

Valentine Forest Project

About the Valentine Eastern Sierra Reserves

The Valentine Eastern Sierra Reserves are comprised of two of the 41 field research stations within the University of California Natural Reserve System. These two sites - the Sierra Nevada Aquatic Research Laboratory (SNARL) and Valentine Camp Reserve – are located in Mammoth Lakes, CA and provide facilities, programs, and expertise that support use each year by over 3,500 researchers, educators, and students from the local community and across the globe. **The Valentine Camp Reserve** is located at the wildland-urban interface between the resort Town of Mammoth Lakes and the Inyo National Forest. This 154-acre site preserves a diverse natural montane ecosystem, supporting biodiversity that is now rare elsewhere in the Sierra Nevada. Although the montane forest of Valentine seems 'pristine' in many ways, this system has diverged from the natural cycle of fire that would normally occur in a forest of this type. Studies using Valentine's oldest trees have shown that forest fires were historically common events in this area, and prior to human development in the region, fires swept through the forest every 15-25 years. In recent centuries the widespread practices of fire suppression have prevented these frequent fires, and the Valentine forest and surrounding areas have not experienced a forest fire in over 150 years, resulting in forests with high densities of trees that are more vulnerable to the effects of drought, pathogens and wildfire.



The Valentine Forest Project

To address the ever increasing threats of tree mortality and wildfire, and with funding and project support from the California Department of Forestry and Fire Protection, the Valentine Camp Reserve is engaged in a fuels reduction project aimed at increasing the health and resilience of the forest and decreasing the risk of fire to not only this important research and education site, but also to the Town of Mammoth Lakes, which surrounds the reserve. Fuels reduction work started in Summer 2020. This work is not only reducing the threat posed by fire to the Reserve and surrounding area, but is also providing unique research opportunities to improve understanding of how various management strategies affect forest health and wildfire risk.

Project Goals and Methods

The project focus is on reducing tree density, and the amount of hazardous fuels in the forest, which will help prepare for, and avoid, the impacts of out-of-control catastrophic wildfires like those seen in California over the last 5-10 years. These treatments are predicted to increase understory vegetation, forest complexity, and biodiversity. The project uses a mixture of approaches and equipment types specifically to achieve minimal-impact fuels reduction goals oriented around preservation, conservation and wildfire safety. These include increasing and varying tree spacing, maintaining a diversity of tree species and ages, and conserving and restoring wildlife habitat. The fuels material will be managed using a mixture of techniques of on-site chipping, complete removal of commercially viable material for firewood, and some minimal piling and burning. Although fuels treatments may initially appear dramatic and unsightly, these visual impacts are temporary in the process of restoring forest ecosystem resilience and health (see Figure 1).



Figure 1. Example of forest stand with high tree densities following more than a century of fire exclusion (left panel) and a "restored" forest stand characterized by low and variable tree densities, sparse surface fuels, and complex habitat structures (right panel) in the eastern Sierra Nevada (Images courtesy of Marc Meyer, USFS).

Benefits for Fire Prevention and Forest Health

Fuels reduction treatments are essential tools to restore the health and resiliency of a forest, and provide a wide range of ecosystem and social benefits. Healthy forests provide opportunities for recreation and enjoyment, in addition to economic benefits resulting from reduced threats to property from wildfire. In many California forests, where fires have been suppressed for decades, forest structure has shifted towards fewer large, and more small trees, relative historic forests. Large trees store and sequester more carbon than small trees, but in dense forests large trees are more vulnerable to mortality from drought and forests pests, including bark beetles. Reducing tree density reduces competition among trees for resources, such as water and light, and improves the health of the remaining trees, allowing them to more effectively sequester carbon and grow. Forest thinning promotes resiliency by enhancing tree vigor, which reduces a tree's susceptibility to bark beetles, a major cause of tree mortality in the Sierra Nevada, and lowers the potential for severe or catastrophic fire.

A Unique Opportunity for Research

Scientists from UC Davis are using the Valentine Forest project to evaluate the short and long-term effects of fuels reduction treatments on forest health and resiliency. Before the start of the project, the researchers established and collected data on tree health, plant diversity and soil carbon in 50 large vegetation monitoring plots. These data will serve as a baseline to evaluate the effects of the fuel reduction treatments over time. Measurements of water stress in trees before and after thinning will provide important information on how access to water in remaining trees may change as a result of forest thinning. To evaluate the effects of the fuels reduction treatments on wildfire risk, researchers are using computer models to simulate wildfire behavior with- and without fuels reduction, and under a range of future climate scenarios. Results from these studies will provide information to guide forest management, now, and into the future.

For More Information on Forest Management:

California Fire Science Consortium Fuel Treatment Summaries:

<http://www.cafiresci.org/research-publications-source/tag/Fuels+%26+Fuel+Treatments>

An Ecosystem Management Strategy for Sierran Mixed Conifer Forests general technical report:

https://www.fs.fed.us/psw/publications/documents/psw_gtr220/

Managing Sierra Nevada Forests general technical report:

https://www.fs.fed.us/psw/publications/documents/psw_gtr237/



For more information about the
Valentine Eastern Sierra Reserves

<https://vesr.nrs.ucsb.edu/>

