concern have more information than others. Eventually each lichen's profile will include photographs and information on the State Rank rationale, identification characteristics, look-alike species, diagnostic characteristics, habitat, ecology, management, reproductive characteristics, threats or limiting factors, range, Montana distribution, and Montana observation data.

This checklist was made possible by decades of work by Bruce McCune, Roger Rosentreter, Toby Spribille, Othmar Breuss, and Tim Wheeler who authored Montana Lichens: An Annotated List (2014). The checklist was further enhanced by subsequent research by Tim Wheeler and the many lichenologists who publish to share their research findings. Many thanks also goes to NatureServe for assisting the MTNHP in databasing the State checklist.

Montana has a revised Moss checklist! It is available on the MTNHP website as a downloadable PDF at <http://mtnhp.org/Reports.asp?key=3> and on the Moss Field Guide at: <http://fieldguide.mt.gov/displayClasses.aspx?phylum=Bryophyta>

This revision of the 1993 Montana Moss Checklist was made possible by bryologist Joe Elliott. Montana is home to 521 moss taxa primarily documented from verified specimens. The checklist also contains County distribution maps, synonyms, standardized common names, habitat associations, and notes on rare or unusual collections.

As with all species on our Montana Field Guide, each moss profile list NatureServe's Global Rank, Montana's State Rank, agency status designations, and external links to other sites. Currently, 387 moss species or varieties have profiles containing State Rank rationale, identification, diagnostic characteristics, reproductive characteristics, habitat, range, Montana distribution, and Montana observation data. About 676 captioned photographs are posted on the Moss Field Guide.

### **But wait the MTNHP has more updates coming your way!**

Check out Evansia for an article on *The History, Biogeography, and Species of Montana Mosses (1880-2018)* by Joe Elliott and Andrea Pipp, which we anticipate will be published this spring.

The University of Montana herbarium (MONTU) houses at least 2,500 moss specimens dating from the late 1800's to 2018. The collection has mostly gone unnoticed because the information isn't electronically available. Joe Elliott spent considerable time verifying the identifications and updating their names to current standards used by the Flora of North America. The MONTU

Curator and MTNHP Botanist successfully won a grant from the Institute of Museum and Library Services, which is funding to database and geo-reference the collection. In less than a year's time the updated and verified MONTU collection should be showing on the MTNHP Map Viewer application and portals for the Consortium of Pacific Northwest Herbaria and Consortium of North American Bryophyte Herbaria.

As MTNHP staff time and funding become available, moss and lichen observation data from herbaria and field surveys will be entered into the botany database. In several years time, the database should be ready to support a re-evaluation of the Montana Species of Concern list for mosses and lichens.

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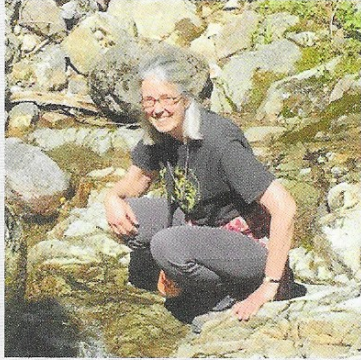
## Women in Lichenology Postcard Series:

The Canadian Museum of Nature published a series of postcards celebrating women in lichenology. One of these postcards features our very own Daphne Stone!

### Women in Lichenology – The Discovery Series, 3/4

### Les femmes en lichénologie - Série Découverte, 3/4

#### Dr. Daphne Stone



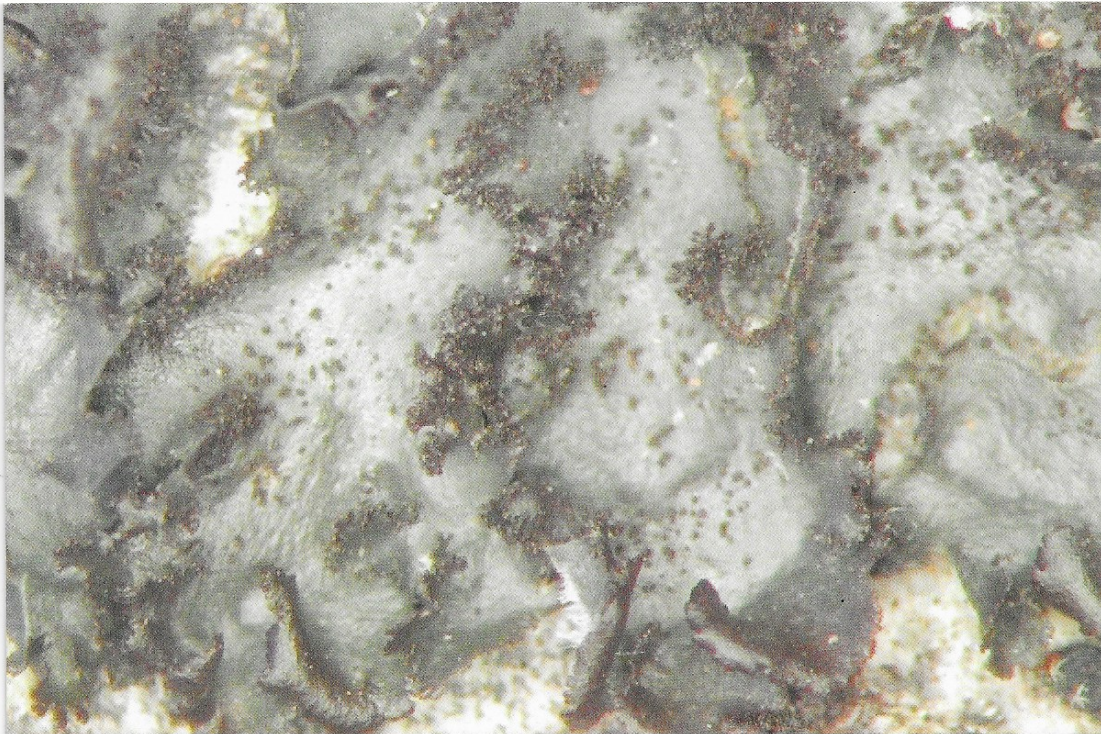
Photograph by/Photo prise par Steve Rasmussen.

Daphne leads a team of lichenologists and bryologists that survey lands in the Pacific Northwest of the USA, searching for rare species and special habitat, mostly on Federal lands. She specializes in lichen genera with cyanobacterial photobionts, including *Collema*, *Rostania*, *Leptogium* and *Scytinium*. She also studies the soil crusts of eastern Oregon and Washington, and the effects of grazing on these fragile communities that are important to conservation of western dry lands. Other genera of focus are *Usnea* and *Cladonia* and the aggregation of genera that make up calicioid lichens. She is the President of Northwest Lichenologists and lives in Eugene, Oregon.

Daphne dirige une équipe de lichénologues et de bryologistes qui étudient les terres du Pacifique Nord-Ouest des États-Unis, à la recherche d'espèces rares et d'habitats spéciaux, principalement sur les terres fédérales. Elle se spécialise dans les genres de lichens à photobiontes cyanobactériens, dont *Collema*, *Rostania*, *Leptogium* et *Scytinium*. Elle étudie également les croûtes de sol de l'est de l'Oregon et de Washington, ainsi que les effets du broutage sur ces communautés fragiles qui sont importantes pour la conservation des terres arides dans l'Ouest. Les autres genres d'intérêt sont *Usnea* et *Cladonia* et l'agrégation des genres qui composent les lichens calicioides. Elle est présidente de la Northwest Lichenologists Association et vit à Eugene, en Oregon.

**Front:** *Scytinium siskiyouensis* (D.F. Stone & Ruchty) Otálora, P.M. Jørg. & Wedin, named after the Siskiyou Mountains of southern Oregon and northern California, which are its center of distribution. The name was also chosen to honor the native American tribes who named these mountains.

**Devant:** *Scytinium siskiyouensis* (D.F. Stone & Ruchty) Otálora, P.M. Jørg. & Wedin, du nom des montagnes Siskiyou du sud de l'Oregon et du nord de la Californie, qui sont son centre de distribution. Le nom a également été choisi en l'honneur des tribus amérindiennes qui ont baptisé ces montagnes. Photograph by/Photo prise par Daphne Stone.



## From Rebecca Durham:

Our biocrust field research culminated in this manuscript published in *Plant and Soil*. The open access article is available at <https://doi.org/10.1007/s11104-018-3725-3>

Durham RA, Doherty KD, Antoninka AJ, Ramsey PW, Bowker MA (2018). Insolation and disturbance history drive biocrust biodiversity in Western Montana rangelands. *Plant and Soil*, 430: 151–169

### Abstract

#### *Background and Aims*

Biological soil crust (biocrust) communities, though common and important in the intermountain west, have received little research attention. There are gaps in understanding what influences biocrust species' abundance and distributions in this ecoregion. Climatic, edaphic, topographic, and biotic forces, in addition to anthropogenic disturbance can all influence the biocrust.

#### *Methods*

We determined the relative influence of several possible environmental filters in biocrust communities of western Montana (USA) grasslands at two spatial scales. The larger scale exploited strong topographically-dictated climatic variation across >60km<sup>2</sup>, while the smaller scale focused on differences among distinct microsites within ~700m<sup>2</sup> plots.

#### *Results*

We detected a total of 96 biocrust taxa, mostly lichens. Biocrust richness at each site ranged from 0 to 39 species, averaging 14 species. Insolation, aspect, and disturbance history were the strongest predictors of biocrust richness, abundance, and species turnover across the landscape; soil texture was influential for some biocrust community properties. Steep, northfacing slopes that receive longer periods of shade harbored higher diversity and cover of biocrust than southfacing sites. At a small scale, interspaces among native herbaceous communities supported the greatest diversity of biocrust species, but microsites under shrub canopies supported the greatest cover.

#### *Conclusions*

We found that, among the variables investigated, tillage, insolation, soil texture and the associated vegetation community were the most important drivers of biocrust abundance and species richness. This study can inform the practice of restoration and conservation, and also guide future work to improve predictions of biocrust properties.

Representative photos are on the next page.







This poem of mine originally appeared in *Mantis*, 2018

**Meander Belt** by Rebecca Durham

I knew there was going to be something because I have been watching. We get there by walking. We have been watching and knowing and I knew it was going to be something. Not today not that again, not that old thing with the choke-stacked air already catching in the throat, tang of toxin, fixed tangent. Not today no today we just do flowers. We love the flowers and lichens under bunchgrass shadows and watch red velvet mites motor through leaf litter. Today no motors but the roar of the jet and the jerk of the truck pulling us up dirt draws. Up the draws and over we see coyotes and sand hill cranes and the tuft of *Bryoria* we find on the ground where the land folds itself over into extended shadow. We get there by walking, we see what there is and keep walking and all around us miles of blue and green and brown. We are higher than the trees. We are higher than the trees and down below in Tongue Creek a cow elk comes out of the cottonwoods and moves through. How do we move through. Move through that old thing. Subduction zone on the edge of serration. Not that again. Walking we knew we would find certain things but not *Bryoria* on the edge of *Ochrolechia*, brown wiry tuft coming out of those apos. We were walking and we stopped and we were watching and there it was that lichen. Just spilling brown and angling up and moving through.





## Amazing Lichen Art! By Sharron Birzer

On the days surrounding the Summer Solstice 2018, during an artist residency in SE Alaska, I was fortunate to experience kayaking and camping in the Tebenkof Bay Wilderness in the Tongass National Forest with a lichenologist and other Forest Service crew members. I spent much of my time exploring lichens with Karen Dillman, a Forest Service ecologist and lichenologist. There was almost no discernible human impact in this untouched and pristine area of wilderness, except for signs of the native Tlinget inhabitants who once lived there. We did see evidence of former logging and signs of former fox farms on some islands. I observed beautiful and unique life forms at every turn, recording them with photographs and drawings, focusing on lichens. The illustration of *Hypogymnia duplicata* and details in this poster are part of the group of lichen illustrations I worked on as a result. I created this poster for interpretive purposes for the Forest Service as part of this residency.



*Ramalina panizzei*



Editor's note: if anyone is searching for an illustrator, just look above and you may have found one. I happen to know that she is available!



## Two Basidiomycete Fungi in the Cortex of Wolf Lichens Brought to us by Thomas Mumford

### Highlights

- Most wolf lichens contain three fungal species in their cortex
- A *Tremella* fungus thought to be restricted to rare galls is ubiquitous as a yeast
- When in hyphal form, *Tremella* enwraps algal cells
- Bright-field microscopy underestimates secondary fungal occurrence in lichens

### Authors

Veera Tuovinen, Stefan Ekman,  
Göran Thor, Dan Vanderpool,  
Toby Spribille, Hanna Johannesson

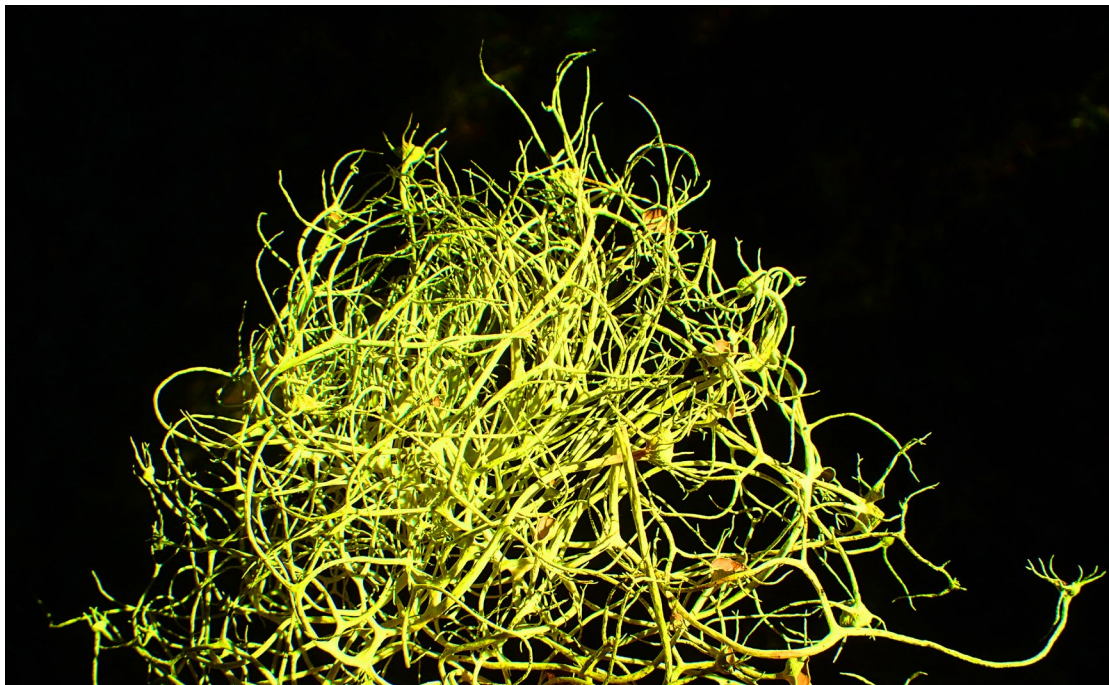
### Correspondence

tuovinen.veera@gmail.com

### In Brief

Lichens have historically been treated as symbioses of a single fungus and an alga, but shotgun DNA sequencing is enabling a re-evaluation of this census. Tuovinen et al. report a third fungal species in the cortex of 95% of sampled wolf lichens. The findings suggest that lichens may not be defined by any one universal combination of organisms.

Editor's note: yet more amazing discoveries in the world of lichen symbioses! However, due to potential copyright conflicts, we cannot present the full article in this newsletter. Full text is available at: <https://www.sciencedirect.com/science/article/pii/S0960982218316543>



## **Shirley Tucker Celebration by Daphne Stone**

In mid-March, a wonderful gathering of lichenologists occurred in Santa Barbara, California, to honor Shirley Tucker. Shirley is a lichenologist and plant systematist who completed her doctoral work at UC Davis in 1956, then had a career as professor of Plant Systematics at Louisiana State University. After retiring in 1995, she moved back to California to continue her life-long work on lichens.



Not only did Shirley bring her passion for plants and lichens and her large lichen collection, in 2018 she endowed a Lichen Chair at Santa Barbara Botanical Garden. Our fellow lichenologist Rikke Reese Naesbourg has been selected as the first Tucker Lichenologist at the Santa Barbara Botanic Garden. Rikke's appointment will bring new energy to lichenology in California, starting with an in-depth survey of lichens of the Channel Islands.

Attending the gathering were lichenologists from the PNW and CA. At a luncheon honoring Shirley, she was presented with paintings of the 6 lichen species named after her.





Following the luncheon we toured the Santa Barbara botanical garden, where we saw *Teloschistes chrysophthalmus* and *T. flavicans* growing lavishly on several trees and debated about a tiny soredate physcioid.



Back Row: Julene Johnson, Rikke Reese Naesbourg, Tom Carlberg, Charis Bratt, Ken Kellman, Hannah Mesrati, Daphne Stone; center row: Shirley Tucker; front row: Adrienne Kovasi, Roger Rosentreter, Shelly Benson, Jes Coyle, Linda Geiser.

The second day of the celebration, we visited Santa Cruz Island, the closest of the Channel Islands to Santa Barbara. With perfect blue skies and as calm waters as could be wished for, we saw whales and dolphins, and took a lichen-packed walk along a trail above the cliffs, on which we covered the amazing distance of 0.7 mile in over two hours! Painted lady butterflies, blown off the mainland by strong winds earlier in the week, flew by our boat and settled on the giant *Coreopsis* flowers that were in full bloom. *Ramalina* species covered oak twigs and we collected Graphidaceae, soil crusts and rock dwellers.



In addition to the gift to SBBG, Shirley funded a 2-year position for a Faculty Research Associate to improve the Oregon State University Lichen Herbarium. That position is shared by me and Mike Haldeman, and we have been working on identifications, curation, and databasing of the OSC lichens. The OSC Herbarium was badly in need of some loving attention, since boxes and boxes of specimens sat unaccessioned on top of the cabinets and many others were in need of identification and curation. In addition, the Forest Inventory and Analysis lichen collection is currently being installed at OSC and Mike and I have been assisting on that large project, as well as using the specimens for research.

Shirley's gifts are welcome additions to lichenology on the west coast, and I believe we will be feeling the repercussions of her generous gifts for years to come.

## **Book Review:**

### **Common Mosses of Western Oregon and Washington**

Bruce McCune and Martin Hutten. 2018. Wild Blueberry Media, Corvallis, Oregon ISBN 978-0-9987108-2-2. \$40 from [www.wildblueberry.net](http://www.wildblueberry.net)

Book Review by David Wagner

There are few people who would be as excited as I was when I first got this book in my hands. Even though mosses are just background color to most, this book is sufficiently ground breaking that it warrants a close look. This is the first book I have found that uses modern digital photography to make identification of our common mosses easy for the neophyte. The hundreds of high quality photos are what makes this book so wonderful, many of them taken through a microscope. These photomicrographs provide the detail needed for positive identification.

Like most identification books, traditional dichotomous keys are used to guide one through the process. Each step in a dichotomous key consists of two contrasting descriptive statements. These two statements are called a couplet. Each individual statement in a couplet is a lead. All of the features used in the couplets are illustrated with photographs. The critical photos are indexed after each lead. These are often supplemented by instructional photos that illustrate similar kinds of features to help understand the key descriptions.

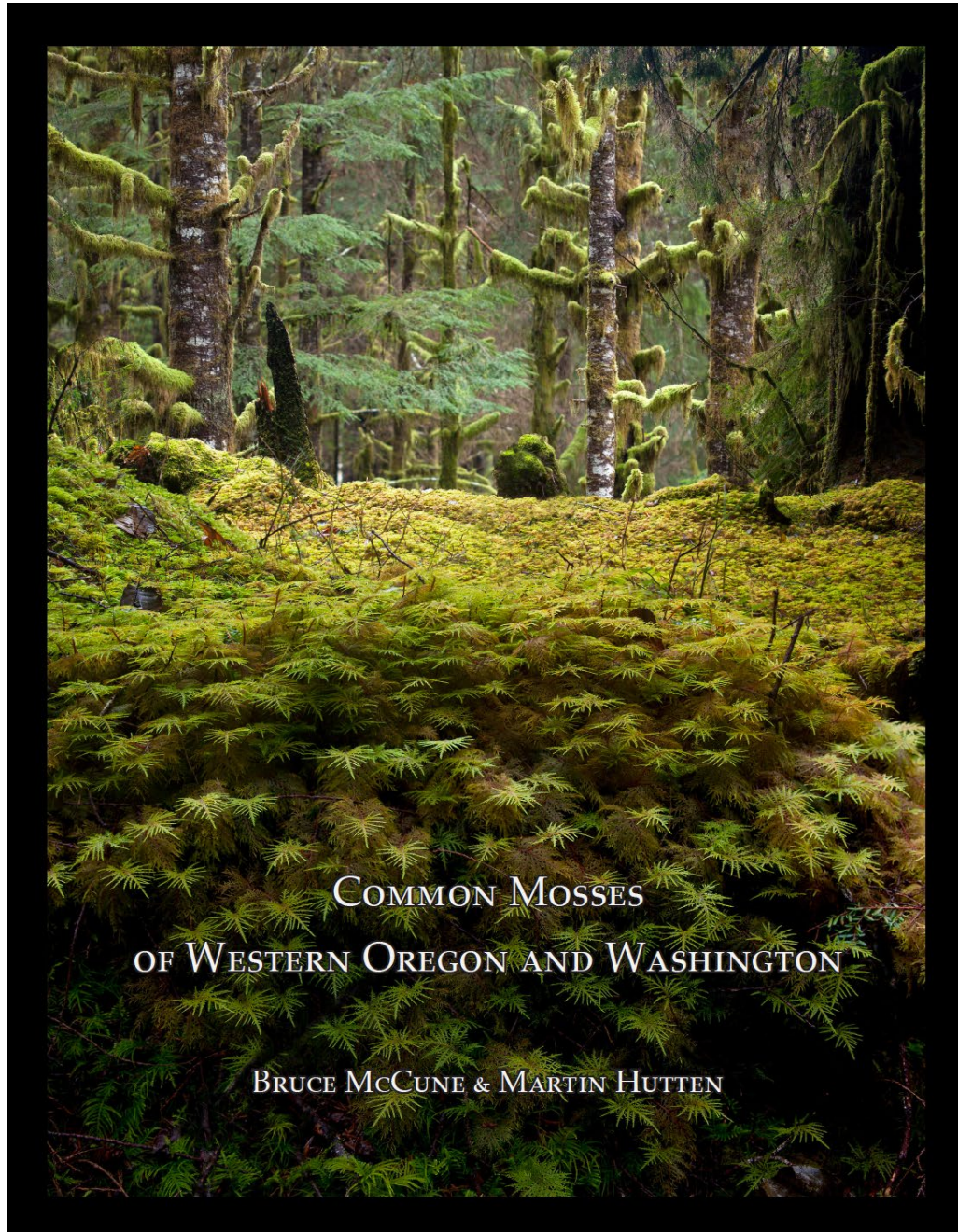
The authors have generated keys based on features which are generally easy to use. They have separated coherent groups of species into smaller keys. The first part of the introductory key emphasizes sorting out the groups of mosses that can be recognized by examination with the naked eye or a hand lens. These are the large, showy species such as the forest floor mosses. It is always a good idea to first pick out the easily recognized species.

This book takes a bit of study for a beginner to get a feeling for of the style of writing. The instructional chapters are well crafted, including an illustrated glossary. These will make keying go smoothly. I like that the easier keys are near the front of the book and the harder ones near the end. The coverage of the area is better than the title, "Common Mosses..." implies. There are 200 species in 100 genera covered in this book, a significant portion of the 500 or so species known from Oregon. The crispness of the images, 529 pictures on 146 pages, is remarkable. The photomicrographs of leaf cells are stunning, precisely what is needed to compare with a specimen on your slide. All are clearly labeled, many with a scale bar.

After the easy groups are separated out, the book cannot be used effectively without having and knowing how to use a compound microscope. This is not a bad thing. Decent binocular microscopes are available for about \$200. Microscopy is a traditional activity that should have more followers. The beauty of the photomicrographs in this book will generate interest to learn how to make slide preparations of moss leaves.

Eventually, one must learn how to cut thin sections of moss leaves. Each of the two authors has a personal style of making thin sections. This is not unusual as many moss students have a personal style of making free hand sections. Like many, I believe my method is better than Bruce or Martin's because it requires no special equipment, is easy to teach and produces good sections. Even without microscopy, however, this book will be enjoyed by all who appreciate this Lilliputian world.





COMMON MOSSES  
OF WESTERN OREGON AND WASHINGTON

BRUCE MCCUNE & MARTIN HUTTEN



## Lichen Apparel and Publications

### **Letharia columbiana apparel**



Northwest  
"Lycanologists"



NWL Shirts and Caps

Email this form to Daphne Stone at [daphstone@gmail.com](mailto:daphstone@gmail.com)

Once I confirm we have your items, then mail a check made out to Northwest Lichenologists to:

Daphne Stone  
30567 Le Bleu Rd  
Eugene, OR 97405

| Shirts: LETHARIA        |              | adult S  | adult M | adult L | adult XL | Adult XXL      | PRICE   |
|-------------------------|--------------|--|---------|---------|----------|----------------|---------|
| regular T all cotton    | black        |  |         |         |          |                | \$20.00 |
| regular T all cotton    | medium blue  |  |         |         |          | n/a            | \$20.00 |
| long sleeve all cotton  | black        |  |         |         | n/a      |                | \$20.00 |
| Ladies T, all cotton    | black        |  |         |         | n/a      | n/a            | \$20.00 |
| tissue T, poly mix V-   | blue         |  | n/a     |         | n/a      | n/a            | \$20.00 |
| tissue T, poly mix,     | blue         | n/a  |         |         | n/a      |                |         |
| tissue burnout T, round | blue         |  | n/a     | n/a     | n/a      | n/a            | \$20.00 |
| ladies tissue, deep V,  | black        |  |         |         | n/a      | n/a            | \$20.00 |
| youth T                 | black        | youth S  | youth M |         |          |                | \$15.00 |
| Men's zip hoodie        | black        |  |         |         |          |                | \$35.00 |
| Women's zip hoodie      | black        | n/a  |         |         | n/a      | n/a            | \$35.00 |
| shirts: LYCAN           |              |  |         |         |          |                |         |
| ladies T                | black        |  |         |         |          |                | \$20.00 |
| men's T                 | black        | n/a  |         |         |          |                | \$20.00 |
| cap w/ embroidered      | black        |  |         |         |          |                | \$18.00 |
| cap w/ embroidered      | blue         |  |         |         |          |                | \$18.00 |
| Shipping                | \$28 or less | \$5  |         |         |          |                |         |
|                         | \$28-\$50    | \$9  |         |         |          |                |         |
|                         | over \$50    | ask for quote:<br><a href="mailto:daphstone@gmail.com">daphstone@gmail.com</a> |         |         |          | shipping cost: |         |
|                         |              |  |         |         |          | TOTAL          |         |

# Monographs in North American Lichenology

## A series sponsored by Northwest Lichenologists

Northwest Lichenologists aim to produce a series of reasonably-priced, peer-reviewed, paperback academic books on lichens, with a focus on topics of regional interest, such as generic monographs, annotated state lists, ecological works, local floras, and symposium proceedings. Our purpose is to provide an outlet for very long papers and books of wide interest but that are too long for regular scientific journals. Volumes will be produced sporadically. We expect 0-2 volumes per year. Works on any aspect of lichenology will be considered.

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### *Monograph in North American Lichenology, Vol. 3*

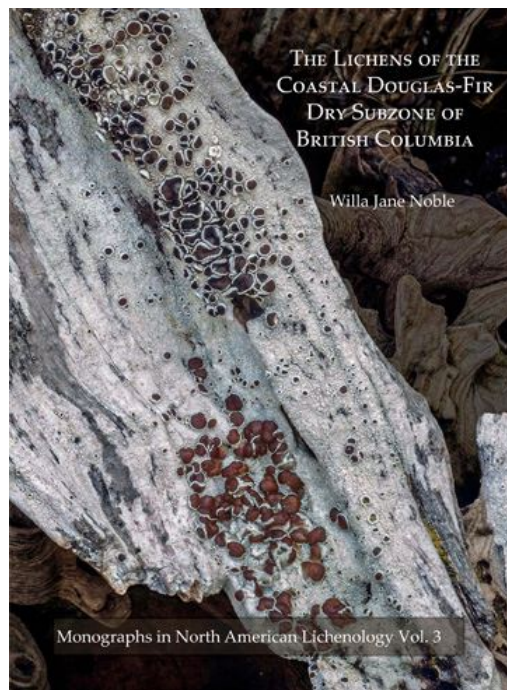
#### **The Lichens of the Coastal Douglas-Fir Dry Subzone of British Columbia**

The single most valuable book for people interested in learning the crustose lichen flora west of the Cascade Range has been Willa Noble's unpublished Ph.D. dissertation. This massive work contains an excellent lichen flora for a portion of British Columbia. But its importance extends well beyond that. It is an indispensable reference work for lichen studies from Alaska to northern California.

For ordering information, please use the "Store" tab at the new NW Lichenologists website. Sample pages are posted

[Order by credit card using PayPal](#) from [www.nwlichens.org](http://www.nwlichens.org)

Noble, W. J. 1982, Reprinted in 2017 with nomenclatural updates by Michael Haldeman. **The Lichens of the Coastal Douglas-Fir Dry Subzone of British Columbia**. Monographs in North American Lichenology 3: 1-260. Pbk. \$30. Keys and full descriptions, B/W line drawings of spores.



## ***Monograph in North American Lichenology, Vol. 2***

We are pleased to announce that we now have in hand volume 2 of *Monographs in North American Lichenology*, entitled **Montana Lichens: An Annotated List**.

Why would a non-Montanan lichenologist want one? This is the first comprehensive summary of the occurrence, literature references, and ecological context for lichens in any state or province in the Pacific Northwest or northern Rocky Mountains. Because we also include reports from adjoining states and provinces, the book should be useful in a broad area. The monograph will be an invaluable reference for people delving into either crustose lichens or macrolichens.

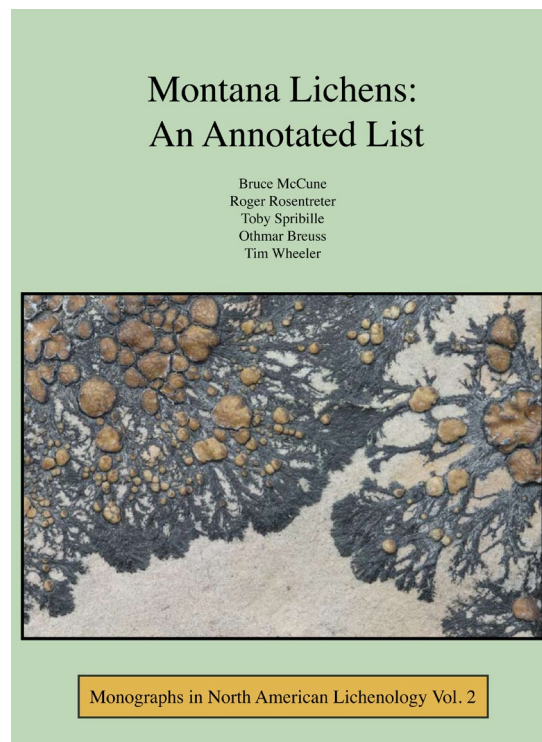
So far, a total of 1074 species are documented from Montana. Of these, 283 species are new for the state and 19 are new to North America. We discuss the rare, threatened, and endangered lichens of Montana. Priorities for surveys and monitoring are evaluated by placing species in one of eight categories, based on all combinations of global rarity, ease of detection, and habitat vulnerability.

You will also find new names for a number of old friends. Do you recognize *Lobaria anomala*? *Scytinium palmatum*? *Circinaria rogeri*? Dig in and find out.

For ordering information, please use the "Store" tab at the new NW Lichenologists website. Sample pages are posted.

[Order by credit card using PayPal](#) from [www.nwlichens.org](http://www.nwlichens.org)

McCune, B., R. Rosentreter, T. Spribille, O. Breuss and T. Wheeler. 2014. ***Montana Lichens: An Annotated List***. Monographs in North American Lichenology 2: 1-183. Pbk. \$30. ISBN-13: 978-0-9790737-1-7



***Monograph in North American Lichenology, Vol. 1***

McCune, B. and R. Rosentreter. 2007. **Biotic Soil Crust Lichens of the Columbia Basin. Monographs in North American Lichenology 1:** 1-105. Pbk. \$30. Fully illustrated in color. [[See sample pages.](#)] ISBN-10: 0-9790737-0-7 ISBN-13: 978-0-9790737-0-0

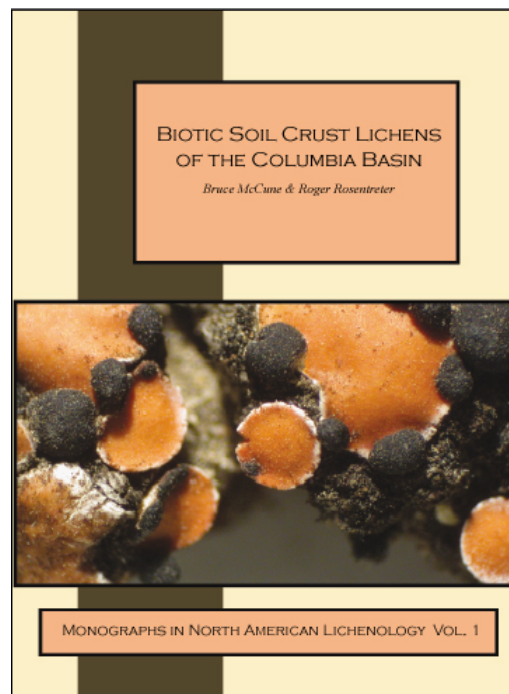
[Order by credit card using PayPal](#) from [www.nwlichens.org](http://www.nwlichens.org)

Why write a book for identifying soil crust lichens? We have three reasons: (1) they are ecologically important, (2) they can be difficult to identify with existing sources, or they are omitted altogether, and (3) they should be more widely recognized for what they are.

Macrolichens are much better known in North America than crustose lichens, but most of the lichens found in biotic crusts are crustose lichens. Keys and line drawings for macrolichens from the Pacific Northwest and northern Rocky Mountains are provided by Goward et al (1994), McCune and Goward (1995), and Goward (1999). Brodo et al. (2001) and McCune and Geiser (1997) provided color photos for selected species. Despite these resources, almost none of the lichen species growing in biotic crusts in the Pacific Northwest have been illustrated with color photos in sufficient magnification and detail for confident identification. We hope that this book will help to relieve that problem.

Lichens in soil crusts are often difficult to identify. Currently available books for identifying lichens do not illustrate the critical features needed for identification. We try to fill this need by providing photographs of all of the species at the necessary scale – ranging from what you can see with a hand lens to what you can see through a compound microscope. Wherever possible, we emphasize macroscopic features, but in many cases microscopic characters make the task much easier and help to confirm the identification.

This book is aimed at both technical and naturalist audiences. We hope that the use of color photographs will help someone without much experience, while we strive to provide the technical details needed for more certain identification.





## Miscellaneous

### Lichen Blitz



#### *Are you interested in hosting a NW Lichenologists lichen-blitz?*

Once or twice a year NWL members come together for a multi-day fieldtrip to a lichen-rich area in the Pacific Northwest of North America. The purpose is to get to know each other, and learn from each other while doing what we love to do: “lichenize.” These gatherings bring together much expertise. Our collaborative efforts typically result in an inventory list of species encountered, often uncover noteworthy finds (rare species, disjunct populations, others of conservation concern), and thus far one undescribed species.

If you manage a natural area, and are interested in hosting a lichen-blitz, please contact us. We are a low-maintenance group that usually camps or bunkhouses in remote locations. Formal permission to collect lichens is naturally required. NWL will periodically review its blitz requests and optional associated donations; a foray to the best candidate area will then be scheduled.

Donations will be used to support the educational, nonprofit purposes of NW Lichenologists.

[Contact the secretary of NW Lichenologists](#)