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Public Land Grazing for Private Land Conservation?¹

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Abstract

California ranchers with substantial private oak woodlands sometimes use public lands as an important component of their production cycle. Yet allowed public grazing has declined and is likely to continue to decline. This, combined with intensifying development pressure and land use change, dramatically affects the resource base for ranch operations, which in turn influences landowner management decisions and practices. Such individual decisions have a significant role in shaping California's future landscape. As private rangelands are developed and taken out of production, public lands become a greatly sought after forage resource for livestock operators. Public agencies could dramatically expand their spheres of conservation influence by leveraging these important connections between private oak woodland ranches and their public leases. This scenario is examined in two key areas in California: the central Sierra's oak woodland foothills, and the San Francisco Bay Area's East Bay grassland and hardwood rangelands. In both of these areas, the public manages large and crucial swaths of grazed lands surrounded by privately held oak woodland ranch lands. After conducting more than 50 in-depth interviews over the past six years, we find differences between the two groups of operators in reactions to public forage reductions. In the Sierra foothills seeking replacement forage is a common response, whereas in the Bay Area reducing the herd is the most common reaction to a reduction in allowed public grazing. Nevertheless, in response to a total loss of public grazing more than one-third of both groups feel it is likely they would sell their ranches. When the private acreage attached to these public leases is taken into consideration, this study reveals how public land management decisions affect the risks to California's remaining hardwood range.

Keywords: Conservation, development, land use change, leasing, livestock, permittees, public lands, public land grazing, ranching, rangelands, working landscapes.

Introduction

California's oak woodlands are 82 percent privately owned and, due to their beauty and mild climate, are under severe development pressure (CDF-FRAP 2003). One way to conserve this ecosystem is to work with livestock ranchers, as they own and manage most of it. Unfortunately, livestock ranchers face a myriad of well-documented threats: estate taxes, heirship issues, increasing property taxes, industry economics, loss of infrastructure, conflicts with urban neighbors, fragmentation and development of grazing lands, and an unstable forage base (Anderson and others

¹An abbreviated version of this paper was presented at the Sixth California Oak Symposium: Today's Challenges, Tomorrow's Opportunities, October 9-12, 2006, Rohnert Park, California.

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2002, Hargreave 1993, Hart 1991, Huntsinger and Hopkinson 1996, Johnson 1998, Liffmann and others 2000, Rowe and others 2001a&b, Smith and Martin 1972, Sulak and Huntsinger 2002a&b, Zollinger and Krannich 2002). This last threat, that of an unstable forage base, is the most direct consequence of land use change and development but also possibly the most over-looked. Methods to mitigate this problem could be a powerful key to oak woodland landscape scale conservation.

The inter-linkage of public lands and private lands within livestock operations is common throughout the west and has been since the first public land management agencies were established. Most Americans are aware that public land grazing occurs on the federal lands across the west, but many people do not realize that it is common on many other types of public lands as well—city, town, utility, and local park lands. Using livestock grazing for vegetation management is accepted and defended by many government agencies, as well as nonprofit organizations, as an integral part of land management. It can be used for fire fuel reduction as well as restoring native plants, promoting biodiversity, and enhancing wildlife habitat, including habitat for special status species (EBMUD 2001, Holecheck and others 2006, Nuzum 2005). Nevertheless, despite much research documenting the benefits of grazing for conservation goals, there is a general public and scientific negativity towards public land grazing due to historical and well-documented years of mismanagement, controversial politics, and conflicts with recreation. Consequently, the use of livestock grazing on public lands has declined in recent decades.

As development pressure increases, land in agriculture declines, individual ranches shrink and dependence on the dwindling amount of grazing land increases. Many ranches have, over time, expanded their forage base and their operations by leasing private as well as public lands. Private leases can be tenuous due to their propensity to be lost to housing developments in many areas, whereas public leases are “protected” and are unlikely to be developed. This dependence on leasing has created a scenario in which the policies and management strategies of these federal, regional, and local public agencies directly affects the private oak woodlands and their owners. This relationship should be capitalized upon to the benefit of private ranch land conservation and California’s oak woodlands. Public agencies could dramatically expand their spheres of conservation influence by leveraging these important connections between private oak woodland ranches and their public leases through the lessees. In this paper, we will discuss research conducted over the past six years with grazing permittees and lessees in two different areas within California to reveal these inter-linkages between public and private lands and highlight how this relationship could be used to leverage oak woodland conservation.

Study Area

We focus on two areas in which oak woodland ranch lands are threatened by immense development pressure—California’s central Sierra foothills and the San Francisco Bay Area. California’s land use history is marked by the Spanish and Mexican land grants, which originally divvied up the lands of the state, and the Gold Rush in 1849. The Gold Rush heralded a huge influx of people and livestock and the tradition of transhumance grazing was established. California’s Mediterranean climate encouraged this practice, which is defined by the movement of animals between the lower Sierra foothills and the higher elevation mountain meadows. The mountain meadows stay green when the foothills dry out and turn brown in the spring

and summer (*fig. 1*, Rinschede 1984). These high-elevation, summer grazing lands are what were placed under the management of the United States Forest Service at the turn of the century and the inter-linkage of public and private lands began.

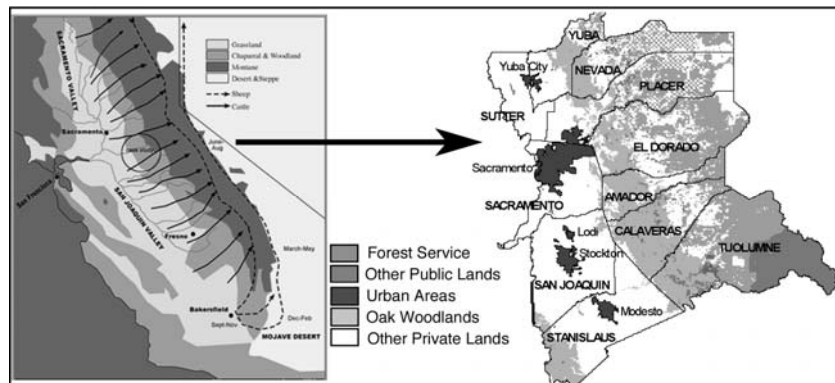


Figure 1—General location map for central Sierra study area and explanation of transhumance in California (Rinschede 1984, CDF-FRAP 2001).

Population growth in the Sierra Foothill study area has boomed since the 1970s and is expected to continue to grow at an exponential rate (*fig. 1*). The Sierra Nevada Alliance, an association of environmental groups active in Sierra-wide conservation issues, estimates that between 1970 and 1990 the population of the counties in the Sierra doubled (Hickey 2005). In El Dorado County specifically, the fastest-growing county within our study area, the population grew by 23 percent between 1990 and 2000 (Hickey 2005). Further, in the western portion of El Dorado County, these demographic and land use changes caused the land used for livestock grazing to decrease from 49 percent of the region in 1930 to 6 percent in 2004 (Wacker and Kelly 2004). Of the ecosystems in the Sierra, the oak woodlands are most under threat. They are home to about 70 percent of the region's population, and less than 1 percent of the foothills are protected from development (Davis and Stoms 1996, SNEP Summary 1996). According to Sierra Nevada Ecosystem Project data published in 1996, 68 percent of Sierra hardwood rangeland is privately owned, almost 2 million acres, but, even then, more than 800,000 acres of oak woodlands in the Sierra had already been converted to other uses (SNEP Summary 1996). The foothill woodlands host the greatest native biodiversity of any of the ecosystem types of the Sierra, and there are 86 species of terrestrial vertebrates that require west-slope foothill oak woodlands for their survival (Graber 1996, Sierra Nevada Ecosystems, SNEP 1996). Overall the Sierra Nevada and its foothills are predominantly federally owned, although the nine counties specifically in our study area are 38 percent publicly owned with individual counties ranging from Tuolumne, which is 76 percent public, to Sutter, which is 3 percent public (CDF-FRAP 2003).

The two counties of focus in the other study area of this research, Alameda and Contra Costa counties, are located in the San Francisco East Bay and stretch from an urbanized shoreline along the Bay on their western edge out through rolling hills of oak woodlands and grasslands towards the Central Valley (*fig. 2*). Land use changes to more intensive agriculture, rural residential, and urban uses have reduced the extent of grazing lands over the years, although on the eastern edges of the counties



Figure 2—General location map of San Francisco East Bay study area. Colored lands are public (green), or private lands with conservation easements (orange). (Bay Area Open Space Council 2005).

the ranching community persists. Currently, in Alameda and Contra Costa counties, the public owns about 25 percent of the land area (BAOSC 2005), yet almost 40 percent of the two counties is private rangeland and, of the hardwood range specifically, 67 percent is privately owned—about 68,000 acres (CDF-FRAP 2003). These beautiful and productive lands are developing into more intensive uses very quickly and conservation organizations have taken note. In the San Francisco Bay Area, 31 percent of the region's conservation easements are on privately held oak woodland properties (Rissman and others unpublished manuscript). This makes these two study areas at the same time both public and private, urbanizing and rural, as well as ecologically valuable with livestock ranchers controlling much of the remaining oak woodlands.

Methods

We conducted in-depth oral and written interviews of central Sierra ranchers with grazing permits on the Eldorado, Tahoe, and Stanislaus National Forests in 2000 and 2001 (*fig. 1*). This was followed in 2005 and 2006, in a similar interview process, with a group of lessees of three agencies in Alameda and Contra Costa counties: the East Bay Regional Park District, the East Bay Municipal Utility District, and the San Francisco Public Utilities Commission (*fig. 2*).

The central Sierra foothill participants included ranchers with base property in Sutter, Sacramento, Stanislaus, Tuolumne, Calaveras, Amador, El Dorado, Placer and Nevada counties, with some also owning land or leasing outside the study area. Ranchers living further than 150 miles from the study area or to the east of the Sierra crest, and those who were no longer using their permit, were not included, leaving a qualified population of 47 ranchers out of 60 total permittees on the three forests. Twenty-three permittee ranchers completed the survey process. These 23 permittees make up 38 percent of the total population of permittees of the three national forests and about half of the selected population.

The three Alameda and Contra Costa public agencies had 44 cattle lessees between them in 2005. Of those, 33 were selected for the study because they either

had an address within the two counties and/or owned land in the two counties. Of those 33, a total of 29 lessees participated in the study. The 29 participants make up 66 percent of the cattle lessees of the three agencies and 88 percent of the selected population.

Data was collected through oral interviews as well as written surveys composed of open-ended, fill-in the blanks, and multiple-choice questions. Some questions reported here were based on surveys created by Helen Rowe and Tom Bartlett for research conducted in Colorado (Rowe and others 2001a&b). In the few instances in which our two case study area responses seemed to be different, comparisons were made using independent-samples “t” tests, and we considered differences of $p \leq .05$ to be significant.

Results

Who is Leasing Public Lands?

The primary interviewees were predominantly male, in their late 50s, and had operations of about 350 brood cows on average, although their herd sizes varied widely (*table 1*). All participants ran cattle, mostly cow/calf operations, although one Forest Service permittee was predominantly a sheep operation. In Alameda/Contra Costa, self-defined combination cow/calf and stocker or yearling operations made up almost half the group, whereas in the central Sierra, permittees considered themselves cow/calf operators while keeping only a very few stockers or yearlings. The two groups’ reliance on family members with off-ranch jobs was similar: 63 percent and 65 percent of the central Sierra and Bay Area groups, respectively, had a family member who worked off the ranch at the time of the interview.

Table 1—*Characteristics of cattle ranchers with public leases in Alameda/Contra Costa counties (A/CC) and the central Sierra (2000 – 2005).*

Characteristic	Participant responses		n	Sig
Percent male	92%		52	
Mean age of interviewee	57 years old		50	
Mean size of cow herd	349 mother cows		41	
Family members with off ranch job	64%		50	
Participation in Williamson Act	83%		41	
	A/CC	Central Sierra		
Year began ranching	1885	1907	51	.05
Mean acres owned	4,811	1,904	28	ns

The mean amount of land owned by Alameda/Contra Costa lessee operations is 4,811 acres (sd 11,997, n=18), while central Sierra Forest Service permittees own 1,904 acres (sd 2,387, n=10). However, because of the huge variation in ranch sizes, the two groups are not significantly different (*table 1*). Their public lease sizes are different—the Forest Service average lease size is more than 30,000 acres as compared to a little less than 3,000 acres in the Bay Area due to the difference in natural productivity of each ecosystem. Approximately 83 percent of landowners in the combined group participate in the Williamson Act (a statewide tax relief program and agricultural preserve program). Overall, most of these families began ranching in their areas around 1897, but the Forest Service permittees have been in their area longer, since 1885 on average, and the Bay Area lessees since 1907 on average.

Importance of Leasing

The use of leases, both private and public, allows operations to maintain a herd size that permits a better economic return and provides economies of scale. All but one of the central Sierra Forest Service permittees leased other lands in addition to their federal leases. In the Bay Area, all of the cow/calf lessee operations except two used private leased lands in addition to their public lease and another two operations, which were entirely stocker operations, were completely conducted on the public lease.

In terms of acreage, the Bay Area lessees' operations are an average of 81 percent leased (n=23). Seven operations are conducted entirely on leased lands, both public and private. On the opposite side of the spectrum, one operation whose only lease is public qualified him for the study but makes up only 6 percent of the acres in his operation. That one operation is the exception, however, and if it is removed from the calculation the minimum becomes 41 percent leased and the average increases to 85 percent leased.

In an AUM (animal unit month) based analysis, an average of 18 percent (range of 2 to 45 percent, n=17) of a central Sierra permittee ranch's total forage supply comes from the Forest Service allotment. When asked, "What percentage of your ranch income is attributable to the use of your public lease?" Forest Service permittees and Alameda/Contra Costa lessees reported that the public lease contributed an average of 41 percent and 44 percent to their ranch income, respectively (ns).

In the Alameda/Contra Costa group of lessees, those that used at least one private lease used an average of four different private leases per operation. Four participants did not use any private leases at all, but one rancher used between 10 and 15 private leases each year. The central Sierra group also reported using multiple leases but used fewer, on average about 2.6 per operation (p=.039).

Why Use Public Leases?

Central Sierra Forest Service permittees were asked, "How important to you are the following reasons for using your Forest Service allotment(s)?" "Green feed" was the most important reason for using the Forest Service allotment, with 94 percent of respondents rating it as a "more" or "highly important" reason.

The Alameda/Contra Costa County lessees ranked "location close to other private lands" as their most important reason for using their public lease. Most, or 13 of the 17 landowners who owned ranchlands in Alameda or Contra Costa counties, were adjacent to their public lease or another protected open-space property, and at least five had originally sold their now-leased lands to the public agency. The second most important reason that Bay Area ranchers use their public leases is that there is a "lack of another alternative," and many mentioned during the interview that "the public owns so much land in the two counties" as a reason why public land grazing is so important to the local cattle industry. Similarly, though not quite as strongly, "lack of another alternative" was rated "more" or "highly important" by 84 percent of the participants in the Sierra foothills study area. Although, "lack of another alternative" was rated behind the economic role it played in the operation and also behind the enjoyment of the lifestyle for the Sierra ranchers.

What if Lessees Lose Their Public Leases?

In the written portion of the survey, both groups of participants were asked, “If the public agency that regulates your public lease(s) were to permanently decrease the allowable forage by 25 percent on your public lease(s), what would be your most likely response or responses?” The same question was asked for 50 percent and 100 percent reductions. Compensation strategies choices were described as: 1) “continue” ranching without change; 2) “sell” all or part of your ranch; 3) “stop” ranching but hold on to the ranch; 4) “reduce” your herd; 5) “replace” public land forage with other sources of forage; 6) “diversify” your ranch production; 7) look for off ranch “employment.”

For the 20 landowners in the Alameda/Contra Costa group, any level of change in allowed grazing would result in a parallel reduction in cattle in these operations. “Reduce” was the most popular compensation strategy at the 25 percent and 50 percent reduction levels, and “replacing” the forage was the second most popular. At the 100 percent level, if participants lost their public leases completely, 9 of the 17 lessees that owned land inside Alameda or Contra Costa counties would likely sell all or some of their own land. If these landowners were to lose their leases, a little more than half of them would likely sell all or part of their lands. In comparison, “replacing” the lost forage is the most popular strategy for the central Sierra Forest Service permittees at all reduction levels. Even at the 100 percent reduction level, “replacing” is the most popular hypothesized strategy. Nevertheless, if the Forest Service were to revoke the permit altogether, more than a third of the permittees felt they would likely “sell” all or part of their ranch lands.

Discussion

The preponderance of male interviewees in their late 50s is common to many other studies in California and across the west (Anderson and others 2002, Gentner and Tanaka 2002, Liffmann and others 2000, Rowan and White 1994, Smith and Martin 1972). Concerns about agriculturalists getting older abound, yet they do not seem to age between studies. Their dependence on off-ranch jobs is also true across space and time—with studies originating in the 1970s reporting the role of employment in the local economy as a way to support ranches (Gentner and Tanaka 2002, Smith and Martin 1972). The average size of the operations in this study, though highly variable, is slightly larger than most beef cattle operations across California today but is similar to other studies of public land permittees (Anderson and others 2002, CDF-FRAP 2003, Gentner and Tanaka 2002, USDA Census of Agriculture 2002).

What may surprise researchers and conservationists is the substantial amount of land a California rancher leases to complete the annual forage requirements for a herd of cows. Leasing is important in terms of acres used, AUMs supplied, as well as income generated—all from lands that are not owned or controlled by the operator (Anderson and others 2002, Gentner and Tanaka 2002, Rowan and White 1994). In a California-wide study conducted in 2000 and 2001, researchers found that 88 percent of their sample ranchers owned land as well as leased additional land for their cattle operations (Anderson and others 2002). A survey of 113 Alameda and Contra Costa ranchers in 1993-1994 found 35 percent of respondents used public lands in their operations but unfortunately did not ask about private leasing (Liffmann and others 2000). In our two cases, out of 52 operators, all but three used more leases than their

public lease. For the Alameda/Contra Costa group, an average of 80 percent leased acres is an impressive reliance on other people's property.

Land use change in both of these areas has reduced the amount of rangeland available for grazing overall. According to the Farmland Mapping and Monitoring Program, Alameda and Contra Costa counties lost more than 13,000 acres of grazing land between 1994 and 2004 (CDC 2006). The nine-county central Sierra study counties lost more than 34,000 acres of grazing land during the same time period (CDC 2006). These numbers are likely to be much higher because the Farmland Mapping and Monitoring Program does not always include the entire county in its mapping, especially the earlier acreage calculations, and does not include data for Calaveras and Tuolumne counties at all. Hence, regional grazing land is shrinking, and purchasing land locally is unlikely for both groups, which leaves leasing as the main source of forage.

So it seems obvious why cattle operations in these areas would use just about any lease they could find—they must do so in order to have enough land to sustain their operation. But why use public leases in particular, since they have many evident drawbacks? Using public lands, lessees face negative public pressure, deep and slow moving bureaucracies, complex rules and regulations that may run counter to their own management ideas, recreation conflicts, and so on. Their reasons for using public leases differ somewhat due to their location—Forest Service permittees especially value the green feed that the mountain meadows supply. Public lands in the Bay Area are as dry as any other non-irrigated parcel, a function of local geography, and their use is not confined to the summer. Green forage, found in the mountain meadows in the summer when lowland range loses nutritional value, is critical to these operations, and Forest Service permittees often specifically noted that they find summer forage the hardest to replace.

The importance of these leases, and lessee reactions to their hypothesized loss, highlights the opportunity that agencies have to create a more stable local industry and landscape. If one-third to a little over one-half of the participants in each study area is likely to sell all or some of their lands if they lose their public lease, the agencies have an opportunity to influence the fate of their regional landscapes. From our survey, it appears that any reduction in public grazing in Alameda and Contra Costa counties would result in a parallel reduction in the local livestock inventory.

The Bay Area's lessees and livestock industry may be more vulnerable than the central Sierra group, and both of these groups of California ranchers are likely to be more susceptible to changes in public land grazing than their peers in Colorado. In 2001, researchers reported that 26 percent of the 37 federal permittees in their survey would likely sell their land in response to a total loss of their public permit (Rowe and others 2001a&b). The central Sierra ranchers suggested that they are hopeful that "replacing" is possible in their area but similar to the Colorado study, suggested that this may be impossible in reality. For the Alameda/Contra Costa group, the "replace" option never tops the list, an acknowledgement of the impossibility of that compensation strategy. In reality, it is unlikely that even the central Sierra permittees would be able to replace lost permits if the Forest Service changed policy. They, too, have very limited private lands available for grazing and shipping out of state, though common, is expensive.

Both groups lease a lot of land, both public and private, although the public leases seem to be of particular importance. If the public were to revoke grazing leases

in these two study areas, there would likely be large shifts from bucolic oak woodlands towards more intensified land uses as the lands are sold. Public agencies could influence landscape stability and management beyond their bureaucratic borders by working together with lessees. According to respondents, simple improvements in communication as well as general agency appreciation would go a long way. However, if the agencies could take this idea a few steps farther into proactive management and clear intentions for promoting local ranching and working landscapes conservation their influence could be dramatic.

Conclusions

We encourage public agencies to look at how decisions and practices ramify out to the landscape scale, and to think creatively about how they can help their lessees continue to protect their lands from land use change. Through their lessee selection processes, agencies are likely to be choosing the future livestock operators of their area, a role that should be understood and carefully considered. Agencies often depend on private ranches as buffers, and as providers of wildlife habitat for species that roam in and out of private and public lands. An overt appreciation of these connections and their benefits would be ideal, and more transparent, secure and collaborative relationships between agencies and lessees would be a start. Conservation organizations have developed region-wide approaches to conservation, but need to grapple with public-private land interconnectedness. Perhaps one of the most (in)famous examples is in the Arizona borderlands, where the Malpai Borderlands Group has negotiated conservation easements that are linked to state leasing policies (Sayre 2005).

The need of ranchers for more and stable forage supplies is an excellent opportunity for agencies to work with the ranching community. Agency influence through their grazing programs extends the affects of public policy directly to private oak woodland ownership. For example, it has come to our attention that the California Department of Forestry and Fire Protection (CDF) is beginning an initiative to enhance its “vegetation management” efforts in California. However, the vision of grazing for fire hazard management, based on current draft documents (Range Management Advisory Committee to the State Board of Forestry meeting July 7, 2006, Sacramento), is limited to small-scale applications of goats. Cattle, sheep, and other stock also remove fine fuels and can suppress brush encroachment. In light of the problems and costs associated with prescribed burning in the urban-wildland interface, perhaps CDF should think creatively about a convergence of interests between an industry that needs more grass and a fire management agency that wants less of it building up. In this way, agencies could leverage their lands and foster relationships that could conserve their local ranching industry and surrounding landscape.

Acknowledgments

The authors thank the ANR CORE Grants Program, the IHRMP, the California Rangeland Trust, the Sierra Nevada Alliance, National Fish and Wildlife Foundation, and the Agricultural Experiment Station for providing funding for this project. Advisory groups in the Sierra and in the East Bay played a crucial role in the project, and we are grateful for their time and guidance. Our advisors included: Larry Forero,

Sheila Barry, Laurel Ames, David Amme, Tom Bartlett, Steve Bishop, Steven Blank, Cristi Bozora Creegan, Sue Britting, Ray Budzinski, Bill Frost, Helen Howe, Tim Koopman, Sharon Johnson, Dan Macon, Michelle McFarlane, Rich Reiner, Karen Sweet, Rod Tripp, and John Woodbury. A more complete report on the Sierra Study, *Sierra Nevada Grazing in Transition*, is available at:
<http://www.sierranevadaalliance.org/publications/publication.shtml?type=pgm02>

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