

Utah's Public Lands Socioeconomic Baseline Study: Summary Report



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A Report for the Utah Governor's
Public Lands Policy Coordination Office

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UTAH'S PUBLIC LANDS SOCIOECONOMIC BASELINE STUDY SUMMARY REPORT

INTRODUCTION

The Utah Socioeconomic Baseline Study was funded by the Public Lands Policy Coordination Office (PLPCO) of the Governor's Office. The study was an outgrowth of a request by the Six County Association of Governments (SCAOG) to Utah State University to provide support for the SCAOG's response to the socioeconomic impact analyses in the Richfield BLM proposed Resource Management Plan (RMP). Although the counties within the SCAOG were designated as cooperators with the Bureau of Land Management (BLM) in developing the RMP, the counties had no reliable database from which to suggest specific impact areas that the RMP should address or provide critical review of the proposed RMP. An earlier study by Dixie, Fishlake, and Manti-La Sal National Forests (2003) identified many potential socioeconomic linkages between public lands and local communities, but did not contain substantial quantitative measures of those linkages. This study used that study as a base from which to begin identifying critical linkages.

Other regions of the State of Utah and the Utah Association of Counties' Natural Resource Subcommittee (UAC NR) also expressed interest in having Utah State University participate in similar exercises. The Governor's Office, through the PLPCO, requested that a socioeconomic team from Utah State University develop a baseline of socioeconomic connections, or linkages, between public lands and local communities and the state. The USU socioeconomic team was formed and began activities for planning the study in early March 2006. The contract between the PLPCO and Utah State University was completed in late April.

Research was divided into two phases: Phase 1 included a general population survey of Utah residents and "key informant" focus groups with local associations of governments were used to identify the highest priority issues related to socioeconomics and public land management; Phase 2 included specific studies on the five highest priority issues that lacked sound databases, in the opinion of the researchers, the PLPCO, and local officials, represented by the UAC NR. Throughout the two phases, local officials were kept informed of progress through presentations and discussions at periodic Association of Governments (AOG) meetings and meetings of the UAC NR. This report summarizes the research and results in both phases. Copies of all questionnaires and detailed results may be found in the final reports for each of the studies.

PHASE 1

AOG focus groups

At each AOG meeting throughout Spring 2007, a Powerpoint[®] presentation of the study's background and objectives was given (See Appendix 1, Phase 1 Final Report). Note that the Wasatch Front AOG did not participate in the study, although Tooele County asked to be included. For most meetings, the Powerpoint[®] presentation describing the study was sent prior to the meeting and distributed to attendees by the AOG staff. After this presentation and any discussion among the participants, each participant was given a set of cards with 11 different

connections, including: Oil and Gas, Forest Products, Grazing, Minerals, Water, Tourism, Wildlife Resources, Motorized Recreation, Non-Motorized Recreation, Wild Lands, and Ecological Integrity (See Appendix 2, Phase 1 Final Report). The participants were asked to rank these cards in accordance with the priority or importance each had as a connection between public lands and *their* community or region. “Other” cards were also provided in case, in their opinion, other important linkages existed and needed to be included. Participants were told that the order of the cards represented *their* ranking of importance.

Each card also contained five reasons for the ranking, including economic impact, impact on quality of life, impact on the identity and character of their local community or region, controversy surrounding the impacts, and likely importance in the future in their community or region. Participants were asked to respond to each of the reasons on a five-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” Participants were given enough time to complete the exercise, after which they stapled their priority-ranked cards and sealed them in an envelope. They were informed that their response was completely confidential, but they were asked to supply their name, affiliation or position, length of time in the region, and contact information on the outside of the envelope in case the socioeconomic team had questions and needed to contact them.

In several cases, a discussion period followed the ranking exercise; however, in other cases, most of the discussion took place before the ranking cards were distributed. The collected responses were entered into Excel worksheets for purposes of analysis.

Results of the ranking of priority connections by AOG regions, presented in Table 1, suggested that the top five connections/linkages included water (#1 in 5 of the 7 AOGs and #2 in the remaining 2 AOGs), grazing (#2 or #3 in all AOGs), oil and gas development (#1 or #2 in the 3 energy-related AOGs, but mid-ranking in non-energy AOGs), tourism (#3 or #4 overall, and #4 or #5 in most AOGs), and minerals (ranking #5 in both analyses, but with a somewhat more dispersed ranking among the AOGs. Note that the “average ranking” and “priority” are based on simple averages of the AOG averages. That is, each AOG’s ranking was weighted equally. The general conclusion that can be drawn from these results is that the public officials, as represented by the AOG members, rank extractive uses of the public lands as the highest priority connections for their local communities. Tourism and recreation taken together also appear to be of high concern. Although the exercise did not identify links between wildlife and recreation, it is likely that hunting and fishing might well be included in the latter.

Recreation, wildlife, and timber-related production rankings were the next highest priorities and were consistent across the average rankings and, in general, across AOG rankings. Finally, wildlands and ecological integrity ranked last in almost every AOG, and in the averages.

The “other” categories were mentioned very seldom, and frequently they were ranked at the bottom of the list. Nevertheless, some were ranked very highly and, as a result, some of the average and priority rankings were affected. These connections were included in each analysis. In the “top 3” rankings, one of the seldom-mentioned “other” categories is ranked higher than wildlands (which is ranked last), but those rankings are, again, too few to be statistically significant.

Table 1. Average Ranking of each Linkage per AOG

Connection	Bear River	SE Utah	Five Cty	Uintah Basin	Six City	Tooele	Mountain-land	Average Rank	Priority
Oil and gas	6.6	3.1	6.5	2.2	4.1	9.9	6.6	5.6	4
Forest prod	6.2	6.5	6.2	6.0	5.9	9.4	7.6	6.8	8
Grazing	4.3	5.7	5.2	4.3	4.8	2.9	6.4	4.8	2
Minerals	7.5	3.8	5.7	5.6	5.1	7.3	8.3	6.2	5
Water	1.7	3.2	2.9	2.7	2.2	1.6	2.5	2.4	1
Tourism	4.9	5.3	5.8	5.6	6.8	5.4	5.0	5.6	3
Wildlife	6.3	7.4	9.1	7.4	6.3	4.7	4.5	6.5	6
Motorized recreation	5.5	6.9	6.8	9.1	6.2	6.7	4.7	6.6	7
Non-motorized recreation	6.2	7.3	9.8	9.3	9.3	8.3	5.4	7.9	9
Wildlands	8.8	9.6	11.2	10.7	8.4	5.0	9.2	9.0	10
Ecology	6.2	8.7	10.0	11.1	9.6	10.0	8.1	9.5	11
Other									
Watershed	12.0	12.0	11.2	12.0	12.0	12.0	11.2	11.8	16
Wilderness	12.0	12.0	12.0	12.0	11.6	12.0	11.2	11.8	18
State Mandate	12.0	12.0	12.0	12.0	12.0	12.0	11.2	11.9	20
Public Education	11.2	12.0	12.0	12.0	12.0	12.0	12.0	11.9	19
Public Infrastructure	12.0	10.9	11.2	12.0	12.0	12.0	11.3	11.6	13
Military Bases	12.0	11.5	12.0	12.0	12.0	10.4	12.0	11.7	14
Employment	12.0	12.0	11.3	12.0	12.0	12.0	12.0	11.9	23
Land Exch	12.0	12.0	11.4	12.0	11.4	12.0	12.0	11.8	17
Urbanization	12.0	12.0	10.5	12.0	11.8	12.0	12.0	11.7	15
SITLA*	12.0	12.0	12.0	12.0	12.0	12.0	11.2	11.9	20
Multiple Use	12.0	12.0	12.0	12.0	11.3	12.0	12.0	11.9	24
Special Interests	12.0	12.0	12.0	12.0	11.3	12.0	12.0	11.9	24
Nuclear Waste	12.0	12.0	12.0	12.0	12.0	8.7	12.0	11.5	12
Air Quality	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	26
PILT**	12.0	12.0	12.0	12.0	12.0	12.0	11.2	11.9	20

*State of Utah School and Institutional Trust Lands Administration

**Payments in Lieu of Taxes [Federal government payments to local governments for Federal Lands to offset loss of property tax revenue]

Table 2 presents the overall rankings, in which there is an implicit weighting of the number of participants in each AOG meeting. That is, it is the average of all individual responses, even though attendance at the public official meetings varied across AOGS. Compared to the rankings obtained from the averages of the separate AOG rankings (Table 2), there are some differences. The top five connections remain water, grazing, oil and gas development, tourism, and mineral development, but the priority differs slightly because of the two weighting schemes.

The next highest-ranking group (recreation, wildlife, and timber-related products) were the same as for the separate AOG averages, as was the bottom ranking for wildlands and ecological integrity.

Table 2. Overall Rankings

Pre-identified Connection	Overall Priority	
Oil and gas	4.7294118	3
Forest prod	6.2705882	8
Grazing	4.7159091	2
Minerals	5.6744186	5
Water	2.4615385	1
Tourism	5.2988506	4
Wildlife	6.1204819	7
Motorized recreation	5.9759036	6
Non-motorized recreation	7.325	9
Wildlands	8.6973684	10
Ecology	9.0632911	11

In so far as the explanatory questions were concerned, in most cases, the AOG participants selected the “Economic Impact” as “Very Important” most frequently (water: 86%; grazing: 57%; oil and gas development: 70%; tourism: 56%; and mineral development: 60%). The “Identity and Character” was selected as “Very Important” for water by 61% of the participants and for grazing by 53% of the participants. The water linkage also had more than 90% of the participants selecting “Very Important” for “Quality of Life,” 85% for “Future,” and more than 60% for “Controversy.” Almost 90% of the respondents also indicated that the “Future” was “Very Important” for oil and gas development. The other linkages all had “Very Important” selected by less than 50% of the respondents.

General population survey: The socioeconomic team developed a telephone survey questionnaire designed to elicit the importance of various connections to the respondent (See Appendix 3, Phase 1 Final Report). It was composed of a series of questions regarding connections to public lands and resources that was similar, but not identical, to those presented to the public officials. These included livestock grazing; water for irrigation; water for homes and businesses; water for fish and wildlife; energy resource development; sand, gravel, and mineral development; logging and lumber mills; trees/vegetation important for wildlife; tourism and recreation; off-road motorized recreation; non-motorized recreation; hunting and fishing; unroaded areas and undeveloped landscape; and biodiversity and habitat. Each respondent was asked to rank each connection on a five-point Likert scale ranging from “Very important” to “Not at all important” to the overall “quality of life” of people living in their local area. In addition, questions were asked to identify other resources and activities important to the local quality of life, and about the respondent’s dependency on public lands for income. Information on the county of residence was also collected for each respondent. The sample was randomly

selected, although rural counties were “overweighted” to assure a sufficient number of responses. The cooperation rate among eligible individuals who were contacted and asked to participate in the survey was approximately 31%. The data were compiled and analyzed to determine a ranking of the various “linkages” on the basis of percentage of respondents reporting that the specific linkage was “Very important.”

The rankings indicate that water for irrigation and domestic use is the highest priority for the general population, both across AOG regions and in total. The next two most important linkages are wildlife habitat (water and trees and vegetation). Next (5th) is non-motorized recreation. The 6th ranked linkage is energy resource development, and the 7th is hunting and fishing. Tourism and recreation follow with a ranking of 8th, and is the last connection/linkage to have higher than a 50% “Very Important” selection. Extractive industries, such as grazing (9th ranked), timber harvesting (13th ranked), and non-energy mining (14th ranked) appear to be identified by Utah residents as less important, based on the percentage of respondents rating them as “Very Important.” Comparing the rankings across AOG groupings, it is clear that water is consistently the highest-ranking connection, and water and trees/vegetation is next highest, but with some deviation in some AOG groupings.

Non-motorized recreation is a high priority in some AOGs (3rd through 5th) but lower (7th and 9th) for others. Energy development, tourism and recreation, and hunting and fishing appear to be reasonably consistently ranked together across all AOGs. Off-road motorized recreation, timber harvesting, mining, unroaded areas, and biodiversity protection all rank at the bottom, although the distribution across AOG regions is not consistent.

Comparisons across the county categories (metropolitan, outlying metropolitan, and nonmetropolitan) are similar to those obtained for the AOG regions. In general, there is considerable agreement: Water for consumption and irrigation are the most important connections, with water and trees/vegetation for habitat being the next two most important. Non-motorized recreation is generally 5th, followed by energy development. Tourism/recreation is next, although rural areas rank hunting and fishing above both energy development and tourism and recreation. Biodiversity and habitat protection and livestock grazing follow, although the ranking is reversed as between metro and outlying metro and non-metro populations. Undeveloped landscapes, off-road motorized recreation, timber production and minerals rank at the bottom of the priorities for all population categories. The relative consistency in rankings among the metro, outlying metro, and non-metro counties was somewhat unexpected.

Table 3. Overall Rankings and Rankings by AOG Regions

	Overall Rank	Bear River	Five County	Mountain-land	Six County	South-eastern	Uintah Basin	Wasatch Front
Water for Homes and Businesses	1	1	1	1	2	1	1	1
Water for Irrigation	2	3	2	4	1	3	2	2
Water for Fish and Wildlife	3	2	4	2	3	2	3	3
Trees/Vegetation Important for Wildlife	4	5	5	3	8	5	4	4
Non-Motorized Recreation	5	9	3	5	7	9	7	5
Energy Resource Development	6	4	7	9	5	4	6	6
Hunting and Fishing	7	6	8	7	4	6	5	9
Tourism and Recreation	8	7	6	8	9	7	8	7
Livestock Grazing	9	10	9	11	6	10	9	11
Biodiversity and Habitat Protection	10	11	12	6	12	11	11	8
Off-Road Motorized Recreation	11	8	13	12	10	8	14	13
Unroaded Areas and Undeveloped Landscape	12	14	14	10	14	14	12	10
Logging and Lumber Mills	13	13	11	14	11	13	10	14
Sand, Gravel, or mineral Development	14	12	10	13	13	12	13	12

Comparison between Public Officials and General Public Survey Results: Results from the two approaches revealed both similarities and differences. In general, water appears to be viewed as the most important connection with public lands among both public officials and the general population. Tourism and recreation and energy development are among the top six in both

groups (the top five if the water linkages for irrigation and consumption are aggregated in the public survey results). Unroaded and undeveloped areas and wildlands represent similar connections and are ranked at the bottom of the priorities in both approaches.

The major differences between the two groups of respondents are the importance of extractive industries. Grazing ranks second in importance for the public officials, but only 10th (9th if the two water categories are aggregated) in the general public survey. Minerals extraction and timber harvesting are both relatively high priorities for public officials (5th and 8th, respectively), but at the bottom of the priority list for the general public (14th and 13th, respectively). Non-motorized recreation is ranked highly by the general public (5th without aggregation of the water categories), but has a low priority with public officials (9th). To a lesser extent the same disparity is evident in the case of ecological integrity (ranked 11th for public officials and 9th for the public survey (8th with aggregation).

Closure of Phase 1: As a final activity for Phase 1, the socioeconomic team met with the UAC NR to present the findings of the Phase 1 surveys and to discuss specific details about those results in an effort to help the team better develop the Phase 2 studies. The meeting was organized into a presentation of results, and two periods of round-table discussions on the topics of water, grazing, oil and gas development, recreation and tourism, wildlife and habitat protection, protected areas, and minerals development. Participants were asked to complete a questionnaire to be used to clarify and develop questions for the general public survey and to identify and develop special studies. Following the completion of the questionnaires, general discussion about the topic took place with a facilitator from the socioeconomic team who recorded the discussion and completed a discussion form. Four possible areas for specific studies were identified as a result of the closure exercise: (1) water; (2) recreation and tourism, (3) grazing, and (4) oil, gas, and mineral development.

After considerable discussion among the research team and PLPCO personnel, as well as meetings with the UAC NR, five specific studies were identified for Phase 2: a general population survey to determine Utah residents' linkages to and attitudes toward public lands; a survey of ranchers, including those using public lands; an analysis of the effect of vegetation manipulation on water production for selected watersheds in Utah; an examination of Wild and Scenic River designation and its impact on public and private land users; and a survey of off-highway vehicle (OHV) users and their activities. Oil, gas, and mineral development studies were undertaken by the University of Utah in an independent effort.

PHASE 2

A review of each study and its results is provided below.

STUDY 1. GENERAL POPULATION SURVEY

Upon completion of Phase 1, the study team had a significant amount of data from the telephone survey and local officials' input upon which to base the development of a survey instrument for the general population of Utah. Members of the study team developed a self-completion questionnaire to assess the ways in which Utah residents utilize, interact with, and think about

public lands and public land management issues (See Appendix 2, Public Lands and Utah Communities: A Statewide Survey of Utah Residents, Phase 1 Final Report).

The sampling strategy for the survey of random probability samples of households from each of Utah's 29 counties. A national firm specializing in survey sampling (Survey Sampling International) was asked to provide mailing address information for samples of 588 households in each of the state's six metropolitan counties (Cache, Davis, Salt Lake, Utah, Washington, and Weber counties) and samples of 353 households in each of the twenty-three nonmetropolitan counties. The targeted statewide total sample based on this allocation was 11,647. However, Survey Sampling International was unable to provide samples of the requested size in five of Utah's more rural counties (Beaver, Daggett, Piute, Rich, and Wayne) due to the combined effects of low population and inadequate access to mailing address information derived from telephone listings and other public records used to develop sampling lists. As a result, the total initial sample size for the combined 29 counties in Utah was 10,722 residential addresses (see Table 1).

The survey administration process included up to five separate mailings to each household address included in the samples, using procedures popularized by Dillman (1978; 2007). A pre-notification letter announcing the study and indicating that recipient households were being asked to participate in the survey was mailed to all sampled households in April 2008. An initial first-class mailing of questionnaire packets (including an explanatory cover letter, questionnaire booklet, Utah map designating county boundaries and major public land areas, and postage-paid return envelope) was mailed to all sampled households on May 7. Cover letters requested that the questionnaire be completed by the adult member of the household whose birthday had occurred most recently, an approach that provides for randomized selection of individual respondents within sampled households. This initial mailing of survey materials was followed one week later by a reminder postcard designed to encourage response. Follow-up mailings of questionnaire packets to non-responding households occurred in late May and again in late June.

Substantial numbers of the pre-notification letters and questionnaire packets were returned by the U.S. Postal Service as undeliverable, due primarily to incorrect or incomplete address information or to relocation by individuals whose names appeared on address labels. In combination, 2,338 of the originally sampled household across the state were deleted from the sample due to delivery problems, resulting in an adjusted total sample size of 8,384. The adjusted sample sizes within individual counties also declined, resulting in relatively small samples in several of Utah's most rural counties (particularly Beaver, Daggett, Piute, and Wayne). The final statewide survey response rate produced by this five-wave mailing process was 45.3%. Response rates for individual counties ranged from a low of 33% in Davis County to a high of more than 56% in Daggett County.

Initial results from the survey were grouped by counties that were most closely related to BLM RMPs, rather than Utah associations of governments (AOGs). These 11 groups should provide more appropriate bases for the local governments to respond to those RMPs and so that the results would be more useful to the Federal agencies during their planning processes. The groups also can be generally identified as urban Wasatch Front (Davis, Salt Lake, Utah, and Weber), urban peripheral (Cache, Rich, Morgan, Wasatch, Summit, Iron, and Washington), and

rural (the remaining groupings). Clearly, some of the counties within the peripheral urban are, in fact, quite rural, but the associated urban counties dominate the region economically.

Table 4 presents the socioeconomic characteristics of the survey respondents. Although many of the characteristics are consistent with the respective local populations, respondents were more likely to be male and few respondents were under 30 years of age. The percentages of respondents with a college education (or more) varied widely across areas of the state, ranging from a low of approximately 25% in the Daggett/Duchesne/Uintah and the Carbon/Emery clusters to a high of 60% in the Morgan/Summit/Wasatch cluster. Nearly all respondents identified themselves as year-round residents of the communities where they were contacted. In all areas most respondents indicated that they had lived in their current community of residence for 10 years or more; long-term (20 years+) residence was especially prevalent in the Daggett/Duchesne/Uintah, Carbon/Emery, and Beaver/Juab/Millard clusters. In all areas respondents most frequently reported that their households were comprised of two persons; the combined percentage of one-person and two-person households was highest in the Carbon/Emery and Garfield/Kane/Wayne clusters, and lowest in the Box Elder/Tooele, Cache/Rich, and Morgan/Summit/Wasatch clusters.

Respondents from each of the multi-county clusters were most likely to report that they are affiliated with the Church of Jesus Christ of Latter-day Saints, with the percentages of respondents who are LDS ranging from lows of approximately 51% in the Morgan/Summit/Wasatch cluster and 56% in the Grand/San Juan cluster to highs of nearly 84% in the Cache/Rich and Beaver/Juab/Millard clusters. The percentage of respondents identifying themselves as white/Caucasian was overwhelmingly high across all of the clusters. In most areas, respondents were most likely to report annual household income levels in the \$50,000-\$99,999 range. Reports of annual income levels in excess of \$100,000 occurred most frequently in the Morgan/Summit/Wasatch, Davis/Salt Lake/Utah/Weber, and Iron/Washington clusters, while household incomes below \$25,000 were most common in the Daggett/Duchesne/Uintah, Carbon/Emery, Piute/Sanpete/Sevier, and Garfield/Kane/Wayne clusters.

Table 4. Summary statistics for selected socio-demographic characteristics of survey respondents.

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Religious Affiliation											
LDS	71.7%	83.6%	79.6%	51.3%	71.1%	57.2%	82.4%	83.4%	71.4%	56.0%	57.5%
Other religions	16.6%	10.6%	13.0%	29.4%	20.6%	27.1%	10.1%	7.3%	16.5%	24.8%	20.7%
No religion	11.7%	5.8%	7.4%	19.3%	8.3%	15.7%	7.5%	9.2%	12.1%	19.2%	8.8%
Race/Ethnicity											
White/Caucasian	94.0%	96.1%	95.6%	96.6%	95.2%	96.1%	96.4%	95.3%	96.2%	95.4%	97.7%
Black/African Am.	0.4%	0.0%	0.5%	0.0%	0.5%	0.6%	0.0%	0.3%	0.0%	0.5%	0.4%
Hispanic/Latino	2.0%	1.6%	1.6%	0.0%	1.4%	1.8%	1.1%	1.0%	1.2%	11.5%	1.4%
Asian	2.2%	0.8%	0.0%	1.2%	0.4%	0.0%	0.0%	0.6%	0.0%	0.3%	0.5%
Pacific Islander	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.5%	0.0%	0.2%
Native American	0.8%	0.4%	3.0%	0.5%	3.4%	1.2%	2.0%	0.8%	3.7%	3.1%	1.2%
Other race	0.2%	0.4%	0.0%	1.3%	0.9%	0.6%	1.9%	1.6%	0.7%	0.5%	0.5%
Household Income											
under \$25,000	12.3%	8.2%	12.2%	8.9%	18.3%	18.0%	21.6%	15.3%	22.8%	14.8%	11.6%
\$25-\$49,999	22.0%	32.8%	27.6%	18.4%	26.1%	30.3%	37.7%	32.1%	35.3%	33.5%	31.8%
\$50-\$99,999	44.2%	43.3%	47.1%	35.8%	41.2%	43.9%	31.7%	41.7%	33.6%	43.9%	37.5%
\$100,000 or more	21.6%	15.6%	13.1%	37.0%	14.5%	7.8%	9.2%	10.9%	8.3%	8.7%	19.1%
Gender											
Male	68.0%	65.9%	69.8%	69.3%	63.9%	75.4%	68.7%	73.2%	67.7%	66.5%	68.5%
Female	32.0%	34.1%	30.2%	30.7%	36.1%	24.6%	31.3%	26.8%	32.3%	33.5%	31.5%

Table 4. (continued) Summary statistics for selected socio-demographic characteristics of survey respondents.

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San-Juan	Iron Washington
Age											
under 30	4.8%	11.2%	6.7%	3.9%	6.6%	4.1%	7.6%	6.4%	1.5%	5.9%	5.4%
30-59	57.3%	61.6%	56.9%	64.9%	51.8%	50.2%	45.7%	50.9%	41.2%	50.2%	42.0%
60 or older	37.9%	37.2%	36.4%	31.2%	41.6%	45.7%	46.7%	42.7%	57.3%	44.3%	52.6%
Education											
4-year college degree or higher	48.5%	50.7%	34.1%	60.0%	25.4%	25.5%	31.9%	27.6%	39.6%	44.1%	43.2%
Residency Status											
Year-round residents	98.9%	97.9%	98.5%	96.4%	98.0%	98.1%	99.0%	98.2%	92.2%	98.4%	96.1%
Length of Residence											
under 2 years	1.8%	6.0%	3.9%	4.7%	2.2%	0.9%	3.3%	1.1%	3.9%	1.8%	4.6%
2-5 years	10.4%	8.5%	13.9%	15.7%	8.1%	5.8%	10.9%	11.0%	6.4%	9.6%	23.7%
6-10 years	8.7%	9.2%	14.9%	15.9%	4.9%	6.5%	9.0%	6/0%	8.7%	8.6%	15.2%
10-20 years	16.9%	16.1%	14.5%	27.8%	16.6%	9.8%	20.3%	11.5%	24.1%	18.2%	24.5%
more than 30 years	62.2%	60.2%	52.9%	36.0%	68.1%	77.0%	56.5%	70.5%	56.9%	61.8%	32.1%
Household Size											
1 person	14.3%	9.7%	10.4%	10.6%	11.0%	18.2%	16.0%	14.1%	19.1%	13.9%	10.4%
2 persons	35.7%	37.0%	33.7%	37.0%	40.0%	46.8%	42.8%	38.8%	48.1%	45.8%	46.3%
3-4 persons	28.0%	33.0%	29.9%	34.0%	28.6%	25.7%	22.0%	28.4%	22.5%	23.6%	22.0%
5 or more persons	22.0%	20.3%	25.9%	18.4%	20.3%	9.2%	19.2%	18.8%	10.3%	16.7%	21.3%

When asked to report their political orientations, 50% or more of respondents were most likely to indicate that they adhere to either conservative or moderately conservative political perspectives except in the Morgan/Summit/Wasatch and Carbon/Emery county groupings.

The first series of questions included in the survey questionnaire focused on respondents' participation in a variety of recreational and other non-economic activities involving public lands and public land resources located anywhere in Utah. Table 5 reports the percentages of respondents who indicated that they had participated in any of 30 different outdoor recreation activities on public lands in Utah sometime during the preceding 12 months. Reported levels of participation in these public land recreation activities were uniformly high throughout the state for camping, picnicking, day hiking, wildlife viewing, visiting historic sites, and sightseeing/pleasure driving. Participation in camping was reported by between 55% of respondents (Iron/Washington counties) and 76% of respondents (Carbon/Emery counties). Even higher levels of participation in picnicking on Utah's public lands were reported, with percentages ranging from about 64% in the Davis/Salt Lake/Utah/Weber cluster to nearly 82% in the Grand/San Juan cluster. Reported participation in day hiking on public land areas ranged between about 50% in the Piute/Sanpete/Sevier cluster and 75% in the Morgan/Summit/Wasatch cluster.

There was substantial variation across areas of the state in several specific categories of recreation activity. For example, reports of participation in mountain biking ranged from only about 12% of respondents in the Garfield/Wayne/Kane and the Daggett/Duchesne/Uintah clusters to nearly one-half of respondents in the Morgan/Summit/Wasatch cluster. Participation in hunting on public lands also varied substantially across the state, ranging from a low of approximately 21% among respondents in the Davis/Salt Lake/Utah/Weber cluster to more than 50% in the Carbon/Emery and Beaver/Juab/Millard clusters. Reports of fishing participation also varied substantially, ranging from a low of about 41% in the Iron/Washington cluster to 71% in Carbon/Emery counties. Sharp variations were also evident with respect to ATV riding on public lands, with the percentage of respondents reporting that activity ranging from just under 27% in Davis/Salt Lake/Utah/Weber counties to over 65% in the Beaver/Juab/Millard cluster.

The second series of questions in this portion of the questionnaire focused on participation in nine different non-commodity personal use activities involving collection and use of various types of materials or resources from public lands. Response distributions to this series of questions are summarized in Table 6. Respondents from across the state were generally most likely to report that they had collected materials for craft projects, collected rocks for home landscaping, or collected fossils, rocks, or minerals from public lands during the preceding 12 months. Variations in levels of participation were especially evident across the 11 multi-county clusters with respect to cutting of firewood for home use, cutting of Christmas trees, and gathering of pinyon nuts from public land areas. While only 6-7% of respondents in the Cache/Rich and Davis/Salt Lake/Utah/Weber county areas reported that they had cut firewood for home use on public lands in Utah during the past 12 months, substantially higher firewood cutting participation was evident in other areas, especially in the Piute/Sanpete/Sevier, Beaver/Juab/Millard, Garfield/Kane/Wayne, and Grand/San Juan county areas. Cutting of Christmas trees was similarly low in the Davis/Salt Lake/Utah/Weber and Cache/Rich clusters, but much higher in the Daggett/Duchesne/Uintah,

Piute/Sanpete/Sevier, Beaver/Juab/Millard, and Garfield/Kane/Wayne clusters. Reported participation in the gathering of pinyon nuts also varied considerably across areas of the state, a finding that is not surprising since pinyon pines are commonly found in only limited localized areas in southern Utah.

Table 5. *Percentage of survey respondents reporting participation in selected recreation activities on Utah public lands during the past 12 months, for designated multi-county sub-regions of the state.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Camping	57.7%	62.4%	62.9%	66.3%	71.0%	76.3%	69.7%	74.7%	63.8%	70.7%	54.6%
Picnicking	64.3%	76.6%	68.5%	76.5%	78.4%	75.2%	76.4%	76.8%	73.2%	81.6%	69.1%
Backpacking	20.4%	24.3%	20.0%	34.9%	18.5%	16.5%	20.6%	21.5%	23.8%	29.9%	20.7%
Day hiking	55.0%	62.4%	53.1%	74.9%	51.0%	54.7%	49.9%	56.1%	65.9%	70.9%	66.8%
Bird watching	22.4%	21.1%	20.9%	30.1%	28.8%	25.2%	26.4%	25.6%	33.9%	36.6%	28.7%
Wildlife viewing	47.7%	48.4%	59.2%	67.5%	69.2%	70.5%	69.0%	74.4%	73.5%	75.3%	56.8%
Nature photograph	30.0%	29.3%	27.2%	35.2%	38.4%	38.7%	36.5%	33.6%	44.2%	41.6%	35.3%
Canoeing/kayaking	6.5%	10.0%	8.7%	16.4%	9.2%	8.1%	4.1%	5.4%	5.7%	15.8%	4.6%
River rafting	9.3%	7.5%	6.3%	20.8%	20.6%	12.1%	6.5%	8.4%	6.3%	18.5%	4.1%
Motor boating	26.4%	28.9%	33.9%	35.0%	33.2%	37.2%	29.7%	35.2%	26.7%	20.0%	29.1%
Jet skiing	9.8%	12.4%	10.6%	9.1%	6.6%	9.1%	8.3%	9.8%	6.1%	7.3%	8.8%
Swimming	30.7%	43.1%	34.9%	41.8%	39.4%	40.7%	30.7%	42.8%	28.8%	37.3%	35.9%
Rock climbing	6.5%	6.8%	10.7%	14.0%	13.2%	18.0%	10.2%	17.2%	19.9%	20.2%	18.9%
Mountain climbing	12.4%	14.8%	18.1%	18.8%	16.5%	21.0%	20.8%	25.3%	16.4%	22.6%	15.1%
Hang gliding	0.1%	0.4%	0.0%	0.4%	0.7%	0.0%	0.1%	0.7%	0.0%	0.0%	0.0%
Mountain bike riding	17.6%	23.3%	18.0%	46.9%	12.9%	17.5%	15.5%	13.2%	12.4%	23.8%	20.7%
Hunting	21.1%	25.5%	33.2%	26.2%	47.7%	54.6%	47.2%	57.0%	48.5%	43.6%	22.4%
Fishing	42.4%	42.0%	53.3%	44.4%	65.8%	71.4%	64.3%	59.9%	59.6%	47.7%	41.1%
Horseback riding	9.8%	18.3%	18.8%	22.6%	25.0%	23.0%	24.2%	29.2%	30.2%	26.4%	14.8%
Orienteering/ geocaching	6.9%	7.2%	5.7%	6.9%	7.5%	9.0%	10.8%	13.2%	10.6%	12.6%	9.2%
Rock hounding	11.4%	8.5%	16.8%	12.1%	27.2%	27.7%	21.8%	35.4%	33.4%	35.8%	18.4%
Visiting historic sites	60.9%	50.7%	63.0%	61.0%	62.1%	65.1%	63.6%	66.2%	66.9%	66.6%	72.1%
Resort skiing/ snowboarding	20.7%	32.5%	19.0%	54.5%	8.4%	9.9%	11.2%	9.4%	12.9%	5.2%	15.9%

Table 5. (Continued) *Percentage of survey respondents reporting participation in selected recreation activities on Utah public lands during the past twelve months, for designated multi-county subregions of the state.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Backcountryskiing/ Snowboarding	4.9%	7.6%	4.7%	23.3%	3.4%	5.6%	7.5%	3.7%	3.7%	10.3%	2.6%
Snowshoeing	8.6%	8.0%	7.0%	30.8%	5.1%	5.2%	5.0%	2.6%	5.0%	6.5%	4.1%
Snowmobiling	10.5%	20.3%	17.3%	18.5%	12.8%	9.0%	13.5%	12.8%	9.8%	8.3%	4.4%
ATV riding	26.6%	29.2%	42.7%	28.7%	44.2%	58.7%	56.6%	65.5%	57.7%	51.6%	37.1%
Dirt bike riding	9.8%	8.4%	12.4%	11.8%	11.6%	14.2%	11.1%	17.7%	10.2%	18.9%	8.3%
4-wheel driving/ Jeeping	21.1%	24.1%	27.1%	26.6%	32.7%	46.1%	44.6%	45.8%	52.9%	56.7%	32.9%
Sightseeing/ pleasure driving	76.8%	75.0%	78.6%	85.3%	81.4%	85.9%	84.4%	85.7%	86.2%	86.1%	85.2%

Table 6. Percentage of survey respondents reporting participation in selected non-commodity personal use activities on Utah public lands during the past twelve months, for designated multi-county subregions of the state.

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Cutting firewood for home use	6.9%	5.7%	10.4%	11.8%	25.9%	20.3%	30.7%	31.6%	51.9%	39.1%	17.1%
Cutting Christmas trees	5.6%	5.6%	7.1%	7.4%	30.6%	19.8%	28.9%	32.1%	38.2%	25.8%	13.5%
Collecting material for craft projects	13.3%	12.4%	14.2%	13.8%	20.1%	21.9%	18.1%	21.8%	23.9%	26.3%	14.6%
Collecting rocks for home landscaping	14.8%	13.2%	22.8%	16.8%	32.0%	29.0%	24.0%	39.6%	36.9%	45.1%	31.2%
Collecting plants for home landscaping	4.4%	3.4%	4.6%	4.6%	8.4%	13.6%	9.0%	10.5%	15.5%	16.9%	8.4%
Collecting wild mushrooms	0.4%	0.8%	0.3%	3.4%	1.0%	2.5%	1.1%	2.0%	2.4%	5.8%	0.5%
Gathering pinyon nuts	3.8%	3.3%	10.5%	3.8%	14.4%	21.0%	13.3%	30.9%	31.5%	34.5%	15.2%
Gathering berries or other wild foods	4.0%	9.3%	7.4%	7.6%	11.2%	10.3%	10.2%	6.9%	11.1%	14.0%	6.2%
Collect fossils, rocks or minerals	13.8%	9.2%	16.4%	13.2%	22.3%	26.6%	20.5%	29.5%	30.2%	30.6%	20.1%

Participation by Utah residents in economic activities that are directly or indirectly linked to resource conditions and resource uses on public lands was a major area of focus in the survey questionnaire. The first series of questions in this section asked respondents to indicate whether any portion of their household income is directly linked to activities that involve permitted use of public lands administered by the U.S. Forest Service, the Bureau of Land Management, some other federal agency, or the State of Utah. A follow-up portion of each question then asked those who did report participation in such activities to indicate the percentage of total annual income that this permitted activity produces for their households (Table 7).

The percentages of survey respondents reporting household participation in permit-based economic activities on lands administered by the U.S. Forest Service were fairly low across all areas of the state. At the same time, there is considerable variation in the presence of such linkages across the 11 multi-county areas considered in this analysis. Responses regarding participation in permitted economic activities on BLM lands exhibited even more variation across the 11 multi-county clusters, although the percentages were slightly higher in most county groups. Generally speaking, fewer households reported permit-based activities on other federal agencies' and State of Utah land. However, for several of the rural county groups, the percentage of household income reported by those who do participate in permit-based economic activities was substantial, although the variation across county groups was large.

In addition, questions were asked about specific linkages between household income and tourism and recreation on all public lands, and linkages between household income and commodity-based (grazing, timber, etc.) production from all public lands. More substantial variation and substantially higher area-specific levels of participation are evident for the remaining four commercial activities considered in this series. The percentages of respondents indicating participation by their household in livestock grazing and related work was very low (under 5%) in the Davis/Salt Lake/Utah/Weber, Cache/Rich, and Iron/Washington clusters, and highest in the Beaver/Juab/Millard (17.2%) and Garfield/Kane/Wayne (17.3%) clusters. Reported household participation in commercial firewood cutting/gathering was highest in the Daggett/Duchesne/Uintah (10%), Grand/San Juan (11.3%), and Garfield/Kane/Wayne (11.4%) county clusters. Participation in mining of coal, uranium, or other minerals was reported by relatively few respondents from all areas except for the Carbon/Emery cluster, where 19% of respondents reported household involvement with some form of mineral mining activity. Finally, participation in oil and gas exploration or development was reported infrequently across all areas of the state except Daggett/Duchesne/Uintah, where nearly 30% of respondents indicated household participation in that type of commercial activity.

The third general topic of the survey was related to the importance of various aspects of public lands to the quality of life of the respondents. In general, Utahns view public lands and the services they offer as contributing significantly to their quality of life, as shown in Table 8.

Table 7. *Percentage of survey respondents reporting that a portion of their household's income is directly linked to permitted uses of public lands or public land resources, and percentage of those who reported such activities indicating that 25% or more of household income is derived from those activities, by land management agency.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Agency											
Forest Service											
Permitted use reported	2.6%	1.8%	4.5%	3.8%	7.4%	13.8%	10.8%	8.5%	14.2%	10.2%	3.5%
≥ 25% of income	20.5%	19.6%	29.1%	51.6%	47.0%	83.5%	53.7%	23.8%	43.5%	22.5%	24.6%
BLM											
Permitted use reported	1.9%	1.6%	5.6%	2.7%	18.0%	15.4%	7.9%	13.8%	16.5%	15.8%	3.0%
≥ 25% of income	22.5%	27.6%	42.0%	35.9%	85.7%	75.2%	44.9%	46.3%	32.3%	34.6%	29.4%
Other federal agency											
Permitted use reported	1.1%	0.9%	1.6%	2.4%	6.9%	2.8%	2.4%	3.6%	7.1%	7.7%	3.0%
≥ 25% of income	54.3%	3.4%	30.6%	34.6%	63.6%	71.7%	45.8%	25.4%	56.5%	54.8%	28.6%
State of Utah											
Permitted use reported	4.1%	1.1%	5.4%	6.0%	14.2%	11.3%	5.9%	7.6%	10.1%	9.5%	4.5%
≥ 25% of income	20.6%	51.6%	40.9%	31.0%	43.6%	57.8%	55.1%	30.6%	25.6%	43.6%	19.9%

Table 8. Survey respondents' levels of agreement that the natural environments provided by public lands in Utah are a key part of their lives.

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Strongly disagree	2.5%	1.2%	3.1%	1.6%	2.3%	1.2%	2.0%	1.7%	1.2%	1.6%	1.2%
Somewhat disagree	2.8%	1.3%	1.6%	1.5%	2.3%	2.7%	3.2%	2.5%	2.1%	1.5%	2.6%
Neutral	12.8%	16.2%	16.4%	8.3%	14.3%	12.7%	17.3%	11.7%	12.9%	9.9%	13.1%
Somewhat agree	32.3%	33.4%	28.9%	21.5%	35.9%	25.8%	32.4%	33.3%	29.9%	28.1%	36.0%
Strongly Agree	46.8%	47.1%	47.1%	65.3%	42.0%	54.6%	43.4%	47.9%	53.2%	57.2%	46.2%
Don't know/ no response	2.8%	0.8%	2.8%	1.8%	3.3%	2.9%	1.6%	2.9%	0.6%	1.8%	0.9%

The next set of questions dealt with the respondents' attitudes about various aspects of management of public lands. As might be expected, there are significant differences between the urban (Wasatch Front and peripheral urban counties) and rural populations with respect to management directions. In general, urban populations favor environmental management options more strongly than rural populations, while the latter support increasing or maintaining traditional extractive uses of public lands more strongly and reveal opposition to many environmentally based policies. As examples, Tables 9 and 10 present representative responses regarding public land management and uses. However, some results were predictable. For example, support of grazing on public lands was relatively strong even among urban respondents, as shown in Table 11. There was also broad support from both groups relative to the development of water resources in Utah (Table 12).

The next set of questions concerned the respondents' evaluations of the public land management agencies and their employees relative to public land management. Tables 13, 14, 15, and 16 present the opinions of the respondents relative to the Forest Service and BLM managers and management, respectively. In general, a significant portion of the rural populations of Utah view federal land managers as having different values than local populations and fail to take local opinion into account in setting land use policy. Responses of urban residents are more generally neutral or distributed equally around neutral with respect to those issues. However, the responses of both urban and rural Utahns appear to suggest that Utah residents think both the Forest Service and the BLM do a "good job of preserving environmental quality." With respect to management goals, rural respondents favor increasing extractive use of public lands (Forest Service and BLM) more than urban respondents, but both appear to support the development of tourism and recreation as an economic growth mechanism.

A set of questions regarding participation in public land policy development generally indicated that less than half of the respondents were involved in some form of participation (attending meetings, writing officials, etc.). Of those who have participated, most were either somewhat satisfied or neutral with respect to their participation. Of those who have not participated, a large plurality reported that they felt their input would have little or no effect on policy decisions.

The final portion of the survey contained questions that assessed the respondents' socioeconomic characteristics. While the distribution of respondent characteristics was similar to the Utah population in general, in some aspects the responders were not representative. In particular, many more males completed the questionnaire than females, and very few respondents were under 30 years of age. This distribution probably reflects the differences between those interested in public land policy and the general population.

In summary, most Utahns participate in activities on public lands and most see those public lands as contributing to their own or their community's quality of life. There was a difference in management preferences between urban (metropolitan and peripheral) and rural respondents, with the latter favoring more extractive use of the public lands. The same "split" was reflected in attitudes toward the federal public land managers, with rural respondents less positive about federal land managers and their goals relative to local populations. Less than half of the respondents had actively participated in policy development activities, and, of those, about half were somewhat satisfied or neutral about their impact on the process.

Table 9. *Survey respondents' views regarding whether public land managers should reduce or increase the extent to which designation of wilderness areas occurs on Utah's public lands.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Major reduction	6.8%	4.3%	8.4%	5.5%	11.5%	24.8%	19.6%	26.3%	39.7%	33.0%	11.4%
Moderate reduction	8.1%	12.3%	14.5%	6.2%	18.5%	12.8%	16.3%	15.5%	15.3%	17.2%	15.9%
Stay about the same	34.0%	41.6%	35.4%	29.0%	40.5%	27.5%	36.7%	34.2%	25.3%	24.0%	36.4%
Moderate increase	24.9%	22.6%	22.2%	27.5%	16.2%	17.0%	14.9%	11.9%	7.4%	7.4%	14.7%
Major increase	14.2%	9.6%	9.9%	25.8%	3.2%	9.6%	5.7%	3.0%	8.7%	13.6%	11.9%
Don't know/ no response	12.0%	9.6%	9.5%	6.0%	10.1%	8.4%	6.9%	9.1%	3.5%	4.8%	9.6%

Table 10. *Survey respondents' views regarding whether public land managers should reduce or increase the extent to which mineral exploration and extraction activities occur on Utah's public lands.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Major reduction	8.5%	5.6%	7.7%	13.4%	3.1%	7.2%	4.4%	1.5%	9.6%	9.5%	6.8%
Moderate reduction	14.1%	11.8%	9.8%	21.4%	8.5%	8.0%	8.0%	5.8%	3.7%	10.7%	7.7%
Stay about the same	34.1%	44.6%	45.3%	37.4%	41.0%	40.9%	43.1%	40.1%	24.4%	26.2%	38.1%
Moderate increase	16.8%	13.3%	13.9%	12.3%	27.4%	22.7%	21.3%	23.3%	32.0%	26.3%	21.1%
Major increase	4.3%	6.0%	6.6%	3.1%	10.9%	13.3%	11.2%	14.7%	23.2%	21.0%	10.4%
Don't know/ no response	22.1%	18.7%	16.7%	12.4%	9.1%	7.8%	12.0%	14.5%	7.0%	6.3%	15.9%

Table 11. *Survey respondents' views regarding whether public land managers should reduce or increase the extent to which livestock grazing occurs on Utah's public lands.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Major reduction	5.6%	4.4%	4.0%	8.1%	2.8%	5.4%	4.9%	5.9%	5.1%	9.2%	5.1%
Moderate reduction	11.3%	12.7%	11.6%	12.2%	6.3%	12.5%	8.8%	6.0%	6.8%	11.8%	6.5%
Stay about the same	54.1%	58.7%	53.1%	53.6%	53.4%	47.3%	53.0%	44.9%	39.2%	41.3%	52.9%
Moderate increase	10.2%	10.3%	14.7%	12.7%	14.4%	16.5%	17.8%	18.5%	23.8%	21.2%	17.1%
Major increase	3.4%	4.3%	6.2%	5.9%	13.8%	8.6%	7.8%	16.1%	20.1%	10.4%	6.3%
Don't know/ no response	15.3%	9.6%	10.4%	7.5%	9.2%	9.6%	7.8%	8.6%	5.0%	6.1%	12.1%

Table 12. *Survey respondents' views regarding whether public land managers should reduce or increase the extent to which development of water storage and delivery systems to meet the needs of nearby communities occurs on Utah's public lands.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Major reduction	0.6%	0.4%	1.4%	2.5%	3.1%	1.5%	1.6%	2.4%	0.3%	2.6%	2.1%
Moderate reduction	1.3%	1.6%	2.8%	6.2%	0.0%	1.8%	0.6%	1.0%	2.0%	2.6%	1.4%
Stay about the same	18.9%	25.9%	22.1%	27.2%	20.5%	19.4%	21.2%	23.1%	14.1%	15.6%	14.2%
Moderate increase	33.8%	41.2%	34.1%	31.6%	36.3%	37.1%	37.3%	33.5%	36.9%	34.8%	33.9%
Major increase	33.7%	23.6%	31.5%	24.2%	31.4%	33.0%	34.2%	33.1%	42.0%	38.3%	41.6%
Don't know/ no response	11.7%	7.2%	8.1%	8.2%	8.7%	7.2%	5.0%	6.9%	4.7%	6.1%	6.8%

Table 13. *Survey respondents' levels of agreement or disagreement with the idea that most Forest Service land managers have values about resource use that are very different from those of most people living in respondents' communities.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Strongly disagree	2.4%	2.8%	1.7%	3.6%	1.8%	5.1%	3.2%	3.1%	2.3%	2.0%	2.4%
Somewhat disagree	10.9%	14.5%	10.4%	16.9%	7.7%	6.9%	11.0%	7.9%	7.4%	6.4%	7.0%
Neutral	31.2%	30.6%	34.6%	27.5%	24.3%	34.1%	19.2%	27.9%	17.8%	18.4%	29.6%
Somewhat agree	17.1%	21.1%	22.2%	21.1%	28.7%	26.3%	28.1%	20.6%	27.8%	28.9%	24.0%
Strongly agree	7.9%	9.6%	9.5%	7.9%	19.2%	17.3%	17.1%	26.7%	35.5%	26.5%	11.3%
Don't know/ no response	30.5%	21.4%	21.6%	23.0%	18.1%	10.3%	21.3%	13.8%	9.2%	17.8%	25.7%

Table 14. *Survey respondents' levels of agreement or disagreement with the idea that Forest Service land managers generally consider community members' concerns and opinions when making resource management decisions.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juaab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Strongly disagree	7.2%	5.5%	7.5%	5.8%	12.5%	14.3%	12.1%	19.1%	21.6%	16.4%	8.2%
Somewhat disagree	16.9%	19.5%	17.8%	20.6%	22.3%	20.3%	25.4%	28.7%	26.6%	25.5%	21.5%
Neutral	24.6%	27.5%	25.6%	22.5%	24.0%	26.3%	20.4%	20.7%	14.8%	21.1%	22.4%
Somewhat agree	20.0%	22.9%	19.6%	23.0%	17.4%	22.2%	18.2%	14.0%	22.4%	20.4%	21.0%
Strongly agree	2.5%	3.2%	3.3%	3.7%	3.6%	4.4%	3.9%	4.7%	5.7%	1.8%	1.6%
Don't know/ no response	28.8%	21.5%	26.2%	24.5%	20.1%	12.4%	19.9%	14.9%	9.5%	14.8%	25.4%

Table 15. *Survey respondents' levels of agreement or disagreement with the idea that most BLM land managers have values about resource use that are very different from those of most people living in respondents' communities.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Strongly disagree	4.2%	1.2%	2.2%	3.5%	3.3%	5.2%	4.4%	3.6%	6.6%	5.1%	4.0%
Somewhat disagree	12.5%	12.3%	10.5%	10.2%	4.9%	9.9%	9.1%	8.3%	10.0%	9.2%	10.0%
Neutral	28.5%	29.2%	29.1%	30.7%	21.7%	26.6%	22.6%	21.6%	16.7%	18.6%	27.3%
Somewhat agree	18.6%	23.3%	19.2%	20.1%	29.3%	25.9%	23.1%	25.9%	24.1%	27.8%	20.8%
Strongly agree	10.1%	9.4%	12.1%	9.7%	22.1%	21.6%	23.0%	25.3%	33.9%	25.8%	14.7%
Don't know/ no response	26.2%	24.5%	26.8%	25.8%	18.8%	10.8%	17.7%	15.2%	8.8%	13.5%	23.3%

Table 16. *Survey respondents' levels of agreement or disagreement with the idea that BLM land managers generally consider community members' concerns and opinions when making resource management decisions.*

	Davis Salt Lake Utah Weber	Cache Rich	Box Elder Tooele	Morgan Summit Wasatch	Daggett Duchesne Uintah	Carbon Emery	Piute Sanpete Sevier	Beaver Juab Millard	Garfield Kane Wayne	Grand San Juan	Iron Washington
Strongly disagree	7.4%	5.4%	5.1%	4.8%	12.0%	15.8%	14.3%	21.4%	25.9%	17.4%	7.0%
Somewhat disagree	18.7%	16.1%	20.1%	18.5%	24.8%	23.6%	24.7%	24.3%	25.2%	24.6%	23.2%
Neutral	23.3%	31.3%	25.1%	26.9%	22.4%	23.1%	21.7%	21.5%	16.5%	21.0%	25.6%
Somewhat agree	15.8%	15.9%	19.2%	15.5%	20.0%	22.8%	16.0%	14.8%	19.2%	22.2%	18.6%
Strongly agree	1.7%	2.0%	2.8%	2.1%	1.7%	3.3%	1.4%	3.2%	3.6%	4.1%	3.0%
Don't know/ no response	33.0%	29.3%	27.5%	32.1%	19.0%	11.4%	22.0%	14.7%	9.6%	10.7%	22.7%

STUDY 2. LIVESTOCK GRAZING:

The second special study dealt with livestock grazing on public lands. It consisted of a review of the historical perspective of both the numbers of livestock in Utah and the historical trends of public land grazing, and a survey of livestock operators in Utah (See Appendix 3, Livestock Grazing in Utah: History and Status).

Available data from the U.S. Forest Service, the BLM, the State of Utah, the Department of Agriculture, and others were compiled and reviewed to examine the trends in livestock production in Utah. Findings suggest that there has been a significant shift from sheep production to cattle production in Utah as can be seen in Figures 1 and 2. The data also indicate that the number of cattle in Utah has risen over the past decades.

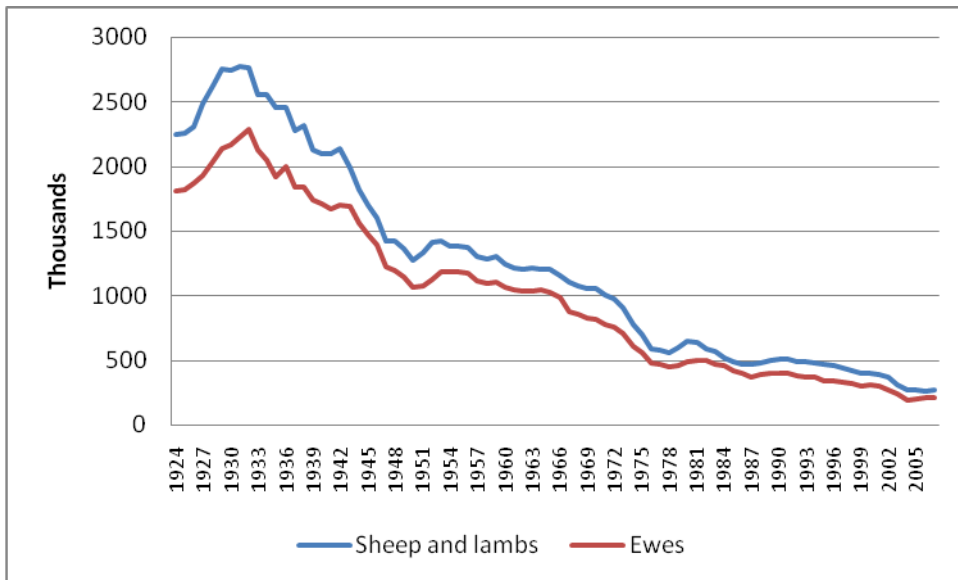


Figure 1. Sheep production in Utah

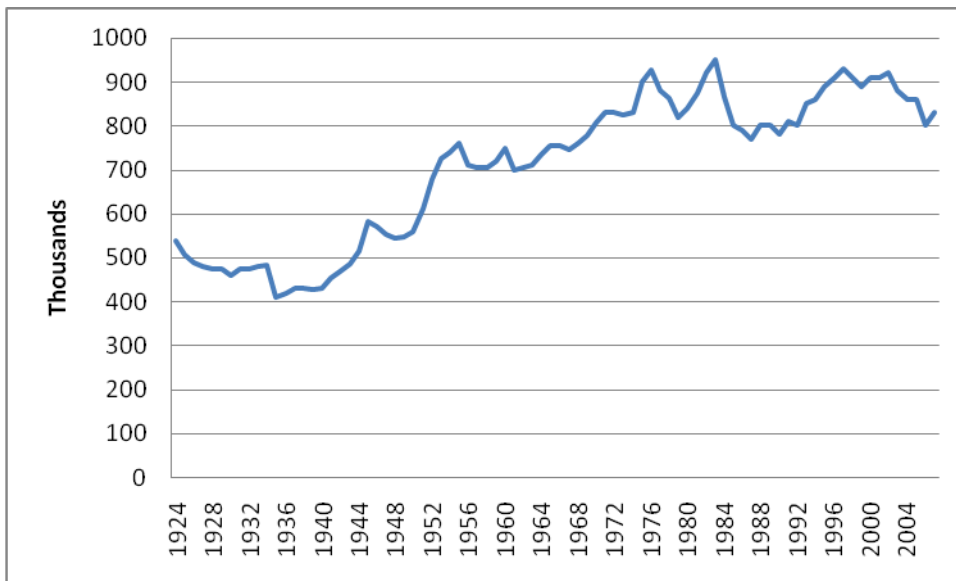


Figure 2. *Cattle production in Utah*

These data sources also show that up to 75% of all farm receipts in Utah are derived from livestock and poultry production. Sheep and cattle production made up approximately one-third of all farm receipts over the past decade. Dairy production added another approximately 20%. Thus, the livestock sector in Utah is a very important part of agricultural production and income in Utah.

Data from the Forest Service and BLM indicate that the permitted grazing use on federal lands has declined. The BLM data show a long-term trend from a high of more than a million animal unit months (AUMs) of cattle grazing in the mid-1950s to slightly more than 500,000 AUMs in 2006 (Figure 3). However, sheep grazing on BLM land has declined from 1.5 million AUMs in the 1940s to less than 250,000 AUMs in 2006. Long-term trend data for the Forest Service suggest that Forest Service grazing AUMs decreased from slightly more than 1,000,000 AUMs in 1940 to slightly more than 600,000 AUMs in 2006. In general, the permitted use of public lands for grazing has declined significantly on both BLM and Forest Service lands. Given these data, it appears that livestock production in Utah is shifting from federal grazing to private grazing.

The second part of the study involved a survey of livestock operators in Utah. To the extent possible, all livestock operators in Utah were identified through Utah Department of Agriculture data, Utah registered brands, the Forest Service, and the BLM. In all, approximately 9,750 livestock operators were identified (note that approximately 300 of these operators were out-of-state residents). A mail survey instrument was designed and mailed to all of these operators. The survey was designed so that operators could self-select into those with federal land grazing permits and those without. Approximately 3,250 usable responses were received, so that the survey represents approximately one-third of all the livestock operators in Utah.

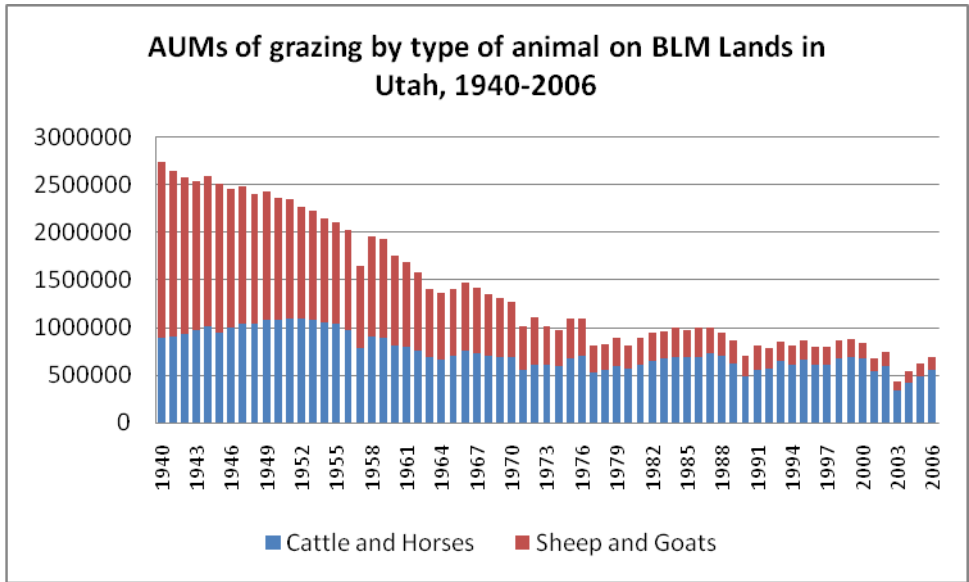


Figure 3. *AUM's on BLM land*

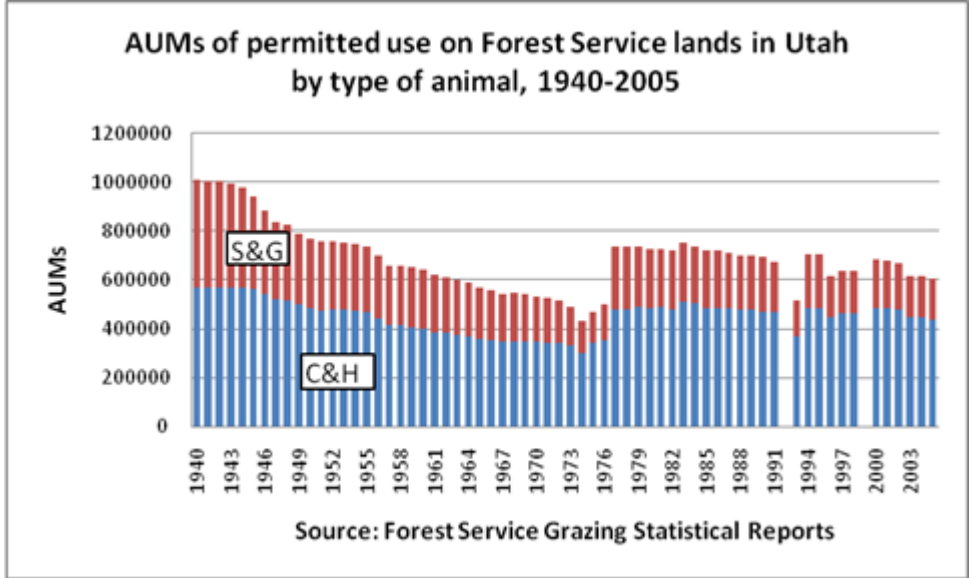


Figure 4. *AUMs on Forest Service land*

The mail survey focused on several aspects of both the operation of the ranch and attitudes or expectations about the future of public land grazing. The data indicated that those who held public land permits to graze (permittees) were strikingly different from those operators who did not hold public land permits (non-permittees). Table 17 presents some of these differences between the two groups in Utah. In general, permittees owned larger numbers of livestock, supported a greater number of household units, depended more heavily on the farm operation for household income, tended to have more longevity, and expected to keep the ranch in the family. Moreover, permittees appeared to substitute federal grazing for pasture. Sources of feed differed substantially for both permittees and non-

permittees across these regions (see Tables 18 and 19). In terms of economic impacts, however, both groups tended to spend about the same proportions of input purchases locally.

Table 17. *Some general results from the survey.*

Characteristic	Permit	No-permit
Average number of cows	162	28
Average number of ewes	766	6
Average number of families per ranch	2	1
Years ranch has been owned by the family	50+	30+
Percent that plan to pass ranch to next generation	75%	52%
Key sources of grazing	Federal lands/ Pasture	Pasture/ Private
Type of operation	Full-time	Part-time
Percent of sales to local firms	57	62
Percent of purchases from local firms	84	84
Percent that have wage & salary income	53	58
Percent that have business income	55	44

Table 18. *Percentage of feed obtained by source and region by non permittees during the grazing season in Utah, 2007*

Region	Pasture	Private range	Aftermath	Other Private	State	Federal	Other
State	78	14	6	1	<1	1	<1
Davis/SL/Utah/Weber	75	9	12	1	1	1	2
Daggett/Duchesne/Uintah	16	17	2	1	14	1	48
Carbon & Emery	62	5	13	3	1	15	1
Grand & San Juan	51	2	1	<1	39	6	<1
Garfield/Kane/Wayne	59	17	6	3	3	13	<1
Iron & Washington	56	19	9	1	2	13	<1
Beaver/Juab/Millard	44	45	6	<1	2	1	1
Morgan/Summit/Wasatch	62	27	2	1	5	3	<1
Cache & Rich	57	28	4	1	2	7	<1
Box Elder & Tooele	67	8	9	13	1	2	1
Piute/Sanpete/Sevier							
Out of state							

Table 19. *Percentage of feed obtained by source and region during the grazing season by livestock operators that have permits to graze on public lands in Utah, 2007.*

Region	Pasture	Private range	Aftermath	Other Private	State	Federal	Other
State	30	11	17	< 1	1	41	<1
Davis/SL/Utah/Weber	34	14	5	2	8	31	6
Daggett/Duchesne/Uintah	24	15	5	4	9	41	3
Carbon & Emery	29	8	14	1	6	41	<1
Grand & San Juan	20	7	4	1	13	55	1
Garfield/Kane/Wayne	21	28	2	1	4	44	<1
Iron & Washington	24	8	5	1	10	52	<1
Beaver/Juab/Millard	48	27	1	<1	3	21	<1
Morgan/Summit/Wasatch	38	10	3	1	1	46	1
Cache & Rich	23	20	8	1	8	40	<1
Box Elder & Tooele	31	14	3	<1	4	47	<1
Piute/Sanpete/Sevier							
Out of state							

A small percentage of non-permittees who had formerly had grazing permits on the public land were identified. For most regions, the percentage was quite small, as can be seen in Table 20. However, for Grand and San Juan counties, the percentage exceeds 50%. The principle reason given for selling or relinquishing permits was difficulty dealing with federal regulations. In fact, when permittees were asked to identify the difficulties facing public land grazing, legal issues, including regulations, were cited as the most problematic, followed by low returns. Finally, both permittees and non-permittees identified fire control as the biggest benefit to public land grazing, and infestation of invasive species and/or weeds as the biggest cost.

Table 20. *Percent non-permittees previously holding permits.*

Region	BLM	Forest	SITLA
State	7	9	2
Davis/SL/Utah/Weber	10	13	4
Daggett/Duchesne/Uintah	8	5	2
Carbon & Emery	24	16	13
Grand & San Juan	52	38	25
Garfield/Kane/Wayne	24	18	10
Iron & Washington	30	20	5
Beaver/Juab/Millard	5	9	2
Morgan/Summit/Wasatch	6	11	2
Cache & Rich	13	8	3
Box Elder & Tooele	14	28	4
Piute/Sanpete/Sevier			
Out of state			

STUDY 3. OFF-HIGHWAY VEHICLE USE

The third special study focused on the preferences, attitudes, activities, and economic impact of Utah off-highway vehicle (OHV) owners.¹ Two reports were compiled: Study 3A examines the preferences and attitudes of OHV enthusiasts; Study 3B focuses on the predicted economic impacts of changing public land policies in Utah.

Study 3A reports that the number of registered OHV owners in Utah has risen 233% over the past decade to more than 170,000 in 2006. Clearly, this segment of the recreation sector is becoming increasingly important both to recreationists and to public land managers. The impacts of OHV visits on the economies of local Utah communities has been debated at length during the process of federal agency planning activities, but little information about those impacts is available. A survey of Utah's OHV owners was developed to assess these impacts.

The survey instrument included six categories of data for each respondents: 1) Most recent trip, including expenditures at the destination; 2) trips within the last 12 months; 3) experience level; 4) activities/motivations; 5) environmental attitudes; and 6) respondent demographics. Each questionnaire was accompanied by a map of Utah from which respondents could identify trip destinations by name and by county. A copy of the questionnaire may be found in Appendix 4, Recreational Off-Highway Vehicle Use on Public Lands in Utah, and Appendix 5, The Economic Impacts of Land Use Restriction on OHV Recreation in Utah. A random sample of 1,500 registered OHV owners in Utah was obtained from the Utah Department of Motor Vehicles with the cooperation of the Utah Division of State Parks and Recreation. Questionnaires were mailed to this sample, of which 84 were undeliverable. Three rounds of mailings were completed, as well as a reminder post card. Six hundred completed questionnaires were returned, a return rate of slightly more than 42%.

As might be expected, Utah owners of OHVs tend to be older than the Utah average head of household and have higher incomes (about 51% with incomes of \$75,000 or more compared to approximately 33% in the 2000 Census). More than 75% have completed at least some college, compared to about 64% reported in the 2000 Census. However, mean number of individuals in the household is consistent with the Utah average. Owners tend to be long-time residents (a mean of 40+ years). About 60% of OHVs are owned by residents of the Wasatch Front (Davis, Salt Lake, Utah, and Weber counties) and an additional 11% in Cache and Washington Counties (peripheral urban). However, the Wasatch Front houses more than 75% of the total Utah population, so that rural residents are relatively more likely to own OHVs than urban residents. Trends in ownership, as determined from two previous OHV studies (1994 and 2001) suggest that average number of OHVs owned is increasing, and this increase is primarily in three- and four-wheeled vehicles.

About 65% of the respondents classified themselves as advanced or expert riders, and another 30% classified themselves as intermediate riders. However, almost 75% of respondents reported preferring "more difficult" trails, rather than "most difficult" or "extreme" trails. OHV owners see the provision of well-signed trails and OHV areas as most important relative to the other four categories. Respondents were also asked to rank the importance of five categories of management, using a 5-point Likert scale (1 being the least and 5 being the most important). The signage had a mean value of 4.08 and was

¹ Snowmobiles are not included in the definition of OHVs for this study.

followed closely by the provision of “information” (4.00), “site maintenance” (3.98), “trailhead facilities” (3.74), and “law enforcement” (3.68) were ranked significantly lower.

Respondents also were asked to indicate their satisfaction with these five categories on their most recent trip. Responses were consistently positive as all of the five categories exhibited a mean score of at least 3.48 on the satisfaction measures (a score of three would indicate neutrality and a score of five would indicate strong satisfaction). The mean scores for “site maintenance,” “signage,” and “law enforcement” were high, 3.67, 3.56, and 3.57, respectively. The other two categories (information and trailhead facilities) saw less satisfaction; however, these categories still exhibited positive levels. It appeared that “information” provision (maps, websites, newsletters, etc., concerning rules, hazards, etc.) is the category with most importance and least satisfaction. It is also clear that OHV owners are a heterogeneous group. Measures indicating various aspects of respondent characteristics, including annual trips, self-assessment, numbers of vehicles owned, and expenditures all exhibited relatively large standard deviations. Respondents were not supportive of fees, including taxes or fees on new OHV purchases, parking fees, or daily use fees. Daily use fees on heavily used areas had the most support, but that was still less than 40%.

Table 21. *Factor and Reliability Analysis of Specialization Dimensions*

Specialization dimension and variable	<i>M</i>	<i>SD</i>
Annual trips to a particular place	0.62	0.81
Self-assessed skill level	3.71	0.80
Preference for trail difficulty	2.10	0.80
Number of vehicles owned	2.92	2.14
Total trips within the past 12 months	10.39	12.80
Percentage of life riding	0.43	0.26
OHV expenses	2,601.98	5,047.18
Miscellaneous: Includes riding apparel, safety gear, emergency supplies, memberships, and entry fees.	163.44	300.16
Lifetime expenditures	30,243.08	37,020.05

The emerging “Benefits-Based Management” approach attempts to link management to users’ perceived benefits. Results from the survey suggested that “stress release and nature appreciation” and “sharing similar values” with other OHV owners were the most important benefits of OHV activity (Table 22). Results from the “environmentally aware” portion of the questionnaire suggested that OHV users, contrary to popular perceptions, tend to be environmentally and ecologically sensitive. A majority of respondents consistently indicated that humans and human uses must be consistent with environmental and ecological constraints. However, most respondents rejected the notion that an ecological crisis is eminent, and that population and natural resource limits have been reached.

Table 22. OHV Owners' Motivations for Riding

(n≥576)	Not important	Neutral	Important
Stress relief and nature appreciation			
• Enjoyment of natural scenery	1.5%	4.1%	94.4%
• Getting away from the demands of life	1.8%	3.8%	94.5%
• Experiencing personal freedom	1.4%	10.7%	87.9%
• Experiencing solitude	2.8%	16.2%	81.1%
• Releasing or reducing built-up tension	3.8%	18.3%	77.9%
Sharing similar values			
• Being with other people who enjoy the same activities that the owner does	5.4%	10.0%	84.6%
• Being with members of a group	4.9%	10.2%	84.9%
Achievement/Stimulation			
• Doing something challenging	10.4%	25.2%	64.4%
• Enjoying a place that is special to the respondent	3.3%	12.2%	84.6%
• Experiencing excitement	6.9%	18.5%	74.5%
• Developing skills and abilities	9.9%	27.7%	62.4%
• Testing the capabilities of their OHV	23.4%	35.1%	41.5%
Learning new things			
• Experiencing new and different things	5.5%	15.2%	79.3%
• Learning more about the natural history of an area	6.8%	21.7%	71.6%
Independence			
• Doing things respondent's own way	10.7%	31.0%	58.3%
• Being in control of things that happen	7.2%	25.3%	67.5%
Teaching and leading others			
• Helping others develop their skills	10.0%	28.4%	61.6%
• Sharing what the respondent has learned with others	8.1%	22.4%	69.5%
• Leading other people	15.6%	40.6%	43.8%
Meeting new people			
• Talking to new and varied people	18.9%	36.1%	45.0%
• Observing other people in the area	27.8%	35.7%	36.6%

Study 3B focused on where OHV riders used their vehicles and how changes in public lands policy would affect where and how often they took a recreational trip. The number of trips taken in the last 12 months was compiled by destination. Table 23 indicates the results. As can be seen, eight counties had visits in excess of 50,000. Expenditure data on the “most recent trip” were collected. These data were compiled by destination county and used in conjunction with the number of trips to determine the impact of OHV use in various combinations of counties.

Table 23. *Number of trips and change in trips by county*

County	Baseline Trips	Change in Trips with New BLM Management Plan	% change in trips by county
Beaver	12,688.11	234.8058	1.85%
Box Elder	20,512.44	379.6027	1.85%
Cache	56,885.03	1,052.713	1.85%
Carbon	26,645.03	-7901.32	-29.65%
Daggett	3,172.028	43.19468	1.36%
Davis	33,412.02	618.3219	1.85%
Duchesne	21,569.79	424.3963	1.97%
Emery	46,100.13	-16,857.9	-36.57%
Garfield	22,627.13	-1,045.52	-4.62%
Grand	23,473.00	-4,082.41	-17.39%
Iron	23,895.94	428.1865	1.79%
Juab	78,454.81	1,451.882	1.85%
Kane	49,483.63	-1335.6	-2.70%
Millard	37,006.99	684.8502	1.85%
Morgan	12,476.64	230.8924	1.85%
Piute	14,168.39	-1146.32	-8.09%
Rich	20,300.98	375.6893	1.85%
Salt Lake	30,028.53	555.707	1.85%
San Juan	18,609.23	-960.944	-5.16%
Sanpete	58,999.71	-2,198.14	-3.73%
Sevier	63,229.08	27,273.26	43.13%
Summit	66,824.05	1,236.644	1.85%
Tooele	74,013.98	1369.7	1.85%
Uintah	18,397.76	-1749.22	-9.51%
Utah	8,8605.3	1,639.727	1.85%
Wasatch	55,616.22	1,029.232	1.85%
Washington	73,802.51	1,365.787	1.85%
Wayne	21,781.26	-3,701.25	-16.99%
Weber	18,186.29	336.555	1.85%
Arizona	17,128.95	316.9878	1.85%
Idaho	74,518.85	1,379.044	1.85%
Wyoming	11,298.36	209.0871	1.85%

The initial number of trips by county was modeled using a standard travel cost modeling approach, which statistically estimates the impacts of distance (travel cost) and other variables on the selection of a site to visit. The other variables used in this model were the presence of specific attributes (“red rocks,” and “sand dunes,” and the amount of open, limited (that is, restricted to specific trails), and closed areas on BLM lands in the particular county. A site-specific dummy variable was also used in the estimation, to account for unspecified quality differences among sites. Some interpolation was required in that

BLM jurisdictions do not coincide with county lines, so where possible the specific destination was identified as to county location. Where that was not possible, the distribution of visits across counties was made from the trailhead location.

The results from the model were consistent with our expectations. All variables with the exception of the site-specific dummy variables were significant, and some of those dummy variables were also significant in some estimations. In particular, the variables associated with the amount of land open, limited, and closed to off-highway vehicle use had the expected signs (positive and negative, respectively).

In order to estimate the impacts of proposed changes in BLM policies toward off-highway vehicle use, the draft and completed RMPs that were available were used to determine the changes in acreages available for open, closed, and limited use. Those changes were then used in the estimated model to predict the changes in use in each county (also presented in Table 23). In general, the predicted changes are quite small for most counties. However, for some counties, particularly in eastern and southeastern Utah, losses of visits were significant, while increases in visits were large in some areas of western and northern Utah. These results should be used with some caution, since the BLM RMPs for northern Utah and some parts of western Utah have not been completed, so that changes in the availability of land for OHV use could not be determined. Thus, the predicted shift of use from eastern and southeastern Utah to northern and western Utah could change significantly if there are large changes in land availability in the RMPs currently in preparation. Moreover, the transportation policies of the Forest Service were not considered, since those data were not available, either.

As indicated above, the questionnaire included information about the expenditures that were made by the respondent on the “most recent” trip. Those expenditures were categorized into the relevant economic sectors in order to estimate the economic impacts of existing trips and of changes in the trips. These analyses were done for groups of counties, consistent with the BLM field offices (as closely as possible) for the associations of governments in the state. In order to estimate these impacts, the number of intra-region trips had to be deducted from the total trips, since in accepted practice, local expenditures (by residents) are not included in impact analyses. Average expenditures in each sector for the destination regions were used in an IMPLAN[®] model to estimate those impacts.

In general, OHV expenditures are a very small part of these regional economies, never exceeding more than about 1.5 % of total employment, income, value added, or RGO. Nevertheless, an important number of jobs and associated amounts of income and value added are due to OHV visitors in several counties and regions. Clearly, the small changes in visits in most counties due to BLM land management policies will have no perceptible effect on these regional economies. The largest proportional change is in Carbon and Emery counties, where about 30% of the jobs and income associated with OHV recreation are lost as a result of reduced OHV use. However, that is less than a 0.1% change in the total local employment. In no case does the change in any economic measure exceed 0.1%. Thus, the impacts of changes in OHV visitation due to the currently planned regulations on OHV use should not have major impacts on any of the regions.

STUDY 4. WATERSHED MANAGEMENT

The fourth special study examined the impact of various kinds of vegetative manipulation on water production. The researchers focused on 39 watersheds in Utah, representative of the various climatic

and hydrologic regimes of the state, as selected by the research team and State of Utah hydrologists (each of the watersheds is identified in the Watershed Management report in Appendix 6, Watershed Management and Water Production Study for the State of Utah). Initially, the research attempted to relate changes in vegetative cover over time to changes in streamflow, as measured at gauging stations in each of the watersheds. Unfortunately, the data available for vegetative cover was inconsistent. Most studies were cross-sectional and the various definitions and descriptions of the vegetative cover differed from study to study, so that no consistent measure of vegetative change could be determined. Even in the two GAP studies, it was not clear that the vegetation categories were consistent, and that study was done for two points in time, eliminating any possibility of statistical analyses. Thus, the study focused on a theoretical analysis of changes in water production with various types of vegetative cover.

Streamflow, temperature, and precipitation data for these watersheds were obtained (for various periods of record, depending on the gauging and climatic stations). These data suggested that temperatures are rising and precipitation falling. Mann Kendall runoff ratio trend analysis results revealed that there is a significant decreasing trend for 14 of the study watersheds, with this trend being highly significant (statistically) in Weber River near Plain City, Virgin River at Virgin, Rock Creek near Mountain Home, Duchesne River near Tabiona, and Sevier River at Hatch watersheds. Analysis of the annual as well as seasonal temperature records revealed that there are increasing temperature trends for most of the watersheds studied. No significant trends in precipitation were seen in any study watersheds. A decreasing trend in runoff ratio (streamflow to area) means that less of the precipitation leaves the watershed in the form of streamflow. In the watersheds where there are significant decreases in the ratio, these decreases may be directly due to diversions, storage, and water use, or due to increases in evapotranspiration due to land use changes or temperature changes. Five of the 39 watersheds examined were HCDN watersheds deemed to be relatively free from direct effects of diversions and use. One of these watersheds, the Sevier River at Hatch (#2201) had a decreasing streamflow and runoff ratio trend. The cause for this is not known, although one reviewer noted that the Sevier River at Hatch has at least four major diversions in it, calling into question its inclusion in the USGS HCDN network of relatively unimpacted streams.

The study used a water balance approach. The sensitivity of streamflow to land cover change for each watershed was evaluated for some potential land cover changes of interest. $\bar{E}/\bar{P} = \phi(\bar{R}/\bar{P})$ (3) where, \bar{E} is the average annual evaporation, \bar{P} is the average annual precipitation, \bar{R} is the mean annual potential or reference evapotranspiration (surrogate for the net radiant energy), and ϕ is a general partitioning function. Budyko (1974) suggested the following partitioning function, ϕ , based upon best fitting to data as:

$\phi(x) = \phi_B(x) \equiv [x(\tanh(x^{-1}))(1 - \cosh(x) + \sinh(x))]^{1/2}$. The generalized Budyko function was used at watershed scale resulting in:

$$E/P = \phi(R/P)$$

A range of Budyko curve parameters ($v=1.5, 2, 10$) were used to explore the sensitivity of the findings to this parameter. The sensitivity to changes in a specific land cover type was evaluated by increasing it and reducing some other land cover types in proportion to their land cover fractions while holding remaining land cover proportions constant.

The changes in streamflow were, in general, close to being linearly proportional to the changes in land cover, so have expressed sensitivity in terms of a derivative that was evaluated numerically using a 10% land cover fraction increase. For example, for a watershed with 40% of a particular land cover type, the sensitivity to change of that specific land cover type would be calculated as

$$S_{v=j}^{lc=i} = \frac{\text{Streamflow}_{50\%} - \text{Streamflow}_{40\%}}{0.5 - 0.4} \quad (10)$$

Streamflow in units of acre-ft/mi²/yr was used, so the sensitivity values were calculated in terms of acre-ft/mi²/yr per fraction change in land cover proportion as reported in Appendix 6.

In general, coniferous forests decrease streamflow, while increasing Range/Shrub/Other increases streamflow. The reduction in streamflow with increasing coniferous forest, regardless of whether the relative potential evapotranspiration coefficient for Deciduous or Coniferous is greater, is due to the generally large area of Range/Shrub/Other that is displaced and has smaller water use in this sensitivity model. Streamflow reductions are calculated to be larger for the case when the relative potential evapotranspiration coefficient for Coniferous is greater. The increase in streamflow with increasing Range/Shrub/Other is similarly due to the generally large area of Forest (either Deciduous or Coniferous) that is displaced and has greater water use in this sensitivity model. An example graph of the relationship for the Tabiona watershed is given in Figure 4. Note that, when the range/shrub land cover is increased, agricultural land cover remains constant. The changes in land cover are proportional for the other three cover types (coniferous, deciduous, and barren). These types of results are available in Appendix 6. Changes in the amount of runoff available depend on the amount of cover types in the watershed, as well as the changes in vegetation (compare Figure 5, changes in runoff for the Sevier River near Hatch, with Figure 4).

The value of additional water generated by manipulation of the vegetation depends upon where it is generated and how it will be used. The value of irrigation water, as reflected in market transactions and in programming models, varies from \$25 to \$75 per acre foot per year, or about \$500 to \$1,500 in perpetuity at a discount rate of 5%. Municipal and Industrial water, on the other hand, can be as high as \$25,000 per acre foot in some areas. Thus, it is difficult to estimate what additional water will be worth; the value depends on location, use, and time.

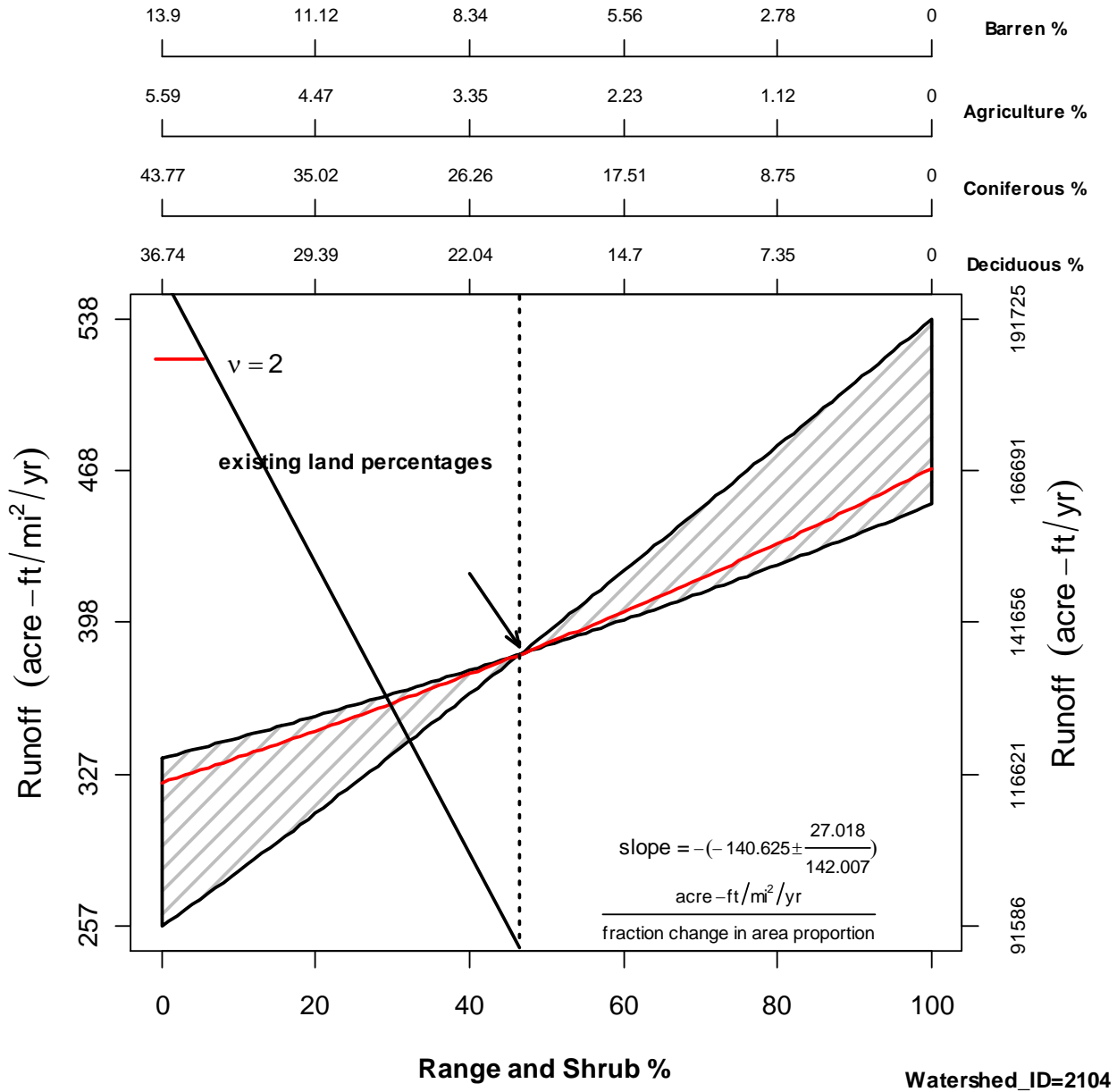


Figure 5. Runoff sensitivity to changes in Range/Shrub/Other land cover percentage in the Duchesne River near Tabiona watershed. Other land cover percentages adjust proportionately. The relative potential evapotranspiration coefficients are: Coniferous 0.8, Deciduous 0.9, Range/Shrub/Other 0.6, Barren 0.5 and Agriculture 1.0. The watershed area is 356.37 mi².

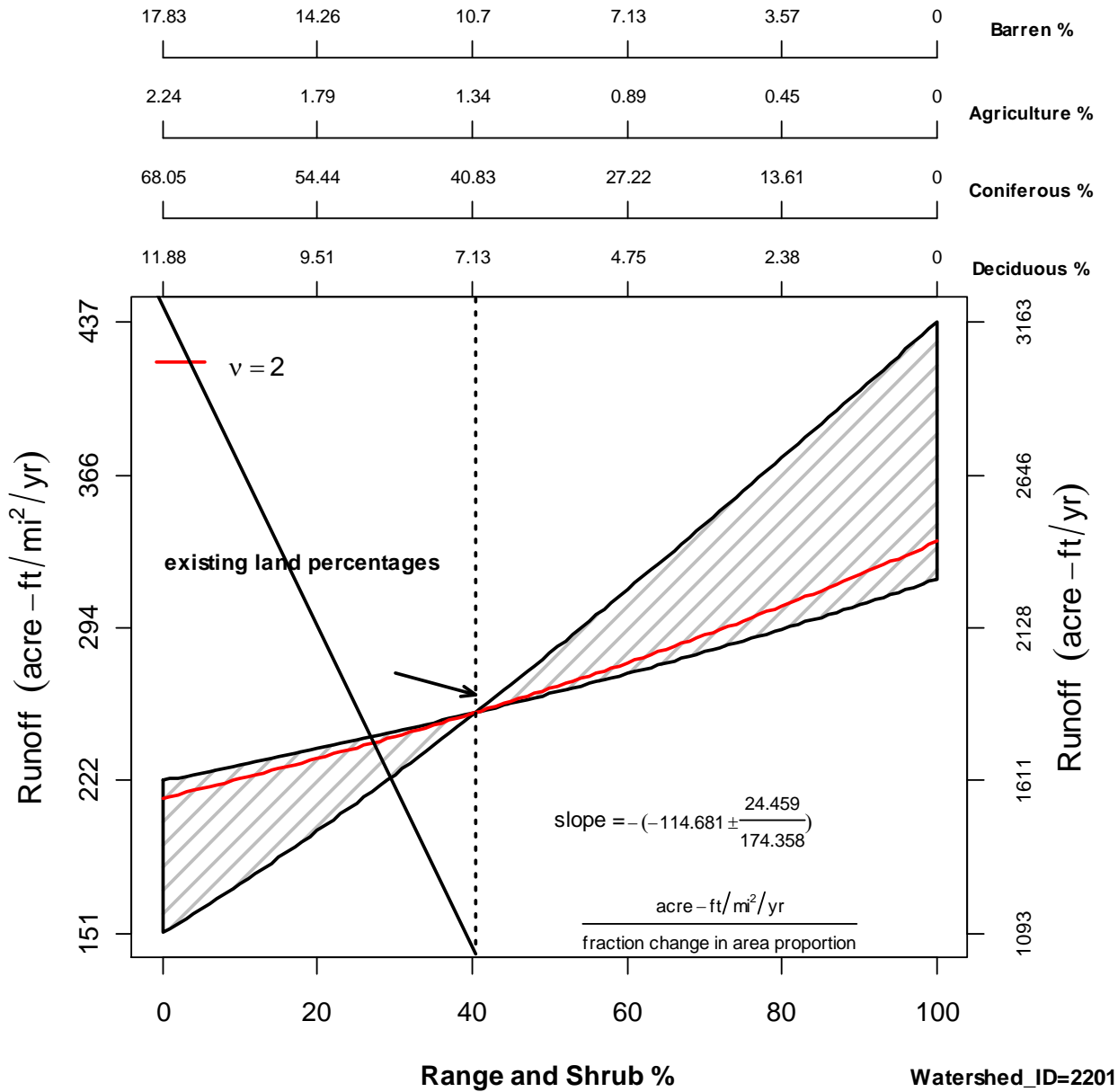


Figure 6. Runoff sensitivity to changes in Range/Shrub/Other land cover percentage in the Sevier River near Hatch watershed. Other land cover percentages adjust proportionately. The relative potential evapotranspiration coefficients are: Coniferous 0.9, Deciduous 0.8, Range/Shrub/Other 0.6, Barren 0.5 and Agriculture 1.0. The watershed area is 335.21 mi².

STUDY 5. WILD AND SCENIC RIVERS

The fifth special study was aimed at determining the potential economic effects on water and land management that might result from the designation of some reaches of Utah rivers as Wild and Scenic (Appendix 7. Impacts of Wild and Scenic River Designation). Economic impact arguments for designation centered around increased tourism; arguments against designation focused on the impacts of designation on uses of public and private land that could curtail traditional uses. These two issues were the focus of the study.

The likelihood of recreational use increases due to designation, the “designation effect,” was examined in a literature review, since there was no effective way to analyze recreation use data and designation in the time frame of the study. There were six major publications identified as related to wild and scenic rivers. The two most frequently quoted studies were from rivers in the eastern United States, the Chattooga River and the Farmington River studies. Neither study directly tested the effect of designation on recreational visits. The latter study examined the changes in land values as distance from the river increased and included a dummy variable for the designation year. No significant effect of designation on land values was found. The former study included a question about changes in visitation with changes in river flows (due to a hypothetical man-made conditions) and respondents indicated that they would take fewer trips. A third study of Colorado residents’ willingness to pay for wild and scenic designation of 11 rivers in Colorado suggested a relatively large value for that designation, but no indication of changes in use rates. Other studies differed in their conclusions about the designation effect, but none had strong analytical foundations. As a result, this study could only suggest that the issue of designation effect for wild and scenic rivers is unresolved, and should be studied carefully when the opportunity arises.

The second aspect of wild and scenic designation was the potential impact on private and public land and water uses which may have resulted in the past. An initial literature review was completed on that topic, as well. There were only three publications found, none of which focused on the specific topic. The Farmington River study reported above looked at land values. There were two studies in the St. Joe and Clearwater rivers that examined the consistency of land values and scenic easement payments. The results suggested that land values did indeed drop as a result of the scenic easements taken by the U.S. Forest Service on the two rivers, but that the easement payments appeared to be consistently determined by the agency. They did not examine the relative value of the land with scenic easements plus the easement payments.

In order to assess a broader scope of impacts, a key informant interview study was done for a set of wild and scenic designations in the western United States. EISs for more than 50 designations were examined, and 16 were selected for use in the study because they appeared to have possibilities of conflicts associated with them (that is, the reaches designated were not in an already protected area, such as National Parks, National Monuments, etc.). These rivers were:

- Arizona:
 - Verde River
- California:
 - Eel River
 - Smith River

- Lower American River
- Kings River, and
- Tuolumne River
- Colorado:
 - Cache La Poudre River
- Idaho:
 - Clearwater/Salmon/Lemhi Rivers
 - St. Joe River, and
 - Owyhee River²
- Oregon:
 - Donner und Blitzen River
 - John Day River
 - Malheur River, and
 - Owyhee River
- Washington:
 - Skagit River and
 - Lower White Salmon and Klickitat Rivers

The interview process included identifying key individuals from the EISs, contacting them, and completing an interview (see Appendix 3, Impacts of Wild and Scenic River Designation).

Each individual was asked to identify others who played an important role in the designation. Those individuals were then contacted. This interview process continued until either the same individuals were being named as possible contacts or the information was repetitive. Approximately 150 telephone interviews were conducted during the study. Responses to these interviews were reviewed and compiled by the study team. Results are as follows:

1. In general, since the law specifies that existing water rights will not be impacted, no evidence of impact on those rights from designation was found. There is currently one case in litigation relative to unallocated “excess” water production on the Lemhi River in Idaho.
2. In several cases, priority dates for potential upstream uses senior to the federal reserved water rights for the designated segment(s) of the river were guaranteed in the specific designation Act or amendment to the Act.
3. Some private land has been obtained by condemnation, although not in the western United States, due to the legal limits placed on land purchase by the Act.

² The Owyhee River in Idaho has not yet been designated as a Wild and Scenic River; however, the process being applied to its designation – the Owyhee Initiative – appears to present some informative possibilities.

4. Scenic easements have been obtained by the managing agency through condemnation of private property, without specific limit in the Act. Agency regulation of activities on those easements has occurred, including limiting both physical and use modifications.
5. The existence of a local (county or regional) planning and/or zoning commission usually provides local input to private land management. Where no zoning exists, the managing Federal agency may control private property uses.
6. There is some evidence of limited ability to construct flood protection on private property in Washington. In general, however, respondents were satisfied with the designation and felt little impact on their private land.
7. Some public land uses (federally permitted uses) have been affected by designation. At least one placer mining claim has been closed and others have been regulated (particularly gravel operations).
8. The largest issue to date appears to be grazing in riparian areas. Several court cases in Oregon have determined that grazing fails to maintain the water quality in the designated segments and grazing has been eliminated in those areas at least until appropriate agency plans are forthcoming that protect the water quality.
9. To date, timber harvest does not appear to have been affected by designation (although timber harvest on Federal land has continued to decline for other reasons).
10. It is the opinion of the researchers that, in order that local users and landowners can maintain their property rights and privileges, local citizens and officials and state officials should become involved in the designation process more deeply than simply providing comments on designation plans. Official committees or task forces made up of local residents and officials, state officials, and Federal managers should be formed to determine what segments are recommended to Congress to be designated.

CONCLUSIONS AND RECOMMENDATIONS

The studies reported above have established a set of baseline socioeconomic data for use in managing the public lands in Utah. The database is, of course, not comprehensive. The researchers recognize that a “static,” one-shot effort is insufficient to determine trends in public land use and the attitudes, perceptions, and economic impacts of those public lands in Utah. We hope that these studies will be augmented with ongoing efforts to update and enlarge the databases and the analyses of public land use in Utah. We hope that the studies provide both information for current decision makers and the impetus for the State of Utah and the public land agencies to support research efforts that will provide information on trends in the relationships among public lands and the various uses and users in Utah.