# Lava Cap Wildflower Fields

*by Karen Callahan[1] and Jennifer Buck-Diaz[2]*

Lava caps provide a special botanical heaven in the Sierra Nevada foothills, where acres of brilliant wildflowers bloom in the spring and linger into the summer. These distinctive open habitats have shallow soils underlain by an ancient solidified volcanic mudflow, or lahar. This cement-like layer, along with gentle slopes, allows rainfall to collect in depressions before slowly draining off or evaporating. Showy, mostly native, annual plants thrive here with little competition from invasive species that have a low tolerance to restricted drainage and shallow soils.

Hell's Half Acre in Nevada County is one prime example of lava cap habitat in the north-central Sierra Nevada (featured on the cover of this issue). This 70-acre area is located about 1.5 miles northwest of Grass Valley (elevation 2,600 feet) and consists of open, rocky flats dominated by grasses and wildflowers, surrounded by foothill pines (*Pinus sabiniana*) and manzanita (*Arctostaphylos viscida*) chaparral. The lava cap supports over 100 species of native plants, including at least 10 species typical of vernal pools that occur in a matrix with upland plants. In addition, rare and uncommon plants such as Sanborn's onion (*Allium sanbornii* var. *sanbornii*), Lemon's stipa (*Stipa lemmonii* var. *pubescens*), Pratten's buckwheat (*Eriogonum prattenianum* var. *prattenianum*), and Orcutt's quillwort (*Isoetes orcuttii*) are found here with important wildlife species such as Cooper's hawk (*Accipiter cooperii*) and several species of bat (*Myotis* spp).

The California Department of Fish and Wildlife (CDFW) maintains a Natural Communities List which includes both Global and State Ranks for each plant community type across the state (CDFW 2010). However, many rare natural communities, including lava caps, have not been adequately described or defined in order to achieve recognition at the state level. Vegetation sampling and classification is currently the most effective, science-based method available to document the location, variation, and rarity of plant communities in California (CDFW 2010).

In 2009, the Redbud Chapter of the California Native Plant Society (CNPS) launched a project to document their local lava cap habitats. A vegetation sampling workshop was organized to train staff and volunteers. Through this workshop and other efforts, 23 plots were surveyed across four separate lava cap formations within a ten-mile radius. The statewide CNPS Vegetation Program compiled and analyzed the data along with more than 800 other herbaceous plots from the Great Valley and Carrizo Plain (Buck-Diaz et al. 2013). The analyses revealed that

*Allium amplectens* and *Festuca microstchys. Photo: Karen Callahan*

lava cap wildflower fields are uniquely distinct from other types of grassland and meadow types in California (and may be a candidate for global and state recognition as a rare natural community).

Lava cap vegetation falls within a new provisional community, named as the *Festuca microstachys–Allium amplectens* Association, based on important indicator species. This newly defined type is nested under one of the most widespread native herbaceous communities in the state, the *Lasthenia californica–Plantago erecta–Festuca microstachys* Alliance. This alliance represents a triad of native species that have a broad tolerance of adaptation to California's Mediterranean climate. Virtually all high-quality examples of this community are on shallow, rocky, or otherwise nutrient-deficient substrates. Prior to the introduction of non-natives into California, this alliance was presumably much more widespread (Sawyer et al. 2009).

The two indicator species (see above photo) of the new *Festuca microstachys–Allium amplectens* Association are found across all

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23 of the plots (100% constancy) and they comprised an average of 25% of the relative plant cover. *Festuca microstachys* is one of eight native grasses that occur on these sites, and it is the most widespread native annual grass in California. Species richness is extremely high within lava cap habitats, with an average of 30 unique plants detected across all surveys. When compared to other annual grasslands sampled in California, these sites were among the most species-rich in the state (top 15%).

The ancient volcanic mudflows of the Sierra Nevada foothills support some of the best remaining wildflower fields in our state, making the protection of these landforms of the utmost importance. However, the future of these lava cap meadows is still uncertain. The flat, open land of these habitats is often degraded by off-highway vehicles, trash dumping, domestic animals, and recreational use. Many important sites, such as Hell's Half Acre, are privately owned, open land zoned for commercial and residential development and thus are at risk for conversion (City of Grass Valley 1999). Conservation activities by local groups include weed removal (Scotch broom) and education in the form of wildflower field trips, stories in local newspapers and on television, slideshows, and other advocacy efforts that are key to building public interest in these sites. The Redbud Chapter of CNPS and other local groups envision the preservation of these important lava cap habitats to protect their thriving biodiversity and to enable access for wildflower lovers of all ages and abilities.

**References:**


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