

A Discussion Paper by



The Agricultural Economy and Public Lands Ranching Strategies in Southern Utah



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ABOUT HEADWATERS ECONOMICS

Headwaters Economics is an independent, nonprofit research group whose mission is to improve community development and land management decisions in the West.

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Purpose and Background

This report provides decision-makers and stakeholders involved with public lands management a broad overview of the role of agriculture in the regional economy. The report then identifies some of the specific economic issues facing livestock producers who hold permits to graze on public land in Southern Utah, in particular the Fishlake National Forest.

The three National Forests in Southern Utah are engaged in efforts to address the efficacy of existing policies and their implementation to protect forest ecosystems, particularly riparian areas. The Forest Service is under considerable pressure from conservation advocates to respond to concerns that in many parts of the Manti-LaSal, Fishlake, and Dixie National Forest, riparian health is in decline.

Recently, efforts to remediate riparian and other rangeland health concerns on specific grazing allotments have involved collaborative working groups developing restoration plans predicated on changes in grazing management and the construction of enclosures and other infrastructure. Examples include the Tushar Collaborative process and the UM Allotment.¹ Whether such time-, money-, and maintenance-intensive projects are feasible across the extent of the public lands in need of restoration in Southern Utah is an important question as federal land managers seek solutions to conflicts over riparian and rangeland health.²

Headwaters Economics initiated this research effort recognizing that economic arguments are likely to play an important role in future policy discussions about managing public lands grazing in Southern Utah. We received guidance from the Fishlake National Forest Supervisor's office about the content and direction of the report. Specifically, we learned that that it would be useful to have economic information that would help the agency better describe the opportunities and constraints that shape capacity among forest permittees to respond to restoration initiatives.

To respond to this information need, our report takes two approaches to ranching in Southern Utah.

The first involves situating livestock production within the broader regional economy. Part 1 of the report describes county-level trends in the agricultural economy in the Fishlake National Forest region. The region is defined as Beaver, Garfield, Millard, Sevier, Piute, and Wayne counties.

The second approach focuses on the economics of livestock production among forest permittees. Part 2 focuses on developing a snapshot of the different types of ranch operations that use forest permits, based on size of operation. Finally, Part 3 discusses results of a preliminary interviewing effort with different types of permittee operations. A primary goal of the interviews was to identify the factors that contribute to ranch viability in the context of limited resources, including capacity to respond to ecological and economic variability.

¹ CommUnity Resolution, Inc., 2009. Tushar Grazing Allotments Collaboration Final Report. <http://projects.ecr.gov/tushar/pdf/FINALREPORT050209.pdf>, Shell Valley Consulting, 2010. Fishlake National Forest 2002 Level II Riparian Inventory—2009 Revisit, UM Creek Watershed.

² Wildlife, specifically elk, contribute to management challenges on National Forest grazing allotments. This report does not address these issues.

The research is based on publicly-available datasets from the U.S. Census, U.S. Department of Commerce and the U.S. Department of Agriculture, as well as Forest Service permit information and interviews conducted in January 2011 with local producers and agricultural professionals in the region. Conducted within a limited scope and with limited resources, this study is intended to provoke discussion by raising questions and pointing out economic issues that merit attention.

Headwaters Economics is a non-profit research group based in Bozeman, Montana. Our mission is to provide data and analysis to decision-makers to improve land management decisions. We have a longstanding interest in the role of public lands in regional and local economies. We also benefited from the insights of regional agricultural specialists. The analysis and any errors herein remain our own.

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I. The Regional Economy & Agriculture

This section discusses the key trends in the economic performance of the counties surrounding the Fishlake National Forest, with a focus on the role of agriculture in the region. Data presented in this section are publicly available and are from the Department of Commerce, the Department of Agriculture, and Bureau of the Census.

Population and Economic Growth, 2000 to 2009

The Fishlake region can be described as lower-performing economically compared to rural peers. Many rural areas rich with public land, scenery, and amenities witnessed significant economic and population growth during the 1990s and 2000s. Another geographic factor contributing to rapid growth in rural parts of the Mountain West in the 2000s is intensive energy development (unconventional natural gas and oil). In terms of key recent demographic and economic metrics, the six rural counties that make up the core of the Fishlake National Forest—Beaver, Garfield, Millard, Piute, Sevier, and Wayne—have been less prosperous than other rural counties in the Intermountain West.

Between 2000 and 2009, the Fishlake region counties underperformed compared to the non-metro Interior West (all non-metro counties in Idaho, Montana, Wyoming, Colorado, Utah, Nevada, New Mexico, and Arizona) in terms of the following metrics:

- Population growth (2.6% Fishlake Region v. 9.9% non-metro Interior West)
- Employment growth (10.6% Fishlake Region v. 13.6% non-metro Interior West)
- Personal income growth (21.0% Fishlake Region v. 29.7% non-metro Interior West)
- Average Earnings per Job (\$32,182 per annum in 2009 Fishlake Region v. \$37,932 non-metro Interior West)
- Per Capita Income (\$27,750 in 2009 Fishlake Region v. \$33,540 non-metro Interior West)³

However, the area has certain competitive advantages, such as greater than average population growth in the under 21 age cohort and lower than average increases in unemployment (4.2% change in unemployment 2000-2010 for the region versus 4.4% for the non-metro Intermountain West).

The region is slightly less dependent on non-labor income (dividends, interests, and rents and transfer payments) than the non-metro Interior West region (40.4% v. 41.0% in 2009). Transfer payments were the fastest growing component of non-labor income from 2000-2009, indicating that non-labor income in the region may primarily be age-related rather than investment-related.⁴

In terms of new real personal income, economic growth in the region for the period 2001-2009 was led by Transportation and Warehousing (increased \$21.9 million); Mining (increased \$20.3 million)⁵; and Retail

³ Population, employment, income (including per capita), and earnings from: U.S. Department of Commerce, 2011. BEA/REIS, Table CA30. All dollar figures are adjusted for inflation to 2010. All of the data reported in this section are available in the appended “Profile of Socioeconomic Measures” for the 6-county area, benchmarked against the average values for all non-metro counties in AZ, CO, ID, MT, NM, NV, UT, and WY.

⁴ Definition of Non-Labor Income: Dividends, interest, and rent (money earned from investments), and transfer payments (includes government retirement and disability insurance benefits, medical payments such as mainly Medicare and Medicaid, income maintenance benefits, unemployment insurance benefits, etc.) make up non-labor income.

⁵ In 2008, 440 of the 623 mining jobs in the region were located in Sevier County; 357 of the Sevier County mining jobs were associated with coal mining. Mining jobs constitute seven percent of total jobs in Sevier County. U.S. Department of Commerce. 2011. Census Bureau, County Business Patterns, Washington, D.C.

Trade (increased \$10.1 million). Personal income from agriculture decreased by \$91.4 million during the period 2001 to 2009, indicating the agriculture is not a source of economic growth in the region.⁶

Amenity-Led Economic Development in Southern Utah and the West

During the prosperous 1990s, the highest rates of population growth across rural America occurred in those counties with amenities such as mild winters, mountainous topography, and water—rivers, streams, and lakes. Endowed with an exceptional volume of such assets, the West was a leading region nationally in amenity migration from 1990 through 2005.

During this period, the rural counties in the West that grew most quickly were those counties with short travel times to airports, fine climates, and the cluster of amenities that one team of researchers calls “New West” characteristics—outstanding recreational opportunities, proximity to public lands, and a significant role for service- and knowledge-based jobs in their economies.⁷

Surveys of business owners have consistently identified quality of life, including environmental amenities such as public land, as a key reason why entrepreneurs chose to locate in rural areas.⁸ Similarly, amenities are well-known to be a key factor in the attraction of retirement wealth.⁹

As a point of contrast to the Fishlake region, amenity- and retirement-led growth in Cedar City and St. George creates very different profiles for nearby Iron and Washington counties (adjacent to the Dixie National Forest). These two counties witnessed a total net population change of 45.9 percent from 2000 to 2009 and an increase in employment of 38.7 percent during the same time period. The rural economy of the greater Fishlake area did not share in the amenity-led migration and corresponding prosperity that developed in much of the Mountain West and in Iron and Washington counties during the 1990s and 2000s.

Access to transportation corridors—for the export of goods and the import of people and their wealth—is a defining element in the contemporary economy of the U.S. West. While major interstate highways and rail lines traverse the west and northern portions of the Fishlake region, the area’s mountainous geography isolates large parts of the region from key transportation routes, including both highways and airports. This may help to explain some of the challenges facing counties and communities within the area.

The absence of strong amenity migration trends has advantages and disadvantages for agriculture. On the one hand, most of the Fishlake area has seen little pressure from rural residential development which can inflate land values and compete with agriculture. The exception is Garfield County and to a lesser extent Wayne County, which attracted some spillover amenity-led growth from the St. George/Cedar City region in the late 1990s and prior to the 2007-2009 recession. The downside for livestock producers and farmers

⁶ In terms of their contribution to total personal income in 2009, these sectors tally as follows: Transportation and Warehousing 10.1%; Mining 5.7%; Retail Trade 8.2%; Farming 5.6%. U.S. Department of Commerce, 2011. Headwaters Economics, from BEA/REIS, Table CA05N.

⁷ Shumway, J. M. and S. Otterson, 2001. Spatial Patterns of Migration and Income Change in the Mountain West: The Dominance of Service-Based, Amenity-Rich Counties. *Professional Geographer* 53(4): 492-502. See also: Rasker, R., et. al. 2009. The Economic Importance of Air Travel in High-Amenity Rural Areas. *Journal of Rural Studies* 25(2009): 343-353

⁸ A longer bibliography of recent research on this subject can be downloaded from the Headwaters Economics web site. http://headwaterseconomics.org/pubs/protected-lands/Protected_Lands_Reading.pdf. Johnson, J. and R. Rasker, 1995. The role of economic and quality of life values in rural business location. *Journal of Rural Studies* 11(4): 405-416, Mathur, V. and S. Stein, 2005. Do amenities matter in attracting knowledge workers for regional economic development? *Papers in Regional Science* 84(2): 251-269.

⁹ Haas, W. and W Serow, 2002. The Baby Boom, Amenity Retirement Migration, and Retirement Communities: Will the Golden Age of Retirement Continue? *Research on Aging* 24(1): 150-164.

generally is that off-farm jobs in the region are limited and typically pay below average wages when compared to other rural areas in the West.

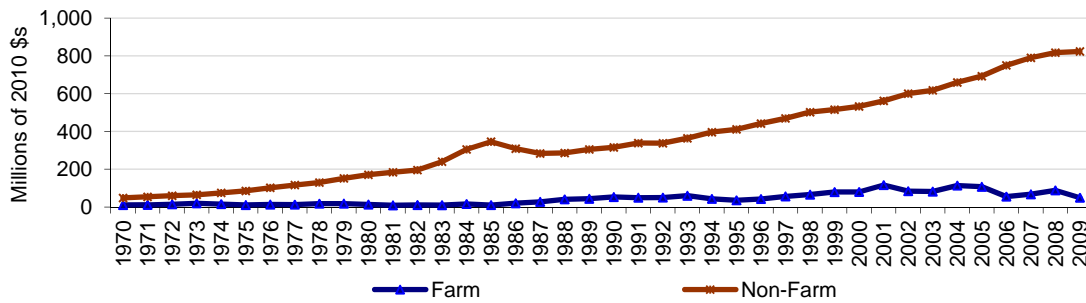
Farm Employment and Income Trends

The six-county economy is concentrated on agriculture relative to other parts of the West and the nation. Compared to the Rural Intermountain West, the area has a farm employment “location quotient” of 1.9; compared to the nation the location quotient is 6.0.¹⁰ This figure, which compares an industry’s share of total employment to the regional share, indicates a relatively high level of economic concentration in agriculture. However, this does not mean that agriculture is necessarily a major contributor to the economy in terms of net earnings. The concentration in agriculture reflects the region’s struggle to integrate with a changing economy rather than a prosperous agriculture sector. Employment and income data described in this section show that agriculture’s share of total employment continues to decline in several of the study counties and is a volatile performer in terms of net earnings.

Employment (jobs) includes wage and salary jobs and proprietors, and includes both full-time and part-time employment.

An example of the declining role of agriculture in the regional economy is the expanding gap between farm and nonfarm earnings, illustrated in Figure 1.

Figure 1. Farm and Nonfarm Earnings, Fishlake Region Counties, 1970–2009



Sources: U.S. Bureau of Economic Analysis. Regional Economic Information System, Tables CA05 & CA05N. These data include self-proprietor income.

From an historical perspective, agriculture has declined in terms of its role in total employment in the Fishlake region, while other sectors have grown or remained stable. While total employment in farming changed relatively little from 1970 to 2000, barely growing from 2,956 jobs to 3,069 jobs,¹¹ it declined from a 24 percent share of total employment to a 12.5 percent share. Jobs in Services increased from 1,109 (estimated) to 5,641 (estimated), moving from a 9.1 percent share in 1970 to a 23 percent share of total employment in 2000. Government employment, including local, state, and federal jobs, has increased from 2,682 jobs to 4,479, but actually declined slightly in terms of its share of total employment, moving from 21.7 percent of all jobs in 1970 to 18.3 percent in 2000.

More recently, for the period 2001-2009, agriculture continued to lose ground, shrinking from 12.7 to 10.5 percent of employment. Jobs in Services continued to increase, growing to 47.4 percent share of all jobs. Government employment declined slightly in terms of share of total employment, moving from 18.3 percent in 2000 to 17.0 percent in 2009.

¹⁰ LQ = (ei/e) divided by (Ei/E), Where: ei = Local employment in industry i; e = Total local employment; Ei = U.S. employment in industry i; E = Total U.S. employment. Data from U.S. Department of Commerce, 2010. BEA/REIS, Table CA25N. Employment in farming includes self-proprietors as well as wage laborers.

¹¹ Employment (jobs) includes wage and salary jobs and proprietors, as well as full-time and part-time employment.

Table 1 reports the most current farm employment data by county available from the U.S. Department of Commerce (2009). Farm proprietor is another term for farm self-employed and can include full-time and part-time operators. Farm employment includes proprietors as well as partners or hired labor.¹² Table 1 indicates that farm employment is a high share of total employment in Beaver, Millard, Piute, and Wayne counties. Sevier County is a regional service hub that may provide jobs for neighboring counties and consequently has fewer farm jobs relative to total employment than other study counties. In Garfield, Piute, Sevier, and Wayne counties, the majority of employment in farming is self-employment. Beaver and Millard counties offer more positions in farm labor, likely due to the presence of corporate hog and dairy farms. Though it has declined from a historical perspective, farm employment’s share of total employment remains high when comparing the region to state and national trends, as discussed above.

Figure 2 estimates the share of total farm operations that have forest service grazing permits. This is based on comparing estimates of unique permittee operations developed in Part 2 of this report (see page 21) to agricultural census data on farm numbers. An estimated 8 percent of all farms in the six-county area surrounding the Fishlake National Forest use forest service grazing permits.

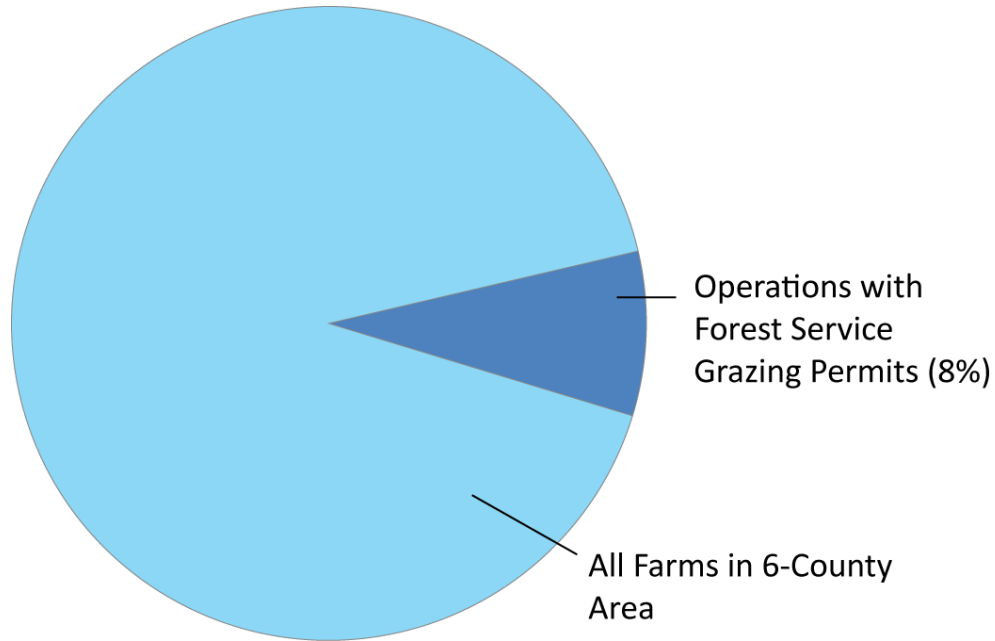
Table 1. Farm Proprietors, Employment, and Total Employment, 2009

County	2009 Farm Proprietors	2009 Farm Employment	Total Employment	Farm Employment Share of Total
Beaver	178	546	3,629	15.9%
Garfield	236	298	3,394	8.8%
Millard	606	970	6,571	14.8%
Piute	93	145	679	21.3%
Sevier	568	681	11,191	6%
Wayne	172	215	1,672	12.8%
Non-metro Interior West				5.6%

Source: Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts. Employment is shown by place of work.

¹² Farm employment is the number of workers engaged in the direct production of agricultural commodities, either livestock or crops; whether as a sole proprietor, partner, or hired laborer. Farm self-employment is defined as the number of non-corporate farm operators, consisting of sole proprietors and partners. A farm is defined as an establishment that produces, or normally would be expected to produce, at least \$1,000 worth of farm products--crops and livestock—in a typical year. Because of the low cutoff point for this definition, the farm self-employment estimates are effectively on a full-time and part-time basis. The estimates are consistent with the job-count basis of the estimates of wage and salary employment because farm proprietors are counted without regard to any other employment. BEA gives equal weight to full-time and part time jobs in its estimates of employment. Wage and salary jobs and proprietors’ jobs are counted, but unpaid family workers and volunteers are not. <http://www.bea.gov/regional/definitions/nextpage.cfm?key=Farm%20proprietors%20employment>.

Figure 2. Operations with Fishlake National Forest Service Grazing Permits as Share of All Farms, Estimated, Six-County Area

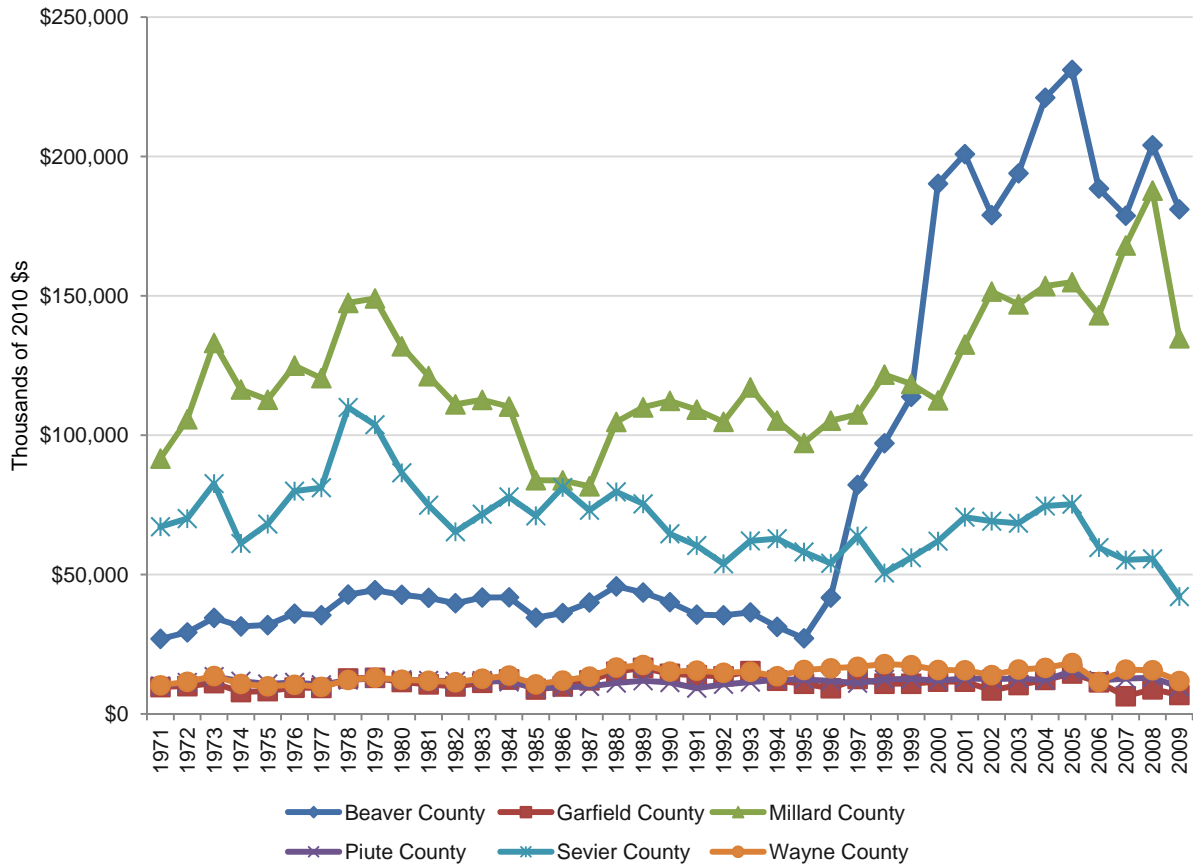


Source: This figure compares USDA Census of Agriculture figures (from 2007) to an estimate of the number of livestock operations using National Forest grazing permits data from 2010. The details involved in creating this estimate are offered on page 21.

Figure 3 shows the size of the various counties' agricultural economies as a function of total cash receipts from agricultural marketings. Beaver and Millard stand apart from other counties in terms of the scale of commercial agriculture in each county. The two counties have accounted for an average of 75 percent of all cash receipts from agriculture in the six-county area for the period 1997 to 2009. In 2009, 23 percent of total agricultural cash receipts were based on crops, the rest on livestock and products. In 2009, crops had the highest relative value in Millard, Sevier, and Garfield counties (40%, 39%, and 27% of 2009 cash receipts) and were least important in Piute, Beaver, and Wayne counties respectively (6%, 7%, and 13% of 2009 cash receipts).¹³

¹³ U.S. Department of Commerce, Bureau of Economic Analysis, 2010. REIS Table CA45.

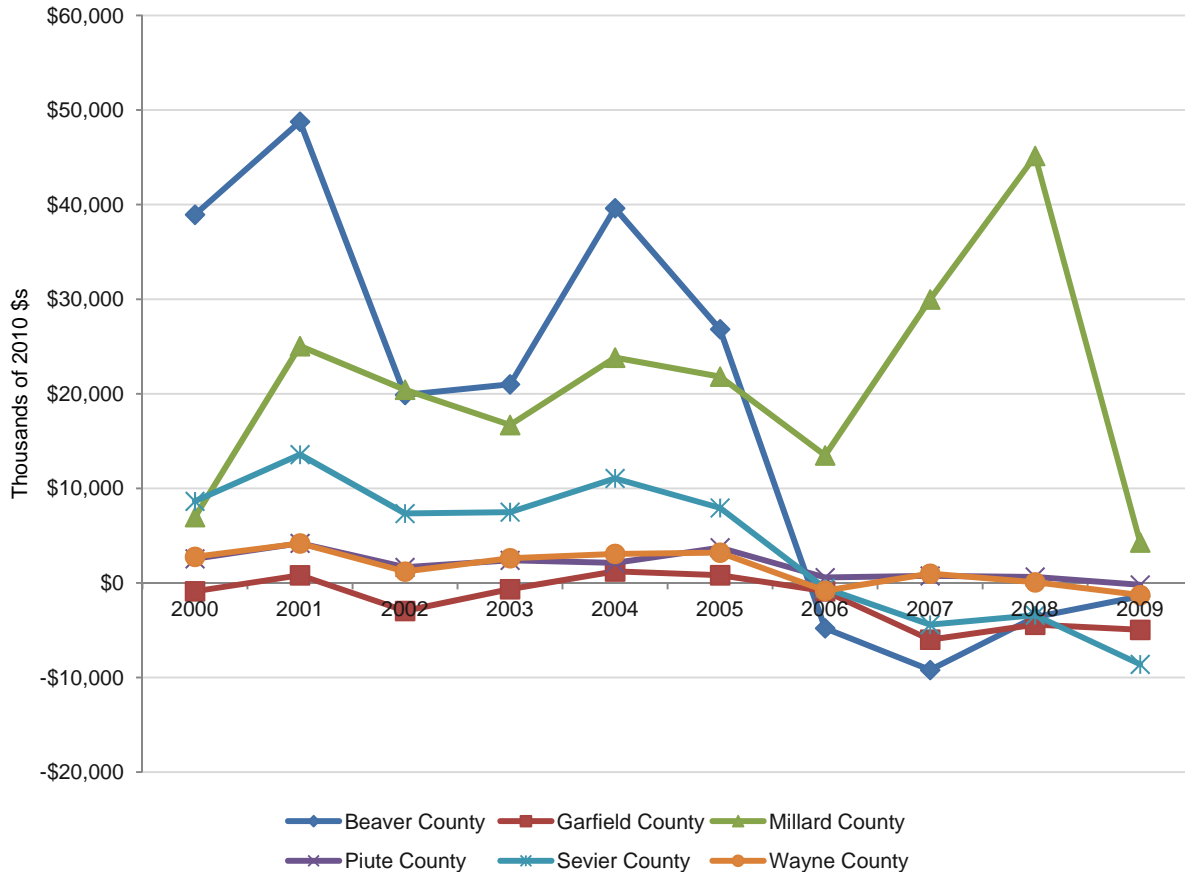
Figure 3. Cash Receipts from Agricultural Marketings by County, 1971–2009



Source: U.S. Bureau of Economic Analysis. Regional Economic Information System, Table CA45. Excludes corporate farm income.

Figure 4 records net farm proprietor income at the county level by year from 2000 to 2009. This chart indicates major volatility in farm income, as well as the frequency with which net farm proprietor income is negative in the region (based on what is reported to the IRS). Net income is calculated as the sum of total cash receipts and other income minus the sum of all production and overhead expenses. Volatility in net income can be driven both by changes in the value of farm products and swings in the price of production inputs such as feed, fertilizer, fuel, labor, and interest on borrowed money.

Figure 4. County-wide Net Farm Proprietor Income, 2000–2009



Source: U.S. Bureau of Economic Analysis. Regional Economic Information System, Table CA45. Excludes corporate farm income.

On average, net farm proprietor income was negative one in three years in the region during the period 2000 to 2009. However, patterns vary widely. Millard County had no net negative years during this period, while Garfield County operators recorded net negative income 7 out of 10 years. Elsewhere, the values for the number of years that net farm proprietor income was negative are as follows: 4 out of 10 years in both Beaver and Sevier counties; 2 out of 10 in Wayne County; and 1 out of 10 in Piute County. Despite the variance from county to county, the overall frequency with which farm income is negative raises a number of questions.

1. How many of the proprietors declaring net negative income are livestock producers?
2. What is net income most sensitive to?
3. What strategies are important in minimizing exposure to volatility?

Livestock Production and Negative Net Income

It is not possible to quantify with any accuracy whether livestock operations play a role in net farm income losses. The best data on net farm income, annual data from the Department of Commerce, do not determine the share of net income claimed by livestock versus other types of farm operations. It is possible that dairy farms or hay farms, which have a strong presence in different parts of the region, contribute to volatility. (In 2007, the region marketed 66 cents of dairy products for every \$1 of livestock products in 2007.¹⁴) However, Garfield County, with small to no presence of large-scale dairying but a relatively strong role for crop-based farm income, has the worst record among the six counties for declaring net losses, so it is hard to draw firm conclusions in the absence of better data.

Factors in Net Farm Income

Farm operations are sensitive to prices received for their products and the cost of production. While prices received are relatively easy to track, production costs vary significantly across types of agriculture and from operation to operation. What follows is a preliminary attempt to explore available data to understand those costs to which livestock producers in the area may be vulnerable.

Published data on the prices of production inputs are available from several data sources that vary in how the data are gathered as well as the frequency with which they are reported.¹⁵ In Table 2 and Figure 5, we report production expenses from the Census of Agriculture for which data are available for 2002 and 2007. In five of the six study counties, feed is reportedly the most expensive production input. The exception is Millard County, where gasoline and energy costs rank the highest as a share of total expenses, reflecting the number of intensive farm operations there. The importance of feed costs to the study counties where livestock production dominates is reinforced by farm finance data from the Utah Technology College's (UTC) Farm/Ranch Management Annual Report for 2009. For the 20 Utah-based cow-calf operators reporting data to the study, feed costs were 39 percent of total production costs.¹⁶ Rent, which includes grazing fees, ranges from 0.5 to 4.5 percent of total production costs. The UTC 2009 data shows that among the 20 operators reporting, average pasture costs were about 6.2 percent of total production expenses.

¹⁴ Inferences about this data are extremely difficult because they are available only in the five-year increments in which the Census of Agriculture is conducted. The spread between dairy and livestock sales values changes from year to year as the two markets track differently. Some states maintain state agricultural statistics surveys with monthly and annual county-level data, but this does not appear to be the case in Utah. Dairy sales vary significantly by county, with Millard selling more dairy products than livestock products in 2007, Garfield having virtually no dairy sales, and the other counties all having between .38 to .48 ratios of dairy product dollars to livestock product dollars in 2007. USDA Census of Agriculture, 2007. Table 11. Cattle and Calves - Inventory and Sales: 2007 and 2002. Net sales for hay crops are not available for comparison.

¹⁵ Department of Commerce data on farm business expenses are largely derived from income tax returns, whereas the Census of Agriculture reports on surveys of farm operators, who may or may not use tax return data to complete information about farm expenses. In addition, Utah Technology College's Farm/Ranch Management program publishes farm financial information based on financial records from a small sample of farms and ranches enrolled in farm business management programs. These records are likely to be the most accurate, however, they are drawn from a small, non-random sample of farms from the entire state of Utah and therefore it is impossible to infer general trends from them.

¹⁶ Olsen, et. al. 2010. 2009 Annual Report: Utah Technology College's Farm/Ranch Management. Richfield, Utah: Snow College Richfield.

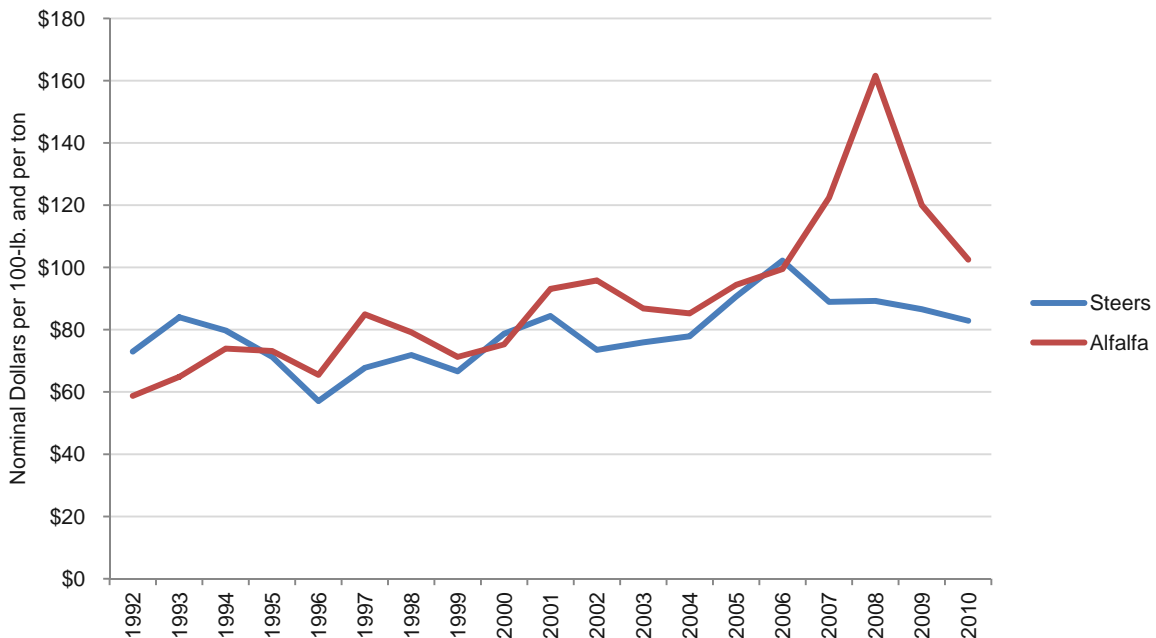
Table 2. Type of Production Expense as Share of Total Production Expenses, 2002 and 2007

	Beaver		Garfield		Millard		Piute		Sevier		Wayne	
	2002	2007	2002	2007	2002	2007	2002	2007	2002	2007	2002	2007
Fertilizer, Chemicals, Seeds	5.8	5.2	0.7		4.7	2.5	6.0	5.0	2.3	2.2	4.4	
Livestock Purchased	9.9	15.5	15.9	27.8	6.5	3.8	4.5	16.0	21.4	8.9	14.8	21.9
Feed Purchased	29.0	23.9	54.2	39.3	9.4	9.7	30.1	25.7	30.0	30.2	28.3	16.6
Gasoline, Utilities, Supplies	16.7	15.1	8.2	10.0	23.2	29.7	16.6	13.1	12.8	17.3	16.3	14.7
Labor: Hired, Contract, Custom	14.0	14.5			16.4	20.2	14.4	14.6	13.0	10.7		
Rent: Buildings, Land, Machinery	3.0	3.0		0.5	2.7	2.5	2.5	1.9	2.1	2.0		4.5
Interest and Property Taxes	6.5	6.8	1.1	2.1	8.2	9.9	7.5	5.9	8.6	8.7	7.6	8.1
Depreciation	9.4	8.7	5.7	6.9	20.6	13.4	10.8	8.3	6.6	12.2	11.4	12.2
All Other Expenses	5.8	7.2	2.7	1.6	8.3	8.2	7.7	9.5	3.3	7.7	7.8	7.1

Source: U.S.D.A. Census of Agriculture, 2002 and 2007. Table 3, Farm Production Expenses.

The spread between cattle prices and alfalfa prices increased dramatically in the late 2000s.

Figure 5. Prices Received for Cattle and Hay, 1992-2007



Source: Cattle Prices are Annual Average Prices per cwt for 800-900 lb. Steers at Chicago Mercantile Exchange, Data accessed via Utah State Extension: source: <http://extension.usu.edu/agribusiness/htm/prices>. Hay prices are Annual Average Prices Paid for Alfalfa Hay per ton in Utah, Based on NASS-USDA data, accessed via University of Wisconsin Department of Agricultural and Applied Economics, Dairy Markets and Graphs, source: http://future.aae.wisc.edu/data/annual_values/by_area/2053?tab=feed.

Net income varies significantly from operator to operator based on a variety of factors, chief of which are marketing options (which products and when they are sold) and exposure to volatility in the price of inputs. As the UTC study shows, operators vary significantly in their capacity to manage direct and indirect expenses. Among the 20 farms reporting data in 2009, net returns ranged from an average of -\$115.60 to \$260.14 per cow while the average price/cwt of cattle marketed ranged only from \$94.18 to \$107.07.¹⁷ Put another way, while prices received vary little among all producers and are obviously beyond the control of operators, the cost of production can vary widely from ranch to ranch and can be influenced by management decisions.

There are two key implications of these observations of income sensitivities of livestock producers in the Fishlake National Forest region.

First, the region exports a resource on which livestock producers are highly dependent: hay. Producers with the least ability to respond to annual variations in forage productivity—those with little farm ground, poor farm ground, junior water rights, or who depend on cash income from selling hay—are those most sensitive to the cost of feed. This *may* explain the greater number of years of net losses in farming in Garfield County relative to the rest of the region. The area is particularly sensitive to drought, yet exports a valuable, water-dependent crop (premium hay). The compatibility of a premium export hay industry and livestock production in this region, particularly under scenarios that predict extreme climate fluctuations and prolonged drought scenarios, merits further attention.¹⁸

Second, assuming that livestock producers are represented among the ranks of those farm operators declaring net annual losses on their tax returns, continuity in the industry clearly depends on ranchers finding ways to absorb losses. Possible mechanisms for absorbing or minimizing lost income are numerous: subsidy of the farm through off-farm income, use of agricultural welfare programs, diversifying farm income sources, and minimizing the costs of production. Part Three of this report considers some of these strategies and implications for managers in the Fishlake National Forest Region.

¹⁷ Olsen et al. 2010. 42.

¹⁸ A 2009 study suggested that one option to improve ranch productivity was to intensify forage production on private ground through improved irrigation among other approaches. While the model found that such investments could be profitable under certain limited scenarios, it did not consider the opportunity cost of using private ground to target other markets, e.g. export hay. Coppock et al. 2009. Intensifying Beef Production on Utah Private Land: Productivity, Profitability, and Risk. *Rangeland Ecology and Management* 62: 253-257.

Part One Summary

- The economy of the Fishlake National Forest region shows slower growth in jobs, population, and personal income than peer areas in the Interior West and has lower than average earnings per job and per capita income.
- At 10 percent of all jobs, agriculture is more important in the Fishlake National Forest region than in peer areas. Rather than indicating a robust agricultural economy, however, this trend speaks more to the region's difficulty in capitalizing on new economic opportunities.
- Dependence on agriculture contributes to the region's economic difficulties due to the sector's volatility: on average, net farm proprietor income in the six counties was negative one out of every three years in the region during the period 2000 to 2009.
- Beaver and Millard counties, with strong concentration in dairying, hog finishing, and crop farming, generate the majority of the region's cash receipts from agriculture (an average of 75% from 1997 to 2009).
- In addition to fluctuations in commodity prices, net farm income in the region is sensitive to the cost of feed.
- The region's increasing focus on exporting premium hay may be increasing economic vulnerability of those public land-dependent livestock operations whose winter feeding resources are marginal.

II. Types of Farm and Ranch Operations

The central goal of this study was to help develop an understanding of the different types of ranch operations in the Fishlake area. This section starts by describing conventional approaches to classifying farm operations, as well as the ways in which public lands ranchers have been described in recent published literature. Part Three adapts this information to the Fishlake National Forest.

Describing Local Farms through the Census of Agriculture

County-level data from the Census of Agriculture are useful to develop a snapshot of the types of farms and farmers at the county level, although they do not distinguish public lands permit holders from other farming operations.

Farm Operator Demographics

Table 3 provides basic demographic information for all farms in each county from the 2007 Census of Agriculture. Five of the counties had relatively high numbers of operators reporting a place of residence other than their farm (“Off-farm operated”)—the number of “not on farm operated farms” in Utah was 29 percent of all farms.¹⁹ Although at most one-third of farm operators were full-time farmers in 2007, the region on average had more full-time farmers than the state—24 percent of Utah’s farmers reported farming as a primary occupation. This figure may reflect a large number of retired operators (retired from wage work, but still running a small farm, some operators may report farming as a primary occupation). In Garfield and Wayne counties, about one in three farm operators was 60 years of age or older in 2007.

Table 3. Farm Operator Characteristics, 2007

	Beaver	Garfield	Millard	Piute	Sevier	Wayne
Total Farms	229	275	703	113	655	201
Not On Farm Operated	54%	42%	36%	24%	39%	38%
Total Operators	376	428	1,070	188	982	341
Percent Male	56%	60%	61%	56%	62%	56%
Percent Full-Time Farmers	32%	29%	31%	36%	23%	32%
Percent 60 or older	20%	34%	29%	25%	26%	32%

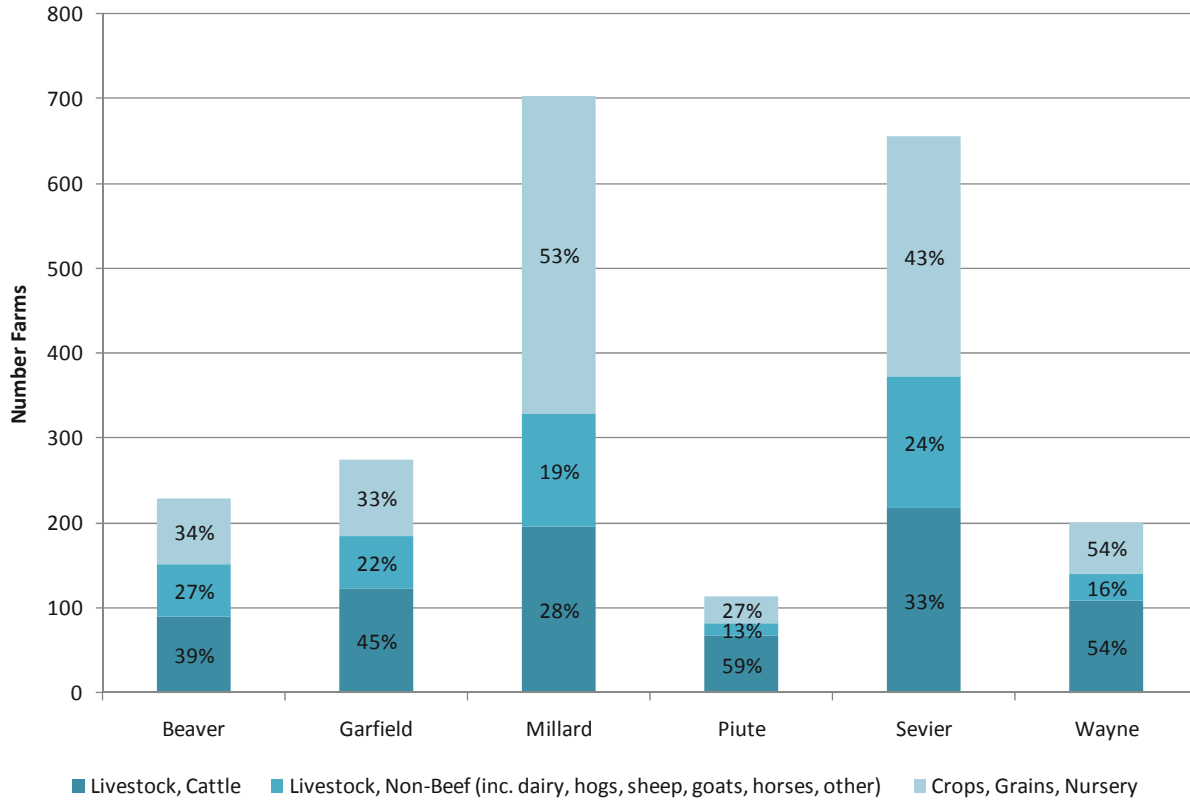
Source: U.S.D.A. Census of Agriculture, 2007. Table 46, Selected Operator Characteristics.

¹⁹ Off-farm operations include a local operator farming a piece of land discrete from the parcel on which his/her home is located. This pattern of land use is not infrequent in some counties, such as in Sevier.

Types of Products and Operations

The majority of farms in Beaver, Garfield, Piute, and Wayne counties are livestock farms, while Millard and Sevier counties have sizable numbers of crop farms. The data shown in Figure 6 are from the 2007 census.

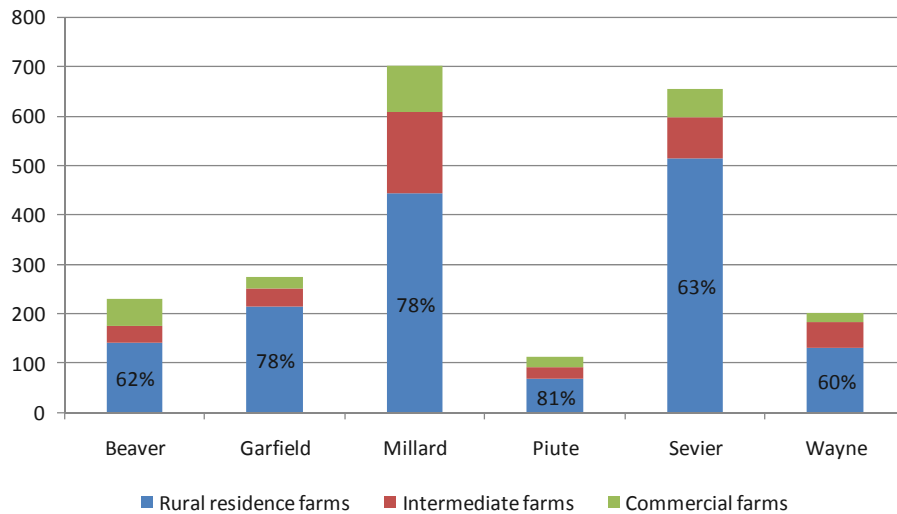
Figure 6. Farms by Primary Product, 2007



Source: USDA Census of Agriculture, 2007. Table 46, Selected Operator Characteristics.

In addition, the majority of farms in the study counties are what the USDA’s Economic Research Service considers “rural residence” farms, distinguished by one or more of the following: low volume of sales coupled with low income, retired operators, and/or an operator with a major occupation other than farming. Figure 7 reports these numbers for the study counties, and the typology is described in full on the following text box.

Figure 7. Farms by Type, Collapsed Typology, 2007



Source: U.S.D.A. Census of Agriculture, 2007. Table 46, Selected Operator Characteristics.

The ERS Farm Classification System

The Economic Research Service (ERS) has developed a farm classification to sort U.S. farms. 2007 was the first year the U.S. Census of Agriculture applied this typology to farm operation data.

Small Family Farms (sales less than \$250,000)

Limited-resource farms. Small farms with sales less than \$100,000 in 2003 and low operator household income in 2003 and 2004. Household income is low if it is less than the poverty level in both 2003 and 2004 or if it is less than half the county median income both years.

Retirement farms. Small farms whose operators report they are retired (excludes limited-resource farms operated by retired farmers).

Residential/lifestyle farms. Small farms whose operators report they had a major occupation other than farming (excludes limited-resource farms with operators reporting a nonfarm major occupation).

Farming occupation/low-sales. Small farms with sales less than \$100,000 whose operators report farming as their major occupation (excludes limited-resource farms whose operators report farming as their major occupation).

Farming occupation/high-sales. Small farms with sales between \$100,000 and \$249,999 whose operators report farming as their major occupation.

Other Family Farms

Large family farms. Farms with sales between \$250,000 and \$499,999.

Very large family farms. Farms with sales of \$500,000 or more.

Nonfamily farms

Nonfamily farms. Farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.

Collapsed Farm Typology

The collapsed farm typology combines the eight farm typology groups into three categories:

Rural residence farms. Includes limited-resource, retirement, and residential lifestyle farms.

Intermediate farms. Includes farming occupation/lower-sales and farming occupation/higher-sales farms.

Commercial farms. Includes large, very large, and nonfamily farms.

Table 4 reports 2007 Census of Agriculture estimates for the number of farms according to the full ERS farm typology for each county. It indicates that within the “rural residence” cohort, retirement and residential farms predominate.

Table 4. Farms by Type Based on USDA-ERS Expanded Typology, 2007

	Beaver	Garfield	Millard	Piute	Sevier	Wayne
Rural Residence Farms						
Limited Resource (Gross sales <\$100,000)	23	42	72	19	104	19
Retirement (Gross sales <\$100,000)	46	78	127	21	121	55
Residential/Lifestyle (Gross sales <\$100,000)	73	95	245	28	290	57
Intermediate						
Farming occupation-lower sales (Gross sales <\$100,000)	19	31	99	21	58	44
Farming occupation-higher sales (Gross sales \$100,000-\$249,999)	14	5	64	4	24	9
Commercial Farms						
Large family farms (Gross sales \$250,000-\$499,999)	21	3	18	9	19	8
Very large family farms (Gross sales \$500,000 or more)	18	1	27	1	10	2
Nonfamily farms (Gross sales >\$250,000)	15	20	51	10	29	7

Source: U.S.D.A. Census of Agriculture, 2007. Table 46, Selected Operator Characteristics. See previous page for explanation of typology.

Existing Classifications of Public Land Grazing Permittees

The best known study of types of public land permit holders is Gentner and Tanaka’s 2002 study, “Classifying Federal Public Land Grazing Permittees,” that reported on a random survey of 2,000 USFS and BLM permittees across the West.²⁰ The survey attempted to identify unique groups of public lands ranchers based on seven criteria: objectives and goals, primary income source, use of hired labor, education, scale of operation, business organization, and debt load and financial stress. Applying clustering algorithms to survey responses, they developed two groups, Hobbyists and Professionals, each with four sub-categories. The full typology is shown on the following page.

Gentner and Tanaka attempted to evaluate the policy implications of their classification by asking each respondent asked how they would respond to changes in management, such as reductions in AUMs, increases in grazing fees, and elimination of each of four seasons of grazing use. Respondents could respond according to five strategies: Continue (unchanged); Reduce (cut back, pass operation on to next generation, reduce herd or sell ranch); Intensify (intensify use of private grazing land); Diversify (seek change in employment, seek other revenue sources from ranch, etc.); and Unknown.

²⁰ Gentner, B.J. and J.A. Tanaka, 2002. Classifying Federal Public Land Grazing Permittees. Journal of Range Management 55: 2-11. The survey achieved a high response rate of 53.5 percent.

Gentner and Tanaka's Typology of Public Lands Ranchers

In a 2002 study published in the *Journal of Range Management*, authors Gentner and Tanaka reported on a survey of 2,000 USFS and BLM permittees. Using statistical methods to seek similarities in responses to survey questions about a number of personal, operational, and economic characteristics, the study suggested two major categories of public lands ranchers with four sub-categories.

Hobbyists

Small hobbyist; 11.1% respondents, low dependence on ranch for income; educated; smallest herd size and deeded acreage; low profit emphasis; low dependence on federal forage

Retired hobbyist; 18% of respondents; more dependent than other hobbyists on ranch for income; possibly these are retired ranchers rather than hobbyists, perhaps scaled back family ranchers

Working hobbyist; 15.4% of respondents; highest dependence on off-ranch income; lifestyle oriented, possible heirs to working ranches

Trophy rancher; 6% of respondents; low profit motivation, high use of hired labor, high use of business organization to reduce risk; educated

Professionals

Diversified family rancher; 13.5% of respondents; smallest herd size of any dependent on ranch income; more diversified by farm income types, e.g. ag commodities, forestry, as well as off ranch jobs

Dependent family rancher; 18.6% (largest cohort) highest dependence on ranch income, rank profit low, strong lifestyle orientation, least educated, most use of sole proprietorships, low degree of financial stress by ranking but highest debt load

Corporate rancher; 13.1% of respondents; dependent on ranch for income, has largest herds and large deeded acreages, hires large labor force, more use of sub chap S and sub chap C corp status, most financially stressed (use of seasonal loans to pay hired labor), larger number of cow-calf yearling operations

Sheep rancher; 4.3 % of respondents, large herds, largest deeded acreage holding; highest dependence on public forage across seasons

Gentner and Tanaka were unable to identify statistically significant patterns distinguishing how different types of ranchers would respond to potential changes in public lands grazing management. The responses were simply too heterogeneous, reinforcing a key assertion of the study: motivations and related approaches to management vary widely across the public lands ranching population. Their analysis of survey responses prompted the authors to emphasize two points: (1) At small levels of increases in federal grazing fees (from \$1.35 to a range from \$2 to \$5/AUM), the majority of ranchers responded that they would absorb the added cost, making no changes to their operations; (2) Ranchers were unlikely to select diversification as a possible response to management changes, and as levels of management changed in intensity, so did the uncertainty in responses for key cohorts, such as retired hobbyists and dependent family ranchers. The greater the degree of proposed change, the less certain respondents were about how they would respond. The authors observe that this may reflect a lack of preparedness for, or knowledge of, livelihoods beyond ranching.²¹ Gentner and Tanaka's study complements other research suggesting that for a majority of public lands ranchers, a profit motive is relatively low priority.²²

²¹ Gentner and Tanaka, 2002: 9-10.

²² Torell, et al. 2001. The Lack of Profit Motive for Ranching: Implications for Policy Analysis. Paper Presented at the Annual Meeting of the Society for Range Management. Kailua-Kona, Hawaii, Feb. 17-23, 2001. Accessed

2008 Utah Governor's Office for Public Land Policy Survey

At the request of the Governor's Office for Public Lands Policy, Utah State University Professor Bruce Godfrey recently oversaw a statewide survey of livestock producers focused on the role of public lands ranching in livestock production in Utah. It was published in 2008. The survey was mailed to every livestock producer in the state and achieved a 30 percent response rate. For the study counties, between one in three and one in five respondents were permittees (versus livestock producers not utilizing public lands grazing.)²³ The study provides several key findings:

- Public lands permittees holders are the dominant beef producers in Utah by volume, while non-permit holders are the most common type of operator.
- The survey found that the average number of cows on public lands vs. non-public lands operations was as follows:²⁴
 - Garfield/Kane/Wayne 114 v. 69;
 - Iron & Washington 108 v. 16;
 - Beaver, Juab, Millard 160 v. 30;
 - Piute/Sanpete/Sevier 145 v. 33.
- The survey found that nearly one-fourth of permittee operators indicated that at least one hired family depended on the ranch for some of their income; the average was 1.2 hired families per operation.
- An average of 1.5 owner families depended on the ranch for some of their income statewide.
- The survey reported that permit operators obtain a majority of ranch income from sale of livestock, but the survey doesn't discuss whether this ranch income is adequate to support a family.

The study explored a number of practical and subjective considerations about public lands management issues.

For example, the study tallies the percentage of grazing permits from each agency (BLM, Forest, SITLA, Other) owned by permittees in each of 12 multi-county regions in the state. The survey responses (non-random and therefore not necessarily representative) show that Piute, Sanpete, and Sevier counties utilized much less BLM land as a share of total federal leases than did other counties in the Fishlake National Forest region.²⁵

Interestingly, the survey also asked permittees to rank the agency lands and seasons of use determined to be most critical to their operation. In the regions containing Beaver, Garfield, Millard, and Washington counties, BLM summer pasture was deemed the most critical. In the region containing Piute and Sevier counties, Forest Service summer pasture was deemed the most important.²⁶ A followup question asked permittees to estimate the share of total public lands forage provided by each agency: BLM was 70 percent or more on the west and south sides of the Fishlake, but in the Piute, Sanpete, Sevier corridor, dropped to about 45 percent, compared to 50 percent for Forest Service.²⁷

online, 5/6/2011: <https://ageconsearch.umn.edu/bitstream/16629/1/cp01to01.pdf>. Rowe, H.I., E.T. Bartlett, and L.E. Swanson, Jr. "Ranching Motivations in Two Colorado Counties." *Journal of Range Management* 53(2001):314-321.

²³ From the Fishlake National Forest region, the survey collected 63 responses from Beaver County (20 permittees, BLM or USFS); 56 responses from Garfield County (24 permittees); 21 responses from Piute County (7 permittees); 109 responses from Sevier County (18 permittees); 58 responses from Wayne County (29 permittees).

²⁴ Results were reported for regions (groups of counties) rather than counties specifically.

²⁵ Godfrey, 2008: 52.

²⁶ Godfrey, 2008: 53.

²⁷ Godfrey, 2008: 56.

In addition, Godfrey's survey asked permittees to report the percentage of permitted AUMs that they actually utilized for a sample year (2006). The average response from respondents was about 70 percent use of permitted AUMs.²⁸

Like Gentner and Tanaka, Godfrey's study sought to understand how permittees might respond to changes in management. Permittees were asked to indicate what percent reduction it would take to have them make various alternative adjustments (go out of business, reduce herd size, seek other sources of forage, subdivide private land, supplement ranch income with off-ranch income, sell the ranch, or lease the ranch to another producer). The report interprets these survey results to suggest that at low levels of change, "most permittees would likely stay in business and get by with private resources," but also states that "If the reduction in AUMs was as much as 50 percent, more than half of the permittees would consider going out of business."²⁹

Part Two Summary

- The majority of all farms in the six-county areas (from 60 to 81% depending on the county) are described as rural residence farms, meaning that they have small sales volumes and are either operated by a retiree or someone working full-time off the property.
- Average herd sizes for the study counties reported in a 2009 study suggest that the majority of livestock producers are operating ranches too small to provide adequate income to support a family.
- Surveys of public lands ranchers from across the West and in Utah suggest that many operators are committed to the ranching lifestyle despite fluctuating profits, and therefore operators have capacity to absorb low levels of changes in public lands pasture availability.

²⁸ Godfrey, 2008: 55.

²⁹ Godfrey, 2008: 57.

III. Fishlake Region Public Lands Ranch Types: Implications for Management

Evidence from Part One suggests that commercial dairying, hog finishing, and crop farming dominate the agricultural economy in the Fishlake National Forest region, while Part Two suggests that in the West generally, and Utah specifically, the majority of public land livestock operations do not provide an adequate income to support a family. Taken together, these trends suggest that changes in the availability of public lands grazing resources would not noticeably affect county-level economic performance indicators. Resource management changes are more likely to alter the economic viability of part-time or hobby enterprises.

What follows is an exercise in framing these issues in terms of quantitative information about types of permittees in the Fishlake-Dixie National Forests region, along with a discussion of ranch management issues based on preliminary interviews.

National Forest Permittees by Estimated Herd Sizes

In the absence of robust survey data, farm income is a widely used measure to categorize farms in specific geographies. Here, we run through an example of using publicly available data from the USFS and BLM to estimate herd sizes and based on that, gross sales. Because of the many assumptions involved, this technique provides only a tentative sketch of the area's public lands grazing economy. It is not a comprehensive solution to the failure of county-level agricultural census data to report specifically on public lands operations. However, as a first step, the sketch provided by such a technique raises some useful questions for discussion when evaluating range management options.

The USDA's Economic Research Service typically uses \$100,000, \$250,000, and \$500,000 in gross sales as break points—with gross sales less than \$100,000 indicating a “small” or “lower sales,” and frequently part-time, farm operation; up to \$250,000 in gross sales qualifying an operation as “intermediate”; and more than \$250,000 in gross sales establishing a “commercial” operation.

Assuming that livestock (e.g. cull cows, calves, yearlings, lambs and wool, etc.) constitute the majority of gross sales on ranches that use public lands grazing permits,³⁰ then income-based cohorts can be established based on estimated herd sizes. To link herd size to gross income, we used a gross production value per mother cow established by taking the average value for the period 2003-2010 reported in the Utah Technology College Livestock Enterprise Analysis dataset.³¹ For sheep operations, this report utilizes per ewe gross income data from the Sheep Enterprise Budget information produced by the USDA Cooperative Extension unit at the University of Utah.³²

³⁰ Godfrey's survey of livestock producers in Utah found that on average statewide, 77 percent of “farm income” on permittee ranch operations came from the sale of livestock.

³¹ The average gross income per cow for the period 2003-2010 is \$533. The range is from a low of \$487 in 2009 to a high of \$573 in 2010.

³² Some assumptions and changes to this enterprise for sheep data were required, for example, this assumes that the ratio of production cost to value remains the same today as when the sheep enterprise budget was last updated (1997).

Using these data—and assuming no other source of ranch income, about 187 mother cows or 713 ewes would be required to achieve more than \$100,000 in gross income, and 469 cows or 1784 ewes would be required to yield more than \$250,000 in gross income. Because 187, 713, 469, and 1784 are such odd integers, we adjusted the values to reflect herd size breaks that track more closely with the ways people in the region discuss ranch size:

- Small:** up to 149 mother cows or 749 ewes
- Intermediate:** 150-449 cows; 750 to 1499 ewes
- Commercial:** >450 cows or >1500 ewes

To put this into context, the Utah Technology College Livestock Enterprise Analysis dataset’s net return data can be used to estimate amounts of net income that might be achieved based on these thresholds. Annual average net returns per cow in the dataset range from a low of -\$130.64 in 2008 to a high of \$169.25 in 2004. The average for the period 2003 to 2010 is \$81.85.

Table 5. Possible Range of Net Returns by Herd Size Using UTC Livestock Enterprise Dataset

Herd Size Cohort	Range of Net Returns, Cattle Operations		
	Worst Year	Average	Best Year
Per Cow	-\$130.64	\$81.85	\$169.25
150 cows	-\$19,596.00	\$12,277.50	\$25,387.50
450 cows	-\$58,788.00	\$36,832.50	\$76,162.50

Source: Olsen, 2003-2010. The sample size ranges from 14 to 28 per year and participating ranches are from all over Utah. These data are offered only to reinforce the likelihood that net returns vary by operator and his/her control over production costs.

Permit Data Preparation and Consolidation

Range specialist staff provided us with permit records for the Dixie and Fishlake National Forests. In order to better understand the quantity and quality of local use of public grazing resources, we made a concerted effort to link Forest Service permit records with BLM permit records. BLM permit information is available online; however, it is not complete for every field office. We were able to obtain complete permit records for the following field offices in Southern Utah: Cedar City, Fillmore, Grand Staircase/Escalante, Kanab, Richfield, and St. George. Considering BLM and Forest Service permit information together can help eliminate some underestimating of herd size by providing another data point about ranch operations and can also help create a picture of the ways in which operations balance public and private resources in their grazing operations.

The usefulness of the BLM data in Southern Utah is limited.³³ We were not able to include records for the Monticello or Price BLM Field Offices. Nor did we include any BLM data for out-of-state regions, such as the Arizona strip, that may be used by some Southern Utah livestock operations. This analysis excludes other sources of public grazing such as state lands. We also suspect that BLM permit records are updated with less frequency than the Forest Service records—specifically, there were a number of permittees whose BLM permits indicated they held sheep grazing permits, but who held cattle permits on the National Forest.

Our goal was to create as accurate a tally as possible of unique livestock operations within the limits of available data. For this reason, we went through several processes to eliminate duplicate and extraneous records from the Forest Service permit database. This included grouping unique individuals that appeared to be associated with a single ranch operation. We merged information based on mailing addresses—this

³³ We used information available through the BLM’s online tool. Some of these data availability issues could possibly be resolved through a specific data request to the agency.

reduced the list of Forest Service permits from 366 to 336. We then read the permit records to identify possible duplicates not indicated by mailing address—for example, shared surnames sharing an allotment, or instances where a ranch name was used in one place and a proper name in another, but other information suggested the same operation. In these instances, we searched the Utah Brand Book. If operators shared a brand, they were assumed to be a single operation. We also eliminated horse-only permits (which typically numbered fewer than five permitted head) and a couple of in-holding related permits (also typically numbering fewer than five head and often involving a week or less of time on the National Forest). These efforts further reduced the number of distinct livestock operations to a total of 290 for the region: 176 on the Fishlake National Forest and 115 on the Dixie National Forest.³⁴ Considering only the Fishlake permits relative to the six-county area profiled in Part One, forest permittees constitute an estimated 8 percent of all farms.³⁵

Herd Sizes Estimates

Summary information about estimated herd sizes use of Forest Service and BLM grazing resources is provided in Table 6 and Table 7.

Table 6. Cohorts of National Forest Grazing Permit Holders by Estimated Herd Sizes, Dixie and Fishlake National Forests (2010 data)

Operation Type	Cattle	Sheep
Commercial (450 or more cows; 1500 or more ewes)	12	2
Intermediate (150 to 449 cows; 750 to 1499 ewes)	92	4
Small	157	6

*Excludes horse permits and 17 operations that could not be typed because their permits included both sheep and cattle.

Source: Headwaters Economics from Dixie and Fishlake National Forest permit records, courtesy USFS, and BLM permit records, via Rangeland Administration System Public Reporting Application.

Table 7. USFS and BLM Grazing Permit Combinations, National Forest Permit Holders, Dixie and Fishlake National Forests (2010 data)

Permit Combination*	Cattle	Sheep
Summer Forest Service Only	163	2
Summer Forest Service and Summer BLM	54	
Summer Forest Service and Winter BLM	43	11

*Excludes horse permits and 17 operations that could not be typed because their permits included both sheep and cattle. Any of these three permit combination groups could include fall or spring BLM permits.

Source: Headwaters Economics from Dixie and Fishlake National Forest permit records, courtesy USFS, and BLM permit records, via Rangeland Administration System Public Reporting Application.

With the caveats about the limits of this technique in mind, these data suggest the following hypotheses about grazing permittees on the Dixie and Fishlake National Forests:

- 54 percent of permittees on the Dixie and Fishlake National Forests have small cattle operations with herd sizes smaller than 150 mother cows. Half of these permittees have 50 or fewer permitted head. This suggests that averaged across the years 2003-2010, about half of the

³⁴ In instances in which an operation had permits on both the Fishlake and the Dixie National Forests, we assigned the operation to the forest where it had the most permitted AUMs.

³⁵ There were 2186 farm operations in the six counties according to the 2007 Census of Agriculture.

operations grazing on the National Forest yielded net ranch income of about \$12,000 or less. Half of these would have earned less than \$4,000 in net income, based on estimates using the Utah Technology College dataset.

- 32 percent of permittees are intermediate-sized cattle operations (150 to 449 cows). Estimates of average net income from the ranch operation for the period 2003-2010 on these operations could range from just under \$13,000 to about \$36,000, based on estimates using the Utah Technology College dataset.
- 15 percent of permittees can be considered commercial operations, with net income in excess of \$36,750, as an average for the period 2003-2010 based on estimates using the Utah Technology College dataset.
- As a point of comparison, the average earnings per job for the non-metro interior west in 2008 was \$37,789 (see page). Put another way, in order to earn in an average year as much as one average job in the broader economy, a ranch would need 450 mother cows. Based on these estimates 85 percent of the public lands operations utilizing permits on the Fishlake and Dixie national forests bring in less net income than did the average job in the rural West in 2008.
- Based on data from the Cedar City, Fillmore, Grand Staircase/Escalante, Kanab, Richfield, and St. George BLM Field Offices, 19 percent of Dixie-Fishlake grazing permittees also hold BLM winter grazing permits. This suggests that about 81 percent of Dixie-Fishlake grazing permittees depend on winter forage located on private, state, and possibly other federal lands. (This number may be much smaller, depending on the use of BLM winter grazing from the Price and Monticello Field Offices and on the Arizona Strip.)
- About four percent of all permittees are sheep operations; the National Forest region supports two commercial sized sheep operations, four intermediate operations, and six small operations, based on herd size estimates using permitted head.

At the county level (county data are shown in Table 8, next page):

- Expressed in terms of the ratio of unique operations to all cattle and sheep operators recorded by the Census of Agriculture, Dixie-Fishlake permittees are most numerous (as a share of livestock operations) in Wayne County (38%), followed by Garfield County (28%), Piute and Sevier Counties (24%), Iron County (20%), Beaver County (19%), Washington County (12%), and Kane County (7%).
- Counties with large amounts of crop land (Millard, Sevier) have a greater share of Dixie National Forest and Fishlake National Forest permittees using only Forest Service summer pasture. These operators may focus on leased cattle (not overwintered) or may take advantage of opportunities to graze on crop aftermath.
- BLM winter forage (for the Utah BLM Field Offices providing data—e.g., excluding Monticello and Price) appears to be most important to National Forest permittees in Garfield, Washington, and Wayne counties.
- In all but two counties, the median permitted herd size was 150 or smaller, meaning that the trend toward about half of all permittees falling into the “small” herd size cohort is well-distributed throughout the region.

Table 8. County Level Permit Information

	Beaver	Emery	Garfield	Iron	Juab	Kane	Millard	Other *	Piute	Sanpete	Sevier	Wash'tn	Wayne
No. of Permittee Operations	17	6	36	32	3	6	35	8	17	3	54	29	43
Cattle	17	6	35	21	3	6	35	8	13	2	51	29	34
Sheep				7					1		1		3
Mixed			1	4					3	1	2		6
USDA Census Farm Numbers, 2007													
No. Farms	229		275	487	335	145	703	n/a	113	879	655	593	201
No. Cattle Operations	87		118	127	102	76	189		64	205	205	225	107
No. Sheep Operations	4		10	35	9	7	22		7	26	26	9	7
Primary Permits													
Fishlake National Forest	15	6	34		3		35	4	13	3	50	27	40
Dixie National Forest	1		3	32		6		4	4		4	2	3
Permit Herd Size, Cattle Operations													
Min.-Max. Permit Size	5-1200	23-559	18-700	5-248	94-300	45-451	4-2500	24-125	24-865	50-1000	1-2485	1-450	35-800
Mean (Average) Herd	202.5	187.3333	127	69	153	191	409	69	358	50	182	103	137
Median Herd	115	87.5	74	50	94	130	150	82	275	525	64	66	81
No. of Operation Type (Permitted Herd Size)													
Commercial (450 or more cows)	1	1	3			1	1		1		2	1	
Commercial (1500 or more ewes)				1							1		2
Intermediate (150 to 449 cows)	5	1	4	2	1	2	6		5	1	40	5	21
Intermediate (750 to 1499 ewes)				2									1
Small (Fewer than 150 cows)	11	4	29	19	2	3	28	8	7	1	9	23	13
Small (Fewer than 750 ewes)				4									
Permit Types													
Summer FS only, cattle	8	6	18	17	2	4	24	6	6	1	43	14	14
Summer FS only, sheep				1									1
Summer FS & BLM, cattle	4		3	2		2	2		1	1	1		
Summer FS & BLM, sheep													
Summer FS &/or BLM, with BLM winter, cattle	5		15	2	1		9	2	6		7	15	20
Summer FS &/or BLM, with BLM winter, sheep											1		2

*Includes Salt Lake County (3), Utah County (3), and two unknown addresses.
Source: Fishlake National Forest data and Headwaters Economics.

Interview Summary: Ranch Types, Their Economics, and Implications for Management

The following observations are based on limited field interviews in the Fishlake region in January 2011. The author visited 9 ranches and met with 9 agricultural and resource management professionals representing various agencies, namely the Forest Service, NRCS, Utah State-USDA Extension, Utah Association of Conservation Districts, and U.S. Farm Services Agency. Interviews focused on production strategies, ranch economics, and secondarily on the use of Forest Service grazing permits and perceived barriers to and opportunities for improved management.

The nine ranch interviews involved the following types of ranches: 5 small ranches, 1 intermediate ranch, and 3 commercial ranches. Ranch interviews were suggested by cooperative extension agents who were asked to recommend a variety of ranch operations. The sample is skewed toward full-time ranch operations based on the recommended cohort and due to difficulties in scheduling interviews with retiree part-time operators. Ranch locations included the communities of Beaver, Meadow, Milford, Loa/Fremont, Circleville, and Panguitch. Interviews lasted between 45 and 90 minutes.

The following observations are based on this very limited, non-random sample of the regional public lands ranching and agricultural professional community. What follows is a series of notes on different operation types, and brief notes on assorted issues of note, namely regional factors influencing an operation's economic competitiveness, the prevalence of allotments involving multiple permittees, and rates of turnover in Forest Service grazing permits.

Small (Part-Time) Ranches

Many of the area's small livestock operations with fewer than 150 mother cows are part-time operations. Some, particularly the very small, are operated by retirees, while others are operated by younger ranchers who would prefer to be full-time ranchers, but have to work full-time off the ranch. Many are constrained at a herd size of 100-125, which anecdotes suggested represents the largest number of cattle that a single operator who works off that farm can manage on his or her own, particularly with regards to putting up hay and feeding in winter. To make the ranch operate, part-timers work double shifts in the summer, irrigating and putting up hay after regular work hours, and utilize family and other discounted labor for chores like branding and moving cattle.

Public land permits are critical to the viability of this business model—while many interviewees noted that public land pasture demands more in terms of expected labor, its cost is far less than that of private land: “buying a permit pencils out better than buying land,” in the words of one area agricultural professional.³⁶ Indeed, the Farm Services Agency often provides start-up and/or expansion financing in the form of loans to acquire livestock as well as financing for the acquisition of a permit. Such loans vary in term from seven to 20 years, and may be (and often are, reportedly) renewed. Livestock are frequently used as collateral for loans to buy permits, potentially setting up conflicting objectives between two arms of the Department of Agriculture: USFS and FSA. However public lands grazing permits in the area rarely change hands (see below). BLM winter range permits are particularly desirable according to several interviewees as they minimize the amount of hay needed to feed in winter.

³⁶ The actual costs may not be so disparate—when lost animals, maintenance, and labor are factored in. However, the simple fact is that the actual cash cost is very different. For ranch operations working with extremely limited cash margins, the ability to acquire permits with little direct cash outlay is a major cost-savings. A recently published comparison of public and private grazing costs that integrates total operating costs found that: “Total Public Land 2010 Cost was estimated to be \$33.24/AUM. Comparable private land cost was estimated to be \$32.04/AUM. So the fee that would equalize total costs of grazing in 2010 would be a payment to public land ranchers of \$1.20/AUM. In others words in 2010, public land grazers are paying \$1.20/AUM more than those leasing private land. If current NASS lease rates for the 3 study states are used a payment of \$0.20/AUM would be warranted, not unlike the \$0.13/AUM difference found in 1992 (Torell et al. 1994).” Rimbey, N. and L.A. Torrell, 2011. “Grazing Costs: What’s the Current Situation?” Agricultural Economics Extension Series No. 2011-02, March 22, 2011. Accessed online 5/6/2011. <http://www.cals.uidaho.edu/aers/PDF/AEES/2011/GrazingCost2011.pdf>.

One key difference between part-time family ranchers and other larger operations may be in their capacity to feed calves after they come off public lands. Interviews with family ranchers suggest that virtually all intermediate- and commercial-size, full-time producers have for many years targeted a series of sales dates between December and March with larger 800-850 lb. animals. This is accomplished by backgrounding on farmland, using private pasture in shoulder season, utilizing local feedlots—all of which may be beyond the scope of small, part-time operations. Smaller operations are more likely to be forced to sell at the time of gathering, which limits their feeding costs but also reduces their window of marketing opportunity.

Capacity of part-time family ranchers as individuals is highly limited—this includes both cash flow and time. At 150 head herd sizes, permittees are operating on very narrow margins—possibly seeing as little as several thousand dollars in net return in an average year—and the continuity of the operation from year to year depends on minimizing production costs as much as possible. As one extension agent put it, “Most guys do the bare minimum” in terms of investing time and money in the public lands allotment. Given the demands of summer-time farming, it is very clear that part-time operators have limited time to spend attending to issues on NF allotments. Some solve this through neglect, others through cooperation in grazing associations that allow them to schedule their time around other work demands, or by substituting family labor—a retired father or brother available on weekends—for their own. The reliability of these scenarios varies by operation.

These operators have limited cash flow and correspondingly, very little flexibility when it comes to implementing new breeding or other herd management strategies, such as converting part of their herd to yearlings to exploit shifting market conditions.

Interview questions included asking how part-time family ranchers respond to shortages in public land forage, such as delayed dates of spring turn-out or early round-up dates. For any operator, this means increasing his/her own forage production either by buying hay, grazing available non-FS forage more heavily, or reducing herd numbers in order to spread available forage more widely. Interviews indicated that any number of combinations of these scenarios is possible depending on the operator’s circumstances, the cost of feed, the cost of cattle (replacements) and other factors like winter conditions/herd health going into a shortage. Selling cattle is considered a last resort because replacement cattle prices are currently high relative to slaughter prices. Perhaps one rule of thumb for part-time family ranches is that they may have capacity to absorb forage shortages for one season, but have little margin to manage consecutive losses. Several interviewees noted a spate of herd liquidations in Garfield and Wayne counties in response to ongoing drought in 2001-2004, indicating the brittle circumstances of many area ranches.

Intermediate Family Ranches

Intermediate ranches have moved past the 125-150 head bottleneck frustrating small, part-time ranches—often because of fortunate family legacies. For example when one son is able to go into full partnership with a father, versus the ranch being divided among multiple children, the finances can be more favorable to the son than to his peers. An intermediate-sized operation may similarly benefit from wise financial management on the part of his parents that enable them to transition farm assets to him at low cost. Perhaps most importantly, there is some indication that the viability of small family ranches hinges on access to quality farming resources and or other winter feed availability (such as desert BLM permits). An example might be operating a small local feedlot, using custom feeding fees to offset winter feed costs of the ranch’s herd.

Interviews indicated intermediate-sized operations are relatively rare in the Fishlake region—most are smaller and a few are much bigger.

Commercial Family Ranches

Commercial family ranches are a minority of operations in the Fishlake Region, but with large herds and the capacity to support two families and hired help, these operations represent an ideal for many aspiring, smaller operators. The two commercial-scale family operations visited with were both managed by men in their 70s, indicating the importance of longevity in developing a successful ranch. (As one operator put it, “it takes a lifetime to acquire a profitable herd.”) Both of the large family ranches visited have sizable farming operations that include some custom work (custom work can offset the high cost of farm machinery). One operation utilizes a large BLM winter permit, the other backgrounds calves through December on private farmland.

Commercial-scale family ranches are in a better position than smaller operations to hire labor to assist with tasks such as daily riding on forest permits. These operations often depend on a consolidated group of permits built up within the family over several generations and as such may be more likely to have control over an entire allotment or share it with few others.

Despite their command over significant assets, as Gentner and Tanaka observed, commercial family ranches (Dependent Family Ranches in their typology) often have high debt loads. Cattle may be their only source of liquidity and this group’s herd size may fluctuate with time in response to shifting market conditions. A very cursory scan of federal payments from the Livestock Subsidies program indicates that this group may be a key user of subsidy payments, such as the Emergency Livestock Feed Assistance program.³⁷

Corporate/Trophy Ranches

Interviews pointed to three large, absentee-owned ranches—there are possibly a handful of others. Two are likely familiar to many readers—the Flying V, and White Sage Ranch/Missouri Flats. The ranches have been owned by two different prominent businessmen and their families, one from Salt Lake City, the other from Santa Barbara. The Missouri Flats holdings are in the process of being transferred to the LDS Church (according to the manager). The third, Sandy Ranch, receives less attention but is owned by an Oklahoma-based energy company, Tercero Corporation, and is located near Torrey. It is reportedly on the market.

There is no question that the owners of these operations have the financial resources to comply with existing management requirements for federal grazing permits. Whether hired managers are empowered with the time, resources, knowledge, and instruction to do so appears to vary considerably among the operations.

Economic Advantages and Disadvantages Specific to the Region

Whatever their classification, few operations among all Fishlake National Forest permittees have an ideal set-up—all but a few absentee-owned corporate ranches compensate for one or another less than ideal circumstances. One goal of the interviews was to identify the factors that contribute to ranch viability in the context of limited resources, including an operation’s capacity to respond to ecological and economic variability. It may be helpful to consider the region in terms of those assets that enhance ranch performance in comparison to the strategies deployed to compensate for the absence of such assets. The following list reports observations from interviews about aspects of the regional livestock ranching system that work to the advantage of the cost position of ranchers who utilize summer permits to graze on the Fishlake National Forest:

³⁷ In terms of federal payments, \$6.2 million was awarded through the Emergency Feed Assistance Program in the 6 county area between 1995-2009. A majority of the top 20 recipients in each county in the Livestock Subsidies categories are also public lands permittees. Environmental Working Group, Farm Subsidy Database. <http://farm.ewg.org/>.

- Quality farm ground—seen by many as a limiting factor on ranch size. May depend on water rights
- Desert winter range—less reliable than private ground, more labor intensive (involves hauling water), but competitive cost-wise. Opportunity is best when coupled with high quality shoulder forage (breeding success is poor on desert, bred cows need 30 days or more of high quality feed before and after desert grazing, according to one manager)
- Quality summer grazing—appears to be highly subjective (everyone says theirs is the best FS allotment in the region), although one large rancher did mention that certain higher elevation permits in his portfolio were costly to use (20% death rate, high brisket problems)
- Multiple opportunities to target markets (e.g. selling calves several times during the year), which depends on a diverse portfolio of forage options (low elevation winter range), ample time to participate in herd management, and access to operating funds
- Flexibility to shift stock type (for example, mixing a combination of yearling finishing with conventional cow-calf), depends on access to operating funds via credit or positive cash flow

The following list reports observations from interviews about ways in which livestock producers may minimize their input costs or otherwise compensate in the absence of the above-listed assets.

- High use of federal and state tax relief to offset farm losses
- Livestock assistance payments and other subsidies for forage shortages
- Pooling labor, esp. through grazing associations (see below)
- Supplementing or subsidizing ranch income with full-time work elsewhere
- Dependence on full-time employment with benefits for spouse
- Minimizing capital costs: no new machinery, fences, breeding stock, etc.
- Minimize labor input in herd management (e.g. season-long breeding)
- Maximizing value of family-based advantages: unpaid labor, generous loan/buy-out terms, partnerships, conference of grazing permits via family
- Maximizing use of public land
- Minimal trucking (avoids fuel costs)

Multi-Permittee Allotments & Grazing Associations

One general note is that the operations most likely to be involved in multiple-permittee allotments are those within the various small ranch cohorts. There is widespread consensus that these arrangements can contribute to problems in resource management, absent a high-functioning, well-resourced grazing association.

Table 9 below records the percent of total AUMs allocated to different allotment management scenarios—single operator, multiple operators up to five, or five or more operators. This table suggests that the majority of allotments in each district are utilized by multiple parties, and that in the Loa and Richfield districts, a majority of permitted livestock graze on allotments used by 5 or more permittees.

Table 9. AUMs in District According to Number of Permittees per Allotment (2010 data)

Ranger District	Permittees		
	1	2-4	5 or more
Beaver	20%	49%	27%
Fillmore	14%	47%	41%
Loa	29%	0%	71%
Richfield	23%	22%	55%
Teasdale	<1	83%	17%

Source: Headwaters Economics from January 2011 Fishlake National Forest Permit Data.

Grazing associations have a long history in the Fishlake Region. Their current status merits a more detailed inquiry than was possible in this interview effort. Superficially, preliminary interviews suggest that grazing associations vary significantly in their motivation to impose management actions—for example, some associations respond to fence repair needs by hiring a laborer to complete the work and assessing all members a shared portion of the cost, while others allow association members to take charge of repairing fences on an as-needed basis. Some associations hire a full-time rider to assist association members who serve riding needs on a rotational basis, others rely only on members for riding services. In the few interviews with participants in grazing associations, reported annual assessment rates for salt, outside labor and riding services, and other costs ranged from \$2 in one association to \$17.13 per cow in another. (The higher figure included water line materials and shared vaccination costs.)

While many observers from within and outside grazing associations express frustration with the difficulty of managing a group of small-scale operators, many with limited resources, to achieve management objectives, this institution may be serving an important role in minimizing costs. As Jay Olsen, Snow College Farm and Ranch Finance Instructor, points out: high production costs are best met by amortization across the largest number of production units.³⁸ It may be that with some production costs, grazing associations provide the scale necessary to reduce individual costs. This is purely speculative, but worth considering in discussions of the role of grazing associations.

³⁸ Olsen, J. Personal Communication, 1/17/11.

Part Three Summary

Operation Size

- Herd size estimates and interviews lend credence to the hypothesis that changes in the availability and or conditions for use of public lands grazing resources would not noticeably affect county-level economic performance indicators in the Fishlake region. Resource management changes are more likely to alter the economic viability of part-time or hobby enterprises—more than half of all permits according to herd size estimates.
- Based on herd size estimates, 54 percent of permittees on the Dixie and Fishlake National Forests have small cattle operations with herd sizes smaller than 150 mother cows. Half of these permittees have 50 or fewer permitted head. This suggests that averaged across the years 2003-2010, about half of the operations grazing on the National Forest yielded net ranch income of about \$12,000 or less. Half of these would have earned less than \$4,000 in net income, based on estimates using the Utah Technology College dataset.
- In all but two counties, the median permitted herd size was 150 or smaller, meaning that the trend toward about half of all permittees falling into the “small” herd size cohort is well-distributed throughout the Fishlake-Dixie region.

Existing Economic Strategies and Capacity for Adapting to Management Change

- For a majority of permittees, the region offers challenging conditions for ranch profitability. Strategies for coping with economic marginality fall into two categories:
 - Strategies that minimize the costs of production by avoiding investments of capital and time in non-essential operational activities, despite potential benefits to production of such investments
 - Subsidizing the operation through off-ranch sources of income and in some cases, through direct support payments from the federal government
- Interviews indicate limited capacity on the part of small operations to assume additional management or financial responsibility for federal grazing permits. This raises questions about the viability of recent strategies to address range and riparian condition concerns, strategies that tend to involve added costs in terms of maintenance, riding, and infrastructure.
- Small, part-time operations may have capacity to absorb forage shortages for one season, but have little margin to manage consecutive losses. Permanent changes in seasons of use or consecutive drought-related forage losses have the potential to cull some marginal, small ranches from the region’s cohort of ranch operations.

Conclusions

A basic observation in this report is that a relatively high level of specialization in agriculture in the Fishlake Region is less indicative of prosperity in agriculture than it is of the absence of the kinds of opportunities that have been fundamental to rural growth in recent years. In the rural West, areas that have prospered in the past two decades are those that have unique opportunities for energy-related development and those with amenities necessary to capture knowledge-based businesses—such as access to air transportation, an educated workforce, and quality of life.

The agricultural economy of the region is volatile. Farm operations in the Fishlake National Forest region generally show uneven economic performance, with net farm proprietor income being negative an average of one in three years during the period 2000 to 2009. It is difficult to pinpoint key elements in farm production costs that have caused operations to lose money and to evaluate the strength of the contribution that cattle production plays in net negative income versus other types of farming in the area.

The degree of integration of public lands-dependent livestock production and those agricultural activities that are more economically significant (by volume of sales) likely varies by county. This study offers an estimate that the number of unique ranch operations utilizing national forest permits is 290 for the entire Dixie-Fishlake region. In the six-county region adjacent to the Fishlake National Forest, 8 percent of all farms are estimated to hold grazing permits for the Fishlake National Forest.

Applying an adapted version of existing farm typologies to data on herd size based on grazing permits on the Dixie and Fishlake National Forests, this report finds that a majority of permittees are highly marginal and have little capacity to absorb sudden increases in production costs. Continuity for these marginal operations hinges on family strategies with regards to use of time, land disposition, and asset management that prioritize ranch continuity. It also depends on individuals absorbing or minimizing non-cash production costs—such as foregoing capital expenditures and depending on unpaid labor. Some of these strategies appear to be at odds with the expected contributions of National Forest grazing permittees to the operation of grazing allotments.

Policy implications of this study include the following:

1. Restoration strategies that depend on significant investments of capital or time on the part of permittees are unlikely to succeed in the long-term in Southern Utah due to limited capacity on the part of most permittees.
2. Forest permittees are a small proportion of the larger farm population and their influence on the broader agricultural economy is not measurable in county-level performance metrics.
3. Subsidizing the time and capital investments of permittees should be understood as a subsidy that may directly benefit less than 10 percent of the region's farms. Careful quantification of the public benefits of such narrowly targeted investments would help build a case for these investments, especially in terms of opportunity cost (how else might these subsidies be directed?).

This report was conducted as a preliminary effort to sketch out possible approaches to and issues in conversations about the long-term sustainability of grazing on Southern Utah's National Forests. One outcome of this effort is to point out the many ways in which the area's livestock economy is not well understood. Appendix B contains suggests research approaches that could be useful in informing future discussions about economic sustainability of public lands ranching.

Appendix A: Permit Turnover on Fishlake National Forest 2000-2010

Ranch ownership change, sometimes with significant implications for public lands management, has been documented in many parts of the Interior West in the 1990s and 2000s.³⁹ However, Godfrey's 2008 study of Utah livestock producers identified a high level of determination on the part of survey respondents to continue in ranching and to pass their ranch on to heirs—the scores were especially high in Southern Utah.

One method to assess continuity in ranch operations is to evaluate the rate and volume of turnover in public lands grazing permits. The number and nature of permit exchanges says a great deal about recent trends in continuity. As a preliminary exercise, we requested permit information from the Fishlake National Forest and evaluated trends in permit turnover—renewal versus suspension and reassignment—in the past decade.⁴⁰ The results of this exercise are offered in the appendix because they are very preliminary.

Of the 197 active permits with previous permit information, 163 have been renewed by the same permittee in the last 10 years. 4 permits have changed hands within families (based on matching surnames). 30 appear to have changed hands, based on a difference in the permittee name. This suggests a 5 percent turnover rate in permits.

Of the permits that changed hands, all but one were cattle permits. There were 3 transactions on the Beaver, 5 on the Fillmore, 11 on the Loa, 9 on Richfield, 2 on Teasdale. The Loa transfers involved the transfer of a single permit on a single allotment held by a sole permittee to 6 distinct permittees. This may be the only evidence of small herd owners acquiring a new permit in the past 10 years. It is the only case in the database of a single permit being divided up among multiple new permittees.

It is difficult to evaluate the significance of this rate in the absence of benchmarks for comparison. Permit turnover rates for other National Forests in the state or region would be a helpful point of reference.

³⁹ Gosnell et al. 2005. Gosnell et al. 2007.

⁴⁰ For the Fishlake, we gathered all active permits and consolidated them from 272 records to 210 unique Permit ID numbers. In 62 cases, permit numbers cover multiple allotments, but the permittee is the same. There were 13 records with no data in the "Supercedes column" meaning that there is no information on hand for a previous permit.

Appendix B: Suggested Future Research

Detailing Net Returns under Various Management Scenarios

2009 Utah College of Technology Livestock Enterprise data suggest a tremendous level of variation in the net return to livestock enterprises that is driven by production costs. There would be much value in expanding the dataset to understand with greater specificity the production costs to which livestock operations utilizing public lands are particularly sensitive. One immediate benefit of this approach would be to evaluate the economic viability of range improvement and management scenarios that depend on significant contributions by livestock producers—e.g. can producers really afford the labor or other in-kind contributions that are often a component of allotment management solutions?

This would also be an opportunity to better understand the role that grazing associations play in minimizing costs and evaluating the key elements in a functioning association.

Documenting the Range of Responses to Forage Loss

In the past decade, southern Utah has experienced both large-scale fire and intense, multi-year drought. A study documenting the specific economic and operational strategies by which livestock operations responded to these severe circumstances—and assessing the relationship of any changes in productivity to regional economic health, local social well-being, and so on—would do much to inform evaluations of policy scenarios that could result in net loss of available public forage.

Regional Ranch Carrying Capacity

A more detailed analysis involving agglomerating BLM and FS records and comparing them to the numbers of livestock producers and volume of cattle herds in the region could be instrumental in better assessing the role that permits play in providing forage for area livestock production. (This is frequently a component of socio-economic impact analysis but is typically done by total AUMs with little relationship to cohorts of ranch classes.) Based on this, one might model or evaluate different scenarios of range management and their influence on the social and economic carrying capacity of the region.

For example, quality farm-ground and winter range is seen by many as a limiting factor on ranch size. A sustainability analysis might start with the limits of existing private land agriculture: water, soil quality, etc. and estimate the range of maximum “sustainable” AUMs based on that unit, and compare it to existing permits or potential permitted AUMs on the National Forest.

Quantifying Public Investments in Livestock Ranching in Southern Utah

Benefit-cost evaluation is an accepted element in economic impact analysis. Socio-economic impact analyses of potential changes in grazing permit terms and conditions are often criticized for having an overly narrow framework for assessing economic inputs and outputs from livestock production. This type of report could provide some useful framing for a key input to a benefit-cost evaluation with regards to the types of investment, public as well as private that help support continuity in livestock ranching.

