



Vital Sign Update: 2023 Results for Vegetation Community Monitoring at Oregon Caves National Monument

Importance

Lush old growth forests with an overstory dominated by fir trees and a highly diverse herbaceous understory grow at Oregon Caves. These forests respond to local climate, soil, and disturbance conditions and play a vital role in the monument's health. They feed and shelter animals, and cycle water, carbon, and other nutrients through the soil. But natural and human-caused changes, like changing fire regimes, climate, local land-use, and invasive species can profoundly affect plant communities. To alert monument managers if conditions change, we've been monitoring land plants (terrestrial vegetation) within the monument since 2013, though not in the expansion area. We measure composition (variety and abundance of species), structure (tree size, height, and density; shrub height) and function (tree death and regeneration) as vital signs of ecological health. This brief describes how we measure one of these elements—*species composition*—at Oregon Caves, and reports the results of our most recent sampling event in 2023.

Measuring Vegetation Composition

Changes in vegetation are not always unhealthy. To discern which changes are concerning, we examine our species data in multiple ways. Taken as a whole, these different measures provide the context monument managers need to identify negative trends and make decisions.



Within a 20 x 50 m plot (0.1 ha), this botanist uses her trusty hand lens to identify plants for a total count of native and nonnative species present. In smaller nested plots, we also measure the total cover of each species to calculate diversity at different scales within the monument.

Species Richness

Richness is a straight count of the number of vascular plant species (not mosses or fungi) in our plots. In general, the wider variety of species we find, the more biodiverse and resilient the ecosystem is. Related to species richness, we also examine several measures of *diversity*—each one provides slightly different information about the balance of species relative to each other.

Nonnative Species

Because nonnative species can cause serious ecological problems, we report how many nonnative species we detect, how much area they cover, and the ratio of native to nonnative species. This ratio is a useful measurement to track over time and to compare with more disturbed areas inside and outside the monument.

Results and Ongoing Monitoring

Every 3 years, between June and early July, we monitor terrestrial vegetation at 10 sites at Oregon Caves, barring unforeseen complications. In 2023, we sampled all 10 sites. We'll sample vegetation again in 2026.

In 2023, Oregon Caves sites had an average of about 48 vascular plant species. Upland plots have more vascular plant species on average than upland plots at our other 5 Klamath Network parks. However, we do see an average decline of 5 species per plot between 2013 and 2023 in the park, highlighting the importance of long-term monitoring. Nonnative species were rare: only 1 species (bull thistle, *Cirsium vulgare*) was observed at 1 site in 2016 and 2019, but not in 2023. View the map on the back for detailed results.

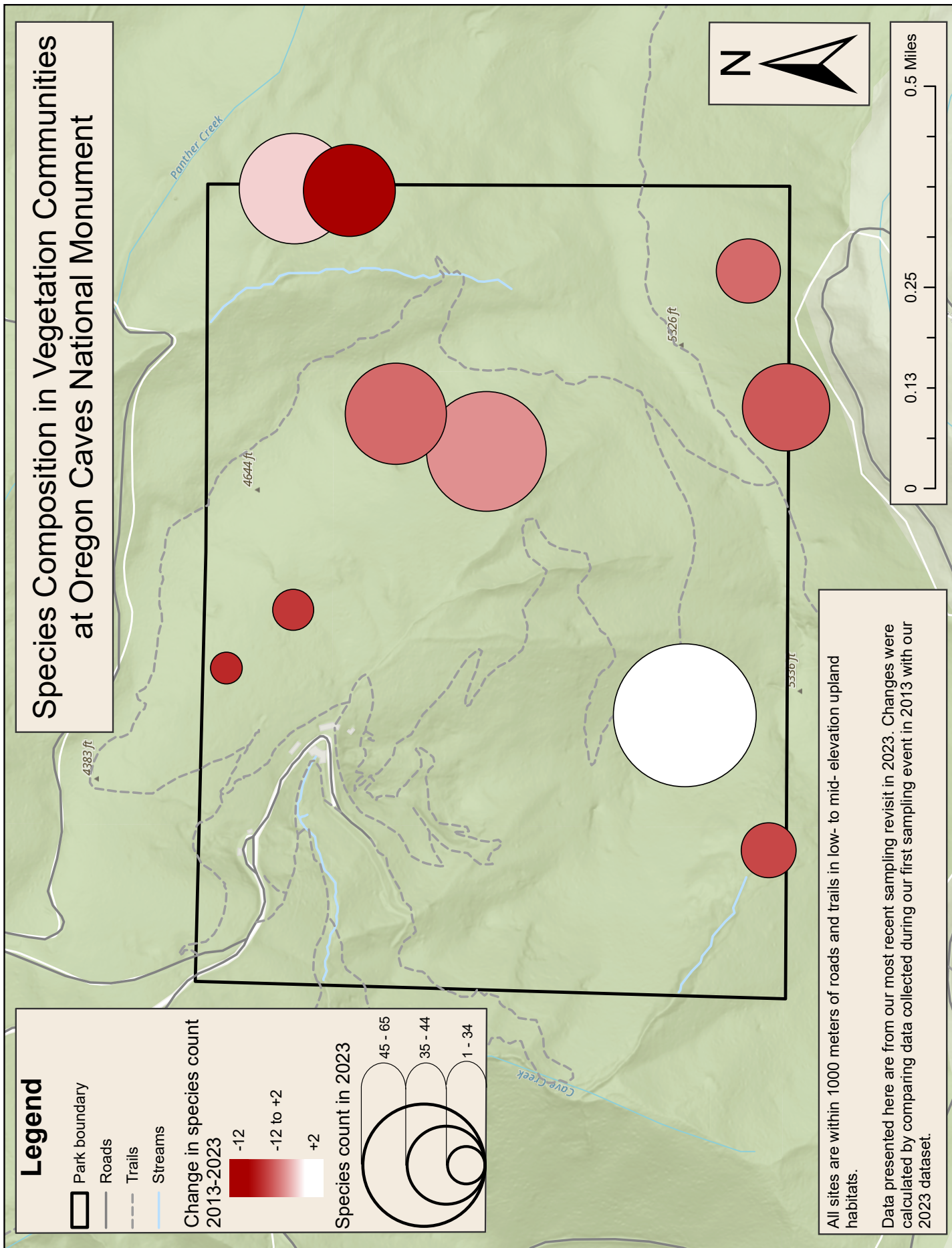
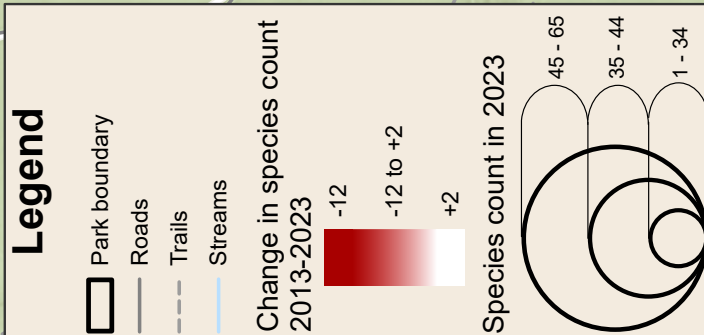
More Information

Lauren Youngblood, Ecologist
Klamath Inventory and Monitoring Network
lauren_youngblood@nps.gov; 541-552-8870

Project overview, reports, and protocol:
<https://www.nps.gov/im/klmn/vegetation.htm>

Datasets and all related publications:
<https://irma.nps.gov/Datastore/Reference/Profile/2171794>

Species Composition in Vegetation Communities at Oregon Caves National Monument



All sites are within 1000 meters of roads and trails in low- to mid- elevation upland habitats.

Data presented here are from our most recent sampling revisit in 2023. Changes were calculated by comparing data collected during our first sampling event in 2013 with our 2023 dataset.