

Implications of declining grazing permits on public land: An integrated social and economic impact analysis

Paul A. Lewin¹, J.D. Wulforth², Neil R. Rimbey³, K. Scott Jensen⁴

INTRODUCTION

Over the last few decades, rural residents often have come into conflict with urban residents, resource managers, and public lands stakeholders over perceived acceptable land uses. These conflicts are more common in the West, where federal land ownership is disproportionately higher for many states: 85% of the total area of Nevada, 65% of Utah, 62% of Idaho, 53% of Oregon, and 48% of Wyoming. Many diverse users actively utilize these lands for both recreational and commercial activities such as fishing, camping, hiking, hunting, boating, grazing, logging, and mining. Many times, the multi-use nature of these activities includes overlap, and sometimes conflict, between them. Importantly, the landscapes also provide critical ecosystem services related to water quality, air quality, and wildlife habitat along with a host of other functions.

One of the most sensitive resource management topics in these landscapes has been the reduction in public lands grazing (Pearce et al. 1999). On the one hand, resource managers are required to keep land uses within environmentally acceptable limits. Some interest groups also advocate for removal of livestock from public lands because they define grazing of public lands as an adverse and unnecessary use of western landscapes. On the other hand, the livelihoods of families and communities in the West depend on livestock grazing on public lands with livestock production remaining as a core sector of commerce.

Such communities have strong ties to the livestock industry, which help to provide economic stability and a rural lifestyle to their families (Pearce et al. 1999, Boyd, Beck, and Tanaka 2014, Davies, Bates, and Boyd 2016). Although rural communities in this region continue to diversify, the livestock industry provides not only economic

¹ Assistant Professor of Ag Economics & Rural Sociology for University of Idaho

² Professor of Natural Resources and Society for University of Idaho

³ Emeritus Professor of Ag Economics & Rural Sociology for University of Idaho

⁴ Extension Educator & County Chair for Owyhee County Extension Office University of Idaho

stability for many communities (Boyd, Beck, and Tanaka 2014), but also ecological and landscape functions to manage increased wildfire risk (Davies et al. 2016).

The Bureau of Land Management (BLM), US Forest Service (USFS), and National Park Service (NPS) policy decisions in recent decades have resulted in a consistent downward trend in the amount of federal grazing authorized in the West (Pearce et al. 1999). These previous and ongoing grazing reductions have impacted livestock operations, associated rural economies, and rural communities' social cohesion.⁵

In this article, we examine the economic and social impacts of grazing permits on Owyhee County, Idaho, which is a livestock-dependent county that heavily relies on public lands for seasonal grazing.

OWYHEE COUNTY

Owyhee County, Idaho (see Figure 1), is the second largest county in Idaho consisting of 7,678 square miles. Over 75% of the county's total area is federal public lands in addition to 6% of the county owned by the State of Idaho. Much of the county is very rural with towns along the Snake River, which is the northern border of the county. Most of the federal and state lands are rangelands and used for livestock grazing by private landowners who hold grazing permits and leases. There are 4,741 households in Owyhee County with a median household income of \$33,626, which is below the state average of \$47,015 (U.S. Census Bureau 2018).

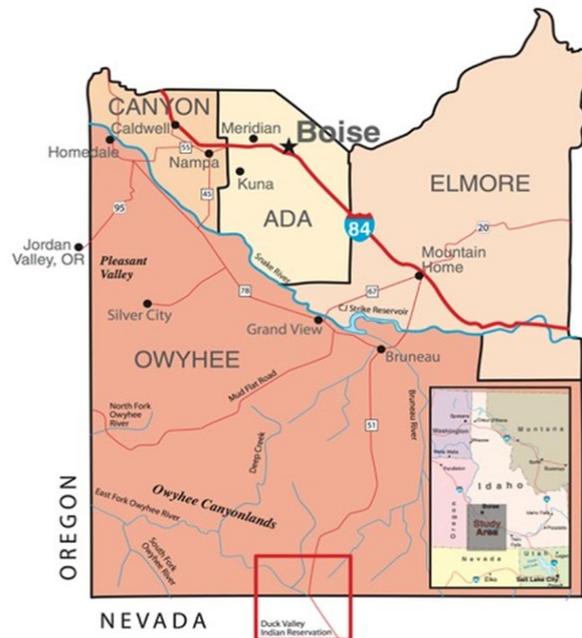


Figure 1. Map of Southwestern Idaho

⁵ When public policies affect a community, measuring social cohesion is important to understanding community impacts. No single definition of social cohesion exists, but recent literature reviews emphasized 6 core dimensions found across most studies that operationalize the concept: social relations, identification, orientation toward the common good, shared values, quality of life, and equality (Schiefer and van der Noll, 2016).

Beef production in Owyhee County started back in the early mining days with cattle that were trailed north from Texas, California, and Nevada. Presently, there are approximately 27,000 dairy cows, 48,000 beef cows, and 85,000 other cattle (feeders, replacement heifers, and others) in the county (USDA 2018). The beef industry plays a strong socio-economic role in the county and ranching families are the backbone of Owyhee rural towns.

Dating back to the 1990s, a substantive number of acres and affected grazing permits managed by the BLM in Owyhee County have been under review and challenged by additional constraints. The overall management pattern occurring in recent decades has become a reduction in animal unit months (AUMs)⁶ by the BLM on many Owyhee County public lands allotments. Most ranches in this region rely on a matrix of public and private lands that include the ability to rotate cattle through lower and higher elevation areas to follow forage availability with the seasons.

METHODS

We estimated the economic impact of federal grazing permit reductions in Owyhee County using a Social Accounting Matrix (SAM) and evaluated social cohesion in the communities using sociological approaches. The methods are described below.

Owyhee's social accounting matrix

The SAM accounts identify the economic linkages between industries' purchases and sales, household income and household expenditures, government revenues and government spending, and saving and investment (Holland and Wyeth 1993). The Owyhee's SAM was constructed using enterprise budgets for cattle ranching and cattle feeding and regional data⁷. Based on Idaho agricultural statistics, observations of Owyhee County feedlots and ranches, and interviews with personnel from University of Idaho Extension, we estimate the value of the cattle ranching and feedlot sector is approximately \$130 million. Around 25% of the beef cows finished in the Owyhee feedlots come from Owyhee ranches.

To account for different production practices and their respective cost and returns in Owyhee County, we updated enterprise budgets from producer panel interviews. Then, we used the local enterprise budgets to build the cattle ranching sector and the feedlot sector in the SAM following procedures explained by Willis and Holland (1997) and Holland and Beleiciks (2006).

⁶ An AUM is a measure of the amount of forage that one animal unit (a cow or cow with calf) will consume in one month. It is common for public land grazing leases to be charged based upon the number of AUMs consumed or allotted for the parcel of land.

⁷ We used data from the IMPLAN software, which helps to alleviate the cost of obtaining primary data for the model construction.

Sociological methods

Sociological data for the analysis were collected through in-depth qualitative interviews and a social survey among the general public. Using a snowball sampling method, we conducted 28 key-informant interviews between July 2014 and July 2016 with officials, community leaders, agency personnel, and interest group representatives to emphasize in-depth and explanatory data within a case study (Stake 1995). The protocol for interviews included the questions listed in Table 1. Interviewee responses to questions #2 and #5 often elicited issues related to Animal Unit permitting.

Table 1. Protocol for key-informant interviews.

Q1. Please describe life in Owyhee County concerning social, economic, and cultural contexts.
Q2. What are the primary issues associated with land/resource management practices and policies affecting the Owyhee region?
Q3. Please explain your view on the state of social cohesion in Owyhee County and the main factors affecting its residents.
Q4. Please describe whether you observe more conflict or cooperation over resource management issues facing the Owyhee region.
Q5. What are the most critical contemporary issues facing rangelands in the Owyhees?

In the fall of 2015, we administered a 15-minute telephone survey of the general population of Owyhee County along with three surrounding, more urbanized counties. The survey was designed to collect data on resource management perspectives. Table 2 summarizes the sampling frame structure, geography, number of completed surveys, final response rate⁸, and cooperation rate⁹.

Table 2. Summary of design and outcomes for the Owyhee County-related surveys

Geography of sample	1) Owyhee Co.; 2 and 3) rural & urban subsamples of Ada, Canyon, and Elmore Cos.
Sampling frame / structure	Dual-frame (Land & Cell Lines), random-digit dialed, simple random sample
Completed surveys	N = 669
Response / Cooperation rates	35% / 52%

⁸ A response rate is the number of completions with respondents divided by the number of eligible respondents in the sample.

⁹ A cooperation rate is the proportion of all respondents surveyed of all eligible respondents ever contacted.

RESULTS

The agricultural sector remains the dominant activity in Owyhee County, accounting for 70% of the total economic output. Within this category, cattle ranching on the vast rangeland resources remains a mainstay for many livestock producers who reside in the county and contribute substantively to the local economy.

The economic contribution of the beef cattle industry (ranching and feedlots) includes cash receipts of \$130 million (\$30 million in ranching and \$100 million in feedlots), which together accounts for 18% of total cash receipts; value added of \$29 million, which accounts for 10% of Owyhee County's gross product; and 308 jobs, which accounts for 7% of total jobs. The beef cattle industry is the leading exporting industry in the county with \$80 million in exports, which accounts for 20% of total exports.

If we consider the total gross product, employment and value added of the Owyhee County economy across all sectors that is generated by the beef cattle industry activity, the importance of this industry is even more significant. This analysis is known as an *economic base*, and it gives credit to the sector that brings new dollars into the region through exports for the economic activity that it supports in the regional economy. For example, if a tire merchant sells a tire to a local livestock producer, the value of this transaction is typically counted in the "tire store" or retail sector. However, because this sale is only possible because of the new dollars that are brought into the region by the livestock producer (exports), the base analysis gives credit for this transaction to the livestock industry.

The beef cattle industry is one of the most important economic drivers in Owyhee County. Its *base contribution* is \$165 million or 22% of the Owyhee County total gross product, and \$13 million or 11% of the Owyhee County total value added. Similarly, its base employment is about 592 jobs or 14% of Owyhee County total employment. This base measure equals the sum of beef cattle output, value added, and employment for exports and the indirect output, value added, and employment from other sectors needed by the beef cattle industry to produce these exports.

Grazing permit loss and community-level impact

Grazing permit reductions invoke a great deal of social and economic stress within ranchers and communities in the county. Primarily stemming from the overall permit loss, the reduction of AUM of public forage available reduces the profitability of the livestock industry and puts at risk the economic activities across all sectors that are generated by the cattle ranching industry. In addition, AUM reductions increase litigations, uncertainty, and risk faced by ranchers.

Economic impact of grazing permits loss

The first step to estimate the direct economic impact of AUM losses is to calculate a value of output lost per AUM. Based on local interviews and enterprise budgets, we

calculate that each cow in Owyhee County needs approximately 7.72 AUMs of public land forage. There are approximately 45,660 cows in the cattle ranching sector. Multiplying the number of cows by the number of AUMs per cow yields approximately 352,495 AUMs of public land forage in Owyhee County. This estimate is consistent with the Bureau of Land Management (BLM) estimate of permitted AUMs within the county. Each cow requires one AUM of forage each month of the year. Therefore, the total demand for forage is 547,920 AUMs. With 352,495 AUMs coming from public lands, the dependency on public lands is thus 64%. In other words, 64% of the forage for the Owyhee County cowherd is coming from public lands. The direct output impact of an AUM lost (regardless of land ownership) is \$54.26 per AUM.

A critical assumption of the IO model is that no substitutes exist for inputs used in the production process. Using the cattle ranching sector as an example, if public land forage is reduced, livestock producers will have to adapt to the new scenario with fewer AUMs available and adjust herd size to the new level of inputs. This seems to be in contrast to work done by Van Tassell and Richardson (1998) that suggested ranchers will do all that they can to maintain herd size in the face of federal grazing reductions. In fact, our interviews with Owyhee County ranchers revealed a tendency to maintain herd size in the short run through increased hay purchases and leasing of private pasture or rangelands. Yet, in the long run, herd size would have to be reduced because the new inputs of hay and or leased forage dramatically increased operating costs and these new costs could not be maintained in the long run. One operator explained the general pattern this way:

"Yeah, the agency continuing to cut our permits and the number of animals we're able to run in certain timeframes puts us closer to the this-doesn't-work mark! Some guys, depending on their private acreage, can move things around for a while, but eventually they don't escape the bottom line that the economics of this beef production and using the good forage in rangelands around here relies on the combination of the public and private allotments to keep your herd at a viable size, optimize timing of your forage use, and allow you to keep your input costs down. Otherwise, before long, you're in the red. There's a limit on the amount of private ground in production."

Thus, for many operators, the only long-term, economically viable alternative is to reduce herd size in the face of federal grazing allotment reductions. Torell et al. (2014) estimates Idaho ranches' annual net income declined by \$17.04 for each AUM lost during the spring, \$12.54 for each AUM lost in the fall and \$17.15/AUM for losing both spring and fall forage resources. They also showed that 25 and 100% reductions in BLM forage resulted in declines in annual net income of \$13.21/AUM (for 25% reduction) and in \$29.76/AUM (for 100% reduction).

We estimated the output impact to Owyhee County's economy from one AUM of grazing is \$78.31. This impact includes the direct change in the cattle ranching sector (\$54.26); the indirect change in other industries (\$18.86) as they respond by adjusting

their inter-sector purchases to the new demand from the cattle ranching sector; and the induced change in household consumption (\$5.19) as a result of changes in production from the cattle ranching sector and the other industries in the economy. Thus, if the permitted grazing within the Owyhee County's public land forage decreases by 25%, the county would lose \$6,900,558 of gross product.

Litigation, uncertainty, and social cohesion effects of grazing permit loss

The economic effects also relate to the social cohesion components of the AUM loss pattern as well as cumulative effects to the equation of sustaining rural communities. For instance, one key variable that has catalyzed the pattern of AUM loss relates to interest group litigation over agency permitting processes, management plans, and resource policies. Cumulatively, these factors can induce stress and anxiety into social interactions within the community and affect cohesion because the local population begins to bear greater degrees of uncertainty and social costs associated with their livelihood, operational decisions contingent on resource use, and intergenerational succession. A local stakeholder we interviewed described these impacts:

"Now, with all the people moving back and forth between the urbanizing area around Boise and the rural parts of (Owyhee) County, the regional population is becoming more aware of impacts to these producers from all the lawsuits over how many cattle they can graze. From a management standpoint, there's an irony here because of the push to preserve wilderness in the same landscape. You can't say it's got ecological integrity to be wilderness at the same time you claim the cows are the trashing the landscape. If you're the producer, that kind of conflict not only hurts your bottom line, it damages your morale when you're trying to help feed the world."

Within the community-level impacts, the magnitude of these reductions has social consequences. In 2013, groups of permittees within the BLM-managed Owyhee Resource Area (ORA) were notified about significant reductions (in some cases, in excess of 50%) of permitted AUMs. The agency's planned changes also included seasonal shifts for some key allotments that would mean impractical use of forage considering time and/or space for operations. These changes invoke a great deal of stress and anxiety within the community of individuals affected within the ORA. In many cases, ranchers opted to appeal the changes to the Interior Board of Land Appeals (IBLA) to request stays for their operations and keep the permits functional until final decisions could be negotiated for the allotments. One permittee described the impactful process as follows:

"The '68'¹⁰ has put the community in a position of absolute dire uncertainty. It affects enough people, we think of it as the community. It has taken quite a lot of money to fund the lawyers to deal with this as we have made appeals to try to keep operations viable. Their [BLM]

¹⁰ It refers to a particular set of 68 affected grazing permits within the Owyhee Resource Area (ORA) of BLM-managed lands in Owyhee County, which have been under review and challenged since the 1990s.

revised plans for certain allotments didn't make sense from either ecological or economic terms, so we're still trying to figure out the rationale. The science they used has some big questions in it about how they apply it to some rangeland monitoring standards."

Others interviewed in Owyhee County and grappling with the long-term uncertainties invoked by the Owyhee 68 process reflected on the ties between these management policies and impacts to operations, families, and communities:

"This has drawn out now for a couple more years and conjured up some permit issues that have been around a long time and never settled well. The increased stress now – with some of these guys facing like 40-50% reductions on public ground, which is just not sustainable – also has impacts as we're trying to figure out how an extended family can continue to make a go of it. The younger generation of ranchers trying to get started out here are already facing land value costs that don't work sometimes, so if you add legal fees to the business model, and the true cost to everyone's well-being from the collective anxiety we go through, what's the total bill here? It leaves a lot of us scratching our heads and wondering."

Mitigation of AUM reduction is a multi-scale challenge. Even if an individual producer adapts to find an operational balance across the social and economic impacts, the longer term and broader geography impacts are also often public costs to the broader society.

Grazing permit reduction and the increasing number of litigations over natural resource management disputes facing many Owyhee County ranching operations has compound and cumulative impacts on the social fabric and socio-economic well-being of the communities, and ultimately, the county. These impacts have been pervasive, but remain hard to decipher as tangible, or quantifiable effects. To the local population, they feel like moving targets, external threats, and high-risk issues for the long-term viability of the community.

There is a strong perception among the general public that litigation, which targets removal of livestock grazing on public lands, has a lot of impact on ranches in Owyhee County (Figure 2). While this is a very general measure, the result suggests a high degree of local awareness about community impact related to the contemporary phenomena.

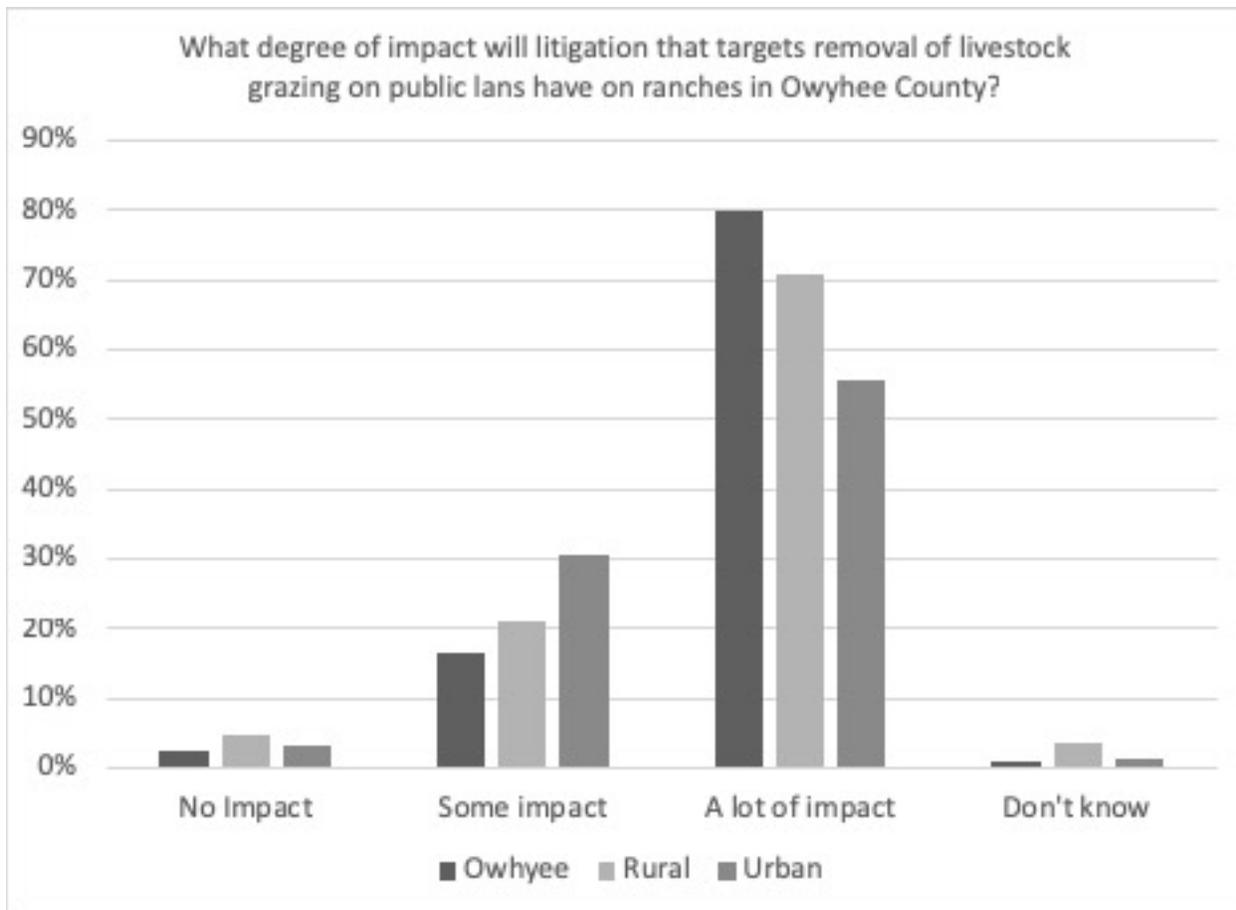


Figure 2. Perception of impact on ranches of litigation targeting removal of livestock grazing on public land

Some of those interviewed offered related comments that reveal how that larger and broader awareness affects social cohesion factors within the Owyhee County communities:

“People in Owyhee County have faced an unfair share of external threats and risks simply because of the resources they have to work with. There’s enough going back and forth – cars, people, goods, money, ideas – between out there and the metropolitan area, even people who live and work in Boise are becoming more familiar with these impacts, the extent of emotional damage they cause through stress, and among a lot of people, there’s a common sense perspective that prevails. Not everybody has this undying sympathy for everything dire that happens in Owyhee County, but people get it and take issue with how much of a bullseye the place has become. If you think it through, why would they chronically be on the hit-list of ‘the next great national monument’ if the landscape were trashed because a bunch of cows are out there?”

Sentiments like these cut across the categories of those interviewed for the project indicating that the wider community is talking about the extent and cumulative nature

of ongoing impacts, but also figuring out ways to mitigate whether the social disruption effects have lasting impact.

DISCUSSION AND IMPLICATIONS

The public typically views a reduction in Federal land grazing permit holders as an isolated incident with few repercussions. However, rural communities highly dependent on ranching and public land, like the Owyhees, experience significant economic impacts. The land in Owyhee County is very suited for grazing and not much else. Thus, the loss of grazing permits reduce the economic opportunities for its residents since public land grazing is a vital component of its economy and culture. The reduction of the number of permits decrease the profitability of the livestock industry and increase litigations, uncertainty, and the risk faced by ranchers. It also puts at risk the economic activities across all sectors that are generated by the cattle ranching industry and increases the stress of households living in the community. Even if ranch conditions may shift away from production value, ranching communities, like the Owyhees, will remain steadfastly tied to the industry of raising cattle (Harp and Rimbey 1999). Thus, the reduction in public land grazing has serious negative consequences to rural communities, counties, households, and ranchers.

As the debates over grazing in public lands continue, the conflict and economic impact that comes with this type of policy will continue to intensify as well as the pattern of litigation that compounds these conflicts. Also, it will put at risk the viability of some rural communities, their social cohesion, and ranch operations. The following passage reflects the social impact of AUM management policies:

"[...] Our kids had to grow up listening to all this anger and frustration about who we are and what we do—sometimes it was us being upset with one another, which was not good for them to see, you know, as their own parents, but usually it was both of us just being so strung out by the agency [BLM] for the past fifteen years. I mean, THAT has been their life—almost the entirety of it—seeing us fighting with the BLM and almost always losing. What would you think if that's all you saw and heard every day? You wouldn't want to take over the family ranch either. Even though they have some of their own cows, it's just for cash; they don't want to do this for a living. They want out of here. It hurts us, but we can't hardly blame them."

If the primary livelihood options for ranching communities in the West are to continue, it is essential for the public to understand rural communities have to work within the bounds of the available resources they have, including open space, ranch, federal land, and remoteness, which provide meaning for long-standing residents of that place. Also, it is necessary for the public to appreciate the contribution that cattle production offers to rural communities, not only at the economic level but also at the social and cultural level. For these rural communities "work itself offers both a fundamental way of knowing nature and perhaps [their] deepest connection with the natural world" (White 1996, 174). For many rural families "concepts of environment

and place are far from interchangeable," (Sagoff 1992, 358), since the place, as an element of the environment, determines the way individuals ground their lives with meanings to others (Wulfhorst, Rimbey, and Darden 2006). As one respondent summarized it, "our ranch and this place you see here is not just our business—it's our home and our collective heart too".

REFERENCES

Boyd, Chad S., Jeffrey S. Beck, and John A. Tanaka. 2014. "Livestock Grazing and Sage-Grouse Habitat: Impacts and Opportunities." *Journal of Rangeland Applications* 1:58-77.

Darden, Tim D., Neil R. Rimbey, Aaron J. Harp, and Thomas Russell Harris. 2001. Regional-level economic impacts of grazing policy changes: a case study from Owyhee County, Idaho. Western Regional Coordinating Committee on Rangeland Economics: WCC-55.

Davies, Kirk W., Jon D. Bates, Chad S. Boyd, and Tony J. Svejcar. 2016. "Prefire grazing by cattle increases postfire resistance to exotic annual grass (*Bromus tectorum*) invasion and dominance for decades." *Ecology and Evolution* 6 (10):3356-3366. doi: 10.1002/ece3.2127.

Davies, Kirk W., Jon D. Bates, and Chad S. Boyd. 2016. "Effects of Intermediate-Term Grazing Rest on Sagebrush Communities with Depleted Understories: Evidence of a Threshold." *Rangeland Ecology & Management* 69 (3):173-178. doi: 10.1016/j.rama.2016.01.002.

Harp, Aaron J., and Neil R. Rimbey. 1999. Cohesion, Integration and Attachment in Owyhee County Communities. In *Agricultural Economics Extension*. Moscow, ID: University of Idaho, Department of Agricultural Economics and Rural Sociology.

Holland, David, and Nick Beleiciks. 2006. The economic impact of potatoes in Washington State. Department of Agricultural Economics, Washington State University. <https://research.wsulibs.wsu.edu:8443/xmlui/handle/2376/4553>.

Holland, David, and Peter Wyeth. 1993. SAM multipliers: their decomposition, interpretation and relationship to input-output multipliers. In *Research Bulletin*, edited by Washington State University College of Agriculture and Home Economics Research Center. Pullman, WA, USA.

Pearce, Rob, Don Henderson, Tom Harris, and Tim Tetz. 1999. "Impacts of federal land livestock reductions on Nevada's economy." *Rangelands* 21 (4):22-24.

Sagoff, Mark. 1992. "Settling America or the concept of place in environmental ethics." *Journal of Energy, Natural Resources & Environmental Law* 12 (2):349-418.

Schiefer, D. and J. van der Noll. 2016. The Essentials of Social Cohesion: A Literature Review. *Social Indicators Research*. 6 April: DOI 10.1007/s11205-016-1314-5.

Stake, Robert E. 1995. "The art of case study research." In. Thousand Oaks: Sage Publications.

Torell, Allen L., Neil R. Rimbey, John A. Tanaka, John P. Ritten, and Thomas K. Foulke. 2014. Ranch-Level Economic Impacts of Altering Grazing Policies on Federal Land to Protect the Greater Sage-Grouse. University of Wyoming %U <http://www.wyomingextension.org/agpubs/pubs/B1258.pdf>.

U.S. Census Bureau. 2018. "American Fact Finder." <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>.

USDA. 2012. "Census of Agriculture 2012."

USDA. 2018. Press Release, National Agricultural Statistics Service

Van Tassell, L. W., and J. W. Richardson. 1998. Impact of federal grazing reductions on Wyoming ranches. In *Stubble height and utilization measurements : uses and misuses*. Corvallis, OR: Oregon State University, Agricultural Experiment Station.

White, R. 1996. "Are you an environmentalist, or do you work for a living?: Work and Nature." In *Uncommon ground: Rethinking the human place in nature*, edited by William Cronon, 171-185. New York: Norton.

Willis, D., and David Holland. 1997. Translating farm enterprise budgets into input output accounts: another example from Washington state. Department of Agricultural Economics, Washington State University.

Wulfhorst, J. D., Neil Rimbey, and Tim Darden. 2006. "Sharing the Rangelands, Competing for Sense of Place." *American Behavioral Scientist* 50 (2):166-186. doi: 10.1177/0002764206290631.