

Silvopastoralism and Sustainable Land Management



Edited by
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Conservation “matching funds” from working woodlands in California

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Abstract

Rancher-subsidized oak woodland silvopastoralism is being used to conserve land in California oak woodlands. As part of the Working Landscapes movement, non-governmental organizations like the Nature Conservancy and a proliferation of land trusts are brokering private and public fund transfers in exchange for title restrictions that preclude development on land used by “environmentally friendly” low intensity livestock grazing enterprises. Increasingly, ranchers are willing to trade their option to develop their land for capital, tax benefits and the continued opportunity to enjoy the ranching lifestyle, as a result sharing title with conservation-oriented non-governmental organizations or public agencies. A shift away from the traditional American land acquisition model and from subsidies and other policies for stimulating increased agricultural production, the relatively passive and indirect role of government is attractive to regulation-averse ranchers. Ranchers will invest considerable labour and capital in the ranch in return for lifestyle benefits, including environmental and other non-monetary benefits. Many such benefits are shared by the public. The high value of lifestyle to ranchers is widespread in the USA and California, with more than half of ranchers in various studies holding outside jobs to provide funding to invest in the ranch. Protecting the lifestyle and cultural values that motivate such ranchers is an important consideration for conservationists.

Introduction

Public land management in the United States has become costly and contentious, and does not include sufficient area of important habitats, notably in California’s Mediterranean oak woodlands. For this and other reasons interest in private land conservation and management has grown substantially in the last decade. An effort to conserve “working” private agricultural lands in the United States, the Working Landscapes movement is a shift away from traditional American conservation models. In California’s oak woodlands, working landscapes equate to conservation of large silvopastoral landownerships.

In this chapter we argue that the tendency of ranchers to forgo opportunity costs in order to enjoy the diverse non-monetary values that accrue from oak woodland ownership augments public conservation investment, providing a form of “matching funds” for conservation of “environmentally friendly” agriculture. The considerable overlap between landowner and public values in the land (shared utility) contributes to the viability of this model for public investment.

Shifting models for conservation

Since the late 1800s, the central approach to land conservation in the United States has been national government land reservation or acquisition (Raymond and Fairfax, 1999). About half of California is public land, owned and managed by the federal government. This is a low proportion compared to the rest of the western United States. The neighbouring state of Nevada is 97% public land. Numerous governmental agencies manage public land for diverse purposes, but most have some mandate for environmental protection.

At the same time, the flaws in the public lands model of conservation have become more apparent. Historic USA land disposition practices resulted in the more productive and well-watered lands being claimed by private landowners, along with critical wildlife habitat (Maestas *et al.*, 2001; Scott *et al.*, 2001). Consequently, some habitat for 95% of all federally threatened and endangered flora and fauna is on private land, and 262 or 19% of these species survive only on private parcels (Wilcove *et al.*, 1996).

One of the richest California habitat types that is largely outside public lands is open oak woodland and savannah, home to more than 300 vertebrate species (Jensen *et al.*, 1990). The woodlands have high biodiversity, with rich acorn mast, mild climate and high productivity, and are perhaps the most significant wildlife habitat in the state on a regional scale. In addition, oak woodlands are valued for their aesthetics and amenities, and are considered part of the “heritage” of California. Historically undervalued for conservation purposes, more than half have been cut and the land cultivated since the mid-nineteenth century (Burcham, 1957). In the 1940s-1960s further oak removal was subsidized by government grants to increase forage production, in an era characterized by the drive to increase commodity production. Oaks were part of the subsequent collateral environmental damage. The woodlands that remain are largely those that have, until the recent advent of hillside vineyard production, been largely non-arable. Such lands have been

grazed by livestock as part of silvopastoral production since the Spanish first brought domesticated livestock to California in 1769.

Driven by urban out-migration and a booming second home market, oak woodland area has declined by thousands of hectares per year over the last decade, and it is projected to continue to decline at similar levels through 2040 (CDF-FRAP, 2003). High land costs make government acquisition expensive, but the cost of acquisition pales in comparison to the costs of public management. National agencies are frequently locked into costly legal battles, subject to shifts in political climate, and criticized as insensitive to local needs and conditions. Management initiatives that have been promulgated on a nationwide basis, such as fire suppression, are blamed for fuel accumulations contributing to California's current severe wildfire risk. In addition, complex and costly environmental regulations have alienated many public land users. Budgeting for the major public conservation agencies is politicized, erratic, and has either been reduced or failed to keep up with inflation in recent years. As one example, the agency holding the majority of the public land in the USA has unfunded infrastructural maintenance needs of \$190-\$300 million and yet underwent a budget reduction in 2003 (GAO, 2003).

In order to conserve the woodlands, American conservationists have had to develop new and, for the United States, unusual tools for conserving them. Operating within the context of an American political system that emphasizes the primacy of individual, private property rights and independence, the Working Landscapes movement, which seeks to preserve private agricultural lands and rural communities through collaboration and incentives, has gained strength in recent years. Non-governmental organizations like the Nature Conservancy and an increasing number of land trusts have taken the lead in this initiative, and broker some of the most common conservation arrangements, with private as well as public funding sources, commonly including tax relief. In California's oak woodlands, Working Landscapes programmes manifest as conservation of silvopastoral grazing enterprises, and draw on the "willingness to pay" of ranchers for a lifestyle.

California's Mediterranean oak woodlands

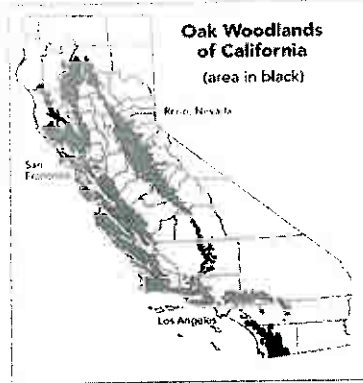
About 2 out of the approximately 3 million ha of California oak woodlands are open enough to be suitable for grazing (Figure 1), and more than half are owned by livestock producers. Another 25% are leased for grazing (Huntsinger *et al.*, 1997). Most California oak woodland ranches are owned by families who live and work on the ranch. In general, they rely on a base herd of cattle to produce calves each year for market (Table 1). Calves are the major source of agricultural income, followed by firewood, game and lamb.

Table 1. Californian savannah characteristics (Campos-Palacin *et al.*, 2001).

Californian savannah	
Extent	2 million ha savannah out of 3 million ha total oak woodlands and grasslands (Allen-Diaz <i>et al.</i> , 1999)
Most common oaks	Blue oak (<i>Q. douglasii</i>), valley oak (<i>Q. lobata</i>), coast live (<i>Q. agrifolia</i>) and interior live oaks (<i>Q. wislizenii</i>)
Ownership	80 %+ private (Ewing <i>et al.</i> , 1988)
Owner's primary residence is ranch	80-92% (Huntsinger <i>et al.</i> , 1997)
Average ranch size	800-960 ha (Huntsinger <i>et al.</i> , 1997; Sulak and Huntsinger, 2002)
Stocking rate of livestock (does not include wild herbivores, nor does it meet total animal demand)	5-10 ha/LU per year (Ewing <i>et al.</i> , 1988)
Small stock	Declining
Large stock	Declining; 92% of animal demand is cattle (California Agricultural Statistics, 1990-2001)
Commodity products	Beef, followed far behind by lamb, wool, firewood, game, grazing resources

Woodlands are dominated by each of four common oak species, with mixtures of other oaks (Allen-Diaz *et al.*, 1999). More than 85% of understoreys are dominated by introduced annual grasses. Oak regeneration and/or recruitment is a concern in some areas (Bolsinger, 1988), but there is considerable site to site and study to study variation (McCreary, 2001).

Figure 1. Oak woodlands of California (Allen-Diaz *et al.*, 1999).



Rancher values and emerging conservation approaches

A review of studies of ranchers throughout the western United States, including the states of California (CA), Arizona (AZ) and Colorado (CO) (Table 2), reveals a consistent pattern of “consumptive” ownership. Most ranchers subsidize their operations with outside income. Smith and Martin (1972), in Arizona in the late 1960s, noted that ranchers were not “economic men”, but that what ranching needed from local communities was job opportunities so that ranchers could support their ranches. Torell *et al.* (2001) notes that the lack of a powerful monetary motivation among ranchers grazing federal land is almost universal. Gentner and Tanaka (2002) randomly surveyed 1052 ranchers throughout the west with public land grazing permits. They found that about half of public land ranchers ranch full time and depend on the ranch for over 80% of income, while the other half have the majority of their income and wealth from other sources. But, when asked about their motives for ranching, both groups ranked the lifestyle and way of life above the monetary profits they might make from the ranch.

Table 2. Selected studies of ranchers in the western United States. Oak woodland studies shaded. Bureau of Land Management (BLM); United States Forest Service (USFS).

	Sulak and Huntsinger (2002)	Liffmann <i>et al.</i> (2000)	Huntsinger <i>et al.</i> (1997)	Rowe <i>et al.</i> (2001)	Smith and Martin (1972)	Bartlett <i>et al.</i> (1989)	Gentner and Tanaka (2002)
State	CA	CA	CA	CO	AZ	CO	Western US
Sample	Permittees of three forests, similar non-permittees	All ranchers in three CA counties	Oak woodland ranchers statewide	Permittees in CO two counties	All AZ ranch owners	All CO federal permittees	All permittees of USFS and BLM
Off-ranch income	43% not dependent on ranching	44% income is off-ranch	85% have off-ranch income	78% have other source of income	80% hold off-ranch jobs		62% hold off-ranch jobs
Survey type	Interviews	Mail	Mail	Interviews	Interviews	Mail	Mail
Sample size	Small (n = 37)	Large (n = 245)	Large (n = 200)	Small (n = 37)	Medium (n = 89)	Large (n = 313)	Very large (n = 1070)

Such behaviour has been considered “economically irrational”, but in fact a closer look shows that rancher behaviour is rational when personal and family goals are considered. Though beyond the scope of this chapter, for the purposes of analysis these goals can be given a monetary value and added to ranch “income”, as per the “total economic value accounting method” (Campos-Palacin *et al.*, 2001). In paired landowner surveys in areas as diverse as California and Colorado, ranchers were found to have very similar motivations (Table 3). Enjoying a lifestyle, animal production and living around natural beauty far outstripped the goal of “making money”. This does not mean that most ranchers do not need to make money to support their continued ranching, but only that they acknowledge that ranching is not necessarily the way to obtain the greatest monetary returns on investment. Hence ranchers in California’s oak woodlands are paying for the opportunity to be ranchers. Of course, there are landowners that own a ranch solely for amenity values, but these are as yet a minority in California.

Table 3. Reasons ranchers in California and Colorado studies gave for continuing to ranch (Rowe *et al.*, 2001; Sulak and Huntsinger, 2002).

Percentage who agree the following is an important to highly important reason to continue to ranch	California n = 37	Colorado n = 34-37
Enjoy animal husbandry	95%	97%
Way of life	95%	95%
Family	95%	87%
Tradition	95%	81%
Live near natural beauty	92%	87%
Enjoy the work	89%	89%
It would be difficult to get a job outside the ranch	14%	27%
It's a good way to make money	14%	19%

It appears that there is considerable common ground in the values of ranchers and the public (Table 4), with both seeking environmental and amenity benefits. There are important points of divergence, like public access to the property and the impacts or desirability of certain management practices, but more than half of Californians in a 2001 statewide survey recognized that agriculture provides public benefits. Nearly 60% consider land development and loss of open space to be important problems. The majority approved of the use of public funds to support agriculture as long as conservation benefits were produced (Tarrance Group, 2001). Consequently, the rancher's "willingness to pay" for a lifestyle leverages conservation dollars invested by public and private conservation investors in privately owned working woodlands. The well-documented tendency to forgo opportunity costs in exchange for the lifestyle and other benefits of ranching can be seen as a form of "matching funds" for public conservation dollars when ranchers remain and continue caring for the land.

Table 4. Conceptual table of selected rancher and public values.

Rancher "income"	Public "values"
Natural beauty	Natural beauty
Living on property	Existence and visual appearance
Wildlife and recreation	Wildlife and recreation
Legacy value: heirs	Legacy value: future generations
Production value for agriculture	Healthy agricultural products

Working landscape conservation tools in California

The United States, with its oft-stated premium on "private land rights", is a challenging climate for protection and conservation of private lands. Most ranchers already feel highly over-regulated (Liffmann *et al.*, 2000), and the political and financial costs and unintended consequences of regulation have pushed conservationists into education and incentive-based, and even market-based, modes. Considerable investment has been made in outreach education through university extension services, and this has been shown to have reduced landowner cutting of oaks, among other things (Huntsinger *et al.*, 1997). Approximately 75% of ranchers in California are enrolled in a voluntary tax relief programme under the California Land Conservation Act of 1965, which provides tax benefits to landowners who agree not to sell or develop their land for 10 years. The voluntary and flexible nature of this programme has made it popular with landowners, but studies have shown that it, as well as governmental land-use planning efforts in California, tends to give way when needed most (McClaran *et al.*, 1985; Hart, 1991). Because land-use planning is a responsibility of counties and municipalities in California, zoning regulations are subject to relatively small-scale political influences and often change. In addition, they seldom preclude the subdivision of large properties into small "ranchettes" of 1 to 10 ha, and such small properties do little to protect biodiversity values or traditional agriculture (CDF-FRAP, 2003).

Because of the market for oak woodland properties for housing and other forms of development, and low rangeland calf prices due to competition from government-subsidized grain-based feeds and other forms of intensified production, land values are many times higher than what is justified by earnings from rangeland livestock production. Ranchers historically have only been able to realize the land appreciation by selling all or part of their lands, a practice that is estimated to have resulted in the sale of about 1% of ranch land in California oak woodlands for the years 1985-1992 (Huntsinger *et al.*, 1997). In recent years a market for the "development rights" to privately owned properties has been created through the adaptation of easements, or deed restrictions on land title, for conservation purposes. An agricultural conservation easement on a property title precludes subdivision and development of the land. By selling a conservation easement to a conservation group or agency, the rancher realizes some of the value of land appreciation, but keeps the ranching land and operation intact. Conservation easements have become the most widely used private-sector land conservation method in the United States (Gustanski and Squires, 2000). Land under conservation easements increased by 225% in California in the 1990s (Land Trust Alliance, 2000).

A conservation easement provides financial benefits to the rancher through the marketing of the easement and through various tax benefits, including a reduction in inheritance taxes. Some easements are donated for maximum tax benefit. A prominent example of a private land trust that holds large numbers of easements is the Nature Conservancy.

Though selling or donating an easement is voluntary, once an easement is established it results in permanent sharing of the title with the easement holder. This is transmitted to all future owners and remains a co-ownership. The risks and unintended consequences of this practice are, of course, many (Merenlender *et al.*, 2004), but more than we can take on here.

The value of this right, or easement value, generally is from 35 to 65% of the market value of the property. However, there are many variables and the range of easement values spans from 20% all the way to 90% in rare cases. For example, if land can be sold for \$6000/ha to a developer and is valued at \$1000/ha for agricultural production, the "easement value" is \$5000/ha, which is in fact the average value found in a recent study of 46 programmes in California (Kan-Rice and Sokolow, 2003). This value would be paid to the landowner by a purchaser or can be applied in calculating the tax relief due for easement donation by the owner. In negotiations for easement purchases by a non-governmental organization (NGO), the landowner may accept a payment lower than the market-defined easement value, because of the non-monetary value to the owner of keeping the land for lifestyle, legacy and amenity benefits. The owner accepts the future cost of managing the property and maintaining the agricultural operation.

Each easement and its terms are unique to the property, landowner and funder. By offering tax relief for landowners and sometimes direct grants to NGOs for easement purchase, federal and state governments support the creation of easements. For example, the recently passed federal "Farm Bill" (Public Law No. 107-171 Farm Security and Rural Investment Act of 2002) provides millions of dollars in funding for NGO-brokered conservation easements. Landowners who receive federal funds for farm easements must implement conservation plans developed by the USA Department of Agriculture's Natural Resources Conservation Service. In general, management requirements that are part of easements, if any, are negotiated and influence the easement value.

Easements are the one permanent land conservation method in the USA that encourages the continuation of private agriculture on private land. It has been argued that livestock grazing can be a useful tool for enhancing biodiversity in Mediterranean grasslands and woodlands and, in a more applied sense, for fire hazard control and control of non-native vegetation in California. Grazing can be manipulated at appropriate scales in an effort to change the balance of native and non-native species. Currently, fire and grazing are being used and promoted as a means of enhancing native grassland diversity in different parts of the state (Edwards, 1992; DiTomaso *et al.*, 1999; Meyer and Schiffman, 1999; Reeves, 2001; Fehmi and Bartolome, 2003; Hayes and Holl, 2003; D'Antonio *et al.*, 2004 unpublished results). There are also strong arguments that grazing can degrade ecosystems and harm species (Painter, 1995). Yet the willingness of the public to invest in easements on these livestock enterprises shows a recognition that they produce recognizable public benefit.

Marin County, just north of San Francisco, is one example of a conservation easement programme in California. One of the original non-governmental land trusts, the Marin Agricultural Land Trust, has secured conservation easements on more than 20,000 ha of private ranches and dairies. Easements are coordinated with local land-use planning efforts and with the federally owned National Seashore in the area, so that easements are concentrated in an agricultural zone and buffer the public lands from urban development. Recent surveys show that artisanal and diversified production is more common on land with easements (Gale, 2003). In the north-eastern part of the state, the Nature Conservancy's Lassen Foothills Project was launched in 1997. Before the project started the Conservancy had already purchased about 1000 ha to create the Vina Plains Preserve and had been managing the 15,016 ha Gray Davis Dye Creek Preserve for 10 years. By late 2002 the Lassen Foothills Project had safeguarded an additional 23,200 ha of grasslands, oak woodlands and streamside forests, mainly by purchasing conservation easements. A diverse array of local NGOs, public agencies and private companies are participants in this effort.

Conclusions

Oak woodland ranchers are optimistic about the future of ranching in California, with 77% in one study believing that it was possible to preserve ranching in their community (Sulak and Huntsinger, 2002). Not only are working landscapes "less expensive" than land acquisition, the tendency of landowners to forgo opportunity costs and invest in the enterprise in order to enjoy the diverse non-monetary values that accrue from oak woodland ownership augments public conservation dollars, providing a form of "matching funds" for conservation.

However, it is crucial to remember that ranchers are willing to invest because they enjoy being ranchers (i.e. they receive utility from being ranchers). Conservation easements and other incentive-based programmes are most effective when they allow ranchers to continue their traditions and make an effort to recognize local knowledge, values and interests.

In California's oak woodlands, the Working Landscapes movement seeks to conserve and stabilize large extensive, silvopastoral landownerships. A few landowners owning large amounts of land in a watershed, with similar goals and values, are far easier to work with than numerous small owners with highly diverse motives for owning oak woodland lands. The larger properties also make it easier to preserve intact systems. However, they do raise issues of equity, not only in terms of land distribution, but with respect to accountability - what the public is getting for its money - and other factors. The division of actual costs of various kinds of conservation programmes among the public, the landowner and the non-profit sector is difficult to sort out, and issues of equitability, accountability and the long-term effects of private land conservation on local communities need further study (Merenlender *et al.*, 2004). In his

analysis of Oregon's conservation easement program, noted that problems include private control, loss of local revenue, the potential for low-density development, inefficient use of open space, potential exclusionary effects and the destruction of metropolitan vitality.

On the other hand, conservation easements can perhaps optimistically be seen as a way of dividing tenure, a form of "virtual property redistribution". Though the surface of the land remains intact, the easement is a sharing of title with an NGO or public agency. Current easement prices reflect what is generally marketed: the right to develop and to subdivide. Management and monitoring stipulations are negotiated for each property, and each easement contract is therefore unique. Though highly unusual now, in the future easements might include public access and other requirements. The individuality and voluntarism of easements make some of us nervous, as there is little overarching control and a limited ability to plan. On the other hand, such localized efforts may best meet the current conditions for private land conservation in the United States: little overt or direct government role, tailored to very local ecological and social conditions, and a lot of landowner independence and choice. Ironically, however, these choices set up long-lasting restrictions on future landowners though certainly not as consequential as subdivision and development of the property.

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