

# Black Hills National Forest Botanical Resources Update

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## Dugout Gulch Botanical Area Common Buckthorn Control Project



Younger saplings and seedlings were removed using a weed-eater (Photo B. Doten)

In September of 2014, the Bearlodge Ranger District initiated the first phase of a project to control common buckthorn (*Rhamnus cathartica*) in the Dugout Gulch Botanical Area. Common buckthorn occurs throughout Dugout Gulch and mature trees formed thickets that were a dominant component of the overstory in some areas.



Untreated (left) and treated (right) common buckthorn stand (Photo N. Drozda)

Common buckthorn is an invasive species found across most of the United States, including six counties in South Dakota and five counties in Wyoming (USDA Natural Resources Conservation Service 2015). It is native to Europe, north and west Asia, and northern Africa (Kurylo et al. 2007), but was introduced to North America before 1800 as an ornamental hedge plant (Zouhar 2011). The species has a significant impact on Ecological Community Structure in that it shades out native plants and prohibits fire in fire adapted communities further decreasing habitat suitability for native plant species (NatureServe 2015).



Common buckthorn removal included removing the mature trees using chainsaws (above), chipping and removing the debris (right), and painting the stumps with herbicide (below). (Photo B. Doten)



Three acres of mature buckthorn were removed with chainsaws, the stumps painted with Roundup, and the debris chipped and removed for burning. With the help of the North Zone Fire Crew, Boxelder Job Corps Crew, and other Black Hills National Forest employees, over 3,500 cubic feet of chipped material was removed from the site.

There are still areas within the Botanical Area that require a similar treatment and seedlings still form a carpet in the understory, but the project made notable progress in decreasing the abundance of this invasive species in the Botanical Area. The next phase will be implemented as funding allows.

## Federally Protected Plant Population Confirmed on the Black Hills National Forest



Leedy's Roseroot in the Black Elk Wilderness (Photo C. Mayer)

In 2014, the Black Hills National Forest received confirmation that a population of the federally listed species, Leedy's roseroot (*Rhodiola integrifolia* spp. *leedyi*), occurs in Pennington County, SD. This population was initially discovered in 2000 during a floristic survey of the Black Elk Wilderness and identified as roseroot stonecrop (*Rhodiola rosea*). Samples from this population were collected in 2012 for genetic analysis and comparison to other members of the stonecrop genus (*Rhodiola* sp.) from North America. In 2014 the results were published in *Botany* and the population was confirmed to be Leedy's roseroot (Olfelt & Freyman 2014), greatly expanding the known distribution of this subspecies.

Currently there are seven known populations of Leedy's roseroot, four in Minnesota, two in New York, and one in South Dakota (USDI Fish & Wildlife Service 2015; Olfelt & Freyman 2014). The three centers of population for Leedy's roseroot are geographically isolated and the subspecies as a whole is disjunct from the rest of the ledge stonecrop (*R. integrifolia*) population, which occurs in the Rocky Mountains and northwestern North America (Olfelt & Freyman 2014). Cladistic analysis and geographic distribution suggest that the subspecies became isolated from the rest of the ledge stonecrop population during a Pleistocene glacial maximum (approximately one million years ago) and subsequently became a genetically distinct subspecies.

This subspecies of ledge stonecrop was discovered growing on a limestone cliff in Minnesota by John Leedy in 1936 and the subspecies was described by Rosendahl & Moore in 1947. The Fish & Wildlife Service listed the subspecies as "threatened" under the Endangered Species Act in 1992 and a Recovery Plan was adopted in 1998 (USDI Fish & Wildlife Service 1992 & 1998).

All seven known populations occur on cool, moist cliff sides of varying geology (Olfelt & Freyman 2014). Generally, Leedy's roseroot stems are six to eighteen inches (15-45 cm) tall with closely packed, smooth, succulent, blue-green leaves measuring one to two inches long (3-5 cm). In early summer they produce dark red to yellowish-orange flowers in dense heads (Moran 2009; USDI Fish & Wildlife Service 2015). Leedy's roseroot can propagate by seed (sexual) or rhizome fragmentation (asexual) and are pollinated by insects (Clausen 1975).

The Black Hills National Forest is working with the Fish & Wildlife Service to develop a management plan for the South Dakota subpopulation.



Occupied moist, cliff habitat (Photo C. Mayer)

## Annual Botany Moonwalk Planned for June 27, 2015

On June 27, 2015 the Black Hills National Forest botany cadre will host the annual botany themed Moonwalk. The Black Hills are known for the abundance of ponderosa pine, but there are many other tree species present. We will discuss the many other woody species that contribute to the ecology of the Black Hills. The walk will take place in the northern Hills. Check out the Black Hills National Forest website for the entire season's schedule and more information!

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## Black Hills Lichen

Every year Black Hills National Forest gathers more data on the species and abundance of lichens found on the Forest. Highlighted below are some species that have received special focus.\*

\*All information is from Brodo et al. 2001 unless otherwise noted.



Reindeer lichen (Photo C. Monks)

**Reindeer lichen (*Cladonia mitis*)**  
Fruticose

**Thallus:** fruiting body surface smooth, olive to gray-green, apothecia brown  
**Habitat:** soil in open to partially shaded areas  
**Distribution:** found on every continent except Africa (Rambold 2015)

**Trivia:** Traditionally used for expelling intestinal parasites. Important winter food source for reindeer, caribou, and musk oxen (Lakehead University 2014)

**Wolf lichen (*Letharia vulpina*)**  
Fruticose

**Thallus:** brilliant yellow to chartreuse  
**Habitat:** wood, rarely rocks in dry sites  
**Distribution:** North America and Europe



Wolf lichen (Photo R. Sprague)

**Trivia:** Native Americans had many uses for this lichen including arrow poison and fiber dye. Europeans used this lichen to poison foxes and wolves.



Lung lichen (Photo C. Mayer)

**Lung lichen (*Lobaria pulmonaria*)**  
Foliose

**Thallus:** pale brown to olive-brown when dry, bright green when wet; strongly ridged and pitted surface gives it the appearance of lung tissue  
**Habitat:** trees, mossy rocks, wood; usually shaded areas

**Distribution:** North America, India, Africa, Europe, north Asia  
**Trivia:** Good indicator of rich, unpolluted, old forests. Traditionally used as a dye and medicinally to treat lung diseases across its range. Forage for moose.

### Lichen Terminology (Adapted from Brodo et al. 2001)

- Apothecium** (pl. apothecia): A disk or cup-shaped fruiting body.
- Crustose:** Thallus type that is generally in contact with the substrate (cannot be removed undamaged)
- Foliose:** Thallus type that appears "leafy" with various means of attaching to the substrate.
- Fruticose:** Thallus type that is stalked, pendent, or shrubby with no clearly distinguishable upper and lower surface.
- Lichen:** An association of a fungus and a photobiont (photosynthetic symbiont) resulting in a stable vegetative body with a specific structure, in which the fungus encloses the photobiont.
- Thallus:** The vegetative body consisting of both the fungal, algal, and/or cyanobacteria parts.