The Governance of Rangelands

Rangelands are large natural landscapes that can include grasslands, shrublands, savannahs and woodlands. They are greatly influenced by, and often dependent on, the action of herbivores. In the majority of rangelands the dominant herbivores are found in domestic herds that are managed by mobile pastoralists. Most pastoralists manage their rangelands communally, benefiting from the greater flexibility and seasonal resource access that common property regimes can offer. As this book shows, this creates a major challenge for governance and institutions.

This work improves our understanding of the importance of governance, how it can be strengthened and the principles that underpin good governance, in order to prevent degradation of rangelands and ensure their sustainability. It describes the nature of governance at different levels: community governance, state governance, international governance, and the unique features of rangelands that demand collective action (issues of scale, ecological disequilibrium and seasonality).

A series of country case studies is presented, drawn from a wide spectrum of examples from Africa, the Middle East, Central Asia, Europe and North America. These provide contrasting lessons which are summarized to promote improved governance of rangelands and pastoralist livelihoods.

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'It is not through universities but through daily practices. It is not through few academic years of study or research but through centuries of love and interaction. It is not through greedy private ownership but through collective rights and stewardship that we, pastoralists, learned how to and did keep the rangelands for "us" and others to enjoy them, feeding our livestock, fighting diseases maintaining our souls and contributing to carbon capturing. It is time that all states and controlling parties recognize and respect pastoralists' collective land rights as a legal and legitimate way of governance so that sustainability of pastoralism is ensured, and pastoralists' contribution to food security and carbon sequestration is continued. This book is an important contribution showing many experiences of cooperation based on the traditional knowledge and the sense of ownership of the communities to rangelands. The book brings successful stories of rangeland governance where win-win situations are achieved and conflict among different communities has reduced. The variety of success stories should inspire us all to follow the proven success for a more flourishing and peaceful planet!'

Khalid Khawaldeh, Member, World Alliance of Mobile Indigenous Peoples (WAMIP)

'A clear, empirically based, and well-argued manifesto for how to reverse decades of ill-informed policies, and instead recognise and support one of the planet's most sustainable production and land use systems – starting with the critical step of protecting the territorial rights of pastoralists'

Michael Taylor, International Land Coalition Secretariat

'It was in the early nineties and I visited Chad late in the long, dry season. In the Batha Province, north of the provincial capital Ati, I came across lush grasslands where Dorcas Gazelles abounded. There were empty villages with many granaries, all full of millet. An old man that had stayed behind told us that the herdsmen, owners of the granaries and the traditional waterholes, were still in the South, but moving northwards. They would soon be back. Granaries and grass were to feed the herdsmen, their families and livestock before the rains would arrive, new grass would grow and fields with Millet could be harvested again for the next cycle. I realized that I was witnessing some of the last vestiges of pastoral traditions in Africa. Here, traditional management of natural resources survived, respected by all stakeholders. Transhumant and nomadic pastoralists are not always popular with some governments. Their ephemeral stay in places makes them difficult to control, to tax. And yet, as the above example shows, their traditional way of life is based on sound ecological principles. There are lessons to be learned. Lessons that may need to be adapted to the requirements of modern times, but we should make sure not to lose access to this rich source of indigenous knowledge.'

Piet Wit, Chair, IUCN Commission on Ecosystem Management

The Governance of Rangelands

Collective action for sustainable pastoralism

Edited by Pedro M. Herrera, Jonathan Davies and Pablo Manzano Baena

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4 Ranchers, land tenure, and grassroots governance

Maintaining pastoralist use of rangelands in the United States in three different settings

Lynn Huntsinger, Nathan F. Sayre and Luke Macaulay

Overview

The forms of grassroots governance that have emerged in three different land tenure settings, Arizona, California, and Texas are examined in terms of how they help ranchers maintain access to rangeland resources within each setting. Ranchers and pastoralists need a web of social and political relations to secure their ability to benefit from rangelands, regardless of whether they own, rent, or are permitted to use the land by a government agency. In the Malpai Borderlands, where much of the rangeland is leased from a few public agencies, the need to use prescribed burning, maintain access to public lands, and stave off land fragmentation and development has led to the emergence of a grassroots rancher organization with a system of conservation easements whose permanence is linked to stability of public leases, and a burn and land conservation plan that benefits both ranchers and fire agencies. In California, where a significant proportion of rangeland is private but diverse types of public and reserved land are important, the California Rangeland Conservation Coalition communicates the benefits of grazing to agency managers, and has produced a strategic plan for maintaining rangelands and ranching, in an effort to help keep the growing proportion of public and reserved rangeland available for grazing. In Texas, where the vast majority of rangeland is privately owned, wildlife management associations help ranchers to manage and market game species for hunting in an increasingly fragmented landscape. These wildlife associations help increase benefits to ranchers from game species, a common pool

resource, while maintaining habitat on a landscape scale. All of these groups rely on creating connections among ranchers and regulatory or management agencies, and on sharing knowledge, labor, and resources. Each supports research and policy that benefits pastoralism in ways that an individual rancher cannot. All of them are involved in transboundary management, whether it is fire, wildlife, or maintaining a grazing calendar of several different ownerships. Finally, each group maintains that they are benefiting rangelands, including supporting biodiversity.

Keywords: governance, rangelands, land management, ranching, access

Introduction

Ranchers in the United States maintain production amidst differing configurations of rangeland control and ownership (Starrs 1998; Fairfax *et al.* 2005). As is common in grazing economies, they rely on access to large areas of land, often with tenuous property rights through leases and permits (Huntsinger *et al.* 2010). Here we examine forms of grassroots governance that have emerged in three different land tenure settings, Texas, Arizona, and California, and how they help ranchers maintain access to rangeland resources within each setting. Using the analytic framework of Ribot and Peluso (2003), we show that ranchers and pastoralists need a web of social and political relations to secure their ability to benefit from rangelands, regardless of whether they own, rent, or are permitted to use the land by a government agency (Li and Huntsinger 2011).

This approach is useful in understanding the role of these grassroots governance structures across vastly different institutional arrangements for landowners and land use in the United States. Even when rangelands are private property held individually, and the right to benefit seems most straightforward, the emphasis for a pastoralist must be on maintaining the ability to benefit despite regulatory, market, environmental, social and political relations that might seek to constrain such ability. Where land tenure is complex, with diverse owners and ownership types, the right to benefit comes through leases and permits with diverse objectives and constraints. Acquiring and maintaining the ability to benefit involves coping with multiple social and political relationships, institutional contexts, and competitors for access to the same land. When rangeland is largely owned by the government, finding points of leverage and strategies for negotiation become critical for maintaining a right to benefit, as well as ability to benefit, that in many places is growing increasingly tenuous due to larger-scale social, political, and economic changes. When land is owned by the rancher, income sufficient to support the property is critical to maintain access to the resource and to reduce rangeland conversion to other uses. In turn, government agencies with environmental goals sometimes want to influence management on private land in the context of the considerable autonomy landowners have in the United States. In each of our three case studies, grassroots governance structures act to help pastoralists navigate the contextual factors that shape their access to the rangeland resources they need.

Ribot and Peluso's work (2003) on rights and access provides an analytic frame for comparing how land tenure and regulatory arrangements influence the ability of ranchers to benefit from rangelands, and result in the emergence of different grassroots governance forms. For ranchers using extensive rangelands, the ability to benefit from the resources is as important, or more important, than the right to benefit in the form of landownership or a grazing permit. A right of use allocation like a grazing permit can grant someone the right to benefit from a piece of land, but if the rights holder does not have the ability to use the resources profitably, he or she will not be able to benefit from the land to maintain his or her enterprise. For example, if a permit or lease is granted, but the conditions that must be met in order to be allowed to graze are costly, the grazier will be unable to use the land in a way that allows an income to be returned. Of course, right and ability are often interlinked, but a right is only one aspect of safeguarding the ability to benefit, while ability is embedded in a web of mechanisms, or means, processes, and relations, and is subject to the impacts and outcomes of social relations, including forms of governance (Ribot and Peluso 2003).

The web of social relations that shapes pastoralist ability to benefit from rangelands depends, in the first instance, on the tenure arrangements for that rangeland. Fee-simple ownership implies that the owner has the right to benefit from the land as the owner sees fit, as well as the right to sell or develop the land, but these rights are usually constrained by regulations and land use designations, which may be created and enforced at local to national levels of governance and shape the ability to benefit. Being "over-regulated" was a common reason ranchers surveyed in California gave for "quitting ranching" (Liffmann *et al.* 2000). Environmental regulations can influence pastoralist ability to benefit from their own rangelands. For example, the Endangered Species Act, a federal regulation, requires landowners to protect animal species designated as endangered by the federal government. Similar requirements may be present at the state level. Water quality protections also operate at multiple levels of governance and may preclude certain land uses. Therefore although the pastoralist may have a right to use the land, it can only be exercised within the constraints of regulatory and land use planning institutional arrangements at local to federal scales. This is part of the "web of social relations" that shapes pastoralist ability to benefit from rangelands. The matrix of land uses and ownerships within which a ranch is situated can also affect ability to benefit, as when domestic dogs harass livestock, or neighbors complain about agricultural activities.

Pastoralists may lease rangelands from private and governmental entities. The terms of a lease are a contract with the landowner and vary from property to property, but usually are for specific numbers of animals for specific periods of time. Private leases spell out the obligations of lessor and lessee and may include contributions in kind from the lessee, including fixing or developing infrastructure. They are often given out on a competitive basis, or as the result of a friendship or long-term relationship. Often they grant the lessee exclusive use of the property. Government permits may include in-kind contributions as well, but they usually do not grant the lessee exclusive use of the property, reserving public access for

recreation and hunting, private access for timber harvest, or government access for military operations and so on. Depending on the scope of these other uses and their requirements, this will influence the pastoralist's ability to benefit. Protection of wildlife habitat and other resource values, in addition to whatever environmental regulations may be pertinent, also influence how the land may be used and the ability to benefit.

On some government lands, where the public also holds rights to benefit based on the governance institutions for these "public lands," the amount and nature of the resources allocated to each type of use and user is a subject of contention, and sometimes costly litigation. Different constituencies seek to invoke their rights of access in order to advance their ability to benefit from public lands. For example, the Multiple Use Sustained Yield Act of 1960 and the Forest and Land Management Planning Act of 1972, hold that the Forest Service and the Bureau of Land Management, respectively, must manage public lands for multiple uses, but the statutes do not provide guidance on priorities or methods of allocation among those uses. Pastoralist ability to benefit, then, can be heavily influenced by political and managerial decisions about the rights to benefit from diverse user groups, and by changes in or interpretations of environmental regulations pertinent to livestock grazing. As a Forest Service natural resource manager commented at a 2013 symposium, "for the rancher using the national forest the [environmental] bar keeps getting higher every year." In California, Arizona, and Texas, ranchers have established grassroots local governance organizations that help them maintain the ability to benefit from rangelands in ways that fit to local tenure and institutional arrangements, and to build resilience to shifts in policy and markets that might have an impact on their ability to maintain access to and benefit from rangeland resources.

Evolution of ranching land tenure in the Western United States: a general overview

A general history of livestock grazing in the western United States begins with the implantation of livestock in the Southwest. In 1598, Spanish settlers brought cattle, sheep and goats into what is now New Mexico. For about 200 years, Spanish and Mexican land grants, thousands of hectares in size, were given to individuals and communities for farming, grazing, and woodcutting. Local tribes, such as the Navajo, adopted livestock grazing very early on (Bailey 1980). In California, a short-lived Spanish colonization began in 1769, and as in the Southwest was then superseded by Mexican control in 1822, and finally by the United States in 1848. In the Spanish and Mexican periods of California large land grants were given out to individuals for ranching, leaving a legacy of some extensive private rangeland ownerships.

In the mid-nineteenth century, settlers from eastern regions moved rapidly into the arid western territories, drawn by the Gold Rush and other mining strikes, and by abundant open land for settlement. This land was known as the "public domain" as it belonged to the federal government and it was originally designated

for privatization and development through sales and grants. American land allocation policies were eventually implemented that, beginning with the 1862 Homestead Act, limited settler land claims to a few hundred acres. These claims were made in the rare areas with decent soils and water for irrigation, leaving arid and mountainous land in the public domain. In the Southwest and California, under American governance, the majority of community and individual grants given out by the Spanish and Mexican governments were abrogated by the courts, ceded to clever entrepreneurs and lawyers, or returned to the federal or state governments for back taxes, and only rarely remained in the hands of some of the grantees (de Buys 1985).

Ranchers throughout the West grazed the public domain and created patterns of livestock mobility that suited local geographies, moving stock from arid lowlands in the winter to montane meadows in the summer in mountainous regions. In regions where water and soils supported cultivation, large areas were plowed and converted to farmland. Various land allocation policies supported acquisition of farmlands. In exchange for development of irrigation or drainage infrastructure, land allocations from the public domain for farming could be quite large. At times, it was convenient to leave rangelands in government ownership to avoid the costs of owning land given the low returns per hectare from livestock grazing in arid regions. Extensive areas of government-owned arid rangelands are today embedded with small, scattered plots of claimed private lands that center on the rare water sources. The state of Nevada is the most extreme case, with more than 90 percent of the land in government ownership of one sort or another, and private lands located along rivers, creeks, and springs. Compounding this fractured tenure was the federal government's habit of ceding "sections" (640 acres or one square mile) of cadastral "townships" (6-mile by 6-mile squares) to states or to the railroads. The states were to use the lands to fund education, while the railroads were to use their alternating sections to pay for the expansion of the rails. In the latter case, the legacy is a checkerboard of private and public lands along the rail corridors in many areas, as the government lands were retained rather than sold or granted.

A strategy of "control of the range by control of the water" emerged in much of the West in the nineteenth century. Settlers, limited to small claims by land allocation policies like the 1862 Homestead Act, acquired lowland areas with arable lands and water, and grazed the surrounding public domain open range. In ranching communities, informal rules and practices evolved that helped control grazing, including legal fencing of home properties, illegal fencing of public domain range, grazing agreements among community members, and extra-legal threats and pressures to fend off outside intruders (Nelson 1995). An informal nineteenth-century rule in Arizona held that the owner of a water source had the rights to graze the public domain halfway to the next water source (Sayre 2002). Common gathers where livestock were sorted, with reciprocal labor and herding, and brands to monitor cattle ownership, reflected a nascent pastoral culture as well as Hispano influence (Farquhar 1930).

The latter half of the nineteenth century saw an influx of speculative money, funded by industrial wealth and family fortune, often from overseas, that drove

the rapid development of a commercial livestock industry based on access to low-cost, uncontrolled land, with few ties to local communities. The invention of barbed wire in 1867, and its proliferation in the 1870s changed the face of open range grazing across much of the West. Barbed wire dramatically reduced the cost of enclosing cattle on vast areas of range, and of keeping livestock out of crops. Conflicts erupted between sedentary farmers and ranchers, and grazers with free-range herds who came across newly constructed barbed wire and cut fences, culminating in a "fence cutters war" that resulted in the designation of cutting fences as a felony in Texas in 1884. Many other states followed suit. Profiteering from running cattle crashed toward the end of the century with overstocked ranges, inadequate and badly placed fences, and a few brutal winters. In 1885, Congress forbade stretching barbed wire across the public domain. Enforcement of the open access character of government rangelands fostered continued tensions over pasture use between settled communities and "outsiders" such as widely roaming shepherds and speculative cattle enterprises (Nelson 1995).

The government asserted control over this range in the early twentieth century, committing to government control as a means of governing open rangelands to prevent their degradation (Ostrom 1990). Most montane range was reserved out of the public domain to create national forests, and now is under the jurisdiction of the United States Forest Service (USFS). The motive was to protect forest resources and watersheds from rapacious exploitation by loggers and graziers. Most lowland arid ranges eventually came under the jurisdiction of the United States Bureau of Land Management (BLM), with the dual objective of utilizing and conserving timber, forage, and mineral resources. Sedentary ranchers and sheep producers were given precedence in the allocation of "allotments" on these lands – areas for which the federal government gave grazing permits. Forest Service and BLM lands are known as public lands today, as they are managed in the public interest, including for recreation and wildlife habitat. Meanwhile, well-watered lands were claimed for private ownership.

Ranches today are of course a function of the culture of the settlers and the details of the local environment, as well as the way that land allocation played out (Starrs 1998). A typical western cattle ranch evolved to have a ranch house and private 'deeded acres' located on water or a water development, and a larger extent of land that belongs to the government and requires a permit for grazing. However, each of the case studies diverges from this narrative in important ways.

Case studies

With the exception of Texas, western states agreed to federal government retention of public lands as a condition of gaining statehood. However, they were granted some blocks of this land based on the cadastral survey system to support the development of education systems. When Arizona and New Mexico became states in 1912, for example, they were granted four sections per township and the right to make "in lieu" selections from the public domain to make up for

sections that had already been reserved by the federal government for national forests, parks, and Indian reservations. Arizona selected prime rangelands because they were the most valuable remaining parcels available. The United States Forest Service administers most of the upland forest. The Bureau of Land Management, the largest federal land management agency, manages much of the desert. In this arid country, supporting livestock requires large amounts of land. Overall, the state is approximately 42 percent in federal ownership with 28 percent in Indian reservations under federal jurisdiction (Gorte *et al.* 2012). There is 13 percent in state ownership (National Agricultural Statistics 2007).

In California, the history of Spanish and Mexican land grants and land settlement policies for irrigation development resulted in extensive private rangelands. In addition, water resources are more plentiful, and rangelands are more productive, than in much of the arid West, making relatively small parcels viable for grazing operations. Upland forests and desert areas remained in federal ownership. The most productive rangelands in the state, oak woodland and annual grassland, are more than 80 percent in private ownership (CDF-FRAP 2010). The high value of these lands and the growing population has resulted in many types of land set aside, from local and regional parks, to land trusts and large state parks. Rangelands are owned by numerous different private and public owners. Overall, the state is about 48 percent in federal and 6 percent in state ownership, while the remaining public ownerships are uncensored.

Texas was annexed by the United States in 1845 in the midst of border disputes with neighboring states and Mexico. Texas gave up most of the disputed territories to the federal government in exchange for the U.S. assuming its 10 million dollar debt, and the disputed lands eventually became part of other states. As part of the negotiation process for annexation, Texas was not required to surrender the public domain within its borders to the federal government, unlike Arizona and California. Much of these state lands were gradually sold or traded off to fund projects ranging from the Texas public education system to construction of a state capitol building in red granite. As a result, Texas is less than 2 percent federal (Gorte *et al.* 2012) and approximately 8 percent state land (Texas General Land Office 2013).

Methods

In all three case studies, the benefits of collaboration to ranchers and agencies are summarized in a table, drawing on the framework of Taylor (2005), based on archival and primary interview data. To understand the role of conservation easements in the grassroots Malpai Borderlands Group of Arizona and New Mexico, 25 interviews were conducted in 2009. Eleven interviewees were ranchers whose lands were encumbered by easements; 14 interviewees were public agency personnel who worked with the Group (Rissman and Sayre 2012).

California interviews come from five different interview series in different parts of California. In 2000–2001 ranchers in the central Sierra Nevada foothills were interviewed about their use of public and private lands in the region (Sulak and

Huntsinger 2002a; Sulak and Huntsinger 2007; Huntsinger *et al.* 2010). A second study with the same objectives was conducted in 2005 in the San Francisco Bay area (Sulak and Huntsinger 2007). Twenty-nine interviews were conducted. In 2011, 15 interviews were conducted in the San Francisco Bay area with ranchers leasing land from public agencies, and in 2012, 25 interviews were carried out with ranchers in the northern Sierra foothills with the objective of understanding their ideas about land management and wildlife. Interviewees were selected from lists of lessors in each place, except in the 2011 and 2012 studies, where interviews were based on referrals from the California Rangeland Conservation Coalition, County Extension, and snowball sampling. Some of the founders of the Coalition were interviewed specifically for this chapter in 2013.

The Texas case study has been informed by the ongoing dissertation research of Luke Macaulay that includes four ranch visits with private landowners offering hunting on their properties, a visit to a biannual spring meeting of the Simms Creek Wildlife Management Area, and interviews with eight private landowners in Central Texas. After a literature review and archival research, semi-structured phone interviews were conducted with eight additional individuals with a particular focus on Wildlife Management Areas in 2013: three current or former biologists with the Texas Parks and Wildlife Department, one cooperative extension county agent, and four private landowners who are officers in various Wildlife Management Associations in Texas.

The Malpai Borderlands Group: "implementing ecosystem management"

Headquartered on the Malpai Ranch outside of Douglas, Arizona, the Malpai Borderlands Group (MBG) is a grassroots, landowner-driven nonprofit organization that has a goal of implementing ecosystem management on 800,000 acres of unfragmented rangelands in southeastern Arizona and southwestern New Mexico (http://www.malpaiborderlandsgroup.org/). With one important exception – the huge Gray Ranch (also known as the Diamond A) – ranches in this area comprise a mixture of private and public lands, depending for a significant portion of their forage on leases to graze on state and federal lands. Land ownership in the area is 59 percent private, 11 percent national forest, 23 percent state land (Arizona and New Mexico), and 7 percent BLM.

The rangelands around Douglas are semi-arid, with an average precipitation of 360 mm (NOAA 2000). The desert grasslands are subject to invasion by mesquite (*Prosopis velutina*) and other shrubs, which reduce grazing capacity, soil cover, and habitat for grassland-dependent species. In 1991, several of the area ranchers met at the Malpai Ranch in the San Bernardino Valley to discuss what they saw as a deteriorating situation. The ranchers were concerned about the future of the rangelands they depended on for their livelihoods. The grasslands with some shrubs were moving inexorably to shrublands with some grass. The group believed that using fire to burn the grasslands was part of the solution. As Bill McDonald, one of the founders and leaders of the group said:

> Despite widespread acceptance of the need to reintroduce fire into the natural ecosystems of the Southwest, the maze of conflicting and overlapping regulations seemed even to the agencies to be a gridlock too tough to overcome.
> (http://www.malpaiborderlandsgroup.org/fire.asp)

The ranchers also believed that ranching itself was under attack by environmental groups and misunderstood by the public. They were concerned about the growing demand for residential real estate parcels that was driving the fragmentation of private rangelands throughout the region. The group decided that rather than retrenching, they should reach out to critics and find common ground.

For two years, a small group of ranchers and environmentalists, together with scientist Ray Turner, met to discuss their mutual concerns about the health and integrity of the land. Calling themselves the Malpai Group, after two years they crafted a mission statement and agenda addressing the threat of fragmentation and the declining productivity and loss of biological diversity accompanying the encroachment of woody species on grasslands. The consensus of the group was that more government regulation was not going to help, but would just replace one set of problems with another. The inevitable result would probably be fragmentation into low density residential development. They decided that their solutions should involve good science, a strong conservation ethic, be economically feasible and be initiated and led by the private sector with the agencies coming in as partners, rather than with ranchers as clients.

In 1994, the Malpai Borderlands Group incorporated as a nonprofit organization, capable of accepting tax-deductible contributions and of holding conservation easements. A conservation easement is a legal document by which a landowner conveys certain specific rights, usually associated with the development of land, to another qualified entity for safekeeping. The Board of Directors includes local ranchers, and scientists and other stakeholders. The mission statement of the Group reads as follows:

> Our goal is to restore and maintain the natural processes that create and protect a healthy, unfragmented landscape to support a diverse, flourishing community of human, plant and animal life in our borderlands region. Together, we will accomplish this by working to encourage profitable ranching and other traditional livelihoods which will sustain the open space nature of our land for generations to come.

Fire plan

Fire suppression was believed to be a major factor in the accelerated encroachment of brush in the twentieth century and many ranchers, as well as others, felt it was time for fire to regain its evolutionary role in the ecosystem. The Malpai Group invited the land management agencies to work with them to coordinate fire management throughout the area. The response from the agencies was favorable. The Forest Service, the Bureau of Land Management, the State Land Departments

of New Mexico and Arizona, and the Natural Resource Conservation Service agreed to cooperate with the group in identifying where fires would be suppressed and where they would be allowed to burn. Over the longer term – it took more than a decade – a Comprehensive Fire Plan was developed to facilitate prescribed fires as well. These efforts not only helped increase the amount of rangeland burned, but also helped improved inter-agency and agency-rancher coordination more generally. As one state lands manager remarked:

> Having a coordinated group helped us work together, because everything was laid out beforehand. The fire management plan designated areas such that if a fire started we would let it burn in that area, and ranchers knew that, and we would let go or suppress a fire based on the plan. Everybody knows what is going on and is on the same page.

Grassbanking

The Group also invented the concept of "Grassbanking," by which neighboring ranchers could rest their ranches from grazing by moving their herds to the Gray Ranch to enable conservation practices such as prescribed fires, reduce the impacts of drought, or in exchange for conservation easements on their private lands (Gripne 2005; White and Conley 2007). Although novel for the US West, Grassbanking is reminiscent of what has been termed "reserves" for traditional pastoralists (Fernández-Giménez and Le Febre 2006).

Land conservation

The Nature Conservancy began to work with the group on land conservation issues shortly after it purchased the 235,000-acre Gray Ranch in 1990. The Conservancy was looking to sell the ranch, and the community feared that the buyer might be the federal government. Instead, a local rancher offered to create the private Animas Foundation to purchase the Gray Ranch with conservation easements that forbid development and protect the ranch's native biodiversity (Sayre 2005).

Since that time, the Malpai Borderlands Group has acquired conservation easements on 85,252 acres of private land on 13 ranches. Nine of the easements were purchased outright for cash, with the purchase price determined by appraisals that compared the market value of the particular ranch with and without the easement restrictions. The other four easements were obtained in exchange for access to the Grassbank: the value of the easement – measured as just described – determined the amount of forage provided on the Gray Ranch, measured in market prices for private rangeland leases.

The easements apply only to the ranches' private (or deeded) acres. But they also all contain a clause which provides for extinguishment of the easement, by mutual agreement of the MBG and the landowner, in the event that the ranches' access to public lands for grazing is lost through no fault of the parties to the easement. The ranchers were not willing to encumber their private lands without such a clause, because their viability as livestock operations depends on their

access to state and federal lands. Interestingly, interviews revealed that even with the clause, Malpai's easements have strengthened relations between ranchers and agencies, because the agencies recognize the benefit of preventing development of private lands to the conservation of adjacent public lands. In effect, the clause holds *both* the ranchers and the agencies to a higher standard of cooperation and effective management, as the former seek to maintain their leases and the latter seek to prevent the clause from being exercised (Rissman and Sayre 2012). As one agency employee put it:

> If grazing was abusive and not living up to the ideals of the group in the first place, we would work with the group to try to change the practices before we stopped the grazing; we would work with the group to put pressure on the rancher.

Mutual benefits

Agency personnel interviewed stated unanimously that the Malpai Borderlands Group's work benefited them in multiple ways. Urban encroachment and fragmentation of ranch lands would increase fire suppression needs and costs, make management with prescribed burning more difficult, and create conflicts between the management practices and land uses of adjacent private and public lands. Large undeveloped ranches create a buffer around public lands. Agency personnel felt that they already had a connection, a shared commitment to conservation, when they worked with Group members. As one interviewee commented:

> conservation easement [ranchers] have more of a land ethic... They manage more holistically, more for the long term … if it [the ranch] has an easement, you know things are going to stay around. You walk into a ranch that has an easement, even the crustiest guys have long term plans and objectives. They make infrastructure investments, graze lighter, manage more effectively.

The Group also carries out a wide range of conservation programs and activities, including land restoration, endangered species habitat protection, cost-sharing for range and ranch improvements, and erosion control projects. They hold an annual science symposium attended by ranchers and agency personnel and have a science advisory panel that meets with the Board of Directors. As Executive Director Bill McDonald has explained:

> We have proved to the toughest critics that private sector leadership works by completing the first approved fire prescription ever for the Borderlands region, ending over 80 years of fire suppression. It involved two states, four private landowners, two BLM districts, two state land departments, the Forest Service, the Game and Fish departments in two states, the U.S. Fish and Wildlife Service, a proposed Wilderness Study Area, the Endangered Species Act, and the Antiquities Laws, and coordination with Mexico.

Endangered species

Efforts by ranchers to protect wildlife have also been promoted by the group (Allen 2006). When a drought in 1994 threatened to dry up the water source for two populations of endangered Chiricahua Leopard Frogs, the Magoffin Family began to haul water to a pond. They furnished about 1,000 gallons a week all summer, and the frogs were able to survive. The Malpai Group reimbursed the Magoffins for a portion of their expenses. This "frog project" has now grown into a major effort involving Arizona Game and Fish, US Fish and Wildlife Service, the University of Arizona, and biology classes in the public schools in Douglas, Arizona. Several agency- and Malpai Borderlands Group-supported projects enabled the Magoffins to drill wells and to provide pipelines and ponds to keep the frogs prospering, while providing much-needed cattle water (Allen 2006). In 2008, the MBG and the US Fish and Wildlife Service signed a Habitat Conservation Plan covering 19 rare species of fish, wildlife, and plants. The HCP ensures ESA compliance for ranching and conservation activities in the area, reducing uncertainty and legal exposure and facilitating inter-agency coordination for activities such as prescribed burning.

In March 1996, rancher and guide Warner Glenn encountered a very rare Mexican Jaguar while hunting mountain lions along the New Mexico–Arizona state line. Warner's photos of the cats were published in the book *Eyes of Fire*. A portion of the proceeds from that book is placed in a fund to compensate ranchers who can document losses of livestock to jaguars and to fund jaguar research in Arizona, New Mexico, and the nearby Sierra Madre of Mexico. Efforts of the Malpai Group to encourage research and management of this animal have resulted in an active Jaguar Management team in the Borderlands region, under the leadership of the Arizona Game and Fish Department (Allen 2006).

California Rangeland Conservation Coalition: "Working to keep ranchers ranching"

California ranchers not only work with a large number of agencies and conservation groups, but they engage in very diverse forms of production. Cattle are the predominant livestock, but there are also sheep producers and a few goat operations. Meat and dairy animals graze on rangelands, and grass fed, natural, and conventional products are produced. Proximity to large urban markets means that niche marketing opportunities influence range decisions. Ranch lands are under pressure from social demand for recreation areas, preserves, and "open space" (undeveloped land). In addition, California Mediterranean rangelands are highly desirable for suburban and ranchette development, and ranch lands are usually worth magnitudes more for development than for production. This "development pressure" has a major effect on the ranching community and is the scourge of conservationists. Although about half the state is in federal ownership and protected, this land is largely forest and desert, while the rangelands of the coast and Sierran foothills are the richest wildlife habitat in the state and are in the majority privately owned.

Table 4.1 Ways the Malpai Borderlands Group, a grassroots governance group, helps to maintain rancher ability to benefit from public and private rangelands

Obstacles to ability to benefit for ranchers using state and federal lands	*Individual capacity to respond*	*Collaborative capacity to respond*	*Benefit to agency from collaborative group*
Agencies: agency personnel uninformed about grazing, concerned about impacts, restrict grazing, disagreements with agency managers	Make one-on-one connections, graze only private land, hire consultants, legal actions	Work with leadership of diverse agencies; put on symposia, meetings, and events to increase communication, support research; ability to lobby agencies, political clout; network of experts	Work with and negotiate with group representatives instead of many individuals; develop networks and information; mediation of conflict; working with members is easier.
Development: urban sprawl breaks up community, restricts management options, creates neighbor conflicts	Work with planning departments, vote, put easement on own land, work with neighbors	Create community commitment to ranching landscape, healthy rangelands; coordinate and encourage conservation easements, strengthen community	Lower costs of management, buffers of private land around public lands
Resources: Lack of information and assistance about impacts of grazing, management, monitoring, available grants and programs	Advisory agencies, cooperative extension	Support for ecological and social research, university positions, extension and advisory services; network of expertise, symposia, meetings, and events for knowledge-sharing	More informed lessees, mediation, monitoring. Better management of associated private lands
Regulations: restrictions on burning, liability	Try to get attention of agency to burn or get equipment and resources to do own burning.	Fund research on benefits of fire; create cross boundary burn plan	Improved ability to conduct prescribed burns and/or use "let burn"' policy; less liability for fires crossing property lines if neighbors are in the burn plan
Context: unpredictable drought, loss of forage to fire or restoration projects	Purchase hay, sell animals, lease forage	Grassbank provides reserve forage, leased forage from Gray Ranch	Easier to carry out restoration project, restrict grazing when needed
Other users: Integration with other uses of public lands, environmentalist hostility to ranching	Rely on "multiple use" doctrine for public lands	Creates lobbying group for maintaining rancher "right to benefit" from state and federal lands; publicize stewardship of ranchers	Helps agency work with multiple constituencies

After a decade or two of combative relations, the California Rangeland Conservation Coalition was born out of a recognition that this habitat would largely be lost if the ranching and environmental communities did not work together. A ranch in the San Francisco Bay Area was the backdrop for a meeting between environmentalists, ranchers, and resource professionals from federal and state agencies in the summer of 2005. Out of this meeting of former foes came a resolution documenting common ground for the conservation of the rangeland encircling the Central Valley, including the Sierra Foothills and Interior Coast Ranges. Together these signatories form the California Rangeland Conservation Coalition. The signatories have pledged to work together to preserve and enhance California's rangeland for species of special concern, while supporting the long-term viability of the ranching industry. Signatories either conceptually support the work of the Coalition or are actively engaged in working with other partners to fulfill the underlying principles of the Coalition stated in the resolution and outlined in more detail within a strategic plan (http://www.carangeland.org/).

Unlike the Malpai Borderlands Group, the Rangeland Coalition includes a large portion of the state with both rural and heavily populated areas, and from the outset included agencies and environmental groups as well as ranchers. As urban development, conversion to more intensive forms of agriculture, and land acquisition for preserves or recreation continue to shrink the private rangelands available for grazing, California ranchers typically obtain a quarter to half of their forage from government-owned rangelands. The types of government ownership are quite variable. Some BLM and USFS land is grazed, the US Fish and Wildlife Service, regional and local parks, and utility districts lease significant amounts of lands for grazing, as do state agencies like the Department of Fish and Wildlife. Numerous private conservation reserves, large and small, lease land for grazing, including those managed by groups like the Audubon Society, the Nature Conservancy, land trusts, and a host of others. Interviews with ranchers around the state have revealed that many manage a complex portfolio of owned and leased lands, leasing from government agencies, but also from private landowners who have retired from ranching, own land for investment, or own land for non-ranching purposes. A rancher in the Sierran foothills told interviewers that he used 14 different leases (Sulak and Huntsinger 2007), while another claimed in a 2012 study to have 33 small leases scattered throughout his local area, some grazed by only small groups of cattle. Competition for leases is fierce, and it is not uncommon for ranchers to submit bids for leases that require substantial commitment to stewarding and improving the range.

The Coalition has for the past seven years held an annual Summit. The Summit is an opportunity to hear from researchers about the ecological benefits of grazing and more. Scientists, environmentalists, and ranchers present on rangeland restoration and improvement projects. The 2013 Summit was attended by more than 400 people from across the state (carangeland.org/calendarevents/2013summit.html). An important goal for the Coalition is to inform the public and agencies that ranching is not only a preferred land use

compared to development, but also is an essential resource management tool and can be used to benefit wildlife.

California Rangeland Resolution

The California Rangeland Resolution states that the diversity of the species rangelands support is largely due to the grazing and other land stewardship practices of the ranchers that own and manage them. The resolution was signed by over 100 agricultural organizations, environmental interest groups, as well as by state and federal agencies. New signatories continue to sign on to the resolution on a regular basis. Developing the wording for the resolution was a challenge, because the right balance had to be found so that ranchers and environmental organizations would all feel comfortable signing on. Karen Sweet, a prominent rancher and one of the Resolution's authors, recalls:

> We needed to create a statement about what we all cared about, what we had in common. A committee of 6 was charged with authoring it including ranchers, and representatives of agencies and conservation organizations. We all cared so much about these rangelands, and we learned a lot over the course of putting the language together. Someone would suggest a word, and others would ask what it meant. We had to keep the right tone, and make it layman friendly. It was hard work, but we evolved a common language.

A critical part of obtaining so many signatories was a growing body of research, as well as a number of spectacular conservation failures, that indicated grazing is beneficial and sometimes necessary for maintaining viable wildlife habitat for a number of species of animals and plants. These include species on the endangered list, as well as wildflowers enjoyed by the public. Tim Koopmann, a member of the Coalition in the San Francisco Bay Area, has described his experience with the endangered callippe silverspot butterfly (*Speyeria callippe callippe*). The larvae eat one species of plant only, the yellow pansy, or "Johnny jump-up" (*Viola pedunculata*). On his ranch there are an abundance of Johnny jump ups, so he sold a "mitigation easement" to provide habitat for the butterfly on his ranch when a golf course was developed nearby. On adjacent land protected by the city, cattle were excluded, and the butterfly nearly disappeared. He now has an agreement with the city to graze the city's land to enhance habitat for the butterfly. As in so many cases, the flora the butterfly needed was dependent on grazing to reduce the stature of the invasive exotic annual grasses that now dominate the California grassland. As Tim Koopmann said himself:

> The biodiversity developed over 1000s of years with grazing of some kind. Previously, it was wildlife. Today, grazing can be a tool that is effective in maintaining that biodiversity.
>
> (The Independent, Livermore, 2009)

A similar case was documented for the endangered bay checkerspot butterfly (*Euphydryas editha bayensis)*, south of San Francisco, and further linked to nitrogen deposition that increased grass growth (Weiss 1999). These and other similar cases have lent considerable support to the Coalition's efforts to promote rancher stewardship of wildlife and land. In Coalition publications ranching is linked to conservation and production of pollinators, birds, salamanders, game, native grasses, wildflowers, heritage values, fire resistance, and natural beauty, among other things (http://carangeland.org/stories.html).

In addition to numerous accounts by experts, landowners, and managers, the scientific literature includes findings that support the benefits of grazing for wildlife and plants. Those shown to benefit from grazing include burrowing owls (*Athene cunicularia*) (Nuzum 2005), insects (Dennis *et al.* 1997), kit fox (*Vulpes macrotis mutica*) (USDA-FWS 2010), kangaroo rats (*Dipodomys stephensi*) (USDA-FWS 1997, Kelt *et al.* 2005, Germano *et al.* 2012), wildflowers (Barry 2011), and a host of rare flora and fauna associated with vernal pools (Marty 2005, Pyke and Marty 2005). There are numerous additional anecdotal accounts. In the case of the tiger salamander, continued research has demonstrated the preference of the species for grazed, muddy ponds. Another endangered species, the red-legged frog, also seems to flourish in grazed ponds. This has come as a surprise to the ranchers themselves. As Darrel Sweet, a leader in the Coalition and member of the Board of Directors of the Rangeland Trust, described it in 2013:

> About 15 years ago I was asked to go on a tour of a local Wilderness area with members of their board of directors and senior staff… So we loaded up at the park headquarters and proceeded to climb up a rather steep road. When we stopped at a flat spot the first thing we saw was a stock pond. Obviously it was heavily used by the cattle which, as the only rancher on the bus, was why I thought this was not going to be a fun trip. After we stopped their staff biologist asked if anyone on board had ever seen a red-legged frog, which few had. So he grabbed his net and we unloaded the bus. Most walked carefully to the edge of the pond and watched as the biologist netted a large red-legged frog. He went on to explain why the park removed the fencing they had originally installed to exclude the cattle from many of their ponds as a frog protection effort. This pond had never been fenced and had one of the highest numbers of frogs of any of their 80 or so ponds surveyed/studied.

Sharing the benefits of grazing for wildlife is one way the Coalition gains support and represents its membership. Promoting a positive role for ranching not only encourages the conservation community to support efforts to maintain it, but helps ranchers gain access to public lands and NGO preserves. As rangelands are in short supply and competition for leases is high (Sulak and Huntsinger 2007), this is key to supporting the ranching community's "ability to benefit" from California rangelands.

Land conservation

Most ranchers prefer to stay in ranching and to see the landscape remain a ranching landscape. They depend on a "critical mass" of ranchers to maintain ranching infrastructure such as veterinary services and feed suppliers in an area (Liffmann *et al.*, 2000). Yet they also insist that they should retain the right to do as they like with their land, including selling it to development if needed. The Coalition works to maintain the existence of rangelands and ranching through voluntary, private sector land conservation, largely in the form of conservation easements. Because the conservation community also recognizes the value of unfragmented habitat, and the role of ranching in maintaining large areas of habitat, this is another area of focus for the Coalition.

One of the first things accomplished by the Coalition was to create a map of high priority areas for wildlife and plant conservation in the state, defining rangeland areas that should be protected from development (http://www.carangeland.org/images/Rangeland_Coalition_Map.pdf). Coastal prairies were left out of the prioritized lands because according to Karen Sweet:

> The environmental community was not sure that grazing could provide positive benefits on this type of grassland. We had to make places where there was consensus about the benefits of ranching our priority.

Like the Malpai Borderlands Group, the Coalition is committed to private sector initiatives. Conservation easements appeal to rancher members as a tool because the rancher remains in control of the land and makes the management decisions. According to Karen Sweet, a key concern of the ranching community is that "someone might take away their land or tell them how to manage it." Some ranchers do not believe that the Coalition's environmental signatories really care about the economic viability of ranching. In general the ranching community already feels "over-regulated" (Liffmann *et al.* 2000), and it is important that easements remain voluntary and that easement requirements are clear and minimize interference in ranch management. The California Rangeland Conservation Coalition also has a land trust to which they are closely allied: the California Rangeland Trust. The trust emphasizes that it was founded by ranchers and knows how to work with ranchers (http://www.rangelandtrust.org/). As stated on the website:

> We are … proud of the trust we have established within the landowner community. From its inception, the Rangeland Trust has demonstrated that we share the same values important to ranching families. Additionally, we bring the ranching and environmental communities together to cultivate shared efforts to protect open space and the western lifestyle.

Key benefits of easements for the conservation community are that obtaining easements is less expensive than acquiring land, so more land can be conserved; and the land is managed by the rancher. Costs of management are proving

difficult for public entities to sustain, as exemplified by the closure of some of the California State Parks because of a shortage of funds for management. Public agencies and NGOs alike recognize the importance of unfragmented landscapes and buffer areas to long-term conservation.

Involvement in land use planning is more fraught with difficulty. Some in the ranching community view planning as "regulatory" and fear that it sets limits on their ability to use their property without government consent or compensation. In other words, to tell a rancher that they cannot sell or develop their land is unfairly asking them to bear the conservation burden. On the other hand, the Coalition is interested in Habitat Conservation Planning (HCP), where habitat may be set aside through purchase or easement. The Coalition favors the easement approach, where the ranching enterprise remains as part of the community that supports ranching infrastructure and community. Often they find that ranch land is not recognized as agricultural land and HCP projects inadequately consider the need to maintain grazing and ranching in the area. Once again, clarifying the importance of grazing to species that are often central to HCPs can help to gain the attention of the planners.

As the subject of land conservation is a complex one for the ranchers, there have been controversies when an agency has proposed an easement project for example. The Coalition can provide advice and a network for outreach to ranchers. Hearing about one easement program proposal that engendered considerable controversy among local ranchers, Darrel Sweet commented that:

> Why didn't they have a rancher explain it to the ranchers? That's all they needed to do.

Ranchers, as with most cultural groups, prefer to learn from their peers and Coalition representatives can help with communication and outreach to ranchers on projects they support. Coalition members can also help a rancher communicate with an agency lessor, for example, when disputes arise, and vice versa.

Strategic plan

The Coalition has developed a strategic plan that lays the foundation for signatories to work together to acquire additional federal funding for conservation programs, coordinate permitting processes, garner support for cooperative conservation projects, fill research gaps, conduct outreach on the positive role of managed grazing and provide incentives for ecosystem services. In some cases, research on the benefits of grazing has led public agencies to develop complex grazing plans that ranchers, concerned about marketing their livestock, find difficult to accommodate (Germano *et al.* 2012). As one lessee remarked in the 2011 interviews:

> Regulations and standards vary between agencies, making it challenging to do business … [On some lands] public lands management has set a standard that's virtually impossible for a private landowner to follow and stay in business.

Table 4.2 Ways the California Rangeland Conservation Coalition helps ranchers maintain the ability to benefit from private and public rangelands in California

Obstacle to ability to benefit for ranchers using diverse public lands via lease and permit	*Individual capacity to respond*	*Collaborative capacity to respond*	*Benefit to agency from collaborative group*
Agencies: agency and NGO personnel uninformed about grazing, restricting or eliminating it on public lands whenever possible	Work with knowledgeable individuals and agency reps, graze only private land	Work with leadership of diverse agencies; put on symposia; support conservation easements and conservation grazing; Rangeland Resolution	Improved land management, better communication among rangeland managers via external and internal networks and access to research. Easier to work with leaders than many individuals
Resources: lack of information and assistance about impacts of grazing, management, *monitoring*	Private consultants	Support for ecological and social research, university positions, extension and advisory services	Advisory services help create a more informed lease process, mediation, m*onitoring. Better* management of associated private lands – able to influence management
Development: Urban sprawl and loss of ranching infrastructure, rural environment; neighbors that do not understand ranching	Sell ranch and buy a ranch away from developed areas	Promote conservation easements, California Rangeland Trust	Reduce costs and habitat losses associated with sprawl; provide buffer areas
Regulations: complex and sometimes conflicting regulations, complex permitting processes for improvements, cost-sharing projects	Try to understand, hire private consultants, try to get assistance	Lobby to streamline and coordinate regulations; bring agency representatives and managers together at events and meetings; strategic plan	Lower costs of enforcement and monitoring; enhanced habitat diversity

Regulations: disagreement with landlord, private or public	Get help from private consultant, cooperative extension	Network of experts to draw on, sometimes presentations to boards, interest groups	Informal mediation of conflict
Regulations: shortage of available leases; increasingly complex lease requirements	Compete: hire private consultants	Learn how to write appealing conservation grazing bids; symposia educate lessors about needs of ranchers	More knowledgeable lessees; more successful leases that achieve conservation goals
Context: drought, variable income from livestock production	Diversify	Support incentives, payments for ecosystem services, cost-sharing programs	Positive way to work with landowners
Other users: integration with other uses of public and private land	Be friendly and compliant	Demonstrate benefits of grazing to plant diversity, weed control, wildlife, fire hazard reduction; and research showing grazing harms can be mitigated	Improved habitat, reduced fire hazard

On the other hand, agency interviewees often lamented that finding employees or ranch hands who can herd cattle, work with agency employees, and attend to the ecosystem as requested by agencies is a challenge. "Good employees who can manage cattle and rangelands at the same time are hard to find" was a common statement.

The Coalition works to inform agency managers of the economic constraints of livestock producers and to help managers learn about ranching, and at the same time helps ranchers learn about the requirements the agencies must meet.

While cost-sharing programs and other incentives programs are offered to ranchers by federal and state governments, in too many cases the oversight requirements and paperwork are quite onerous. A rancher related the paperwork and bureaucracy associated with obtaining cost share funding for fixing a pond that was home to the endangered tiger salamander. Not only was the paperwork complex, particularly because more than one agency was involved, it was very difficult to get the agencies to respond in a timely way and to come out as required to observe the work. As one Coalition member put it:

> We had to plan the repairs to avoid affecting the breeding of the salamanders, but the agency was so slow that we couldn't even do it that year, after we had gone through all the other processes to get the permit and had the equipment ready.

The Coalition tries to work with agencies to help streamline such processes, and to facilitate communication and land use decisions. One problem pointed out by Karen Sweet is that it is difficult to reach the consultants who advise the regulators and owner-decision makers. Because of this, some regulatory efforts do not fit the conditions in California, calling for fencing cattle out where they are needed to manage the habitat and so forth. The Coalition sponsors ranch tours and workshops, bringing together experts, ranchers, and regulators in an effort to get the word out about maintaining grazing and ranching.

While the Coalition's original focus was on private land conservation, emphasis has grown to include the need for grazing as a tool for public lands management as well. Among its many activities the group gives its opinions on legislation, lobbies in the state and Washington D.C., produces publications, gives presentations, and writes letters of support for research funding that they believe will build bridges among signatories, inform grazing management, and find ways to support the viability of ranching.

Texas Wildlife Associations: "enhancing land and wildlife stewardship"

In many parts of Texas, hunting of game species has been an integral part of livestock ranching, with the commercialized value of hunting increasing rapidly since the 1970s. One way to diversify, and increase total income or benefits from the land, is to manage for commercial hunting as well as livestock production.

In the United States, most wildlife is under state trusteeship. The ability to use private lands for hunting is constrained by state wildlife regulations, the wildlife resource itself, and the rancher's own management capacity. Game animals, unless they are confined domestics or exotics, cross property lines, making effective management more dependent on coordination among landowners, especially in areas with smaller land holdings. Ranchers wishing to sell hunting opportunities must comply with state hunting regulations and regulatory agencies, but are also affected by the management practices of their neighbors. Wildlife Management Associations (WMAs) help ranchers by improving coordination with neighbors and regulators, understanding of game regulations, and integration of hunting with livestock production (Lyons and Wright 2003). The first known WMA in Texas was established in 1955 and operated in the three corners region of Bee, Goliad and Karnes counties. The first modern day WMA in Texas, the Peach Creek Wildlife Management Co-op, was organized in 1973 with the help of Texas Parks and Wildlife Department (TPWD) wildlife biologists (Texas Parks and Wildlife 2004).

As the population continues to grow in the Texas, and lands are divided (often through inheritance), the overall ownership sizes of rural land tracts are shrinking (Wilkens *et al.* 2009). In addition, while livestock production produces low and variable income on a per hectare basis, the recreational value of rural land is increasing. Hunting, fishing, and recreation in scenic areas are major interests of city dwellers seeking an escape to the countryside. Newer landowners are increasingly interested in wildlife and habitat management, but highly fragmented ownership patterns make management of wildlife habitat difficult (Wagner *et al.* 2007b). Fragmentation is also affecting water and brush management, and wildlife management associations build relationships that can help with collaborative management for other resources. While primarily oriented to improving habitat for game species, wildlife management associations have helped landowners garner additional income from hunting fees, and the social organization of these associations has fostered increased communication and cooperation among landowners. This in turn has led to improvements in knowledge-sharing about livestock practices through participation in educational events and improved range conditions for both livestock and wildlife. Managing for wildlife not only augments rancher income, but incentivizes managing for native species.

In 2007, more than 85 million ha of private lands in Texas were managed for hunting enterprises, charging fees commonly ranging from $15 to $25 per ha, or more. In prime habitat hunting revenues may be greater than those from ranching or crop production (Wagner *et al.* 2007b). As a rancher in San Saba County, Texas, commented in 2013:

> Main thing is, if we do protect our wildlife, then our ranchers stand a chance of being more productive as far as the bottom line for the ranching operation. It helps the bottom line, it really does.

Mike Krueger, a retired TPWD Technical Guidance Biologist, added in a 2013 interview that:

> Running livestock is a kind of break-even proposition, some years you make money and some years not, there are a lot of input costs, but when it comes to leasing wildlife, a lot of that is pure net, not a lot of landowner input is needed to maintain a commercial hunting operation, or to maintain your habitat. If hunters want to build a cabin, they pay for it, the net profit from hunting has always been a lot greater than from the livestock operation.

The Texas Organization of Wildlife Management Associations (TOWMA) (www.towma.org) is a nonprofit NGO founded in 1996 to coordinate a large number of Wildlife Management Associations in Texas. TOWMA promotes coordination between wildlife associations by providing a forum for the exchange of ideas and information. This forum helps maintain interest among existing WMAs and supports the establishment of new associations. TOWMA currently represents over 60 WMAs in 33 counties of Texas and these WMA member landowners total more than 3,000 and control in excess of 1.5 million acres of Texas wildlife habitat. As a collaboration of collaborative programs, TOWMA argues that:

> We exist for several reasons, including the fact that there is strength in numbers. While individual wildlife associations or burn associations may consist of dozens or hundreds of landowners, TOWMA, by bringing them all together, represents thousands. Consequently, TOWMA is more likely to be listened to when addressing issues at the state and national level that affect landowners, land owner's rights, and wildlife in Texas.
>
> (www.towma.org)

Managing a transboundary resource

White-tailed deer, quail, turkeys, doves, and waterfowl are common pool resources that are typically managed for hunting in Texas. Some landowners have also begun managing for birds of interest to recreational birdwatchers. Because game animals often cross property boundaries, their management may depend on the decision-making of the many different landowners owning properties within an animal's range. Managing for quality deer hunting requires adherence to harvest criteria for males and females over a large area. Maintaining sex ratios that result in adequate mature males for harvest depends on cooperation among neighboring landowners to establish rules for hunting and make sure they are followed.

Wildlife management associations (WMAs) have become a popular mechanism for coordinating wildlife management decisions in Texas, and applying game management programs supported by the state (Wagner *et al.* 2007b). Collective decision-making can be fostered through group interaction that builds social capital, including shared norms and goals. As TOWMA puts it:

> quality deer management is not a realistic goal for individual properties under 5,000 acres because mature bucks may range 6 miles or more during the rut. Even after being informed of this complication, most landowners still want to produce trophy bucks in the hope that they will occasionally see one. These small landowners must be prepared to share the fruits of their labor with their neighbors and/or their neighbor's hunters … The concept behind wildlife management associations is founded in that simple truth. Since we are forced to share the fruits of our labor, why not share the labor as well? If we have similar goals, and can increase the likelihood of attaining those goals by working together, why not do it?
>
> (www.towma.org/the_wma_solution.html)

Research has demonstrated that Wildlife Management Associations in Texas contribute to building social capital among landowners, especially when meetings are frequent, and landowners are resident and have owned the property for a long time. The state benefits from these associations by being able to promulgate policies for game management across large areas. Creating a setting that fosters cooperation may also help Texas landowners manage brush with fire, protect watersheds, and maintain scenery (Wagner *et al.* 2007b). In a study of wildlife management associations in the Post Oak Savannah region, Wagner *et al.* (2007b) found that association goals included making habitat improvements, increasing deer numbers through importation of deer, and balancing deer sex ratios to produce more high quality hunting animals.

Wildlife agency personnel value the ecological outcomes of cooperation among landowners, but they also recognize the social values. Quoted in a state guide for wildlife management associations, Mike Kreuger stated:

> It is always gratifying to me to see a group of neighbors (who may have thought that they had nothing in common) realize that they share a common interest in wildlife … It is amazing how getting together, whether it be for a WMA meeting or riding together in the back of a pickup truck for a deer census, can break down barriers and dispel rumors. I personally feel that the social benefits of a WMA are just as important as the biological benefits.
>
> (TPWD 2004: 5)

A Coryell County rancher commented in 2013 that:

> Our association is not all that active. The best result we get from it, it helps neighbors know one another, neighbors get to talk about an issue, a pretty large percent of landowners aren't residents, maybe 50–60%. We don't help out on livestock, but if cattle get out, get through the fence, you can call your neighbor … That's one of the advantages.

In Texas, hunting is regulated by a central authority, the Texas Parks and Wildlife Department. It is to the benefit of ranchers to work closely with the

Texas Parks and Wildlife Department to support development of management plans that improve hunting values. For deer hunting, limits are placed on the number of deer a single hunter may harvest annually, but the number of hunters on a given tract of land is not regulated. Thus, in areas with small ownerships, overharvest of deer can be a problem (Wagner *et al.* 2007a). Wildlife Management Associations most often operate under a written wildlife management plan prepared by a TPWD wildlife biologist (Wagner *et al.* 2007b), carrying the approval of the regulatory agency. Landowners usually also agree to put forth a good-faith effort to get their hunters to comply with plan recommendations (TPWD 2004), and to collect standardized data and observations for monitoring game populations. A San Saba County rancher explained in a 2013 interview:

> We have 2 meetings each year … one in the spring when we go through and look at all deer harvested in past year, record and age them, to see if we're taking the right deer or not. Then in the fall we tally up the results of our spotlight surveys of the summer and plan a selective harvest of deer based on age and quality.

Texas Department of Parks and Wildlife

Being a state dominated by private land, in order to influence land and habitat management, Texas has fostered a collaborative relationship with landowners through wildlife management associations. The state provides a significant reduction in hunting lease license fees for landowners who participate in an association. By participating in many of the practices of the WMAs, landowners are often able to enter into the Managed Lands Deer Program which allows for more flexibility in harvest for hunters through targeted harvest strategies for individual properties.

To encourage landowner participation in programs that include technical guidance by state biologists, Texas has passed a law prohibiting the disclosure of information about a private property when technical guidance is being provided. This law helps encourage landowners to accept technical guidance when they may have endangered species on their properties, as otherwise disclosure of the presence of an endangered species on a private property might result in additional regulatory oversight for that landowner. As a result, landowners are more trusting and open to allowing state employees onto their property to receive technical guidance. Interviewees noticed varying opinions from landowners toward endangered species, with a tendency of more traditional landowners preferring not to know about the endangered species, but a different attitude emerging from newer landowners who were often excited about having these species on their properties (Homerstad interview 2013 and Krueger interview 2013). Interestingly, sometimes landowners who are loath to admit endangered species are on their property are eager to find them if a development project is underway as a way to block a project that would negatively affect their property.

Ranchers obtain substantial benefits through the associations, and may initiate an association in their area in order to improve the number and quality of game species available for their hunting enterprises. In the early development of the first WMAs in the state, Texas Parks and Wildlife biologist Dennis Brown told an interested landowner:

> One of you has to organize it, get it rolling and stay on top of it. Otherwise it just looks like the government is interfering in private business. We'll put on a program and help set up a wildlife management plan, but the establishment of the goals and commitment has to come from the landowners.
>
> (TPWD 2004)

In the state guidelines for wildlife management associations, the point is made that as wildlife plans succeed in producing more wildlife, WMA members and their families "often turn into wildlife activists – pursuing, watching and appreciating the animals they are aiding. Landowners earnestly begin to address habitat, managing and enhancing the vegetation and supporting conditions that are essential to all forms of wildlife" (TPWD 2004: 7). This is important from a conservation perspective because Texas has a high number of rare and endangered species. Gary Homerstad, President of TOWMA, pointed out in a 2013 interview that:

> One good thing is that with landowners cooperating, knowing each other, trusting each other, there is not as great a tendency to high fence their property.

Land fragmentation

Biologists working for the Texas Parks and Wildlife Department describe two types of landowners, the "new" landowner, who is often an urban resident and has little experience in owning rangelands, and "traditional" landowners who have more experience, sometimes multiple generations, in running livestock and harvesting game on their properties. They described the benefits of WMAs in educating new landowners about the use of fire on their properties as well as the benefits of targeted grazing. As Gary Homerstad observed in 2013:

> One survey found that in Washington County, 56% of people who own property don't live in that county, but lived in nearby cities like Houston or Austin. These landowners don't have relatives with ranching background, but the coops have helped even those people realize that they need to graze, they see what happens when they don't. Mowing isn't a viable management tool compared to grazing.

The TOWMA website talks about the problems of coping with land fragmentation, stating:

> Fragmentation usually … means more access roads, land clearing for home sites, out buildings, pens, fences, utility right of ways, and landscaping, all of which reduce the amount of habitat available to wildlife. This is usually compounded by more frequent use of the land by people, motor vehicles and domestic animals. Hunting pressure generally increases because family members and friends suddenly have access to the property. Herbicide, pesticide and other chemical uses increase. Habitat quantity is reduced, its quality declines, and wildlife is forced out or suffers from increased pressure. The only workable solution for small landowners in their quest for better deer, and quality wildlife of all types, is to work together with their neighbors and jointly manage enough habitat to support quality wildlife.
>
> (www.towma.org)

Mike Kreuger relates one case where WMA connections, or social capital, was instrumental in building support for efforts to stop an electricity transmission line from crossing ranch properties and impacting a river watershed.

Influencing policy

At the statewide scale, TOWMA believes that urban voters will ultimately control what happens on ranch lands. Like ranchers in Malpai and California, they are concerned with being "outnumbered" by a growing, non-agricultural population. However, by banding together, landowners believe that they can have more of an influence on state politics and the policies that influence them. The TOWMA website mentions the 1996 proposition allowing land shifted to wildlife management to qualify for agriculture tax appraisals, and regulations affecting which animals can be harvested, as examples of where working with legislators as a group helped to create and support policies that help ranchers maintain their ability to benefit from their lands (www.towma.org). Wildlife Management Associations actively supported the legislation. It provides significant tax savings over residential or unmanaged lands. The landowner needs to demonstrate management to propagate a sustaining breeding, migrating, or wintering population of indigenous wild animals for human use, including food, medicine, or recreation. Joining or creating a Wildlife Management Association that establishes practices that meet this requirement is one way to qualify, and is another way to share the labor required to meet requirements, conduct monitoring, and produce documentation.

Integration with grazing and vegetation management

Wildlife Management Associations can facilitate the development of other grassroots groups that help ranchers to benefit from their lands. TOWMA is seeking additional sources of funding to add full time staff in order to provide more services including support for Prescribed Burn Associations. Organizations whose functions complement TOWMA are considered for membership, including Prescribed Burn Associations, which provide fire training and promote prescribed

fire in their regions. TOWMA believes that memberships of this type are beneficial to both organizations since they expand membership, share resources and act as partners in enhancing habitat and wildlife in Texas.

A San Saba County Rancher, talking about his local WMA in 2013, responded to a question about prescribed burning with the following:

> It's something we're looking into more and more as a management tool, we don't have a burning association but have been talking about getting one started, to try to do some prescribed burning. There are so many liabilities, if fire gets out, then you're facing lawsuits and things like that, but it's something we've got to develop so that we can adequately manage fire. A burn would be beneficial to both livestock and wildlife, cut back on the less desirable species like mesquite and cedar, and keep the undergrowth under control.

Sharing liability costs, training, and equipment is one benefit that has been documented for Prescribed Burning Associations in Texas (Taylor 2005). Mike Krueger mentioned that some members of WMAs have talked about forming grazing associations so that they can move cattle herds from one ranch to another in a large-scale rotation, or at least to share rangelands (interview, 2013).

TOWMA works to continue and even increase the momentum of member organizations by conducting regular meetings and sharing information about successes in wildlife management and operations. Workshops on using burning and grazing may be advertised to members though a WMA. The President of TOWMA in an interview stated that one method for educating "new" landowners about grazing was to invite Cooperative Extension Specialists to speak at WMA meetings:

> At the meetings, they would almost always discuss types of grazing, stocking rates, timing and intensity of grazing. Grazing is so critical. We don't want to see someone hammering a place to death and overgrazing, but we don't want to see a place without any grazing either.

Mike Krueger mentioned in a 2013 interview that cattle grazing and deer management are very compatible. Gary Homerstad described the benefits of grazing, as well as fire, in 2013:

> [without grazing or fire] the grass becomes very thick and dominant, less forbs, which are more important to deer, quail, and turkeys. The forage value of a weed [broad-leaved plant] compared to grass is much better for deer. Deer can't digest grass compared to a weed.

TOWMA has a goal of sharing information and re-usable templates to help organizations avoid "re-inventing the wheel." Every other year a two-day Symposium is held that brings together some of the best wildlife professionals in the United States. Additional learning resources are provided in member

Table 4.3 Ways that Wildlife Management Associations help ranchers to maintain the ability to benefit from private rangelands using fire as a management tool

Obstacle to ability to benefit from private lands	*Individual capacity to respond*	*Collaborative capacity to respond*	*Benefit to agency from collaborative group*
Development: Properties too small to economically benefit from wildlife resource; land fragmentation; game have larger ranges than single property size	Limited because game cross boundaries	Community-level harvest recommendations and habitat management; improved quality of wildlife and resulting income through hunting leases; meetings and events to encourage communication, build relationships, develop plan with wildlife agency, encourage hunter compliance, coordinate with neighbors; support and clout for anti-development initiatives; tax relief and other benefits for wildlife management	Outlet for information about local game conditions; compliance with game plan; peer monitoring; improved herd management, influence on private lands; better habitat
Agencies: Standard wildlife and hunting regulations and fees, low ranching income	Comply with regional regulations	Enhance habitat collaboratively in exchange for increased hunting and harvest flexibility; encourage agency willingness to work with ranchers; work with legislature; training and safety programs; more political clout; reduced license fees for commercial hunting leases	Greater cooperation, safety, peer monitoring; work with leadership rather than many individuals
Resources: not knowing absentee neighbors and who to contact with problems like livestock escape	Make individual outreach effort	Meet neighbors and landowners across the area at biennial meetings; know who to call	Landowners contact each other directly instead of reporting to county agencies

Resources: lack of knowledge about game and habitat management	Engage with state or federal employees for technical guidance, hire private consultants	Biannual meetings and symposia with education and training; network of experts; support for university research, positions, extension and advisory services; source for credible information; support for other groups like prescribed burning associations; awards for stewardship and sharing of best practices.	Improved management, less conflict, influence on private lands
Context: brush encroachment reducing forage productivity	Clear brush or conduct prescribed burns	Learn best practices for brush control; share equipment; reduce risk and spread liability insurance cost	Improved range productivity and native species habitat
Other users: poaching and trespass	Watch own property	Neighbors watch out for neighbors	Reduced poaching
Other users: overhunting by neighbors so less game	Try to harvest it first or try to reason with neighbor	Peer pressure encourages landowners to act responsibly and to not overharvest the wildlife resource	Less over-hunting, higher quality and quantity of game species

newsletters and a website. TOWMA maintains a speaker roster for associations seeking expert speakers on a variety of subjects.

To sum up, wildlife management associations, often called "coops" in Texas, are primarily oriented to improving habitat for game species, but they have helped landowners running livestock garner additional income from hunting fees, and the social organization of these associations has led to the benefits of increased communication and cooperation among landowners. Those who have worked extensively with these associations believe that this has led to improved ability to run livestock successfully, and improved range conditions for both livestock and wildlife. WMAs work to dispel the notion that livestock are in direct competition with wildlife, and have informed landowners oriented toward hunting game animals that livestock are an important tool in habitat management for wildlife. WMAs have helped to encourage burning and have been the nucleus for development of prescribed burning associations and organizations to limit development. In some limited cases, they may even foster cooperation and sharing of grazing resources, although possibly due to the cost of transporting cattle to various small properties, this has yet to be adopted as a widespread practice.

Conclusions

In our three case studies, grassroots organization has helped maintain and increase rancher ability to benefit from rangelands. The need for a collaborative effort seems more obvious when grazing must depend on large amounts of land that are not owned by the rancher, yet even in Texas, where most grazed land is the rancher's, grassroots organizations develop to foster the web of social and institutional relationships that keep ranchers in place and help them benefit from their rangelands. All of these groups rely on creating connections among ranchers, and among ranchers and regulatory or management agencies, and sharing knowledge, labor, and resources. Each supports research and policy that benefits pastoralism in ways that an individual rancher cannot. All of them are involved in transboundary management, whether it is fire, wildlife, or maintaining a grazing calendar of several different ownerships. Finally, all of them argue that they are benefiting rangelands, including supporting biodiversity.

In the Malpai Borderlands, the need to use prescribed burning, maintain access to public lands, and stave off land fragmentation and development has led to the development of a grassroots rancher organization with a system of conservation easements whose permanence is linked to good treatment by public lessors, and a burn and land conservation plan that benefits both ranchers and fire agencies. When rangeland is largely owned by the government, finding points of leverage and strategies for negotiation become critical for maintaining a right to benefit, as well as ability to benefit, that in many places is growing increasingly tenuous due to larger-scale social, political, and economic changes. In California, the California Rangeland Conservation Coalition communicates the benefits of grazing to agency managers, and has produced a strategic plan for maintaining rangelands and ranching, in an effort to help keep the growing proportion of public and

reserved rangeland available for grazing. As private land is developed, lands set aside for mitigation or recreation are becoming a greater part of the rangeland portfolio for California ranchers. The Coalition also helps ranchers and agencies establish conservation easements and collaborative management programs, and learn about recent research results about grazing and the environment.

Finally, in Texas, wildlife management associations help ranchers marketing hunting opportunities to manage game in an increasingly fragmented landscape. By unifying the associations under a statewide network TOWMA has provided increased political influence for landowners. Wildlife Management Associations meet regularly, sharing best practices, supporting research, and helping ranchers work together to manage game and qualify for tax relief. In all three cases, public agencies are participants in the associations, but in Texas, one particular agency, the Texas Parks and Wildlife Department, is a critical facilitator, and benefits from the ability to influence management on private lands through wildlife management plans.

Pastoralists need lots of rangeland, because the production per hectare is low, and because forms of mobility are a common part of the annual calendar. Creating social connections, as illustrated by these case studies, is one way to maintain access to, and the ability to benefit from, rangelands in a changing ecological, economic, and social environment. These connections are important regardless of landownership.