



Vital Sign Update: 2024 Results for Vegetation Community Monitoring at Redwood National and State Parks

Importance

From towering coast redwood forests to oak woodlands and grassland prairies, distinct plant communities grow at Redwood. Each responds uniquely to a particular set of climate, soil, and disturbance conditions, and each is vital to the park's health, providing food and shelter to animals, and cycling water, carbon and other nutrients through the soil for continual reuse. Redwood forests are also powerful carbon sinks, storing more carbon than they release, while understory plants like trillium and redwood sorrel add diversity and support wildlife. But natural and human-caused changes, like altered fire regimes, anthropogenic climate change, local land-use, and invasive species can profoundly affect plant communities. To detect concerning changes that park managers need to know about, we've been monitoring land plants (terrestrial vegetation) at Redwood since 2011. 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 Redwood and reports the average conditions we observed during our most recent sampling event in 2024.

Measuring Vegetation Composition

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



A botanist measures tree diameter at breast height (dbh) within a 20 x 50 m plot (0.1 ha)—one of many variables, including species composition, used to track long-term changes in park vegetation communities.

Species Richness

Richness is a straight count of the number of vascular plant species (not mosses or fungi) detected 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 park.

Results and Ongoing Monitoring

Every 3 years, in Jul–Sep, we monitor plants at 47 riparian and mixed habitat sites at Redwood, barring unforeseen complications. In 2024, road removal from Redwoods Rising allowed only 37 sites to be sampled.

Riparian sites had twice the species richness on average of upland sites in 2024. This highlights the value of park riparian areas in conserving biodiversity. Few nonnative species occurred in riparian and upland sites overall. However, 3 sites had concerningly high cover (25%–70%) of nonnative species, highlighting the urgent nature of managing invasive nonnatives. View the map on the back for detailed results. We'll sample park vegetation again in 2027.

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 Redwood National and State Parks

