

Variation in Old-Growth Coast Redwood (*Sequoia sempervirens*) Reference Sites in Mendocino County, California

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Summary By:

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When considering different approaches to resource management, it is important not only to recognize overall ecosystem characteristics, but also site-specific differences in individual areas. This is especially important to keep in mind when looking at *Sequoia sempervirens* Coast Redwoods, one of the oldest living organisms on Earth, found only along the Pacific coastline. By examining specific sites and recording differentiating factors, the authors Kristin K. Michels and Will Russell help provide land use managers with reference material to support restoration projects.

This study was conducted at 60 sites across three old-growth, *S. sempervirens* dominated areas in Mendocino County. Old-growth forests are areas that reach old age without significant disturbance. Two of the areas, Hendy

Woods and Montgomery woods, are found moderately inland, on well-drained soil, have maintained facilities, and have managed trail systems. The third area, Russell Unit, is one of the last old-growth stands left directly on the coast and receives little to no managing. The 20 sites were chosen using geographic information systems, land management history, and regional knowledge.

At each site, the 20 plots were randomly sampled for overstory, midstory, and understory species, or species found at different height levels within a forest. Indicator Species Analysis (ISA) was used to determine if flowering species were specific to certain growth sites. ISA is a program that uses statistics and species



Photo by Will Russell taken at
Russell Unit in Mendocino County

abundance data to calculate indicators that reflect the state of the environment, provide evidence for the impacts of environmental change, or predict the diversity of other species. Flowering species were present in different amounts depending on the site's age and level of disturbance.

Even though all three sites were dominated by *S. sempervirens*, there were still significant differences both across sites and across plots within a single site. This indicated more diversity and structural differences than previously thought in coast redwood old-growth forests. ISA found four indicator species for Russell Unit, four for Henry Woods, and six for Montgomery Woods. Most of these indicator species were perennial, rhizomatous species found in moist, shady forests such as *Oxalis oregana*. These plants are durable, long-lasting, and low to the ground. Between inland and coastal sites, there were significant differences in tree density, basal (base) area, and understory cover. Differences across plots within the same site were mostly due to canopy gaps, where patches of light allowed otherwise suppressed species to grow. It was also found that Russell Unit (the site by the coast away from human activity) received a lot of natural disturbance from the ocean, but contained many species typically not present in areas of human disturbance. The differences and other subtle features observed provide further insight on these old-growth stands, helping us understand the uniqueness of the fading redwood ecosystem.



Photo by Will Russell taken at
Russell Unit in Mendocino County