SHEEPROCK MOUNTAINS VISITOR USE REPORT

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November 2018



INSTITUTE OF OUTDOOR RECREATION AND TOURISM UTAH STATE UNIVERSITY

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An analysis of the types, motivations, and spatial patterns of outdoor recreation use.

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RESEARCH FUNDED BY



Yamaha Outdoor Access Initiative

AND ADDITIONAL SUPPORT FROM





Jack H. Berryman Institute at Utah State University

Institute of Outdoor Recreation and Tourism at Utah State University



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PURPOSE OF THE RESEARCH

The Sheeprock Mountains, located in southern Tooele and northern Juab counties, support a variety of uses. The mountains are a popular destination for camping, hunting, and off-highway vehicle use; they also support domestic livestock grazing operations through public land grazing allotments, and provide important habitat for numerous wildlife species (Chelak & Messmer, 2016).

These uses have co-existed for many years, with many of them well documented through either public records (e.g., grazing leases) or scientific data collection efforts (e.g., vegetation mapping). However, there is very little empirical data detailing outdoor recreation use in the region. The only known data come from two-way traffic counters; data from these counters suggest an increase in vehicle traffic throughout the region over the past several years. Aside from this, very little is known about visitors to the region. A better understanding of visitor use in the Sheeprock Mountains can:

- be used to inform management decisions involving the allocation of limited resources (e.g., personnel, financial, time, etc.) to manage visitor use in the future;
- be used by local trails committees (e.g., the Tooele and Juab County Trails Committees) in their efforts to secure external funds for trail maintenance and improvement projects throughout the region;
- provide local businesses in the outdoor recreation industry with a better understanding of how the area is being used; and
- be used to understand how recreation uses relate to other uses and values.

This report details the first visitor use study to be conducted in the Sheeprock Mountains. We specifically set out to do the following:

- **1.** characterize the types and amount of outdoor recreation use occurring within the region; to
- 2. better understand recreationists' motivations for visiting the area; and to
- 3. identify the spatial patterns of off-highway vehicle use in the area.



STUDY AREA

The Sheeprock Mountains (Figure 1) are managed by a variety of different entities; these include the Bureau of Land Management, the USDA Forest Service, private landowners, and the State of Utah (as both State Institutional Trust Lands and other lands under the jurisdiction of the Utah Department of Natural Resources). The area's climate is characterized by warm, dry summers and cold winters. The elevation of the valleys below the Sheeprock Mountains are at approximately 1500m; these areas are comprised primarily of Wyoming big sagebrush (A. tridentada spp. wyomingensis) crested wheatgrass (Agropyron cristatum), and bulbous bluegrass (Poa bulbosa) (Robinson, 2007). As elevations increase, shrubs and juniper trees (Juniperus spp) become more common, with the highest elevations dominated by black (A. nova) and low sagebrush (A. arbuscula). The area's highest elevation is approximately 2950m.



Figure 1. The Sheeprock Mountain study area.

METHODS

We collected data by intercepting visitors on-site during the spring and summer of 2018. Visitors were contacted during **25 sampling days** between May 4 and September 4, 2018. Sampling days included all holidays during this time period as well as at least one weekday on either side of the holiday; the full sampling schedule is provided in Table 1. We intercepted visitors at developed and undeveloped campsites.

Table 1. Sampling days	Number of days
Friday May 4 - Sunday May 6	3
Saturday May 12	1
Friday May 25 - Tuesday May 29	5
Thursday June 14 - Monday June 18	5
Tuesday July 3 - Wednesday July 4	2
Friday July 20 - Monday July 23	4
Thursday August 30 - Tuesday Sept 4	5
TOTAL	25

The only developed campground is the Vernon Reservoir Campground and most undeveloped camping occurs along Forest Road 005. We asked the adult within the group with the most recent birthday to complete a questionnaire. The questionnaire was brief and administered in person; the full questionnaire instrument is included in Appendix A. Through the questionnaire, we asked respondents to:

- characterize their trip;
- rate the importance and satisfaction of several management issues;
- provide input on their motivations for visiting the region; and to
- describe the sociodemographic characteristics of their group.

The questionnaire instrument was approved by the Utah State University's Internal Review Board.

To learn more about off-highway vehicle use in the area, we also collected data on the spatial behavior of visitors while they were on site; these data were collected via global positioning system (GPS) devices attached, with permission, to sampled off-highway vehicle users' vehicles.

Of 174 groups intercepted, we collected a total of 169 completed questionnaires; this tabulates out to a **97% response rate**. We were also able to collect 64 GPS tracks from groups who brought an off-highway vehicle with them on the day they were contacted.

RESULTS

The characteristics of sampled groups are displayed in Table 2. The average group size was slightly over 7. The largest group contacted had 30 members. The composition of these groups was primarily family. Nearly all (91%) sampled groups contained immediate family members. Only 42.6% contained extended family members and only 24.3% contained friends (this could be either groups of friends or family groups that also brought friends).

Local visitors represent the majority of the groups contacted, as the average distance traveled to the

Sheeprock Mountains was just over 58 miles (Table 3). Off-highway vehicle use was very common in the area, with 65% of sampled groups bringing at least one off-highway vehicle. All-terrain vehicle and utility task vehicle use are equally common with 38.5% of visitors bringing an all-terrain vehicle and 37.9% bringing a utility task vehicle with them. Motorcycles were the least common (16.6%) type of off-highway vehicle brought to the area. However, it was common for visitors to bring multiple all-terrain vehicles, motorcycles, or utility task vehicles with them (Table 3).



Table 2. Group Characteristic		Mean	Std. Dev.	Min	Max
Group Size					
Average group size (no. of individuals)		7.4	5.8	1.0	30.0
Group Composition					
Proportion of total groups containing immediate family members (individuals living in the household)	91.1				
Proportion of total groups containing extended family members (individuals living outside the household)	42.6				
Proportion of total groups containing friends	24.3	-			

Table 3. Trip Characteristics	Percent	Mean	Std. Dev	Min	Max
Time and Distance to Sheeprock Mountains*					
Distance to Sheeprock Mountains (kilometers)		93.6	37.1	0.0	386.5
Distance to Sheeprock Mountains (miles)		58.1	23.0	0.0	240.1
Driving time to Sheeprock Mountains (minutes)		73.4	24.4	0.0	220.0
Off-road Vehicle Use					
Proportion of visitors bringing 4-wheelers (excluding side-by-sides)	38.5				
Proportion of visitors bringing side-by-sides or UTVs	37.9				
Proporton of visitors brining off-highway motorcycles or mini-bikes	16.6				
Proportion of visitors not bringing any off-road vehicle	34.3				
Average number of 4-wheelers (excluding side-by-sides) per group (if at least 1 was brought)		2.3	1.2	1.0	5.0
Average number of side-by-sides per group (if at least 1 was brought)		1.5	0.8	1.0	5.0
Average number of off-highway motorcycles per group (if at least 1 was brought)		2.6	1.8	1.0	7.0
Average number of trips taken per year using an off-road vehicle		5.8	6.8	0.0	30.0
(trip destination not limited to Sheeprock Mountains)					
Trip Length					
Proportion of trips that are overnight	88.2				
Proportion of trips that are day trips	12.4				
Average number of nights stayed (if overnight)		5.0	2.0	1.0	8.0
Average number of hours stayed (if day trip)		2.6	1.1	1.0	7.0
Sheeprock Mountains Visitation					
Average number of visits taken to the Sheeprock Mountains between Easter and Labor Day		2.4	2.0	1.0	12.0
Average number of visits taken to the Sheeprock Mountains at other times of the year		0.5	1.0	0.0	6.0

* Distances are calculated to/from zip codes; 0.0 values indicate trips from the 84080 zip code (likely individuals who live in Vernon).

Most visitors to the Sheeprock Mountains stayed multiple days; 88% of sampled groups reported staying at least one night with the average number of nights stayed being 2.6 (Table 3). Only 12% of sampled groups reported visiting for less than one full day. Of these visitors, the average time spent in the area was 5 hours. The average group visited the Sheeprock Mountains 2.4 times between Easter and Labor Day. Visiting over the winter months is quite rare for the summer visitors we sampled, as the average number of reported trips to the area between Labor Day and Easter was only 0.5. The area is a popular hunting destination in the fall however; limiting our sampling design to the spring and summer months prohibited us from sampling the majority of visitors who come primarily in the fall and winter.

Table 4. Reasons for visiting		
Coming to camp	88.2	
Coming to fish	69.2	
Coming to hike/walk	46.7	
Coming to ride 4-wheelers	40.8	
Coming to ride side-by-sides (UTVs)	39.1	
Coming to sightsee	36.7	
Coming to shoot guns	31.4	
Coming to picnic	29.0	
Coming for wildlife/bird watching	23.7	
Coming to photograph the area	20.7	
Coming to ride motorcycles	17.2	
Coming to hunt	17.2	
Coming for other reasons	15.4	
Coming to visit historical/archaeological sites	10.1	
Coming to geocache	1.8	

Visitors to the area were mainly coming to camp (Table 4). Most visitors also fished, with 69% reporting that they fished at Vernon Reservoir during their trip. Approximately 40% of sampled groups reported riding off-highway vehicles in the area (40.8% reporting riding all-terrain vehicles and 39.1% reporting riding utility task vehicles). This is notable because we expected that off-highway vehicle use would play a much greater role in the interests of those visiting the area. The percentage of respondents participating in each recreational activity is presented in Table 4.

Motivations were measured using well-established Recreation Experience Preference scale items (Manfredo et al., 1996). The Recreation Experience Preference scale items were developed in the late 1970s to identify motivations for engaging in outdoor recreation (Driver & Brown, 1978). The scale is composed of numerous statement items that describe different types of motivations. Visitors to

Table 5. Motivations for visiting	Mean Si	.u. Dev.	
Achievement/stimulation			
To test their abilities	2.92	1.41	
To experience excitement	4.07	1.03	
To develop their skills and abilities	2.87	1.44	
Escape personal/social pressures			
To avoid everyday responsibilities for awhile	4.67	0.71	
To get away from the usual demands of life	4.89	0.38	
To help release or reduce some built-up tensions	4.76	0.59	
Escape physical pressure			
To be away from crowds of people	4.58	0.86	
To get away from the noise back home	4.58	0.90	
To experience tranquility	4.63	0.73	
Family togetherness			
To bring their family closer together	4.59	1.01	
To do something with their family	4.65	0.93	
To do something the family could do together	4.60	1.00	
Learning			
To discover something new	4.25	0.92	
To get to know the lay of the land	4.08	1.14	
To experience new and different things	4.23	0.92	
Enjoy nature			
To be close to nature	4.70	0.57	
To view the scenery	4.62	0.65	
To enjoy the smells and sounds of nature	4.40	0.86	
Similar people			
To be with friends	4.02	1.40	
To be with members of your group	3.95	1.52	
To be with others who enjoy the same things they	4.19	1.25	
Teaching-leading others			
To lead other people	3.26	1.41	
To share what they have learned with others	3.85	1.28	
To teach outdoor skills to others	3.83	1.36	

Table 5 Motivations for visiting

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Note. Questions rated on a 5-point scale where 1 = not important at all, 2 = not very important, 3 = neutral, 4 = moderately important, and 5 = very important.

the Sheeprock Mountains were not motivated by the opportunity to experience *achievement and stimulation* (Table 5). Of the three statement items describing this type of motivation, two had means under the midpoint. Conversely, visitors indicated being highly



Table 6. Importance of and Satisfaction with Site Management	Mean	Std.	Dev.
Importance of			
Information about rules, hazards, and conditions in the area. This includes maps, brochures, newsletters, laws, etc.	1.95		1.18
Bathroom facilities provided in the area.	2.92		1.59
Rules and regulations being enforced by ranger patrols and other enforcement officals in the area.	2.14		1.21
Satisfaction with			
Information about rules, hazards, and conditions in the area. This includes maps, brochures, newsletters, laws, etc.	2.71		1.10
Bathroom facilities provided in the area.	2.79		1.00
Rules and regulations being enforced by ranger patrols and other enforcement officals in the area.	2.57		0.95
Level of concern over how off-highway vehicle use impacts the area	3.43		1.51

moderately important, and 5 = very important. Satisfaction questions rated on a 5-point scale where 1 = not satisfied at all, 2 = not very satisfied, 3 = neutral, 4 = moderately satisfied, and 5 = very satisfied.

motivated by the opportunity to experience family togetherness, to enjoy nature, and to escape personal and social pressures. Motivations to escape personal and social pressures received notably high ratings. "To get away from the usual demands of life" was the highest rated scale item with a mean at 4.89 and a standard deviation of only 0.38.

We asked visitors about their opinions on three management actions (Table 6). Visitors rated each of the three actions based on both how important it was to their group as well as how satisfied they were with it during their visit.

On average, visitors did not believe it was important for management agencies to provide "information about rules, hazards, and conditions in the area" (Mean = 1.95, Std. Dev. = 1.18) or to have "ranger patrols or other officials enforce rules and regulations" (Mean = 2.14, Std. Dev. = 1.21). Visitors, on average, were neutral (Mean = 2.92, Std. Dev. = 1.59) about the importance of "bathroom facilities provided in the area." By and large, visitors were neither notably satisfied or dissatisfied with "information about rules, hazards, and conditions in the area", the "enforcement of rules and regulations by ranger patrols or other enforcement officials", or the "bathroom facilities provided in the area.

The sociodemographic characteristics of visitors are provided in Table 7. The average age of visitors was 43. Nearly one-fifth (19.7%) of sampled visitors reported having a four-year degree. A third (36.9%) only had a high school education. By far the majority of visitors were married (75.0%) and had at least one child.

Visitors' spatial use patterns gathered from the voluntary GPS tracking revealed a preference for

Tuble 71 boologiculting rupine characteristics	rercent	Mean St	u. Dev.
Age		43.3	13.4
Highest level of education completed			
Less than high school	2.4		
High school	36.9		
Some college	20.8		
2-year degree	20.2		
4-year degree	13.7		
Advanced degree	6.0		
Marital status			
Single	23.2		
Married	75.0		
Divorced/Separated	1.8		
Children under the age of 18 living in the household	(C	1.3	1.4

Table 7. Sociodemographic characteristics Percent Mean Std. Dev.

existing roads, particularly those close to Vernon Reservoir (Figure 2). High concentrations of tracks were observed on Forest Road 005. While a few of the tracks used single track trails and smaller two track trails, the highest concentrations of use are on roads. The tracks also revealed several loops, some of which exceed 70 miles (113 km) in length. Several roads in the area access summits and pass through steep terrain. Many of these were used by the off-highway vehicle users tracked in this study.



Figure 2. Spatial use patterns of outdoor recreationists using off-highway vehicles.

DISCUSSION

These data shed new light on the outdoor recreation use of the Sheeprock Mountains. Many of our findings have clear implications for how the area may be managed in the future.

First, our analysis determined the average group consisted of more than 7 individuals and that most (88.2%) visitors were camping on their visit. Currently however, there is only one developed campground in the area (at Vernon Reservoir). Knowing that visitors are coming, and more than likely camping, in such large groups, future management efforts should focus on building developed campsites to accommodate the current demand and observed use patterns. If increasing the number of developed campsites within the region is not feasible, local trails groups would be well positioned to advocate for funding to either educate visitors about low-impact dispersed camping or to sign established dispersed camping locations so that future dispersed camping is concentrated to existing campsites. Local outdoor retailers can also use the knowledge that visitors are coming, and most likely camping, in such large groups. For example, these retailers can informally promote the area's appeal as a hot-spot for large overnight social gatherings. Second, the data also revealed that over two-thirds (69.2%) of visitors fished at Vernon Reservoir during their visit. This was substantially more than those who rode all-terrain vehicles (40.8%), utility task vehicles (39.1%), or motorcycles (17.2%) in the area. Off-highway vehicle use is not the primary summer outdoor recreation activity participated in by visitors to the area. We advise the Utah Division of Wildlife Resources to consider improving the quality of fishing opportunities at Vernon Reservoir (e.g., improving access, increased stocking, etc.).

Third, the data clearly suggested visitors were not motivated by the opportunity to experience achievement and stimulation. Rather, they were more motivated by the opportunity to experience family togetherness, to enjoy nature, and to escape personal and social pressures. The various management entities present in the Sheeprock Mountains should prioritize actions that enhance these opportunities (e.g., installing or maintaining picnic areas in developed areas) over actions that enhance opportunities for visitors to test their skills and abilities (e.g., developing more technical trails or play areas). Local trails committees should also consider using these data to demonstrate the majority of off-highway vehicle users throughout the region use the area to socialize with family and friends and that the area does provide clear social and psychological benefits to visitors.

Fourth, visitors were neither satisfied or dissatisfied with "information about rules, hazards, and conditions in the area", the "enforcement of rules and regulations by ranger patrols or other enforcement officials", or the "bathroom facilities provided in the area." There appears to be room for improvement in all three of these areas. The various management entities present in the Sheeprock Mountains should seek ways to inform visitors about rules, hazards, and conditions in the area. This information does not necessarily have to be presented on-site. Managers may see benefits from partnering with local trails committees and local outdoor retailers to disseminate information (e.g., announcements through e-mail lists managed by local trails committees or brochures distributed at local offhighway vehicle retailers). It is unclear whether more "enforcement of rules and regulations by ranger patrols or other enforcement officials" is needed, as this study did not attempt to document any environmental impacts caused by outdoor recreation use in the area.

Collectively, this study provides a better understanding of visitors to the Sheeprock Mountains, including information about who they are and how they are using the area. This information is a valuable source of preliminary data that may assist with managing the area for multiple uses. The findings from this study should be considered in conjunction with data on other uses to allocate limited resources (e.g., personnel, financial, time, etc.) in such a way that visitor use is accommodated alongside other uses such as grazing and the protection of critical wildlife habitat.

LIMITATIONS

There are a few limitations to this study that should be considered while interpreting the findings. Because the study was conducted during the summer months, our findings may not reflect the opinions of visitors coming during the fall and winter. Also, since sampling occurred at campsites and not fixed locations, it is possible that some visitors were not sampled because they were either not present at their campsite when the interviewer came by, or because they left the area before they could be contacted.

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References

2018 Sheeprock Mountains Visitor Use Survey

1. What is your zip code at your primary residence?

ZIP_____

- 2. If you brought off road vehicles with you on this trip, how many are in each of the following categories?
 - a. Off-highway motorcycles or mini-bikes ____
 - b. 4 Wheelers (excluding side-by-sides)
 - c. Side-by-sides or UTVs
 - d. Other, please specify:
 - e. I did not bring an off road vehicle with me on this trip
- 3. How many people are in your group today?
- 4. How many of those people are...
 - a. Immediate family (individuals living in your household)?
 - b. Extended family (individuals living outside your household)?
 - c. Friends?
 - d. Others, please specify:

5. How long is your trip to this area?

- ____ Nights if overnight
- ____ Hours if a day trip

6. How frequently does your group visit this area between Easter and Labor Day?

Trips	per	summer	season

7. How frequently does your group visit at other times of the year?

____ Trips during other seasons of the year

8. If you brought off road vehicles with you on this trip, how many other trips do you make each year specifically to drive or ride off road?

____ trips

9. What are the main reasons your group comes to this area? Check all that apply.

Camping	Riding 4-Wheelers	Riding Motorcycles
Riding side-by-sides (UTVs)	Fishing	Shooting
Hunting	Wildlife/Bird watching	Photography
Hiking/walking	Picnicking	Sightseeing
 Visiting Historical/Archaeological sites 	Geocaching	Other, please specify:

10. How IMPORTANT is it to your group that there is information about rules, hazards, and conditions in this area? This includes maps, brochures, newsletters, laws, etc...

Not important at all	Not very important	Neutral	Moderately important	Very important

a. How SATISFIED is your group with the availability of information about rules, hazards, and conditions in this area?

Not satisfied at all	isfied at all Not very satisfied Neutral Moderately satisfied		Very satisfied	

11. How IMPORTANT to your group is it that there are bathroom facilities provided in this area?

Not important at all Not very important		Neutral	Moderately important	Very important

a. How SATISFIED is your group with the bathroom facilities provided in this area?

Not satisfied at all	Not very satisfied	Neutral	Moderately satisfied	Very satisfied

12. How IMPORTANT is it to your group that rules and regulations are enforced by ranger patrols or other enforcement officials in this area?

Not important at all	Not very important	Neutral	Moderately important	Very important

a. How SATISFIED is your group with the enforcement of rules and regulations by ranger patrols or other enforcement officials in this area?

Not satisfied at all	Not very satisfied	y satisfied Neutral Moderately satisfied		Very satisfied

13. What is the main purpose of your group's trip to this area today?

a. Using the following list, please indicate how important each item is to your group for this trip.

	Not important at all	Not very important	Neutral	Moderately important	Very important
To develop your skills and abilities.					
To test your abilities					
To experience excitement					
To do something with your family					
To bring your family closer together					
To do something the family could do together					
To be with members of your group.					
To be with others who enjoy the same things you do					
To be with friends					
To experience new and different things					
To discover something new					
To get to know the lay of the land					
To view the scenery					
To be close to nature					
				(continued on r	next page)

Please indicate how important each item is to your group for this trip.

	Not important at all	Not very important	Neutral	Moderately important	Very important
To enjoy the smells and sounds of nature					
To teach your outdoor skills to others.					
To share what you have learned with others					
To lead other people.					
To get away from the usual demands of life.					
To avoid everyday responsibilities for awhile					
To help release or reduce some built-up tensions.					
To experience tranquility					
To be away from crowds of people					
To get away from the noise back home					

14. How concerned are you about how OHV use impacts this area?

Not at all concerned	Slightly concerned	Somewhat concerned	Moderately concerned	Extremely concerned

15. In what year were you born?

16. What is the highest level of education you have completed?



APPENDIX A: SURVEY INSTRUMENT, CONTINUED

17. What is your present marital status?

Single
Married
Separated/Divorced
Widowed

18. How many children do you have under the age of 18 in your household?

_____# of children

Thank you for your participation in this survey!

Your answers will help inform managers about how to best meet the needs of recreationists like yourself.





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