

Lichens of Tualatin River National Wildlife Refuge



Lichens are the most overlooked of the conspicuous organisms in the natural landscape.

“The eye often cannot see what the mind does not already know.” – *Stephen Sharnoff*

Description

Lichens aren't just a single organism; they're "composites", made up of a fungus and its photosynthetic partner (green algae, cyanobacteria, or both) growing together in a symbiotic relationship. Lichens are not biologically similar to plants, and they're also very different from mosses and free-living fungi (like mushrooms). The fungal partner makes up most of the mass and the entire visible structure of lichens. The fungus surrounds the algae cells, providing a habitat and shading the algae from harsh sunlight. The algae feeds itself by photosynthesis (the process of creating food such as simple sugars from carbon dioxide, using the energy in sunlight). The color of the lichen comes mostly from the algae partner. The fungus also benefits from the food the algae produces, receiving carbon and energy – the products of photosynthesis. The fungus allows the algae to survive in places it would normally not live, and the algae cells multiply faster than the fungus can eat them.

With more than 5500 kinds in the United States and Canada, lichens are a major part of the diversity in a habitat. Lichens, though, are extremely vulnerable to changes in the environment, so it's no surprise that the habitats with the highest lichen diversity are the remnants of ancient forests and other undisturbed ecosystems. The link between high diversity of lichens and pristine habitats is so clear that scientists use lichens as indicators of good ecosystem health – to help identify areas that should be protected.

Discovery & Naming characteristics

Lichens are currently named after their fungal partner. Worldwide, about one fifth of all fungi species are known to participate in lichens. On the other hand, there are only about 40 genera of algal or cyanobacterial partners.

Distribution & Habitat

Lichens grow in the challenging, leftover spots of the natural world that are sometimes too harsh for other organisms. They are pioneers on bare rock, desert sand, cleared soil, dead wood, animal bones, rusty metal, and living bark. They are able to go dormant during periods of tough conditions, and can survive extremes of heat, cold, and drought.

Reproduction

Lichens are spore-producers, and reproduce asexually, sexually, or both, and also via fragmentation. Overall, lichens grow and spread slowly compared to plants. Most lichens grow very, very slowly, often less than a millimeter per year, and some lichens are thought to be among the oldest living things on Earth.

Conservation

As a major item in the food web of the northern spotted owl, the need to protect lichens is redefining the approach to forest management in the Pacific Northwest. Direct conservation of lichens has not been addressed at this time.

Wildlife Uses

On the Refuge, deer, squirrels, voles and mice eat lichens; some bats and at least 45 species of North American birds use them as nesting materials. They are a critical component of the Pacific Northwest food web. For example, flying squirrels rely on brown beard lichen as their primary winter food source; the squirrels, in turn, are primary prey for the northern spotted owl. Black-tailed deer are one of the large animals who consume lichen (mostly witch's hair) as both a winter food source and a source of water.

Fun Facts

- The cyanobacteria partner in some lichens fix atmospheric nitrogen into a form that can be used by plants and animals.
- Desert crusts of lichens reduce soil erosion by catching run-off and helping rainwater filter into the soil.
- For thousands of years, many kinds of lichens have been used by indigenous peoples and ancient cultures around the world as sources of warm, earthy colors in dyes for yarns and other woven textiles.

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Antlered Perfume (*Evernia prunastri*) is an example of a **fruticose** style of lichen; it has flattened branches 1-10 mm wide. The upper surface is greenish to yellowish-green, and the lower surface that is whitish. It's attached by a single holdfast to the wood or bark substrate of hardwood trees and shrubs. It is common in most habitats at low elevations west of the Cascades, especially hardwood forests, savannas, urban and agricultural areas, but less abundant in lower mountain forests. Because it branches just once per year, the age of an individual can be estimated by counting a series of branch points.

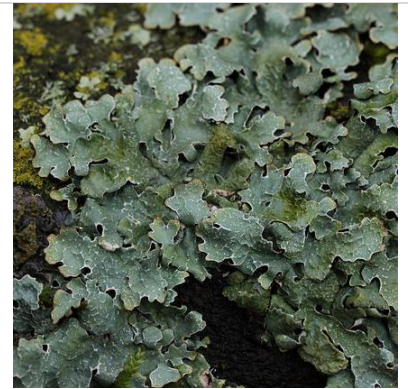
Antlered Perfume has been used since the 16th century as a fragrance by itself, or to fix and stabilize other desired scents in a blended perfume.

Photo by [Richard Droker](#) (c/o Flickr.com).



Hammered Shield (*Parmelia sulcata*) is a **foliose** or leafy type of lichen. It has medium-sized lobes mostly 1-4 mm across, and an upper surface that is whitish gray to blue-gray, with pale markings toward the lobe tips; the lower surface is brown to black. It's attached by multiple rhizines (fine, root-like structures) to the substrate of wood or bark. It is widespread throughout the Pacific Northwest. Occurring in a wide range of habitats, in both continental and oceanic climates, and from urban elevations to the middle elevations of mountains.

Photo by [Björn S.](#) (c/o Flickr.com).



Usnea cornuta is another **fruticose** style of lichen, but the main body tends to be inflated-looking. The color is generally pale greenish or yellowish-tinged, and branching is varied but often with numerous perpendicular, short (2-20 mm), lateral branches. The branches are mostly round in cross-section with a dense central cord. They often form very large (to 15 cm or more), drooping tufts with thick, swollen branch segments, giving the lichen a bushy appearance. Found on bark or wood in coastal forest, scrub and wetlands, but rarely on rock. Common on the central coast from BC to California, but unknown east of the Cascades.

Photo by [Jason Hollinger](#) (c/o WaysofEnlichenment.net)



Cushion Orange (*Xanthoria parietina*), another **foliose** example, with tiny, leaf-like scales producing upright stalks resembling cups. It has 8-10 cm wide leafy lobes that are bright gold in color and are commonly topped with small cups that may aid in reproduction. It's found from BC to Baja and into the Willamette Valley. It clings to bark and wood in riparian areas on aspen, elm & poplar, but rarely on rock, roofs or fiberglass.

Photo by [Vilseskogen](#) (c/o Flickr.com).



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