

Overview Section: History

A Look Back at the Historical Role of Agriculture in the Rockies

By Patrick Creeden

THE 2010 COLORADO COLLEGE STATE OF THE ROCKIES REPORT CARD

Key Findings:

- 46 percent of land in the Rockies was claimed for agriculture during the homesteading period from 1862 - 1976.
- Since 1870, the weighted average farm size has increased by 938 percent.
- The peak of the Rockies farm population percentage was 35 percent, reached in 1920, today it is 2 percent.
- Since 1870 over 145,000 new farms have been added to the Rockies region.

Introduction

Each day in the Rockies, farmers and ranchers produce agricultural commodities that are traded and sold across the country and world, in small local farmers markets and on global commodity markets. This production takes on a variety of forms from large-scale milk production in the nation's fifth largest dairy in Hatch, New Mexico, to small organic farms on Colorado's Western slope. Agriculture in this region of the country, spanning across mountain valleys and wide open plains, and ranging from organic wool to grain for cattle, has greatly shaped the unique environment and culture of the West.

This year's *State of the Rockies Report Card* focuses on the many aspects of agriculture that have changed since the initial settlement of the West. Drawing upon results of the *2007 Census of Agriculture*, this report sketches the current condition of agriculture and how it has evolved over the past decade. Though the ever-changing Rockies region is fast urbanizing and the economic importance of agriculture has decreased over the decades, the historical, cultural, and environmental aspects of agriculture are critical in helping maintain the wide open spaces and rural ranches, farms, and communities so central to the character of the region. Given agriculture's importance to the region as a

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whole, this *Report Card* attempts to summarize many of the various components of agriculture: demographics, production, land, financial aspects, and farm organization. These sections of the *Report* quantify and examine the changing role of agriculture as an essential determinant of the culture and physical landscape of the Rocky Mountain West. This introductory section briefly outlines the historical role of agriculture in shaping and being shaped by the Rockies' land and environment, both key elements in the opening of the interior West.

Origins of Agriculture in the Rockies

The evolution of agriculture has altered, for better or worse, many aspects of this delicate region. In 1879 John Wesley Powell, a Civil War veteran, published an account of his travels across America's Frontier: *Report on the Arid Region of the United States*. His report detailed the people and places of the unconquered and undocumented western United States. Commissioned by Congress to survey much of the West and Southwest, Powell is most well known for his expedition down the Colorado River through the Grand Canyon. Included in his report were a number of observations and suggestions about how the West could become livable for Anglos from the East. He described what we now call the Rocky Mountain West as, "Within the Arid Region agriculture is dependent upon irrigation. The amount of irrigable land is but a small percentage of the whole area."¹

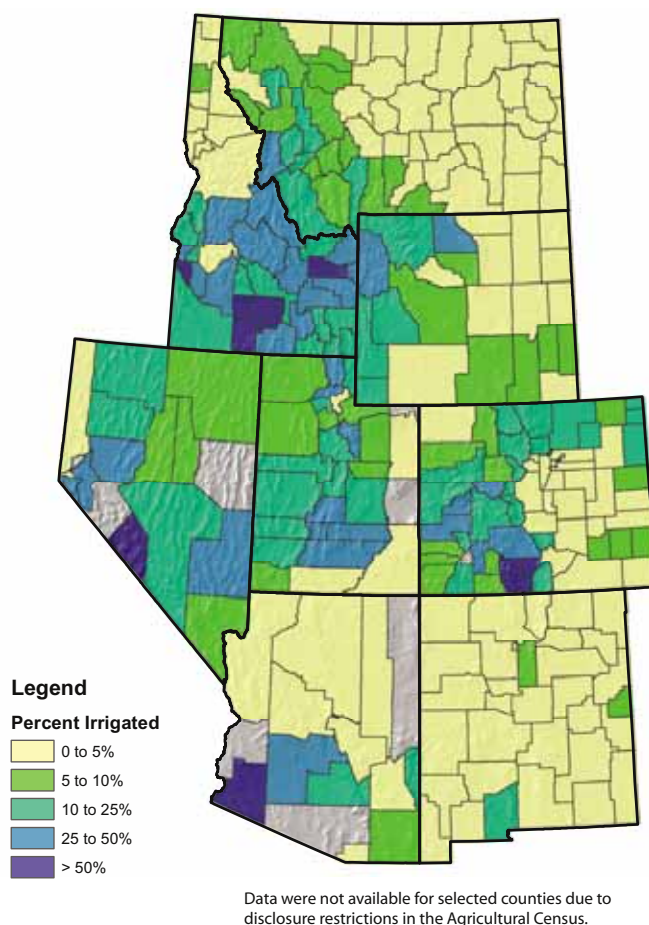
The water-starved West had supported American Indian and Hispanic agriculture for hundreds of years, but in its natural state would not be able to accommodate the increasing needs of settlers. Powell explained that given the climate and landscape of the West, this region only facilitated small-scale farming in the lower foothills and valleys where there was concentrated groundwater. Because of the cyclic drought possibilities, if the area was to support any large-scale agricultural production, major water diversion and irrigation projects would need to take place.²

Since John Wesley Powell's observations of the late 1860's, settlers in the Rockies have on a massive scale dammed rivers, built reservoirs, and diverted water for a number of uses. As population grew in the West, large quantities of water were diverted from rivers, used initially for mining and then later for agriculture and urban centers. This initial manipulation of the environment remains central to the viability of agriculture in the Rockies region today.

Both the agricultural and urban development of the West show humans' ability to alter and manage the arid regions of the Rockies. Establishing agriculture required the help of the federal government for land settlement, transportation, and infrastructure: all of which are foundations for farming and ranching in the Rockies.

It is difficult to quantify all of the agricultural production in the Rockies during the late 1800's because along with new Anglo settlers from the East, were the Hispanic and American Indian communities which had been farming for generations. The historical data in this *Report Card* deal mainly with crops produced by Anglo settlers,

Figure 1: 2007 Percent Irrigated Farm Land by County



Source: 2007 Census of Agriculture, National Agriculture Statistics Service, U. S. Department of Agriculture.

but despite our inability to quantify American Indian and Hispanic production, it was still present during this time. Many settlers grazed smaller herds of cattle and sheep, producing largely for themselves; no large-scale crop and grazing activities were present in the early 1800's. However, as the frontier became more populated, key acts and bills passed by the federal government and state governments as they entered the Union throughout the late 1800's assisted the growth and expansion of the entire western United States and its agricultural economy.

1862 Opening the West

At the forefront of legislation to open the West was the Pacific Railway Act of 1862.³ The Pacific Railway Act gave land grants to private railroad companies in return for construction of the transcontinental railroad. Not only did this land subsidy increase exploration of the West, but it also facilitated the building of a strong infrastructure of rail and associated communities and services, by which certain agricultural commodities would eventually be transported across the region and beyond. With a new method of efficient transit, farmers began to produce higher volumes of crops to meet growing demands for commodities in local towns and in distant markets alike.⁴

Although the railroads are not solely responsible

for the population boom, many companion legislative acts during 1862 aided expansion into the frontier. The United States Department of Agriculture (USDA), formed in 1862, was the first regulatory agency that set guidelines and monitored much of the agricultural production across the country. The USDA encouraged farmers to join co-ops and form alliances to improve the financial aspects of farming. The Morrill Land Grant College Act of 1862 set aside tracts of land throughout the West for the development of agricultural schools.⁵ These acts exemplified the national goals of improving and expanding agriculture across the West.

The Homestead Act of 1862 encouraged settlement in the western U.S. This legislative act gave various allotments of land to those who would spend a minimum of five years on each parcel to produce agricultural commodities. While the Homestead Act provided stability for new settlers, it drastically altered property distinctions and grazing patterns. The region once known as the open range began to be crisscrossed by barbed wire, delineating newly homesteaded private properties.⁶ Although the Homestead Act spurred migration westward, large-scale settlement would not occur until further infrastructure was established in the Rockies.

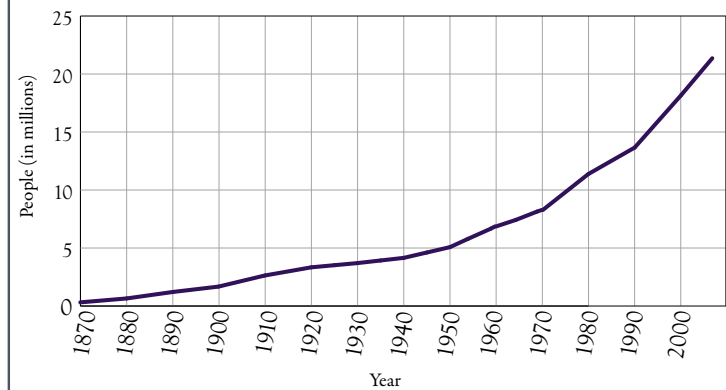
Growing the West with Water

As homesteaders and sodbusters acquired property to farm and ranch in the arid West, the region still lacked significant irrigation systems. To meet this need, the U.S. government passed the Reclamation Act of 1902. This act is arguably the single most important event

in creating organized, large-scale agriculture in the Rockies region. Large-scale damming of rivers diverted water and supplied farms and expanding towns of the West with more consistent quantities of water.⁷

The growing infrastructure for water systems made the West more habitable, motivating more people

Figure 2:
Historical Total Population, Rockies Region, 1870 to 2000
Source: Historical Statistics of the United States, 2006



to migrate west while also facilitating more intensive agriculture, largely in areas conducive to irrigation. Figure 1 shows the 2007 percentage of irrigated farmland by county in the Rockies region. Many areas within these counties, such as the San Luis Valley in Colorado (Alamosa, Costilla, and Huerfano counties) and Big Horn County near Dayton, Wyoming, were founded on agriculture because of their close proximity to rivers and water sources. In the following decades, as

Historical Agricultural Timeline

Invention of the cotton gin, a machine that revolutionized cotton production.

The Louisiana Purchase. Large portions of the Southeast, Midwest and Rocky Mountains are purchased by the United States from France.

State legislature sets up the New York State Board of Agriculture, first organization of this type

The Philadelphia Society for the Promotion of Agriculture is organized. Today the Society is the oldest, continuously active, agricultural society in the United States.

George Washington Parke Custis instituted an agricultural fair in Arlington, VA.

First American agricultural periodical, the Agricultural Museum, began publication.

1780

1785

1790

1793

1800

1802

1803

1808

1809

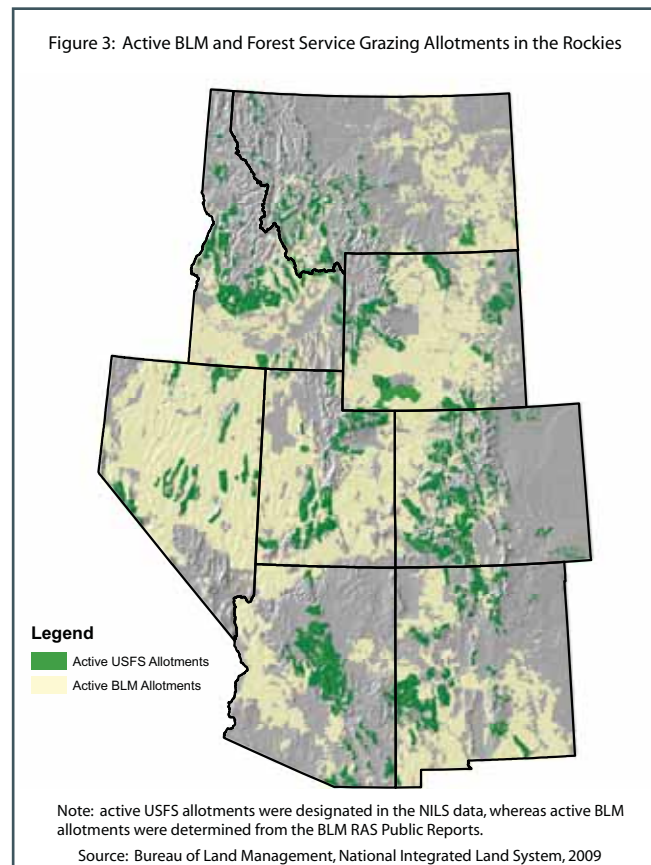
shown in Figure 2, steady population increase occurred in the Rockies as miners and homesteaders from the east moved west in search of new opportunities, centered around mining and commerce as well as livestock and agriculture.

Ironically, Powell, who described this arid region as virtually uninhabitable because of the lack of available water sources died in the same year the 1902 Reclamation Act was passed. Were he to have lived longer, he likely would have been astounded to observe the massive reclamation projects that took place, literally reshaping the Rockies by the “hand of man.” Many changes resulted in the growth of large-scale agriculture which brought with it associated major impacts on natural systems, a precursor to current environmental concerns so prevalent in the Rockies today.

The new irrigation projects and advances in farming technology helped settlers get started in the New West, but this development of agriculture also brought the regulation and consolidation of the industry towards an incentive-based approach to large-scale agriculture.⁸

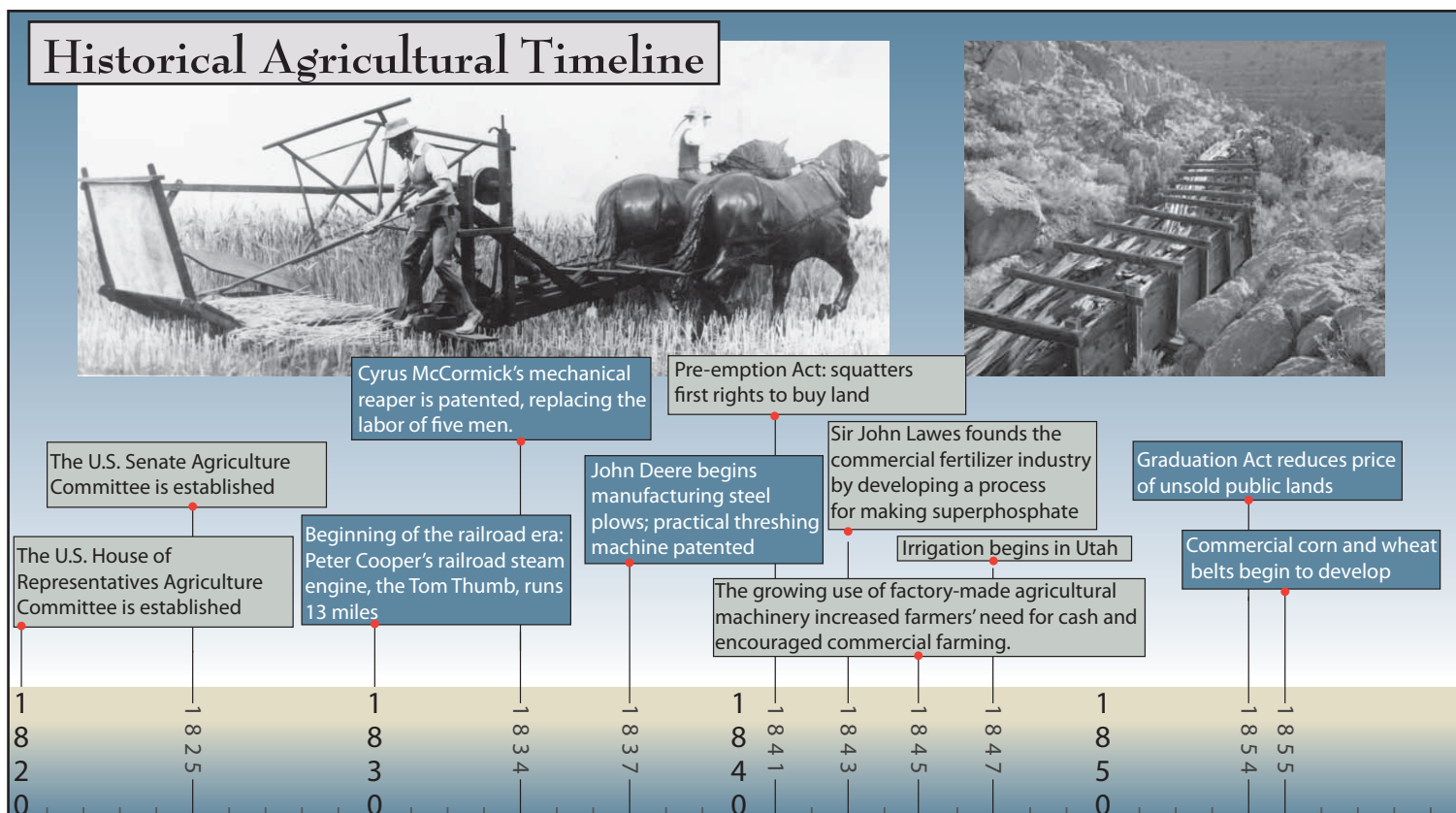
The Taylor Grazing Act of 1934 authorized livestock grazing on public lands to encourage and regulate grazing across the West. The act helped retain in the public domain portions of federal and state lands that had not yet been homesteaded. It documented and divided much of the public land of the Rockies, but also provided a mechanism by which to sustain the livestock industry. After the act was passed, President Franklin D. Roosevelt’s remarked,

The Federal Government has taken a great forward step in the interests

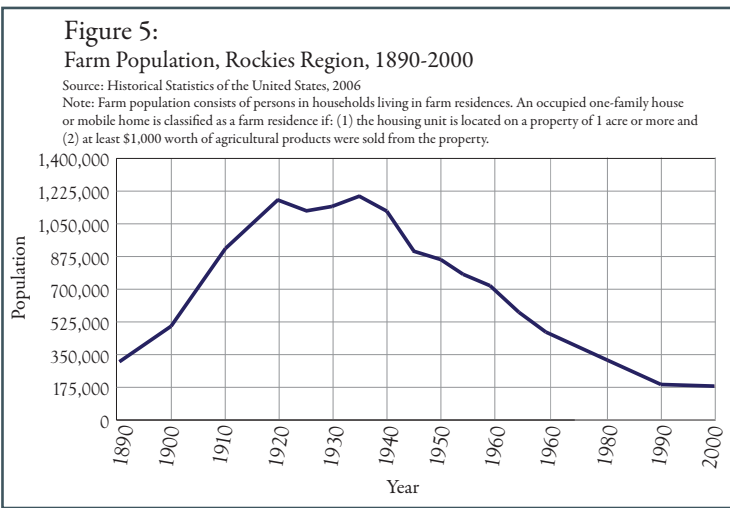
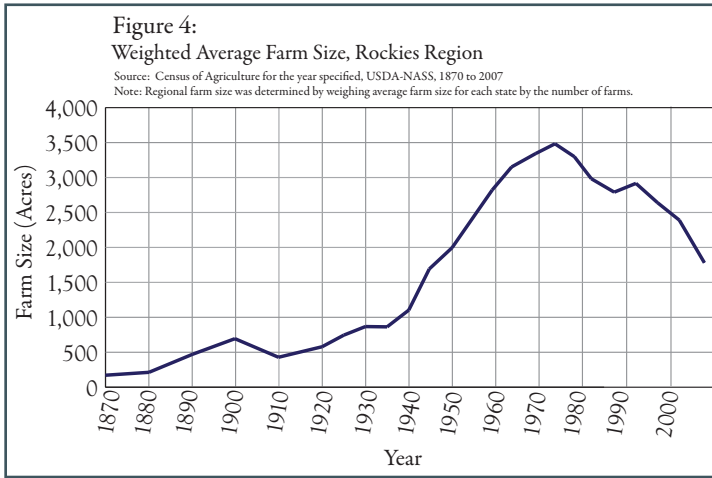


of conservation, which will prove of benefit not only to those engaged in the livestock industry but also to the Nation as a whole.⁹

Figure 3 shows the active grazing allotments



in the Rockies for 2007. These allotments are grazing districts that are regularly grazed with livestock such



as cattle and sheep. These vast grazing lands exist today because of the original Taylor Grazing Act. The extent to which the Rockies is saturated by livestock production is linked to a partnership between private farms and ranches and adjudicated uses of adjacent public lands under preferential terms.¹⁰ Ultimately, ranchers who owned land close to these BLM allotments were given preference for adjacent grazing permits. In recent decades the federal government’s allowance and management of livestock grazing on federal and state lands has been a central and sometimes polarizing issue in conflicts between ranchers and environmentalists in the West.¹¹

The Green Revolution

Classified by some as the “Agricultural Revolution,” advances in machinery, chemical inputs, and animal breeding all led to the increased efficiency of the agricultural industry throughout the 1950’s. As farmers implemented new technology, they radically shifted the overall makeup of farms across the country.¹²

The size of farms increased because of the ability to harvest more crops per acre due to the new efficient technology.

Figure 4 depicts the growth of the weighted average farm size in the Rockies region from the late 1940’s to the 1970’s. Forces underlying the rapid growth of farm size in these decades included access to water via government-subsidized reclamation projects, enhanced transportation infrastructure, technological breakthroughs in agricultural seeds, supplements of

Historical Agricultural Timeline

1862: U.S. Department of Agriculture established

1862: Morrill Land Grant College Act: provides states land to open agricultural universities

1862: Homestead Act: opens the West by offering free public land to persons who have proven the land for five years

1874: The era of unrestricted, open range grazing ends as Glidden barbed wire becomes available

1874: Grasshopper plagues in the West. U.S. Entomological Commission established to help with problem

1876: Hatch Experiment Station Act: sets up Federal-State cooperation in agricultural research and establishes agricultural experiment stations

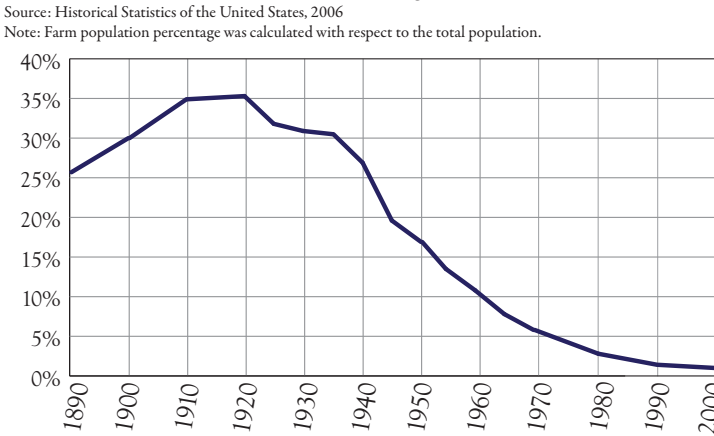
1876: U.S. census shows that the frontier settlement era is over

1876: Second Morrill Act: broadens the land-grant program and establishes funding for African American land-grant schools

1876: Rural Free Delivery starts. Rural Americans can now send and receive mail easily and inexpensively

1879: First Federal Meat Inspection Act

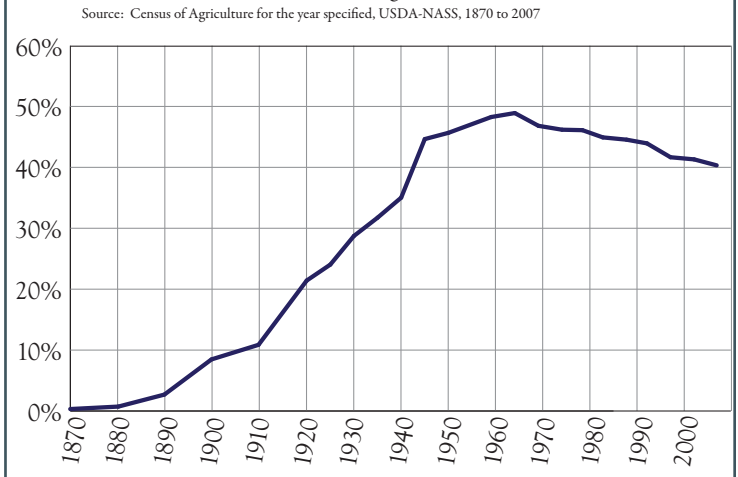
Figure 6:
Farm Population, by Percent, Rockies Region, 1890-2000



fertilizers, herbicides, and pesticides, and inexpensive financial capital via USDA programs and subsidies. Post-World War II globalization trends further stimulated U.S. agriculture. Starting in the mid-1970's, however, a dramatic decrease in average farm size began in the Rockies region. This decrease opposes the national trend, where farm sizes continued to increase through the end of the 20th Century. The disparity could be due to Rockies' role in the rise of Confined Animal Feeding Operations (CAFOs) beginning in the 1960's. As Midwestern regions grew "fence row to fence row," the Rockies increased its cattle production, feeding not on grass, but on corn shipped across the great plains.

From 1950 to 1970 the farm workforce declined by 50 percent, while the value of agricultural goods increased by nearly 40 percent.¹³ An unintended consequence of large agriculture based upon sophisticated

Figure 7:
Land in Farms, Percent, Rockies Region



technological advances and large financial underpinning was that it created barriers for those seeking to enter farming for the first time.

Equally significant to changing farm size were the dramatic decreases in workers and families engaged in agriculture in the Rockies over these decades. As shown in Figure 5, depicting total numbers of people on farms and Figure 6, giving the percentage of the Rockies population engaged in farming starting in the 1920's, the percentage of population engaged in farming has steeply declined since the mid-1930's. These changes were spurred by environmental and economic factors. The dust bowl made agricultural lands on the eastern plains unprofitable, causing many farmers to fold. The continued drop in farm population is an effect of the "get big or get out" mentality of industrialized agriculture.

Historical Agricultural Timeline

- 1902:** Reclamation Act: funding for irrigation in the West
- 1905:** Pure Food and Drug Act: a landmark in food safety
- 1906:** President Roosevelt's Country Life Commission is established to improve social, sanitary and economic conditions on American farms
- 1908:** U. S. Forest Service created
- 1914:** Stock Raising Homestead Act: increased area limitation for homesteading
- 1916:** Rural Post Roads Act: begins regular Federal subsidies to build rural roads
- 1916:** Smith-Lever Extension Act: creates a national extension service for direct farmer education
- 1920:** Future Farmers of America founded to promote youth agricultural education
- 1924:** Immigration Act: greatly reduces the number of new immigrants
- 1928:** Taylor Grazing Act: regulates grazing on public lands
- 1930:** Drought and dust-bowl conditions develop throughout the West
- 1932:** Executive orders withdraw public lands from settlement and sale
- 1932:** Rural Electrification Act: brings electricity to rural areas
- 1933:** Agricultural Adjustment Act: initiates crop and marketing controls
- 1933:** Soil Conservation and Domestic Allotment Act: links farm programs with conservation
- 1934:** Taylor Grazing Act: regulates grazing on public lands
- 1936:** Rural Electrification Act: brings electricity to rural areas

Along with new technology for planting and harvesting commodity grains, the government subsidies for commodities and a drought-ridden Soviet Union made big farms more profitable.

**Agriculture Today In the Rockies:
Report Card Preview**

As briefly shown above, agriculture in the Rockies from 1870 to the present has undergone changes on a scale akin to a revolution, literally reshaping the topography, hydrology, and environment that compose the Rockies region. This *Report* tackles many of the different issues of agricultural production in the Rockies region, from the changing economies of agricultural towns to environmental impacts.

Currently, most crops produced through large-scale agriculture are planted and harvested with expensive machinery, complex GPS systems, and laser-guided tractors, allowing computer monitoring of fertilizer, seed dispersal, and soil quality.¹⁴ In addition, farms now have closer ties with large-scale agri-businesses that help process, sell, and transport crops, and prices are established through commodity markets, making local products marketable on a global scale.

Today, although only three percent of Rockies residents are employed by agriculture and one percent are farmers, agricultural land occupies 40 percent of the region.¹⁵ After a dramatic upswing in farmland during the homesteading period, the percentage of farmland has steadily decreased since the mid-1970's when the agricultural revolution leveled as displayed in Figure 7.

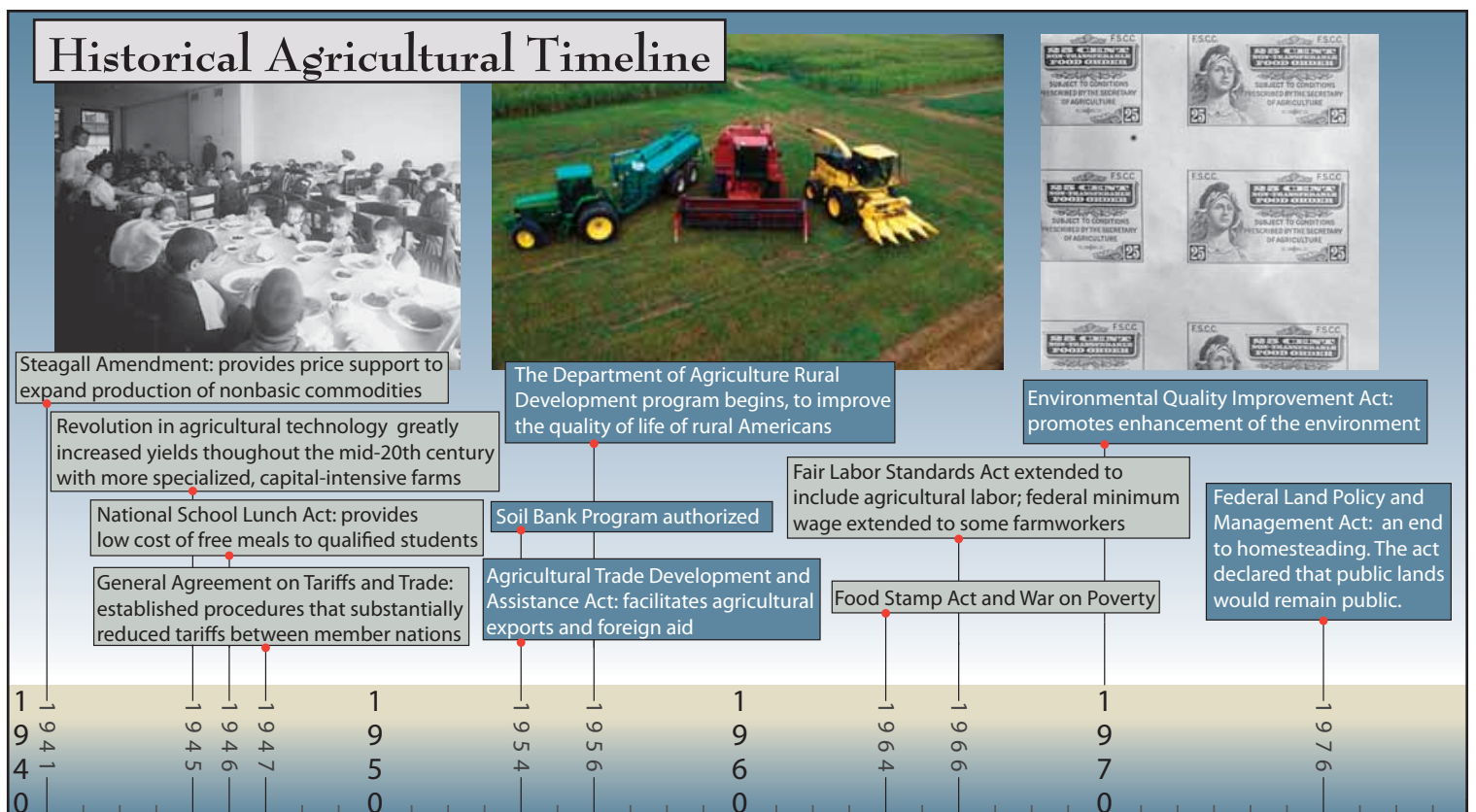
The percentage of farmers in the Rockies

population shows a similar trend. As illustrated in Figure 6, after peaking in 1920 at 35 percent, the percent of the population in farming has plummeted.¹⁶ The shift in the ratios of farmers to farmland shows not only the shift of agriculture, but also the general population growth in the Rockies region.

The number of small, organic, and natural farms is gradually increasing, mid-sized farms are disappearing, and large farms are becoming even bigger.¹⁷ Farmers face difficulties maintaining control of their land in the face of sprawling urban development. There are also difficulties in obtaining a dependable agricultural workforce, especially in the southern Rockies, because of new international border regulations.

Although agriculture in the Rockies no longer defines the region economically, farms and ranches assert a geographic and cultural influence way beyond their "economic" size. Farms and ranches help maintain open space and habitat for wildlife as well as sustain the rural and scenic qualities of the Rockies region. As summarized above, changes in agriculture over fourteen decades have altered land, water, environment, people, and the culture of the Rockies. Each section of this *Report Card* discusses in more detail the evolution and current state of various aspects of agriculture, divided into the following sections.

- *Land*: Katherine Sherwood provides an overview of land and water use in the Rockies, and how the Rockies weighs the balance of municipal and agricultural use. Her overview section is supplemented by a case study on the New Food Economy.



- *People:* Zoë Wick details the changing demographics of agriculture in the region, accounting for race and ethnicity, sex, age, and tenure. She highlights the current and historic roles of hired farmworkers, American Indians, and Latinos in Southwestern Agriculture.

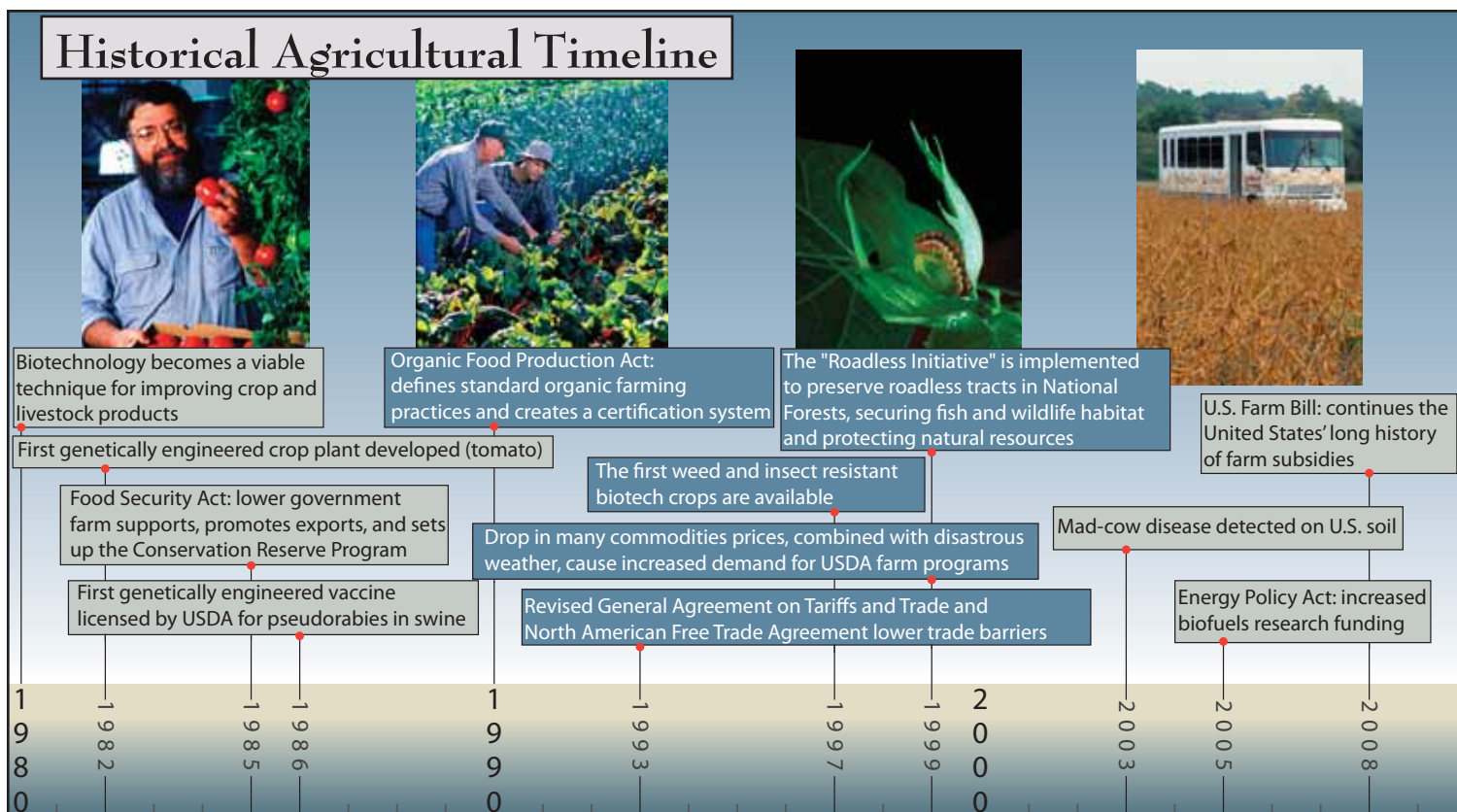
- *Production:* Russell Clarke delves into the agricultural production trends of the Rockies region, highlighting current production trends and how the Rockies' production has changed over time. In addition to his overview, he provides case studies on cattle and bison production.

- *Finance:* Emil Dimantchev focuses his overview section on the financial characteristics of agriculture in the Rockies. Going beyond the profit margins, and spending breakdowns, Dimantchev investigates the role federal subsidies play on farmers' production decisions.

- *Organization:* Jayash Paudel explains the intricacies of farm organization in the Rockies. Using a variety of organizational definitions, Paudel highlights the trends and possible consequences of organization and policy on beginning farmers and small family farms.

¹ Powell, John Wesley. "Report on the Lands of the Arid Region of The United States. With a More Detailed Account of the Lands of Utah." Washington Government Printing office 1879. p. 23.
² Kirsch, Scott. "John Wesley Powell and the Mapping of the Colorado Plateau, 1869-1879: Survey Science, Geographical Solutions, and the Economy of Environmental Values." *Annals of the Association of American Geographers*, Vol. 92, No. 3 (Sep. 2002), p. 2.
³ Pacific Railway Act, July 1, 1862. Enrolled Acts and Resolutions

of Congress, 1789-1996; Record Group 11; General Records of the United States Government; National Archives. <http://www.ourdocuments.gov/doc.php?flash=true&doc=32> (Accessed June 24, 2009).
⁴ Gardner, Bruce L. "American Agriculture in the Twentieth Century, How It Flourished and What It Cost." Harvard University Press. 2002. p. 202.
⁵ Act of July 2, 1862 (Morrill Act), Public Law 37-108, which established land grant colleges, 07/02/1862; Enrolled Acts and Resolutions of Congress, 1789-1996; Record Group 11; General Records of the United States Government; National Archives. <http://www.ourdocuments.gov/doc.php?flash=true&doc=33> (Accessed June 24, 2009).
⁶ USDA. "A Condensed History of American Agriculture." <http://www.usda.gov/news/pubs/99arp/timeline.pdf> (Accessed July 28, 2009).
⁷ Bureau of Reclamation, US Department of the Interior. "The Bureau of Reclamation: A Very Brief History." <http://www.usbr.gov/history/borhist.html> (Accessed June 25, 2009).
⁸ Conkin, Paul A. "A Revolution Down on the Farm." University Press of Kentucky. 2008. p. 53.
⁹ Hurlburt, Virgil. "The Taylor Grazing Act." *The Journal of Land & Public Utility Economics*, Vol. 11, No. 2 May, 1935, pp. 203-206 University of Wisconsin Press.
¹⁰ Bureau of Land Management. National Integrated Land System. 2009.
¹¹ Dagget, Dan. Drouard, Jay. "Beyond the Rangeland Conflict Toward a West that Works." Good Stewards Project. 1998. p. 7.
¹² Conkin, Paul A. "A Revolution Down on the Farm." University Press of Kentucky. 2008. p. 106.
¹³ Garner, p. 28-47.
¹⁴ Bamford, Paul J. Ginsburg, Alan. "Agricultural Technology--A Real Industry-Education Partnership [and] John Deere Ag Tech in New York." *Tech Directions*; April 1996, Vol. 55, Issue 9, p. 22.
¹⁵ United States Bureau of the Census. American Community Survey. 2007 American Community Survey One-year Estimates. 2008.
¹⁶ United States Department of Agriculture. *1920 Census of Agriculture*.
¹⁷ United States Department of Agriculture. *2007 Census of Agriculture*. 2009.



Threats to Farm and Ranchland in the Rockies

By Patrick Creeden

Introduction

There is a quiet but insatiable force nibbling away at agriculture in the Rockies. Week by week, American ranchers and farmers see, hear, and feel the “city” encroaching upon their land, bringing new urbanized neighbors and associated roads and infrastructure as well as tempting vulnerable “land-rich, cash-poor” owners of productive agricultural acreage to “sell out.” They witness the disappearance of open space, a shifting culture in their local communities, and a declining interest in ranching and farming. The threats to ranches and farms have grown both in quantity and form, making it increasingly difficult for ranchers and farmers to sustain agricultural production as a way of life. This case study examines some of the key challenges that farmers and ranchers face in the Rocky Mountain West.

Population Increase

The Rockies remain predominantly rural as measured by sparsely populated area. And yet the region has experienced a great deal of land use change associated with the loss of farm and ranchland. With regional population across the Rockies growing at several times the national average, sprawling subdivisions and highways have infiltrated once-rural communities and redefined the

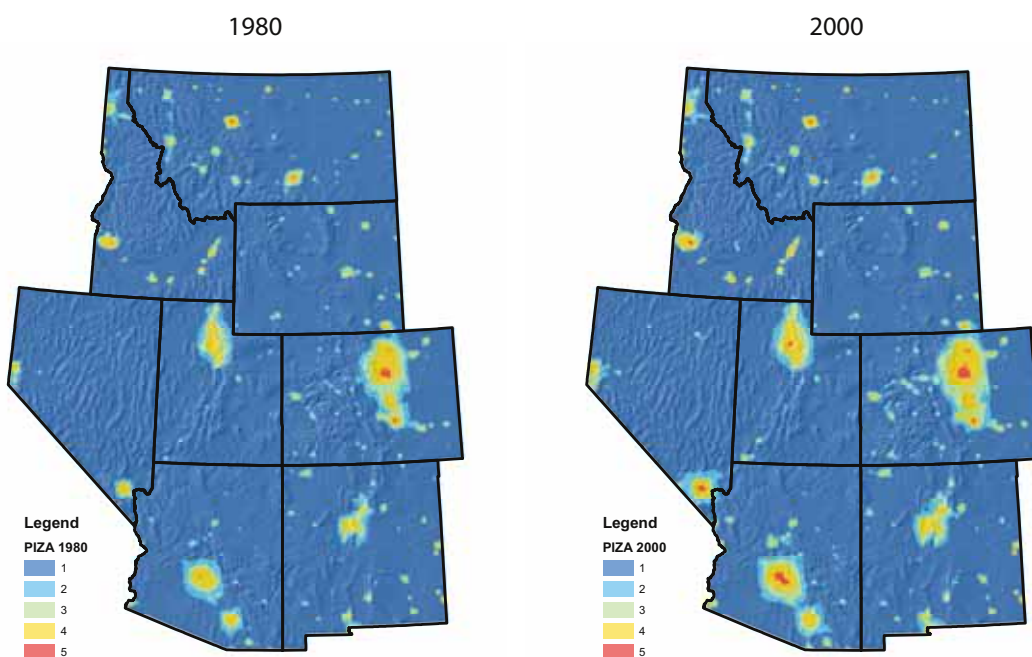
culture and economy of the West.¹ Though “ex-urban” development is not a phenomenon exclusive to the West, the intensity of current population growth makes the changes more apparent, and more urgent.² The Rockies region experienced an 18 percent population increase from 2002–2007, with Arizona and Nevada growing by 24 percent and 28 percent, respectively.³ Originally settled by farmers and ranchers, the landscape of the West is fast shifting toward a mosaic of land ownership and uses which juxtapose rural next to urban next to light industrial activities fueled by new economies and population growth, all helping further fragment the open spaces of the Rockies.

The growth of interaction between agricultural and urban areas can be displayed through a measure called “the population interaction zone for agriculture” (PIZA) developed by the USDA’s Economic Research Service. Interaction zones in this case are areas where urban development and agricultural production are occurring in close proximity to one another. The PIZA maps in Figure 8 show increased agricultural and urban interaction across the Rockies region from 1980–2000. Though the locations of interaction have not changed substantially, the size and level of interactions have increased. These zones surrounding the urban centers (Colorado’s Front Range, Tucson, Salt Lake City, and Las Vegas) show the highest threat levels. Some more rural areas with very little threat in 1980 are also seeing their threats increase, such as the I-70 corridor west of Denver, the I-10 corridor of Phoenix-Tucson, and the outskirts of the Carson City-Reno area and the area south of Las Cruces, New Mexico.

Table 1 shows the percent change and change in total acres of population

interaction zones in the Rockies region. In 2000, 83 percent of private land in the Rockies was located in highly rural areas (PIZA rating of 1). These areas from 1990 to 2000 underwent only a three percent loss in their PIZA “rural” category displaying highly rural areas of the Rockies that practice agriculture and are currently safe from the pressures of urban development. The largest gains in threats to agriculture from 1980–2000 occurred close to urban areas where there was an 82 percent increase in rural land under threat. These changes show the profound impact of

Figure 8: Population Interaction Zones for Agriculture, 1980 and 2000



Warm colors denote a high degree of interaction between population centers and agricultural areas.

Source: Economic Research Service, U.S. Department of Agriculture, 2005

growing urban centers in the Rockies.

The Rockies region’s population increased by 3.1 million from 2000–2007. However, in 2000 the farm population in the Rockies represented only one percent of the total population, making them a small percentage of the population that controls nearly 40 percent of the land in the Rockies.⁴ The number of farms in the Rockies region is growing, but the total number of acres of farmland continues to decrease.⁵

New Development

Due to the demand for new housing developments in the scenic landscapes of the Rockies, many states have lost a vast amount of prime agricultural land. In the Rockies region the amount of farm and ranchland decreased by two percent from 2002–2007, similar to the two percent national decrease. Figure 9 depicts regional disparities in land held in farms. By regional comparison, the Pacific and the South Atlantic regions in the U.S. have lost more than five percent of their total farmland, greater losses than in any other regions in the U.S. Although the Rockies region experienced only two percent farmland loss, a smaller magnitude than other U.S. regions, such losses of agricultural land have profound effects on rural economies, communities, and the environment. At the state level, Figure 10 shows similar changes in land in farms. Wyoming experienced nearly a 12 percent loss of its farmland from 2002–2007, followed by Nevada, with a seven percent loss over the same time period.

Rising Land Values and Water Rights

Economically, agriculture can be a high-risk occupation. In many cases, the incomes of farmers and ranchers largely depend on weather conditions, most importantly adequate precipitation. In times of drought bad crop yields historically meant that farmers were financially unstable for a short period of time but were then able to rebound in following years. However, as land values rose from 1997 to 2007, farmers and ranchers were pressured to sell their land in times of difficulty.

The average market value of land (per acre) increased by nearly \$430 in the Rockies region from 1997 to 2007, as shown in Figure 11. When compared to other regions, this increase seems marginal. However, many ranches and farms are composed of large tracts of land, and thus a \$430 increase per acre applied to thousands of acres yields a hefty sum. As displayed in Figure 12, the largest value increase among Rockies states was in Idaho, where the average market value of land (per acre) increased by \$937 from 1997 to 2007. Although rising land values have plagued agricultural markets over the past decade, new reports by the USDA suggest that because of the recent recession, agricultural land values across much of the West have plummeted. Figure 13 depicts the most recent available

Table 1:
Change in Population Interaction Zones for Agriculture (PIZA) area for Rockies Private Land, 1980 to 2000

PIZA Category	Category	PIZA Area, 1980 (acres)	PIZA Area, 1990 (acres)	PIZA Area, 2000 (acres)	2000 Percent Private Land	1980 to 1990, percent change	1990 to 2000, percent change
1	Rural (little or no urban-related population interaction)	175,947,745	173,835,493	169,146,580	82.9	-1	-3
2	Population interaction, low	11,188,217	11,658,198	12,495,329	6.1	4	7
3	Population interaction, medium	8,609,967	9,192,013	10,612,080	5.2	7	15
4	Population interaction, high	8,067,792	8,914,792	10,931,247	5.4	10	23
5	Urban	293,377	506,602	921,862	0.5	73	82

Source: USDA Economic Research Service, Population Interaction Zones for Agriculture data, 2005.

Figure 9:
Land in Farms, Percent Change, 2002 - 2007, by Census Division

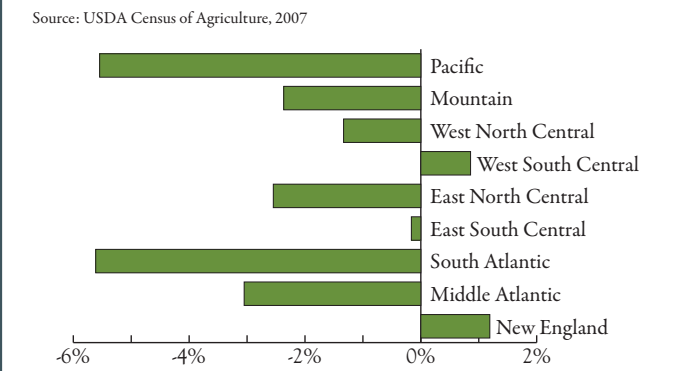
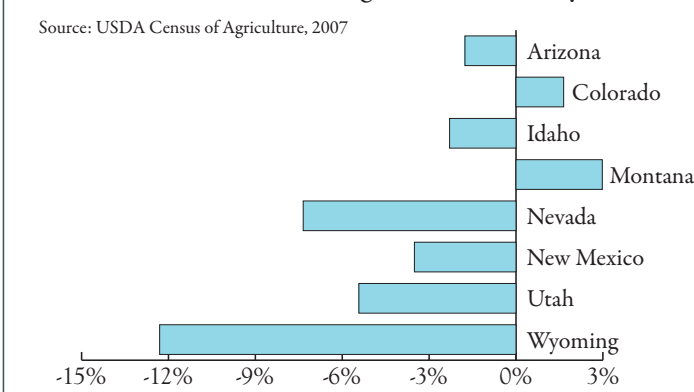


Figure 10:
Land in Farms, Percent Change, 2002 - 2007, by State



data on changes in farm values. While the nation’s farm and ranchland values dropped three percent in 2008, the value of farm real estate in the Mountain⁶ division dropped 11 percent, clearly creating new challenges for farmers and ranchers thinking of leaving agriculture and selling their land.⁷

The battle for water rights also threatens operators’ tenure of ranch and farmland. Many agricultural operations own senior water rights, but senior water rights can raise the value of land for development as builders seek guaranteed and reliable water sources for new

subdivisions. Some farmers and ranchers sell their water rights to developers because the profit is often higher than many consecutive years of good crop yields.⁸ Cities have also purchased water rights from farmers and ranchers to supply the growing urban populations across the Rockies with water.⁹ Unfortunately, when farmers sell their water rights, their land value and productivity decrease. Some farmers who sell their rights have turned to dryland ranching and farming, which do not require diversion of

ranch plague the agricultural world, especially during times of economic hardship. One example of this is the Bair Family Farm in Longmont, Colorado. *High Country News* ran a special on their difficulties, and their family ranch was eventually sold because of the difficulty in maintaining or inheriting land.¹¹

The Preservation of Agricultural Land

Various grassroots organizations have developed agencies and trusts to help protect and conserve agricultural land across the Rockies region and the country. Agencies and methods that have helped protect this land include:

- **Land Trusts:** A non-profit organization that through purchase, donation, or conservation easements, works to protect land in the public interest.¹²

- **Conservation Easements:** An agreement between a landowner and a private land trust or government. The agreement limits certain uses on all or a portion of a property for conservation purposes while keeping the property in the landowner's ownership and control. The agreement is usually tailored to the particular property and to the goals of the owner and conservation organization. It applies to present and future owners of the land.¹³

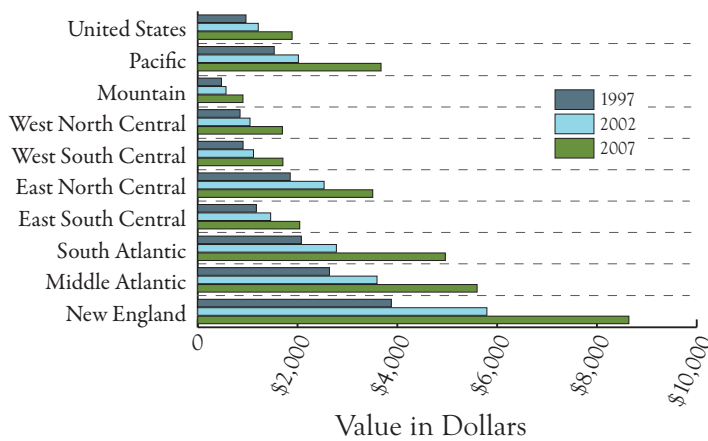
- **National Resource Conservation Service-Large-Scale Incentive Based programs:** Originally the Soil Conservation Service, the NRCS is a government-run program that provides technical and financial support for voluntary conservation measures. The NRCS houses over 50 programs, including the Farm and Ranchlands Protection Plan from the 2008 Farm Bill.¹⁴

- **Estate Planning:** A process involving the counsel of professional advisors who are familiar with your goals and concerns, your assets and how they are owned, and your family structure. Estate planning covers the transfer of property at death as well as a variety of other personal matters and may or may not involve tax planning.¹⁵

Many of these organizations have effectively conserved farm and ranchland on local and regional scales. The 2008 Farm Bill seeks to address many of the threats to farm and ranchland nationwide, extending protection of farmlands from simply soil conservation to lands that

Figure 11:
Market Value of Buildings and Land per Acre,
1997 - 2007, by Census Division

Source: USDA Census of Agriculture, 2007



water sources to produce crops or livestock. Diversion of water from agriculture to municipal and industrial uses often follows the adage: “water in the West flows up hill to money.” This process further marginalizes agricultural activity in the Rockies.

Continuing the Family Farm

In addition to the many economic issues that contribute to the loss of farm and ranchland in the Rockies are myriad social components. In the past 30 years, when costs became too high, the most viable option for many family farmers and ranchers has been to sell their land.¹⁰ Family conflicts over whether to divide or sell the farm or

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have “prime, unique or other productive soil or contains historical or archeological resources.”¹⁶ This and a clause that ensures protection of lands that continue the “economic viability of agriculture” are two additions to the bill that will benefit a wider range of farmers and ranchers.¹⁷ However, it is difficult for broad-based legislation to accommodate the many different types of agricultural land loss that have different causes in each region of the country.

The urban population increase and subsequent geographic expansion of Western cities is, to a degree, inevitable. The American Farmland Trust suggests that the solution to conserving farmland has to start with more efficient, wisely planned urban development, similar to the tenets of smart growth.¹⁸ If counties and communities develop inclusionary zoning principles, install public transportation, and create high-density, livable communities, the rapidity at which farmland is destroyed can decrease.

Because of an aging agricultural population and high demand for agricultural land and water rights, the number of farmers and ranchers in the Rockies region could continue to decline. Preserving ranch and farmland helps protect ecosystems and wildlife while maintaining cultural traditions in the Rockies.

¹ Hecox, Walter and Patrick Holmes. “Land and the Environment” In *The 2004 State of The Rockies Report Card* p. 26. Colorado Springs: Colorado College, 2004.

² American Farmland Trust. “Farming on the Edge Report.” 2003.

³ Carlson, David and Elizabeth Kolbe. “Rockies Baseline.” In *The 2009 State of the Rockies Report Card* p. 11. Colorado Springs: Colorado College, 2007.

⁴ USDA Census-NASS, 1870 to 2007.

⁵ United States Department of Agriculture. *2007 Census of Agriculture*. 2009.

⁶ “Mountain division” is the classification that is given to the “Rockies region” by the USDA. Mountain division is used here for easier reference to the figure.

⁷ USDA, *Land Values and Cash Rents Summary*. August 2009. <http://usda.mannlib.cornell.edu/usda/current/AgriLandVa/AgriLandVa-08-04-2009.pdf> (Accessed November 20, 2009).

⁸ Peglar, Victoria. “Drying up the Melon Capital.” *High Country News*. July, 2000.

⁹ Knudson, Thomas. “Dry Cities of West Buy up Farm Water Rights.” *New York Times*. February 10, 1987.

¹⁰ Bartlett, Peggy. “American Dreams, Rural Realities: Family Farms in Crisis.” University of North Carolina Press. 1993. Chapel Hill, N.C.

¹¹ Bair, Julene. “Out in the Cold: Selling the family farm severs connection with place and past.” *High Country News*. December 8, 2008.

¹² Pennsylvania Land Trust Association. <http://conserveland.org/information/con101/glossary> (Accessed January 15, 2010).

¹³ *Ibid.*

¹⁴ USDA NRCS. NRCS Conservation Programs. <http://www.nrcs.usda.gov/programs> (Accessed January 15, 2010).

¹⁵ American Bar Association. <http://www.abanet.org/rpte/public/est-plan-overview.html#estateplanning> (Accessed January 15, 2010).

¹⁶ “Summary of Changes to the Farm and Ranch Lands Protection Program in the 2008 Farm Bill.” American Farmland Trust. <http://www.farmland.org/programs/farm-bill/analysis/documents/AFT-2008FarmBill->

Figure 12:
Average Market Value of Land and Buildings per Acre, 1997 - 2007, by State

Source: USDA Census of Agriculture, 2007

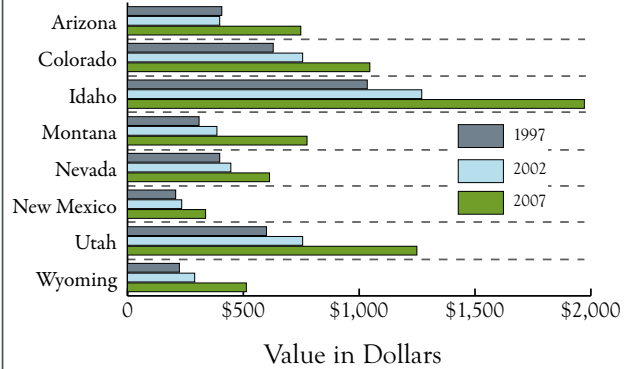
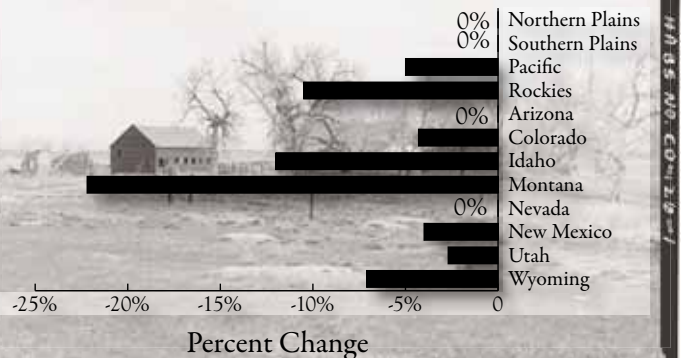


Figure 13:

Percent Change in Farm Real Estate Value, 2008-2009

Source: USDA, National Agricultural Statistics Service, 2009



FRPPchanges-May2008.pdf (Accessed November 20, 2009).

¹⁷ *Ibid.*

¹⁸ American Farmland Trust Farmland Information Center. “Why Save Farmland,” 2003. http://www.farmlandinfo.org/documents/28562/Why_Save_Farmland_1-03.pdf (Accessed November 23, 2009).



Photo: USDA-NRCS

The Malpai Borderlands Group: Community-Based Land Management in a Changing West

By Patrick Creeden

Controversy on the Range

The picture of the iconic American cowboy working cattle in a majestic setting embodies a common myth: working livestock in the West is simple, romantic, and carefree. However, the working cowboy of the late 1800's and early 1900's is rare in the West today; ranchers have to manage more than just a healthy herd of cattle to maintain ranching as a way of life. Livestock growers are assuming additional jobs to diversify their income. They also must cooperate with various land management organizations to make their operations profitable. Similarly, more and more

ranchers consider themselves managers of ecosystems instead of just livestock, working to ensure the health of their soil, grasslands, and watersheds to increase the productivity of their herds over time.

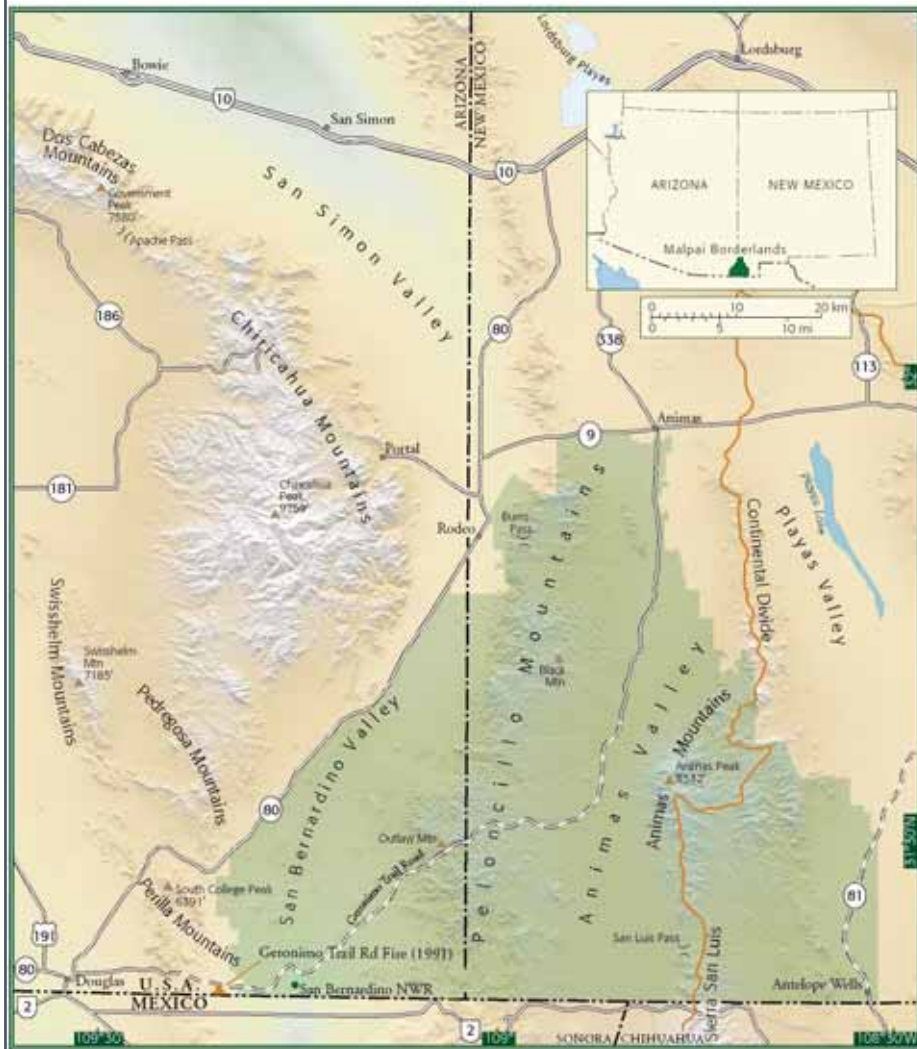
As ranching has evolved, so too have its values and practices. Throughout the 1980's and 1990's, ranchers were criticized by environmentalists for being profit-hungry, solely viewing the land from a profit-maximizing perspective.¹ Critics suggested that the production-based management strategy of ranching had little regard for the health of the rangelands, many of which were seen as being ruined by overgrazing. This stereotypical view of ranchers was endorsed by many environmental groups throughout the early 1990s' in a campaign titled "Cattle Free by 93" aiming to end all livestock grazing on public lands by 1993. The movement was supported by the Sierra Club and Earth First, two environmental organizations that accused ranchers of destroying public lands.²

Many ranchers were angry because they were all being placed in one group, accused of overgrazing public lands. Decades of poor management across much of the West had led to the destruction of many riparian areas, wildlife, and native plants. However, not all ranchers were guilty of this offense, and a complete removal of cattle from these lands seemed like an excessive solution to the overgrazing problem.³ On the other side, environmentalist groups had concerns that the federal government was subsidizing the outright destruction of public lands across the West and that reform was needed to save the ecological integrity left on public lands.⁴

In response to the "Cattle Free by 93" campaign and the ensuing controversy, a group of ranchers in southern Arizona and New Mexico sought to work effectively with environmentalists who did not necessarily seek an end to grazing, but wanted to restore the damaged rangelands across the American West. The ranchers attempted to form alliances among environmental organizations and federal land management agencies. Wendy Glen, a New Mexico rancher and founding member of the Malpai Borderlands Group (MBG), described the conflict: "We would go to a meeting about land conservation and there would be police officers outside to prevent

Figure 14:
Malpai Borderlands Region

Source: Malpai Borderlands Group



physical altercations between the ranchers and environmentalists...there was just too much fighting.”⁵

The MBG was created to improve communication among these diverse groups and to work toward common goals. Each side of the grazing debate needed to understand their counterparts better, and through a series of discussions at many local ranches, compromise was found.⁶ An important part of this compromise is to sustain ranching as a profitable career for future generations. The MBG pioneered a cooperative land management plan that was the first of its kind in the West. This case study examines the successful land management strategies employed by the MBG through private-public partnerships.

Malpai and the “Working Wilderness”

Today, the MBG, whose location is shown in Figure 14, has grown into a broad-reaching organization. Members include representatives from The Nature Conservancy, National Resources Conservation Service, United States Geological Survey, U.S. Forest Service, Arizona and New Mexico Divisions of Wildlife, stream restoration hydrologists, the United States Border Patrol, and local ranchers. Representatives from organizations with often differing opinions come together and constructively tackle land restoration and conservation issues specific to the borderlands region. Figure 15 displays the many different land managers, public and private, that control property in this region. The borderlands region of southern Arizona and New Mexico is an extremely diverse area, culturally and geographically. The Malpai region includes high mountain peaks and lowland valleys, at elevations ranging from 4,000 to 8,500 feet above sea level. This varied topography creates a significant amount of precipitation in parts of the borderlands, but strong winds and warm temperatures evaporate most of the precipitation that may fall making the region extremely arid.⁸

They MBG works to protect endangered species, restore water sheds, and manage ecosystems within a “working wilderness.”⁹ This name includes human management in the definition of wilderness, which is not included in most classifications of the term. Additionally, it maintains that

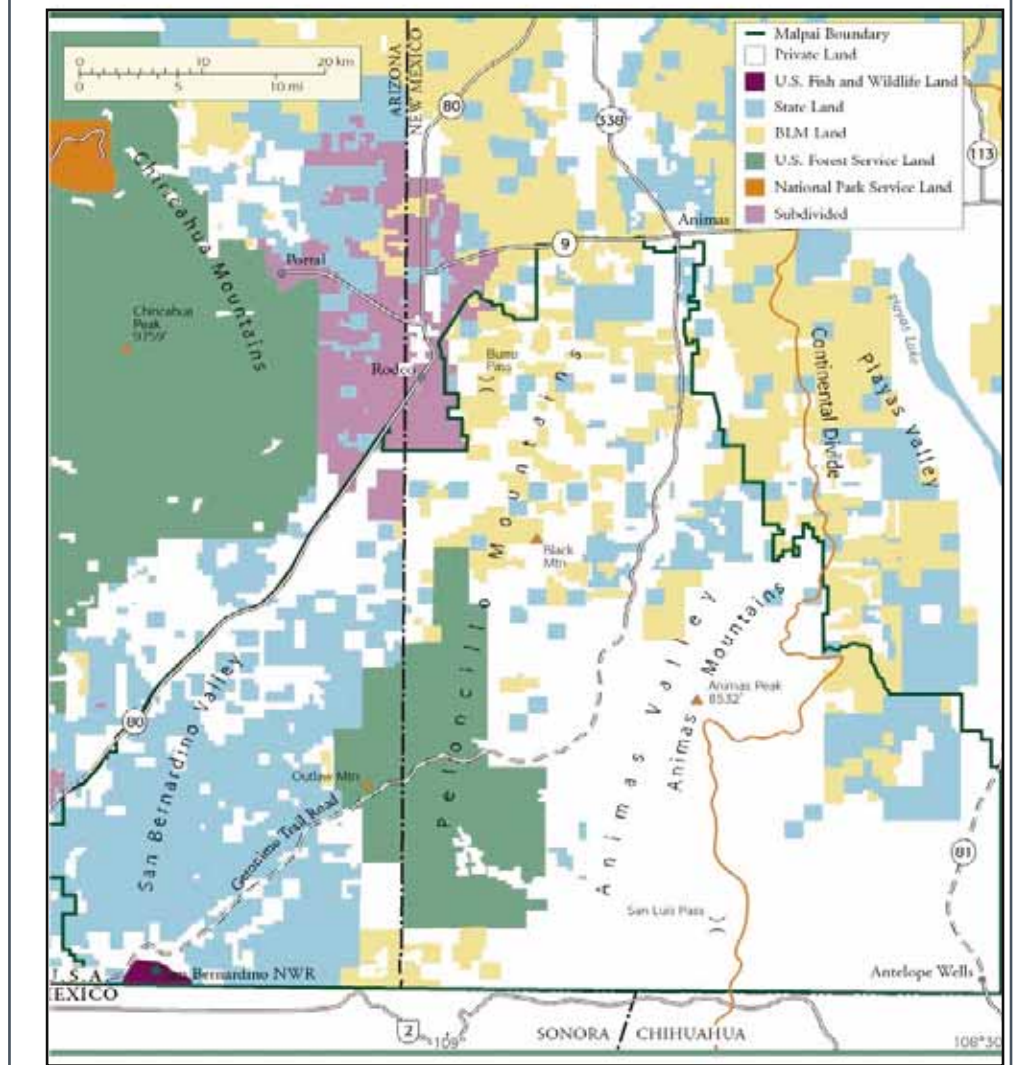
rangelands do work as they produce commodities, both quantifiable and theoretical for humans.¹⁰ As stated by Nathan Sayre, an expert on ranching, “These values (or commodities) are produced by the interaction of natural processes and human activities.”¹¹ Essentially this interpretation of wilderness asserts that humans work

Malpai Borderlands Group Mission Statement:

“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.”⁷

Figure 15:
Malpai Region Land Management Agencies

Source: Malpai Borderlands Group



in conjunction with natural processes.¹² The working wilderness depends on human management as these lands have already been altered by human activities.

Land Conservation

To preserve the various ecosystems and maintain ranching in the Malpai region, the group needed to ensure that private ranchlands could be protected from threats of development and subdivision. Because much of the private ranchland was located adjacent to public lands where their cattle grazed, the Malpai members formed a land trust that would help encourage conservation and maintain large grazing areas for both cattle and wildlife. The MBG land trust was formed using a concept developed by Drum Hadley, a rancher and member of the Borderlands group. Hadley developed the concept of a “grassbank,” a parcel of land that would provide grazing allotments for ranchers whose land was in poor condition and needed to be rested.¹³

Grassbanking was created by allowing ranchers to graze animals on the grassbank ranch, and in return for the lease, a conservation easement would be placed on

development. In addition, media attention about the Malpai’s activity gained national as well as regional attention in the 1990’s, helping inform the ranching community about conservation easements and grassbanks. Though many Western ranchers were wary of these new conservation methods, throughout the late 1990’s numerous grassbanks were formed across the West, following the Malpai model. Those operations have encountered similar challenges, but the model that the Malpai pioneered provided an initial blueprint for grazing lands across the new West.¹⁶

Fire

Central to the management practices of the MBG is the reintroduction of low-intensity ground fires. Land management agencies such as the U.S. Forest Service and the Bureau of Land Management had become extremely efficient at extinguishing wildfires across the West; however, fire suppression was preventing natural ecosystem services and cycles,¹⁷ and part of the rangeland degradation blamed on cattle may in fact be attributable to the disappearance of fires as early as the 1890’s.¹⁸ Additionally, the combination of overgrazing and drought conditions during the late 1880’s eliminated many of the native grasses of these ecosystems, and because of the inconsistent ground cover, natural fires were unable to spread.¹⁹ Fires return nutrients to the soil and kill encroaching shrubs. Without fire, grasses were unable to recover and eventually woody species such as mesquite spread across the borderlands region.²⁰ The Malpai petitioned these agencies both to allow natural fires to burn on publicly grazed land and private property, and to set prescribed fires in these areas.

Prescribed fires are commonly used in the Malpai region today to help decrease the density of woody plant species. These fires and subsequent grassland development have helped restore the historical biological diversity, wildlife habitats, and watershed stability.²¹ Setting low-intensity fires as a form of disturbance was traditionally not consistent with the U.S. Forest Service’s fire policy. However, through collaboration with the Malpai group, the regional land management agencies altered their position on extinguishing fires. Through this partnership of private landowners and public land managers, the MBG has taken great steps toward returning fire to the region and restoring natural ecosystem disturbances.

Community-Based Management for the Future of the Western Range

In addition to specific conservation and restoration programs, the MBG has also provided a



© Russell Clarke '10. Malpai Ranch, July 2009

the resting land. Instead of using regular cash leases for payment of grazing fees, grassbanking allows ranchers to sell the development rights to their land as compensation for grazing fees. The conservation easements are held and managed by the Malpai group.¹⁴ Grassbanking was also used by the MBG to accumulate vegetation on resting parcels of land for prescribed burns. This new method of land conservation and management worked well until drought conditions hit the grassbank, causing it to shut down.

Although, the Malpai’s grassbank is not currently operating, the group’s model conserved nearly 310,000 acres of private land in the borderlands region,¹⁵ protecting nearly 56 percent of the Malpai borderlands area in southern Arizona and New Mexico from possible

new model of community-based land management that has been used on small scales across the West. Viewing wilderness and rangelands as places requiring community-based management was a radical idea when the group was first formed.²² Managing these areas rich in biodiversity through multiple viewpoints and perspectives has proved to be an effective method of preserving land, conserving species, and maintaining ranching as a way of life in southern Arizona and New Mexico.

This type of collaboration has provided a land management model that sets a standard for the whole Rockies region. As the Rockies region continues to develop and expand, multiple organizations with varied interests can successfully partner to accomplish common goals: open space, healthy ecosystems, and the preservation of cultural traditions such as ranching and farming.

¹ “Terra 414: Ranching in the New West part 1. The Nature of Our World” (video). Duke Phillips. 2007.

² Gillis, Anna. “Should Cows Chew Cheatgrass on Commonlands?” American Institute of Biological Sciences. *BioScience*, Vol. 41, No. 10 (Nov. 1991), p. 668-675.

³ Fleischner, Thomas L. “Ecological Costs of Livestock Grazing in Western North America.” *Conservation Biology*, Vol. 8, No. 3 (Sep. 1994), p. 629-644. Blackwell Publishing for Society for Conservation Biology.

⁴ Matteson, Mollie and George Wuerthner. *Welfare Ranching: The Subsidized Destruction of the American West*, Island Press, 2002.

⁵ Glen, Wendy. Interview with author, near Douglas, AZ, July 10, 2009.

⁶ Sayre, Nathan. *Working Wilderness: The Malpai Borderlands Group and the Future of the Western Range*. Rio Nuevo Publishers. 2005. p. 40.

⁷ *Ibid.*, 8.

⁸ *Ibid.*, 33.

⁹ *Ibid.*, 94.

¹⁰ *Ibid.*, 163.

¹¹ *Ibid.*, 164.

¹² *Ibid.*, 164.

¹³ Hadley, Drummond. “Grassbanks in the West: Challenges and opportunities.” Proceedings from a two day conference of ideas and experience. 2001. p. 2.

¹⁴ Sayre, 130.

¹⁵ *Ibid.*, 132.

¹⁶ *Ibid.*, 128.

¹⁷ Gottfried, Gerald J. and Larry S. Allen. “A Plan for Landscape Fire Restoration in the Southwestern Borderlands.” *Ecological Restoration*. Vol. 27, No. 2 (June 2009), p. 129.

¹⁸ Kaib, Mark, et al. “Fire History in the Canyon Pine-Oak Forests, Intervening Desert Grasslands, and Higher-elevation Mixed Conifer Forests in Southwestern Borderlands.” Toward integrated research, land management, and ecosystem protection in the Malpai Borderlands: conference summary. USDA Forest Service proceedings RMRS-P-10. 1999.

¹⁹ Gottfried, Gerald J. et al. “Private-public Collaboration to Reintroduce Fire into the Changing Ecosystems of the Southwestern Borderlands Region.” *Fire Ecology: Special Issue*. Vol. 5, No. 1 (2009), p. 87.

²⁰ McPherson, Guy R. and Jake F. Weltzin. *Distribution and Climate Change in United States/ Mexico Borderland Plant Communities: State of the Knowledge Review*. USDA Forest Service General technical report RMRS-GTR-50. 2000.

²¹ Gottfried, Gerald J. et al. “Private-public Collaboration to Reintroduce Fire into the Changing Ecosystems of The Southwestern Borderlands Region.” p. 88.

²² Sayre, 144.

²³ *Ibid.*, 163.

²⁴ The Nature Conservancy. “The Rocky Mountain Front: Conservation Easements Supporting Protection of Rich Wildlife Habitat.” <http://www.nature.org/partners/commonground/partnership/rockymnt.html> (accessed November 20, 2009).

²⁵ Ansley, Jim, et al. “Sustainable Management Strategies for Mesquite Rangeland: The Waggoner Kite Project.” *Rangelands*, Vol. 19, No. 5 (October 1997), p. 4-8. Allen Press and Society for Range Management.

²⁶ Clothier, Van. Interview by author, near Douglas, AZ, July 10, 2009.



However, this model may not be completely sustainable partially due to a current lack of funding. With much financial support coming from philanthropic organizations, the current state of the economy will make these conservation projects more difficult. These partnerships are essential to the group's survival. Much like the MBG, more land management agencies are adopting a “working wilderness” approach to their management models.²³ The Nature Conservancy has now adopted some of the same principles in running western rangelands while maintaining ranching as a primary practice on the landscape.²⁴

The MBG acknowledges and understands that much of the land throughout the Southwest has been damaged, and in some cases partially destroyed, because of grazing. However, what they have discovered is that the proper use of animals, fires, and rest can help restore some of these degraded lands.²⁵ As noted by Van Clothier, a stream restoration hydrologist and member of the MBG, diverse ideas can foster improved environmental solutions and disparate parties can effectively work together. When asked how he felt about working with this group of ranchers given their different political viewpoints from his, he responded “I am blessed to have these people in my life,”²⁶ an opinion historically not often used by environmentalists to describe a community of ranchers.