Conserving lands and prosperity: Seeking a proper balance between conservation and development in the Rocky Mountain West

For:

Sportsmen for Responsible Energy Development

By:

Southwick Associates

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Conserving lands and prosperity: Seeking a proper balance between conservation and development in the Rocky Mountain West

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Abstract:

Public lands comprise a major portion of the western landscape and shape rural economies and cultures by providing raw materials, recreational opportunities, wildlife habitat and desirable scenic qualities. Management goals for public lands range from conservation to development of commodity resources such as oil, gas and minerals. This paper examines the relationship between economic security and varying land management and usage strategies in the rural Rocky Mountain West. A geographic information system is used to analyze the percentage of land in each county managed under three scenarios:

(1) Recreation and conservation;
(2) Development of commodity resources; and
(3) A combination thereof.

The analysis indicates that the jobs, income and growth from the commodity production sectors in the rural Rocky Mountain West, while still significant, have not experienced the growth seen by the rest of the regional economy. Rural counties with greater areas actively conserved for recreation, conservation plus lower impact commodity uses – including balanced levels of timber, mining and energy development - actually enjoy relatively higher income, population and employment growth. Counties dominated by conservation and recreation lands also have higher property values and high proportions of higher-income workers.

Communities need the energy and materials provided by the commodities sector. Individuals – residents and tourists alike – demand the quality of life provided by the region's fish, wildlife and scenic resources. Nearly all rural Rocky Mountain communities need the jobs and income generated by both sectors. Public officials at the local, state and federal levels must carefully balance the needs and impacts from land use management decisions on all economic sectors to ensure the best, most rewarding economic future for the Rocky Mountain West.

Introduction

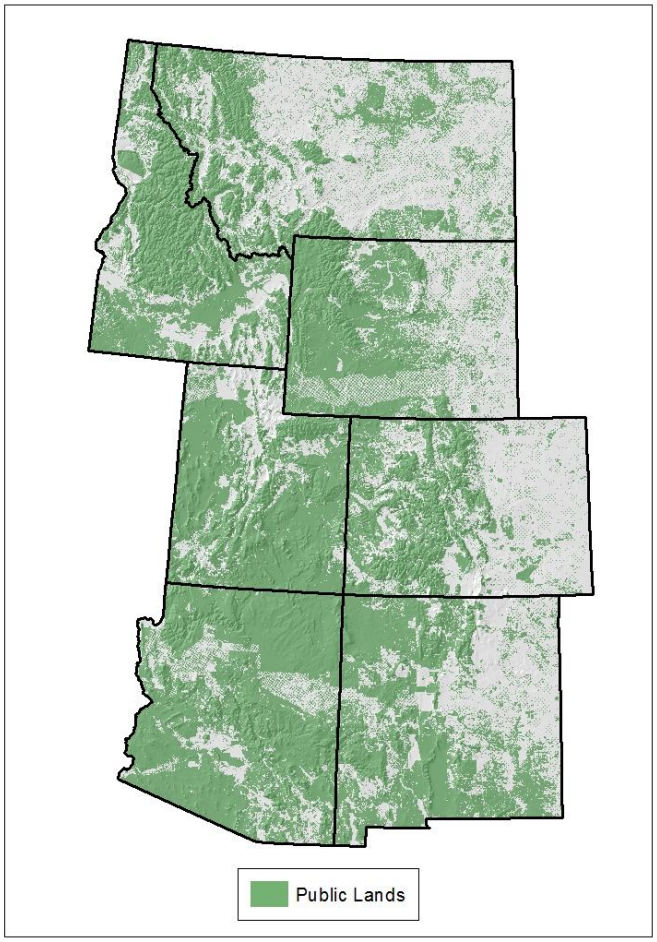
More than half of the land in the Western United states is managed by state and federal governments (Jackson, 1995). Public lands in the seven Rocky Mountain States[1] alone cover an area roughly 7.5 times larger than Florida (see Figure 1). These public lands shape rural economies and cultures by providing raw materials, recreational opportunities, wildlife habitat, natural beauty and ecosystem services. The wide range of benefits provided by public lands are partially the result of diverse and sometimes conflicting management goals, which range from encouraging extraction, to promoting tourism, to preserving wilderness.

Recent increases in energy prices have placed extra emphasis on developing the West's energy resources. Calls for rapid expansion of oil and gas extraction may or may not have considered their impact on existing – and growing - economic sectors such as fish, wildlife and other outdoor recreation, plus the growth driven by people and businesses desiring the quality of life benefits possible from the region's wild and scenic resources. Given the perceived conflicts between various types of economic activities occurring on rural public lands, it's not surprising there is often widespread disagreement on how to best manage these lands.

[1] *The Rocky Mountain States include Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming*

The U.S. needs the raw materials provided on western public lands, and the jobs supported by these activities are important contributors to the western economy (see, for example, Power 1996a, Rasker 2006, Charnley 2008 and Lorah and Southwick 2003). Likewise, jobs and economic benefits dependent on fish, wildlife and the areas' natural scenic qualities have provided steady growth and are likewise important – but often overlooked - contributors. Recognizing both activities are beneficial, and that they often can occur in the same locations, it is important to strike a proper and healthy economic balance. This report describes the trends associated with both important sectors, and provides information to help decision makers find an effective balance that protects current jobs and provides for a healthy economy in the long run.

Figure 1. Public Lands in the Rocky Mountain West.
Source: Conservation Biology Institute (2010).



Background

Economic growth from the West's fish, wildlife and scenic resources has been significant, but is often overlooked, underestimated or not understood. The economic model of developing commodity resources contrasts with the amenity-based model of economic development (Charnley 2008). In the amenity-based model, public lands with desirable fish, wildlife and scenic resources have the potential to support thriving rural

economies by attracting service jobs at all income levels[2], wealthy retirees, small business owners and tourists. Conserving natural beauty and recreational opportunities is seen as preserving economic security for many areas by limiting "lost landscapes" (Power 1996). The economic activity generated by hunting, fishing, hiking, skiing and other forms of outdoor recreation can outweigh commodity production in many, but not all areas, and communities near areas with recreational or scenic qualities have the opportunity to develop diverse, rapidly growing amenity economies. Proponents of this model note that it is increasingly rare for communities to remain primarily dependent upon traditional resource-based rural industries (Winkler 2007). Rural economies face a number of challenges, including the cyclical nature of otherwise valuable commodity production jobs and the fact that knowledge-based and generally higher paying firms generally cluster in more urban areas. Despite this, a number of modern rural economies continue to thrive (McGranahan et al. 2010). This rural growth is uneven and is often concentrated in areas that benefit from the presence of natural amenities (Shumway and Otterstrom 2001).

The assertion that environmental amenities promote growth is supported by surveys (Rudzitis and Johansen 1991, Johnson and Rasker 1993) indicating that scenic beauty and recreational opportunities are a leading factor in attracting new migrants and business owners to many areas in the rural West. Similarly, a wide range of studies provide ample evidence that the lure of natural, scenic and recreational opportunities and a comfortable climate increasingly explains patterns of rural growth (see for example, Ullman1954, Knapp and Graves 1989, Gottlieb 1994, Howe et al. 1997, Johnson and Beale 2002, Rudzitis 1999, Booth 1999, McGranahan 1999, McGranahan 2008, Nelson 1999, English et al. 2000, Deller et al. 2001, Lorah and Southwick 2003, Dearien 2005, Hunter et al. 2005, Reeder and Brown 2005, Gosnell and Abrams 2009.)

By attracting new residents and retirees, scenic and natural amenities such as fish and wildlife also support employment. Many of these people also bring a variety of skills, investment capital, creativity and entrepreneurial energy that are essential components of a thriving economy (McGranahan 2010). For example, McGranahan and Wojan (2007) demonstrated that many people with the ability to choose where they live and work are attracted to rural counties with scenic landscapes. The purchasing power of new residents stimulates growth in a wide range of industries including construction, healthcare, retail, and professional services (Power 1996b, Rudzitis 1999, Rasker and Glick 1994).The result is that in high-amenity rural areas "jobs follow people" (Greenwood, 1991, Goodstein 1999, Nelson 1999, Vias 1999, Carruthers and Vias 2005, McGranahan 2008).

While environmental amenities can be defined in a variety of ways, some researchers focus on the relationship between the availability of public lands and rural growth. In northwestern Montana, Rasker and Hackman (1996) found that conservation lands counties outperformed commodity production counties in job formation, income growth and economic diversification. Lorah and Southwick (2003) found that the presence of undeveloped, scenic areas were associated with income, employment and population growth in the non-metropolitan west. A similar study by Holmes and Heacox (2004) demonstrated that growth in counties with such lands outpaced growth in counties without public conservation lands in the Rocky Mountain West. Other studies find similar results (Rudzitis 1996, Raster and Hackman 1996, Rudzitis 1999, Lewis et al. 2003, Frentz et al. 2004, Rasker 2006, Frentz et al. 2004).

Methodology

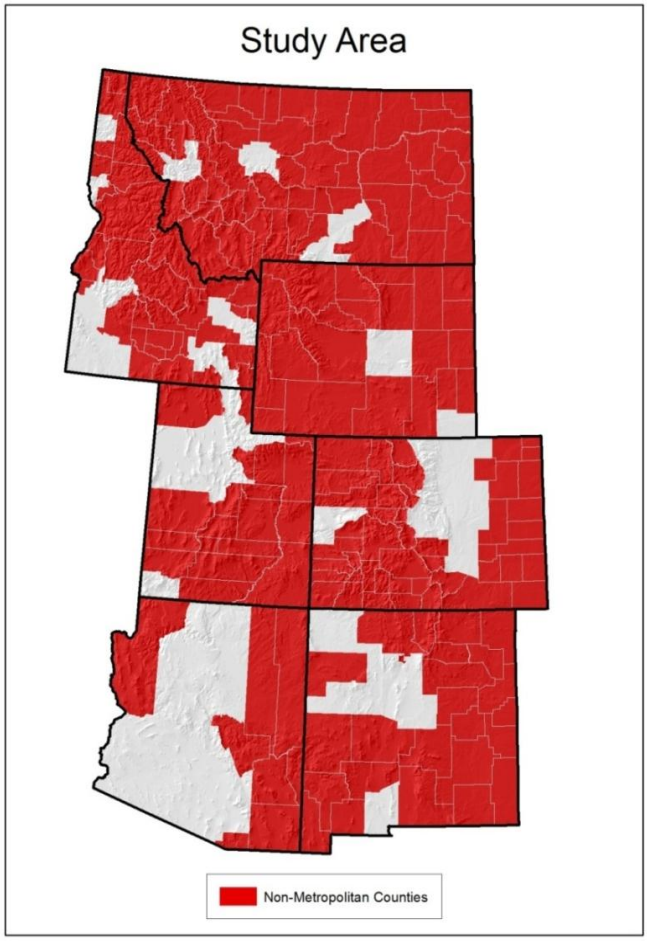
This paper analyzes detailed data on the management, location and extent of public lands in concert with county level economic data dating to 1969. Rural lands in the Rocky Mountain West are divided into three primary categories: conservation/recreation (lands either protected legislatively or allowing some level of resource development, as explained further below), moderately managed lands, and intensely managed lands. A geographic information system (GIS) is used to overlay the locations of these lands on patterns of economic development to analyze the relationship between land designations and economic development. Historical data are examined to identify the long term trends in employment, income and other economic measures by type of land.

[2] *Various income levels are defined by occupation rather than industry and include workers in the fields of science and technology, design, business and management, health care and law, and arts, culture, media, and entertainment.*

Study Area

This study focuses on the relationship between land usage and economic growth in the 204 non-metropolitan counties in the Rocky Mountain West (Figure 2). Non-metropolitan counties were taken from the Rural-Urban Continuum Codes database (Economic Research Service, 2003). Rural counties in the seven Rocky Mountain states were selected for two main reasons. First, the region contains the highest concentration of conservation/recreation lands in the contiguous United States. Approximately half of the land in the region is owned and managed by the federal government. Second, the focus is on rural counties, which are more likely to have both public lands and resource-based jobs than metropolitan counties. Few would promote logging or mining in cities to create jobs.

Figure 2. Study Area: Nonmetro Counties in the Rocky Mountain West.
Source: Economic Research Service (2003).



Land Definitions and Categories

Land use definitions were obtained from the Protected Areas Database from the Conservation Biology Institute (2010). This GIS database contains detailed information on the location, extent and management goals of state and federal lands. Management goals for these lands are quite diverse, ranging from wilderness preservation to active promotion of oil and gas leasing and other commodity production activities.

The Protected Areas database assigns state and federal lands to several categories. These definitions are provided directly from the Conservation Biology Institute:

> **"GAP Status 1:** An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference or are mimicked through management."
>
> **"GAP Status 2:** An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance."
>
> **"GAP Status 3:** An area having permanent protection from conversion of natural land cover for the majority of the area, but subject to extractive uses of either a broad, low-intensity type (e.g., logging) or localized intense type (e.g., mining). It also confers protection to federally listed endangered and threatened species throughout the area."
>
> **State Trust Lands:** State Trust Lands generally have no mandate for environmental protection. "Unlike other categories of public lands, the vast majority of state trust lands are held in a perpetual, intergenerational trust to support a variety of beneficiaries, including public schools. . . these lands are actively managed for a diverse range of uses, including: timber, grazing, mining for oil and gas and other minerals, agriculture, commercial and residential development, conservation, and recreational uses such as hunting and fishing… revenue generation from state trust land has focused on the leasing and sale of natural products. Even in the present day, many Western states continue to obtain significant financial benefits from specific natural resource management activities on trust lands – particularly subsurface uses. Oil, gas, coal, and other mineral extraction continues to provide the bulk of the revenues derived from trust lands for states such as Colorado, New Mexico, Texas, Utah, and Wyoming, and will likely continue to do so in the future. Timber management also continues to provide significant revenues …"

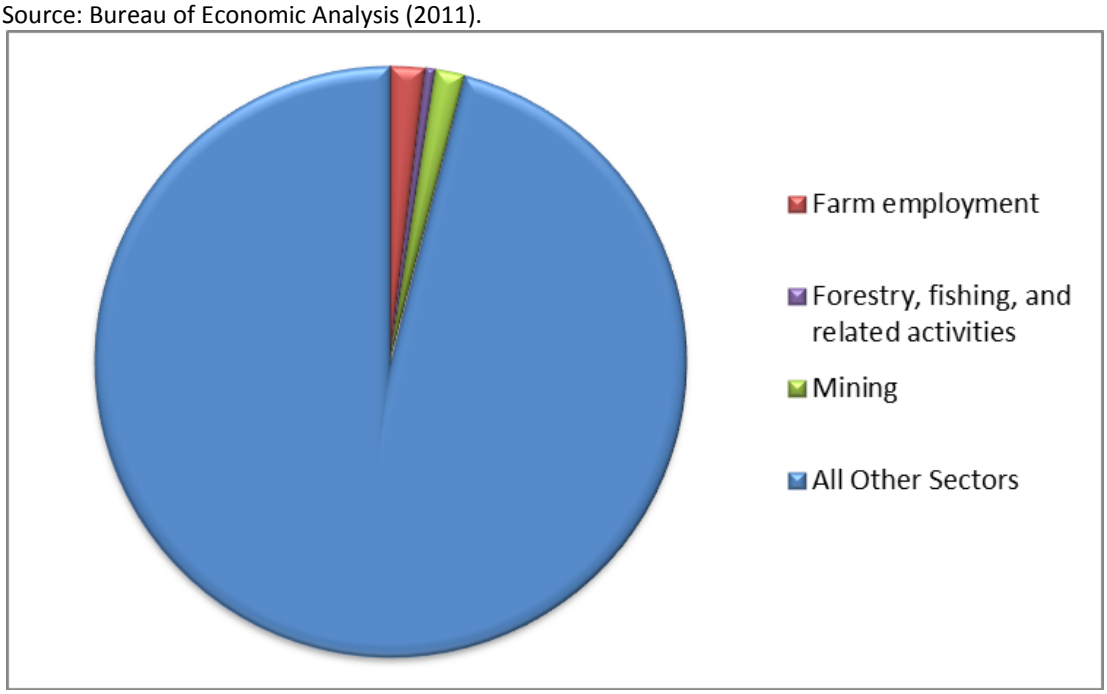
Gap 1 lands, having the highest levels of use restrictions, are generally areas that have received wilderness designation, are National Park lands and in some cases monuments. Gap 2 lands include most U.S. Forest Service lands and BLM lands which timber, grazing and other valuable commercial uses are permitted and monitored. Together, these two types of lands are combined in this report and referred to as **conservation/recreation** lands. Gap 3 lands allow higher levels of commodity production such as some mining and energy development, and are referred to in this report as **moderately managed lands**. Gap 1, 2 and 3 lands represent the spectrum of federal lands managed under the multiple-use doctrine. The third major land category used in this report allows intensive commercial development of natural resources and are often referred to locally as **state trust lands**, and in this report, will be referred to as **intensely managed lands** per the description provided above. These lands are often important sources of tax revenue and income for state and local communities. Moderately managed lands can be considered the combined approach between conservation/recreation and intensely managed lands. Appendix 1 provides maps showing the breakout of each of the three land designations used in this report, plus a map highlighting the percentage of each county within each of the three categories.

Is Commodity Production the Base of Rural Economies?

The economic model of commercial development of commodity resources assumes that commodity production is the foundation for rural economies (Power 1996a). Therefore, if energy development, mining, logging and agriculture decline, the rest of the economy will automatically follow, accordingly. (This view reflects the economic history throughout much of the West: towns were given names like Golden, Gold Creek, Silverthorn, Silverton, and Marble for good reason. In recent years, however, there has been a transition in many areas towards service economies, a transition that is apparent in government economic data, diversifying the rural western economy and provided additional potential and realized jobs and income.

The Bureau of Economic Analysis has collected county-level data on employment by industry since 1969. Figure 3 displays data from the Bureau of Economic Analysis (2011) on total full-time and part-time employment by industry in the seven Rocky Mountain States in 2009. For the Rocky Mountain West as a whole, including metropolitan areas, commodity production (energy development, mining, agriculture and timber) comprises 4.02% of total employment. If agriculture and agriculture services are excluded, employment in forestry, commercial fishing and mining (which includes energy development) accounts for 2.1% of the region's jobs.

Figure 3. Total full-time and part-time employment by industry, 2009. All counties in the Rocky Mountain West.
Source: Bureau of Economic Analysis (2011).

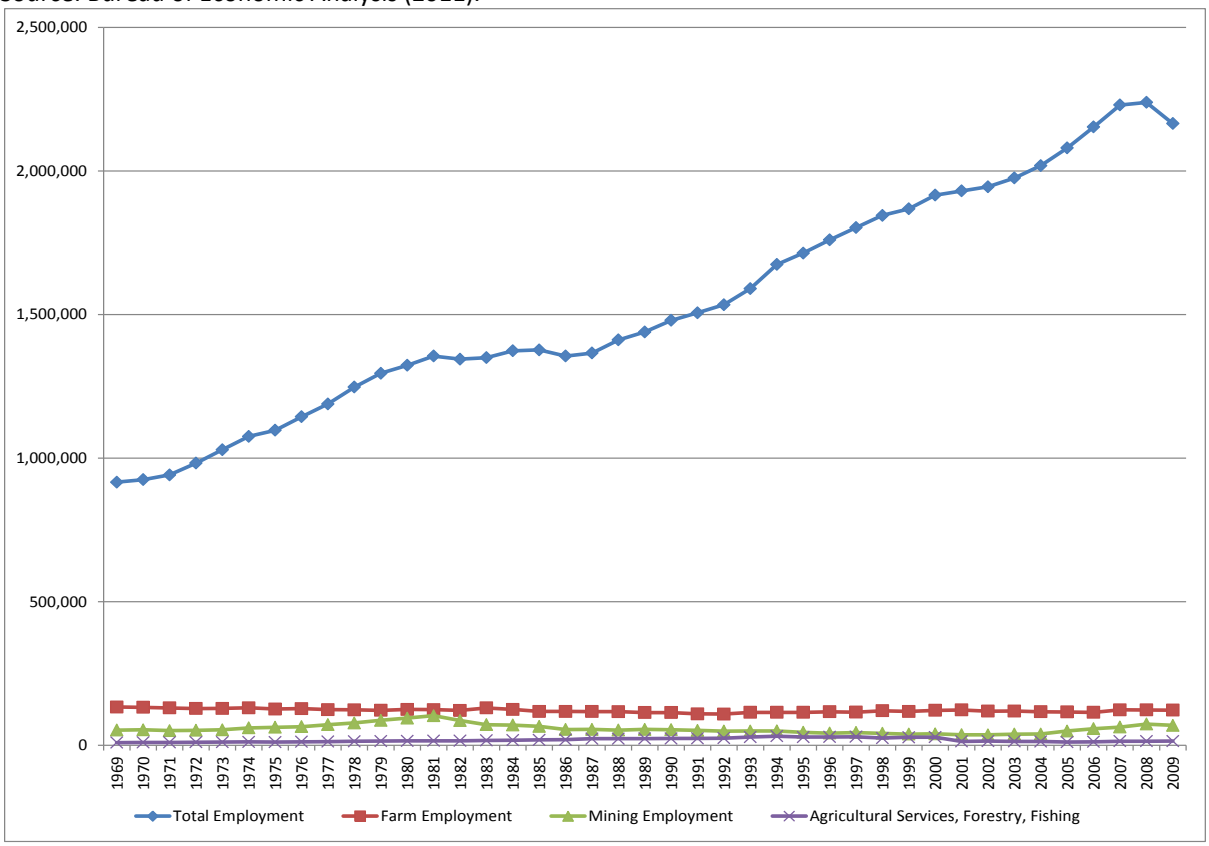


** Fishing refers to commercial fishing only.*

Figure 4 shows employment change in non-metropolitan areas of the Rocky Mountain West (the study area in Figure 2)[3] and highlights the growth in the sectors outside of the traditional – yet still valuable – commodity production sectors. Between 1969 and 2009, employment in the commodity production sectors remained flat, while total employment increased 136%. Overall job growth was slowed by a period of stagnation in the early 1980s and a more serious downturn in 2007 that impacted nearly all sectors.

[3] *Figure 4 displays all available data from the Bureau of Economic Analysis. Because county level data are occasionally suppressed to protect the privacy of employers in counties with few competitors, it is not possible to precisely calculate the percent of jobs in extraction for the non-metro counties.*

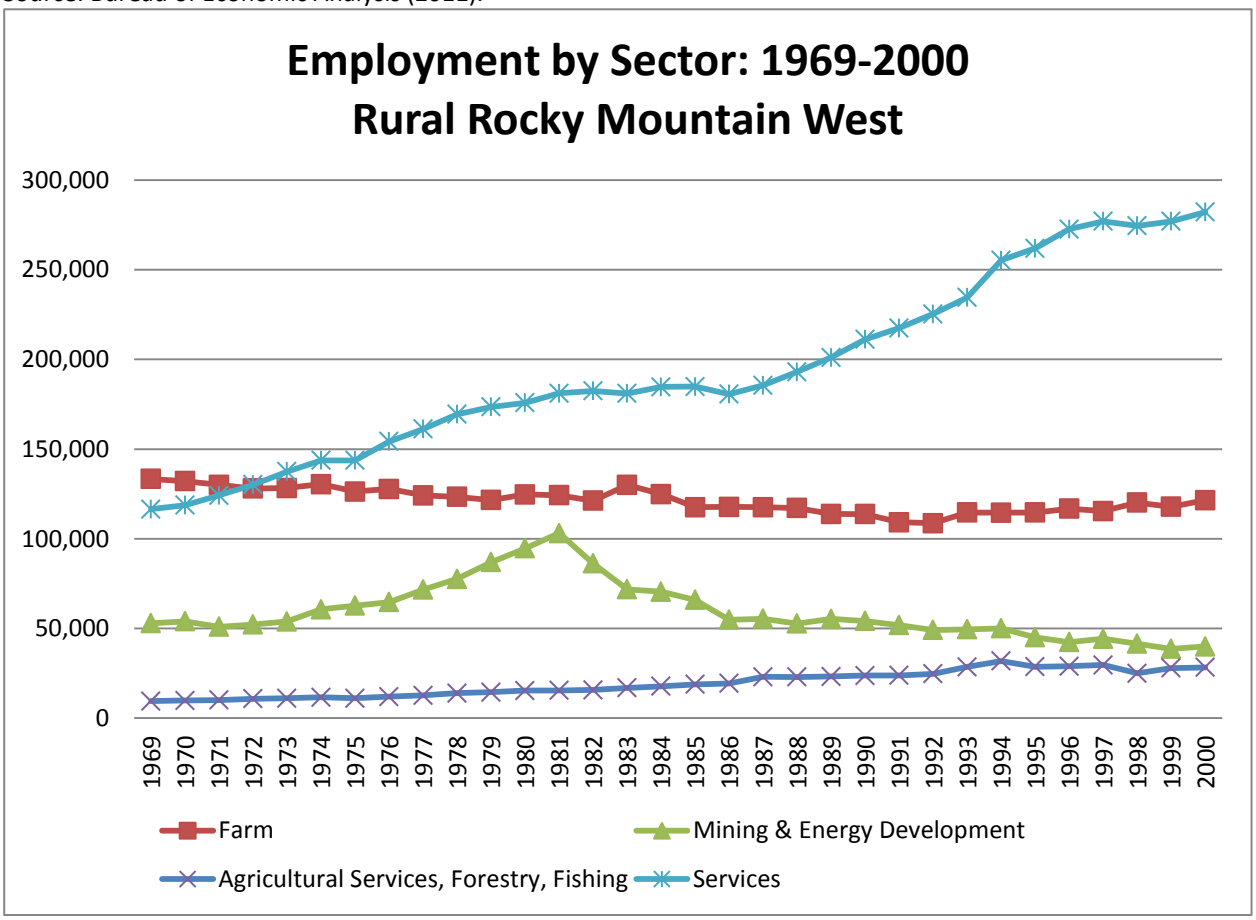
Figure 4. Employment growth by industry in the non-metropolitan West, 1969- 2009.
Source: Bureau of Economic Analysis (2011).



Cyclical Nature of Various Economic Sectors

The same Bureau of Economic Analysis (BEA) county-level data can be further examined for trends in specific industries. These base definitions used by the BEA of U.S. industrial and economic sectors were revised in 2000 with the introduction of the North American Industry Classification System (NAICS) and the retirement of the Standard Industrial Classification (SIC) codes. The revised BEA data, based on the new NAICS system, provides detailed information on trends for sectors within the service economy. Two charts are shown. The first (Figure 5) shows trends from 1969 to 2000 based on the previous SIC system, and Figure 6 presents the 2001-2009 trends using the new NAICS basis.

Figure 5. Employment growth by industry in the non-metropolitan West, 1969- 2000.
Source: Bureau of Economic Analysis (2011).



** In this table and those that follow, "fishing" refers to commercial fisheries only.*

Figure 5 shows that up to 2000, growth in the primary commodity production sectors did not grow with the rest of the western economy. Mining and energy development experience strong job growth until 1981, but then encountered a downward cycle. All economic sectors are subject to down periods, but the upward and downward cycles in commodity sectors, such as mining, energy and timber, are often be more severe than other economic sectors. The services sector shows the strongest job growth since 1969 and has become the top jobs provider. Jobs in this sector range from traditional service employment such as retail to professional services such as medical, legal, accounting and other highly skilled and white collar employment, as discussed further in this document.

Figure 6. Employment growth by industry in the non-metropolitan West, 2001 - 2009.
Source: Bureau of Economic Analysis (2011).

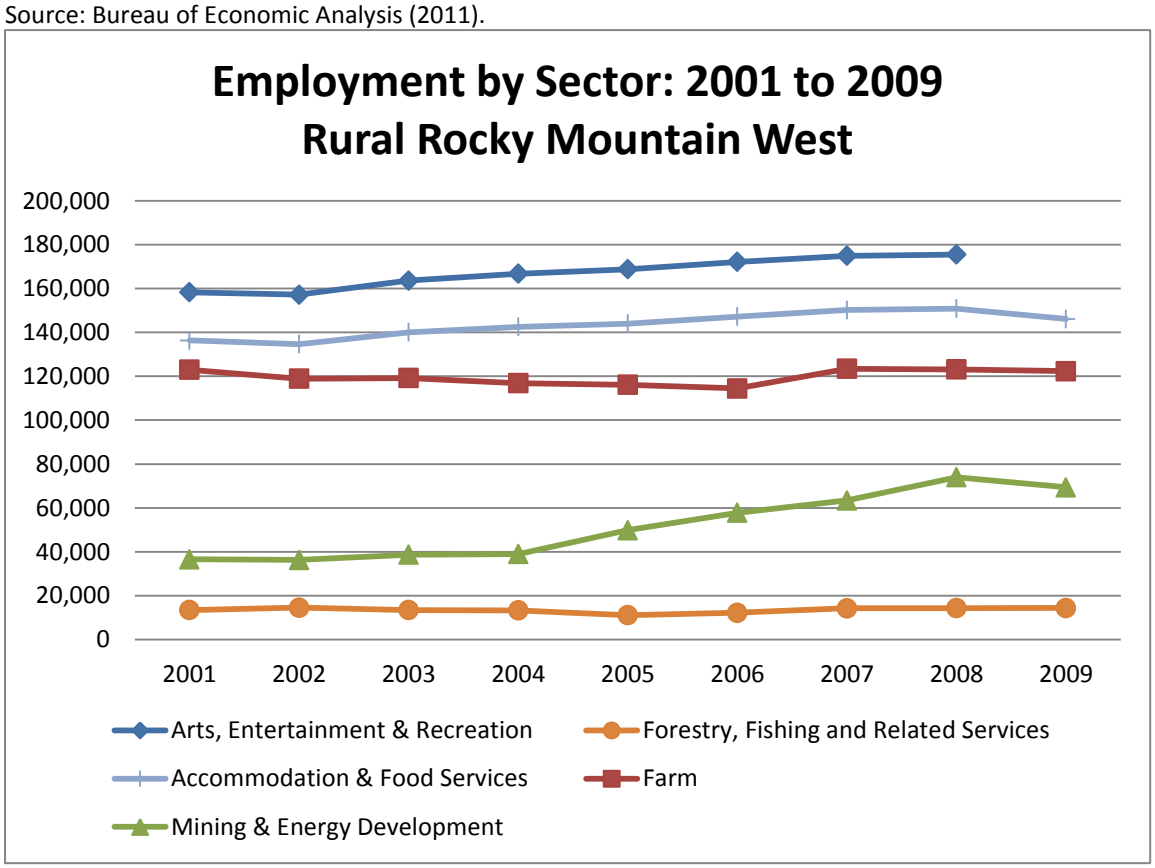


Figure 6 shows that, since 2001, the traditional commodity production sectors remained stable, with the exception of mining and energy development which showed strong growth since 2004. The dip in 2009 may have reversed in 2010 or later, based on activities observed by the authors in the region. As seen historically, the cycle at some point is likely to decrease. The two amenity-oriented sectors on top of the chart, with higher levels of employment, also showed growth. Data for 2009 "Arts, Entertainment and Recreation" were not available. Like the rest of the U.S. economy, accommodations and food services dipped in 2009.

Figures 5 and 6 provide a couple important points:

1) Mining and energy development are important parts of the western economy, along with the larger and growing sectors supported by recreation, tourism and amenity-based economic development.
2) Some sectors are subject to upward and downward cycles more severe than others. Therefore, it is prudent for western decision makers to foster growth for all major sectors, ensuring the base of each sector remains healthy, intact and viable to ensure a balance that allows other sectors to help overcome decreases in any specific sector. "Balance" is the key to long-term economic health.

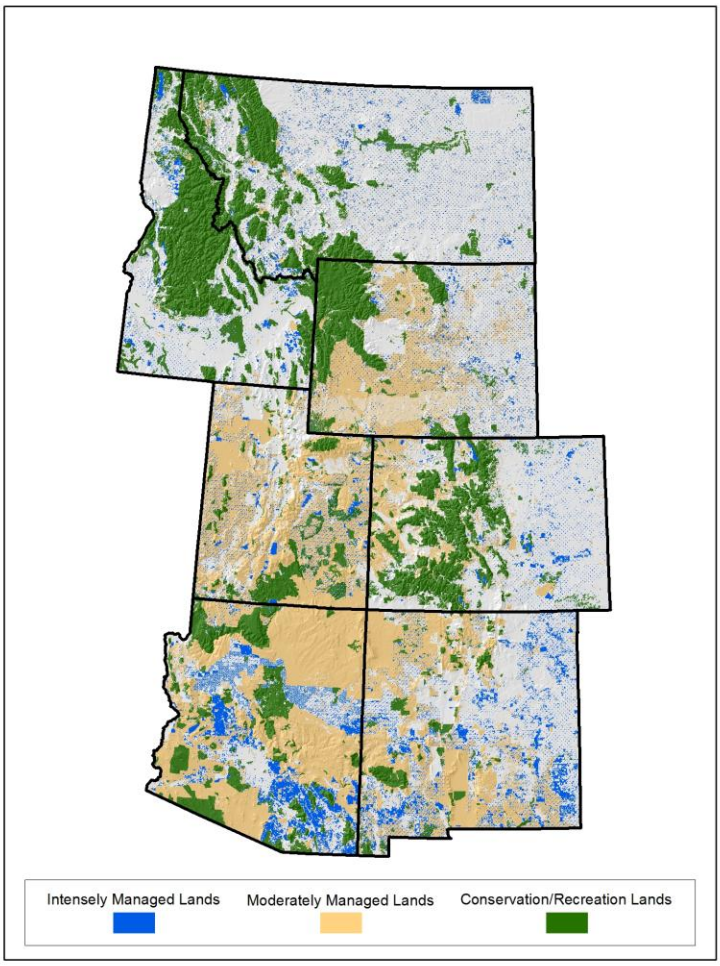
Do Conservation Lands Limit Economic Growth?

Commodity production does not share the same proportion of the western rural economy in the Rocky Mountain West as it did several decades ago. The commodity-production economic models can be interpreted to say limiting these sectors will slow growth in employment, population and income, when in fact, amenity-based economies are compatible and often provide greater benefits. Amenity-based economies include people and businesses attracted to an area based on the scenic, quality of life and recreational characteristics. Tourism is largely driven by the same benefits. Environmental and recreational enhancements and protections harm rural economies no more than commodity production absolutely benefits them. Every community boasts unique

characteristics that must be weighed when considering whether to manage lands for amenities, commodities or a well-managed blending of both. Finding a proper balance between commodity production and amenity-based economic activities, while conserving natural and scenic resources as a source of future jobs, is a necessary task.

To test these assertions, a GIS approach was used to map federal and state lands in the Rocky Mountain West using the Protected Areas Database (Conservation Biology Institute 2010). This GIS-based shapefile contains detailed data on the location, extent and management goals of state and federal lands. Management goals for these lands are quite diverse, ranging from wilderness preservation to active development of oil and gas leasing. Public lands were assigned to three categories: conservation/recreation lands, moderately managed lands, and intensely managed lands (also known locally as state trust lands). They appear in Figure 7. As previously described, conservation/recreation lands are managed to limit changes to natural land cover and maintain a natural state. Moderately managed lands are also managed to protect land largely in its natural state, but also support commodity development such as logging, mining and energy development (Conservation Biology Institute 2011). Intensely managed lands are often actively managed to generate revenue for schools and other state services by leasing agricultural land, as well as selling timber, minerals, oil, gas and coal (Culp et al. 2005). These three management categories include the majority of state and federal lands in the study area. Lands not yet classified by the Conservation Biology Institute were not included in the study.

Figure 7. Protected Federal and State Lands: Conservation Biology Institute (2010)



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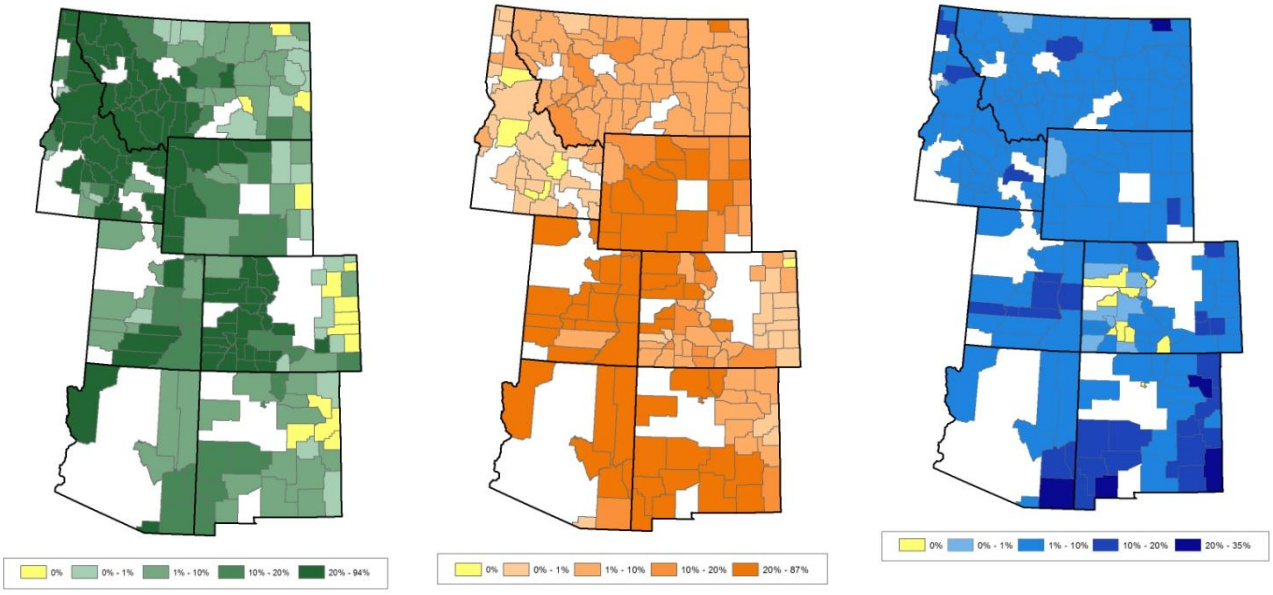
To calculate the proportion of land in each county utilized for conservation/recreation, moderate management, and intensive management, the area of each county in each of the three management categories was calculated. Then, the public lands layers were intersected with the county layer to calculate the proportion of land managed for protection, multiple use and extraction by county (Figure 8).

Figure 8. Proportion of land managed for conservation/recreation, moderately managed and intensely managed in the counties of the rural Rocky Mountain West. Calculated by the author.



% Conservation/Recreation Lands % Moderately Managed Lands % Intensely Managed Lands

The tables in Appendix 2 are based on the data from these maps. They display the top five conservation/recreation, moderately managed and intensely managed counties. The counties were ranked by the percentage of land managed in each of the three categories. Appendix 2 also contains a list of mining and energy development-dependent counties, as defined by the 2004 County Typology Codes (USDA Economic Research Service 2003). In these counties, 15 percent or more of average annual labor and proprietors' earnings were derived from mining and energy development (including coal, oil and natural gas) from 1998 to 2000. This is the latest data for which the County Typology Codes have been determined. Since the analysis examines economic and population changes from 1969 to 2009, this is a reasonable demarcation point for identifying mining and energy-dependent counties. Data on income, population and employment growth between 1969 and 2009 (the first and last years of county-level data availability) are from the Bureau of Economic Analysis (2011). Data on housing values come from the Geographic Research Incorporated SimplyMap database (2012) and data on creative class workers from (McGranahan and Wojan 2007).[4]

[4] The data (both SIC and NAICS) are occasionally suppressed by the BEA at the county level to protect the privacy of individual businesses. This generally happens in small counties with only a few businesses in a particular industry. When this happens for employment data, the actual number of jobs is not given. One of two adjustments were made when the actual # of jobs were

Results

Across the West, many small towns are surrounded by a matrix of diverse public and private lands. As these communities developed, some grew near wildlands that were later protected, others grew near wildlands that were converted into working landscapes supporting development of minerals and resources. The result is a natural experiment: If the management of public lands affects the fortunes of nearby communities, then different courses of economic growth should be noticeable.

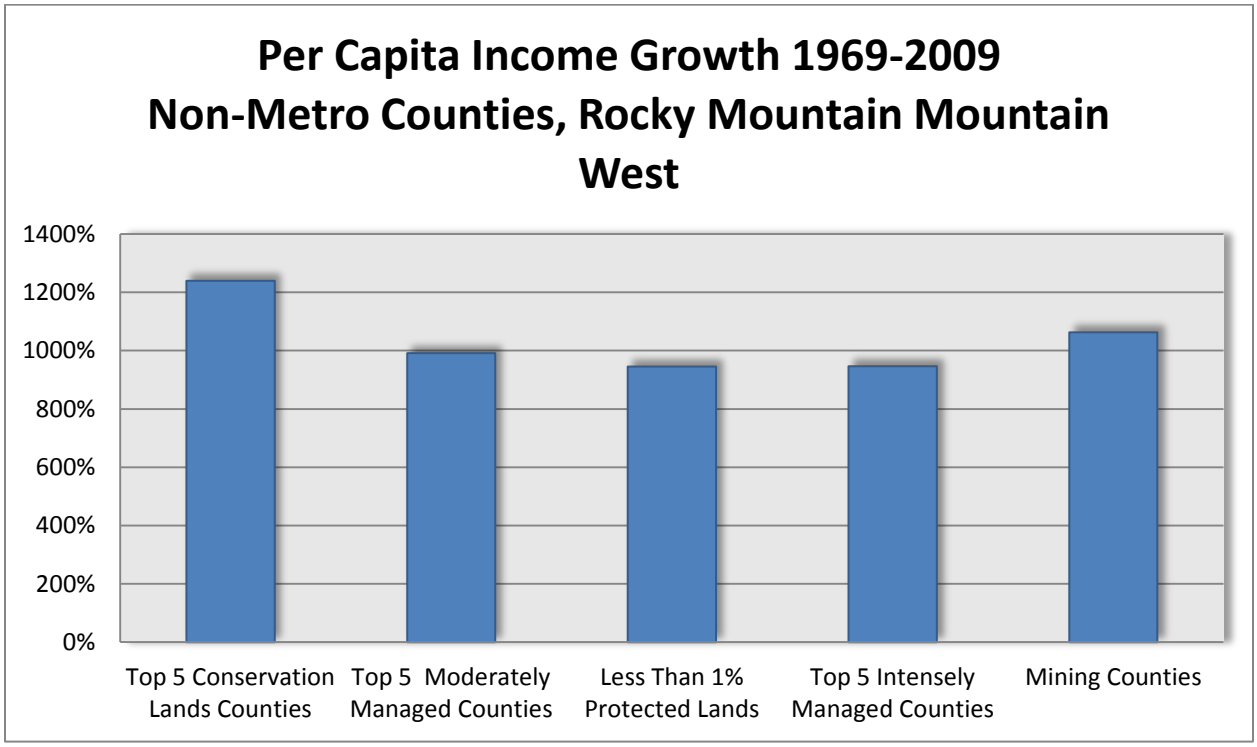
We know where conservation/recreation lands are and where working public lands are; we can also map patterns of economic development to locate pockets of growth and stagnation. If the strict commodity-based model of economic development is correct, public lands supporting extraction should be found near thriving communities. Conversely, the presence of public conservation lands should be correlated with poor economic performance. The economic damage caused by policies promoting conservation and recreation should also be apparent when the growth of conservation lands counties is compared to growth in counties where commodity production is allowed or actively promoted.

Evidence from the development history of the Rocky Mountain West undermines these claims, however. Conservation/recreation lands dominate the landscapes of counties where relatively high levels of growth and wealth occur, while the presence of lands managed for the extraction of natural resources is associated with relatively slow growth. This can be seen in the following figures, which compare measures of economic development in counties with landscapes dominated by conservation/recreation lands, moderately managed lands, and intensely managed lands, along with mining counties (as defined by the USDA Economic Research Service 2003) and counties with less than 1% conservation/recreation lands.

Figure 9 displays the relationship between per capita income growth and public lands management in the rural Rocky Mountain West (the time period, 1969 – 2009, is based on the first and last year of data availability). The top five protected lands counties (listed in Appendix 2), averaging 84.3% protected lands, benefit from the highest per capita income growth rates while the top five intensely managed lands counties had the lowest income growth rates. While this does not prove that the presence of conservation/recreation lands caused relatively rapid income growth, the correlation between income growth and environmental conservation is noticeable. Similarly, counties with high proportions of intensely managed lands grew relatively slower. Many of these counties may not have the scenic and recreational assets necessary to sustain an amenity-based economy.

not given: 1) If the number of jobs in an economic sector is less than 10, 10 jobs were assumed to exist; or 2) If the number of jobs had been suppressed, no jobs were assumed to exist.

Figure 9.



Uneven income growth rates result in pockets of relative wealth across the landscape. Figure 10 displays per capita income in 2009 by land management category. It shows that the wealthiest counties also have the highest percentage of conservation/recreation lands. In the top five conservation/recreation lands counties, per capita income averaged $61,300, the highest income level in the study area. Per capita income in the top five moderately managed counties, intensely managed land-oriented counties and counties without protected lands did not top $35,000.

Figure 10.

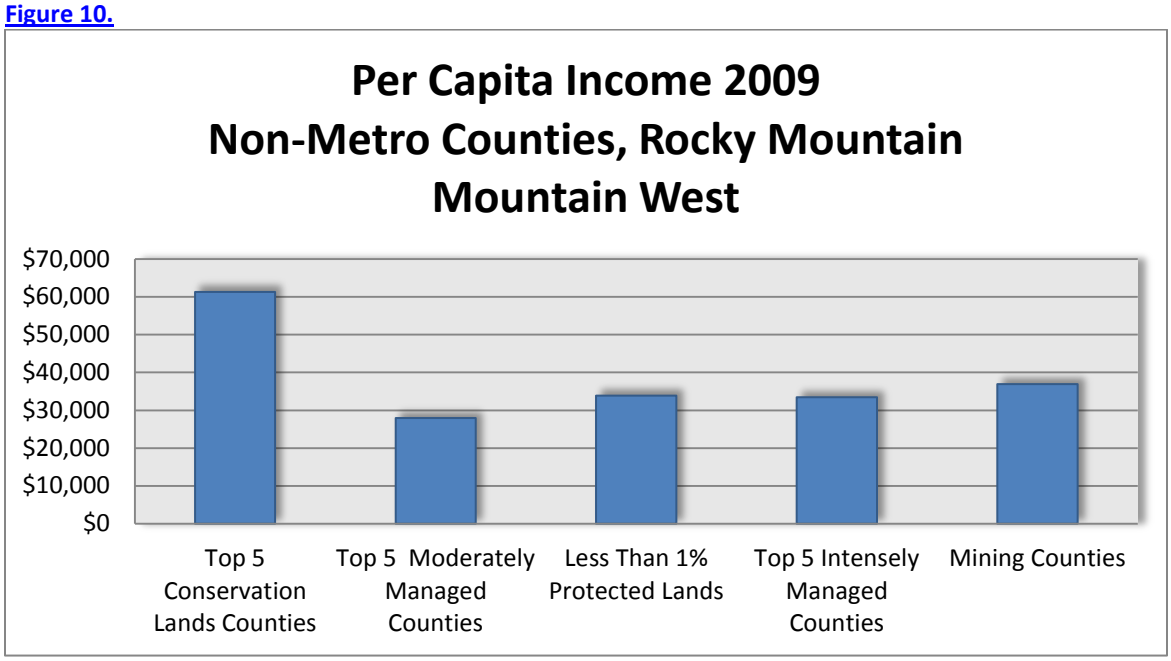


Figure 11 displays employment growth rates between 1969 and 2009 by land management category. Again, the presence of conservation/recreation lands and growth are correlated. Counties characterized by large amounts of conservation/recreation lands benefit from the region's highest employment growth rates. Conversely, the absence of conservation/recreation lands was associated with slower growth. Employment in the top five conservation/recreation lands counties grew approximately 5.3 times faster than employment in counties dominated by intensely managed lands.

Figure 11.

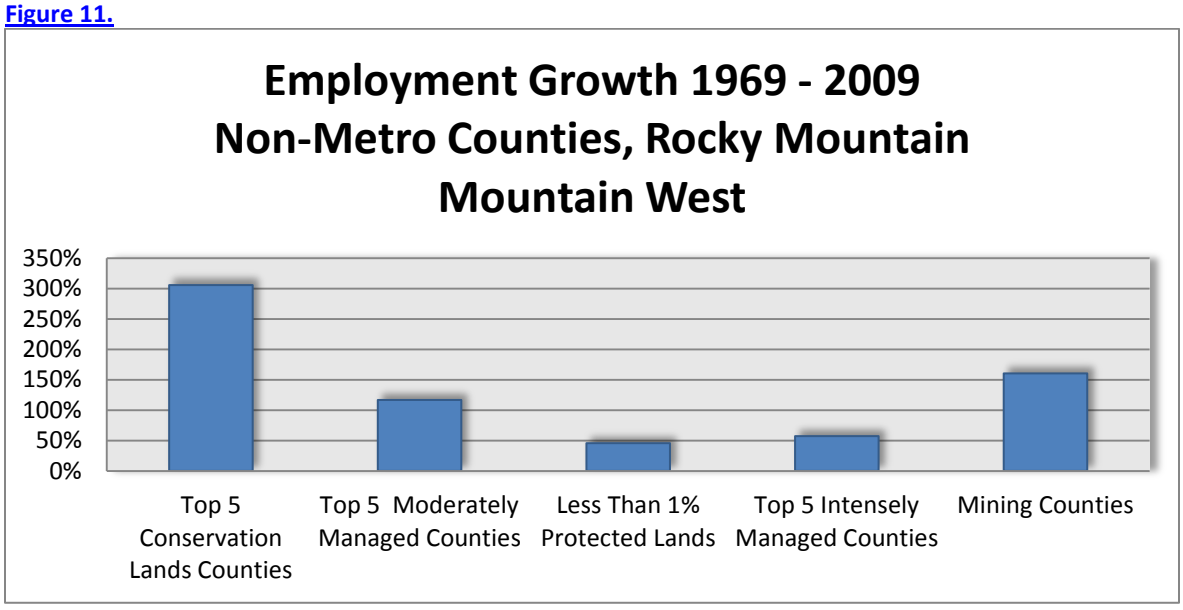


Figure 12 also indicates that managing lands for conservation/recreation is compatible with growth. It shows population change between 1970 and 2010 by land management category. Again, rapid growth and conservation are correlated: the populations of conservation/recreation lands counties grew more than an order of magnitude

faster than counties with less than 1% of such lands, and four times faster than counties dominated by intensely managed lands.

Figure 12.

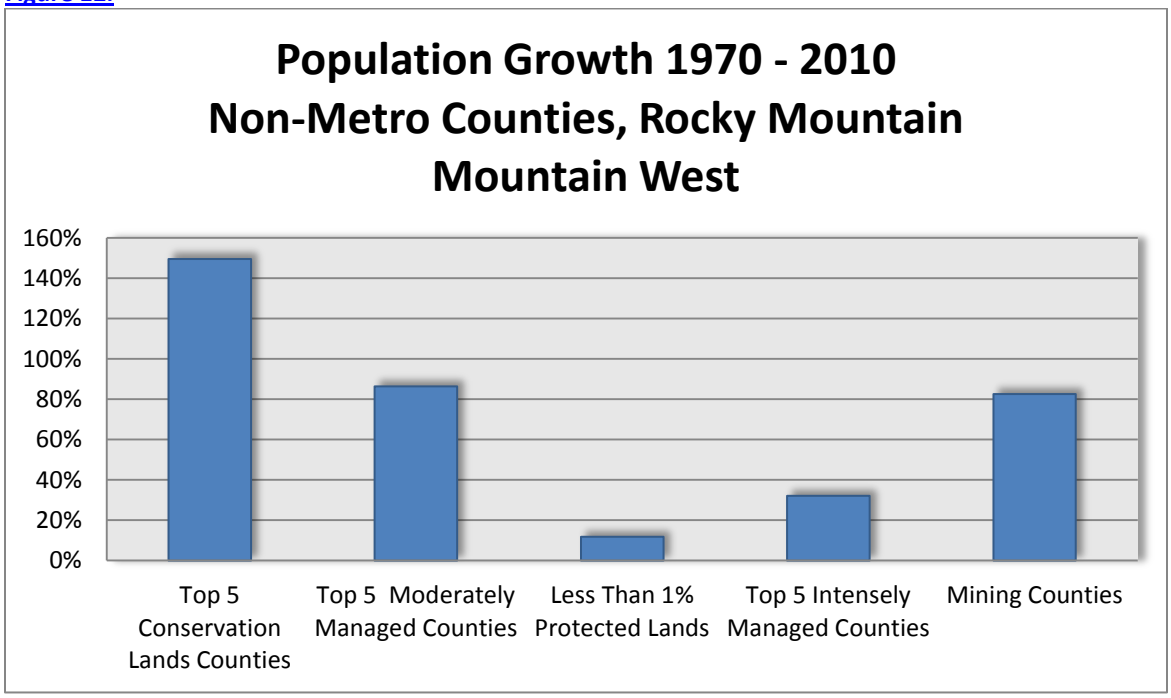
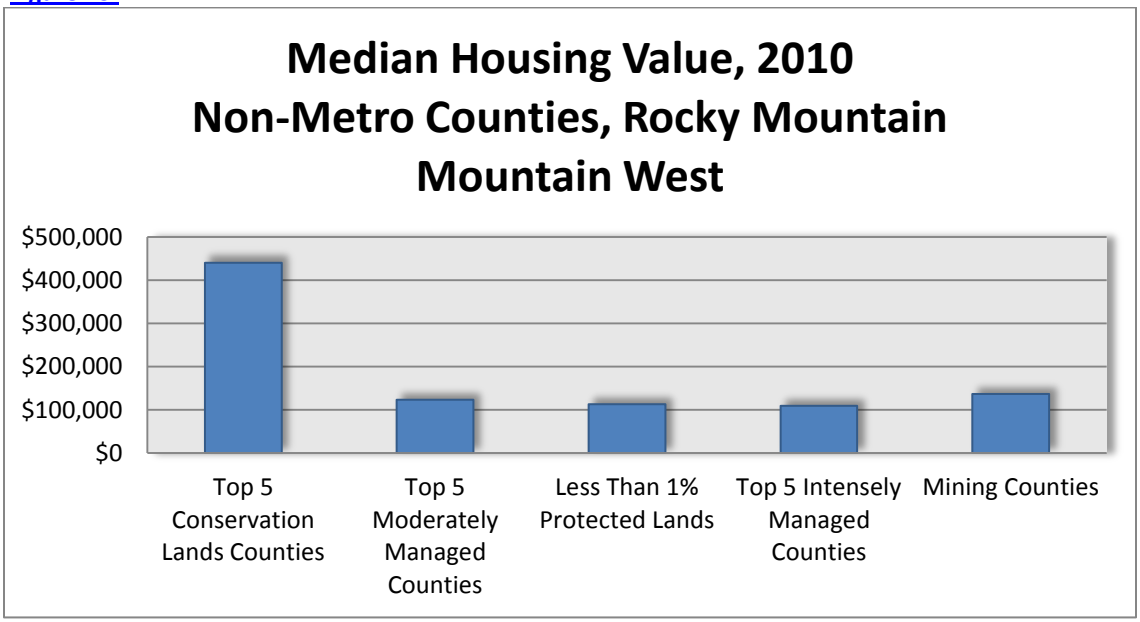


Figure 13 shows the relationship of conservation/recreation lands and housing values. Places that enjoy higher incomes, growing populations and faster rates of growth in employment, income and population should have relatively high property values. It is not surprising to find the highest housing values in counties with the highest proportions of conservation/recreation lands. Median housing values in the top five counties dominated by intensely managed lands are less than a quarter of the median housing value of the top 5 conservation/recreation lands counties.

Figure 13.



These bar charts also display the economic performance of the 23 mining-dependent counties in the study area. Mining also includes energy development. To be categorized as a mining dependent county by the USDA Economic Research Service, at least 15% of total earnings were derived from mining between 1998 and 2000. In all cases, the economic performance of mining-dependent counties lags behind the top five conservation lands counties. The mining counties also tend to underperform when compared to the top 50 conservation counties. Please note that mining dependent counties generally outperform other resource-based counties such as logging or agriculture.

An argument is frequently made that growth in amenity-based economies is driven by an influx of higher-than-average income new residents, whose local purchases spur increases in only low paying jobs. However, this does not appear to be the case. Table 1 displays a statistical test known as the Pearson's product-moment correlation coefficient that measures the strength of the relationship between the percentage of conservation/recreation lands in rural Rocky Mountain West counties and indicators of economic and demographic health. The evidence supports the amenity-based model of economic development's contention that conserving lands for recreation can attract people and talent by increasing the desirability of nearby communities.

Table 1 . Correlations with percent conservation/recreation lands

Population Growth 1970-2010	0.338**
% Creative Class Workers	0.451**
Median Housing Value 2010	0.466**
PCI 1969	0.253*
PCI growth 1969-2009	0.172**
Employment Growth 1969-2009	0.375**
*Note. *p < .01, **p > .001* (n=204 counties)	

First, the presence of conservation/recreation lands in the study area is correlated with relatively high rates of population growth. Second, conservation/recreation lands tend to be found in counties with relatively high proportions of workers in highly skilled jobs. This is a strong indication that population growth in conservation/recreation lands counties is driven by more than just an influx of wealthy retirees and low-wage service workers. This finding supports McGranahan and Wojan (2007) who found that the most successful rural counties nationwide benefit from environmental amenities that attract highly skilled workers, suggesting there is a high quality of life value associated with the overall aesthetics of the area. Third, real estate values reflect a community's desirability, and as the proportion of land managed for conservation and recreation increases, so does a county's median housing value. The demand for housing in conservation/recreation lands counties can be quite strong: in an extreme example, in Pitkin County, Colorado, where the resort town of Aspen attracts wealthy residents from around the world, 79% of the county consists of public conservation/recreation lands and the average sale price of a home recently topped $4.6 million (Aspen Times Staff 2011). This study does not suggest that the majority of county lands reserved for conservation could yield such median home prices, nor should that ever be the goal.

In addition to being correlated with population growth, increased levels of higher paying jobs and desirable housing, Table 1 also shows that the presence of conservation/recreation lands is correlated with economic development: where you find conserved lands, you tend to find relatively rapid employment growth, income growth and higher incomes when compared to other rural counties in the Rocky Mountain West. The results displayed in Table 1 do not prove that conservation/recreation lands are responsible for the success of protected lands counties, as correlation is not causation.

Figures 7-11 have shown that counties with landscapes dominated by conservation/recreation lands are relatively wealthy and experience relatively rapid growth. The figures in Appendix 3 provide further evidence that

conserving public lands for recreation and habitat protection does not limit economic growth in the rural Rocky Mountain West. They display measures of economic development in counties at the opposite ends of the land management spectrum: conservation/recreation counties and intensely managed lands. The figures show that as the proportion of conservation/recreation lands declines, so do indicators of economic health and growth. In contrast, counties with the highest proportion of intensely managed lands fare relatively poorly. In some cases, the changes in the proportion of land managed for commodity production does not appear to be correlated with measures of economic security. In others, growth and wealth actually increase as the proportion of intensely managed lands declines. These results lend claim that the overstated "jobs versus the environment" arguments for opening lands rich in recreation and scenic characteristics is a misleading statement.

Conclusions

Public lands are one of the defining features of the western landscape, supporting and shaping rural communities. This is especially true in the rural Rocky Mountain region, where vast tracts of public lands often surround mountain and desert communities. Federal and state lands have long provided raw materials that fuel logging, mining and grazing and, in the past, drove western development. In recent years, a variety of factors have suppressed the growth in benefits from commodity production including resource depletion, increasing foreign competition, mechanization, a history of cyclical boom and bust periods, as well as increased government regulation and litigation fueled by protectionist interests. As a result, the economic returns from the commodity production sectors, while still significant, have not experienced the growth seen by the rest of the Western economy.

Services have been the major driver of economic growth in the Rocky Mountain region as tourists, retirees and business owners have been attracted by the region's quality of life. This growth provides a boost in low, medium and higher paying, highly skilled jobs and increase property values and average incomes. By conserving the fish, wildlife and natural/scenic habitats that drive this new source of economic growth, the rural Rocky Mountain economy will be healthier and more sustainable in the near and long term.

Both economic models, commodity production and amenity-based growth, are valuable to the Western economy. Some areas are more conducive to one or the other, while many, if not most, areas have succeeded in balancing both activities. In cases where commodity production has exceeded this balance, the local economy will achieve less growth, and be in a worse position to offset the next downward cycle in the commodities sector. Likewise, communities that have under-utilized natural resources and are in a position to responsibly develop their resources will not receive their according levels of economic returns.

The message is about balance. Tourists and residents in all communities need the energy and materials provided by the commodities sector. Individuals – residents and tourists alike – demand the quality of life provided by the region's fish, wildlife and scenic resources. Nearly all rural Rocky Mountain communities need the jobs and income generated by both sectors. Public officials at the local, state and federal levels must carefully balance the needs and impacts from land use management decisions on all economic sectors to ensure the best, most rewarding economic future for the Rocky Mountain West.

Appendix 1

Figure A-1. Conservation/Recreation lands (Gap 1 and Gap 2 lands). Source: Conservation Biology Institute (2010).

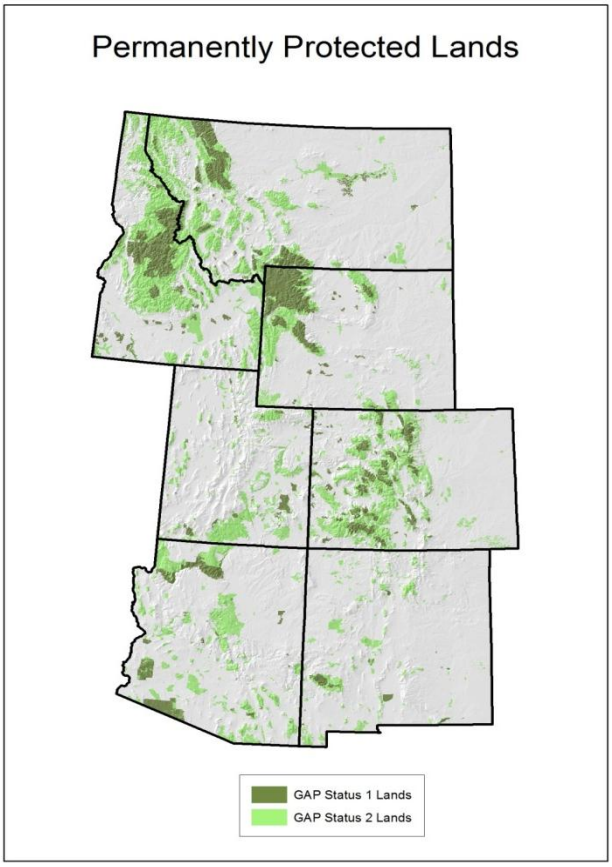
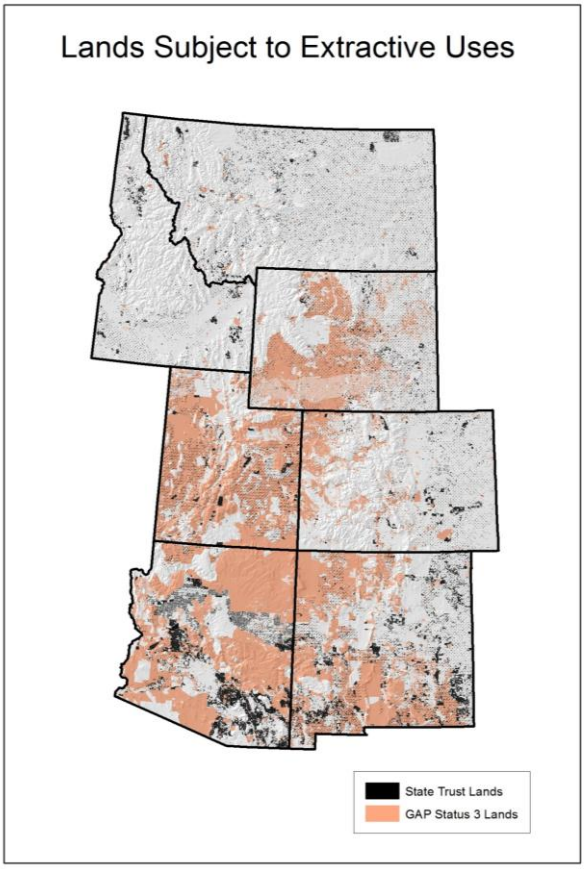


Figure A-2. Moderately managed (Gap 3) and Intensely managed Lands. Source: Conservation Biology Institute (2010).



To calculate the proportion of land in each county managed for protected lands, moderately managed lands, and intensely managed lands, the area of each county in the study area was calculated, along with the areas of land in each of the three management categories. Then, the public lands layers were intersected with the county layer to calculate the proportion of land managed for protection, multiple use and extraction by county, as shown earlier in Figure 7.

Appendix 2

Top 5 non-metropolitan counties in the Rocky Mountain West, ranked by percent of conservation/recreation lands.

County	State	% Conservation/ Recreation Lands
Teton	Wyoming	93.90%
Valley	Idaho	84.30%
Mineral	Montana	82.10%
Idaho	Idaho	81.90%
Pitkin	Colorado	79.30%

Top 5 non-metropolitan counties in the Rocky Mountain West, ranked by percent of moderately managed lands.

County	State	% Moderately managed Lands
Gila	Arizona	86.20%
Otero	New Mexico	77.10%
Sevier	Utah	77.10%
Beaver	Utah	75.40%
Apache	Arizona	74.30%

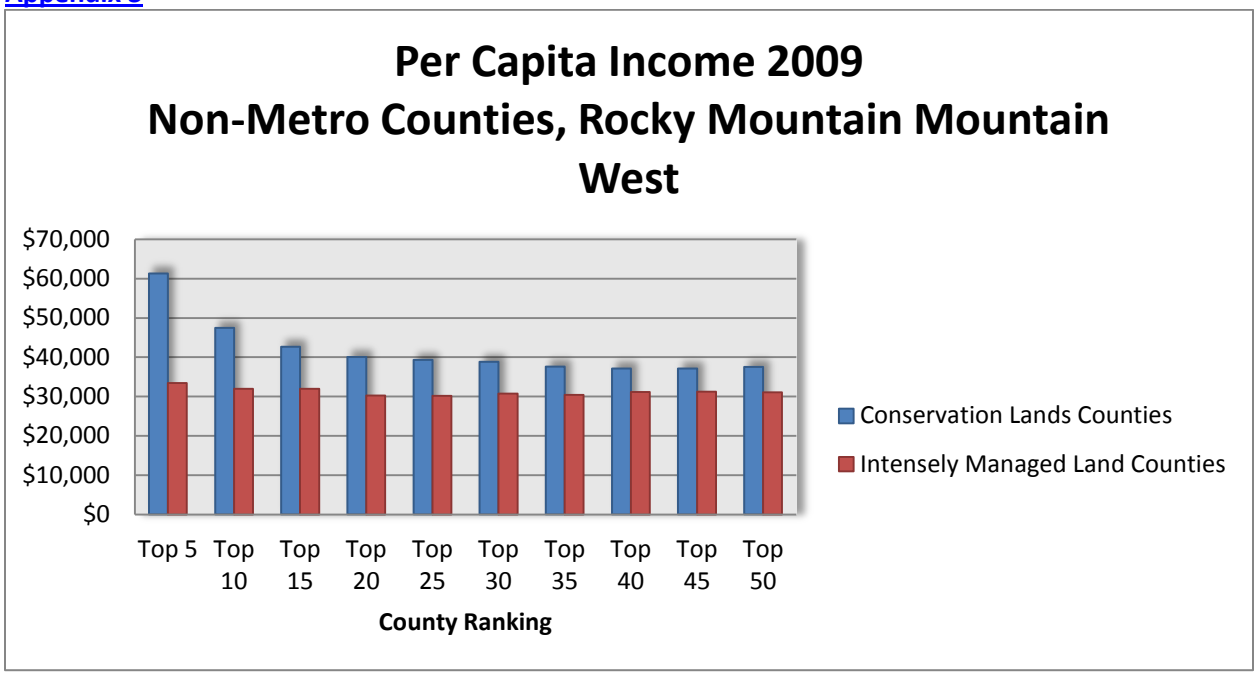
Top 5 non-metropolitan counties in the Rocky Mountain West, ranked by percent of intensely managed lands.

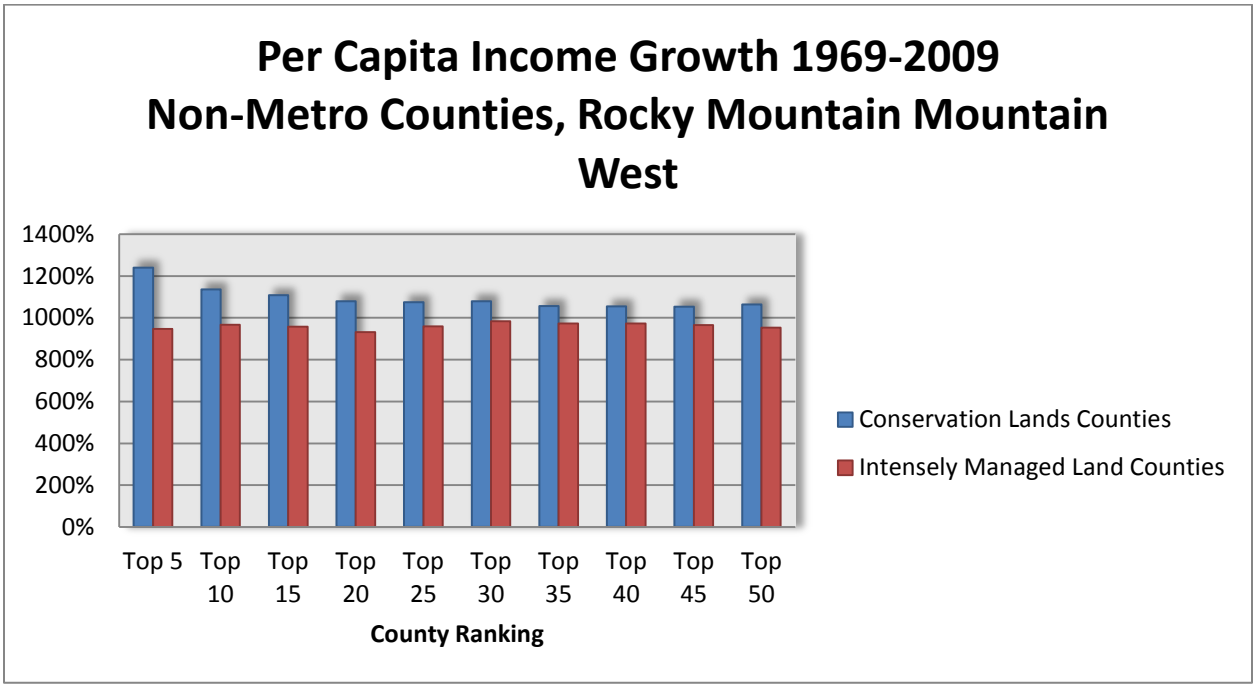
County	State	% Intensely managed Lands
Cochise	Arizona	34.5%
Lea	New Mexico	33.4%
Luna	New Mexico	28.7%
Harding	New Mexico	26.2%
Daniels	Montana	24.1%

Mining-dependent counties in the Rocky Mountain West, as classified by the USDA Economic Research Service (2003).

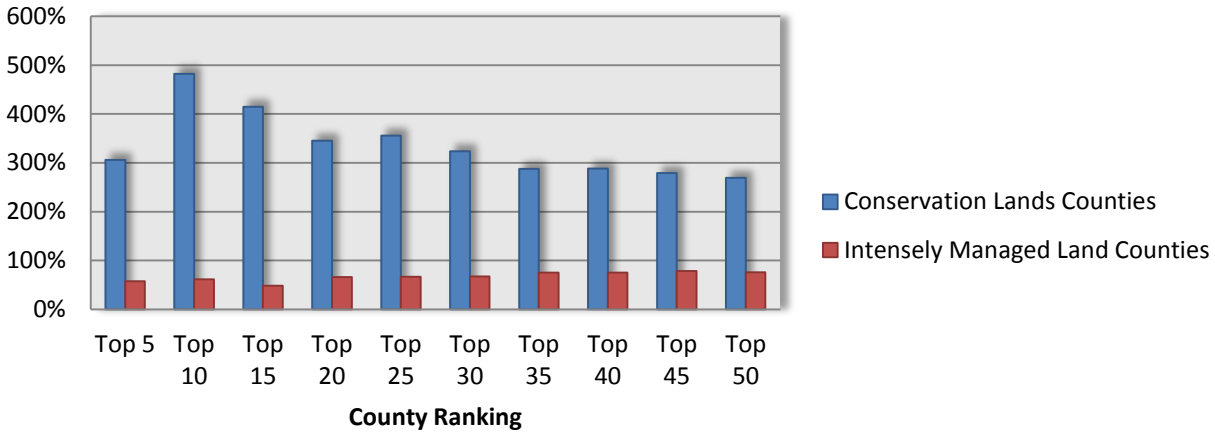
County	State	County	State	County	State	County	State
Greenlee	Arizona	Jefferson	Montana	Carbon	Utah	Converse	Wyoming
Moffat	Colorado	Rosebud	Montana	Duchesne	Utah	Sublette	Wyoming
Rio Blanco	Colorado	Stillwater	Montana	Emery	Utah	Sweetwater	Wyoming
Custer	Idaho	Eddy	New Mexico	Uintah	Utah	Uinta	Wyoming
Shoshone	Idaho	Grant	New Mexico	Big Horn	Wyoming	Weston	Wyoming
Big Horn	Montana	Lea	New Mexico	Campbell	Wyoming		

[Appendix 3]

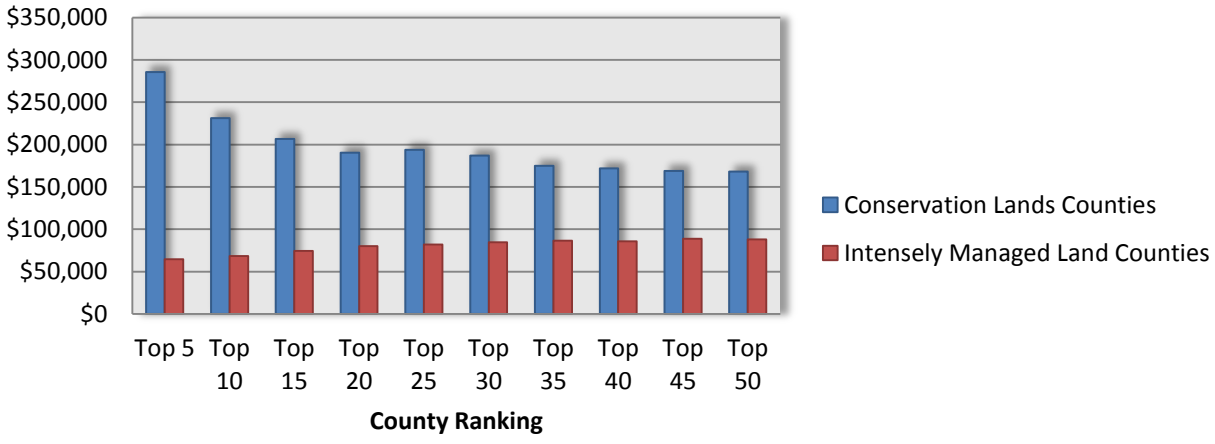

Per Capita Income 2009
Non-Metro Counties, Rocky Mountain Mountain West
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
Top 5
Top 10
Top 15
Top 20
Top 25
Top 30
Top 35
Top 40
Top 45
Top 50
County Ranking
Conservation Lands Counties
Intensely Managed Land Counties

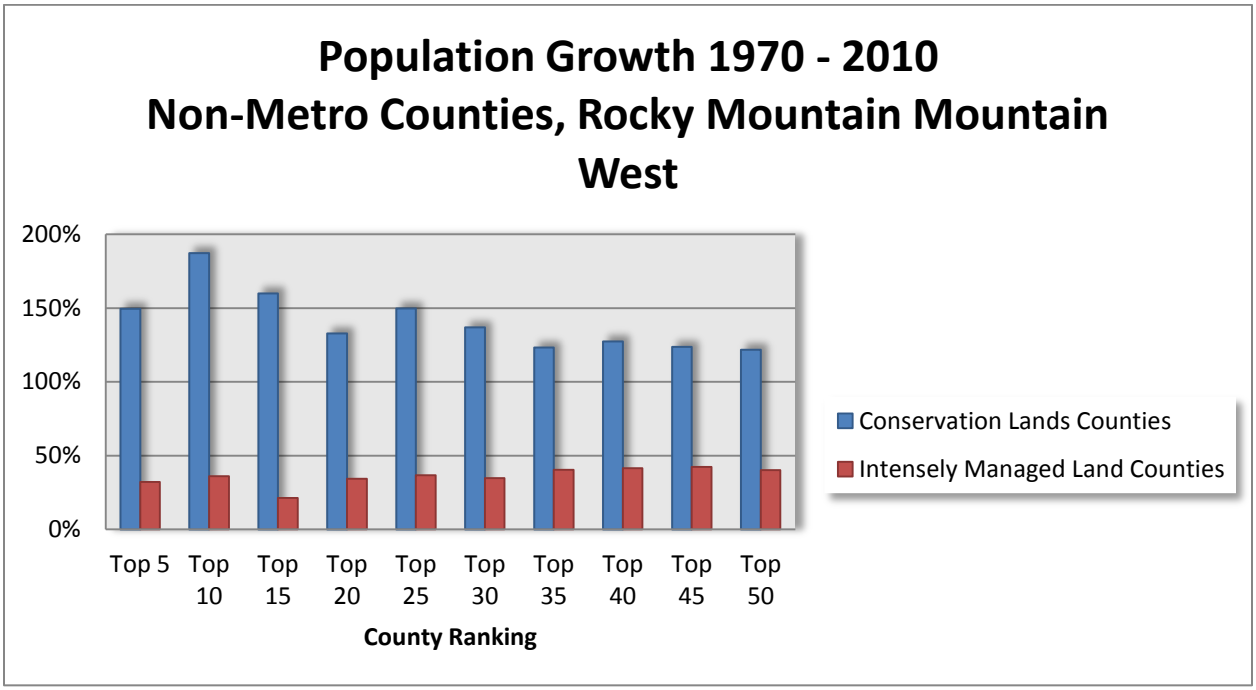

Per Capita Income Growth 1969-2009
Non-Metro Counties, Rocky Mountain Mountain West
1400%
1200%
1000%
800%
600%
400%
200%
0%
Top 5
Top 10
Top 15
Top 20
Top 25
Top 30
Top 35
Top 40
Top 45
Top 50
County Ranking
Conservation Lands Counties
Intensely Managed Land Counties

Employment Growth 1969 - 2009
Non-Metro Counties, Rocky Mountain Mountain West



Median Housing Value, 2004
Non-Metro Counties, Rocky Mountain Mountain West




Population Growth 1970 - 2010
Non-Metro Counties, Rocky Mountain Mountain West
200%
150%
100%
50%
0%
Top 5
Top 10
Top 15
Top 20
Top 25
Top 30
Top 35
Top 40
Top 45
Top 50
County Ranking
Conservation Lands Counties
Intensely Managed Land Counties

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