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Spatial distribution of economic change from Idaho ranches

AARON J. HARP, ROBERT R. LOUCKS, AND JAMES N. HAWKINS

Authors are assistant professor, Department of Agricultural Economics and Rural Sociology, University of Idaho, Moscow, Ida. 83844-2334; professor, University of Idaho Cooperative Extension System, Lemhi County, Salmon, Ida 83467; professor, University of Idaho Cooperative Extension System, Custer County, Challis, Ida. 83226.

Abstract

Economic impacts from federal grazing policy frequently figure in public debate about federal land in the American West. The spatial and economic level of aggregation at which impacts are estimated is a significant issue, both politically and methodologically. We present an input/output model incorporating spatial detail at the sub-county level. Seven community-level economies are portrayed and contrasted with the aggregated 2-county economy. Our argument is that economic dependencies, notably dependencies on the range cattle industry, differ significantly between communities and that this differentiation is completely masked when the 2 county area is examined as 1 economy. The sub-county breakdown illustrates the degree to which communities are differentially vulnerable to reduced cattle prices and a reduction in available federal forage.

Key Words: Public land, grazing, input/output models

Resumen

Los impactos económicos de las políticas federales de apacentamiento frecuentemente figuran en los debates públicos acerca de las tierras federales del oeste Americano. El nivel de agregación espacial y económico al cual los impactos son estimados es un problema significativo, tanto político como metodológico. Aquí presentamos un modelo de entrada/salida en el que se incorpora detalles espaciales al nivel de sub-municipio. Siete economías a nivel de comunidad se describieron y contrastaron con el agregado de 2 economías de municipio. Nuestro argumento es que las dependencias económicas, dependencias notablemente en la industria ganadera de pastizal, difieren significativamente entre comunidades, y que esta diferenciación es completamente enmascarada cuando las 2 áreas municipales se examinan como una sola economía. La separación en sub-municipios ilustra el grado al cual las comunidades son diferencialmente vulnerables a los precios reducidos del ganado y a una reducción del forraje federal disponible.

The importance of the range cattle industry to communities in the western U.S. is a frequent topic for local people, policy makers, federal land managers, and the general discussion of public land management. The economic impact of changes in grazing policies on public lands continues to be an important issue. Typically, overall economic impacts are evaluated either with statistics about employment or earnings derived from an industry (Power 1996), with regional economic techniques (Lacy and Johnson 1990), or with econometrics (LaFrance and Watts 1995). Other studies focus on the impact of changes in grazing fees or other land management issues (Torell and Drummond 1997, Bartlett et al. 1979, Cook et al. 1980, Anderson et al. 1993, Torell and Doll 1991, Lambert 1987, Rowan and White 1994). All approaches to estimating economic impacts have limitations. Most approaches can only focus on ranches as a group or on a large region taken as a single area. Given this, a notable limitation of traditional impact studies is the absence of spatial economic detail. Estimation of local economic impacts on communities and their spatial distribution are beyond the capabilities of most methodologies and approaches.

The level of spatial and economic aggregation used to assess policy changes is a significant problem for impact assessment. It is not simply a methodological choice to use a state or county estimate, for example. The choice has implications for policy in that an impact may be very large for 1 county, but negligible for the state as a whole. Thus, how we approach aggregation frames the policy discussion about the estimated economic consequences of different policy choices. Even county level analysis can mask significant differentiation between community-level economies and this differentiation has direct implications for evaluating the range cattle industry and federal grazing policies.

We use input/output techniques to evaluate the spatial distribution of economic impacts from public land grazing across 7 communities in a 2 county area of central Idaho. Examining the importance of ranching at the 2 county, aggregate level portrays the local economy very differently from the disaggregated community economies of the area. We use this model to illustrate how economic change will be distributed across 7 communities when cattle prices decline or available federal grazing animal unit months (AUMs) are reduced.

Materials and Methods

Custer and Lemhi Counties in central Idaho are dominated by federal lands: both counties contain over 90% public land. The U.S. Forest Service and Bureau of Land Management dominate the management of these lands. Local economies have historically depended on ranching, recreation, government, mining, and some timber.

We conducted over 160 semi-structured household interviews for a parallel social assessment. Respondents in these interviews

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helped define numerous assumptions used in the economic models. Respondents defined the trade "hierarchy" used in the economic model. In such a hierarchy, some communities "trade up" to a central trade community from which money "leaks" to larger, outside trade centers. To accomplish this, we asked both personal interview and business interview respondents to describe the spatial pattern of their purchases. For example, they broke purchases down into local and non-local categories. We added further detail by asking which purchases were made in which local communities. This information was used to build the local trade hierarchy. In central Idaho, it is reasonable to assume that Salmon is a dominant trade area. The Tendoy/Leadore, Pahsimeroi, Northfork, and, to a lesser extent, Challis communities are connected to the trade center at Salmon. The Mackay area has sufficient trade with Challis to warrant inclusion in the trade hierarchy. The Stanley Basin, on the other hand, is in Custer County but has less trade in the 2 county area. Its primary economic trade with the rest of the county involves fuel, transportation services, and outfitters and guides.

Respondents also assisted in defining functional economic areas. We disaggregated the 2 counties into 7 functional economic areas closely resembling the Census areas from the 1990 Census of Population[1]. Figure 1 outlines these areas. Census areas are usually defined in rural areas by physical boundaries, political boundaries, or long distances between population centers. The functional areas described by respondents matched very well with the areas used in the Census.

The primary economic sector examined in this paper is agriculture and this is almost exclusively cow/calf ranching. [A small dairy sector around Salmon supplies milk to a small cheese plant there.] Ranch sector data is derived from actual ranch records of 15 enterprises in the 2 county area using the FINPACK program (FINPACK 1993). These 15 enterprises are not a sample. They represent all local ranches willing to provide the very detailed financial records necessary to accurately estimate and evaluate ranch costs and returns using FINPACK. These data are used to construct a detailed ranch sector in the I/O model. According to the 1992 Census of Agriculture 316 ranches in this area are commercially viable and 217 of these operations hold federal grazing permits. A small percentage of land is privately

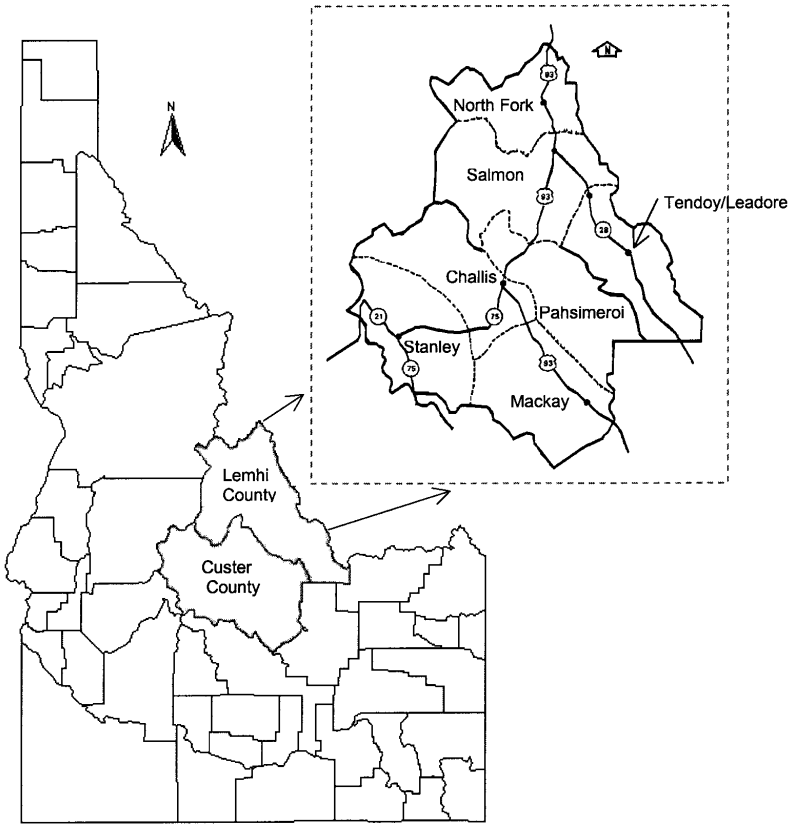

Fig. 1. Central Idaho study area.

owned. Our interviews with local ranchers indicated that, in the short run, few if any private forage options exist for federal permit holders. Ranchers indicated that in the past they had more options than they do currently. When feasible, nearby ranches could be purchased for additional forage and federal AUMs. The current appreciation of ranch land for non-agricultural uses mitigates this strategy. Many respondents had focused their efforts in recent years on upgrading their agronomic and irrigation practices to raise forage yields on their private ground. As an option, this was seen as quickly reaching its technical limits. Purchasing hay or grazing forage outside the area was judged to be unrealistic even in the long run. In the end, we concluded that if federal AUMs are reduced, herd size must be reduced or management intensified on existing private forage while searching for other forage sources and opportunities[2].

For all other economic sectors, telephone books and local interviews were used to identify businesses in each community. We attempted to survey all known local businesses using drop off/pick up and personal interview methods. Respondents supplied information about their employment, sales, where they purchased inputs, and to whom they make sales, by sector. Over 250 businesses were surveyed. The data were used along with employment totals from state and federal sources to build the final model. Finally, we derived unearned income estimates from household income breakdowns for the respective Census areas. These estimates include Social Security payments, dividends, interest, rents, pensions, income support, Medicare, and similar payments. The base year for this model was 1991.

We derived model parameters from interviews with ranchers and businesses in each area. These interviews provided insights into trade patterns, economic exports, income sources, functional economic areas, and reactions to possible changes in the ranch economy. The accuracy and legitimacy of this model rests on these extensive interviews which allowed us to make the fewest assumptions possible.

[1]For a technical description of this model and its theoretical basis, see Robison (1997).

[2]More intensive management of existing private forage on the part of federal permit holders might make up for some of the AUM reduction, but this factor is almost impossible to estimate and will not be evaluated here..

Table 1: Custer and Lemhi combined economy, and income summary, 1991.

	Earnings		Employment	
	($1,000's)		(Jobs)	
Agriculture	21,254	21.8%	1096	24.2%
Mining	27,887	28.6%	850	18.7%
Timber	8,543	8.8%	314	6.9%
Visitors	13,725	14.1%	1030	22.7%
Linked to RUI[1]	5,387	5.5%	228	5.0%
Government				
S & L Local	8,861	9.1%	377	8.3%
Federal	9,906	10.2%	562	12.4%
Other	2,032	2.1%	78	1.7%
Total Earnings	97,595	100.0%	4535	100.0%

Two–County Income Summary

	($1,000's)	%
Earnings Total	97,595	78.6%
RUI1	26,540	21.4%
Total	124,135	100.0%

[1]RUI is residents' unearned income. This is all unearned income such as dividends, transfer payments, rents, pensions, income support payments, etc. or income that is unrelated to employment. Earnings and income in this category represent secondary economic activity attributable to the expenditure of residents' unearned income.

Economy of Custer and Lemhi Counties

Table 1 displays the combined economy and income summary of Custer and Lemhi counties. The economy appears most dependent on agriculture, mining, government and visitors for its earnings and employment. It is important to note that about 21% of total income comes from residents unearned income (RUI), which in turn generates about 5% of the total economic activity. The low percent of economic activity related to RUI is derived from the its relation to economic activity. Unlike most sectors, unearned income does not generate direct employment or sales. It is spent as household expenditure, and therefore its impact is limited to a few sectors. Visitors account for about 14% of earnings, but almost 23% of the jobs in the 2 county area. Low wages and seasonal employment account for this disparity.

The economies of the 7 communities are presented in Tables 2, 3, and 4. Table 2 presents earnings and Table 3 presents employment, by sector, for each community. Table 4 presents a breakdown of earned and unearned income for each community. Salmon is the county seat of Lemhi County and the trade center for the 2 county region. The government accounts for over 24% of the earnings due to a BLM District office, a U.S. Forest Service supervisor's office, and state and local government including the school districts. Visitors account for almost a quarter of all jobs, but less than 20% of the earnings. Northfork is heavily reliant on visitors who account for 43% of earnings and 63% of employment. At the same time, over 50% of their income is unearned. This situation is not reflected in the local economy because Northfork has few services or retail establishments where local people can spend that income. They must drive to Salmon to buy most goods and services. Wholesale trade and fuel come to North Fork from Salmon to supply goods that are sold there. This is an example of how Salmon serves as a trade center.

The economy of Tendoy/Leadore is clearly dominated by agriculture. The same situation holds for the Pahsimeroi Valley. Over 85% of earnings in Tendoy/Leadore, and 96% of the earnings in the Pahsimeroi Valley are derived from ranching. These levels of dependence are extremely high. They also represent extreme departures from the local economy depicted at the 2 county level of aggregation. Note also that almost 44% of the income in the Pahsimeroi Valley comes from unearned income, income unrelated to earnings. While the earnings of people in the valley are dependent on ranching, almost half of the personal income has nothing to do with ranches. This is partially an artifact of Census aggregation techniques. The Patterson Census area includes a small subdivision on the Salmon River with a largely retired population. This accounts for the high proportion of unearned income. Again, people travel to Salmon or Challis for household purchases so the contribution of this income to their local economy is minimal. A high dependence on mining holds for Challis. Almost 69% of earnings in that area are derived from mining activities. These payrolls push the percentage of total income from earnings to well over 90%. The economy of the Stanley area is similar, but the dependence instead is on visitors. Finally, the economy of Mackay illustrates another situation. Ranching is extremely important to this area. At the same time, resident's unearned

Table 2. Earnings in 7 communities in Custer and Lemhi Counties, 1991.

	EARNINGS													
	Salmon		Northfork		Tendoy–Leadore		Pahsimeroi		Challis		Stanley		Mackay	
	($1000)	(%)	($1000)	(%)	($1000)	(%)	($1000)	(%)	($1000)	(%)	($1000)	(%)	($1000)	(%)
Agriculture	7,126	15.8	19	1.0	4,089	85.4	2823	96.5	3194	10.0			4003	49.8
Mining	5,660	12.5							22001	68.8			226	2.8
Timber	7,866	17.4	75	3.9					410	1.3			192	2.4
Visitors	8,886	19.7	838	43.7	93	1.9%	16	0.5	1587	5.0	2002	72.3	303	3.8
Linked to ROI	3,564	7.9	56	2.9	53	1.1%	24	0.8	729	2.3	22	0.8	939	11.7
Government														
S & L Local	5,495	12.2	216	11.3	305	6.4%	39	1.3	1644	5.1	197	7.1	965	12.0
Federal	5,635	12.5	709	36.9	245	5.1%	24	0.8	1656	5.2	497	17.9	1140	14.2
Other	935	2.1	6	0.3	3	0.1%			765	2.4	50	1.8	273	3.4
Earnings Total	45,167	100.0	1,919	100.0	4,788	100.0%	2926	100.0	31987	100.0	2769	100.0	8042	100.0

Table 3. Employment in 7 communities in Custer and Lemhi Counties, 1991.

	EARNINGS													
	Salmon		Northfork		Tendoy–Leadore		Pahsimeroi		Challis		Stanley		Mackay	
	(Jobs)	(%)	(Jobs)	(%)	(Jobs)	(%)	(Jobs)	(%)	(Jobs)	(%)	(Jobs)	(%)	(Jobs)	(%)
Agriculture	522	22.7	5	2.8	139	76.8	68	84.0	157	13.1			205	50.7
Mining	181	7.9							664	55.4			5	1.2
Timber	293	12.7	3	1.7					12	1.0			6	1.5
Visitors	572	24.8	112	63.6	11	6.1	7	8.6	143	11.9	151	79.1	34	8.4
Linked to ROI	150	6.5	4	2.3	3	1.7	2	2.5	32	2.7	1	0.5	36	8.9
Government														0.0
S & L Local	234	10.2	9	5.1	13	7.2	2	2.5	70	5.8	8	4.2	41	10.1
Federal	309	13.4	43	24.4	15	8.3	2	2.5	97	8.1	30	15.7	66	16.3
Other	42	1.8	0	0.0					24	2.0	1	0.5	11	2.7
Employment Total	2303	100.0	176	100.0	181	100.0	81	100.0	1199	100.0	191	100.0	404	100.0

income accounts for about 35% of the total income and generates enough secondary activity to account for well over 12% of the earnings. This situation is mostly due to the number of care facilities for the elderly located in Mackay. This draws unearned income in the form of Medicaid, Social Security and pensions into the economy, and a large portion of it is spent in these care facilities. Finally, employees of the Idaho National Engineering Laboratory near Idaho Falls also live in Mackay, accounting for a higher proportion of federal government earnings.

The economic structure of these 7 communities differs greatly from that of the 2 county aggregate area. Examined at the aggregate level, the economy of this area appears balanced, as does the economy of Salmon, its major trade center. However, extreme departures from this economic structure are the dependence of Tendoy/Leadore and the Pahsimeroi Valley on ranching, the role of mining in the economy of Challis, and the dependence of the Stanley Basin on visitors and tourism. The spatial distribution of economic change in this area is now examined with respect to the ranching sector.

Spatial Distribution of Economic Impacts

Significant changes to the ranching sector in Custer and Lemhi Counties will clearly affect these 7 communities in different ways. To illustrate this spatial distribution of effects, the input/output model is used to examine 2 scenarios, 1 real and 1 hypothetical. First, we examine the impact of the decline in cattle prices from 1991 to 1996. This serves as an example of the straightforward economic fluctuation of a cattle cycle that affects community economies. Second, we examine a hypothetical reduction in available AUM's on federal range. This serves as an example of a public policy impact that, while hypothetical, is commonly discussed and for which impacts are often estimated.

Reduced Cattle Prices: FINPACK data indicated that total revenue per cow in Custer and Lemhi counties averaged $508 in 1991. By 1996, this was reduced to $398 per cow, or a 21.7% drop in per cow revenue[3]. We do not expect ranchers to reduce herd size significantly in response to lower prices. Their proprietor's income is reduced and their options include postponing household purchases, or reducing the overall household draw from ranch revenues. We evaluate the reduced income by reducing household consumption. The implication is that herd size and associated costs remain fixed.

The total impact of this reduction in price on the 2 county area and the 7 communities is presented in Table 5. Sales, earnings and employment in the 2 county area each fall about 2%. The distribution of these impacts differs among communities. These differences depend, largely, on primary versus secondary impacts. North Fork has few ranches, and loses little. The Pahsimeroi Valley and Tendoy/Leadore experience different effects. The Pahsimeroi area has few establishments at which ranch households can spend money. Hence, the impacts presented in Table 5 are almost exclusively direct impacts. In terms of sales and earnings, the Mackay economy is hit hardest. Ranches in this area can trade for household goods in Mackay to a greater extent than the more ranch-dependent areas of Pahsimeroi and Tendoy/Leadore. Challis is dominated by mining and this dilutes the overall impact of falling cattle prices on the local economy. In addition, these areas trade with Salmon. Salmon therefore loses sales, earnings and jobs from direct impacts on its ranching sector. It also derives secondary impacts from lost regional trade. However, the overall impact represents a small percentage due to the relative size and diversity of the Salmon economy.

Reduced federal AUMs: The recovery of endangered fish species is an important issue in Custer and Lemhi Counties. Frequently, recovery plans in this area include proposals to reduce grazing near riparian fish habitat on both public and

Table 4. Community income summary for 7 communities in Custer and Lemhi Counties, 1991.

	Total Earnings		RUI		Total Income
	($1000)	(%)	($1000)	(%)	($1000)
Salmon	45,167	77.3	13,298	22.7	58,465
Northfork	1,919	49.6	1,952	50.4	3,871
Tendoy–Leadore	4,788	85.3	826	14.7	5,614
Pahsimeroi	2,926	56.3	2,273	43.7	5,199
Challis	31,987	90.9	3,207	9.1	35,194
Stanley	2,769	81.9	611	18.1	3,380
Mackay	8,042	64.8	4,373	35.2	12,415

[3]Ranchers might use the futures market to reduce price risk. Our experience, however, is that this excellent option is rarely utilized.

Table 5. Impacts on sales, earnings and employment of drop in cattle prices, 1991 to 1996.

	CHANGE					
	Sales		Earnings		Employment	
	($1,000)	(%)	($1,000)	(%)	(Jobs)	(%)
CHALLIS	$(2,059)	–1.8	$(801)	–2.5	(39)	–3.2
Stanley	$ –	0.0	$ –	0.0	0	0.0
Mackay	$(1,225)	–4.7	$ (246)	–3.1	(9)	–2.3
Pahsimeroi	$(45)	–0.6	$ (18)	–0.6%	(1)	–1.6
SALMON	$ (1,837)	–1.5	$ (745)	–1.6%	(33)	–1.4
Tendoy–Leadore	$(280)	–2.5	$ (113)	–2.3	(6)	–3.4
North Fork	$ (1)	0.0	$ (0)	0.0	(0)	0.0
2 *County Change*	$ (5,447)	–1.9	$ (1,923)	–2.0	(89)	–2.0

private land. The National Marine Fisheries Service (NMFS) directs recovery efforts in this region for endangered and threatened salmon species. In the delineation of critical habitat, NMFS has suggested that salmon require a 25% reduction in grazing on federal public lands in this area (Huppert et al. 1992 p.3–82 [citing Haynes et al. 1992]). Other similar proposals to reduce grazing on public lands are common throughout the West. Thus, a common policy question is the economic impact such reductions will have on ranchers and rural communities. We model a 25% reduction in federal grazing and estimate how these impacts would be distributed across the 7 community area.

The available AUMs, both private and federal, are presented in Table 6. Federal AUMs account for over one quarter of all AUMs in the 2 county area. Private pasture accounts for another third of the AUMs. Private land is very limited in these counties and rancher interviews indicate that virtually no additional private pasture is available to compensate for lost federal AUMs in the short run. To estimate the changes in sales, earnings and employment from a 25% reduction in all federal AUMs in the 2 counties, we estimate the corresponding reduction in the cow herd and the resulting drop in ranch revenue.

There were 221,286 federal AUMs in Custer and Lemhi Counties in 1991. A 25% reduction would be a loss of 55,322 AUMs. Data from FINPACK indicate that 13.1 AUMs are required per cow per year (7.9 pasture and 5.2 hay). With the absence of additional private pasture, a loss of 55,322 AUMs results in an estimated 2 county herd reduction of 4,223 cows (7.4%). Though not ideal, the most reasonable way to estimate the impact of this loss is to distribute the herd reduction proportionally across the seven areas defined in the model. Table 7 presents baseline and reduced cow herd numbers and cow revenues and reflects a 7.4% reduction in cow herd for each area. The economic impact of this reduction in AUMs and revenues is presented in Table 8. The impact on the overall economy is small, less than 2% of sales, earnings and employment. Even in those areas highly dependent on ranching, the losses in sales, earnings and employment are roughly in the 5% to 7% range. The impact on any single ranch operation of a loss in federal AUMs might be enormous, depending on the flexibility of its nonfederal forage base and other factors. Nonetheless, the overall impact on each community of a 25% loss of federal grazing ranges from negligible to just over 7% of economic activity, and the magnitude of the impact is a function of the economic dependence on ranching.

Ideally, the actual AUM reductions would be enumerated by ranch and aggregated in each community area. This would shift the spatial distribution of the cuts to an unknown degree, and result in a different spatial pattern of impacts. However, current discussions about endangered species recovery often include area-wide reductions in grazing and/or forage utilization and cross federal agency jurisdictions and county boundaries. The assumption that all areas will have a proportional AUM reduction is reasonable.

Table 6. Available AUMs, Custer and Lemhi Counties, 1991.[1]

	Custer[2]	Lemhi[2]	Total	Total
Federal AUMs				(%)
USFS			113,716	14.7
BLM			107,570	14.0
Total Federal AUMs			221,286	28.7
Private Pasture AUMs			243,700	31.6
Hay AUMs			306,067	39.7
Total Feed AUMs	305,322	465,731	771,053	100.0

[1]Source: Census of Agriculture (1992).
[2]These AUMs cannot be disaggregated. Ranchers have permits in both counties, the Challis National Forest is in both, and the county line splits the Pahsimeroi Valley.

Conclusions

An input/output model of 7 communities in a 2 county area of central Idaho was described. This model incorporates intercommunity trade and the spatial detail of the local economies. The important result is the degree to which local economies differ from the aggregate 2 county economy. To illustrate this finding, the model was used to evaluate 2 changes in the local ranching industry: the fall in cattle prices from 1991 to 1996, and a 25% reduction in available federal grazing AUMs. The spatial distribution of those changes indicated that communities highly dependent

Table 7. Cow herd distribution and revenues before and after 25% reduction in federal AUMs, 1991.

	Baseline Cows	Baseline Revenues	Proportional Herd Reduction	Proportional Revenue Reduction
	(Number)	($1,000)	(Number)	($1,000)
Mackay	9,370	$ 4,760	696	$ (354)
Pahsimeroi	12,250	$ 6,223	910	$ (462)
Challis	8,500	$ 4,318	631	$ (321)
Tendoy/Leadore	14,545	$ 7,389	1,080	$ (549)
Northfork	75	$ 38	6	$ (3)
Salmon	12,120	$ 6,157	900	$ (457)
Stanley	0	$ –	0	$ –
Total	56,860	$ 28,885	4,223	$ (2,145)

Table 8. Impacts on sales, earnings and employment 25% reduction in federal AUM's, 1991.

	CHANGE					
	Sales		Earnings		Employment	
	($1,000)	(%)	($1,000)	(%)	Jobs	(%)
CHALLIS	–517	–0.5%	–194	–0.6%	10	–0.8%
Stanley	0	0.0%	0	0.0%	0	0.0%
Mackay	–676	–2.6%	–210	–2.6%	11	–2.7%
Pahsimeroi	–521	–7.3%	–214	–7.3%	5	–6.4%
SALMON	–1,000	–0.8%	–389	–0.9%	31	–1.4%
Tendoy–Leadore	–668	–6.0%	–273	–5.7%	9	–4.9%
North Fork	–3	–0.1%	–1	–0.1%	0	–0.2%
2 County Change	–3,385	–1.2%	–1,281	–1.3%	–66	–1.5%

on ranching experience greater overall economic impact than do communities with more diverse economies, or those highly dependent on other industries such as tourism or mining. This situation is not surprising yet it is overlooked in most public policy assessments.

There are larger, more normative policy implications that can be drawn from this research. First, if the impact of eliminating all public land grazing in Custer and Lemhi counties is evaluated at the level of the Idaho state economy, it is probably negligible. The impact of a 25% reduction in AUMs in those counties appeared to be negligible on the 2-county area as a whole, but did have differential impact on individual communities. Nonetheless, the decision to evaluate the impacts of a public policy at the state level implicitly chooses to ignore local impacts. Moreover, economic changes from different sources can produce cumulative impacts greater for some economies than others. The model presented here forces recognition that local impacts often differ greatly from aggregate impacts. The level of analysis in evaluating grazing policies is a vital issue in the overall public debate.

Second, changing cattle prices affect local economies differently than a reduction in AUMs. We assume that ranchers reduce household consumption when prices fall, but maintain production expenditures, at least in the short run. Reductions in AUMs require overall production in the area to be reduced in addition to contractions in household consumption. In the long run, a reduction in AUMs creates a demand for additional forage in an area where private land is both scarce and high priced. Thus, management flexibility greatly determines how well ranchers can respond to change. Over time, ranchers respond to fewer AUMs via management options and this produces a proportionally larger impact on local economies than a short-term price reduction. To illustrate this, a 21.7% drop in prices results in a 21.7% reduction in revenues, and reduces economic activity by about 2% [Table 5]. The loss of 25% of AUMs reduces herd size and associated revenues by about 7.4% [Table 7], reducing economic activity by about 1-1.5% [Table 8]. The overall impact of the AUM loss is proportionally greater than the impact of the price drop.

These findings have implications for modeling efforts addressing public land policy in general. As we show, the structure of local economies can be very different. Many of the policy options frequently offered to ease the economic transition of rural communities to less dependence on traditional industries fail to account for these very different local economies. Some argue that growth in the services and recreation sectors and in single proprietorships not dependent on local resources (so-called "lone eagles") is the best future for the west (Power 1996, Rasker 1993). These sectors can be very important to rural communities, particularly recreation. However, their economic impact depends on the structure of the local economy. In this study, areas like Challis would benefit differently from an expanded recreation sector than would the Tendoy/Leadore area. A basic economic infrastructure exists to capture recreation dollars in Challis, but is almost negligible in Tendoy/Leadore. Moreover, the relationship between earnings and employment in this model reflects the low pay and seasonal nature of many jobs in the service and recreation sectors. These issues are often ignored when the economic future of rural communities in the west is discussed.

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