

California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group

Redwood

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Vegetation

Structure-- Second growth redwood habitats are characterized by even-aged structure with an open parklike appearance. Typically, on disturbed sites the vegetation established very quickly (within one year). In time, the habitat is composed of dense (>60% crown closure), shrubby <10 m (32 ft) vegetation with overlapping canopies (Jepson 1910, Roy 1966a, Becking 1968, Stone and Vasey 1968, Stone, et al. 1972, Zinke 1977, Veirs 1983(No 1983 Habitat Lit Cite. There is a 1981 Cite. Not placed in Bib.). Over time, trees become uniform in size and height, suppressing understory vegetation. Virgin old growth stages of this habitat also exist. Such stands are characterized by tall 70 to < 120 m (230 to <400 ft) dominant and codominant trees. Wood volume in these stands may reach a basal area of 100-150 m²/ha (450-650 H²/ac) (Becking 1968, Veirs 1983). Understory vegetation in old-growth redwood is usually very dense (> 60% crown closure) and composed of 3 to 4 m (10 to 13 ft) tall shrubs. Open parklike old-growth stands seldom occur except on alluvial flats or on lower slope mesic sites (D. Thornburgh, pers. comm.). Redwoods are very vigorous sprouters with sprouts eventually forming the dominant canopy. Redwood and associated conifers also reproduce well by seed. When suppressed by the dominant canopy, seedling heights are usually <10 m (33 ft) (Person and Hallin 1942, Muelder and Hansen 1961, Becking 1968).

Composition-- The redwood habitat is a composite name for a variety or mix of conifer species that grow within the coastal influence zone <50 km (31 mi) from the coast. In the north coast region of California (within 4 km (2.5 mi) of the coast), the Redwood habitat (RDW) consists of Sitka spruce, grand fir, redwood, red alder, and Douglas-fir. Western redcedar and western hemlock are also associates but seldom comprise the major portion of a stand. Redwood becomes dominant along coastal areas approximately 4 to 16 km (2 to 10 mi) from the ocean where Douglas-fir, red alder, and grand fir are its major associates. Further inland, Douglas-fir becomes dominant with tan oak and madrone as the major associates (Becking 1968, Zinke 1977).

The southern extension of the RDW is similar in physiognomy but varies in species composition. Redwood is dominant along the coast, with Douglas-fir as its common associate; tan oak and madrone are also major constituents of the habitat. Other contributing tree species are Bishop pine, Monterey pine, sugar pine, Jeffrey pine, Port-Orford cedar, California bay, Oregon ash, and big-leaf maple. These species are present in response to soil or microclimate conditions.

Understory composition is diverse and varies along a north-south/east-west gradient. Important species are sword fern, deer fern, chainfern, Andrew beardlily, barberry salal, coast rhododendron, California huckleberry, California red huckleberry, coast fireweed creambush oceanspray, salmonberry, poison-oak, western thimbleberry, cascara buckthorn, coyotebush, Scotchbroom, blueblossom ceanothus, snowbrush ceanothus, Idaho fescue, and western fescue.

Other Classifications-- Due to its uniqueness, the redwood type is considered as a uniform type by numerous sources. Other names include Redwood Forest (Cheatham and Haller 1975), Redwood (Eyre 1980), Redwood Zone – Early Seral Shrub, Redwood Zone - Second Growth Forest, Redwood Zone - Old Growth Forest (Proctor et al. 1980), Redwood-Douglas-fir, Redwood (Parker and Matyas 1981).

Habitat Stages

Vegetation Changes-- 1;2-5:S-D,f The climax stage of the redwood habitat is distinguished by a bilayered canopy, usually with redwood or Douglas-fir as the dominant species. Redwood is a self-perpetuating habitat, with or without fire as a disturbance. After disturbance (usually logging, fire, or flooding) succession proceeds rapidly. Initially, disturbed sites are barren with a sparse herb layer. This stage usually gives way to shrubs and redwood sprouts within 10 years. Regeneration of redwoods (seedling or sprouts) is most successful on disturbed sites (Person and Hallin 1942, Muelder and Hansen 1961, Florence 1965). Over time, conifers become more dominant, with resilient shrub types comprising the understory. In drier locations, mid-seral stages are composed of hardwoods which are usually dominant or codominant to the conifers. This mix of conifer and hardwood persists for many years, but eventually gives way to conifer dominance. Fire and flooding in the redwood ecosystem play a major role in terms of reproduction and plant succession. When fire is introduced, various plant species are affected, ultimately altering the habitat stage.

Duration of Stages-- The rate of change from one habitat stage to the next is dependent on site location and quality. Latitude and distance from the ocean also play a major role. Approximate successional time frames for the Redwood habitat are:

Stage	Years
Seedling	<5
Sapling	5-30
Pole	30-60
Small	60-100
Medium/Large	100-150
Multilayered	150-2,000

Biological Setting

Habitat-- Redwood habitats occur in relatively mesic environments along the north and central coasts of California. In the north, the habitat intermingles with the Douglas-fir (DFR) and Klamath-Enriched Mixed Conifer (KMC) habitats. In the southern extent of its range, the Coastal Oak Woodland (COW) habitat is its primary associate. Throughout the range of the redwood habitat, annual/perennial grassland habitats (AGS/PGS) are intermingled as glades and prairies.

Wildlife Considerations-- Redwood habitats provide food, cover, or special habitat elements (for at least one season) for 193 wildlife species (Marcot 1979). This total is comprised of 12 reptiles, 18 amphibians, 109 birds, and 54 mammals. Of these species, 18 are considered harvest species. Moreover, a variety of sensitive species are found in the habitat. Species such as the red-legged frog, ensatina, osprey, ringtail, fisher and marbled murrelet show a relatively high preference for various redwood habitat phases and stages. To a minor extent, sensitive species such as the peregrine falcon, pileated woodpecker, spotted owl, and northern flying squirrel can be found, but are usually vagrants in the habitat. The endangered bald eagle can also be found in the habitat (considering the special habitat element), but is usually not a common visitor.

Physical Setting

Redwood habitats are restricted to coastal areas where temperature regimes are relatively stable. Summer coastal fog and marine air flows inland have a great influence on the habitat. Temperatures in the redwood regions range from summer highs of about 40 C (100 F) to winter lows of about 8.8 C (16 F). Ambient temperatures increase on an inland progression, as elevation increases and marine air flow decreases. Precipitation occurs mostly during winter months, with an annual average of 101 cm (40 in). Precipitation (mostly rain) in excess of 230 cm (90 in) occurs in isolated coastal areas. All variations of topography exist, from gradual elevational changes to steep, abrupt mountain ranges, common in the central north coast. Elevations where the habitat can be found range from sea level to over 915 m (3000 ft) in Monterey County (Becking 1968). Soils are composed of relatively young, deep, fertile alluvial and colluvial parent material. Moreover, sites also exist within the region that have a high acid content. Serpentine soils are also present, which create an open prairie condition and may support relic conifer types.

Distribution

Redwood habitats are distributed along the coast of California ranging from the California-Oregon border to San Luis Obispo County. The habitat can be found in various vegetative phases to approximately 50 km (31 mi) inland from the coast.

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