

## The Lichens of the Horseshoe Ranch Wildlife Area

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with

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### INTRODUCTION

On April 17<sup>th</sup> seven CALS members met at the Horseshoe Ranch Wildlife Area (HRWA) in Siskiyou County to collect and catalog the lichens of the area. Horseshoe Ranch is a 8,871 acre state wildlife preserve owned by California Fish and Game, situated between the Iron Gate Reservoir on the Klamath River and the Oregon border. The HRWA is contiguous with BLM lands in California and the Soda Mountain Wilderness in the Cascade-Siskiyou National Monument in Oregon. The dominant trees include: *Pinus ponderosa*, *Quercus garryana*, *Quercus kelloggii*, *Juniperus occidentalis*, *Pseudotsuga menziesii* and *Populus trichocarpa*.

### GEOLOGICAL, BOTANICAL AND WILDLIFE SETTING

The HRWA is located in the Cascade Range geologic province on the western slope of the Cascades and covers much of the lower reaches of Scotch Creek watershed. The Scotch Creek watershed begins in Oregon on the south face of Pilot Rock, the iconic geologic feature of the Siskiyou Pass area. The geology of these lands consists of Cenozoic volcanic rock types identified as lava flows and pyroclastic deposits, primarily of andesite and basalt composition. Volcanically derived sediments and soils are abundant on the surface in some areas, while others contain bare rock from recent lava flows (Schultz 2001).

Despite its location on the west slope of the Cascades the HRWA lies at a botanical crossroads between the California and Great Basin floristic provinces (Hickman 1993). The vascular flora includes species found in the Cascade Range, Northwestern California, and Modoc Plateau. Just south of the study area, the Klamath River forms a dispersal corridor as it cuts across the Cascade Range from the east, connecting the high deserts of central Oregon with the forested Klamath Mountains to the west. As a result, plant communities not usually found on the west slope of the Cascades can be seen at HRWA: desert plants such as *Juniperus*

*occidentalis*, *Ericameria nauseosa*, and *Purshia tridentata* grow alongside plants of the California Floristic Province, such as *Ceanothus cuneatus*, *Rhamnus illicifolia* and *Quercus garryana*. The influence of the Pacific Northwest on plant communities is also apparent in the mixed conifer stands.

The HRWA and surrounding lands provide winter habitat for several mule deer herds. Although mule deer reside on the HRWA year round, most are migratory with the bulk of the population summering in Oregon. The quality and extent of winter range habitats on the HRWA and surrounding lands is critical to the persistence and health of mule deer herds in this region. Wild horses have been documented foraging in the HRWA for many years.

The first unregulated grazing by sheep and cattle started shortly after the Gold Rush. During a period of ranching in the 1850s through the 1930s, limited irrigation projects began to move water about the landscape. Hunters depleted game and local extinctions of various animal species took place; wolves, antelope, big horned sheep and grizzlies are no longer found in the area. During this ranching period, cattle and sheep grazed throughout the study area, both on an official and unofficial basis. By the early 20th century many of the pastures, rangelands and riparian communities had been badly damaged by overgrazing and indiscriminate burning. Although no historical records of lichens could be found for the HRWA from this period, it is assumed that changes in the lichen communities occurred. The introduction of non-native grasses for forage, the impact of heavy grazing and changes in the hydrologic and fire regimes of the study area all had an impact on lichens. Recovery is continuing to this day. In comparison, on the nearby Cascade Siskiyou National Monument, in areas with little or no grazing history, lichens communities include vagrants and soil crusts.

## COMPOSITION OF THE LICHEN FLORA

Although the HRWA is noted for several rare vascular plants that are found there such as California's only known populations of *Fritillaria gentneri*, a Klamath-Siskiyou endemic, the lichens of the area have not been previously cataloged. The geological and floristic diversity provides some interesting lichen habitats to explore.

Habitats that were visited during this field trip include: large exposed rock outcrops, shrub communities dominated by *Ceanothus cuneatus*, *Quercus garryana* woodlands, mixed conifer/hardwood forests and creekside areas. The mid-elevation area along the Klamath river west of the Cascade Crest and east of the Coast Ranges is noted for its conspicuous populations of *Umbilicaria phaea* var. *coccinea* that dominate the saxicolous lichen community in places. The presence of this regional endemic is what drew us to the area.

The lichens observed at the HRWA include species that are common members of several "floristic elements" (as described by Brodo 2001), found in northern California and southern Oregon. We found species from the Temperate Pacific, Western Montane, and Southwest Desert "floristic elements".

The lichen list presented here (Table 1.) is not a complete list of the lichens occurring at the HRWA, but is a representative sampling of lichen species found in a small area of the preserve. We spent one day collecting; we covered less than three acres of

area, and restricted our foray to easily accessible areas along the trail/road. Under-represented groups include epiphytic, terricolous and aquatic lichens. There are many unexplored acres still awaiting lichenizing in the HRWA.

Lichens of the Temperate Element (Pacific Northwest) are most commonly found on the west slope of the Cascades (McCune and Geiser 2009) and include: *Collema nigrescens*, *Leptogium palmatum*, *Ophioparma rubricosa*, *Physcia aipolia*, *Physcia tenella*, *Physconia americana*, *Polychidium muscicola*, *Physconia isidiigera*, and *Xanthomendoza hasseana*.

Lichens of the Western Montane Element are more common east of the Cascades (McCune and Geiser 2009) and include: *Peltigera malacea*, *Phaeophyscia sciastra*, *Physcia biziana*, *Rhizoplaca chrysoleuca*, *Tuckermannopsis platyphylla*, *Xanthoparmelia loxodes*, and *Xanthoparmelia plittii*.

Lichens of the Southwestern Deserts Element are more common in the Southwest (Nash *et. al* 2004) and include: *Aspicilia desertorum*, *Lecanora neodegelii*, and *Peltula euploca*.

Lichens that are widespread in Northern California (Brodo 2001) include: *Cladonia ochrochlora*, *Dermatocarpon miniatum*, *Dermatocarpon reticulatum*, *Diploschistes muscorum*, *Evernia prunastri*, *Hypogymnia imshaugii*, *Letharia columbiana*, *Letharia vulpina*, *Leptogium lichenoides*, *Melanohalea exasperatula*, *Melanohalea subolivacea*, *Parmelia hygrophila*, *Peltigera ponojensis*, *Physcia adscendens*, *Physcia biziana*, *Platismatia glauca*, *Pleopsidium flavum*, *Staurothele fissa*, *Umbilicaria phaea*, *Xanthomendoza fulva*, *Xanthoparmelia coloradoensis*, and *Xanthoria elegans*.

Lichens that are found on Calcareous substrates (Brodo 2001), (Nash *et. al* 2004) include: *Aspicilia contorta*, *Lecanora neodegelii*, *Leptogium tenuissimum*, and *Lichinella nigrifella*.

Several other species from the list are worthy of comment. The global distribution of *Lecanora neodegelii* is limited to parts of Europe, the Himalayas in Asia, and the state of Arizona (Nash *et. al* 2004) where it is found on limestone and sandstone and other more-or-less calcareous substrates. It has not been reported from California (Tucker 2009) until this publication.

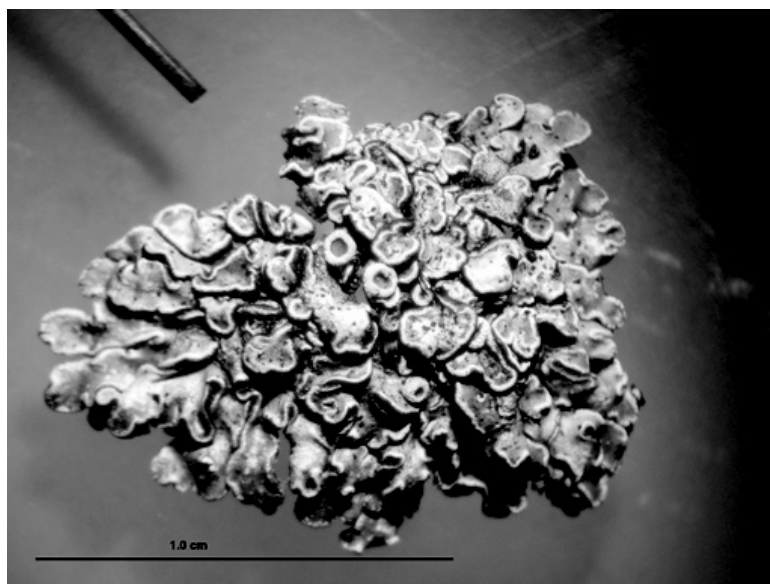


Figure 1. *Lecanora neodegelii*, a representative of the Southwestern Deserts Element found at the HRWA. Photography by Tom Carlberg.

Table 1. Lichens of Horseshoe Ranch Wildlife Area, Siskiyou County CA.

*Aspicilia contorta* (Hoffm.) Kremp.  
*Aspicilia desertorum* (Kremp.) Mereschk.  
*Cladonia ochrochlora* Flörke  
*Collema nigrescens* (Hudson) DC.  
*Chaenothecopsis pusilla*  
*Cyphelium occidentale* Herre  
*Dermatocarpon miniatum* (L.) W. Mann  
*Dermatocarpon reticulatum* H. Magn.  
*Diploschistes muscorum* (Scop.) R. Sant. ssp. muscorum  
*Evernia prunastri* (L.) Ach.  
*Hypocenomyce castaneocinerea* (Räsänen) Timdal  
*Hypogymnia imshaugii* Krog  
*Lecanora neodegelii* B. D. Ryan & T. H. Nash (= *Squamarina degelii* Poelt)  
*Leptogium lichenoides* (L.) Zahlbr.  
*Leptogium palmatum* (Hudson) Mont.  
*Leptogium tenuissimum* (Dickson) Körber  
*Letharia vulpina* (L.) Hue  
*Letharia columbiana* (Nutt.) J. W. Thomson  
*Lichinella nigritella* (Lettau) Moreno & Egea  
*Lobothallia alphoplaca* (Wahlenb.) Hafellner  
*Melanelixia subargentifera* (Nyl.) O. Blanco et al.  
*Melanohalea exasperatula* (Nyl.) O. Blanco et al.  
*Melanohalea subolivacea* (Nyl.) O. Blanco et al.  
*Ophioparma rubricosa* (Müll. Arg.) S. Ekman  
*Parmelia hygrophila* Goward & Ahti  
*Peltigera malacea* (Ach.) Funck  
*Peltigera ponojensis* Gyelnik  
*Peltula euploca* (Ach.) Poelt  
*Phaeophyscia sciastra* (Ach.) Moberg  
*Physcia adscendens* (Fr.) H. Olivier  
*Physcia aipolia* (Ehrh. Ex Humb.) Fűrnr. var. *aipolia*  
*Physcia biziana* (A. Massal.) Zahlbr.  
*Physcia tenella* (Scop.) DC.  
*Physconia americana* Essl.  
*Physconia isidiigera* (Zahlbr.) Essl.  
*Platismatia glauca* (L.) Culb. & C. Culb.  
*Pleopsidium flavum* (Bellardi) Körber  
*Polychidium muscicola* (Sw.) Gray  
*Rhizoplaca chrysoleuca* (Sm.) Zopf  
*Staurothele fissa* (Taylor) Zwackh  
*Thelomma ocellatum* (Körber) Tibell  
*Tuckermannopsis platyphylla* (Tuck.) Hale  
*Umbilicaria phaea* var. *phaea* Tuck.  
*Umbilicaria phaea* var. *coccinea* Llano  
*Xanthomendoza fulva* (Hoffm.) Søchting, Kärnefelt & S. Kondr.  
*Xanthomendoza hasseana* (Räsänen) Søchting, Kärnefelt & S. Kondr.  
*Xanthoparmelia coloradoensis* (Gyelnik) Hale  
*Xanthoparmelia loxodes* (Nyl.) Blanco, Crespo, Elix, Hawksw. & Lumbsch  
*Xanthoparmelia plittii* (Gyelnik) Hale  
*Xanthoria elegans* (Link) Th. Fr.

*Squamarina lentigera*, a closely-related species, is found on calcareous soils in California. At Horseshoe Ranch we found *Lecanora neodegelii* (Figure 1) on calcareous rocks.

*Umbilicaria phaea* var. *coccinea* (Figure 2) is the only lichen we observed that is thought to be restricted in California to the Klamath-Siskiyou region, where it is locally common (McCune and Geiser 2009). Outside of this core area it extends as far north as central Washington, where it is quite rare. It is a Pacific Northwest endemic.

*Lobothallia alphoplaca* (Figure 3) is unreported for California in



Figure 2. *Umbilicaria phaea* var. *phaea* and *U. phaea* var. *coccinea* growing intermixed. Photography by John Villevilla. The varieties are difficult to distinguish in black and white, however the photograph is provided in color on the front cover.

Tucker 2009, but in a personal communication (Tucker 2010), Shirley Tucker states that “Judy and Ron Robertson have listed *L. alphoplaca* in several field trip publications for central and northern CA, and I respect their opinion. I plan to change the listing in the catalog to accept the recent reports of *L. alphoplaca* for inland California as valid, in view of your report as well as that of the Robertson’s”.

*Thelloma ocellatum* was found on wooden corral boards at the ranch house. The distribution of this

mazaedial lichen along the fence was very interesting. It was found only along the fence boards in the immediate vicinity of the vertical metal fence posts. When one thinks of the nitrate enrichment taking place beneath the posts, caused by perching birds, the mystery behind the distribution disappears.

#### CONCLUSION AND ACKNOWLEDGMENTS

Participants in this field trip include the authors and Dennis Ball and Celise Sharpe. After a long day of collecting, a subset of the group spent the next day in the lab of the Cryptogam Biodiversity Observatory at Southern Oregon University just over the border in Ashland, Oregon. Special thanks to Dr. Steve Jessup for arranging the use of the lab, this made the trip worthwhile for folks traveling a long distance to attend the field trip. Thanks to Gretchen Vos, Jason Clark and Daphne Stone who made helpful comments on this paper.

We hope that this paper will provide a preliminary lichen list to the public and the land managers of this unique area.

#### LITERATURE CITED

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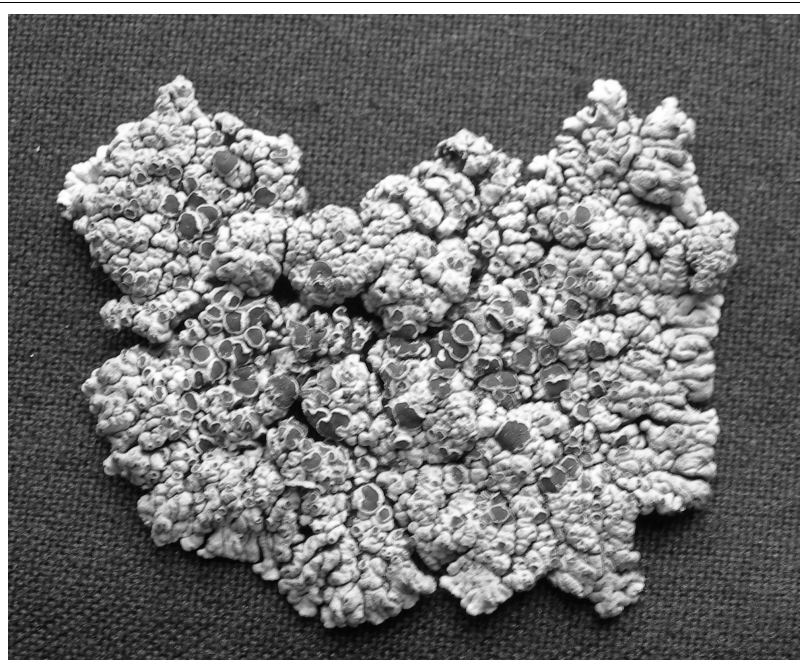


Figure 3. *Lobothallia alphoplaca*. Photography by Tom Carlberg.