Economic Development Report

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ESTIMATED ECONOMIC IMPACTS OF BLM LAND USE CHANGE ON LOCAL AGRICULTURE: THE LITTLE SNAKE RESOURCE AREA MANAGEMENT PLAN

Andrew Seidl,* Steve Davies, John Loomis, Amalia Davies, and Nigel Griswold [1]

The four alternative plans under consideration will generate livestock industry sales of between $4.5 & $7.2 million per year from Moffat County

The chosen alternative will generate between 100 & 150 local jobs per year

The predicted effect of the alternative plans is between a 244 AUM loss in cattle and 49 AUM loss in sheep to a 2,334 increase in cattle and 469 increase in sheep

The alternatives generate a variation in herd size on public lands of 0.4% to 4% of current stocking levels.

Introduction

The Bureau of Land Management (BLM) is part of the US Department of the Interior responsible for the management and conservation of resources on 258 million surface acres, as well as 700 million acres of subsurface mineral estate. These public lands make up about 13 percent of the total land surface of the United States and more than 40 percent of all land managed by the Federal government. Colorado BLM and all BLM lands adhere to the principal of multiple-use management outlined by the Federal Land Policy and Management Act of 1976. This means that the BLM balances outdoor recreation and preservation of wildlife habitat, air and water, and other scenic and historical values with environmentally responsible commercial development of the land and its resources.[2]

he Little Snake Field Office (LSFO) includes approximately 4.2 million acres of land in Moffat, Routt, and Rio Blanco Counties. The Little Snake Resource Management Plan Planning Area (RMPPA) within that area administers approximately 1.3 million acres of public land surface and mineral estate and 1.1 million acres of federal mineral estate where the surface is privately owned or state-owned. Land ownership and/or management within LSFO boundaries are shown in Figure 1. Of the 6 counties that have acreage within the RMPPA boundary, the economic effects will arguably impact Moffat County the most, as the overwhelming majority of BLM surface and subsurface land that will be affected by the new LSFO Resource Management Plan (RMP) lie within it. Some 95% of surface land owned by the BLM that lies within the RMPPA is within Moffat County (Table 1). Therefore, the individual economic impact analysis of the natural resource based industries in the RMPPA under the different RMP alternatives will focus on the impacts found in Moffat County.

* Contact author.

[1] Seidl is Associate Professor, Loomis and Davies are Professors, A. Davies is a private consultant, and Griswold is Research Associate with the Department of Agricultural and Resource Economics at Colorado State University, B320 Clark Building, CSU-DARE, Fort Collins, Co, 80523-1172.

[2] BLM. 2007. http://www.blm.gov/co/st/en/BLM_Information/about_blm.2.html

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The goal of this research series is to inform the public regarding the economic tradeoffs and impacts the proposed LSFO RMP alternatives will have on the natural resource based economic activities on BLM properties under management of the LSFO.

Figure 1 - LSFO-Managed Surface Ownership Boundaries

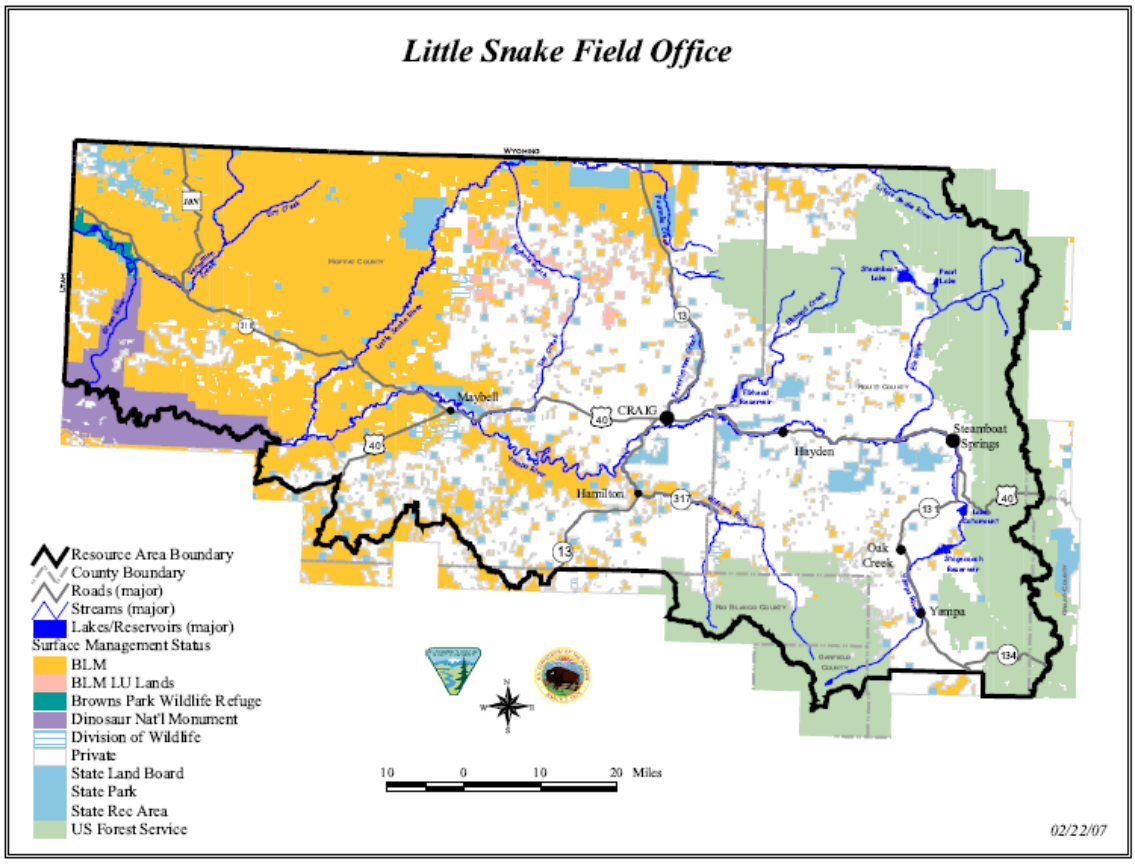

Table 1: LSFO-Managed Surface Ownership by County

County	Acres of County within RMPPA Boundary	Acres of Surface Ownership			
		BLM LSFO	Other Federal Agencies	State of Colorado	Private
Moffat	2,620,700	1,285,200	136,000	183,500	1,016,000
Routt	1,399,300	59,900	566,700	68,100	704,600
Rio Blanco	133,800	4,300	107,900	0	21,600
Garfield	36,300	0	36,100	0	200
Grand	30,000	0	29,800	100	100
Jackson	1,600	0	1,600	0	0
Total	4,221,700	1,349,400	878,100	251,700	1,742,500

Revising the LSFO RMP

Each surface and subsurface area under the management of the BLM has a field office which implements and enforces an RMP specifically designed for the property encompassed within the field office territory. An RMP can require modest revisions or even a complete reconstitution due to changes in public use and shifting demands for recreation, agriculture and livestock grazing, oil and gas productivity, and other factors.

The LSFO RMP was revised three times since its implementation in 1989. In 2001, the LSFO RMP began to consider the process of a complete review and revision due to the rise of management and travel concerns within the oil and gas industry, input from Moffat County and concerns of several environmental organizations. The Northwest Colorado Stewardship (NWCOS) and the BLM developed a collaborative strategy to revise the LSFO RMP in the spring of 2004. When the Little Snake RMP is completed, it will provide a comprehensive framework for managing the BLM-administered public lands and resources and allocating their uses in the RMPPA. One of the four alternatives detailed below will be chosen according to a defined political process, as outlined in Section 1.5 of the 2007 Draft EIS/RMP, and this economic analysis attempts to provide answers to the expected outcomes of that choice.[3]

LSFO RMP Alternatives

Four alternatives (A, B, C, and D) are described and examined in this analysis, each representing varying levels of management actions for each resource and resource use based on achieving the goals and objectives of the given alternative. The National Environmental Policy Act (NEPA) requires a no action alternative, and thus, Alternative A provides a status quo basis to compare the impacts of the differing alternatives.

Alternative B would allow the greatest extent of resource use within the RMPPA, while maintaining the basic protection required to manage resources. Under this alternative, protection of resources would be the least restrictive within the limits defined by law, meaning current designated protections such as areas of critical environmental concern (ACEC) and special recreation management areas (SRMA) would be removed, no new wild and scenic river (WSR) corridors would be recommended for designation, and opportunities for "unmanaged" motorized recreational experiences would increase. With this alternative, unlike Alternative A, areas designated as no surface occupancy (NSO) would also be designated as no ground disturbance (NGD) for other uses.

Alternative C is denoted as the 'preferred alternative' throughout the Draft EIS/RMP (2007), and emphasizes comprehensive multiple resource management in the planning area, protecting sensitive resources while applying the most current information to allow the BLM to set priorities based on flexible and proactive public land management techniques. Commodity production would be balanced against wildlife and vegetation protection, where exceptions could be granted according to established adaptive criteria (see Appendix E, Draft EIS/RMP 2007).[4] Area protections for sensitive resources would be limited to areas where such designations are necessary, while special management prescriptions would be applied to areas without such designations. Existing SRMAs would remain in place, while additional SRMAs and backcountry areas would be identified to provide diverse recreational experiences. More limitations and closures for off-highway vehicle (OHV) areas would occur, while some existing would stay in place. Areas considered no surface occupancy (NSO) would also be designated as no ground disturbance (NGD), as in Alternative B. This alternative would be implemented using the adaptive management approach, as outlined in Appendix M of the Draft EIS/RMP (2007).[5]

Alternative D would allow the greatest extent of resource protection among the four resource management alternatives, while still allowing resource use. Commodity production would be constrained to protect natural resource values or to accelerate their improvement, although exceptions would be granted within the guidelines of the adaptive criteria (see Appendix E, Draft EIS/RMP 2007).[4] Wildlife habitat protections would increase with management objectives focused on restoring vegetation communities to ecologically desirable levels. Designation of ACECs and WSRs would be maximized, with tighter restrictions in the designated areas to protect sensitive resources. Current SRMAs would stay in place while new SRMAs and backcountry areas would be designated to increase access to diverse recreational experiences.

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[3] For information on revising the LSFO RMP see Chapter 1 of the Draft EIS/RMP 2007: http://www.co.blm.gov/lsra/rmp/documents/04_LSDEIS_Chapter_1_SFS.pdf

[4] Appendix E of the Draft EIS/RMP: http://www.co.blm.gov/lsra/rmp/documents/AppE_LSDEIS_Exceptions_Mods_Waivers.pdf

[5] Appendix M of the Draft EIS/RMP: http://www.co.blm.gov/lsra/rmp/documents/AppM_LSDEIS_Adaptive_Management.pdf

Areas open to OHV use would be decreased, and as in Alternatives B and C, areas considered NSO for oil and gas would also be considered NGD for other uses.[6]

Impacts on Agriculture

Cattle and sheep ranching are among the most traditional and important economic activities in the Little Snake region. Based on the most recent agricultural census (2002), Moffat County had approximately 443 farms and ranches on more than 1 million acres of private land. This land supported approximately 32 thousand cattle and calves on 184 ranches (173 per operation) and 86 thousand sheep on 51 ranches (1,692 per operation) based on January 1, 2005 inventories. Moreover, about 45,000 acres of hay was produced in 2004. Moffat County's sales of sheep, beef cattle and calves reached more than $19 million in 2002 (CASS, 2005).[7] A majority of the potentially affected private lands are held in ranching. In this region, ranching and public land management are strongly linked through grazing permits. This section explores the impact of Little Snake management alternatives on the regional livestock sector via the connection between grazing permits on public lands and livestock operations on private lands in the region.

Approach/Key Assumptions

Permits to graze on public lands increase the capacity and profitability of ranch activities on private lands. Without grazing permits on public lands, ranchers would be forced to feed cattle and sheep with grown or purchased hay, presumably at a higher cost to the ranching operation. As a result, a loss of grazing permits on public lands will reduce the profitability of ranches in the Little Snake and may make them unprofitable, inducing a decision to sell the property. If sold, it is likely that the land will be used to grow hay or leased as pasture to the remaining ranchers. It is less likely, but possible, that it would be sold for rural residential use or rural recreational use (e.g., ATV/OMV).

Alternatively, an increase in available Animal Unit Months (AUMs) is likely to increase profitability of farms and ranches through a reduced need for private (owned or leased) pasture and purchased hay. However, increases in AUMs available are not likely to lead to the conversion of private land out of pasture or hay acreage, as the likely impact will be to increase herd size in proportion to available AUMs. Nor is it likely that the economic incentives created by increases in available AUMs will be sufficient to induce the conversion of land from recreational or residential uses to extensive sheep or cattle operations.

Further, providing outfitter services for hunting tourism is an important source of supplementary income for ranchers in the Little Snake region. Outfitter services are considered part of the ranching operation and are included in the decision to operate property as a ranch. However, off farm income is not considered part of ranching operations. It may be an important part of household income and may thus defer the decision to sell unprofitable ranch operations, since off farm income can continue regardless of the use of the rural property. However, rural residential development of ranch properties could prevent outfitter activities. Many non-consumptive rural tourism services (guiding for wildlife watching and photography), currently of minor economic significance, would probably still be possible under rural residential development, depending on its density, but probably not under typical forms of rural recreational use.

Based upon discussions with ranchers in the Little Snake region, we planned to consider ranches in two acreage-based types: 'small' and relatively independent of grazing permits on public lands; and 'large', operations that are relatively dependent upon grazing permits. Both types of ranches can have supplementary income from hunter outfitter services. However, we were unable to collect adequate information from local stakeholders to confidently differentiate between these two categories. As a result, our analysis proceeds to trace the potential effects of Alternatives A-D on two species-based ranch types, sheep and beef cattle, but it is not further stratified into size categories.

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[6] For detailed descriptions of the four LSFO RMP alternatives see Chapter 2 of the Draft EIS/RMP: http://www.co.blm.gov/lsra/rmp/documents/05_LSDEIS_Chapter_2_SFS.pdf

[7] CASS – Colorado Agricultural Statistics Service.

If one or more of the land management alternatives were to result in a loss of available AUMs, we would need to consider three possible actions on the part of affected ranchers: 1) substitute AUMs for more or less locally purchased or grown hay; 2) reduce or increase ranching activity by the amount implied by the AUMs lost or gained; and 3) go out of business entirely, in which case the land is considered to become economically idle. Under Scenario 3, we could, then, increase the number of acres in rural residential development or rural recreational use as the logical alternative uses for idled ranch areas.

Since the estimated changes in AUMs do not appear to be either huge windfall gains or catastrophic losses from a regional perspective, we chose to provide formal estimates only for scenario #2. This scenario is estimated for sheep and beef cattle ranches. Scenario 1 would have generated a more conservative estimate of the economic impact of the increase or decrease in available AUMs, while Scenario 2 will create an upper bound estimate on the likely economic impact of increased or decreased AUMs. These direct impacts are then considered in terms of their indirect and induced economic effects to derive a total impact from the reduction in public lands grazing permits on the Little Snake regional economy by alternative. The budgets for cattle and sheep ranching found in Tables 2 and 3 provide the basis for the regional impact analysis.

The results are provided in terms of annual jobs, income and local value-added and are estimated at the regional scale. That is, a regional increase or decrease in AUMs may or may not represent the impacts on a particular operation, type of operation or in a particular part of the region. As such, it is possible that regional increases in economic opportunity may also result in individual or sub-regional losses in economic opportunity and the converse. In that sense, and as is commonly assumed, each dollar of gain or loss was given equal weight in this analysis, otherwise known as a “Weak or Potential Pareto” or “Kaldor-Hicks” decision criterion. In fact, it was not possible to derive more precise or systematic measures of sub-regional impact with any degree of confidence with available information.

Quantitative analysis: Estimates of AUM impacts of Alternatives A-D

According to the Natural Resources Conservation Services (NRCS) Range and Pasture Handbook, 1 AUM is equivalent to 790 lbs of dried forage per month, 1 cow-calf pair, or 5 sheep. One dry cow is equivalent to 727 lbs of dried forage or 0.92 AUM. The current total permitted use is 149,503 AUMs, based on Rangeland Administration System (RAS) Public Land Statistics for Billing Year 2005, and is the maximum allowable use regardless of scenario. Approximately, 78,963 AUMs constitute the baseline “actual use,” derived from the mean of “Billed AUMs” from 1994 to 2003. The difference between the actual use and permitted use is typically forage that is available but more suitable for wildlife forage, or is used to maintain watershed protection, and will vary by land management alternative.

The BLM has estimated that Alternative A will result in an estimated net loss of 4,172 AUM actual (and permitted) use from the 78,963 AUM baseline, or an estimated actual use of 74,791 AUM (Table 4). The estimated reduction is entirely due to new development associated with oil and gas drilling. Alternative B will result in an estimated 44,087 increase in AUMs due to livestock decisions (e.g., vegetative conversion) and the same decrease in actual use due to development found in Alternative A. Alternative B results in an estimated net gain of 39,915 AUMs to 118,878 AUM actual use. Alternative C results in an estimated net gain of 3,282 AUM in actual use, comprised of an increase in 7,454 AUMs due to livestock decisions and a development driven decrease equivalent to Alternatives A and B. As a result, Alternative C should imply 82,245 AUM of actual use. Alternative D creates an estimated net gain of 18,685 AUM and an actual use of 97,648 AUM. This change is driven by a 21,814 AUM gain due to anticipated livestock management changes and a 3,129 AUM loss due to development. The loss due to development for Alternative D is 25% lower than in Alternatives A, B and C because of large areas in NSO and closed to development.

For the four alternatives under examination, there is an estimated difference of about 44,100 AUM between the ‘best’ scenario from an AUM perspective (Alternative B) and the ‘worst’ scenario (Alternative A), representing a more than 50% swing in actual AUM use in the region. Only Alternative A is predicted to generate a net loss to the livestock sector relative to the current situation. Each of the other three alternatives represents a gain to the

livestock sector. The variation in estimated impacts of the livestock sector of the four alternatives represents approximately 3,673 cattle and calves or 18,370 sheep in the region or as much as 20% of the current stock of livestock.

Table 2: Moffat Cattle Budget, 2002

	Average for Herd Dollars	Per Cow Dollars	Industry Dollars	Percent of total sales
Industry Sales	307,800	513.0	12,908,619	100.00
Costs by Sector:				
Crop	4,654	7.8	195,199	1.51
Pasture	116,268	193.8	4,876,094	37.77
Cattle	32,151	53.6	1,348,361	10.45
Sheep and Lambs	0	0.0	-	-
Other agriculture	0	0.0	-	-
Coal	15,068	25.1	631,923	4.90
Power	0	0.0	-	-
Water	0	0.0	-	-
Heavy construction	0	0.0	-	-
Oil gas	9,916	16.5	415,860	3.22
Manufacturing	16,392	27.3	687,441	5.33
Wholesale trade	0	0.0	-	-
Transport	0	0.0	-	-
Retailing	0	0.0	-	-
Food/bev retaling	0	0.0	-	-
Communication	0	0.0	-	-
FIRE	8,651	14.4	362,816	2.81
Professional services	10,000	16.7	419,396	3.25
Health	0	0.0	-	-
Recreation	0	0.0	-	-
Outfitters	0	0.0	-	-
Hotels	0	0.0	-	-
Food services	0	0.0	-	-
Auto	0	0.0	-	-
Other services	20,195	33.7	846,925	6.56
Miscellaneous	0	0.0	-	-
Government	0	0.0	-	-
Subtotal	233,295	388.8	9,784,015	75.79
Value Added:				
Employee Compensation	26,687	44.5	1,119,214	8.67
Proprietary Income	17,395	29.0	729,522	5.65
Other Property Income	24,706	41.2	1,036,113	8.03
Indirect Business Tax	5,717	9.5	239,756	1.86
Value Added	74,505	124.2	3,124,604	24.21

Based on an average of 600 Head per herd

Table 3: Sheep Budget for 465 Head Operation, 2002

	Average for Herd Dollars	Per Sheep Dollars	Industry Dollars	Percent of total sales
Industry Sales	24,296	52.25	3,742,695	100.00
Costs by Sector:				
Crop	2,233	4.80	343,969.32	9.19
Pasture	4,970	10.69	765,647.32	20.46
Cattle	-	-	-	-
Sheep and Lambs	360	0.77	55,439.06	1.48
Other agriculture	-	-	-	-
Coal	-	-	-	-
Power	54	0.12	8,315.86	0.22
Water	54	0.12	8,315.86	0.22
Heavy construction	-	-	-	-
Oil gas	54	0.12	8,315.86	0.22
Manufacturing	2,168	4.66	333,942.50	8.92
Wholesale trade	-	-	-	-
Transport	1,264	2.72	194,716.15	5.20
Retailing	-	-	-	-
Food/bev retailing	-	-	-	-
Communication	527	1.13	81,131.68	2.17
FIRE	205	0.44	31,600.27	0.84
Professional services	-	-	-	-
Health	1,161	2.50	178,768.80	4.78
Recreation	-	-	-	-
Outfitters	-	-	-	-
Hotels	-	-	-	-
Food services	-	-	-	-
Auto	-	-	-	-
Other services	1,780	3.83	274,223.47	7.33
Miscellaneous	90	0.19	13,859.77	0.37
Government	-	-	-	-
Subtotal	14,919	32.08	2,298,245.92	61.41
Value Added:				
Employee Compensation	1,028	2.21	158,330.27	4.23
Proprietary Income	4,229	9.09	651,470.58	17.41
Other Property Income	3,608	7.76	555,745.80	14.85
Indirect Business Tax	512	1.10	78,902.53	2.11
Value Added	9,377	20.17	1,444,449.17	38.59

Table 4: Estimated Actual AUM Change Due to BLM Alternatives, annual average

Alt.	Base Actual AUMs	Livestock Management (AUM)	Development (AUM)	Net gains/losses (AUM)	Predicted Actual AUM
A	78,963	0	-4,172	-4,172	74,791
B	78,963	44,087	-4,172	39,915	118,878
C	78,963	7,454	-4,172	3,282	82,245
D	78,963	21,814	-3,129	18,685	97,648

In 2005, 54,011 actual AUMs were used for cattle, leaving 24,952 in sheep. That is, about 70% of the AUMs were used for beef cattle production and 30% for sheep production. If AUM variation affects the livestock industry proportionally to their traditional use, we can predict the number of AUMs and changes in livestock numbers resulting from the four alternatives. These estimates are found in Table 5. We estimate that Alternative A will result in a decrease of 244 cattle and 49 sheep due to the reduction in available AUMs. Similarly, we predict Alternative B will result in an increase of 2,334 cattle and 469 sheep on BLM ground, Alternative C a gain of 192 cattle and 39 sheep, and Alternative D an increase of 1,093 cattle and 219 sheep. Of course, this assumes that other economic factors that might vary between the two sub-industries remain relatively similar to current conditions.

Table 5: Predicted Change in Beef Cattle and Sheep AUM Actual Use, annual average, by Alternative

Alt.	Predicted Actual AUMs	Predicted Actual Beef AUMs	Predicted Actual Sheep AUMs	Predicted Increase/Decrease in Beef Cattle	Predicted Increase/Decrease in Sheep
A	74,791	52,354	22,437	-244	-49
B	118,878	83,215	35,663	2,334	469
C	82,245	57,572	24,674	192	39
D	97,648	68,354	29,294	1,093	219

Estimates of economic impacts of Alternatives A-D

Tables 6-9 illustrate the estimated impacts of Alternatives A-D on total sales (Table 6), employment (Table 7), total value added (Table 8), and local taxes (Table 9) in the Little Snake management region. All estimated gains and losses are considered to persist over the life of the plan. Estimated effects on employment, sales, value-added and tax revenues are annual measures, estimated for the 10^{th} year of the 20 yr plan, provided in 2005 dollars. All estimated effects reflect the size of the industry implied by BLM grazing permits and not the total size of the industry in the region.

The impact of the four alternatives on total sales is easily grasped. Alternative A results in total, regional beef industry sales of $3.8 million attributable to grazing on Little Snake lands, while Alternative B raises that figure to $6.1 million in sales derived tied to BLM-related grazing, illustrating the two bounding cases. Alternative D results in predicted beef industry sales driven by AUM availability of about $5.0 million per year, while Alternative C results in about $4.2 million in regional sales. Again, the impacts in the sheep industry are more modest, with Alternative A resulting in about $641 thousand in total regional sheep industry sales attributable to grazing on Little Snake lands, and Alternative B gives $1.1 million in regional output effects. Value added impacts show about 1/3 the impacts on total sales across both industry subsectors.

The sales multiplier in the beef cattle industry generates about $0.69 in additional indirect and induced economic activity for every $1 of sales, while each dollar of sheep sales generates about $0.33 in additional regional economic activity.

Neither the beef cattle nor the sheep ranching industries are particularly labor intensive. As a result, there would need to be a relatively sizeable impact on the livestock industry to result in substantial job loss or gain. On the other hand, the land associated with each job in the livestock industry is large. The predicted employment varies by as much as 31 direct jobs between the best (Alternative B) and worst (Alternative A) case scenarios. This variation represents some 10.5% of direct employment in the industry (31 jobs versus 296 total jobs in the cattle industry) and implies variation of as much as 42 direct, indirect and induced jobs between highest and lowest alternatives. The estimated direct employment in the beef cattle industry of Moffat County under Alternative C is 57 jobs, while the total county employment related to the beef cattle industry is about 77. Estimates for Alternative D increase direct employment by 10 jobs and total employment by 22 jobs over Alternative C. For

every three direct jobs gained or lost, one indirect job (e.g., veterinarian or legal services), serving the cattle industry is gained or lost (Table 7).

Table 6: Impact Analysis Results on Total Sales

Categories	BLM Management Alternatives			
	A	B	C	D
Cattle AUMs				
Direct Impact	2,243,950	3,566,707	2,467,613	2,929,756
Indirect Impact	1,279,053	2,033,026	1,406,541	1,669,963
Induced Impact	305,815	486,085	336,296	399,279
Sub total	**3,828,818**	**6,085,818**	**4,210,450**	**4,998,998**
Sheep AUMs				
Direct Impact	490,807	780,135	539,749	683,255
Indirect Impact	780,135	188,688	130,547	1,086,030
Induced Impact	539,749	117,207	81,092	751,387
Sub total	**640,809**	**1,086,030**	**751,387**	**892,074**
Total	**4,469,627**	**7,171,848**	**4,961,837**	**5,891,072**

Table 7: Impact Analysis Results on Employment

Categories	BLM Management Alternatives			
	A	B	C	D
Cattle				
Direct Impact	51	82	57	67
Indirect Impact	15	24	16	20
Induced Impact	4	6	4	5
Sub total	**70**	**112**	**77**	**92**
Sheep				
Direct Impact	28	45	31	37
Indirect Impact	2	2	2	2
Induced Impact	1	2	1	1
Sub total	**31**	**49**	**34**	**40**

Table 8: Impact analysis results on Total Value Added

Categories	BLM Management Alternatives			
	A	B	C	D
Cattle AUMs				
Direct Impact	542,998	863,082	597,120	708,951
Indirect Impact	587,734	934,189	646,315	767,360
Induced Impact	193,479	307,531	212,764	252,611
Sub total	**1,324,211**	**2,104,802**	**1,456,199**	**1,728,922**
Sheep AUMs				
Direct Impact	189,523	301,246	212,764	247,446
Indirect Impact	62,357	99,116	1,456,199	81,415
Induced Impact	46,652	74,153	597,120	60,910
Sub total	**298,532**	**474,515**	**646,315**	**389,771**
Total	**1,622,743**	**2,579,317**	**2,102,514**	**2,118,693**

Table 9: Impact Analysis Results on Taxes

	BLM Management Alternatives			
Federal Taxes	A	B	C	D
Cattle				
Employee Taxes	45,929	73,003	50,507	59,966
Corporate Taxes	34,272	54,474	37,688	44,746
Household/sales	185,086	294,189	203,534	241,652
Indirect Business Taxes	24,306	38,271	26,477	31,436
Fed sub total cattle	**289,592**	**459,937**	**318,205**	**377,800**
Sheep				
Employee Taxes	6,593	10,480	7,251	8,608
Corporate Taxes	9,699	15,416	10,666	12,663
Household/sales	45,564	72,423	50,107	59,489
Indirect Business Taxes	4,763	7,570	5,238	6,218
Fed sub total sheep	**66,618**	**105,890**	**73,261**	**86,979**
State Taxes				
Cattle				
Employee Taxes	1,852	2,943	2,036	2,418
Corporate Taxes	12,526	19,910	13,775	16,354
Household/sales	14,037	22,311	15,436	18,327
Indirect Business Taxes	22,990	36,541	25,281	30,016
State sub total cattle	**51,404**	**81,706**	**56,528**	**67,115**
Sheep				
Employee Taxes	266	423	292	347
Corporate Taxes	2,651	4,213	2,915	3,461
Household/sales	3,452	5,487	3,797	4,507
Indirect Business Taxes	4,505	7,160	4,954	5,881
State sub total sheep	**10,873**	**17,283**	**11,958**	**14,197**
Local (City and County) Taxes				
Cattle				
Indirect Business Taxes	63,441	100,838	69,764	82,830
Household/sales	1,579	2,510	1,737	2,062
Local sub total cattle	**65,020**	**103,348**	**71,501**	**84,892**
Subtotal state/local cattle	**116,425**	**185,054**	**128,029**	**152,007**
Federal, state and local cattle	**406,017**	**644,991**	**446,235**	**529,807**
Sheep				
Indirect Business Taxes	12,431	19,759	13,670	16,230
Household/sales	388	617	427	507
Local sub total sheep	**12,819**	**20,376**	**14,097**	**16,737**
Subtotal state/local	**23,693**	**37,659**	**26,055**	**30,934**
Federal, state and local	**90,311**	**143,549**	**99,316**	**117,913**

The employment impacts across sheep operations vary by 17 direct jobs in the bounding cases, implying a difference of 18 total jobs between Alternatives A and B. Although the direct effects in the sheep industry are substantial, the predicted employment multiplier effects are very small with only about one indirect and induced job affected for every ten direct sheep ranching jobs created or lost in the region (Table 7). The pattern of value added, shown in Table 8, follows the same relative variation across management alternative that is seen in employment and sales.

Tax revenues change along with economic activity in the cattle and sheep industries. These are shown in Table 9. Employee income, and business and personal sales tax collections will be affected locally. The effect on household sales taxes constituted about ½ of the total estimated tax revenue impact, while three categories of personal or business income taxes made up the other half. The predicted regional tax collections from Alterative A due to the beef cattle industry are $116,425 per year, while Alternative B is predicted to increase tax collections over Alternative A by almost $70 thousand per year. Alternative D generates taxes collected of about $36 thousand, while Alternative C should result in about an increase of $12 thousand per year cover Alternative A. Tax impacts driven by changes in the sheep industry are again more modest, ranging from an increase of $14 thousand in Alternative B to an increase of $2 thousand in C over receipts from Alternative A.

Tables 10 and 11 illustrate the distribution of economic impact through the region attributable to grazing permits on BLM lands from Alternative C. They clearly demonstrate that the principal impacts are directly felt by the cattle and sheep industries, but that there are important effects in other regional industries as well.

Social and economic dimensions not formally addressed

The livestock industry enjoys a long tradition, and directly or indirectly influences the great majority of private lands within the region. As a result, significant changes in the economic viability of the industry, driven by changes in access to public lands or by a variety of other factors, are likely to have important social and cultural implications.

Like many communities with strong agricultural traditions, this region is increasingly concerned about maintaining an agricultural base that is sufficiently large to justify the existence of local agricultural service providers. As the overall size of the regional agricultural economy decreases and the average size of working ranches increases, there are fewer and fewer jobs tied to each dollar of agricultural sales, less incentive for agricultural service providers to operate in the region, and, potentially, fewer opportunities for off farm income for farm households or opportunities for younger generations to continue to make a living in agriculture, locally, should they be inclined to do so. We have not explicitly addressed these threshold effects or the role in public lands management in either increasing or decreasing the pace or direction of cultural change due to changes in the agricultural economy.

Although there is no dependable source of information available, sheep operations are particularly known for employing herders with international expertise. As a result, effects on the sheep industry are more likely to have environmental justice implications than effects on, perhaps, the oil and gas or tourism and recreation industry, for example.

If the permitting AUMs on public lands for livestock decreases the amount of forage available for wildlife, the livestock industry and local recreational opportunities as well as regional tourism visits may be at cross purposes. We were not able to explicitly address potential tradeoffs between the livestock industry, recreation and tourism in our analysis due to a lack of information. As new residents to the region are more often attracted by recreational opportunities than by traditional agricultural uses of both private and public lands, the potential for cultural conflict and change is increased.

Table 10: Alternative C Direct, Indirect and Induced Impacts on Value Added for Cattle Production

(Dollars, by Expenditure Category)

Categories	Direct	Indirect	Induced	Total
Pasture	0	454,396	121	454,517
Cattle	2,467,613	416,078	314	2,884,004
FIRE	0	94,401	21,507	115,907
Wholesale trade	0	78,664	15,228	93,892
Power	0	71,050	11,285	82,335
Other agriculture	0	64,145	333	64,478
Services	0	43,373	18,701	62,074
Other Services	0	30,800	30,274	61,074
Transport	0	28,315	5,009	33,325
Manufacturing	0	28,263	8,056	36,319
Government	0	26,130	8,885	35,015
Coal	0	19,536	4,769	24,305
Oil gas production	0	16,597	2,878	19,475
Communication	0	9,377	10,455	19,832
Heavy construction	0	6,142	884	7,026
Retailing	0	4,499	46,441	50,940
Other animal	0	3,347	418	3,766
Water	0	2,646	446	3,093
Food services	0	2,271	21,586	23,857
Crop	0	2,229	37	2,265
Hotels	0	1,881	3,245	5,126
Oil gas drilling	0	1,263	207	1,469
Health	0	18	66,428	66,446
Housing services	0	0	49,348	49,348
Others	0	1,121	9,441	10,562
Total	**2,467,613**	**1,406,541**	**336,296**	**4,210,450**

Table 11: Alternative C Direct, Indirect and Induced Impacts on Value Added for Sheep Production

(Dollars, by Expenditure Category)

Categories	Direct	Indirect	Induced	Total
Pasture	-	14,203	16	14,218
Wholesale trade	-	10,688	2,658	13,346
Power	-	8,782	1,916	10,698
Other animal	208,422	5,744	39	214,205
FIRE	-	5,347	3,412	8,759
Coal	-	4,052	569	4,621
Manufacturing	-	3,705	548	4,253
Services	-	3,693	2,653	6,346
Transport	-	3,248	605	3,853
Health	-	2	10,173	10,175
Housing services	-	-	9,534	9,534
Others	-	9,112	19,181	28,293
Total	**208,422**	**77,687**	**70,485**	**356,594**

In addition, to the extent that permitting livestock grazing reduces or enhances ecosystem health for native flora and fauna, including rare (e.g., wild horses, mountain plover leks), and threatened or endangered species, the values held by the public at large (outside of the local region) have not been included in this analysis. Although our charge was to assess the social and economic impacts of BLM land use alternatives on the region, these lands are, in fact, federal, so that ownership is really related to the entire US population. There may be feasible policy alternatives not explored because all stakeholders and positions are not heard; "existence" values, therefore, may well exist beyond the non-consumptive use values expressed by recreators and tourists. Even very small per person existence values, if held by the broader American public, can aggregate to a relatively large stated preference for one management alternative over another.

Moreover, the increasing role of (particularly motorized) recreation in the region may create conflict with traditional agricultural practices and important sources of supplementary income in guide services. Increases in off road vehicle use on private and public lands could affect traditional wildlife herd movement, if not health, and create opportunities or challenges to individual landowners that were not in evidence prior to the growth of that industry. Again, insufficient information was available to establish whether or to what extent such a link exists.