



## Klamath Network

# Vegetation Inventory Project Resource Brief

## *Oregon Caves National Monument and Proposed Expansion Area*



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*The National Park Service Vegetation Inventory Program funded an effort to classify and map the vegetation at Oregon Caves National Monument (ORCA) and its proposed expansion area. Southern Oregon University staff performed the inventory work. The Klamath Network Inventory and Monitoring Program coordinated the effort.*

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The ORCA vegetation classification and mapping effort offers a broad context for interpreting vegetation resources and a foundation for future research at the monument. This project provides the most detailed study to date of the distribution and diversity of plant associations in ORCA and the proposed expansion area.



**Bristly gentian (*Gentiana plurisetosa*) is one of two special status plant species found in meadows of the proposed expansion area.**

### **Vegetation Diversity**

ORCA, although small in area, is ecologically diverse as a result of complex terrain, variety of soils and vegetation, and the presence of karst cave environments. The inventory team identified 19 structural vegetation classes, and 34 vegetation associations composed of 397 vascular plant species. Of the 34 plant associations, only 19 occurred within the existing monument boundary. Additional associations were found at elevations outside the park and in the secondary forests of post-logging plantations, which were established from the early 1960s to the late 1980s.

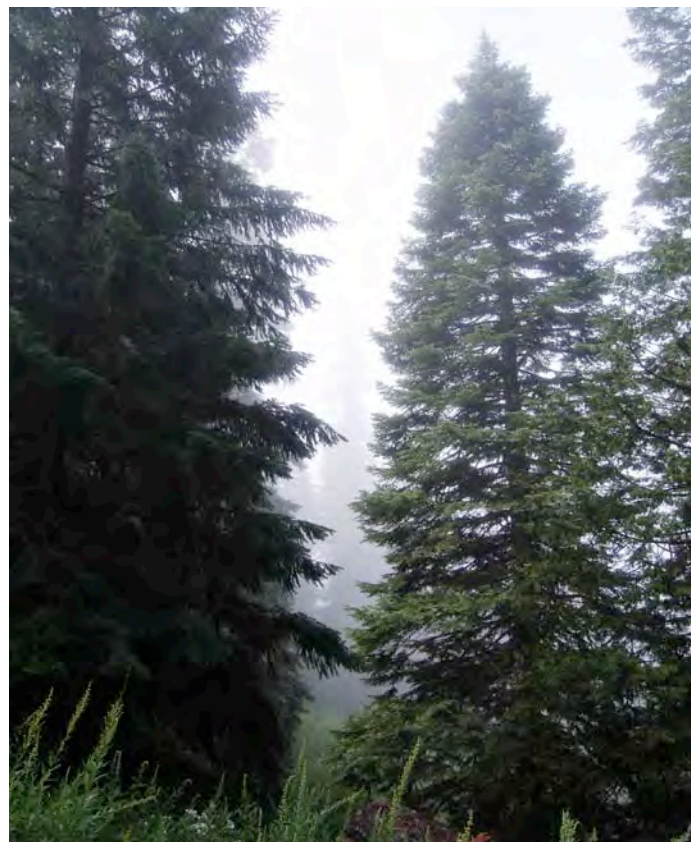
### **The Proposed Expansion Area**

Post logging recovery, ongoing fire management, and potential impacts of non-native species outside the park represent important natural resource concerns that directly affect the vegetation within the existing ORCA boundary. The current size and configuration of the monument boundary greatly limits any effective management influence on these landscape processes. The future management of the vegetation within the monument boundary will be subject to these landscape scale influences particularly at the watershed scale. The proposed

expansion area boundary protects park resources by encompassing the watershed that recharges the streams within the caves. This area also captures a highly scenic and botanically diverse mountain landscape. The proposed expansion would enhance the overall plant diversity found within the park and include a greater number of vegetation associations more common outside of the monument.

### **Invasive species**

Incidences of non-native species within the monument are low, but more common within the proposed expansion area. Potentially problematic invasive weeds include yellow star-thistle (*Centaurea solstitialis*) that can rapidly invade grasslands and forest openings, however infestations typically occur at lower elevations with warmer seasonal temperatures. Several other non-native weeds commonly found in disturbed areas were identified, but are generally not seen as ecosystem transformers. The genetic diversity of trees in plantations in the proposed expansion area may be considerably different than that found in natural forests, due to the re-planting of predominantly Douglas-fir nursery stock.



Port Orford-cedar root rot (*Phytophthora lateralis*), a waterborne pathogen, is a potential threat to native vegetation as it can locally exterminate Port-Orford cedar. It is spread by contaminated mud on vehicles and hiker's boots, however the disease is not currently affecting Port-Orford cedar within the existing monument boundary.

### **Natural Resource Interpretation**

This inventory project illustrates the rich vegetation mosaic present in this small portion of the western Siskiyou Mountains. It thereby provides a valuable resource for ORCA interpretive staff to educate visitors about this important vegetation mosaic and the diverse ecological processes affecting its development.



**Old-growth conifer forest, mountain meadows, oak woodlands, and cave dwelling species unique to the monument are important natural resources.**

As an example, vegetation dynamics are caused by variation in topography, geology and climate as well as a variety of disturbance types. Avalanches, rockslides, floods, and debris flows are common disturbance processes in the landscape in the cool seasons while fire is the most important disturbance during the warm dry summers. Mixed-severity fires create early successional conditions and landscape complexity. The varying stand age mosaics that result help shape the rich habitat and species diversity of the ORCA landscape and are important for many species that use snags and early successional habitats. Natural pest and pathogens

undoubtedly augment the vegetation patterns resulting from environmental complexity and fire.

Fire suppression can lead to a decline in differentiation among habitats, loss in vegetation diversity and reduced occurrence of species dependent on fire and other disturbances. The information provided by this inventory project will aid interpretive staff in explaining these complex ecological patterns and processes to the public.

Another potential natural resource interpretation opportunity lies in the Bigelow Basin, a textbook example of a glaciated subalpine basin with a U-shaped cross-section, distinct glacial features, and a diverse mosaic of wetlands. The Bigelow Lakes are in the late stages of transitioning from aquatic communities to forest communities, and will eventually fill and form a meadow. Trees will continue to invade the meadow margins, drying soils and converting wetlands to uplands. This compact landscape offers a unique opportunity to contemplate past and continued environmental changes.



**The inventory of these resources helps park managers conserve plant biodiversity; manage challenges such as invasive exotic species, insect outbreaks, and diseases; and understand ecological processes.**

The forested areas of the monument and proposed expansion area provide a characteristic regional setting for studying natural and human-caused disturbance dynamics and their implications for native plant and animal diversity. The post-logging succession on proposed expansion area in particular

may be an important interpretive resource for ORCA. Interpretive walks through native and secondary forests might provide an ideal showcase to illustrate and communicate 20<sup>th</sup> century approaches to forestry and their outcomes.

The proposed expansion area, in general, provides the potential to greatly expand the narrative and to add field sites for interpreting the unique glacial, climatic, disturbance, and human history of the western Siskiyou Mountains. This vegetation inventory project provides a valuable snapshot of the vegetation types and will be an important benchmark for evaluating the processes of environmental change in the monument and proposed expansion area.

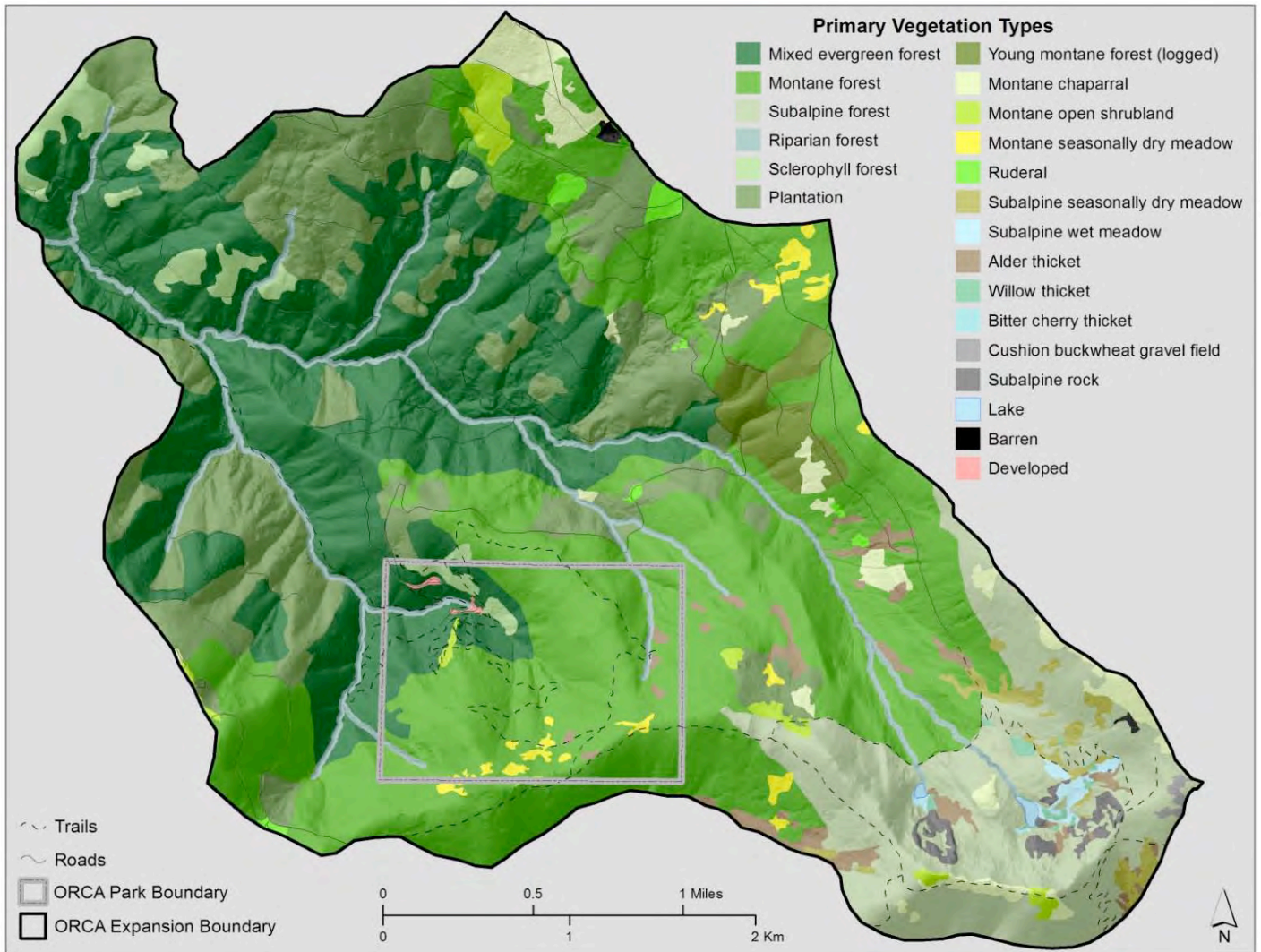


### Research Opportunities

The vegetation map and database combined with recent geology mapping could provide insight into vegetation-environment relations. Analysis of species richness data could reveal patterns related to variables such as vegetation associations, elevation, and disturbances. Complex interactions between environmental data and the mapped vegetation could be examined and yield important information about vegetation composition, structure, and function and how these elements are affected by elevation, soil, slope, aspect, and disturbance. The map data are also useful for wildlife habitat modeling, fire modeling, and as a guide for rare plant surveys, wildlife habitat structural analyses, and inventorying areas that likely contain invasive exotic species.

Secondary forests offer an opportunity for long-term research in forest succession, as a focus for restoration efforts and for evaluating the habitat these forests provide for native plant and vertebrate diversity. They could also serve as a laboratory for

exploring the prospects of increasing biodiversity or altering current trends of succession through the introduction of prescribed fire or mechanical treatments.



**Vegetation Map of the Oregon Caves National Monument and the Proposed Expansion Area**

Odion, D. C., D. A. DiPaolo, L. C. Groshong, and D. A. Sarr. 2013. Vegetation Inventory Project: Oregon Caves National Monument and proposed expansion area. Natural Resource Technical Report NPS/ORCA/NRTR—2013/782. National Park Service, Fort Collins, Colorado.

Photos from Klamath Network libraries.