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The California Lichen Society seeks to promote the appreciation, conservation and study of lichens. The interests of the Society include the entire western part of the continent, although the focus is on California. Dues categories (in $US per year): Student and fixed income - $10, Regular - $18 ($20 for foreign members), Family - $25, Sponsor and Libraries - $35, Donor - $50, Benefactor - $100 and Life Membership - $500 (one time) payable to the California Lichen Society, P.O. Box 472, Fairfax, CA 94930. Members receive the Bulletin and notices of meetings, field trips, lectures and workshops.

The Bulletin of the California Lichen Society (ISSN 1093-9148) is edited by Tom Carlberg, tcarlberg7@yahoo.com. The Bulletin has a review committee including Larry St. Clair, Shirley Tucker, William Sanders, and Richard Moe, and is produced by Eric Peterson. The Bulletin welcomes manuscripts on technical topics in lichenology relating to western North America and on conservation of the lichens, as well as news of lichenologists and their activities. The best way to submit manuscripts is by e-mail attachments or on a CD in the format of a major word processor (DOC or RTF preferred). Submit a file without paragraph formatting; do include italics or underlining for scientific names. Figures may be submitted electronically or in hard copy. Figures submitted electronically should provide a resolution of 300 pixels-per-inch (600 minimum for line drawings in JPEG format); hard copy figures may be submitted as line drawings, unmounted black and white glossy photos or 35mm negatives or slides (B&W or color). Email submissions of figures are limited to 10 MB per email, but large files may be split across several emails or other arrangements can be made. Contact the Production Editor, Eric Peterson, at eric@theothersideofthenet.com for details of submitting illustrations or other large files. A review process is followed. Nomenclature follows Esslinger cumulative checklist on-line at http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm. The editors may substitute abbreviations of author's names, as appropriate, from R.K. Brummitt and C.E. Powell, Authors of Plant Names, Royal Botanic Gardens, Kew, 1992. Instructions to authors will soon be available on the Society's web site (below). Style follows this issue. Electronic reprints in PDF format will be emailed to the lead author at no cost.

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The California Lichen Society is online at http://CaliforniaLichens.org and has email discussions through http://groups.yahoo.com/group/CaliforniaLichens.

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Front cover: *Lichenostigma cosmopolites* on *Xanthoparmelia*. Bar = 5 mm. Photo by Jana Kocourková.

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VOLUME 14 NO. 1 SUMMER 2007

Lichenicolous Fungi

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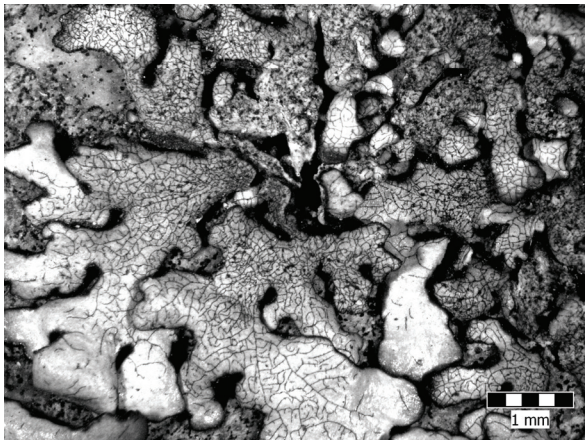
An esoteric branch of mycology and lichenology is the study of lichenicolous fungi. Lichenicoles, as we call them for short in California, form a symbiotic relation with the thalli of lichens. This relationship may be parasitic and pathogenic, causing the destruction of the lichen thallus, as with *Sarcopyrenia bacillosa* on *Acarospora socialis* (Knudsen and Lendemer 2006) or it may be commensalistic, causing no apparent harm to the lichen thallus, except when the lichenicole becomes too prolific. Some lichenicoles are merely widespread saprobes that grow on either decaying lichen thalli or plants. Lichenicolous fungi have complex co-evolutionary histories with their hosts as do all symbiotic organisms such as the bacteria in the human gut for instance or the fungi that cause skin diseases. Lichenicoles are often specific to certain genera of lichens like the pin fungus *Sphinctrina* on *Pertusaria*. Others like members of the genus *Endococcus* may be restricted to a single species like *E. oreinae* on *Dimelaena oreina*.

The natural distribution of lichenicoles is as widespread as their hosts. It is not unusual for lichenicoles to be found in both Europe and North America on different species of lichens in the same genus as for instance *Endococcus stigma* in the strict sense on different species of *Acarospora* (Sérusiaux et al. 1999; Knudsen and Kocourková accepted). But they can be very rare. Why? As Hawksworth (2003) has pointed out lichenicoles are most abundant in habitats with long natural continuity. Jana Kocourková (pers. comm.) has stressed that lichenicoles are most abundant in open sites with high relative humidity and long natural continuity. Thus lichenicolous fungi could potentially be used as bioindicators of the natural history of a particular site. For instance, even where some natural hosts have returned, I have noticed sites with frequent fires in southern California often lack lichenicoles. Jana Kocourková told me that when lichens recover at sites from the abatement of air pollution in central Europe they still remain poor in lichenicoles.

It is not hard if you look to observe or collect the more obvious lichenicoles. For instance, *Lichenostigma cosmopolites* is quite common on *Xanthoparmelia*, covering them with a fine beautiful net of superficial black hyphae (cover photo; insert). But the identification of most lichenicoles is hard. One generally has to be skilled with making sections as well as with a compound microscope. The ascomata for instance are rarely wider than 300 microns. Conidiomata can even be harder to prepare for identification. Specimens can often be skimpy or lack enough spores or conidia for positive identification. Then the literature is often hard to get, in German or Esperanto or published in specialist journals which



Lichenostigma cosmopolites on *Xanthoparmelia*. Bar = 5 mm. Photo by Jana Kocourková.

may not even be in your local university library. Mycologists who specialize in lichenicolous fungi are even rarer than lichenologists. Experts like Javier Etayo or Paul Diederich are overworked with their own research and rarely have the time to look at specimens submitted to them. Another problem is the taxonomy of lichenicolous fungi, while progressing rapidly, is even less developed than crustose lichen taxonomy for instance. Herbaria of lichenicolous fungi specialists are filled with hundreds of undetermined or undescribed taxa. Because the number of specialists in lichenicolous fungi is so small, often lichenicolous fungi are discovered through the study of lichen specimens ordered from herbaria or from specimens collected by non-specialists that were sent to experts rather than collected in the field by the specialists themselves. This is case with many lichenicoles described from California. Thus ecological data or more detailed information on infections may be lacking in descriptions. This information can be highly useful to know in both collecting or identifying lichenicoles.

Shirley Tucker (pers. comm.) estimates approximately 120 lichenicoles have been reported from California but her personal list does not include many recent reports. Worldwide there are over 1500 species of lichenicolous fungi (Lawrey & Diederich 2003) with new species described practically every month.

Dr. Jana Kocourková of the National Museum in Prague in the Czech Republic is a specialist in lichenicolous fungi. She did her doctorate on the lichenicolous fungi of Czech Republic. She recently visited Southern California to collect lichenicolous fungi as a guest of the UCR Herbarium. We restricted our collecting to southern California to 19 sites not previously collected for lichenicolous fungi in San Diego, San Bernardino, and Riverside counties from just above the Pacific shoreline to over 8000 feet. Reports on the actual taxa collected will be published in separate publications. An ample number of taxa new to science, or described but new to North America or California, were collected. But some interesting observations can be discussed here.

Collecting lichenicolous fungi is very different from collecting lichens. Generally when one collects lichens one moves from one rock or tree trunk to another, picking out new specimens as one moves across the landscape, looking always for something different. With lichenicolous fungi we rarely did much hiking. We looked at the same lichen species over and over again until we found signs of infection or ascomata on lichen thalli. While lichens can be almost impossible to distinguish when wet and translucent, hydrated lichens are much easier to spot lichenicolous fungi on. The use of a hand lens with a light was also very useful. The illumination often highlighted the subtle changes in thalli infected by lichenicoles or made perithecia easier to see. It is also very helpful to be familiar with genera and species that lichenicoles are known to have been previously collected on.

I selected the sites we visited. My first criterion for picking sites was that they had fairly undisturbed natural histories, particularly low fire frequency. The second criterion was that sites had relatively high humidity on an annual basis. For instance in the Mojave and Colorado desert, I picked washes. These sites are usually rich in lichens and proved to be also rich in lichenicoles. While sightseeing in the deserts the lichens we looked at in situations not located in drainages invariably lacked lichenicoles. But for our 19 collecting sites these criteria were used.

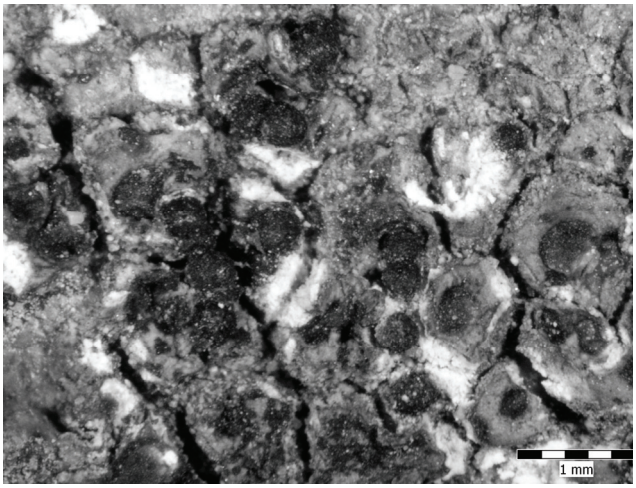
I myself would not have found lichenicoles at all of the sites. But Jana Kocourková is a specialist in lichenicolous fungi with extensive field experience as

Jana Kocourková. Photo by T. Feuerer.

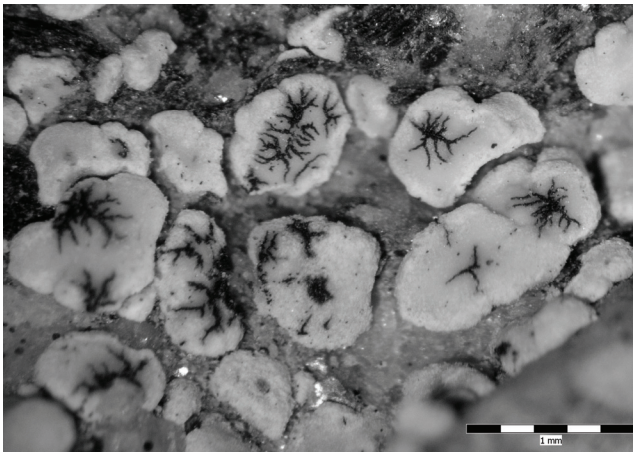
both a lichenologist and even doing botanical surveys. Not one site failed to yield at least two to five lichenicolous fungi or “lifu” as she called them for short and some yielded even more taxa. Some lichenicoles she collected could not just be picked up

by an uninstructed collector like myself. Some perithecia are quite small, less than 70 microns, and knowledge of hosts is very important for finding them and even then they were often rare even when the hosts were abundant. Recognizing some conidia-producing lichenicoles or some of the basidiomycetes need intimate familiarity. Other taxa were not discovered until lichen thalli were studied under a dissecting microscope. It is not unusual on some lichens for several lichenicoles to occur on a single thallus.

Working with Jana Kocourková, I was again impressed with the biodiversity of California. Whether in fungi or invertebrates or other under-studied organisms, the species richness of California is underestimated. Due to development and global warming, many organisms will no doubt disappear without being discovered or described, especially in poorly studied groups. Thanks to biologists like Jana Kocourková, who love the organisms they study, we will learn a little more about the biodiversity of California. We hopefully will be able to protect at least some species through habitat management as we live through the continuation of a great extinction event at the beginning of the 21st century.



Sarcopyrenia bacillosa on *Acarospora socialis*. Photography by Jana Kocourková.



Lichenostigma subradians (species not mentioned in article) on *Acarospora socialis*. Photography by Jana Kocourková.

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A Preliminary Checklist for the Lichens and Allied Fungi of Nevada, U.S.A.

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Abstract:

Seventy-four genera, 185 species, and an additional 3 varieties or forms (total 188 taxa) of lichens and allied fungi are reported for the state of Nevada, U.S.A., with reasonable certainty. Another 37 uncertain species or varieties are reported. This checklist is preliminary but offers the first attempt at a checklist to be published for this exceptionally arid region.

In the neighboring State of California, lichens are not as well studied as vascular plants. However, substantial lichenological exploration has occurred there resulting in numerous publications over the years and a checklist which is now in its second edition (Tucker and Ryan 2006). In contrast, the lichen flora of Nevada is quite poorly known. Few papers have previously been published specifically about lichens in Nevada (Herre 1911a; Herre 1913; Hoare 1982; Beyer and St. Clair 2004). A prominent Californian lichenologist, A. W. C. T. Herre spent one year in Reno, Nevada, as a professor of biology at the University of Nevada (Wiggins 1962). Herre collected lichens only around Reno area and in nearby mountains. A number of collectors have passed through the state and their specimens are sometimes cited in taxonomic works, but their collecting in Nevada has generally been transitory. The following list attempts to present the lichens known from the arid State of Nevada, based on a combination of literature and recent collections.

This compilation is based primarily on the work of the senior author, Bruce Ryan (1950-2004). Ryan was a prolific collector of lichens throughout the western United States and a studious assembler of both taxonomic and geographic data. As with several other western states, Ryan compiled an unpublished 'catalog of the lichens and allied fungi of Nevada', the most recent version dated March 20, 1997, although edits must have continued briefly given the citation of Wetmore and Kärnefelt (1998).

The second author moved to Nevada in the summer of 2000 and began building upon the earlier catalog. Some emails were exchanged between the authors regarding Ryan's catalog, but collaboration toward a publication was not properly begun before Ryan's death. Thus, this is a culmination of independent work by the two authors.

The region covered is defined by the political boundaries of the State of Nevada, U.S.A. Nevada is the seventh largest state in the union, covering 110,540 square miles (286,297 km^2). In terms of annual precipitation, this is the driest state in the nation. Average annual precipitation ranges from less than 5 inches (13 cm) in western and southern valleys to over 40 inches (101 cm) in some northerly mountain ranges and peaking at 63 inches (159 cm) in the Carson Front Range, a finger of the Sierra Nevada that crosses into Nevada (PRISM Group 2006). Cool season precipitation falls primarily as snow while warm season precipitation occurs episodically as thunder showers; cool season precipitation dominates in the northern portion of the state with warm season precipitation increasing toward the east and dominating in the south.

This exceptionally arid region has a great deal of topographic and geologic diversity. The landscape is generally composed of basin and range topography (Figure 1), with granitic, andesitic, and basaltic geologies dominating in western portions, and calcareous rock types dominating eastward. Geologists have distinguished over 300 ranges within the state, many rising from basins with altitudes about 5000 feet (1500 m) to peaks over 10,000 feet (3000 m).

Five ecoregions (Figure 1) occur within Nevada (Bryce et al. 2003). With no aquatic outlets to oceans, the Great Basin ecoregion occupies the

greatest portion of the state, with *Atriplex* and other salt tolerant shrubs at the lowest elevations, sagebrushes (*Artemisia*) at moderate to high elevations, a band of Pinyon and Juniper trees (*Pinus monophylla* and typically *Juniperus osteosperma*) is common at mid elevations, and taller conifers or alpine vegetation at the highest elevations. The Columbia Plateau is often distinguished as a separate ecoregion which enters Nevada along the northern border, though vegetation is fairly similar to the Great Basin. The Mojave Ecoregion occupies much of the southern part of the state, with Creosote Bush (*Larrea tridentata*) dominating lower elevations, diversely mixed shrubs and Joshua tree (*Yucca brevifolia*) dominating mid elevations, then a vegetation much like the Great Basin at higher elevations. The tall-conifer dominated Sierra Nevada ecoregion enters the state around Lake Tahoe. The Colorado Plateau, with more chaparral-like woodlands, enters the south-eastern portion of the state.

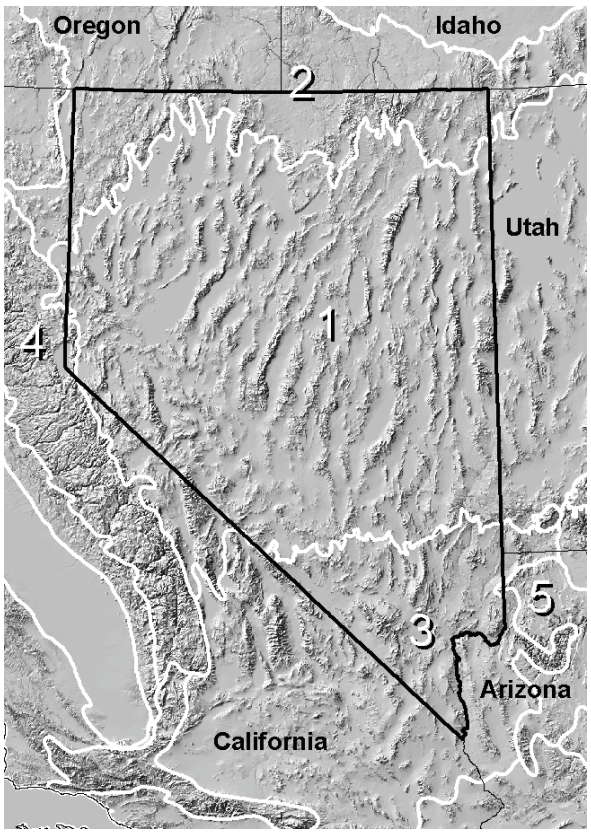

Figure 1. Nevada – topography and ecoregions. Topography is indicated by a hillshade image based on elevation data. Black lines indicate state bound-aries. White lines indicate ecoregional boundaries (Bryce et al. 2003). Ecoregions are numbered in white: 1 = Central Basin and Range (a.k.a. Great Basin), 2 = Northern Basin and Range (a.k.a. Colum-bia Plateau), 3 = Mojave Basin and Range, 4 = Sierra Nevada, and 5 = Arizona / New Mexico Plateau (a.k.a. Colorado Plateau).

In general, exposed rock provides the habitats with the greatest diversity of lichen taxa in Nevada. Soils provide habitat for extensive biological soil crust communities as well. The total historical distribution of biological soil crusts is debatable, but their impressive cover in some of the few remaining lightly disturbed areas (Figure 2) suggests that they may have historically been very common and often with much greater ground-cover than vascular plants. Epiphytes are common on the arid-land shrubs, but with relatively low diversity. The sub-tree curl-leaf mountain mahogany (*Cercocarpus ledifolius*) provides the best habitat in the state for epiphyte diversity. Old juniper trees may host a number of epiphytes, but young junipers and most pinyon pine are poor hosts, probably due to their rapid bark exfoliation.

Several lichens that are generally considered common, or even 'cosmopolitan', are missing from the state, or barely enter the state. Nearly ubiquitous in California, *Parmelia sulcata* has only been found in Nevada in the Carson Front Range. The Carson Front also harbors the only known locations for several species common in dry western forests: *Hypogymnia imshaugii*, *Kaernefeltia merrillii*, and *Nodobryoria abbrieviata*. Some genera are conspicuously absent from the state, such as *Bryoria* and *Usnea*. Peterson has made efforts to find these genera in the Lake Tahoe area without success. Based on experience with them elsewhere in the Sierra, it is likely that *Bryoria* will eventually be found on the Nevada side of the border, but *Usnea* probably is truly absent from Nevada. Other ranges that should be searched for common western epiphytes are the Jarbidge and Ruby Mountains.

The list presented here is a preliminary checklist. Continued work with the collections of Ryan and others at ASU and other herbaria, and the collections of Peterson, will undoubtedly expand upon this list. Further searching of taxonomic literature for citations of specimens from Nevada will likely extend the list as well. And despite Peterson's work in Nevada, the state remains poorly explored for lichens with many taxa awaiting discovery!

Taxonomic nomenclature follows Esslinger (2007). The list is provided alphabetically by genus, as family-level taxonomy remains poorly resolved among lichens and undergoes frequent revision.

Figure 2. Biological soil crusts forming a rough surface in salt desert scrub vegetation, Nevada.

Synonyms will not be listed; only the currently valid name according to Esslinger is given. Symbology is also taken from Esslinger with * indicating parasitic lichenicolous fungi, + indicating saprophytic and non-parasitic lichenicolous fungi, and # indicating fungi of uncertain physiological status. Both literature reports and voucher specimens are cited where possible. Unless otherwise specified, collections of Ryan (BR#xxxxx) are housed at ASU, while those of Tom Carlberg (TC#xxxxxx), Eric Peterson (EB#xxxx) and Roger Rosentreter (RR#xxxx) are housed in their respective personal herbaria. Taxa where identifications or reports are considered reasonable appear in bold, while names used tentatively are printed in regular text. Several taxa were listed in Ryan's unpublished list without references or specimens; these are included here as 'unconfirmed'. Annotations with taxonomic, biogeographical, or ecological information are given for some taxa.

Abrothallus De Not.

* *Abrothallus parmeliarum* (Sommerf.) Arnold – Unconfirmed.

***Acarospora* A. Massal.**

***Acarospora badiofusca* (Nyl.) Th. Fr.** – BR#15890.

***Acarospora bullata* Anzi** – BR#11535.

Acarospora cervina A. Massal. – Herre 1911a. Ryan (1997) notes the report as a possible misidentification.

***Acarospora fuscata* (Schrader) Arnold** – Herre 1911a as *A. squamulosa*; Nash et al. 1977; Thomson 1997.

***Acarospora nevadensis* H. Magn.** – K. Knudsen, pers. comm. May 2007.

***Acarospora nodulosa* (Dufour) Hue –** RR#7315 (hb.McCune).

***Acarospora peliscypha* Th. Fr.** – Fink 1935.

***Acarospora schleicheri* (Ach.) Massal.** (sensu Webber) – Herre 1911a (as *A. bella*); BR#12936b ("sensu Weber"); EP#4256.

Acarospora smaragdula (Wahlenb.) A. Massal. – Unconfirmed.

***Acarospora socialis* H. Magn.** – EP#4291. Probably the most common yellow species of *Acarospora* (excluding *Pleopsidium*) on volcanic rocks in western Nevada.

***Acarospora stapfiana* (Müll. Arg.) Hue** – BR#13069.

***Acarospora strigata* (Nyl.) Jatta** – Herre 1911a (as *A. peltasticta*); Nash et al. 1977; BR#11381.

***Acarospora terricola* H. Magn.** – Nash 41075 (ASU; verified by K. Knudsen)

***Acarospora thamnina* (Tuck.) Herre** – Herre 1911a & 1913; BR#11549. Common on volcanic rocks in western Nevada.

Acarospora thermophila Herre - Herre (1913); Fink 1935. This is a synonym of *A. thamnina* (Magnusson 1929; K. Knudsen personal communication, May 2007)

***Ahtiana* Goward**

***Ahtiana sphaerosporella* (Müll. Arg.) Goward** – EP#3813. A common species in other western states, known in Nevada only from the Carson Front Range.

***Amandinea* M. Choisy ex Scheid. & H. Mayrh.**

***Amandinea punctata* (Hoffm.) Coppins & Scheid.** – BR#11411; EP#3542.

***Anaptychia* Körber**

***Anaptychia elbursiana* (Szatala) Poelt** – BR#11471.

***Aspicilia* A. Massal.**

***Aspicilia arctica* (Lynge) Oksner** – Magnusson 1939.

***Aspicilia caesiocinerea* (Nyl. ex Malbr.) Arnold** – BR#11368.

Aspicilia calcarea (L.) Mudd – Herre 1911a and Nash et al. 1977 as *Lecanora calcarea*. Ryan (1997) states, "Identifications doubtful, and definitely incorrect for material on non-calcareous rocks".

***Aspicilia cinerea* (L.) Körber** – Nash et al. 1977 as *Lecanora cinerea.*

***Aspicilia desertorum* (Kremp.) Mereschk.** – BR#13013. Two forms *sensu* Rosentreter exist in Nevada: f. *desertorum* and f. *convoluta*. These can be represented by RR#4614 (hb.Peterson) and EP#3979, respectively. Field experience of Peterson suggests that form *convoluta* may be restricted to calcareous rocks, typically occurring on pebbles in frequently flooded shrub interspaces.

***Aspicilia filiformis* Rosentreter** – EP#3525 (verified by Rosentreter).

***Aspicilia fruticulosa* (Eversm.) Flagey** – Rosentreter 1997. Presently known from only one site along the northern border with Oregon. Tracked by the Nevada Natural Heritage Program, ranked G3 S1.

Aspicilia gibbosa (Ach.) Körber – Herre 1911a. Ryan 1997 states "identification needs checking".

***Aspicilia hispida* Mereschk.** – EP#4349.

Aspicilia sp. – A number of specimens from multiple collectors have been labeled as *Aspicilia terrestris* Tomin upon earlier suggestion by Roger Rosentreter. That species has never been formally reported for North America. However, Rosentreter now believes there to be multiple species that have been referred to that name and that at least some are undescribed. At least one of these is common in northwestern Nevada.

***Bellemerea* Hafellner & Cl. Roux**

***Bellemerea alpina* (Sommerf.) Clauzade & Cl. Roux** – BR#11402-a.

Biatorella De Not.

Biatorella revertens (Tuck.) Herre – Herre 1911a; Fink 1935. This name does not appear in Esslinger 2007; Ryan (1997) suggests this may refer to *Polysporina simplex*.

***Buellia* De Not.**

***Buellia dispersa* A. Massal.** – BR#13016 (as *B. retrovertens*).

***Calicium* Pers.**

***Calicium adaequatum* Nyl.** – EP#3616. A common species in other western states, known in Nevada only from the Carson Front Range. *Calicium viride* has not been collected in Nevada, but probably does occur infrequently in the Carson Front Range.

***Caloplaca* Th. Fr.**

***Caloplaca atroalba* (Tuck.) Zahlbr.** – Wetmore 1994; BR#13084.

***Caloplaca cerina* (Hedwig) Th. Fr.** – BR#11536 (specimen in unknown location); EP#3784; Rosentreter 4674a and EP#4384 as *C. stillicidiorum*. Esslinger 2007 treats *C. stillicidiorum* as a synonym of *C. cerina*; however McCune and Rosentreter 2007 point to differences in habitat and at least one morphological character. An online search of ASU does not reveal any specimens collected by Bruce Ryan with this collection number nor any identified to this taxon from Nevada.

***Caloplaca cinnabarina* (Ach.) Zahlbr.** – Herre 1911a.

***Caloplaca cladodes* (Tuck.) Zahlbr.** – Wetmore & Kärnefelt 1998.

***Caloplaca decipiens* (Arnold) Blomb. & Forss.** – Wetmore & Kärnefelt 1998.

* ***Caloplaca epithallina* Lynge** – RR#4625; EP#3628. Ryan 1997 included this without citations but stated that it is likely to occur on some of his other collections.

***Caloplaca ferruginea* (Hudson) Th. Fr.** – Herre 1911a.

***Caloplaca pellodella* (Nyl.) Hasse** – Nash et al. 1997.

***Caloplaca saxicola* (Hoffm.) Nordin** – Herre 1911a as *C. amabilis*; Wetmore & Kärnefelt 1998.

***Caloplaca tominii* (Savicz) Ahlner** – EP#4251. This species is common and often abundant in northwestern Nevada. Oddly, in Nevada it is associated with less calcareous soils, though McCune and Rosentreter (2007) list it as an indicator of calcareous soils. Perhaps the distribution of this species is driven by factors other than soil calcium content or pH?

***Caloplaca trachyphylla* (Tuck.) Zahlbr.** – Herre 1911a (as *Caloplaca elegans* var. *trachyphyllum*); Fink 1935; Wetmore & Kärnefelt 1998; BR#11582 (hb.McCune); EP#3639. A very common and widespread species in Nevada.

***Candelaria* A. Massal.**

***Candelaria concolor* (Dickson) Stein** – EP#3330. Although not previously reported for Nevada, this species is common on sagebrush along the western edge of the state. Some taxonomic uncertainty may be warranted as the soralia conform to the undescribed *C.* "*pacifica*" acknowledged by Westberg and Nash (2002).

***Candelariella* Müll. Arg.**

***Candelariella antennaria* Räsänen** – EP#4157.

***Candelariella athallina* (Wedd.) Du Rietz** – EP#3811.

***Candelariella aurella* (Hoffm.) Zahlbr.** – Herre 1911a and Fink 1935 as *C. cerinella*; Nash et al. 1997; BR#11462.

***Candelariella rosulans* (Müll. Arg.) Zahlbr.** – BR#11521-a (specimen in unknown location); EP#3784. An online search of ASU does not reveal any specimens collected by Bruce Ryan with this collection number, however, numerous additional specimens collected by Ryan from Nevada are listed.

***Candelariella terrigena* Räsänen** – EP#3493. Although often referred to as an arctic/alpine species, this taxon occurs infrequently among biological soil crusts in salt desert vegetation.

***Cercidospora* Körber**

* ***Cercidospora epipolytropa* (Mudd) Arnold** - Triebel et al 1991.

***Cladonia* P. Browne**

***Cladonia chlorophaea* (Flörke ex Sommerf.) Sprengel** – BR#11426.

***Cladonia fimbriata* (L.) Fr.** – EP#3655.

Cladonia pocillum (Ach.) Grognot Unconfirmed. Cladonia colonies lacking podetia are common in mid to upper elevations in northern Nevada. It is likely that most of these are *C. pocillum*, but lack sufficient characters for easy identification. Some of these may also be *C. pyxidata*. Several specimens are available in Peterson's personal herbarium.

Cladonia pyxidata (L.) Hoffm. Unconfirmed. See note under *C. pocillum*.

***Collema* F. H. Wigg.**

***Collema coccophorum* Tuck.** – Nash et al. 1977.

***Collema polycarpon* Hoffm.** – Nash et al. 1977.

Collema tenax (Sw.) Ach. – Unconfirmed. It is almost undeniable that this species occurs within Nevada. Proper confirmation should include examining spores (McCune and Rosentreter 2007) yet fertile specimens have not been collected in the state to our knowledge.

***Cyphelium* Ach.**

***Cyphelium inquinans* (Sm.) Trevisan** – EP#3614.

***Cyphelium pinicola* Tibell** – EP#4012.

***Cyphelium tigilare* (Ach.) Ach.** – EP#3530.

***Dermatocarpon* Eschw.**

***Dermatocarpon intestiniforme* (Körber) Hasse** – BR#11493. Heiđmarsson and Breuss (2004) do not include this species in the Greater Sonoran region (adjacent to Nevada), so presumably it can be considered a synonym of one or more of the taxa they do include.

***Dermatocarpon luridum* (With.) J. R. Laundon** – Fink 1935 as *D. aquaticum;* P. Putnam #1 (hb. Peterson). Peterson has sought after the specimen that Fink based his reference on, without luck as yet. Both it and the Putnam specimen need to be verified as they actually be *Dermatocarpon meiophyllizum* Vainio, which was not recognized in North America until recently. The Putnam collection is a tiny sample and verification awaits time for Peterson to fully record and photograph the specimen and to examine it with utmost care. The only site presently known for the species is the source of the Putnam collection in the Spring Mountains of southern Nevada; the Nevada Natural Heritage Program currently tracks this taxon as *D. luridum*, ranked G4G5, S1.

***Dermatocarpon miniatum* (L.) W. Mann** – Herre 1911a; Nash et al 1977. Herre 1911a lists both the normal variety and "var. complicatum (Sw.)".

***Dermatocarpon reticulatum* H. Magn.** – BR#11518a; BR#11519; EP#4014.

***Dimelaena* Norman**

***Dimelaena oreina* (Ach.) Norman** – Herre 1911a as *Rinodina oreina*; BR#11391.

***Dimelaena thysanota* (Tuck.) Hale & Culb.** – Herre 1911a as *Rinodina thysanota*.

***Diploschistes* Norman**

***Diploschistes muscorum* (Scop.) R. Sant.** – BR#27235 (specimen in unknown location); EP#4041. An online search of ASU does not reveal any specimens of this taxon from Nevada, nor any specimens collected by Bruce Ryan with this collection number.

***Diplotomma* Flotow**

***Diplotomma alboatrum* (Hoffm.) Flotow** – Herre 1911a as *Buellia alboatra*.

***Diplotomma ambiguum* (Ach.) Flagey** – Herre 1911a as *Buellia alboatra* var. *saxicola.*

***Endocarpon* Hedwig**

***Endocarpon petrolepideum* (Nyl.) Hasse** – BR#15876-a.

***Endocarpon pulvinatum* Th. Fr.** – RR#4614.

***Endocarpon pusillum* Hedwig** – Herre 1911a; Fink 1935; EP#4237.

Endocarpon tortuosum Herre – Herre 1911a. Peterson has examined the type specimen and considers it likely to be a shaded form of *E. pusillum*, but will leave formal synonymization to someone having more expertise with the genus.

***Fulgensia* A. Massal. & De Not.**

***Fulgensia desertorum* (Tomin) Poelt** – Nash et al. 1977; EP#4233.

Fulgensia fulgens (Sw.) Elenkin – unconfirmed.

***Fulgensia subbracteata* (Nyl.) Poelt** – EP#4235. This species is reported in Arizona by Kasalicky (2004), but not included in Esslinger (2007).

***Glypholecia* Nyl.**

***Glypholecia scabra* (Pers.) Müll. Arg.** – BR#11450.

***Hafellia* Kalb, H. Mayrh. & Scheid.**

***Hafellia disciformis* (Fr.) Marbach & H. Mayrhofer** – Herre 1911a as *Buellia triphragmia*; BR#11431.

***Heppia* Nägeli**

***Heppia lutosa* (Ach.) Nyl.** – Wetmore 1970; Nash et al. 1977.

***Hypogymnia* (Nyl.) Nyl.**
***Hypogymnia imshaugii* Krog** – EP#3812. A common species in other western states, known in Nevada only from the Carson Front Range.

***Kaernefeltia* Thell & Goward**
***Kaernefeltia merrillii* (Du Rietz) Thell & Goward** – EP#3679. A common species in other western states, known in Nevada only from the Carson Front Range.

***Lecanora* Ach.**
***Lecanora argopholis* (Ach.) Ach.** – BR#11362.
***Lecanora dispersa* (Pers.) Sommerf.** – BR 13193-a.
***Lecanora flowersiana* H. Magn.** – BR#11545.
***Lecanora garovaglii* (Körber) Zahlbr.** – Magnusson 1939 as *L. nevadensis;* Ryan & Nash 1997 (lists two representative specimens).
Lecanora horiza (Ach.) Lindsay – Unconfirmed. Ryan 1997 notes a synonym, *L. parisensis* Nyl., but gives no specimen or citation for either name.
***Lecanora muralis* (Schreber) Rabenh.** – BR#11552 (specimen in unknown location). An online search of ASU does not reveal any specimens collected by Bruce Ryan with this collection number. However, numerous additional specimens of this taxon collected by Ryan are listed.
***Lecanora neodegelii* B. D. Ryan & T. H. Nash** – BR#15850.
***Lecanora novomexicana* H. Magn.** – BR#11363; RR#4677a.
Lecanora olivacea (Bagl. & Car.) Steiner – Herre 1911a; Fink 1935. Ryan 1997 notes that this must be a synonym of something, but does not know what. It is not included in Esslinger 2007.
***Lecanora phaedrophthalma* Poelt** – BR#11486.
***Lecanora polytropa* (Hoffm.) Rabenh.** – BR#11402-b; RR#4688.
***Lecanora pseudomellea* Ryan** – Ryan & Nash 1993. The type location for this species is a few miles over the border into California, but several specimens from Nevada are listed in the paper.
Lecanora rupicola (L.) Zahlbr. – Unconfirmed. No specimen or citation available. Ryan 1997 notes that this should be checked against *L. bicincta*.
Lecanora saligna (Schrader) Zahlbr. – Unconfirmed.
Lecanora semitensis (Tuck.) Zahlbr. – BR#13561 (specimen in unknown location). An online search of ASU does not reveal any specimens of this taxon from Nevada, nor any specimens collected by Bruce Ryan with this collection number. Ryan 1997 notes that his specimen fits this name *sensu lato*.
***Lecanora sierrae* Ryan & Nash** – Ryan & Nash 1993. The type location for this species is in the Carson Front Range, a spur of the Sierra-Nevada Range in Nevada.
***Lecanora thallophila* H. Magn.** – BR#14938-a.
Lecanora valesiaca (Müll. Arg.) Stizenb. – BR#15966-b. Ryan 1997 notes uncertainty in this identification.
Lecanora varia (Hoffm.) Ach. – Unconfirmed. Ryan 1997 notes this report as "highly dubious."

***Lecidea* Ach.**
***Lecidea atrobrunnea* (Lam. & DC.) Schaerer** – Herre 1911a & 1913; Fink 1935; RR#4653 (hb.McCune). Ryan 1997 notes this name has been applied *sensu lato*.
***Lecidea auriculata* Th. Fr.** – Fink 1935.
***Lecidea plana* (J. Lahm) Nyl.** - Fink 1935; Thomson 1997.
***Lecidea protabacina* Nyl.** – RR#4654.
Lecidea syncarpa Zahlbr. – BR#11421. Ryan 1997 notes that his specimen should be confirmed; but that may be because the species had not yet been reported for North America at that time.
***Lecidea tessellata* Flörke** – BR#11373.
***Lecidea truckeei* Herre** – Herre 1911a; Fink 1935.

***Lecidella* Körber**
***Lecidella carpathica* Körber** – BR#12992.
***Lecidella stigmatea* (Ach.) Hertel & Leuckert** – BR#11395, det. Rambold.

***Lepraria* Ach.**
***Lepraria cacuminum* (A. Massal.) Lohtander** – RR#4656 (hb.McCune).

***Leptochidium* M. Choisy**
***Leptochidium albociliatum* (Desmaz.) M. Choisy** – EP#4095; TC#001388.

***Letharia* (Th. Fr.) Zahlbr.**
***Letharia columbiana* (Nutt.) J. W. Thomson** – EP#4078. This species may frequently be sterile at the arid extremes of its range, and has probably been misidentified frequently as *L. vulpina*. It can be distinguished, however, by the presence of black pycnidia and the absence soredia or isidia (for example: EP#.3676)
***Letharia vulpina* (L.) Hue** – Herre 1911a; RR#4626; EP#3990. See note under *L. columbiana*. Additionally, at the arid extremes of this species range, the soredia often appear rather isidia-like (for example: EP#4073).

***Lichenothelia* D. Hawksw.**
 # *Lichenothelia metzleri* (J. Lahm) D. Hawksw. – Herre 1911a as *Microthelia metzleri.*
 # *Lichenothelia scopularia* (Nyl.) D. Hawksw. – Fink 1935 as *Microthelia aterrima.*

***Lichinella* Nyl.**
***Lichinella nigritella* (Marton & Galun) P. Moreno & Egea** – Nash et al. 1977; BR#14984 (as *Gonomyenia nigritella*).

***Lobothallia* (Clauzade & Cl. Roux) Hafellner**
***Lobothallia alphoplaca* (Wahlenb.) Hafellner** – Herre 1911a and Fink 1935 as *Lecanora thamnoplaca*; BR#11500.
***Lobothallia praeradiosa* (Nyl.) Hafellner** – BR#11377 (as *Aspicilia praeradiosa*); RR#4699-b (hb.Peterson).

***Megaspora* (Clauz. & Cl. Roux) Hafellner & V. Wirth**
***Megaspora verrucosa* (Ach.) Hafellner & V. Wirth** – EP#3780.

Melanelia Essl.
Melanelia tominii (Oksner) Essl. – Unconfirmed.

***Melanoexilia* O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch**
***Melanoelixia subargentifera* (Nyl.) O. Blanco et al.** – RR#4645.

***Melanohalea* O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch**
***Melanohalea elegantula* (Zahlbr.) O. Blanco et al.** – BR#11412 (as *Melanelia elegantula*); EP#4074.
Melanohalea exasperata (De Not.) O. Blanco et al. – Herre 1911a; Herre 1946. Ryan 1997 notes this as a "probable misidentification."
***Melanohalea exasperatula* (Nyl.) O. Blanco et al.** – EP#3534; TC#001057.
***Melanohalea subolivacea* (Nyl.) O. Blanco et al.** – BR#11412-b (as *Melanelia subolivacea*); TC#001056. Ryan 1997 notes that Herre 1911a reported *Parmelia glabra*, but "based on a misidentification (probably of *M. subolivacea*)."

***Mycocalicium* Vainio**
+ ***Mycocalicium subtile* (Pers.) Szatala** – EP#3606. Known in Nevada from exposed, aged wood from tall-conifer forests high in multiple mountain ranges.

***Neofulscelia* Essl.**
***Neofuscelia subhosseana* (Essl.) Essl.** – BR#13090.
***Neofuscelia verruculifera* (Nyl.) Essl.** – BR#11562.

***Nodobryoria* Common & Brodo**
***Nodobryoria abbreviata* (Müll. Arg.) Common & Brodo** – EP#3402. A common species in other western states, known in Nevada only from the Carson Front Range where it is frequent, though fertile specimens have not been found.

***Ochrolechia* A. Massal.**
***Ochrolechia upsaliensis* (L.) A. Massal.** – RR#4675a.

***Parmelia* Ach.**
***Parmelia sulcata* Taylor** – EP#3455. A common species in other western states, known in Nevada only from the Carson Front Range.

***Parmeliopsis* Müll. Arg.**
***Parmeliopsis ambigua* (Wulfen) Nyl.** – RR#11423.
Parmeliopsis hyperopta (Ach.) Arnold – Unconfirmed.

***Peccania* A. Massal. ex Arnold**
***Peccania arizonica* (Tuck.) Herre** – Herre 1911a.

***Peltigera* Willd.**
***Peltigera kristinssonii* Vitik.** – EP#4323.
***Peltigera rufescens* (Weiss) Humb.** – BR#11432 (specimen in unknown location); TC#001060. An online search of ASU does not reveal any specimens of this taxon from Nevada, nor any specimens collected by Bruce Ryan with this collection number. Ryan 1997 notes uncertainty in this identification.

***Peltula* Nyl.**
***Peltula bolanderi* (Tuck.) Wetmore** – RR#3474.
***Peltula euploca* (Ach.) Poelt** – Wetmore 1970. Wetmore gave the authority as "(Ach.) Wetm.", while Ryan 1997 had given "(Ach.) Ozenda & Clauzade".
Peltula obscurans* (Nyl.) Gyelnik var. *obscurans – Wetmore 1970; Nash et al. 1977.
***Peltula obscurans* var. *deserticola* (Zahlbr.) Wetmore** – Wetmore 1970; Nash et al. 1977.
***Peltula obscurans* var. *hassei* (Zahlbr.) Wetmore** – Nash et al. 1977.
***Peltula omphaliza* (Nyl.) Wetmore** – Wetmore 1970.
***Peltula patellata* (Bagl.) Swinscow & Krog** – Wetmore 1970 as *Peltula polyspora*.
***Peltula richardsii* (Herre) Wetmore** – Wetmore 1970; EP#4241.

Phacopsis Tul.
* *Phacopsis vulpina* Tul. – Unconfirmed.

***Phaeophyscia* Moberg**
***Phaeophyscia ciliata* (Hoffm.) Moberg** – BR#11366.
***Phaeophyscia kairamoi* (Vainio) Moberg** – BR#13006.
***Phaeophyscia nigricans* (Flörke) Moberg** - BR#15035-a.
***Phaeophyscia orbicularis* (Necker) Moberg** - Nash et al. 1977 as *Physcia orbicularis.*

***Physcia* (Schreber) Michaux**
***Physcia adscendens* (Fr.) H. Olivier** – EP#3320.
***Physcia caesia* (Hoffm.) Fürnr.** – BR#11489.
***Physcia dimidiata* (Arnold) Nyl.** – BR#13276, verif. Moberg; EP#4053.
***Physcia dubia* (Hoffm.) Lettau** – EP#4010.
Physcia stellaris (L.) Nyl. – Herre 1911a. Presence of this species in Nevada is dubious and probably based on an incorrect identification.
***Physcia tenella* (Scop.) DC.** – BR#11379-b; TC#001378.
***Physcia tribacia* (Ach.) Nyl.** – Herre 1911a; EP#4119.
***Physcia undulata* Moberg** – EP#4075.

***Physconia* Poelt**
***Physconia americana* Essl.** – Herre 1911a as *Physcia pulverulenta.*
***Physconia enteroxantha* (Nyl.) Poelt** – BR#13382-b.
***Physconia isidiomuscigena* Essl.** – TC#001380.

***Placidium* A. Massal.**
***Placidium lachneum* (Ach.) Breuss** – BR#11470 as *Catapyrenium lachneum*; RR#4623, hb.McCune. Ryan 1997 includes note to double check his specimen.
***Placidium squamulosum* (Ach.) Breuss** – EP#3487.

***Placynthiella* Elenkin**
***Placynthiella uliginosa* (Schrader) Coppins & P. James** – RR#4169; EP#3656.

***Pleopsidium* Körber**
Pleopsidium chlorophanum (Wahlenb.) Zopf – Herre 1911a and 1913 as *Acarospora chlorophana.* Ryan 1997 notes that the identification needs to be examined; Knudsen (2005) states that this species has frequently been misapplied in North America to *Pleopsidium flavum*.
Pleopsidium flavum (Bellardi) Körber – EP#4316. This species is very common and conspicuous along the western side of the state, sometimes covering entire hillsides. See note under *P. chlorophanum*.

***Polysporina* Vězda**
***Polysporina simplex* (Davies) Vězda** – Herre 1911a and Fink 1935 as *Biatorella revertens*, a presumed synonym according to Ryan 1997 although not included within Esslinger 2007.

***Protoparmelia* M. Choisy**
***Protoparmelia badia* (Hoffm.) Hafellner** – RR#4663; RR#4686 (ASU).

***Pseudephebe* M. Choisy**
***Pseudephebe minuscula* (Nyl. ex Arnold) Brodo & D. Hawksw.** – EP#4040.
***Pseudephebe pubescens* (L.) M. Choisy** – Herre 1911a; BR#13551; EP#3676.

***Psora* Hoffm.**
***Psora cerebriformis* W. A. Weber** – Timdal 1986; BR#13385; EP#4274. This species is common and often abundant in northwestern Nevada. Oddly, in Nevada it is associated with less calcareous soils, though McCune and Rosentreter (2007) list it as an indicator of calcareous soils. Perhaps the distribution of this species is driven by factors other than soil calcium content or pH? In some locations, this species appears to be associated with coarse soil texture, such as the north end of Winnemucca Lake basin where it occurs most abundantly on soils with a large component of decomposed granite.
***Psora decipiens* (Hedwig) Hoffm.** – Nash et al. 1977; EP#3460; B. McCune #6417b (hb.McCune).
Psora hymalayana (Church. Bab.) Timdal –EP#3514. This specimen should be verified.
***Psora russellii* (Tuck.) A. Schneider** – BR#13146.
Psora tuckermannii R. Anderson ex Timdal – BR#13079; EP#3486; B. McCune #6417a (hb.McCune).

Psoroma* *Michaux
***Psoroma hypnorum* (Vahl) Gray** – BR#11414 (specimen in unknown location). An online search of ASU does not reveal any specimens of this taxon from Nevada, nor any specimens collected by Bruce Ryan with this collection number.

***Pycnora* Hafellner**
***Pycnora praestabilis* (Nyl.) Hafellner** – RR#4646 as *Hypocenomyce praestabilis*.

***Rhizocarpon* Ramond ex DC.**
***Rhizocarpon cookeanum* H. Magn.** – BR#11517.
Rhizocarpon geminatum Körber – Herre 1911a as *Rhizocarpon montagnei. R. montagnei* is now a synonym of *R. disporum*, however Ryan 1997 felt that Herre more likely referred to *R. geminatum* and only included a casual note that a specimen should be compared against proper *R. disporum*.
***Rhizocarpon geographicum* (L.) DC.** – EP#4125. This species was included in Ryan (1997), but without citation.
***Rhizocarpon intermediellum* Räsänen** – RR#4666.
Rhizocarpon riparium Räsänen - BR#11365. Esslinger 2007 states that this may be a subspecies within *R. geographicum*

***Rhizoplaca* Zopf**
***Rhizoplaca chrysoleuca* (Sm.) Zopf** – Herre 1911a as *Lecanora rubina*; BR#11491.

***Rhizoplaca melanophthalma* (DC.) Leuckert & Poelt** – Herre 1913; BR#11386.

***Rhizoplaca peltata* (Ramond) Leuckert & Poelt** – Herre 1911a as *Lecanora rubina* var. *heteromorpha* Ach.; BR#11555.

***Rhizoplaca subdiscrepans* (Nyl.) R. Sant.** – BR#15806-b. Online search of ASU shows BR#15806 under *Lecanora garovaglii* without a lettered suffix. However, one specimen collected by T. H. Nash III in Nevada is found by the search: #22919

***Rinodina* (Ach.) Gray**

***Rinodina zwackhiana* (Kremp.) Körber** – Sheard 1982.

***Seirophora* Poelt**

***Seirophora contortuplicata* (Ach.) Clauzade & Rondon ex Vězda** – Rosentreter & McCune 1996 and BR#11475 as *Teloschistes contortuplicatus*.

Solorina (Ach.)

Solorina spongiosa (Ach.) Anzi – Beyer and St. Clair 2004. This generally arctic-boreal species is known in Nevada from only two sites in the Spring Mountains of the southern part of the state, and is tracked by the Nevada Natural Heritage Program with ranks of G3G5 and S1.

***Sporostatia* A. Massal.**

***Sporastatia testudinea* (Ach.) A. Massal.** – RR#5085, hb.Peterson.

***Squamarina* Poelt**

***Squamarina lentigera* (Weber) Poelt** - Fink 1935 as *Lecanora lentigera.*

***Staurothele* Norman**

***Staurothele areolata* (Ach.) Lettau** – BR#11420.

***Staurothele drummondii* (Tuck.) Tuck.** – BR#11444; BR#13240 (hb.Peterson).

Teloschistes Norman

Teloschistes flavicans (Sw.) Norman – Fink 1935. Ryan 1997 points out that this is probably a misidentification.

***Thyrea* A. Massal.**

***Thyrea confusa* Henssen** – Herre 1911a and Fink 1935 as *Thyrea pulvinata.* Peterson may have specimens that conform to this taxon, but need verification.

***Toninia* A. Massal.**

Toninia candida (Weber) Th. Fr. – Unconfirmed.

***Toninia ruginosa* (Tuck.) Herre** – BR#11479; RR#3695. Ryan specimen is referred to subspecies *ruginosa*

***Toninia sedifolia* (Scop.) Timdal** – Nash et al. 1977 as *T. caeruleonigricans* (Lightf.) Th. Fr.

***Umbilicaria* Hoffm.**

***Umbilicaria angulata* Tuck.** – EP#3427; TC#001381.

Umbilicaria decussata* (Vill.) Zahlbr. var. *decussata – Fink 1935 as *Gyrophora decussata*; TC#001387.

Umbilicaria decussata var. *darrowii* Frey – Frey 1936. This variety is not addressed by Esslinger 2007.

***Umbilicaria hyperborea* (Ach.) Hoffm.** – Herre 1911a and Herre 1911b as *Gyrophora hyperborea*; RR#4689; EP#3601.

***Umbilicaria krascheninnikovii* (Savicz) Zahlbr.** – Herre 1911a and Herre 1911b as *Gyrophora reticulata*; RR#2030, hb.Rosentreter; EP#3974. Ryan 1997 suggests that Herre misapplied the epithet *reticulata* to this species. Specimens are regularly found in western Nevada with a few rhizinomorphs which may cause confusion in some keys resulting in misidentification of specimens, typically to *U. virginis*. However, these are typically mixed with thalli that lack rhizinomorphs on the same rock surface. Additionally, these occasional rhizinomorphs are rarely much more pale than the surrounding lower surface of the thallus (see photographs in Peterson's photo gallery account on http://www.crustose.net), while in *U. virginis*, the abundant rhizinomorphs typically quite pale or even white (Hestmark 2004).

***Umbilicaria phaea* Tuck.** – Herre 1911a, Herre 1911b, and Fink 1935 as *Gyrophora phaea*; EP#4115.

***Umbilicaria polyphylla* (L.) Baumg.** – EP#3824.

***Umbilicaria torrefacta* (Lightf.) Schrader** – Herre 1911a, Herre 1911b, and Fink 1935 as *Gyrophora erosa*; EP#3820.

***Umbilicaria virginis* Schaerer** – RR#5082, hb.McCune.

***Verrucaria* Schrader**

***Verrucaria fuscella* (Turner) Winch** – Herre 1911a.

Verrucaria hydrela Ach. – BR#11371-b, 11372-b. Ryan 1997 notes some uncertainty with his determinations.

***Verrucaria inficiens* Breuss** – Nash et al. 1977 as *Dermatocarpon plumbeum*.

***Verrucaria sphaerospora* Anzi** – Herre 1911a (as V. standfordii; Knudsen and Lendemer 2006).

***Xanthomendoza* S. Kondr. & Kärnefelt**

Xanthomendoza fallax (Hepp ex Arnold) Søchting, Kärnefelt & S. Kondr. – EP#3332 and EP#3438 appear to match this species, but are poor specimens in need of confirmation.

***Xanthomendoza fulva* (Hoffm.) Søchting, Kärnefelt & S. Kondr.** – Lindblom 1997 as *Xanthoria fulva.*

***Xanthomendoza mendozae* (Räsänen) S. Kondratyuk & Kärnefelt** – Lindblom 1997 as *Xanthoria mendozae*.

***Xanthomendoza montana* (L. Lindblom) Søchting, Kärnefelt & S. Kondr.** – Lindblom 1997 as *Xanthoria Montana*; EP#3437. Widespread and abundant, occurring in some of Nevada's most inhospitable habitats, including the bases of shrubs in very salt deserts. In such habitats, lizards can often be found hiding under shrubs with orange markings that match this species.

***Xanthomendoza oregana* (Gyelnik) Søchting, Kärnefelt & S. Kondr.** – Lindblom 1997 as *Xanthoria oregana*.

***Xanthoparmelia* (Vainio) Hale**

***Xanthoparmelia chlorochroa* (Tuck.) Hale** – Rosentreter 1997; RR#3091 (hb.McCune).

Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale – Herre 1911a as *Permelia conspersa*. Ryan 1997 notes that early reports such as Herre's may be based on other species.

***Xanthoparmelia cumberlandia* (Gyelnik) Hale** – BR#11374.

***Xanthoparmelia lavicola* (Gyelnik) Hale** - BR#15913-a.

***Xanthoparmelia lineola* (E. C. Berry) Hale** – BR#13321.

***Xanthoparmelia maricopensis* T. Nash & Elix** - BR#15833.

***Xanthoparmelia mexicana* (Gyelnik) Hale** – BR#13335.

***Xanthoparmelia neotaractica* Hale** – Nash #22935.

***Xanthoparmelia plittii* (Gyelnik) Hale** – BR#11392.

***Xanthoria* (Fr.) Th. Fr.**

Xanthoria candelaria (L.) Th. Fr. – Herre 1911a as *Xanthoria lychneus* var. *laciniosa*; BR#11514. Ryan 1997 notes "identification needs checking" but does not specify his specimen or the report by Herre.

***Xanthoria elegans* (Link) Th. Fr.** – Herre 1911a as *Caloplaca elegans*; Lindblom 1997; BR#11437; RR#2031 (hb.McCune).

Xanthoria polycarpa (Hoffm.) Th. Fr. ex Rieber – Herre 1911a; BR#11378. Ryan 1997 points out this name was used *sensu lato*; it has probably been misapplied to multiple species of *Xanthomendoza*, including the case of Ryan's specimen.

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Peltigera hydrothyrea, Sponsorship for the CALS Conservation Committee

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TAXONOMY

Accepted scientific name: *Peltigera hydrothyria* Miadlikowska & Lutzoni

Common name: Waterfan (Brodo et al. 2001) or Hydrothyria (local common usage)

Synonyms: *Hydrothyria venosa* J.L. Russell

DESCRIPTION

Adapted from Brodo *et al*. 2001: Aquatic jelly lichen with fan shaped lobes 3-10 mm wide; translucent dark green or brownish when under water, much like a seaweed; dark blue-gray when dry; lower surface of most lobes with smooth, pale, branched veins composed of elongate-colorless hyphae; both upper and lower surfaces covered with a colorless cortex of pseudoparenchyma, lower surface deeply veined. Macula rather dense and thin. Photobiont cyanobacteria (*Nostoc*). Apothecia common on the upper surface of the lobes, biatorine, orange or red-brown, convex and without margins when mature (figure 1). Spores colorless, fusiform, 4 celled. 8 per ascus. Negative to reagents. Western populations lack any lichen substances.

Similar species and distinguishing characteristics: *Dermatocarpon luridum* is small-lobed and only needs to be periodically submerged. Grows on rock at stream edge. Photobiont is a green alga gives thallus a bright green appearance when wet. (Brodo et al. 2001

Leptogium rivale has elongate lobes 0.1-1.5 mm wide forming small rosettes in and close to water (Brodo *et al.* 2001).

BIOLOGICAL CHARACTERISTICS

Growth form: Foliose, gelatinous (McCune and Geiser l997).
Reproduction method: sexual by spores from apothecia.
Dispersal agents: moving water is assumed.
Substrate and specificity: usually on rock submerged in streams. Has been seen on wood and Indian rhubarb (*Darmera peltata*) (Larson 2005).
Habitat specificity: aquatic in cool mountain streams.
Pollution sensitivity: only known in pollution free mountain streams. This lichen is a good indicator of water quality (Management recommendations for H. venosa (USFS 2000).
Ecological function: photobiont is *Nostoc* (cyanobacteria) which fixes nitrogen. This lichen is probably food for animals.

GEOGRAPHY

Global: Endemic to North America. This lichen has been historically reported in all 4 major mountain chains in the United States but has apparently been extirpated in most of the Appalachians. (Dennis *et al*. 1981)

Local: Found in the Stanislaus, Mendocino, Plumas, Sequoia, Sierra, and Shasta-Trinity National Forests (figure 1, dark gray areas). According to the Region 5 Sensitive Plant Species Evaluation and Documentation Form (USFS 2005), Eldorado, Inyo, Klamath, Lassen, Six Rivers and Tahoe National Forests are within the potential range for this lichen (Figure 1, light gray areas). In California this document reports a total of 43 occurrences. (USFS 2005). Also one occurrence in Calaveras Big Trees State Park (Poulsen 2006). One occurrence in the stream on the "hanging meadow" on Mt. Dana, CA (Larson 2005).

POPULATION TRENDS

As recent as 1988 it was thought to have been collected "just a few times in the Sierra" (Hale & Cole 1988), however the US Forest service reports that "it has been in decline throughout its historic

Figure 1. *Peltigera hydrothyria* from Calaveras Big Trees State Park in the Sierra Nevada. The thallus is under water, leading to image distortions. Note veins on lobe at center of image. Photo by Richard Doell.

range. Currently known Sierra populations appear to be stable at this time" (USFS 2005).

It is probable that not enough documentation over a long enough time has occurred to make any accurate evaluation of population trends (Poulsen 2006).

THREATS

History: Threats to this lichen are those actions that alter stream conditions including water quality, chemistry, temperature, light regime, level, opacity or sediment load, stream bank stability, altering of microclimate conditions. Building and decommissioning roads, run off from fertilizers (paraphrase from USFS 2000).

Water transfer projects (aqueducts, flumes, etc.) that reduce cold water flows in later summer and increased sedimentation (sandblasting the thallus) caused by road building/timber harvest where increased levels of sediment would be washed through the populations during snowmelt (i.e. peak flows) (Shevock 2006).

Cattle are known to destroy stream banks which cause an increase in sedimentation. They also are known to pollute streams.

This lichen has been historically reported in all 4 major mountain chains in the United States but has apparently been extirpated in most of the Appalachians. (Dennis *et al*. 1981)

P. hydrothyria is considered uncommon throughout its range (USFS 2000).

Future: Logging, which can cause a local rise in temperature and a reduction in local ground water (Askins 2000) can have a potential affect on streams fed by springs. Livestock and recreation vehicles likely are also probable causes for concern along with acid rain or snow.

The effects of global warming may cause serious changes on stream temperatures and this lichen is very sensitive to water temperature. "The critical temperature above which degradation rapidly occurs is in the 15 to 18 degrees C range. Any environmental change that would raise the stream temperature into or over this range for an extended period would have a detrimental effect on this lichen" (Davis 1999).

Any disturbance could have an adverse effect as although "it appears that there are a lot of occurrences, this still translates into few acres occupied by this lichen" (Shevock 2006).

PROTECTION

Peltigera hydrothyria is a Sensitive plant in Region 5 of the US Forest Service (USDA 2005), and as such is managed for on certain forests (Figure 1). The California Department of Recreation and Parks protects all flora and fauna as does the U.S. Park Service. Protection methods on private lands are unknown and probably do not exist. The California Department of Recreation and Parks monitors this lichen at Calaveras Big Trees State Park.

CONSERVATION STATUS SUMMARY

P. hydrothyria has been partially extirpated in the Appalachian mountain range showing that it is vulnerable to human caused events.(see above)

Because of its very limited habitat of cool mountain streams and that it is uncommon in this habitat and because it is a good indicator of water quality, it should continue to be monitored and/or managed by those agencies who now do so. The Calaveras Big Trees State Park (CBTSP) Resource Management Office is committed to monitoring *Peltigera hydrothyria* for abundance, water temperature, chemical analysis, water flow etc. It should be recommended that other agencies such as California Department of Forestry etc. manage for it also on private holdings within the forests.

Big Trees Creek in the South Grove of CBTSP (Tuolumne County) is approximately three and one half miles in length and the lichen grows in abundance throughout most of its length. (personal and staff observation). Water quality studies were performed in the summer of 2006, including water

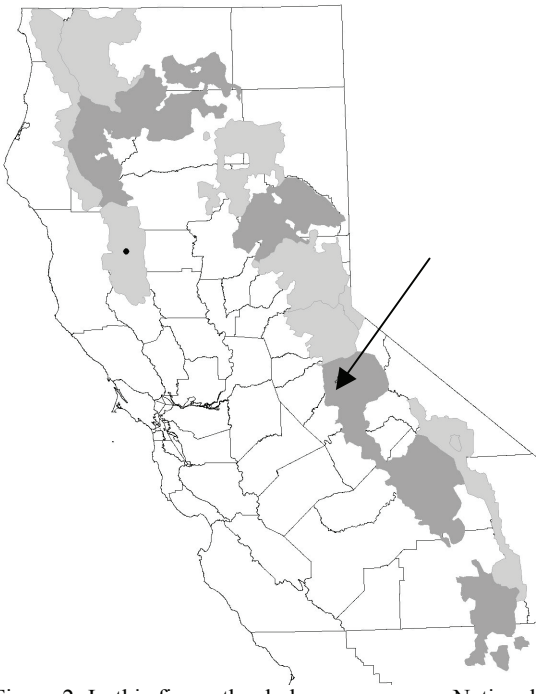

Figure 2. In this figure the dark gray areas are National Forests known to have at least one occurrence of *Peltigera hydrothyria*, while the light gray areas are National Forests that have areas of potential habitat. The arrow points to Calaveras Big Trees State Park The black dot denotes an occurrence on private land within the Mendocino National Forest.

temperature monitoring and nitrate, sulfate and phosphate monitoring (see addendum). These studies show that in Big Trees Creek, July water temperatures already exceed the critical temperature at which *Peltigera hydrothyria* begins to degrade (Davis 1999).

I would suggest that other agencies could be asked to do the same as CBTSP has done such as Sequoia National Park and possibly a USNFS management unit in the northern part of the state.

Peltigera hydrothyria may prove to be an indicator of change due to global warming and/or local warming due to nearby logging. Logging also can contribute to lower local ground water and higher local temperature (see above).

SPECIFIC CONSERVATION RECOMMENDATIONS

Recommended Global Rarity Rank: : G4
North American endemic.

Recommended Global Threat Rank: N/A

Recommended Local Rarity Rank: CA: S3

Recommended Local Threat Rank: CA: .2

Recommended List: CA: 4

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Distribution of *Ramalina puberulenta* Riefner & Bowler in California

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I would like to call attention to the growing usefulness of the CALS Bulletins in connection with recording the distribution of lichen species in California. Thanks to an active program of field trips and subsequent reports on lichens seen in the Bulletin, in twelve years we have accumulated a respectable resource on lichen distribution around the state Granted that there are other records available, and most of them now online, with the Bulletins it is fairly fast to check reports on the areas of interest, and then glance through a relatively short list to see if the lichen species of interest is there.

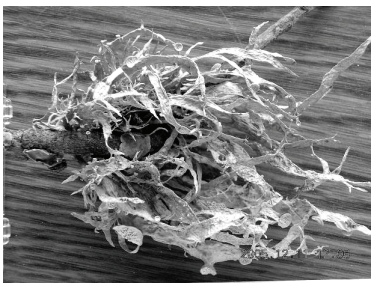
Recently I had occasion to check on the distribution of *Ramalina puberulenta* Riefner & Bowler. I knew there was a lot at Stanford's Jasper Ridge Biological Preserve; had recently learned that there was a large population in the East Bay in and around Pleasant Hill, and had seen reports of it in Southern California. To find out if the reports of this lichen were intermittent or continuous down the coast, I turned to the Bulletins and found that *R. puberulenta* was reported in a continuous line of counties from Contra Costa County to San Mateo County to Santa Cruz County, to the San Benito/Monterey County border, to San Luis Obispo and finally to Santa Barbara County (Figure 1). The gap between Contra Costa and San Mateo Counties is small (<13 miles) and is filled with urban areas and the Bay, where we would not expect to find the original lichen flora.

Figure 1. Distribution of *Ramalina puberulenta* in California, based on reports in the Bulletin of the California Lichen Society.

What is it that all these areas have in common? They all have fog. Although the Jasper Ridge Biological Preserve in San Mateo County is about ten miles inland, the fog does sneak in there on a regular basis. The abundant growth of *Ramalina menziesii* Taylor attests to that. The other inland location, around Pleasant Hill, in Contra Costa County, also experiences a lot of fog, thick at times, according to one of its inhabitants. It is interesting that this lichen does not appear to grow in any of the northern counties. So the other requirement must be some degree of warmth throughout the year.

For the CALS Bulletins to continue to make this source of distribution data easily available, I recommend that all field trip reports continue to have as complete a list of lichens seen as possible. Although it is more agreeable to me when reading a field trip report to find the lichen names within the text, in order to make the article more useful in the long run to researchers it is important to add an alphabetical list of lichens noted at the end, whether all the names are given in the text or not.

It is gratifying to see that the field trips we all enjoy have added another dimension to the usefulness of the CALS Bulletin.



Ramalina puberulenta. Photography by Tom Carlberg.

The 'fuzz'. Photography by Tom Carlberg.

Update on *Usnea longissima* Ach. in California

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In March of this year Scott Peden, a docent at Big Basin State Park discovered some long strands of *Usnea longissima* hanging from a dead snag on a Douglas-Fir (*Pseudotsuga menziesii*) while hiking in the Fall Creek Unit of Henry Cowell Redwoods State Park in Santa Cruz County.

Recognizing that this was an unusual looking lichen Scott e-mailed Dr. Irwin Brodo at the Museum of Science in Ottawa about his discovery. Dr. Brodo suggested he contact CALS member Judy Robertson who, after giving him some advice, contacted me.

Days after reporting his find, Scott revisited the site and found that several of the longer lichen strands had blown down and were lying on the ground. Shortly thereafter my husband Richard and I drove down to confirm the presence of *U. longissima* at Henry Cowell.

The snag from which this lichen was hanging was approximately sixty feet up, and the tree itself must have reached up another thirty to forty feet. We examined the canopy with binoculars but were unable to discern any strands of *U. longissima* up there. It is possible that the last of that population is represented by the few distinctive cross-draped long garlands on the old snag. The canopy was very dense, and there was probably no longer enough light at that elevation to keep the *U. longissima* strong and healthy.

This hidden population was not on one of the regular trails in the park. Although it had become visible from a trail along the creek after it had dropped to the snag, you had to walk off the trail and cross the creek in order to come right up to the tree. Now Scott has become an enthusiastic *U. longissima* hunter and we look forward to hearing from him again.

Scott's find is the first report of this species south of Sonoma County since 1997, when a tree near our cabin in southern San Mateo County, festooned with *U. longissima*, had been blown down in a storm and had fallen into a canyon.

In the mid 20th century *U. longissima* was still abundant in the Santa Cruz Mountains, but habitat loss due largely to construction and the subsequent atmospheric pollution has essentially wiped it out of the area. Getting proper protection for it there is difficult because it is not rare in the northern part of the state, and becomes even more well represented as you go north into Canada and Alaska.

Further reading:

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Doell, J. 2004. The saga of *Usnea longissima* in California. Bulletin of the California Lichen Society 11: 37-44 .

Usnea longissima in Henry Cowell Redwoods State Park. Photography by Scott Peden.

CALS Lichen Foray to Sutter Buttes, California

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As one drives north from Sacramento, a distinctive range of mountains seems to float slightly above the horizon to the east. This is *Esto Yamani*, the Middle Mountains, *Histum Yani*, "the world's smallest mountain range", or, in the most practical contemporary usage, Sutter Buttes. Butte County was named for the mountains, which were originally within its boundaries. Changing times resulted in the Buttes "belonging" to Sutter County. However both the Buttes and the county are named for John Sutter, the California pioneer who owned the sawmill where gold was discovered, sparking the Gold Rush.

The Buttes are volcanic in nature, although there seems to be some controversy regarding their association. This description comes from Wood & Keinle (1990):

> *Sutter Buttes is an anomalous volcanic landform rising starkly from the flat plain of the Sacramento Valley. As interpreted by Howel Williams, rising magmas uplifted Cretaceous and Tertiary sediments, which quickly eroded. Explosive eruptions, extending perhaps 0.5 million years, accompanied the emplacement of viscous intrusions and extrusions at the center and periphery of the uplift. These pelean domes, which strongly uparched the intruded beds, are andesitic in the central core of Sutter Buttes, and are surrounded by a halo of dacitic to rhyolitic domes. It is often suggested that Sutter Buttes constitutes the southernmost Cascade volcano, and the feature does occur along the continental extension of the Mendocino Fracture Zone in a region which might have once covered a subduction zone. However, there are great differences in age and morphology compared to the large and young Cascade stratovolcanoes. Additionally, the lack of continuing volcanism at Sutter Buttes confounds analogues with the conventional Cascade volcanoes*.

Sutter Buttes are approximately ten miles in diameter, and slightly higher than 2100' at South Butte.

The Buttes are largely private property, managed closely by an affiliation of family owners, land trusts and the Middle Mountain Foundation; access is restricted to hikes sponsored by the foundation, and by occasional forays led by interested property owners. Commercial sheep and cattle ranching been the norm for generations, and while the area was once freely used by many people in the area, vandalism and arson have caused landowners to limit access. But interest in the Buttes remains high, for geologists, naturalists, hikers, wildlife biologists and ecologists. They have been the study area for investigations of spiders (Starrett & Hedin 2007), Lyme disease and the ticks that are vectors for it (Wright *et al.* 2005, Wright *et al.* 2003), and several papers studying ringtails (Belluomini & Trapp 1984, Wyatt 1993, Trapp *et al*. 1984). Dragonfly enthusiasts have also contributed to the natural history of Sutter Buttes (Manolis, accessed 2007).

The California Lichen Society was fortunate enough to make a connection with Pete Sands, a property owner and avid naturalist of Sutter Buttes. By the time of this trip, his second lichen foray on the Buttes, he is a well-broken-in lichenologist as well! Pete had invited the Society up in 2004, on what turned out to be an abortive field trip; the planned second day was rained out. The trip planned in 2006 was rained out. The original weekend intended for

Figure 1. *Peltula euploca* at Hough creek. Photography by Tara Collins.

the trip in 2007 was rained out. Fortunately, Judy Robertson planned an alternate weekend for 2007, and got good weather.

On Saturday morning, 17 February, seven people met at the Methodist church in the tiny town of Sutter: Sara Blauman, Tom Carlberg, Tara Collins, Carrie Diamond, Bill Hill, and Judy and Ron Robertson. Pete joined us there, and led us up to the property through an array of gates shared by the various landowners. Each gate had to be closed behind us, and the job of "tail-end Charlie" fell to Judy & Ron.

This first day of the trip was spent at Hough creek and Hough Canyon, not far from Pete and Margit's place, and then on the rocky adjacent hill, colloquially called "The Alps." On the short walk to the creek, Pete pointed out that the canyon was a place where blue oak (*Quercus douglasii*), canyon live oak (*Q. chrysolepis*), valley oak (*Q. lobata*), and interior live oak (*Q. wislizeni*) all grew in close proximity. Canyon live oak and inland oak are very difficult to distinguish, even when growing side-by-side. The creek was shallow and narrow and running with cold fresh water. rocks along the creek harbored abundant poison-oak (*Toxicodendron diversilobum*) and hoary coffeeberry (*Rhamnus californica*). Only the oaks had lichens growing on them, and because of the land use history of grazing on the Buttes, only soil pockets on rocks had terricolous lichens. The rocks themselves, however, supported a luxuriant growth of lichens. (Figures 1 and 2; in color on back cover)

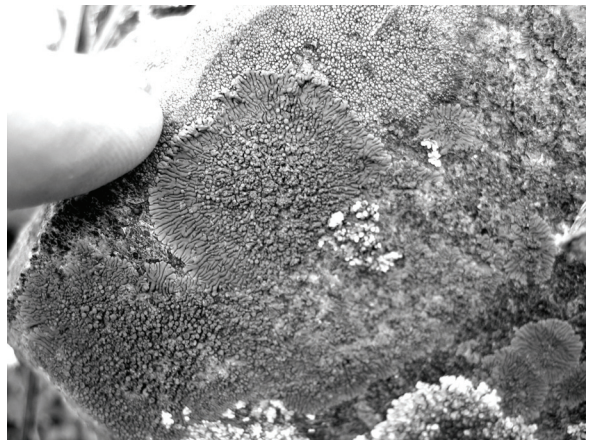

Figure 2. *Caloplaca* sp. at Hough Creek. Photography by Bill Hill.

Our second day on Sutter Buttes began at a place called Lizard Rock, which to certain members of the group resembled a reclining reptile. The hill above was fairly steep, with scattered to dense groves of blue and interior live oaks, numerous rock outcrops sometimes impassable with poison-oak (Figure 3; in color on back cover). In the understory the pipevine flowers (*Aristolochia californica*) were beginning to fall off the vine, prior to the emergence of the leaves. This relative of wild-ginger (*Asarum* spp.) has a close lepidoteran associate, the pipevine swallowtail (*Battus philenor*), which we saw a lot of under the oak forest canopy. On some of the interior live oaks were growing a species of what we think is *Phaeophyscia* that appears to be in the process of having its photobiont pirated by a species of *Xanthoria* (Figure 4; in color on back cover). Identification is frustrating and relies heavily on unpirated juvenile thalli adjacent to the affected thalli, which may or may not be the same species. But there seems to be a clear color gradient within individual thalli

Figure 3. Rock outcrop above Lizard Rock. Photography by Carrie J. Diamond.

Figure 4. Oddly pale - possibly *Phaeophyscia* being invaded by *Xanthoria*, on canyon live oak above Lizard Rock. Note the gradient in the color of the cortex, which tested K+ purple, regardless of color. Photography by Pete Sands.

Figure 5. View of Little North Butte from our lunch spot. Photography by Carrie J. Diamond.

from mineral-gray to orange. Affected thalli have cortical material that is entirely K+ purple, regardless of color.

At the top of the hill was a flat grassy area where we stopped and had lunch. Little North Butte rose above this area (Figure 5 and 6), with a promise of cooler shaded substrate that might yield a different lichen community than the south-facing slopes we had been on all morning.

This year's foray added 28 species to the list (Table 1) from 2004, which had 64 species. There are still a number of "sp." collections, which may eventually increase the total. Some of the unusual finds on this trip include *Melanelia glabroides*; *Phaeophyscia pusilloides*, rare in the Sonoran Desert area but widespread back east; *Lichinella nigritella*, apparently on the fringe of its range; *Hyperphyscia adglutinata*, on the edge of its coastal range; *Caloplaca ignea*, possibly endemic to California; *Peltula obscurans*, pretty far north for Calif. Range and distribution information comes from Brodo *et al.* (2001), Nash *et al.* (2001), and Nash *et al.* (2004).

Figure 6. View from Little North Butte. Photography by Carrie J. Diamond.

Table 1. Species list from Sutter Buttes field trip, February 2007. Checkboxes in columns 1 and 2 indicate year in which a species was found. Entries in columns 4 - 6 credit the first detection of a species. In the case of multiple collections in the same year, collection numbers are given preference, and/or the smallest (earliest) collection number is cited. Nomenclature follows Esslinger (2007). JRR = Judy & Ron Robertson, SB = Sara Blauman, TC = Tom Carlberg.

2004	2007	Species	JRR	SB	TC
	√	*Acarospora socialis* H. Magn.		√	
√	√	*Aspicilia cineria* (L.) Körber	√		
	√	*Buellia badia* (Fr.) A. Massal. (Syn. *Amandines turgescens*)	√		
√		*Caloplaca chrysophthalma* Degel	9029		
	√	*Caloplaca citrina* (Hoffm.) Th. Fr.	√		

√	√	*Caloplaca decipiens* (Arnold) Blomb & Forss.		√		
	√	*Caloplaca demissa* (Körber) Arup & Grube	√			
	√	*Caloplaca ignea* Arup	√			
√	√	*Caloplaca subsoluta* (Nyl.) Zahlbr.		√[1]		
	√	*Caloplaca variabilis*	√			
√	√	*Candelaria concolor* (Dickson) Stein	8983			
√	√	*Candelariella citrina* de Lesd.	8998			
√		*Candelariella rosulans* (Müll. Arg.) Zahlbr.		√		
√	√	*Catapyrenium psoromoides* (Borrer) Sant.	9035			
	√	*Cladonia chlorophaea* (Flörke ex Sommerf.) Sprengel				√
√	√	*Cladonia fimbriata* (L.) Fr.	9054			
√		*Cladonia pyxidata* (L.) Hoffm.	9024			
√		*Cladonia scabriuscula* (Delise) Nyl.		√		
	√	*Cladonia squamosa* Hoffm.		√		
√	√	*Dermatocarpon intestiniforme* (Korber) Hasse	9014			
√	√	*Dermatocarpon miniatum* (L.) W. Mann	9016			
	√	*Dimelaena oreana* (Ach.) Norman	√			
√	√	*Diploschistes muscorum* (Scop.) R. Sant.	9095			
√	√	*Diploschistes scruposus* (Schreber) Norman	9051			
√		*Endocarpon loscosii* Mull. Arg.	9034			
√		*Endocarpon pusillum* Hedwig	9033			
	√	*Evernia prunastri* (L.) Ach.				√
√	√	*Flavoparmelia caperata* (L.) Hale		√		
√	√	*Flavopunctelia flaventior* (Stirton) Hale	8979			
√	√	*Flavopunctelia soredica* (Nyl.) Hale	9020			
	√	*Hyperphyscia adglutinata* (Flörke) H. Mayrh. & Poelt				√
√	√	*Lecanora mellea* W.A.Weber	9066			
√	√	*Lecanora muralis* (Schreber) Rabenh.	8997			
√	√	*Lecidea atrobrunnea* (Ramond ex Lam. DC.) Schaerer	9060			
	√	*Lecidea auriculata* Th. Fr.	√			
√	√	*Lecidea tessellata* Florke	8993			
√	√	*Lecidella asema* (Nyl.) Knoph & Hertel	9082			
√	√	*Leptochidium albociliatum* (Desmaz) Choisy	9053			
√		*Leptogium californicum* Tuck.	9068			
√	√	*Leptogium lichenoides* (L.) Zahlbr.		√		
√	√	*Leptogium tenuissimum* (Dickson) Korber	9074			
√		*Leptogium teretiusculum* (Wallr.) Arnold	8999			
	√	*Lichinella nigritella* (Lettau) P. Moreno & Egea	√			
	√	*Melanelia glabroides* (Essl.) Essl.	√			
√	√	*Melanelia glabra* (Schaer.) Essl.	8982			
√	√	*Melanelia subargentifera* (L.) Essl.	8981			
	√	*Micarea prasina* Fr.	√			
	√	*Mycocalicium subtile* (Pers.) Szatala	√			
√	√	*Neofuscelia verruculifera* (Nyl.) Essl.	9047			
√	√	*Parmeliella cyanolepra* (Tuck.) Herre	9018			
√	√	*Parmelina quercina* (Willd.) Hale	8990			

√	√	*Peltula bolanderi* (Tuck.) Wetmore	9003			
√	√	*Peltula euploca* (Ach.) Poelt	9002			
	√	*Peltula obscurans* var. *hassei* (Zahlbr.) Wetmore	√			
√	√	*Peltula zahbruckneri* (Hasse) Wetmore	9000			
√	√	*Phaeophyscia cernohorskyi* (Nadv.) Essl.	9087			
	√	*Phaeophyscia orbicularis* (Necker) Moberg	√			
	√	*Phaeophyscia pusilloides* (Zahlbr.) Essl.	√			
√	√	*Physcia adscendens* (Fr.) H. Olivier	8989			
	√	*Physcia aipolia* (Ehrh. ex Humb.) Fürnr.				√
√	√	*Physcia callosa* Nyl.	9084			
	√	*Physcia dimidiata* (Arnold) Nyl.				√
√	√	*Physcia dubia* (Hoffm.) Lettau	8980			
√	√	*Physcia stellaris* (L.) Nyl.	8984			
√	√	*Physconia americana* Essl.	8978			
	√	*Physconia enteroxantha* (Nyl.) Poelt				√
√	√	*Physconia isidiigera* (Zahlbr.) Essl.	8986			
√	√	*Physconia perisidiosa* (Erichsen) Moberg			√	
	√	*Placidium chilense* e (Räsänen) Breuss				√
	√	*Placidium lacinulatum*	√			
√		*Placynthiella uliginosa* (Schrader) Coppins & P. James	9027			
√	√	*Pleopsidium flavum* (Bellardi) Korber	9041[2]			
√		*Polychidium muscicola* (Sw.) Gray			√	
√	√	*Psora globifera* (Ach.) A. Massal.	√			
	√	*Psora tuckermannii* R. Anderson ex Timdal	√			
	√	*Starothele fissa* (Tayl.) Zw.	√			
√		*Thermutis velutina* (Ach.) Flotow	9019			
	√	*Toninia sedifolia* (Scop.) Timdal	√ [3]			
√		*Toninia tristis* (Th. Fr.) Th. Fr.	9045			
√		*Trapelia coarctata* (Sm.) Choisy	9007			
√		*Trapeliopsis flexuosa* (Fr.) Coppins & James	9021			
√		*Trapeliopsis granulosa* (Hoffm.) Lumbsch	9092			
√	√	*Trapeliopsis wallrothii* (Florke) Hertel & Gotth.			√	
√	√	*Umbilicaria phaea* Tuck.	9015			
√	√	*Waynea californica* Moberg	9011			
√	√	*Xanthomendoza fallax* (Hepp ex Arnold) Søchting, Kärnefelt & S. Kondr.			√[4]	
	√	*Xanthomendoza mendozae* (Räsänen) S. Kondratyuk & Kärnefelt			√	
√	√	*Xanthoparmelia cumberlandia* (Gyelnik) Hale	8992			
√	√	*Xanthoparmelia mexicana* (Gyelnik) Hale	8991			
√	√	*Xanthoria candelaria* (L.) Th. Fr.			√	
√	√	*Xanthoria polycarpa* (Hoffm.) Rieb.	8985			
√		*Xanthoria tenax* L. Lindblom	8988			

1 Originally reported as *C. modesta*, which Esslinger (2007) lists as a synonym of *C. subsoluta*.
2 The presence of *Pleopsidium* sp. in California below 2000 feet elevation is questionable (Blauman 2007).
3 Originally reported as *T. caeruleonigricans*, which Esslinger (2007) lists as a synonym of *T. sedifolia*.
4 Also reported in 2005 as *Xanthoria fallax*.

One of the real boons from the 2007 trip was the number of photographs that Society members made available. In addition to the ones in this article, there is a photo index of the trip at http://www.californialichens.org/fieldtrips/index.html, with species identifications and photo credits. Another was the humorous good nature of Pete Sands, and his encyclopedic knowledge of Sutter Buttes, from botany to wildlife to natural history. Thanks, Pete! For those interested in the Buttes, the Middle Mountain Foundation has an excellent website at http://www.middlemountain.org/body/about/index.html

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Having fun exploring the Sutter Buttes.

California Page

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The International Association of Lichenologists (IAL) unites lichenologists in all countries and separate regional and national organizations in to one group. Most professional lichenologists as well as most graduate students belong to the organization as well as many non-professionals and a number of CALS members. The major activity of the organization is an international symposium. In 2008, on July 13-19, the 6th IAL Symposium called "Lichens in the New World" will be held at the Asilomar Conference Grounds in Monterey, California. The American Bryological and Lichenological Society (ABLS) will also hold its annual meeting in conjunction with the IAL Symposium. We urge all CALS members to attend. It will be a once-in-a-lifetime opportunity to meet lichenologists from around the world. The actual program as well as workshops were not set as we go to print but will be reported in the winter Bulletin as well as final details on field trips. If you are a student or work with a public agency, it is time to start talking about getting funding to go. Registration will begin this fall. CALS will have a booth at the symposium and plans to host a hospitality suite across from the Asilomar complex. More information in the next Bulletin and on both the CALS and IAL websites (californialichens.org, http://www.botany.hawaii.edu/cpsu/ial.htm).

The long-awaited Volume Three of the *Lichen Flora of the Greater Sonoran Region* begins final formatting and editing in June, 2007 if Bjorn Owe-Larsson completes Aspicilia treatment by end of May. His Aspicilia treatment includes 26 species so far as we go to print, including an Aspicilia species on bark collected in Sequoia by Clifford Wetmore and by Kerry Knudsen in the Palomar and San Jacinto Mountains in southern California. Meanwhile Tom Nash continues to edit the new edition of *Lichen Biology*. Every paper in the original has been revised and five new papers will be added. No news yet on an ultimate publication date.

Just out and recommended to CALS members is *Biotic Soil Crust Lichens of the Columbia Basin* by Bruce McCune and Roger Rosentreter. It is a fully illustrated paperback key to lichens occurring in biotic crusts in that region that can be used in California for identifying many terricolous lichens. It will be reviewed in next issue of the Bryologist and we will try to have a review in next issue of the Bulletin. It can be ordered directly from the website of the Northwest Lichenologists http://www.nwlichens.org.

CALS member Dr. Silke Werth, currently working at UCLA, will be moving this fall to Switzerland to work on her next post-doc on *Lobaria*. See her web site for up-to-date information on her work on *Ramalina menziesii* at http://www.eeb.ucla.edu/Faculty/Sork/Werth/.

CALS member James C. Lendemer will be leaving the Academy of Natural Sciences in Philadelphia in fall to do his doctorate work at the New York Botanic Garden. He will be working in the lichen herbarium, which includes an extensive Hasse collection from southern California bought in 1906. He just published Volume Four of the journal *Opuscula Philolichenum*. Of interest to Californians is the publication of *Lepraria adhaerens* with a type locality in Torrey Pines State Park in San Diego County and several species of the lichenicolous fungus *Tremella* reported by Paul Diederich. The papers are free online at http://clade.acnatsci.org/lendemer/opus.html. Unfortunately as we went to print he had some unresolved software problems. The files can be downloaded with some browsers but not others. Regardless, a high-speed internet connection is recommended.

Eric Peterson plans to move to Weaverville in June. Weaverville is in the Klamath Region. The area harbors diverse forests of conifers and hardwoods, and with slight coastal influences it is a great area for exploring lichens. Once settled, lichen-interested travelers in northern CA will be welcome to stop by.

Eric Peterson has moved Crustose.net out of his garage to a professional web hosting service. Crustose.net is a free information service for the lichenological community of all levels of experience. Eric is also relieved to no longer worry about rodents with a taste for power cords while on vacation or field work. Storage space with the service is very good, so feel free to sign up for a photo account and upload your images, or post other useful information in the discussion forum.

News and Notes

CALIFORNIALICHENS.ORG

Several years ago, the CALS website was given a new look and moved to a new hosting arrangement. Much of the content for the new site was taken directly from the old, but recast into a multi-page format with easy navigation between the pages. The visual design is simple but striking and provides a consistent identity as the user moves within the site from page to page. The home page provides information about CALS and introductions to the other pages of the site. New features include the lending library, photos from field trips and other events, and Conservation Committee information. More Bulletins are available on-line and we have some new items for sale. Page by page, here is what you will see:

- On the **Bulletin** page, you can view or download all but the most recent year's Bulletin in either html or pdf format. The more recent Bulletins are in pdf with color pictures, just like the print version. Several issues are currently missing, but we are now working on making them available.
- The **Conservation Committee** page provides a summary of the activities of the Committee and links to pages on crustose.net for up to date information.
- The **events** page lists recent and upcoming events, updated every six months in sync with the Bulletin issues.
- **Photos** of lichens observed on many of our recent field trips can be seen on the photos page. In order to keep the maintenance of the site manageable, I developed a procedure for contributors to easily create web pages in the CALS web colors and format which can then be integrated into the site. Complete instructions are available at the "Contributor information" link on the photos page.
- The **for sale** page currently lists the 2007 CALS Calendar, lichen notecards, the CALS poster, and the two Mini Guides.
- The **lending library** page describes how to borrow items from the large collection of articles donated to CALS by Stephen Sharnoff.
- The **membership** page consists of a printable form for applying for CALS membership.
- The **resources** page links to literature, books, other sites, and learning materials developed by CALS members.
- CaliforniaLichens.org links to the CALS **yahoo group** web site, which in turn refers back to CaliforniaLichens.org. The yahoo group is used primarily as an email list for CALS members and others interested in lichens, but other web features, particularly photo sharing, are valuable and could be used more. These features are only accessible to people who have a yahoo id.

The site is hosted at Eric Peterson's crustose.net, though reachable by its own URL: http://CaliforniaLichens.org. Eric recently moved his domain, which was run on machines in his garage, to a professional hosting service and kindly took responsibility for moving CaliforniaLichens.org as well. Consequently, our data is now more secure, we can expect less down-time, and access is faster, especially noticeable when viewing images. The older site, formerly maintained by Dick Moe and hosted by the University and Jepson Herbaria, remains online at the old URL, as there may still be bookmarks and links to it.

Suggestions for improvements are always welcome. You can reach me through the CALSWeb link at the bottom of the home page. I would also appreciate receiving photo contributions to be rotated on for the home page and the yahoo page.

Contributed by Michelle Caisse.

CALS FIELD TRIP TO BRICKYARD LANDING, GENERAL MEETING, AND BIRTHDAY CELEBRATION FEBRUARY 3, 2007

Brickyard Landing is the condominium development that is the home of Janet and Richard Doell. The complex, located on Brickyard Cove Road in Point Richmond, was opened in 1985. The purpose of our field trip was to see how many and which lichens had appeared since that time.

Our first stop was at a row of trees lining the path from the first of the buildings to open in 1985 to the clubhouse. There is an abundant growth of *Arthopyrenia lyrata* R.C. Harris, a small, white, crustose lichen with black perithecia, on these trees.

Next, we looked at the lichens on the plum trees in front of the building. The *Xanthoria parietina* (L.) Th. Fr. on these trees was the first lichen to appear after the condos were built. Some specimens are now two to three inches in circumference. Also, on these trees were a variety of foliose lichens common in the Bay area, *Parmotrema chinense* (Osbeck) Hale & Ahti, *Flavoparmelia caperata* (L.) Hale, *Punctelia subrudecta* (Nyl.) Krog.On the same lawn (heavily fertilized over the years), three black acacia trees had a thick growth of *Micarea* species at the base of the trees and on the exposed roots.

We searched the old kilns from Brickyard days, but, interestingly, they did not have the lichens one might expect to see on their walls or roofs. We also examined the back of a narrow concrete wall at the entrance to the complex and found *Lecanora dispersa* (Pers.) Sommerf., *Caloplaca citrina* (Hoffm.) Th. Fr., with other *Caloplaca* and *Candelariella* species. Then we proceeded to Miller Knox Regional Park, located on the bay and just minutes away by car. As we walked through a patch of chaparral we found one Baccharis shrub loaded with *Ramalina farinacea* (L.) Ach., *R. subleptocarpha* Rundel & Bowler, *Physcia adscendens* (Fr.) H. Olivier, *Xanthoria polycarpa* (L.) Th. Fr., *Evernia prunastri* (L.) Ach. Just past that as we entered the older part of the park where there was a large display of *Sigridea californica* (Tuck.) Tehler on Eucalyptus bark. Then we walked north parallel to the shore, beside the pond, looked at alders and other park trees and found quite a few lichens, among them were *Tephromela atra* (Hudson) Hafellner, *Lecanora* species, *Arthonia* species, *Xanthoria parietina* (L.) Th. Fr. On the wooden picnic tables we found *Candelariella* and *Physcia* species. At the head of the lake we headed towards the road, crossed it, and climbed up the hill to a large outcrop of Franciscan melange to view the site where Terry Knudsen and Jim Lendemer had found the lichenicolous fungus *Sarcopyrenia bacillosa* growing on *Acarospora socialis* H. Magn. last year, a first report of that *Sarcopyrenia* since 1897, over a hundred years ago.

By the time the group had descended from the hill and driven back to the Brickyard Landing clubhouse, other members had gathered there and were setting things up for the rest of the activities.

The pot luck meals at this event are always a treat, and we enjoyed the company of fellow lichenologists for our dinner.

After the meal, Bill Hill, CALS President presided over our annual General meeting (see minutes). Bill had videotaped the talk by Dr. Larry St. Clair about mutualism given at San Francisco State University last year. We watched the video and the CALS Conservation Committee Chairperson, Eric Peterson, reviewed the status of the lichens that have been sponsored as part of the committee action on Rare and Endangered lichens in California.

Contributed by Judy Robertson

MINUTES OF THE CALIFORNIA LICHEN SOCIETY GENERAL MEETING FEBRUARY 3, 2007

Location:

The meeting was called to order by President Bill Hill at 7:20 pm, February 3, 2007, at the Brickyard Landing Clubhouse in Point Richmond following field trip to the adjacent ridge and annual potluck dinner. CALS Conservation Committee Chair, Eric Peterson, presented the program after the meeting adjourned.

Officers Present:

Bill Hill, President, presiding
Michelle Caisse, Vice President
Sara Blauman, Secretary
Kathy Faircloth, Treasurer

Minutes:

Provided to the membership via email after the General Meeting last January. The minutes also were published in the Summer 2006 Bulletin.

Treasurer's Report: None.

Committee Reports: None.

Old Business: None

New Business:

- **Alliances with other Organizations** – President Bill Hill reported that there are opportunities for CALS to share in activities with other organizations with similar interests such as the San Francisco Microscopical Society.
- **2008 IAL Meeting in California** – CALS member Judy Robertson reported that CALS needs information regarding the role that the Society will play at the IAL Meeting in 2008 at Asilomar in Central California. CALS member

Eric Peterson volunteered to contact Dr. Thomas Nash in this regard.

- **Collecting Lichens for Dyeing, Artwork, Crafts** – CALS Treasurer Kathy Faircloth asked for the CALS official stance on collecting lichens for arts and crafts. The membership agreed that CALS discourages collecting lichens for commercial purposes. Long standing members present agreed that the Society has voted on this issue in the past.

The meeting adjourned at 7:45 pm February 3, 2007.

Upcoming Events

Assembled by Judy Robertson

DARRELL WRIGHT MEMORIAL LICHEN WALK
AZALEA HILL, MARIN MUNICIPAL WATER DISTRICT
SATURDAY, SEPTEMBER 29
10:00AM TO 2:00PM

Marin County was the haunts of the late CALS member Darrell Wright. His project of compiling the lichen flora of the county was cut short by his recent death to cancer. Join us for this day to honor Darrell and enjoy the sites that he did. We will start our walk to Azalea Hill at the Azalea Hill parking lot on Fairfax Road. We will walk through open grassland and serpentine rock outcrops. There are soil lichens in the area as well.

Bring a lunch, liquids, hand lens and stories about Darrell.

BRUSHY PEAK REGIONAL PRESERVE,
CONTRA COSTA CO.
SATURDAY, OCTOBER 20, 10:00AM

(These two trips, originally scheduled for 2006 have been rescheduled.)

In April, 1998, CALS members took part in an observational field trip to this Livermore Area Recreation and Parks Department Preserve. The purpose was to help the LARPD formulate a preservation and management policy for the site. The report is in the CALS Bulletin Winter 0998, Vol. 5, No. 2.

We will be returning to observe any changes in the lichens from our 1998 visit and use this information in working with the East Bay Regional Parks system formulate management guidelines for the Vasco Caves Preserve which we will visit the following week. See below. A small group of CALS members will take part in this trip. Look for more information on the CALS Website in the fall.

VASCO REGIONAL PRESERVE, CONTRA COSTA CO.
SATURDAY, OCTOBER 27, 2007 10:00AM

This 1,339 acre preserve in the East Bay between Brentwood and Livermore, has just recently been opened to limited tours. The East Bay Regional Parks staff would like to have CALS help with guidelines in managing this area. The Vasco Caves were an ancient gathering spot for American Indians for thousands of years. Tribal spiritual leaders looked for solace in this place with its tall and twisted rock outcroppings, pools of threatened fairy shrimp, and eagles and hawks soaring above scenic vistas. They left behind cave paintings, barely visible today.

A small group of CALS members will be allowed to investigate the lichens in the park and help with plans for future use of the area.

Look for more news on the CALS Website in the fall.

SF MYCOLOGICAL SOCIETY FUNGUS FAIR,
OAKLAND MUSEUM
DECEMBER 2007

No date has been set for the Fungus Fair for 2007, but this is quite a spectacular event. CALS has been hosting a display for many years, even before the formal organization of the Society. Bill Hill sets up a table with microscopes, always a big hit with young and old alike. Seeing lichens, up close and personal, is a new experience for all age folks. .

Please let us know if you can help with the display and please plan to attend. Watch for more information on the CALS http://

CaliforniaLichens.org and our californialichens Yahoo group.

ONGOING LICHEN IDENTIFICATION WORKSHOPS,
MARIN COMMUNITY COLLEGE
THE SCIENCE CENTER, ROOM 191, 2ND AND 4TH
WEDNESDAYS, 5:30 TO 9:00 PM

We encourage you to attend these enjoyable workshops at the Community College.

Dr. Paul DiSilva has graciously allowed us to use the classroom and scopes. Patti Patterson organizes the logistics. We bring our own lichens and work with each other to identify them. There are usually snacks. Parking at the college is $3, however, there often is free parking on the side road next to the campus.

A Sincere Thanks

The California Lichen Society would like to thank our Benefactor, Donor, and Sponsor memberships that arrived since the last (December 2006) Bulletin, and acknowledge our growing list of Life Members. Their support helps in our mission of increasing knowledge and appreciation of California lichens and is greatly appreciated.

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Darrel Wright Memorial Fund

Interested donors may contact Kathy Faircloth, CALS Treasurer, at kathy_faircloth@hotmail.com or send contributions to: CALS, POBox 472, Fairfax, CA, 94930, USA.

President's Message

Darrell Wright (left) with Bill Hill (right), looking for lichens Bolinas Ridge, Marin County, January 26, 1991.

The Passing of an Old Friend and Colleague

You probably already know that Darrell Wright, our first Editor and a founder of CALS has died. He passed away at his home in Greytown, New Zealand in the afternoon of Saturday, March 24, 2007 at the age of 71, after suffering a relapse of cancer which was thought to be in remission in January of this year. Likely as you read this I am still in New Zealand helping his wife Janet Collinson sort out and save Darrell's **lichen legacy**. To this end also I would like to see CALS develop a "Darrell Wright Memorial Fund" to honor, preserve, and aid in the continuation of his lichenological work. I met Darrell years ago – before we had a California Lichen Society. He was living in an apartment in Berkeley at the time, working as an x-ray technician at the hospital a few steps away. In those days Nancy Brewer and I would often be taking a lichen fieldtrip with him each weekend somewhere in Marin County. Darrell had an impressive topo map in his kitchen with a pin marking each place he had visited for lichens. He was thorough and knew the county like the back of his hand. The library at the University was effectively **his,** and he corresponded with lichenology experts around the world. I remember helping him print our first CALS bulletin at the local copy shop – as our first Editor he made the Bulletin into a real scientific journal, yet approachable for beginners. After he moved to Arcata, I remember spending a week with him helping to complete the Summer 2001 issue (his famous *Usnea* exposé), all done with his favorite WordPerfect program. Being the Renaissance Man that he was, he met Janet Collinson in New Zealand through an online romance complete with voice-over-internet chat, and after they visited each other's home territories, Darrell pulled up his roots here and moved to New Zealand to be with Janet. After that he was "Down Under Darrell", sending us an occasional email to our californialichens yahoogroup, expounding about his latest lichen discoveries in his new found home. But he was also in the process of writing a Lichen Flora of Marin County (using of course his extensive reference collection which he had gathered over the previous years and brought to New Zealand with him). Right up to the day he died, he was writing his Marin Flora and also helped David Galloway on a new edition of a New Zealand lichen flora, especially for *Usnea*. He was a dedicated and enthusiastic lichenologist, first in California, and later in larger circles, surely an inspiration and example of what a self-made lichenologist can be. Thank you Darrell for the opportunity to share your life with us. We will miss you greatly.

One of the significant events early this year is that we **finally** revisited Sutter Buttes with another survey/fieldtrip on the weekend of 17-18 February. (See the Foray article in this issue.) This was another step in an ongoing informal cooperative agreement between CALS and landowners to further the study and understanding of this unique 'ecological island'. Sutter Buttes is a kind of relictual refuge for species contained to a climatological mountain island in the midst of the expanse of the central Sacramento Valley, and its preservation is much due to the ecological interest and protective actions by private land ownership there. We are grateful to help in this endeavor.

I also want to remind you again, as Kerry Knudsen mentioned on the California Page here, that next year will be IAL6 in August at the elegant Asilomar conference center in Monterey. This is an opportunity of a lifetime for us to host lichenologists from around the world right in our own territory!

Happy lichenizing wherever you are,
--Bill Hill

The Bulletin of the California Lichen Society

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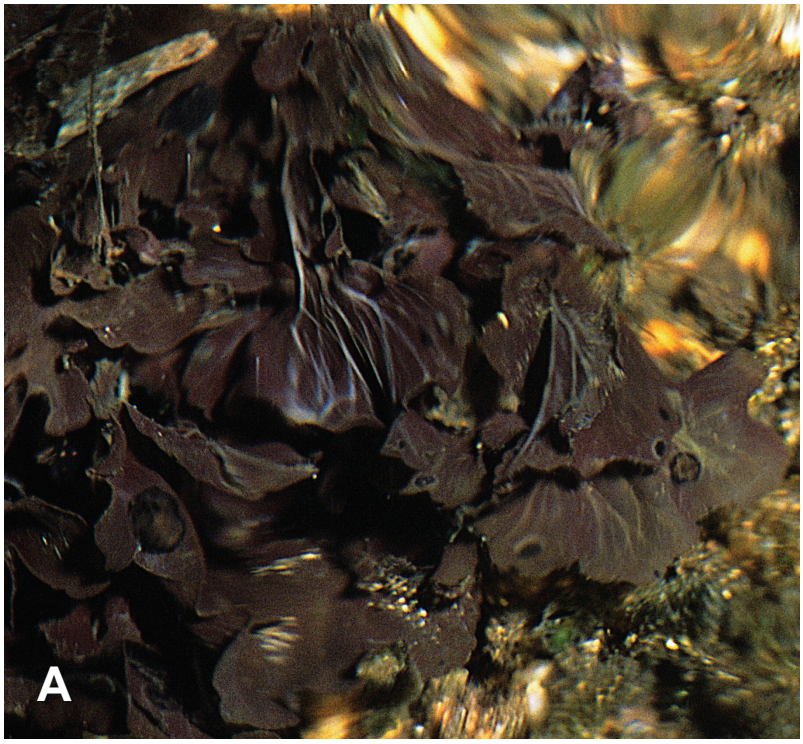
The deadline for submitting material for the Winter 2007 CALS Bulletin is 2 November 2007.

Back cover:

A) *Peltigera hydrothyria* from Calaveras Big Trees State Park in the Sierra Nevada. The thallus is under water, leading to image distortions. Note veins on lobe at center of image. Photo by Richard Doell.
B) *Peltula euploca* at Hough creek. Photography by Tara Collins.
C) *Caloplaca* sp. at Hough Creek. Photography by Bill Hill.
D) Rock outcrop above Lizard Rock. Photography by Carrie J. Diamond.
E) Oddly pale - possibly *Phaeophyscia* being invaded by *Xanthoria*, on canyon live oak above Lizard Rock. Note the gradient in the color of the cortex, which tested K+ purple, regardless of color. Photography by Pete Sands.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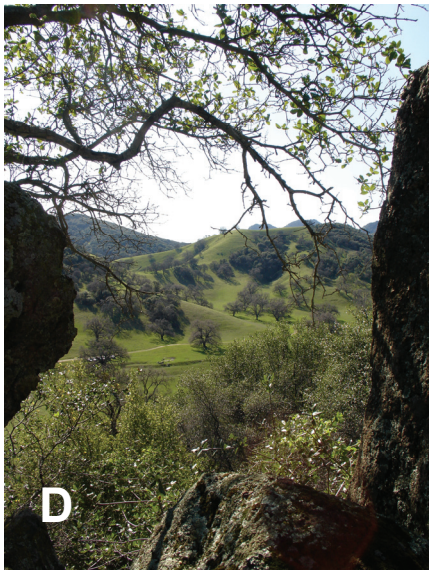
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