Resource Brief

National Park Service
U.S. Department of the Interior

Klamath I&M Network
Natural Resource Stewardship and Science

Vital Sign Update: 2022 Results for Vegetation Community Monitoring at Whiskeytown National Recreation Area

Importance

Whiskeytown has exceptionally diverse vegetation! From white alder covered in California wild grape vines along riparian corridors, to dense upland chaparral, to coniferous forests on Shasta Bally, and many other types in between, distinct plant communities grow in the park. Each responds uniquely to its particular climate, soil, and disturbance conditions. 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. But natural and human-caused changes, like fire, climate, 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 Whiskeytown since 2012. 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*—in the park, and reports the conditions we observed during our most recent sampling events in 2018 and 2022.

Measuring Vegetation Composition

Changes in vegetation are not always unhealthy. To understand which changes are concerning, we examine our species data in multiple ways. Taken as a whole, these different measures provide the context park 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 park.

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 park.

Results and Ongoing Monitoring

Every 3 years, between late May and early July, we monitor terrestrial vegetation at 46 sites from 3 habitats, each in a separate sample frame, at Whiskeytown. In 2022, we sampled 30 sites. We'll sample park vegetation again in 2025.

At Whiskeytown, riparian sites had higher species richness than upland or high-elevation sites. However, all 3 habitat types were diverse. Overall, Whiskeytown had more total species than any other park we sampled. Nonnative species occurred with varying abundance and richness in the park but were absent from most high elevation sites. View the map on the back for detailed results. Note that data from riparian sites are from 2018 as we were unable to sample them in 2022.

More Information

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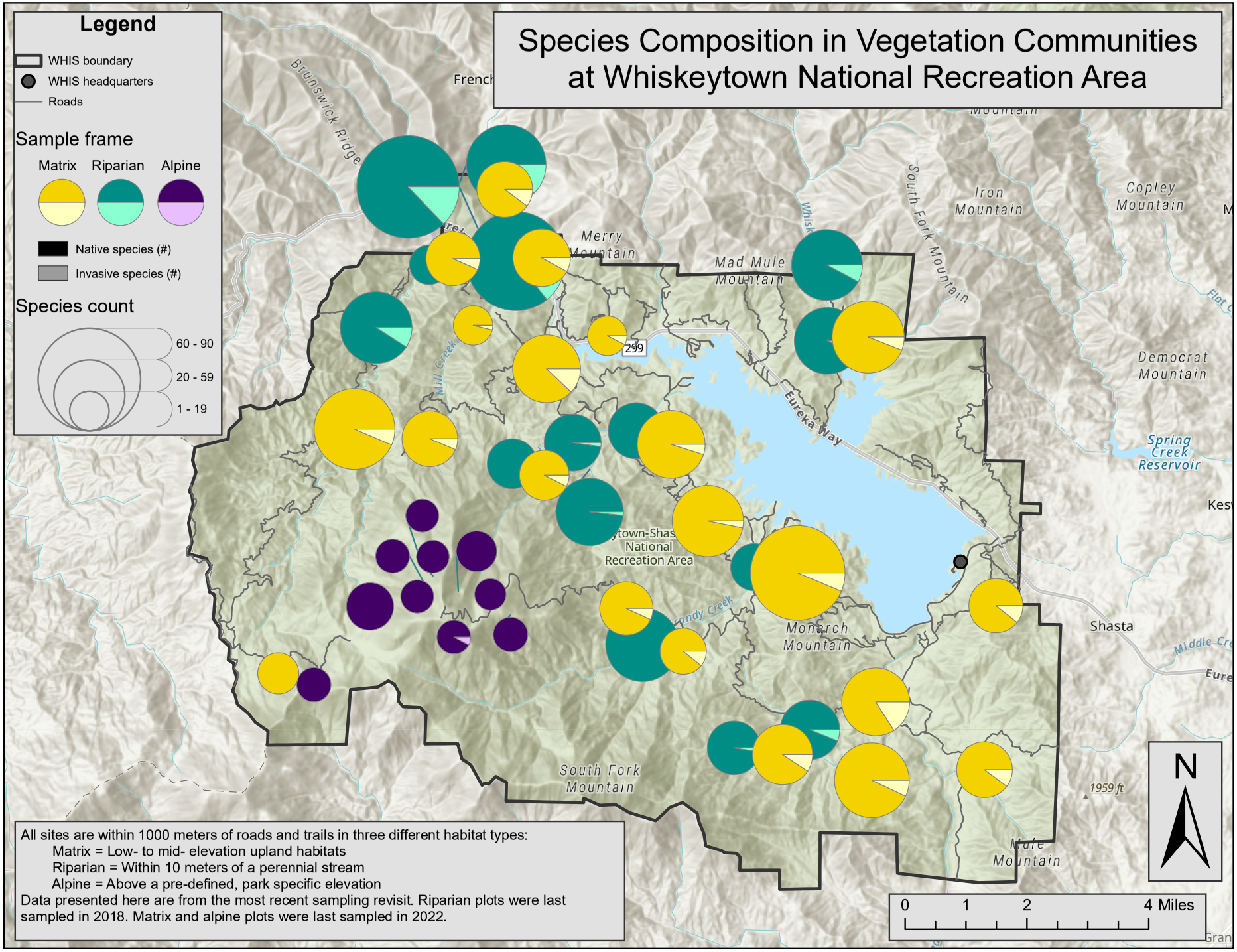
Project overview, reports, and protocol:
https://www.nps.gov/im/klmn/vegetation.htm

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


Species Composition in Vegetation Communities at Whiskeytown National Recreation Area
Legend
WHIS boundary
WHIS headquarters
Roads
Sample frame
Matrix
Riparian
Alpine
Native species (#)
Invasive species (#)
Species count
60 - 90
20 - 59
1 - 19
Brunswick Ridge
French
Merry Mountain
Mad Mule Mountain
South Fork Mountain
Iron Mountain
Copley Mountain
Democrat Mountain
Spring Creek Reservoir
Eureka Way
299
Mill Creek
Monarch Mountain
Shasta
South Fork Mountain
Mule Mountain
1959 ft
N
0
1
2
4 Miles
All sites are within 1000 meters of roads and trails in three different habitat types:
Matrix = Low- to mid- elevation upland habitats
Riparian = Within 10 meters of a perennial stream
Alpine = Above a pre-defined, park specific elevation
Data presented here are from the most recent sampling revisit. Riparian plots were last sampled in 2018. Matrix and alpine plots were last sampled in 2022.