

Oak Policy and Management in California: Spanish Origins and Future Considerations¹

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Abstract

The development of goals and policies for Californian oak woodlands is reviewed; then some important considerations for future policy development are highlighted. California and Spain share long and illuminating histories of human interaction with oak woodlands. The Integrated Hardwood Range Management Program, initiated about 1985, was a focal point for Californian research and policy, but also created connections among researchers, advisors, conservation organizations, and agencies. As the program's funding ran out, those constituencies continued to strengthen relationships through grassroots organizations like the California Rangeland Conservation Coalition. We highlight four aspects of conservation policy and management for oak woodlands that are important as we move forward. These include thinking about the impact of policies and management initiatives at multiple spatial and temporal scales, avoiding policy conflicts and acknowledging tradeoffs, having awareness that most ecosystem services are really social-ecological services, and managing for multiple functions and processes instead of drifting back into single purpose management thereby reducing production of other important services.

Key words: conservation, dehesa, hardwoods, landscape, range

Cross oceanic connections and Mediterranean woodlands

Human interactions with oaks in Mediterranean California and Spain have a long history. Oaks dominate Mediterranean-type landscapes in the northern temperate world (Campos and others 2013). In California, oaks expand their ranges during interglacials, as they have over the past 10,000 years. During the glacial periods that comprised up to 90 percent of the Pleistocene period, oaks were confined to small refugia. People showed up in coastal California 14,000 years ago and by 6,000 years ago there is ample evidence that they were actively utilizing and engineering oak woodlands. Evidence supporting similar human influence on the Spanish oak woodlands also dates back about 7,000 years. Cave art shows that humans interacted with a diverse megafauna in Europe that included large deer, wild sheep, mammoths, cave bears, and lions. A similar diverse megafauna persisted in California up until a few thousand years post-Ice Age and well after human contact. In both instances people used acorns as their most important energy source but used animals to balance this diet with protein. An argument can be made that acorns were the most important source of human energy until the rise and spread of small grain agriculture. Even after cropping was common in Europe, acorns were eaten as a famine food well into the twentieth century. Although the evidence of human activity in California comes much later than in Spain, by 5,000 years ago they were managing and utilizing oak

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landscapes for similar purposes and in similar ways.

European contact dramatically changed California but also forged closer links to Spanish woodlands, which by about 1200 had evolved a system of oak woodland grazing and cultivation called *dehesa* that produced multiple products and relied on plentiful available labor. Spanish colonial systems of land allocation, and rangeland grazing traditions, were brought to California's oak woodlands in the 18th century (Alagona and others 2013). This caused displacement of native people and introduction of now ubiquitous species of plants and animals, including the grasses and forbs that today characterize the oak woodland understory. Some of the oaks in today's woodland are older than European settlement. An important difference between Spain and California is that the Californian oak woodland is relatively stable without intensive human intervention, while the *dehesa* quickly turns into thick scrub without cultivation.

Gold discovery in 1848 and the accompanying California population growth and inland expansion increased pressure on oak landscapes. The more fertile valley oak dominated sites were mostly cleared for cultivation, moving the center of oak distribution into the foothills. Demand for meat led to near extinction of the Tule elk. Conflicts with livestock and resultant predator control led to extinction of the wolf in California and the grizzly. Initial efforts to increase crop agriculture and livestock production led to policies and practices that built on Spanish traditions, including both deliberate burning and prohibitions against burning. The legacy of Native American fire use, coupled with the introduction of livestock and plants, makes it possible to argue that the late 19th century was the period when Californian and Spanish oak woodlands looked most alike: scattered oaks and grass. However, the Spanish achieved a grassy *dehesa* understory through intensive management of brush with cultivation, in order to produce grains, cork, charcoal, cheese, and meats in a relatively small space for local markets and family consumption. California's woodlands were managed by the Spanish primarily for an export market of dried meats, tallow, and hides, requiring little management aside from branding animals to keep track of ownership and capturing them for skinning and rendering at the appropriate times.

The Spanish and later Mexican colonization process, which first allocated land for missions and the military, then to individuals on a merit basis in large ranchos, had historically supported extensive livestock grazing as the major use (de Dios Vargas and others 2013). As crop agriculture spread after statehood in 1850, most valley oak woodlands and many upland types were cleared, for more intensive grazing and for crops. The ranchos and mission lands (already almost completely secularized during the Mexican period) were mostly broken up and transferred to new owners, while other lands were allocated to United States citizens for farming and reclamation projects. Non-arable forests and deserts remained in federal hands, leading to the approximate 50-50 split in today's land ownership for Alta California. Oak woodlands are now primarily (90 percent) privately owned.

Oak woodlands did not initially attract the scientific attention of the higher elevation national forests, because most range research in the first half of the 20th century was conducted by the U.S. Department of Agriculture, Forest Service (USDA FS) in order to better manage public, rather than private, land. However, by the 1930s the University of California (UC) and the USDA FS had established collaborative range research enterprises in Lassen and in Madera Counties. The San Joaquin Experimental Range near Fresno became a center for research on foothill range. Later, UC established the Hopland and Sierra Foothill field stations. All three of these facilities included significant oak woodlands; testing grazing practices, and

range improvements including oak canopy management primarily through tree clearing. At this time it was assumed that as the oak woodlands were primarily owned privately for livestock production, so research and extension should focus on increasing the profitability of grazing practices with little attention to other values, including those of the landowner. This situation changed in California by the 1980s.

The integrated hardwood range management program

In 1985, primarily due to concerns about the impacts of wood harvest as biofuel on deer habitat and resulting pressure for state regulations, the UC proposed a cooperative program of research and education with the Departments of Forestry and Fish and Game focused on oak woodlands (Passof and Bartolome 1985). The primary threats facing hardwood rangelands were viewed as unregulated firewood harvesting in northern California, poor natural regeneration of blue and valley oaks, and the conversion of woodlands to housing and other uses. The Integrated Hardwood Range Management Program (IHRMP) funded basic and applied research, initiating work on ranch economics, woodland regeneration/restoration, and wildlife habitat-relationships. Five Cooperative Extension Specialist positions were hired and strategically placed throughout the state.

Over its more than 20 year history, the IHRMP addressed many basic and applied problems, initially focused on issues of best management practices for the classic multiple use quadrad of forage, firewood, wildlife habitat, and water. It also made an investment in learning about landowner goals and values for their oak woodland—at the time a major step for professions like range management, incubated by public agencies for public lands. This effort translated into research and outreach targeting landowners needs and concerns. The pay off was in documented changes in the acceptance and application of conservation-based practices by oak woodland landowners on ranches. By the end of the IHRMP, emphasis had shifted to broader issues of land use policy and planning and ways to work more closely with local governments and quasi-governmental conservation groups. Much of the effort turned to understanding and promoting sustainability and non-market values including ecosystem services.

The IHRMP had a strong international effect, exemplified by a long-term collaboration and exchange agreement between UC and Spanish academics working on oak woodlands, which culminated in a recent book comparing conservation and management of California oak woodlands and Spanish dehesa (Campos and others 2013).

Quantitative comparisons of Californian (oak woodlands) and Spanish (dehesa) landscapes show that important differences underlie the superficial similarities. Although both the dehesa and oak woodland occur on acidic soils, the dominant landform is a very old and relatively level peneplain in Spain in contrast to the Californian oak woodland's foothill landforms. The need for intensive management to maintain the dehesa, the wide adoption of diverse economic land uses including hunting, and the prevalence of absentee ownership distinguish Spain from California and strongly affect policy.

The IHRMP's 2006 Strategic Plan (IHRMP 2006) reflected a strong shift in program emphasis, listing three broadly defined goals and supporting activities.

- Goal I. Ecosystem goal: Promote healthy and sustainable woodland ecosystems.
- Develop and evaluate recommendations for sustainable management.
 - Develop monitoring protocols.

- Conduct woodland ecology research.
- Monitor the status of oak woodlands.

Goal II. Policy goal: Provide leadership and promote policies to foster oak woodland conservation.

- Develop planning information.
- Promote collaboration with new clientele.
- Balance conflicting demands.

Goal III. Economic goal: Maintain hardwood rangelands as working landscapes with sustainable economies.

- Demonstrate benefits of working landscapes.
- Develop estate-planning alternatives.
- Develop diversification strategies.
- Change the acreage of functional hardwood rangelands
- Change public attitudes
- Promote oak positive management practices among woodland owners and managers.
- Evaluate the use of IHRMP educational materials.

The “integration” component of the IHRMP (It was comprised of the State Department of Forestry and Fire Protection, the Department of Fish and Game, and the UC Division of Agriculture and Natural Resources) was affected by state budget constraints almost at the inception of the program that reduced the scope of non-UC funded research, although demonstrated accomplishments in oak conservation were still considerable (Standiford and Bartolome 1997). The program benefitted enormously from international collaboration, especially in the developments related to economics (Goal III above). The last official IHRMP components were folded into other state programs in 2009, with the UC specialists and affiliated advisors continuing work on hardwood rangelands, but now more loosely affiliated primarily as members of the UC Oak Woodland Conservation Workgroup. Some of the goals in the 2006 IHRMP Strategic Plan have been addressed but the approach still needs updating.

Coalitions and collaboration

From the start, IHRMP research found that oak woodland landowners tend to have strong stewardship values, and a desire to promote wildlife habitat and natural beauty, as part of making a living off of the land. Today, oak woodland managers and owners remain a fascinating topic of study, but now they have broken the shackles of objectification as research subjects, and have taken a leadership role in promoting conservation of oak woodlands and rangelands on what we now call “working landscapes.” Through grassroots organizations like the California Rangeland Conservation Coalition (CRCC), the California Central Coast Rangeland Coalition, and the California Rangeland Trust they speak for themselves, and are building upon landowner values of land stewardship to conserve lands and the spectrum of values of “working landscapes.” As non-profit land trusts like the Nature Conservancy have come to understand the value of the landowner stewardship, conservation initiatives that draw on that ethic, like conservation easements, have become more prominent. These groups have a strong interest in research, and Cooperative Extension, with a long history of working with private landowners, is a valued participant and at times a facilitator of these kinds of collaborative research and conservation efforts. Policies

that promote landowner stewardship and management for market and non-market products, such as EQIP are a very important economic benefit and have made the Natural Resources Conservation Service (NRCS) an increasingly important player in oak management and policy. Tax incentives like the Williamson Act, which reduces the tax rate on agricultural land, are sought. Interestingly, the Nature Conservancy is active in Spain as well, and among landowners, there is today an interest in learning about some of the value-added products from the dehesa and their transferability. The famous acorn-fed ham of Spain is one such product that a few California landowners are exploring.

Four directions

Next we call attention to four important considerations for future policy development. No doubt there are others.

Multi-scalar, cross boundary conservation for working landscapes

As we have shown, there has been a continued diversification of tools and actors involved in oak woodland conservation, and increased reliance on the landowner. For this approach to work, conservation policies must consider the connections between pastures, landowners, and landscapes (fig. 1). Landowner stewardship goals are vital to management of rangelands at the ground level; ranch sustainability is critical to oak woodland conservation at the landscape level. It is important that policies at any scale contribute to strengthening positive connections among scales, rather than weakening any level in this nested hierarchy. For example, the Williamson Act promoted landscape level conservation, by helping to support ranch enterprises—and most oak woodlands belong to ranchers today. Policies like EQIP influence pasture level management, but also help strengthen the ranch enterprise. Funding provided by NRCS for conservation easements works at the landscape scale, and could be linked to programs at the pasture and ranch scale. While regulation is important and has a critical role protecting natural resources, draconian regulations that add costs, make landowners believe they are being treated unfairly, or take away from their ability to enjoy ranching, weaken ranch sustainability, and ultimately weaken both pasture and landscape level conservation. In 2001, a majority of ranchers surveyed in northern and central California reported that “Society’s hostility to ranching” was an important reason they might quit ranching altogether. Organizations like the CCRC, on the other hand, by promoting the value of ranching to California’s environmental health, reinforce the positive aspects of ranching for ranchers.



Figure 1—Conservation strategies must consider the interdependence and feedback among scales in the oak woodland, such as landscape, ranch, and pasture. Changes at any one level will affect the others.

The oak woodland landscape is a complex of interdependent private and public lands. Ranch lands may buffer public lands, ranch cattle may reduce fire hazard and increase biodiversity, meat produced on nearby rangelands may find a market of nearby urban dwellers looking for local products. In some areas, public lands may provide the grazing lands that ranches need to survive. How do we best maintain the mosaic of private and public, urban and rural lands that will support communities and woodlands? Individual oaks are valuable, but do not offer the rich ecosystem services of a woodland. The current emphasis by the NRCS on Ecological Site Descriptions, predictive State-and-Transition models and associated recommended management practices has much potential for assisting oak woodland management decisions at the scale of a ranch enterprise (Spiegel and others 2014).

The landscape of landowners is changing, as numerous studies have shown (Ferranto and others 2011, Huntsinger and others 2010). This is a function of changing demographics and is not new to either Spain or California. The *dehesa* is protected by stringent land use controls, but absentee ownership, scarcity of available labor, and an even lower ratio of cash income to land value put it at risk. In both places growing numbers of landowners own their lands primarily for amenities, including the enjoyment of recreational opportunities, living in the countryside, and even working with livestock. What does this mean for oak conservation policy? Research has shown that these landowners are not as active managers, in fact some have a hands off ethic, assuming the land will take care of itself. Others are very interested in wildlife habitat and reducing fire hazard, but they don't have the tools or information they need to achieve those goals, especially in an oak positive manner. Future policy and research needs to consider the needs of these landowners, and to explore the possibility of boundary-crossing alliances for oak conservation. A recent study found that such landowners were most interested in collaborating with others

on goals that were directly important to them, such as fire prevention (Ferranto and others 2013).

Policy tradeoffs: The baby and the bathwater

A recent USDA series of townhall meetings with agriculturalists around the state found that conflicting policies and management initiatives are a serious problem for rural landowners. For example, in the case of the endangered California tiger salamander (CTS, *Ambystoma californiense*), half of the habitat in the San Francisco Bay Area is now in stockponds created and managed by livestock producers. Fencing the ponds to keep out livestock was once commonly recommended and even required by agencies, reducing the usefulness of the ponds and resulting in costs for fencing and trough installation. Research has shown that salamanders are more common in grazed stockponds because of the effects on the surrounding vegetation (DiDonato 2007). In another example, the rare California black rail (*Laterallus jamaicensis coturniculus*) is often found in small wetlands created by irrigation system leaks in the foothill oak woodlands of Yuba and Nevada counties. Efforts at water conservation, while a needed and important goal, could incidentally result in the loss of significant habitat.

With the federal listing of the California tiger salamander as endangered, the Endangered Species Act (ESA) could have been a burden to the ranching enterprises that maintain open grasslands and stockponds, but this was prevented by Section 4(d), which allows special rules that ease take prohibitions for certain activities. Because of an exemption for normal ranching activities, salamanders can continue to benefit from habitat created and maintained by ranchers. The ESA can offer pathways to additional funding through mitigation easements that can provide income to livestock producers, helping them to continue to manage their stockponds and maintain the ranches that support the whole relationship. This mutually beneficial relationship that is crucial to the persistence of the species (USDI-FWS 2004).

Habitat Conservation Plans required by the ESA work at the landscape scale to mitigate negative impacts to listed species. However, as per the lack of recognition of the “social-ecological” nature of some of this habitat, the needs of rangeland graziers in terms of connectivity and continuity of rangelands at the landscape scale are generally not considered, despite the positive role that grazing has been found have for numerous rare species. Failure to consider scale, goal, and policy conflicts can have negative outcomes; the flexibility to consider multiple goals and consider tradeoffs is needed.

Oak woodlands are social ecological systems

We have described the long-term impact of humans on oak woodlands, and how thousands of years of management have shaped these systems. Yet when we talk about ecosystem services, we tend to forget the human role in how they are and have been produced. In fact, most of what we call “ecosystem services” are social ecological system services” (Huntsinger and Oviedo 2013). Humans have engineered the landscape, and human activity can support desirable ecosystem services. For example, in addition to the cases of the rail and the salamander above, grazing has been shown to improve the ecosystem service of habitat provision for several rare species in vernal pools and grasslands (Marty 2005, Weiss 1999). We have tools for conserving things like land and particular oaks, but how do we conserve the ongoing

practices and activities that contribute to a sustained flow of ecosystem services?

In Spain and the rest of the European Union, direct payment for ecosystem services in the form of payments for particular agricultural practices are common but have not always been directed at needed sustainable and integrated management for dehesa systems. It has also been pointed out that unless such practices fit the landowner culture or become part of landowner culture, they are only ephemera supported by budget allocations (de Snoo and others 2013). Overall, the amount of available subsidies payment to dehesa owners for various practices, and cost-sharing for the Californian oak woodlands, are probably about the same and substantial for the average landowner. One of us asked an Italian cowherd why he said he was going to adopt rotational grazing, although one could see nothing that needed to change in his fantastic alpine rangelands. He said, “well I will get 10 euros a head for that”. Compare that to the wonderfully rich and diverse reasons a California rancher will give you for adopting a particular practice. It is vital that management policies build on, link to, and become part of the landowner value system, and that the reasons are incorporated into or draw on rancher knowledge.

Back to the future

Our woodlands are multifunctional. Over time, the community of those who care about, own, and manage the woodlands has become more and more aware of the multiple benefits these lands are capable of providing to each of us and to society. Wildlife habitat, food, watershed, beauty, all of these will be illustrated in our meeting today. Considerable progress has been made in helping agencies and the public understand the value of working oak woodlands, and even in reaching owners of smaller properties with information about how to manage for some of the things they care about. Unfortunately, at times, when an opportunity arises to manage for something as important as carbon sequestration, increased forage production, or native plant restoration, we may focus single-mindedly on that and fail to consider the impacts on other resources. In Spain, it was found that maximizing carbon sequestration in woodlands reduced biodiversity and water production. Fertilizing rangelands may increase invasive species, eventually negating any benefit. We need to understand the full impacts of our management decisions before we launch into them whole (Spanish) hog.

Conclusions

Can Californians learn anything about policy from Spain? We believe there is a lot to learn about incentives and marketing—there is a well developed labeling system in Spain that helps landowners capture the benefits of environmentally and culturally beneficial management. At the same time, we believe that the Californian education and outreach work is second to none, and might prove useful in Spain. But because of our different land use change systems—in Spain land fragmentation is highly restricted—we are alone in struggling with how to serve the needs of a growing exurban population with oak woodlands to steward. How can we best attract this group into the oak conservation tent?

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