Can the California Forest Practice Rules Adapt To Address Conifer Encroachment?[1]

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Abstract

The loss of oak woodlands to conifer encroachment is widely recognized as a major conservation concern. The increased occupancy of oak woodlands by Douglas-fir (*Pseudotsuga menziesii*) and other conifers has been reported throughout portions of California and the Pacific Northwest in multiple oak habitat types. In California, Oregon white oak (*Quercus garryana*) and California black oak (*Quercus kelloggii*) are particularly impacted by encroachment. Studies point to altered disturbance regimes, and the suppression of low-intensity fire in particular, as the primary cause of increased conifer establishment in these oak woodlands.

Much of the Oregon white oak and California black oak woodlands of California occur on privately owned land and as a result their management is subject to the standards of the California Forest Practice Rules. There are several issues in the current California Forest Practice Rules where there are disincentives to active management of the conifer encroachment issues. The California State Board of Forestry is considering development of an "oak woodlands restoration" approach to address these issues, but faces many challenges in the central design of the rules and the need to balance multiple species and management interests.

Key words: California black oak, California forest practice rules, encroachment, fire exclusion, forest policy, Oregon white oak

California forest policy history 1890s to 1970s

California has a long and rich history of developing policy to guide the management of its timberlands. Within this history there are several key policies that have influenced California black oak (*Quercus kelloggii*) and Oregon white oak (*Quercus garryana*) woodland management.

The Board of Forestry was established in California in 1885. The first State Forester was appointed in 1905. The board and state forester focused on development of a fire protection system and timber slash management, with some effort given toward pest outbreaks and the creation of work camps to address the large number of people out of work from the Great Depression (Arvola 1976). In 1927 the Division of Forestry was created within the new California Department of Natural Resources. As California's timber industry was maturing, there were several efforts on the national front to develop a federal-state regulatory system that would be led by the U.S. Department of Agriculture, Forest Service. California interpreted this as a federal overstep, and the state legislature commissioned a committee, led by UC Berkeley Professor Emanuel Fritz, to provide a "forestry study" (Arvola 1976). The committee's assessment led to a proposed set of forest policies that later became the

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1945 California Forest Practices Act. This act established the creation of four Forest District Boards and each were given the authority to establish rules for their geographic areas. The four boards were largely populated with industry representatives and during their beginning there was little public interest in their actions (Arvola 1976). Following the 1964 flood, public concern about forest management gained momentum, which continues to the present.

In 1971, the California Forest Practices Act was found to be unconstitutional by an appellate court on the basis that the Board did not have sufficient public representation. Additionally, there was mounting public concern about the protection of water, fish, soil, wildlife and other resources in the first rules. In response, the state legislature commissioned UC Davis to write a study about the condition and policy of California's forest lands. This 1972 study became the basis of the 1973 Z'berg Nejedly Forest Practices Act (Institute of Ecology 1972), which remains in effect today. Shortly after adoption of this new Act there were other changes to forest land taxation systems in California. In 1976, the Z'berg-Warren-Keene-Collier Forest Taxation Reform Act changed the method of taxing timber in California by replacing the ad valorem tax on standing timber with a yield tax on harvested timber. Concurrently, the 1976 Forest Taxation Reform created a property tax system that incentivized forest management through a reduced annual property tax for lands dedicated to the growing and harvesting of timber (and compatible uses).

Policy affecting forest regeneration and oak woodlands

In Fritz's 1943 assessment, the committee noted that timber harvest rates were increasing faster than they could be reforested and that fragmentation was occurring (Arvola 1985). To address the reforestation and timberland issues, a related law was established in 1943 that limited the size of conifer trees that could be harvested to no less than 45.7 cm (18 inches) in diameter to ensure that there would be retained trees to provide a seed source on the harvested site (California Forestry Study Committee 1947). With only one state nursery, there was little else that could be done to augment reforestation efforts (California Forestry Study Committee 1947). The seed tree reforestation approach began to change following a 1959 storm that blew down a selectively logged redwood stand, leading to a ground swell of interest in clear-cutting during the 1960s (Arvola 1976). Aerial seeding was the chosen method to restock many of these harvested units (Able, personal communication). This policy changed with the adoption of the 1973 Forest Practices Act. With this act came the focus on ensuring regeneration success and the requirement of a post-harvest conifer restocking survey. At present a landowner has 5 years to achieve a fully stocked stand following timber harvest (in other words, 300 point count of seedlings on higher sites).

Taxation laws have also affected California's forest conditions. Prior to 1977, each county in California assessed standing timber for ad valorem taxation, and landowners with timber were taxed for their trees. As a result, many landowners harvested their timber to reduce their annual property taxes. For many of the ranch landowners, this law encouraged them to harvest most of their large diameter conifers.

This history sets the stage for the today's policy change strategies. Although it is widely recognized that landowners should not be forced to cut their timber to reduce property taxes, the pre-1977 property tax system may have helped reduce conifer encroachment in oak woodlands because it encouraged large diameter conifer harvest. These tax harvests included Douglas-fir (*Pseudotsuga menziesii*) that had

likely encroached into oak woodlands following fire suppression policies that began in the early 1900s. Furthermore, while the 1973 Forest Practices Act has led to better conservation of California's forestlands, it has set up a preference for conifer management and for ensuring conifer regeneration success by requiring replanting where conifers are harvested. This emphasis on conifer regeneration is at odds with efforts aimed at restoring and conserving oak woodlands.

Oregon white oak and California black oak ecology

In California's North Coast region, deciduous oaks are a component of both forestlands and woodlands (fig. 1). In some areas, stands are dominated by Oregon white oak or California black oak, forming intact woodlands that stretch across hillsides or along forest and prairie edges. In other areas, these species are scattered among conifers and other hardwoods. This range of habitats makes oaks an important component across many North Coast ecosystems, but it also complicates efforts aimed at managing and conserving oaks, which are often based on more simple characterizations of growth patterns and habitat types.

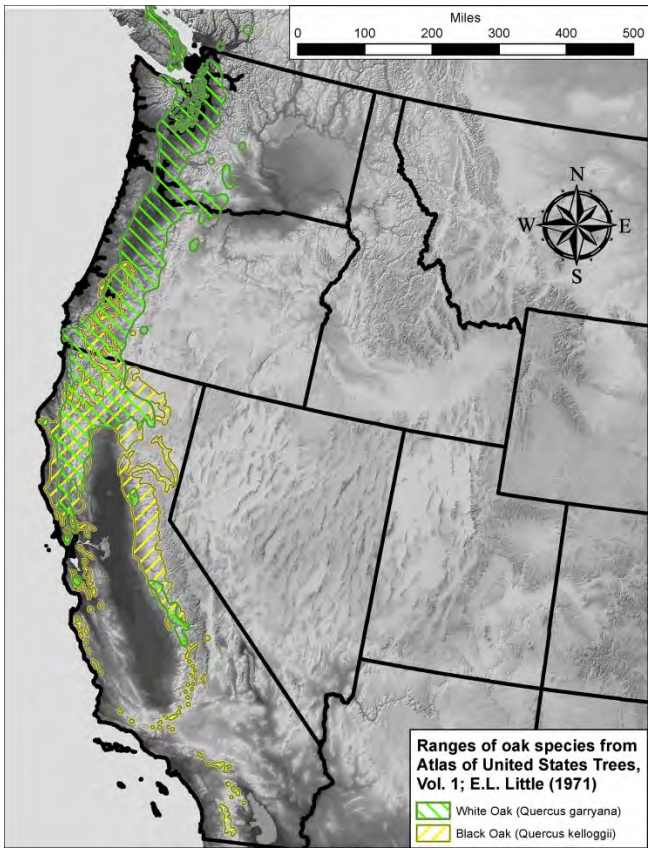

Figure 1—Distribution map of Oregon white and California black oak.

The presence of deciduous oaks in conifer-dominated forests is evidence of the complexity of soils types, topography, and plant communities for which the region is well known, and it is also an indicator of shifts in forest density and species composition over time. In forested settings in the North Coast, deciduous oaks have

been found to be older than many of their coniferous neighbors, and they are often in decline due to competition for sunlight and other resources (Barnhart and others 1996, Cocking and others 2012).

Fire exclusion

One of the primary concerns for sustaining deciduous oak woodlands in the North Coast is the absence of the disturbance regimes that historically shaped and maintained these ecosystems. Both black and white oak woodlands are fire adapted, depending on frequent, low- to moderate-intensity fires to prevent establishment of invading fire-sensitive vegetation and supply conditions suitable for regeneration (Agee 1993, Barnhart and others 1996, Stuart and Stephens 2006). Fire exclusion over the last century has resulted in both direct and indirect impacts to oak woodlands, affecting their recruitment and persistence, stand structures and fire regimes, and overall ability to persist on the landscape (Cocking and others 2012, Engber and others 2011, Sugihara and Reed 1987). Other land management activities, including changes in grazing regimes and management for timber resources, have also contributed to shifts in community composition toward conifer species and the decline of deciduous oak communities.

Though minimally studied, native conifer encroachment is widely recognized as one of the most widespread, direct outcomes of fire exclusion in North Coast oak woodlands (Barnhart and others 1996, Sugihara and Reed 1987, Thysell and Carey 2001). Conifer encroachment has been documented in a range of oak woodland types in northwestern California, and is commonly implicated in widespread decreases of woodland extent throughout the region. In their 1987 analysis of the Bald Hills of Redwood National Park, Sugihara and Reed (1987) documented a loss of almost 30 percent of white oak woodland area to encroachment by Douglas-fir since 1850. These landscape-scale losses of woodlands are pronounced throughout the region, and visible from many well-traveled highways in the North Coast region. In areas where oak stands are smaller, or where individual oak trees are growing in conifer-dominated forest, their decline may be less obvious, yet more accelerated and severe.

Barriers in the California forest practices rules

Much of the Oregon white oak and California black oak woodlands of California occur on privately owned land and as a result, their management is subject to California standards. There are several issues in the current rules where there are disincentives to active management of the conifer encroachment issues. First, the California Forest Practices Act, as written by the legislature, requires that a cover of commercial species be maintained or established after commercial timber harvest. PCR § 4561 defines a post-harvest stocking standard of 300 point count of trees on higher sites and 14 CCR 912.7, 932.7, 952.7 defines a countable tree. Subsection 14 CCR 912.7 (d) states that “the site occupancy of Group A species [these are conifer species] shall not be reduced relative to Group B [these are hardwoods and include both black and white oak]” (table 1). In essence these standards give preference to the conifers and encourage use of planting stock to meet the regeneration standards. Additionally, when thinning a stand, post-harvest conditions must meet these same stocking or proportionality standards (in other words, relative quantity of Group A to Group B species), and it may be necessary to thin across the species in the stand to meet the pre-harvest to post-harvest proportionality standards. The reason this proportionality rule exists is to prevent high-grading or removal of the highest quality

trees species with little regard to the future stand conditions. Furthermore, the removal of conifers for restoration purposes could be viewed as a "conversion" of timberland. While the site is likely to still be capable of growing commercial species, it is conceivable that 14 CCR 1100 (g) (B) would not be met, because stocking would not be ensured within five years following harvest. And finally, 14 CCR 913.11, 933.11, 953.11 sets standards for Maximum Sustained Production of High Quality Timber Products. When a Registered Professional Forester files a timber harvest plan, but does not have a long-term growth and yield plan such as a "Sustained Yield Plan" or "Non-industrial Timber Management Plan" to tie to, the forester will utilizes option (c) in this section. However for oak woodlands restoration, option c specifies that minimum stocking and basal areas standards must be met with Group A species only, thus providing an additional barrier to meeting stocking with the oak species.

Table 1—Comparison of Group A versus Group B species for the Coast District

Group A	Group B
Coast redwood	Tanoak
Douglas-fir	Red alder
Grand fir	White alder
Western hemlock	California black oak
Western red cedar	Monterey pine
Bishop pine	Golden chinkapin
Sitka spruce	Pepperwood
Western white pine	Oregon white oak
Incense cedar	Pacific madrone
Port Orford cedar	
California red fir	
Jeffrey pine	
Ponderosa pine	
Sugar pine	

Possible solutions

Techniques to achieve oak woodland management vary. Some landowners want to have the ability to commercially harvest the encroaching conifers, using any profits to help subsidize the oak restoration costs, while others may only have non-commercial management interests, often guided by state or federal cost-share assistance programs. For the non-commercial interests, California Environmental Quality Act (CEQA)-related permits are rarely required, and thus there is little room to offer legal compliance or protection for these landowners. However, for those forest landowners that are more commercially active, there are a few options. The California Board of Forestry can clarify the standards of 14 CCR 912.7 and state how to meet the intent of PCR § 4561. Furthermore, the legislature could change the approach to stocking from point counts to basal area evaluations, which are easier to conduct for oaks. The legislature could also develop an oak woodlands restoration exemption. At present the California Board of Forestry is in consideration of an Oak Woodland Management Board Policy that may clarify for 14 CCR 912.7, "the director, after an initial inspection pursuant to PRC § 4604 [the standards for post-harvest inspection], shall approve use of Group B species, as exceptions to the pre-harvest basal area percentage stand, if in his judgment the intent of the Act will be met, and there will not be an immediate significant and long-term harm to the natural resources of the state."

In conclusion, the California Forest Practices Act and the Forest Practices Rules are amendable. While the regeneration challenges of the early 20th century have

largely been met, there is now an urgent need to respond to the challenges of a century of fire suppression and the resulting conifer encroachment into these important California ecosystems.

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