Monitoring Horse Riding Use and Understanding Visitor Perceptions of Current and Proposed Conditions at Ozark National Scenic Riverways

Research to Inform the Roads and Trails Plan

A Report to the Management Staff
Ozark National Scenic Riverways

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Abstract

This study examined the number of horse riders and hikers across several seasons and locations throughout Ozark National Scenic Riverways. Additionally, a quantitative questionnaire was administered to horse riders and hikers to understand their perceptions of current conditions and proposed management scenarios at the park. The questionnaire was administered to 456 onsite visitors from April 2016 to October 2016. Researchers also conducted counts of horse riders at the park during periods of high and low use from October 2015 to October 2016. The results of this study may have implications for how different types of use at different locations, during different times of year are managed at the park.

Prepared by faculty and staff in the Park Management and Conservation program at Kansas State University.

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Photos by Ryan L. Sharp and Susi Algrim

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EXECUTIVE SUMMARY

Project Overview

The National Park Service (NPS)'s enabling legislation (the Organic Act of 1916) mandates park managers to protect and maintain the natural and scientific values of the park and to provide for public outdoor recreation (NPS, 2000). The need to balance increasing recreation demands with resource conservation in parks and protected areas presents a challenge for managers. Managing recreational use of large land and/or water areas often involves concerns about increases in numbers of recreation visitors (Chilman & Vogel, 2001). In 2016, Ozark National Scenic Riverways (OZAR) had 1,241,480 recreation visitors (NPS, 2016). Horse riders are a sub-group of recreation visitors that can have disproportionate impacts. This is due to the nature of the activity (e.g., presence of horses, large groups) and the fluctuating seasonal use (e.g. extremely high use during summer and fall). Typical impacts of horse riding include soil erosion and compaction, damage to vegetation, wildlife disturbance, and water pollution. Parks and protected areas require diligent monitoring of these impacts. Along with biophysical impacts, potential social conflicts usually revolve around shared trail use with other horse riders, mountain bikers, and/or hikers.

This study, a continuation of a 2001 project (Trail rider counts and surveys at Lower Jacks Fork River area at Ozark National Scenic Riverways, Chilman & Vogel), conducted horse rider counts over a 10-day period in October 2015 and 4-day periods in April 2016, May 2016, June 2016, July 2016, August 2016, September 2016, and October 2016 at five locations throughout OZAR. Data were collected about levels and patterns of visitor activities on trails at OZAR. Questionnaires were also self-administered to hikers and horse riders during the final three data collections (August 2016, September 2016 and October 2016). There were 456 questionnaires completed, with a response rate of 55%.

The questionnaire was used to examine visitors' perceptions of potential management scenarios regarding horse-riding trails along with gathering demographics and park visitation history. Data for this study were obtained via intercept questionnaire of a random sample of horse riders at OZAR. The sample frame for this study was individuals over 18 years of age who visit OZAR for horse riding (four of the locations) and hiking (one of the locations). Data were collected via stratified random sample at multiple locations in order to capture a representative sample of visitors throughout the park. Each location was identified by the park as a desired sample site. The locations identified were: Cedargrove/Flying W (Cedargrove for the first data collection in October 2015 and Flying W for the remaining data collections, due to the park identifying Flying W as a more suitable site), Susie Nichols Cabin, the park boundary at County Road 19-203, Shawnee Creek Campground, Alley Spring, and Rocky Falls.

Key Findings

General Findings

- The majority of visitors intercepted for the questionnaire were repeat visitors (89%), and the average number of visits in the past 12 months was 4.79.
- Females represented 51% of the sample, with 34% of the sample being between 50 and 59 years of age.

- Horse riding (90.3%), camping (29.6%), and visiting historic sites (12.3%) were the three most reported activities.
- Of the conditions at OZAR, there were slightly lower scores for marking of trails. This may be due to the high number of social trails. As these are not marked, but heavily used, there may be confusion among horse riders as to official trails, which warrant signage, and social trails.

Opinions about management conditions and quality of the park's natural resources

- Visitors generally rank the quality of OZAR services and experiences as high
    - For example, 74.9% of respondents reported that the water quality at OZAR was extremely acceptable
    - 55.6% reported that trail conditions at OZAR were extremely acceptable
        - 32.2% reported they were moderately acceptable
    - 28.4% of respondents reported the marking of trails at OZAR was extremely acceptable
        - 34.3% reported moderately acceptable
- Visitors reported that they disagree with management implementing any type of permit system, use limits, and/or requirement of education on low impact trail practices
    - For example, 34.5% of respondents reported that they strongly disagree with OZAR implementing a *free permit system*
    - 49.5% reported that they strongly disagree with OZAR *requiring users to be charged a fee for a permit*
    - 46.1% reported that they strongly disagree with OZAR implementing an *annual permit system* for trail use
    - 53.4% of respondents reported they strongly disagree with OZAR implementing a *daily permit system*
    - 51.1% of respondents reported they strongly disagree with OZAR *limiting the maximum group size on trails*
    - 54.1% of reported that they strongly disagree with OZAR *limiting the maximum number of groups on the trails*
    - 30.7% of respondents strongly disagree with OZAR *designating trails based on activity type*
    - 50.8% of respondents reported they strongly disagree with OZAR *limiting trail-related river crossings*
    - 38.3% of respondents reported they strongly disagree with OZAR *requiring education on low impact trail practices*.

General perceptions of crowding

- Visitors do not perceive current conditions at OZAR as crowded, with 40% of all respondents reporting feeling "not crowded."

The perceived appropriateness of other trail activities

- 72.1% of respondents reported that horse riding is an appropriate trail activity at OZAR
- 43% of respondents reported that hiking is an appropriate trail activity at OZAR

- 31.9% of respondents reported that mountain biking is neither an inappropriate or appropriate trail activity at OZAR.

Management Implications

- The high number of social trails may be partially responsible for visitors' high levels of satisfaction with current conditions (including the lack of perceived crowding)
- There were few meaningful differences between weekend/weekday visitors and summer/fall visitors across the management scenarios. This suggests that managers may not need to manage these groups differently. Most management may revolve around and focus on the pulses of use (e.g. trail rides). Trail rides are weeklong events where thousands of riders congregate and travel on horses around the park on the trails and county roads.
- There is an opportunity to incorporate this study and the Park (2011) study to inform the Roads and Trails Plan.

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1.0 Introduction and rationale

The beauty and wonder of the national park units around the nation are a major draw for many people enjoy, and provide opportunities for recreation, solitude, and family/friend outings. Different recreational activities have different impacts on the environments in which they occur. Trampling is the most prevalent impact of recreation and nature tourism (Cole, 1987, 2004); other impacts include erosion, rutting, muddiness, and compaction. Many impacts from horses are similar to those from hiking, particularly soil compaction and erosion, loss of organic litter, loss of ground cover vegetation, loss of species, trail erosion and widening, and potentially the spread of weeds and pathogens into natural vegetation (Pickering et al., 2010). The appropriateness of conducting these activities in some locations is contentious because of their potential to degrade trails, natural vegetation and soils, and to disturb wildlife (Watson et al., 1993; Liddle, 1997; Marion & Wimpey, 2007; Newsome et al., 2008; White et al., 2006).

The main difference between the hiking and horse riding is the severity of impacts. For example, the greater weight of horses can result in more damage to vegetation and soils than hiking (Weaver & Dale, 1978; Liddle, 1997), and grazing by horses can result in more damage to grasses and other palatable species (Newsome et al., 2004, 2008; Carter et al., 2008).

Although going to parks is promoted (e.g., Find Your Park, the NPS's centennial promotion) as a genuine natural experience, when visitation increases, so do the impacts. Associated with this increasing visitation are human disturbances and impacts to the environmental conditions of public parks, forests, wilderness, and private lands open to visitation (Monz, Cole, Leung & Marion, 2010). Due to the relationship between visitation and impacts, managers may seek to mitigate impacts and manage use. In areas of higher conservation or archeological value, management action may be needed to reduce or redirect the use elsewhere. These actions need to be founded on specific empirical evidence regarding the use conditions. For example, the numbers and types of visitors, their distribution in location and time, and the visitors' preference for recreation visit conditions.

Impacts from horse riding on trails are often due to the large ground pressure associated with horses which can alter [trail] surfaces (Whinam & Comfort, 1996; Liddle, 1997; Newsome et al., 2004). Direct alteration to the surface of trails can have flow effects, with trail widening, increased depth of [trail], exposure of tree roots, loss of vegetation on the side of trails, and changes in hydrology along the trail and in adjacent areas (Harris, 1993; Whinam and Comfort, 1996; Newsome et al., 2002, 2004). When horse riders take informal (social) trails, the impacts to the natural environment can be more severe. Impacts of horse riding off trail are far greater due to direct trampling of vegetation (Whinam et al., 1994; Newsome et al., 2002, 2004). Damage to vegetation along informal trails can be so great that it often results in the loss of all vegetation cover, with exposure of the litter and soil surface (Pickering et al., 2008).

Social trails are very relevant to this study because OZAR currently has 90 miles of undesignated (informal) equestrian trails, and only 23 miles of designated trails. Many of the undesignated trails have resulted in damage to natural resources, and have made navigation of the trail system difficult for many users (Ozark National Scenic Riverways 2014 General Management Plan).

Due to the impacts these recreation activities have on their surrounding environments, it is crucial that managers of these parks and protected areas assess both social and environmental impacts. The first step in assessing impacts of a recreational activity, in protected areas, is to ensure there is adequate visitor data for the park, including information on the frequency, timing,

and location of visitors (Eagles et al., 2002; Buckley, 2003, 2004; Hadwen et al., 2007). This study's aim is to collect all the previously mentioned data at OZAR.

This study is a continuation of a study conducted by Chilman and Vogel (2001), who explored the numbers and types of visitors to OZAR, their temporal-spatial distribution , and their preferences for recreation conditions. One finding from that study was that of the 144 respondents, 61.4% suggested an improvement to trail conditions by installing trail markers, trail signs, and overall marking of the trails. Another major finding was that the trails were less impacted than expected, possibly due to the rocky nature of Ozark soils (Chilman & Vogel, 2001). There also appeared to be very little contact or conflict with other trail users, such as hikers, mountain bikers, or all-terrain vehicles (Chilman & Vogel, 2001).

1.1 Objectives

This project provides research support for the Roads and Trails Plan consistent within OZAR General Management Planning (GMP) efforts.

- Horse Count Data:
    - Collect an updated assessment of current use to better understand long tem trends and increasing demand, particularly as related to special event rides which bring significant volumes of use into the park at one time
    - Provide research results to inform the selection of indicators and thresholds
- Questionnaire Data:
    - Understand perceptions of users (horse riders and hikers) for the following:
        - Management scenarios
        - Understand influence of temporal and spatial boundaries (e.g. location, season, day of use).
        - Help inform Roads and Trails planning process

2.0 Methods

The study was approved by the Kansas State University Institutional Review Board (#7873) on September 15th, 2015. Additionally, the questionnaire was approved by the Office of Management and Budget (#1024-0224) on July 22nd 2016. Data was collected over 29 week days and 9 weekend days (Saturdays and Sundays) from October 2015 to October 2016 and 20 of those days were collected during known trail rides (i.e. periods of high use). Trail rides are weeklong events where thousands of horse riders congregate and travel park trails and county roads.

2.1 Horse count data collection, management and analysis

Horse counts were conducted on each of the sites at Ozark National Scenic Riverways: Alley Mill, Shawnee Creek campground, and at the park boundary on County Road 19-203. Two

locations in the Upper Current were split (5 alternating days each in October 2015, and 2 alternating days each in all of the 2016 data collections). Researchers collected data on-site from 8am to 3pm each day of the sampling period. Data included recording the number of horse riders (group size), and whether they were entering or exiting the park (where applicable). Additionally, one researcher was stationed at Powell Crossing (Figure 1) to record how many riders crossed the river at this location (data was collected here during three of the trips to OZAR), how long they stayed in the water, and whether the horse defecated in the river while crossing. Data were then entered into the Statistical Package for the Social Sciences (SPSS), and basic descriptive statistics were analyzed.

The time and location of data collection was designed to replicate, as closely as possible, sampling locations from past studies (Chilman and Vogel, 2001). However, there were certain limitations to replicating the collection of data. The original study did not clearly state where the researchers were positioned at the sampling locations. For example, the 2001 study states that the researchers were placed at the "campground area" in Shawnee Creek Campground. This is a large area and the description provided is open to a great deal of interpretation. Also, it is unclear where the researchers for the 2001 study were positioned in relation to the Cross Country Trails Rides establishment. Additionally, new locations were added in an effort to capture baseline data about levels, types, patterns, and impacts from visitors in the Upper Current, as data had not been previously collected for this area. For this data collection effort, all research was conducted within NPS boundaries. There were some days during data collection that were affected by weather and unforeseen circumstances (e.g. weather/lightning and a downed tree, preventing us from getting to the research site).

2.2 Visitor questionnaire: Design

OZAR visitors completed a questionnaire focused on potential management actions, perceptions of crowding, visitation history, and reasons for visiting OZAR (Questionnaire; see Appendix A). The researchers used standard best practices for questionnaire construction, such as those set forth by Vaske (2008) and Dillman (2007). The sites listed in Section 2.1 (depicted in Figure 1.0b) were chosen in coordination with Park staff to give a good representation of equestrian use throughout the park. Each of the questions that warranted a gradient of responses were presented on a 7-point Likert scale, ranging from -3 ("extremely unacceptable") to +3 ("extremely acceptable"), with a midpoint of 0 (neither unacceptable or acceptable).

2.3 Visitor questionnaire: Sampling design and locations

Questionnaire data for this study were obtained via self-administered intercept questionnaire of a random sample of 451 visitors at OZAR (Figure 2.4*b* and 2.4*c*). The sample frame for this study was individuals over 18 years of age who visit OZAR for hiking and/or horse riding. Data were collected via stratified random sample, stratified by days of the week and hours of the day, and by sites (Table 2.4*a*). Trained research assistants (Kansas State University students) approached each visitor or group, informed them about the study, and invited them to participate. Participants were asked to complete the questionnaire while they tethered their horse, and congregated with other horse riders in their group. Based on research assistant feedback, many horse riders intercepted on the County Road location had already completed the questionnaire at

the Shawnee Creek intercept location, which is reflected in the number of questionnaires collected on the County Road. There were 28 days total of data collection (horse and hiker counts) and 12 days of questionnaire sampling.

2.4 Horse river crossing: Sampling design and location

A researcher was stationed at Powell Crossing to record how many riders crossed the river at this location, how long they stayed in the water, and whether or not the horses defecated in the river while crossing.

Table 2.4*a*. *Sampling dates for questionnaire, horse counts, and river crossing counts*

	Horse Counts	Questionnaire Collection	River Crossing Count
October 1-10, 2015	X		X
April 21-24, 2016	X		
May 23-26, 2016	X		
June 13-16, 2016	X		
July 13-16, 2016	X		
August 3-6, 2016	X	X	X
September 2-5, 2016	X	X	
October 1-4, 2016	X	X	X

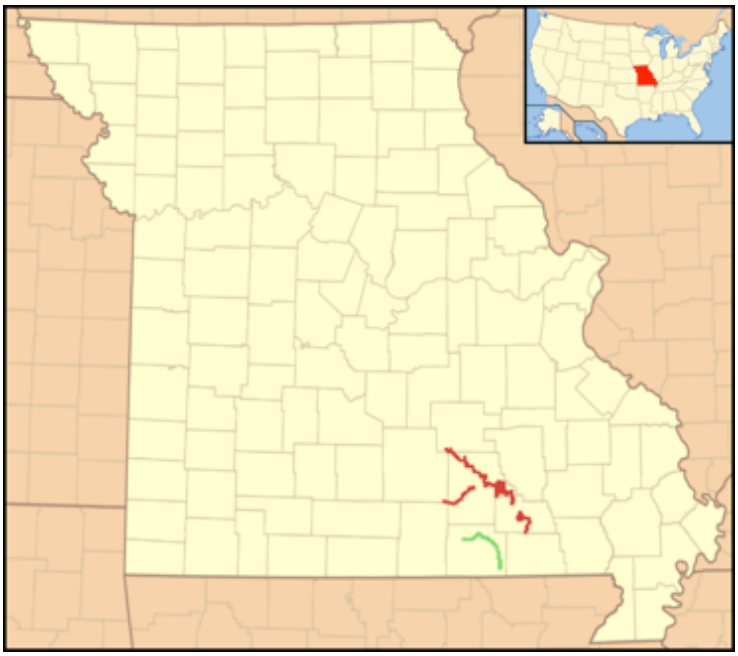

Figure 2.4a. Location of Ozark National Scenic Riverways (outlined in red)

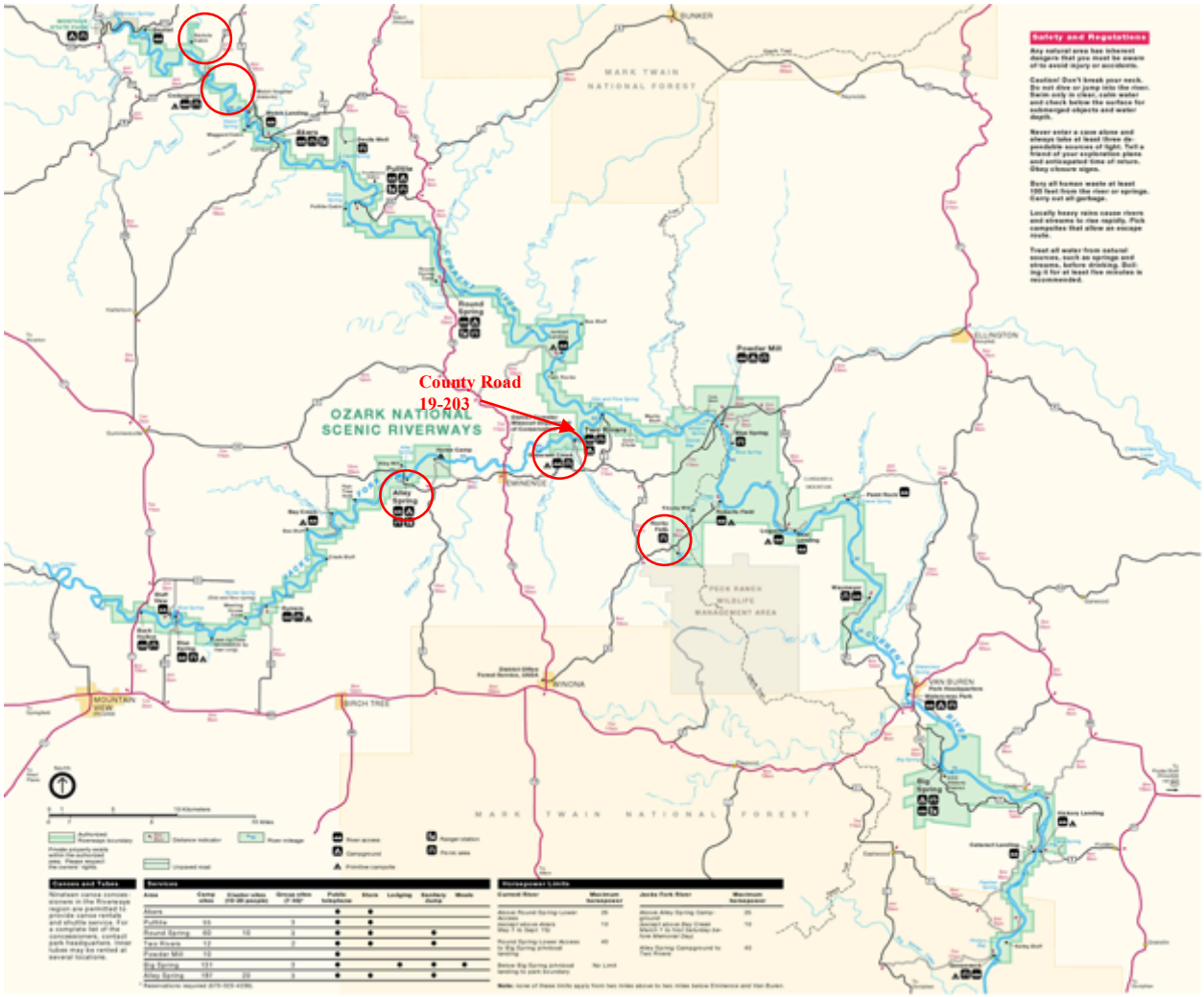

Figure 2.bc. Detailed Map of Ozark National Scenic Riverways showing areas of study

Figures 2.4*c* - 2.4*j* represent the locations that sampling occurred for both the horse counts and the questionnaire administration. The figures also include GPS coordinates for each sampling location. The red circles on the picture further point to the location of each sampling site.

Figure 2.4c. Rocky Falls data collection site. (37° 5’ 42.04” N 91° 12’ 7.068” W)

Figure 2.4d. Shawnee Creek data collection site. (37° 10’ 8.76” N 91° 18’ 3.252” W)

Figure 2.4e. Powell Crossing data collection site. (37° 10’ 29.802” N 91° 18’ 18.708” W)

Figure 2.4f Alley Spring data collection site. (37° 9’ 2.47” N 91° 26’ 26.7” W)

Figure 2.4g. County Road data collection site. (37°10'17.4"N 91°19'06.6"W)

Figure 2.4h. Flying W data collection site. (37° 24’ 10.428” N 91° 35’ 21.078” W)

Figure 2.4i. Cedargrove data collection site. (37° 25’ 13.188” N 91° 36’ 13.998” W)

Figure 2.4j. Susie Nichols Cabin data collection site. (37° 26’ 32.772” N 91° 37’ 14.208” W)

2.5 Visitor questionnaire: Data management and analysis

The questionnaire was administered at OZAR from August 2016 - October 2016. Responses from the on-site questionnaire were analyzed using SPSS 22.0 Statistical Software Package. Data were screened for univariate and multivariate outliers (Tabachnick & Fidell, 2013). Univariate outliers were identified as exceeding $\pm$ 3 standard deviations. No cases were found. Multivariate outliers were removed when exceeding the Mahalanobis distance ($\chi^2 = 59.703$; $p < .001$). A total of 20 cases were removed. Descriptive statistics (e.g., means and standard deviations) were used to evaluate the research questions and address the study objectives. The questionnaire instrument (Appendix A) was designed in cooperation with the NPS staff at OZAR, and follows guidelines for the stratified random sampling approach (Dillman, 2007). To simplify the analysis process, we converted the -3 (strongly disagree) to +3 (strongly agree) scale to a 1 to 7 scale, which will be referenced throughout the results section.

3.0 Results for horse rider and hiker counts (Not all graphs and tables include horse riders and hikers)

3.1 Horse rider and hiker data by month

Table 3.1a. *Total horse rider and hiker use across all locations*

Month (# of days data were collected)	Total # of Horse Riders & Hikers	Mean Group Size	Range of Group Size (Min & Max)	Median Group Size	Gender Ratio (% F:M)
October 2015 (10 days)*	3,688	4.2	1 - 25	3	49%:51%
April 2016 (4 days)	110	3.7	1 - 16	3	39%:61%
May 2016 (4 days)*	62	2.2	1 - 17	0	66%:34%
June 2016 (4 days)*	1,037	4.8	1 - 31	4	50%:50%
July 2016 (4 days)	18	.64	1 - 3	0	50%:50%
August 2016 (4 days)*	960	11.4	1 - 30	4	45%:55%
September 2016 (4 days)*	1,228	4.6	1 - 19	4	49%:51%
October 2016 (4 days)*	1,792	5.3	1 - 32	4	47%:53%

Note: Data collections that occurred during trail rides are indicated by an asterisk. *

Note: No hiker data was collected in October 2015.

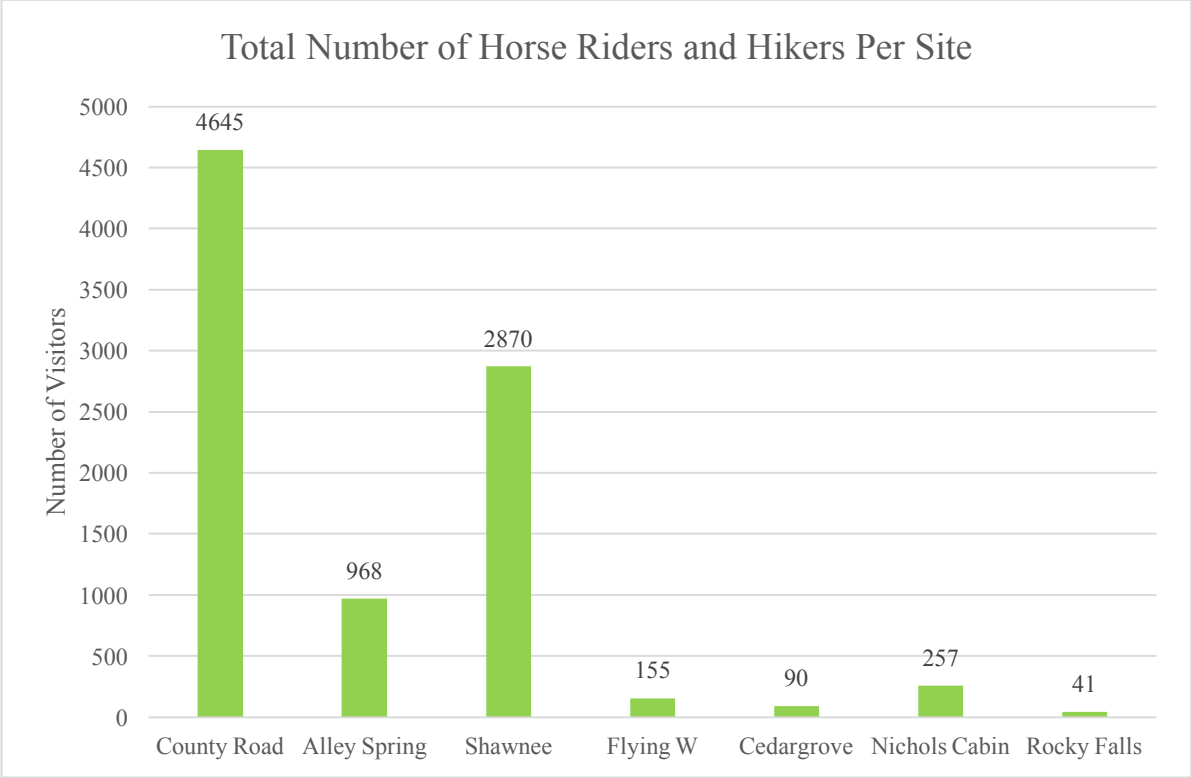

Figure 3.1a. Total number of horse riders and hikers (Rocky Falls) per site across entire sampling period (October 2015 – 2016)

County Road (n=4645) and Shawnee Creek (n=2870) had the highest use. The site with the least number of people counted was Rocky Falls (n=41).

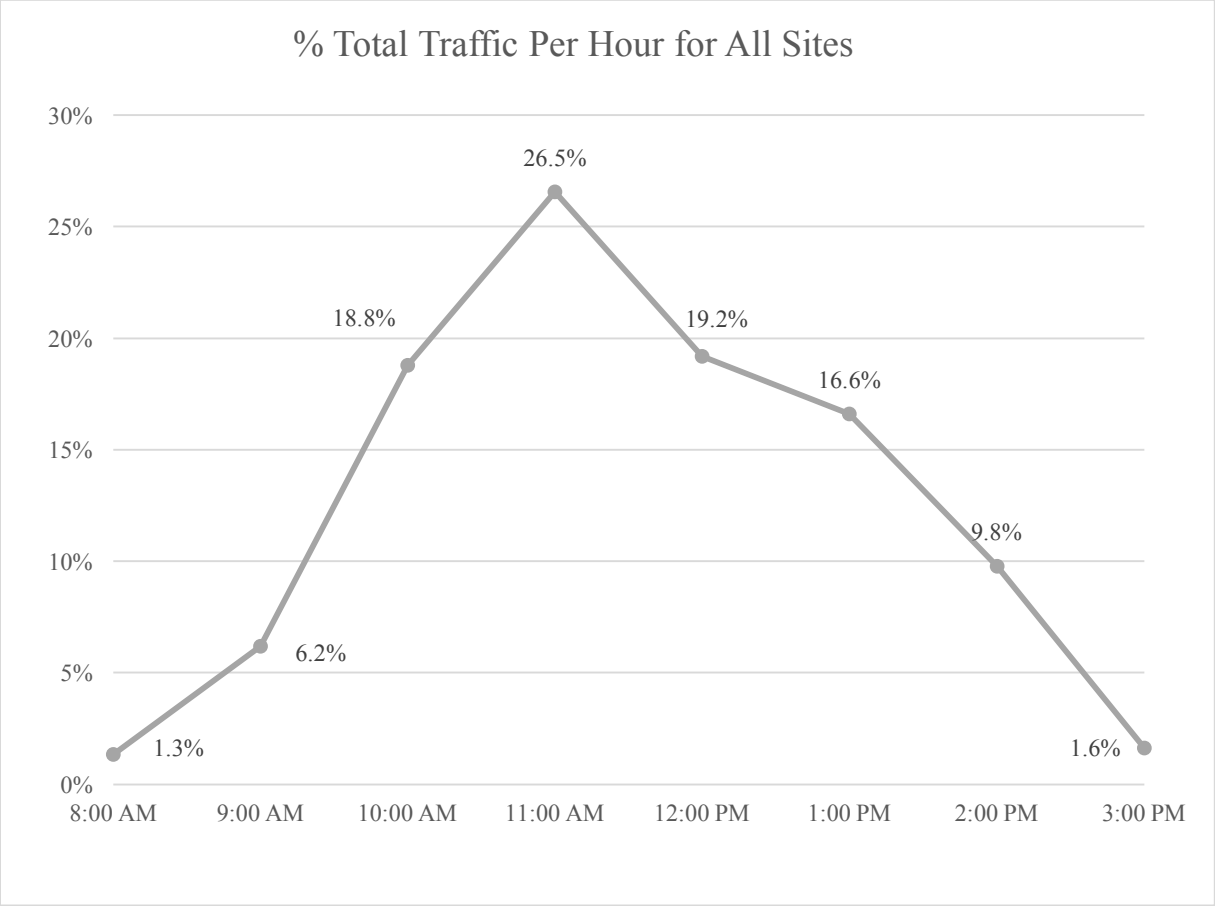

Figure 3.1b. Percent total traffic per hour for all sites

Table 3.1b. *Fall horse rider data: October 1-10, 2015**

Fall horse rider data: October 1-10, 2015

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	2,170	4.3	1 – 25	4	48%:52%
Alley Spring	347	4.2	1 - 13	4	48%:52%
Shawnee	987	4.2	1 – 21	3	51%:49%
Cedargrove	90	2.6	1 – 13	2	47%:53%
Nichols Cabin	94	3.5	1 – 14	3	59%:41%

* Data collection period occurred during a trail ride at OZAR.

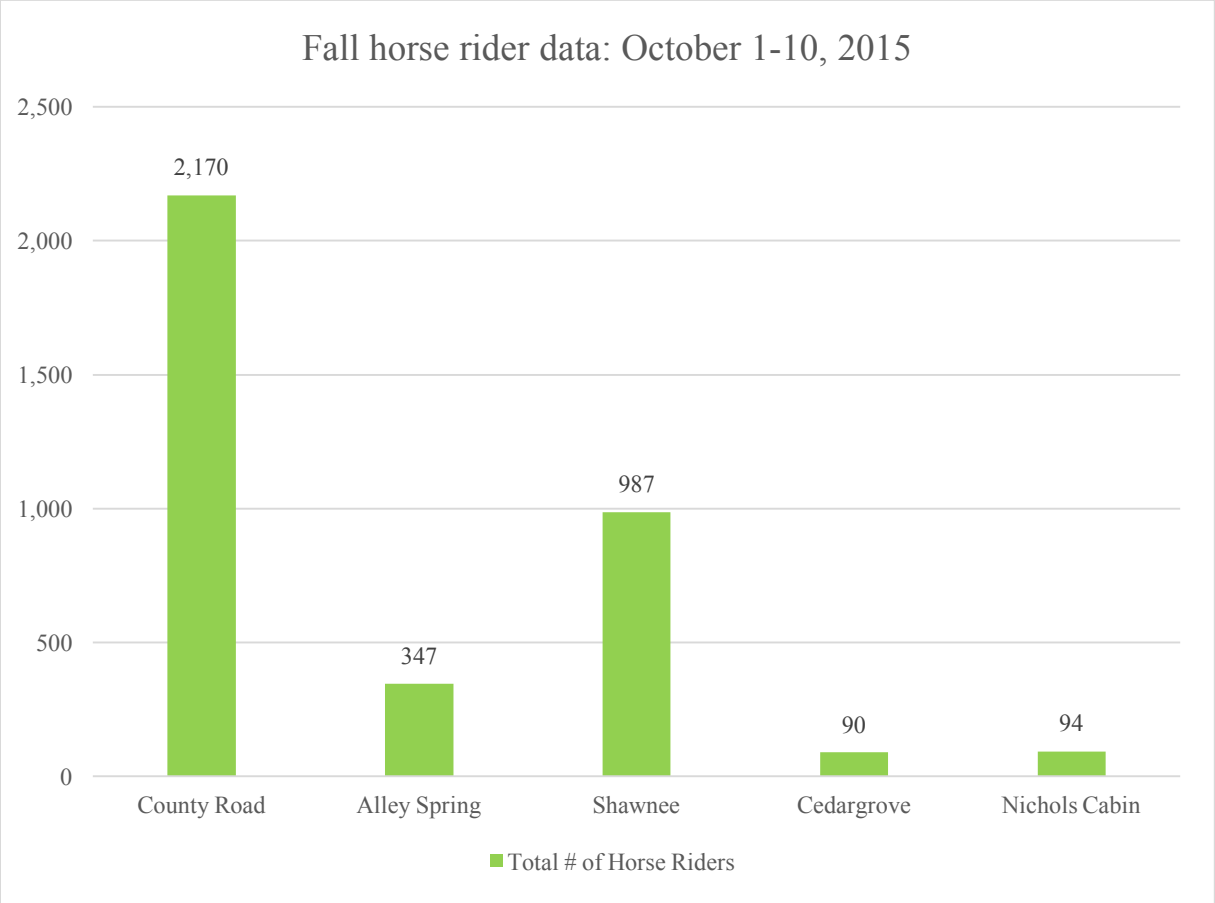

Figure 3.1d. Fall horse rider data: October 1-10, 2015.

This was the preliminary data collection for the project and spanned 10 days. All subsequent data collections occurred over 4-day periods.

County Road (n=2,170) had the most horse riders, with Shawnee (n=987) second. The site with the least amount of traffic was Cedargrove (n=90).

Table 3.1c. *Spring horse rider data: April 21-24, 2016*

Spring horse rider data: April 21-24, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	13	2.2	1 – 4	2.5	38%:62%
Alley Spring	10	2.0	1 – 4	2	50%:50%
Shawnee	14	2.0	1 – 4	2	43%:57%
Flying W	32	8	2 – 16	7	47%:53%
Nichols Cabin	41	7.4	4 – 14	5	40%:60%

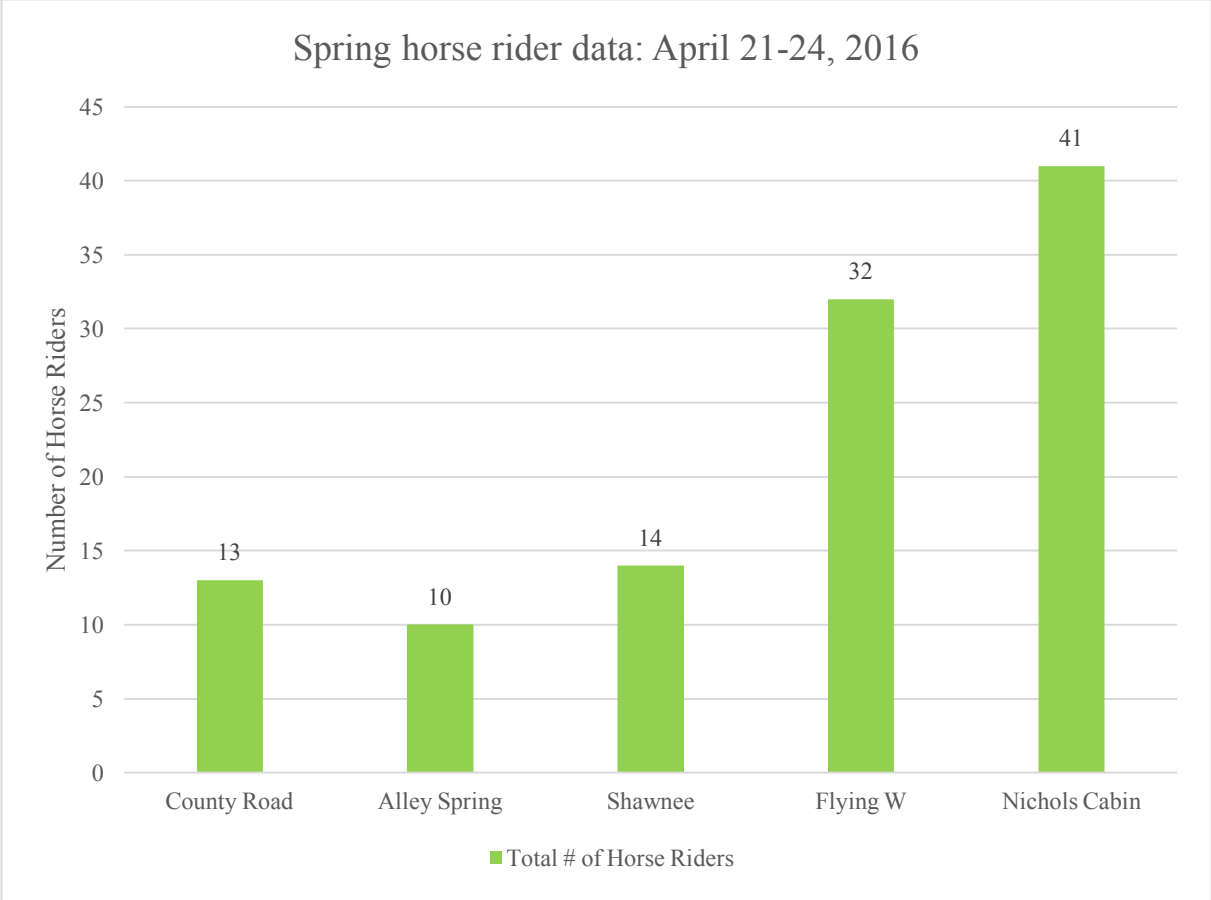

Figure 3.1e. Spring horse rider data: April 21-24, 2016

Nichols Cabin had the most traffic during the April data collection (n=41).

Table 3.1d. *Spring horse rider data: May 23-26, 2016**

Spring horse rider data: May 23-26, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	5	1.3	1 – 4	0.5	60%:40%
Alley Spring	0	0	na	0	na
Shawnee	0	0	na	0	na
Flying W	0	0	na	0	na
Nichols Cabin	57	5.2	1 – 17	3	67%:33%

* Data collection period occurred during a trail ride at OZAR.

Note: During the 4-day sampling period, 2 days had rain throughout the day, with one day having to pull researchers out of the field due to lightning.

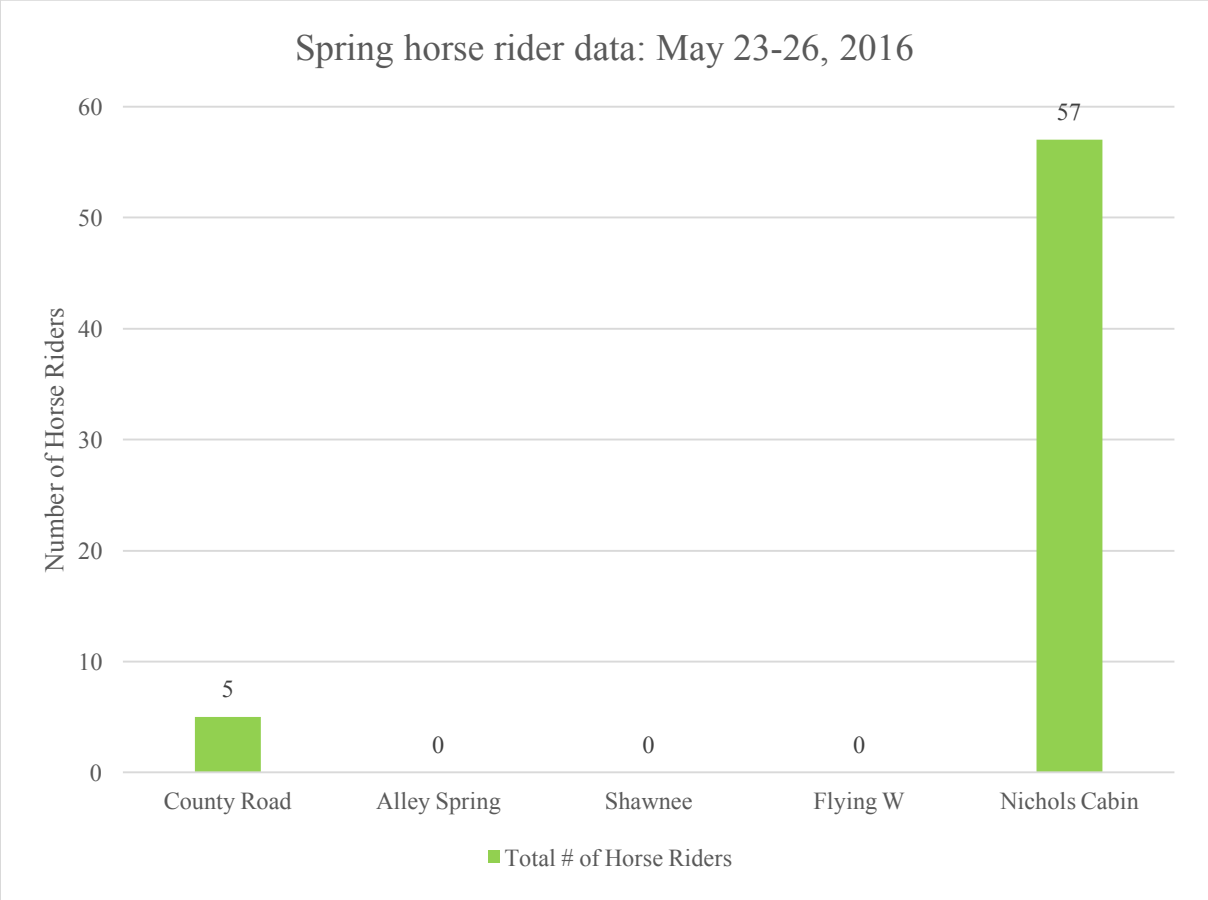

Figure 3.1f. Spring horse rider data: May 23-26, 2016

Nearly all the horse riders (91.2%) were counted at Nichols Cabin during the month of May. There were no visitors at Alley Spring, Shawnee, or Flying W.

Table 3.1e. *Summer horse rider data: June 13-16, 2016**

Summer horse rider data: June 13-16, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	672	5.0	1 – 31	4	51%:49%
Alley Spring	132	5.3	1 – 12	5	58%:42%
Shawnee	213	5.2	2 – 18	5	45%:55%
Flying W	3	1.5	1 – 3	1.5	67%:33%
Nichols Cabin	17	1.7	1 – 3	2	35%:65%

* Data collection period occurred during a trail ride at OZAR.

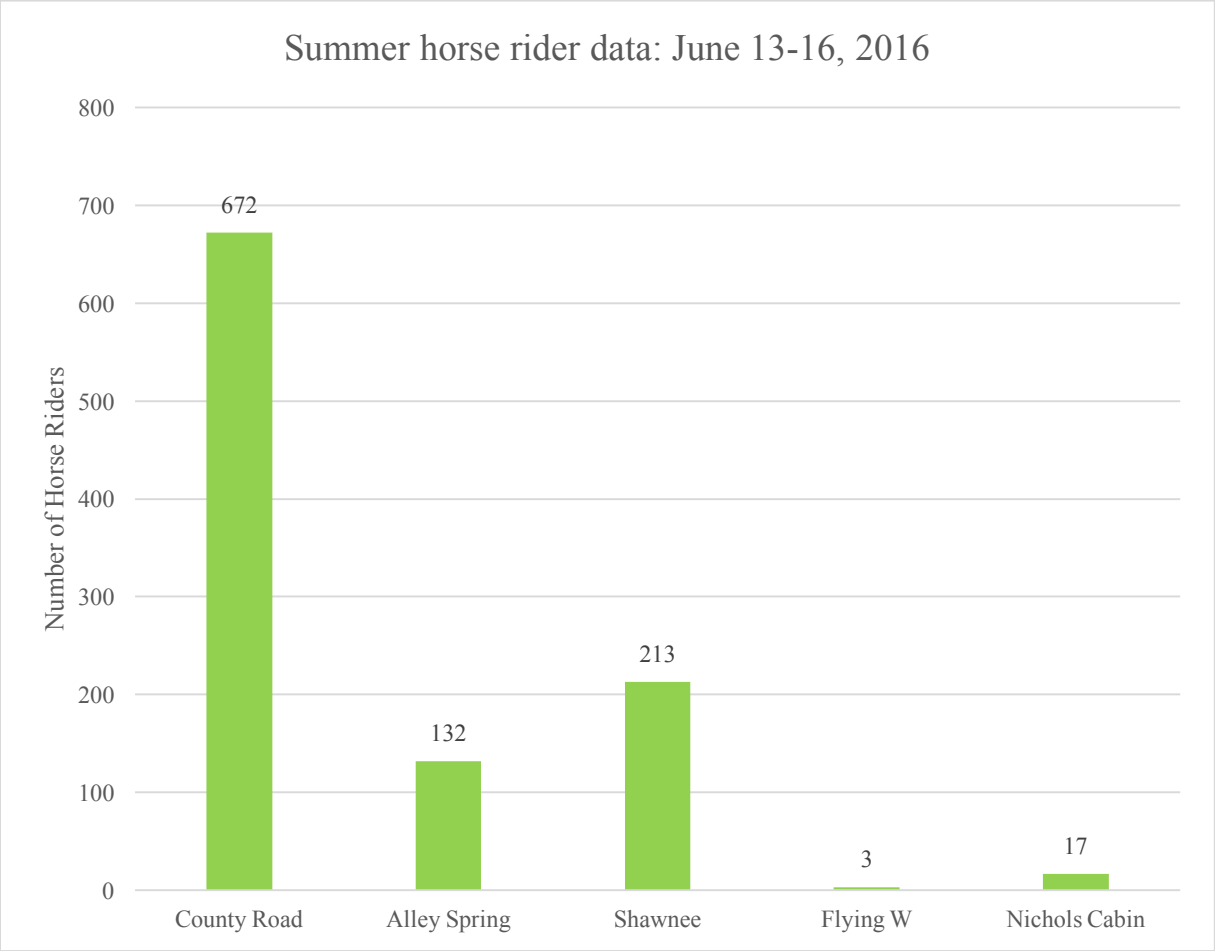

Figure 3.1g. Summer horse rider data: June 13-16, 2016

During June, 65% of all horse riders at OZAR were counted at County Road.

Table 3.1f. *Summer horse rider data: July 13-16, 2016*

Summer horse rider data: July 13-16, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	0	0	na	0	na
Alley Spring	0	0	na	0	na
Shawnee	0	0	na	0	na
Flying W	10	1.7	1 – 3	1	60%:40%
Nichols Cabin	8	1.3	1 – 2	1.5	38%:62%

Note: During day 2 of the sampling period, there was a downed tree in the road preventing access to the County Road data collection site. The downed tree was removed prior to day 3 of data collection.

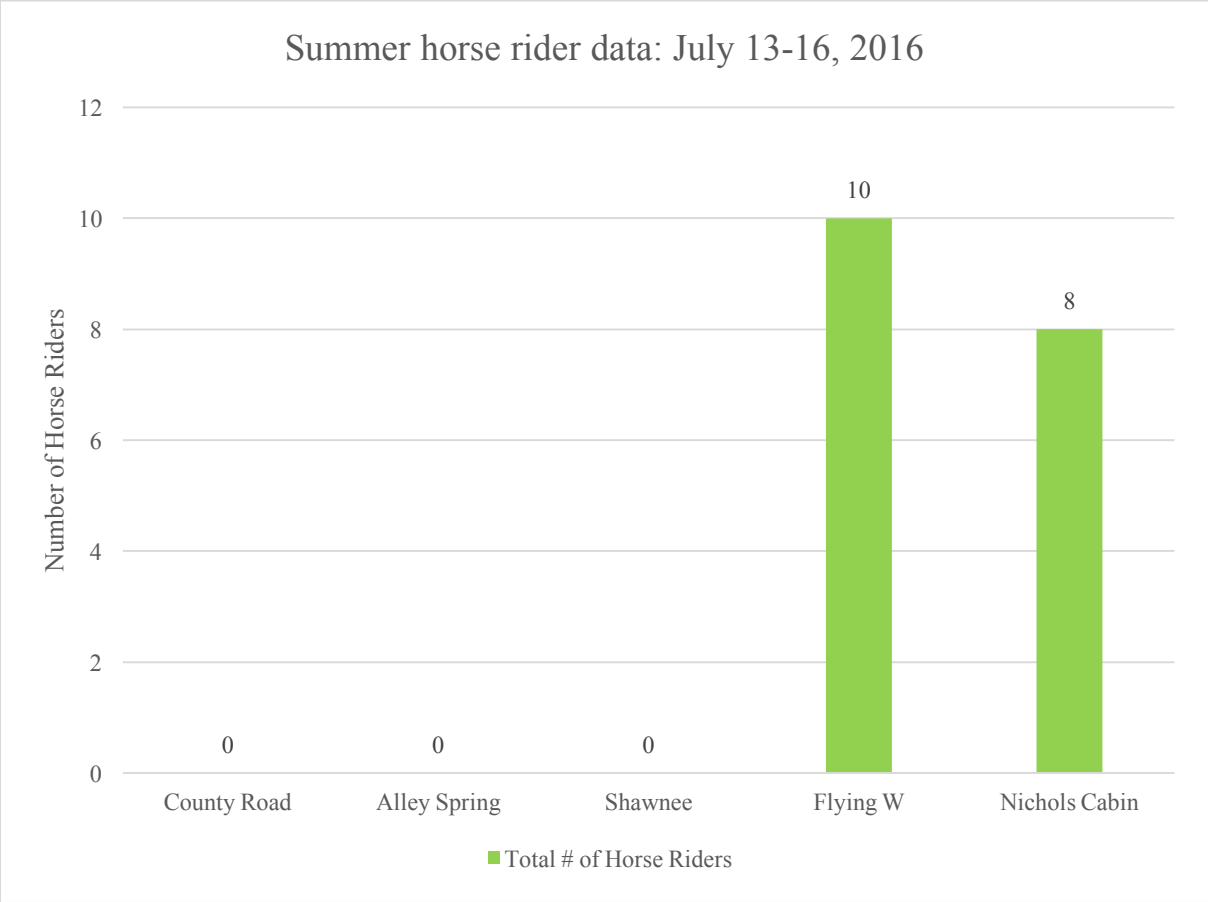

Figure 3.1g. Summer horse rider data: July 13-16, 2016

Only 18 horse riders were counted during the month of July. This could be due to the weather (89.8°F daily high average). Again, only Nichols Cabin and Flying W had horse traffic during this data collection, with a total of 18 horse riders were counted.

Table 3.1g. *Summer horse rider data: August 2-5, 2016**

Summer horse rider data: August 2-5, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	528	5.9	1 – 22	4	46%:54%
Alley Spring	49	5.4	1 – 12	6	33%:67%
Shawnee	383	6.0	1 – 30	4	45%:55%
Flying W	0	0	na	0	na
Nichols Cabin	0	0	na	0	na

* Data collection period occurred during a trail ride at OZAR.

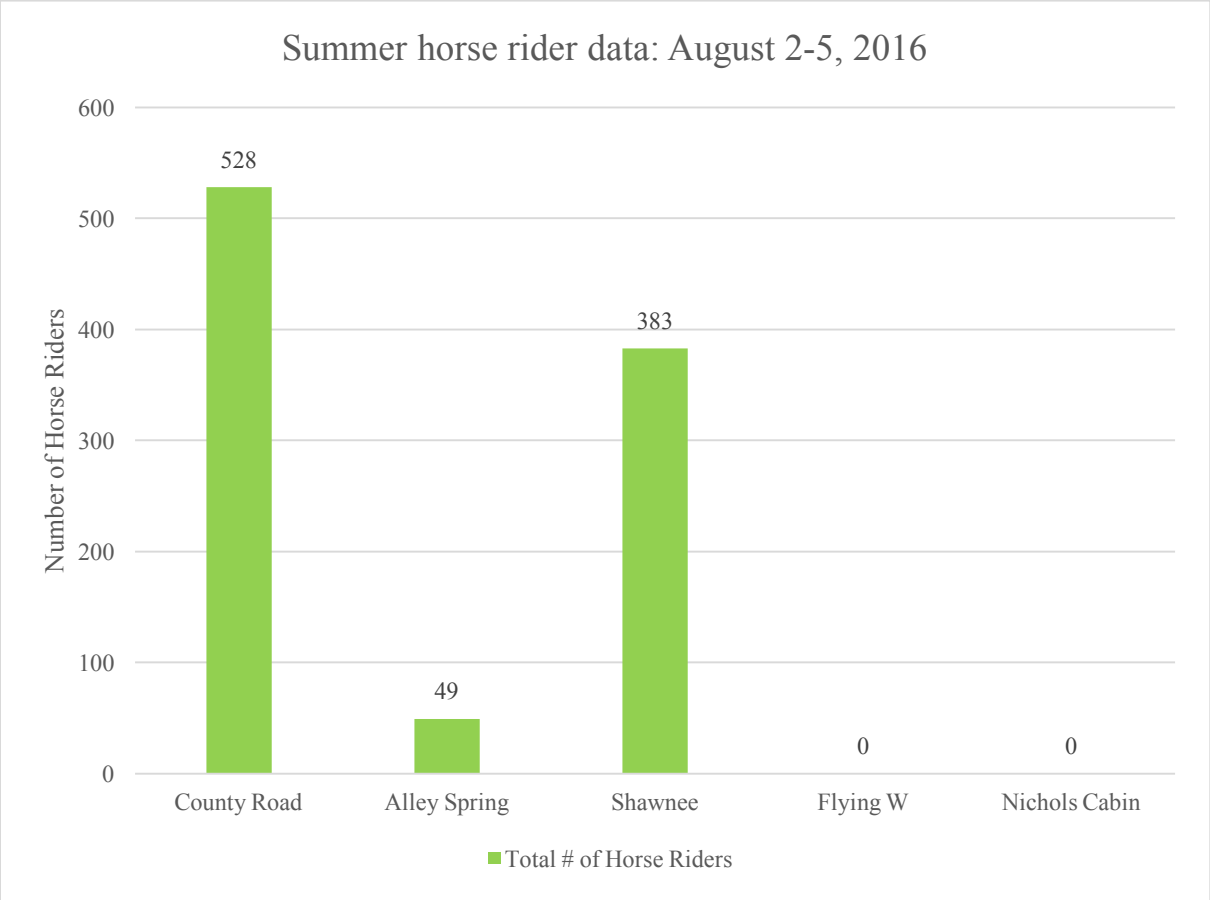

Figure 3.1h. Fall horse rider data: August 2-5, 2016

County Road and Shawnee had the most horse traffic during August. Over half of all horse riders counted were at County Road (55%, n=528), and Shawnee had about 40% of all horse riders (n=383).

Table 3.1h. *Fall horse rider data: September 2-5, 2016**

Fall horse rider data: September 2-5, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	520	4.3	1 – 17	4	49%:51%
Alley Spring	92	4.4	1 – 15	4	50%:50%
Shawnee	565	5.0	1 – 19	4	49%:51%
Flying W	20	6.7	1 – 11	9	40%:60%
Nichols Cabin	31	5.2	1 – 10	5	55%:45%

* Data collection period occurred during a trail ride at OZAR.

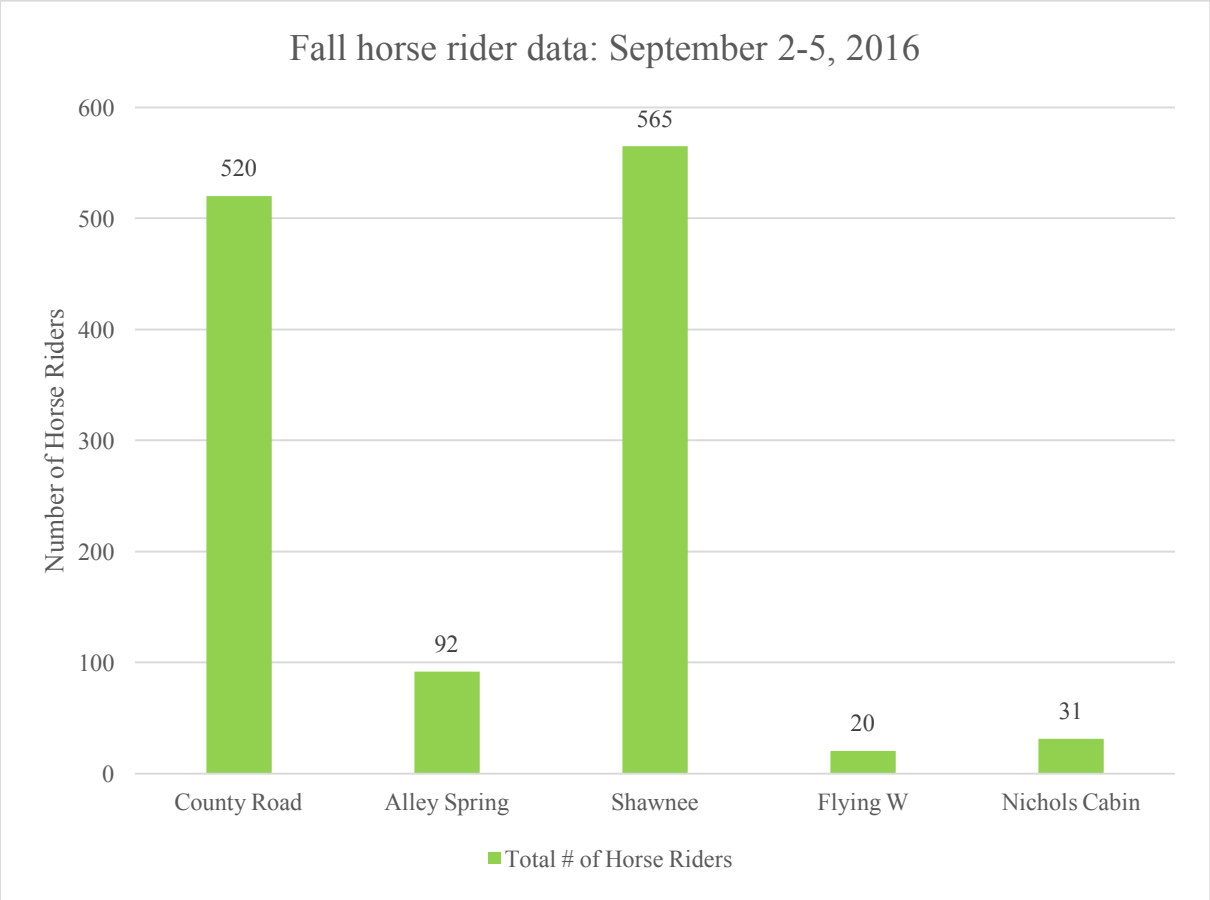

Figure 3.1i. Fall horse rider data: September 2-5, 2016

Table 3.1i. *Fall horse rider data: October 2-5, 2016**

Fall horse rider data: October 2-5, 2016

Location	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
County Road	737	5.2	1 – 32	4	48%:52%
Alley Spring	338	5.5	1 – 26	5	51%:49%
Shawnee	708	5.4	1 – 30	4	44%:56%
Flying W	0	0	na	0	na
Nichols Cabin	9	4.5	2 – 7	4.5	44%:56%

* Data collection period occurred during a trail ride at OZAR.

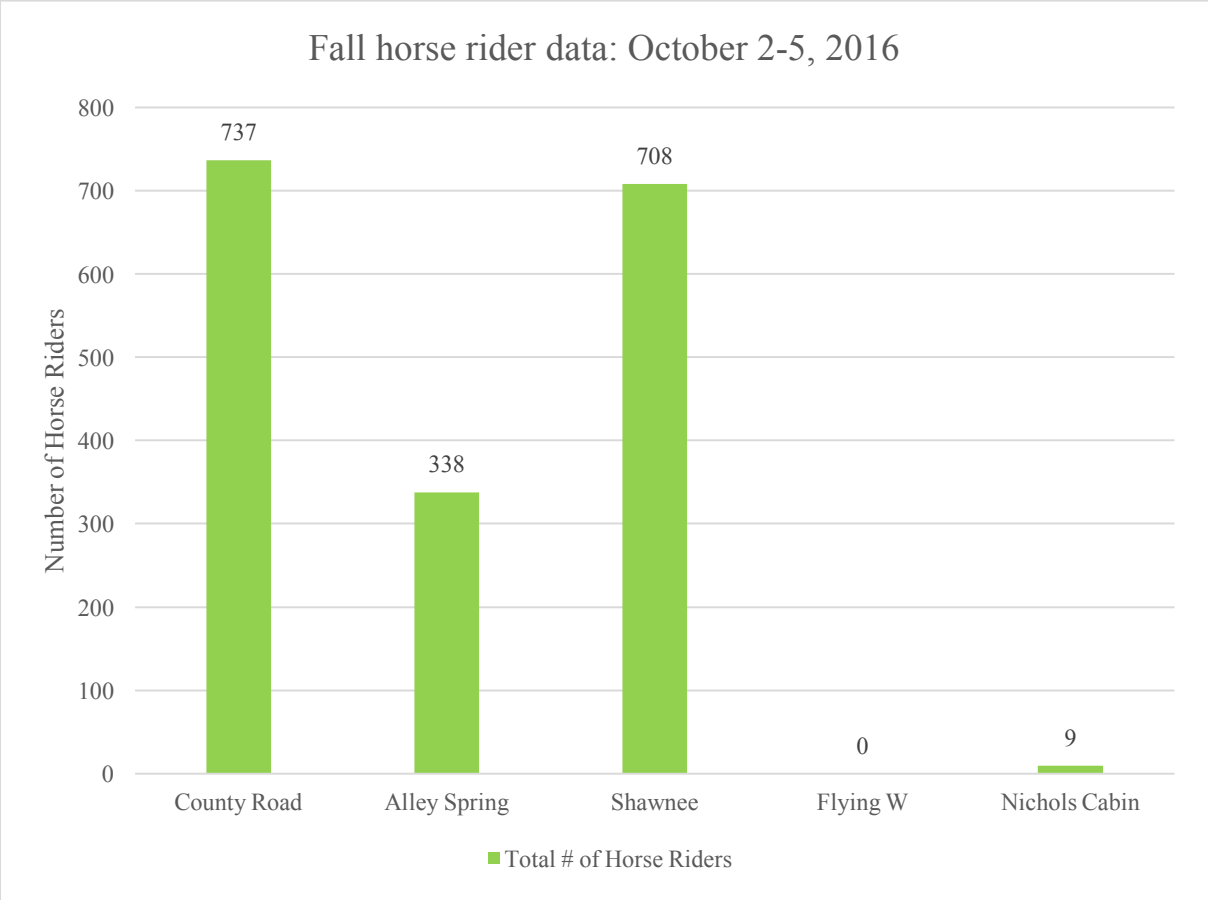

Figure 3.1j. Fall horse rider data: October 2-5, 2016

During the final data collection, the location with the highest amount of use was County Road (n=737), followed by Shawnee (n=708).

Table 3.1j. *Hiker counts: Rocky Falls (only site sampled)*

Rocky Falls					
Month	Total # of Hikers	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
October 2015	na	na	na	na	na
April 2016	16	1.8	1 – 5	1	na
May 2016	0	0	na	0	na
June 2016	0	0	na	0	na
July 2016	0	0	na	0	na
August 2016	0	0	na	0	na
September 2016	20	2.0	1 – 7	1.5	45%:55%
October 2016	5	1.0	1 – 3	0	20%:80%

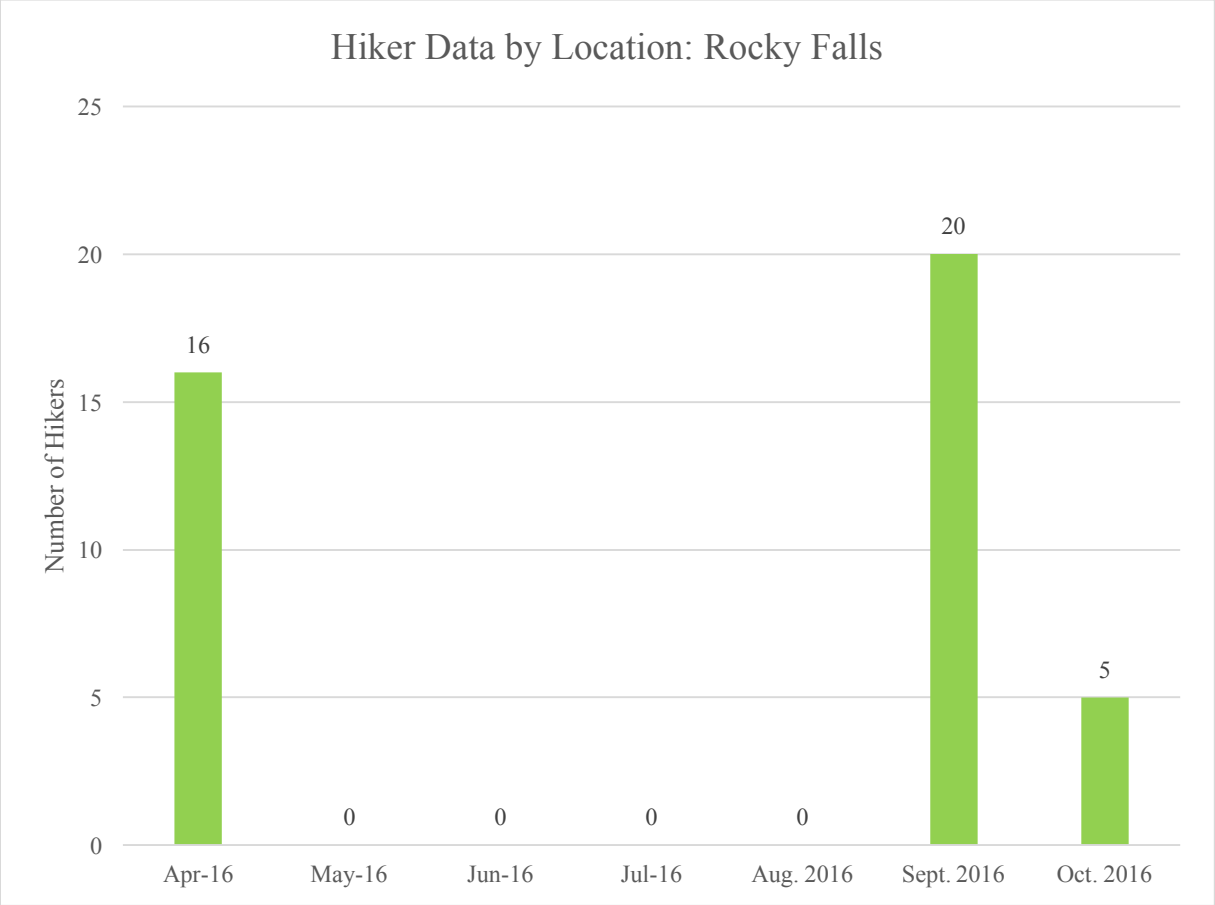

Figure 3.k. Hiker data by location: Rocky Falls
At Rocky Falls, only hikers were counted, i.e. horse riders were not counted.

Rocky Falls was the only location that counted hikers. The month with the highest amount of use was September (n=20), and there were no hikers during any of the summer months.

3.2 Horse rider and hiker data by season

Table 3.2a. *Horse rider and hiker data by season*

Horse rider and hiker data by season

Location	Total # of Horse Riders & Hikers	Gender Ratio (% female:male)
Spring	172	47%:53%
Summer	2,015	47%:53%
Fall	5,480	48%:52%

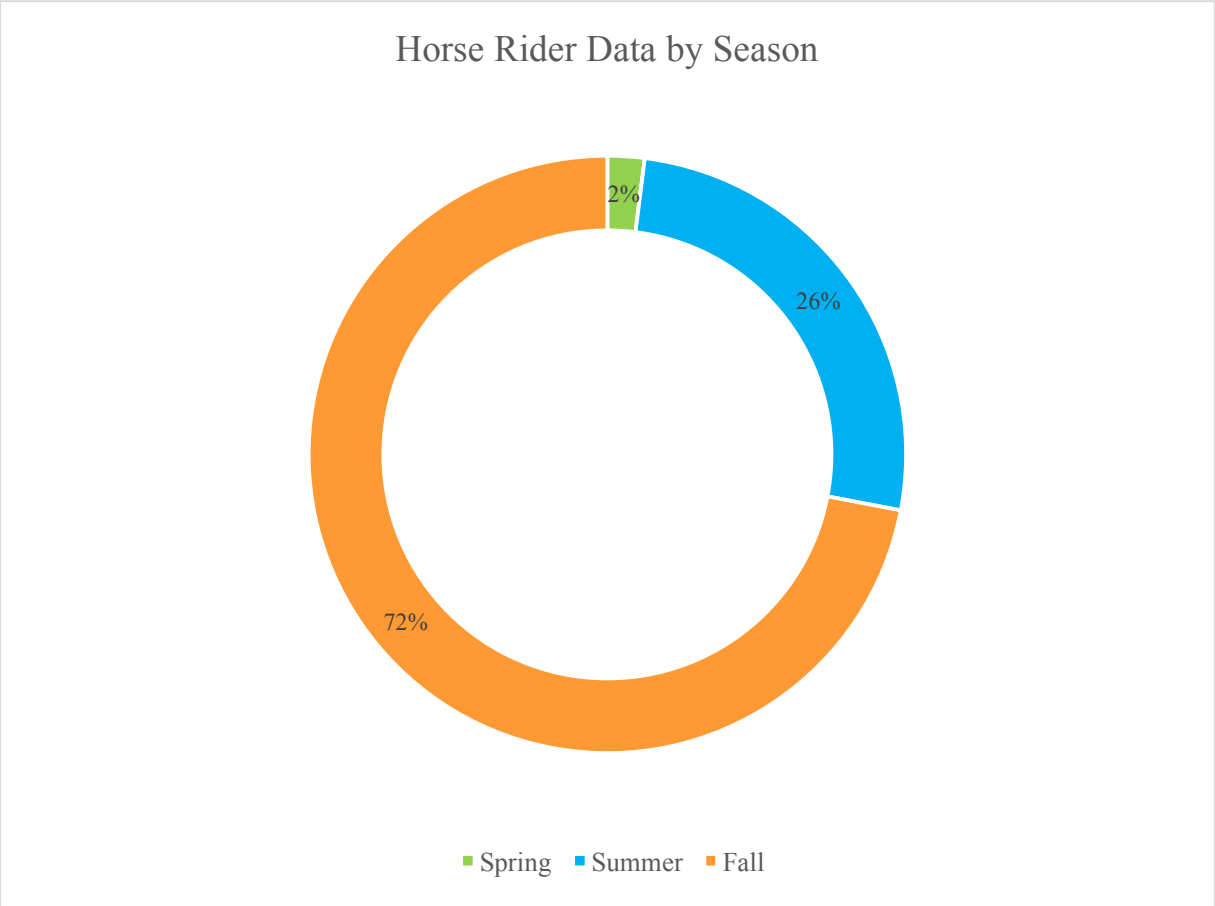

Figure 3.2a. Horse rider and hiker data by season *(%)*

3.3 Horse rider and hiker data by location

Table 3.3a. *Horse rider data by location: County Road*

Month	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
October 2015*	2,170	4.3	1 – 25	4	48%:52%
April 2016	13	2.2	1 - 4	2.5	38%: 62%
May 2016*	5	1.3	1 - 4	0.5	60%:40%
June 2016*	672	5.0	1 - 31	4	51%:49%
July 2016	0	0	na	0	na
August 2016*	528	5.9	1 - 22	4	46%:54%
September 2016*	520	4.3	1 - 17	4	49%:51%
October 2016*	737	5.2	1 - 32	4	48%:52%

Note: Trail rides are indicated by an asterisk. *

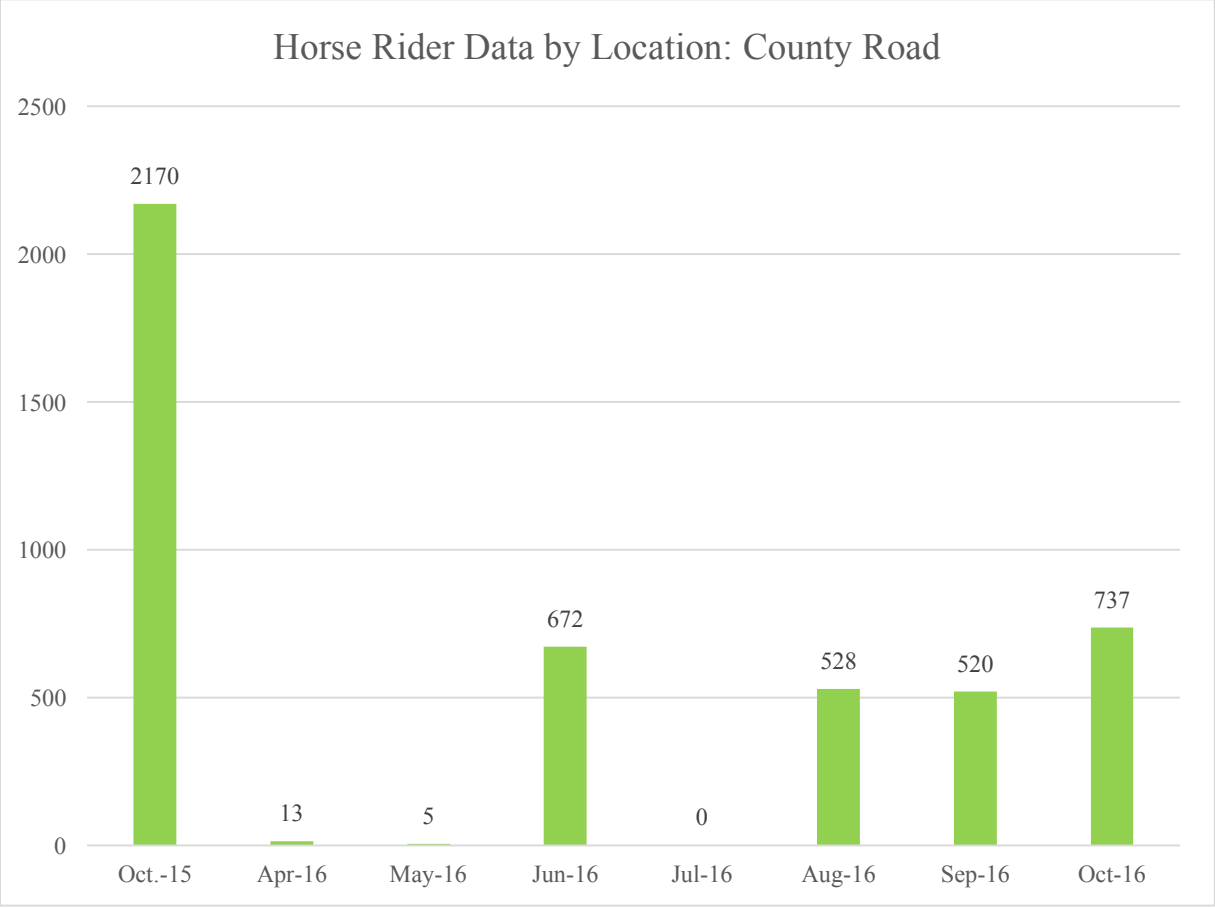

Figure 3.3a. Horse rider data by location: County Road

Table 3.3b. *Horse rider data by location: Alley Spring*

Month	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
October 2015*	347	4.2	1 – 13	4	48%:52%
April 2016	10	2.0	1 – 4	2	50%:50%
May 2016*	0	0	na	0	na
June 2016*	132	5.3	1 – 12	5	58%:42%
July 2016	0	0	na	0	na
August 2016*	49	5.4	1 – 12	6	33%:67%
September 2016*	92	4.4	1 – 15	4	50%:50%
October 2016*	338	5.5	1 – 26	5	51%:49%

Note: Trail rides are indicated by an asterisk. *

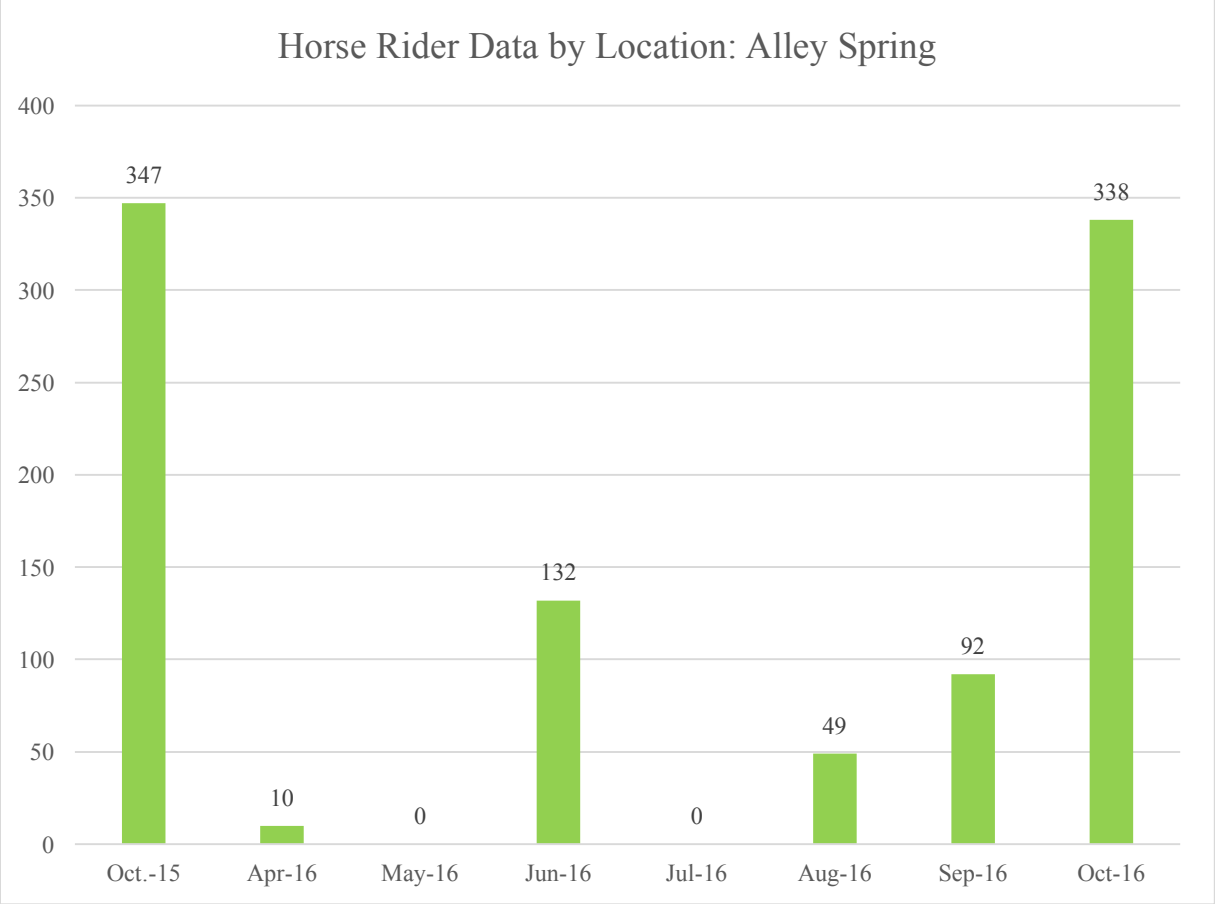

Figure 3.3b. Horse rider data by location: Alley Spring

Table 3.3c. *Horse rider data by location: Shawnee Creek*

Month	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
October 2015*	987	4.2	1 – 21	3	51%:49%
April 2016	14	2.0	1 – 4	2	43%:57%
May 2016*	0	0	na	0	na
June 2016*	213	5.2	2 - 18	5	45%:55%
July 2016	0	0	na	0	na
August 2016*	383	6.0	1 – 30	4	45%:55%
September 2016*	565	5.0	1 - 19	4	49%:51%
October 2016*	708	5.4	1 – 30	4	44%:56%

Note: Trail rides are indicated by an asterisk. *

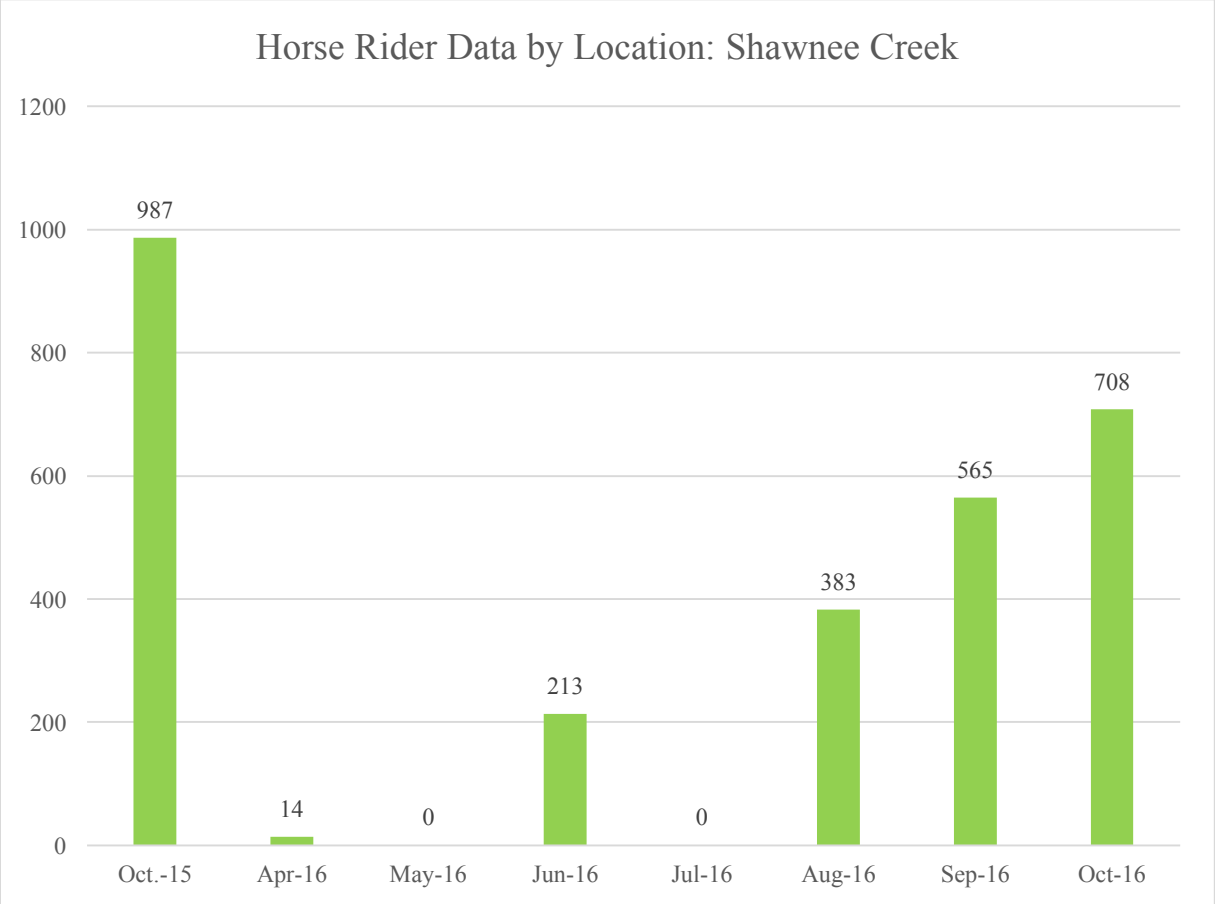

Figure 3.3c. Horse rider data by location: Shawnee Creek

Table 3.3d. *Horse rider data by location: Flying W (Cedargrove for October 2015)*

Month	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
October 2015*	90	2.6	1 – 13	2	47%:53%
April 2016	32	8.0	2 – 16	7	47%:53%
May 2016*	0	0	na	0	na
June 2016*	3	1.5	1 – 3	1.5	67%:33%
July 2016	10	1.7	1 – 3	1	60%:40%
August 2016*	0	0	na	0	na
September 2016*	20	6.7	1 – 11	9	40%:60%
October 2016*	0	0	na	0	na

Note: Trail rides are indicated by an asterisk. *

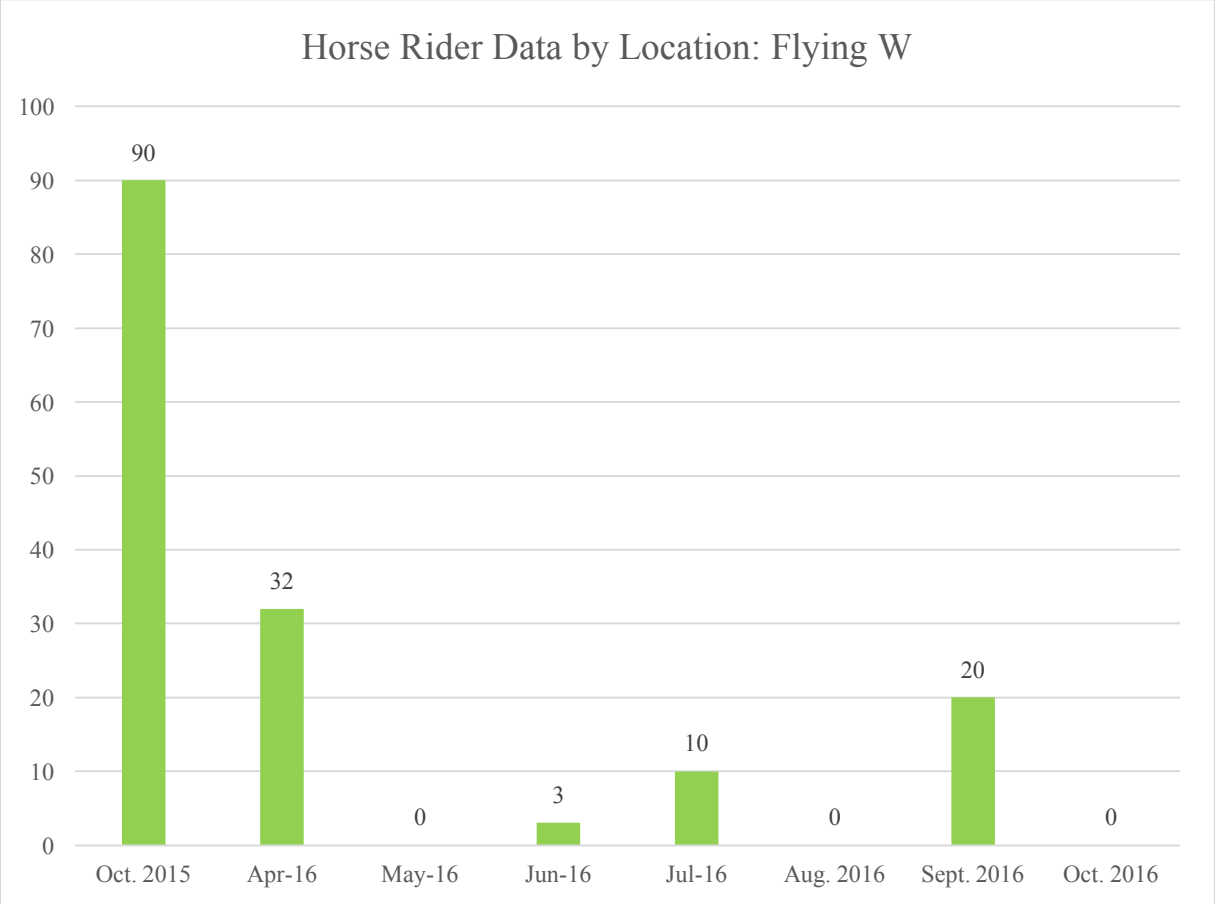

Figure 3.3d. Horse rider data by location: Flying W (Cedargrove for October 2015)

Table 3.3e. *Horse rider data by location: Nichols Cabin*

Month	Total # of Horse Riders	Mean Group Size	Range of Group Size (Min & Max)	Group Size Median	Gender Ratio (% F:M)
October 2015*	94	3.5	1 – 14	3	59%:41%
April 2016	41	7.4	4 – 14	5	40%:60%
May 2016*	57	5.2	1 – 17	3	67%:33%
June 2016*	17	1.7	1 – 3	2	35%:65%
July 2016	8	1.3	1 – 2	1.5	38%:62%
August 2016*	0	0	na	0	na
September 2016*	31	5.2	1 – 10	5	55%:45%
October 2016*	9	4.5	2 – 7	4.5	44%:56%

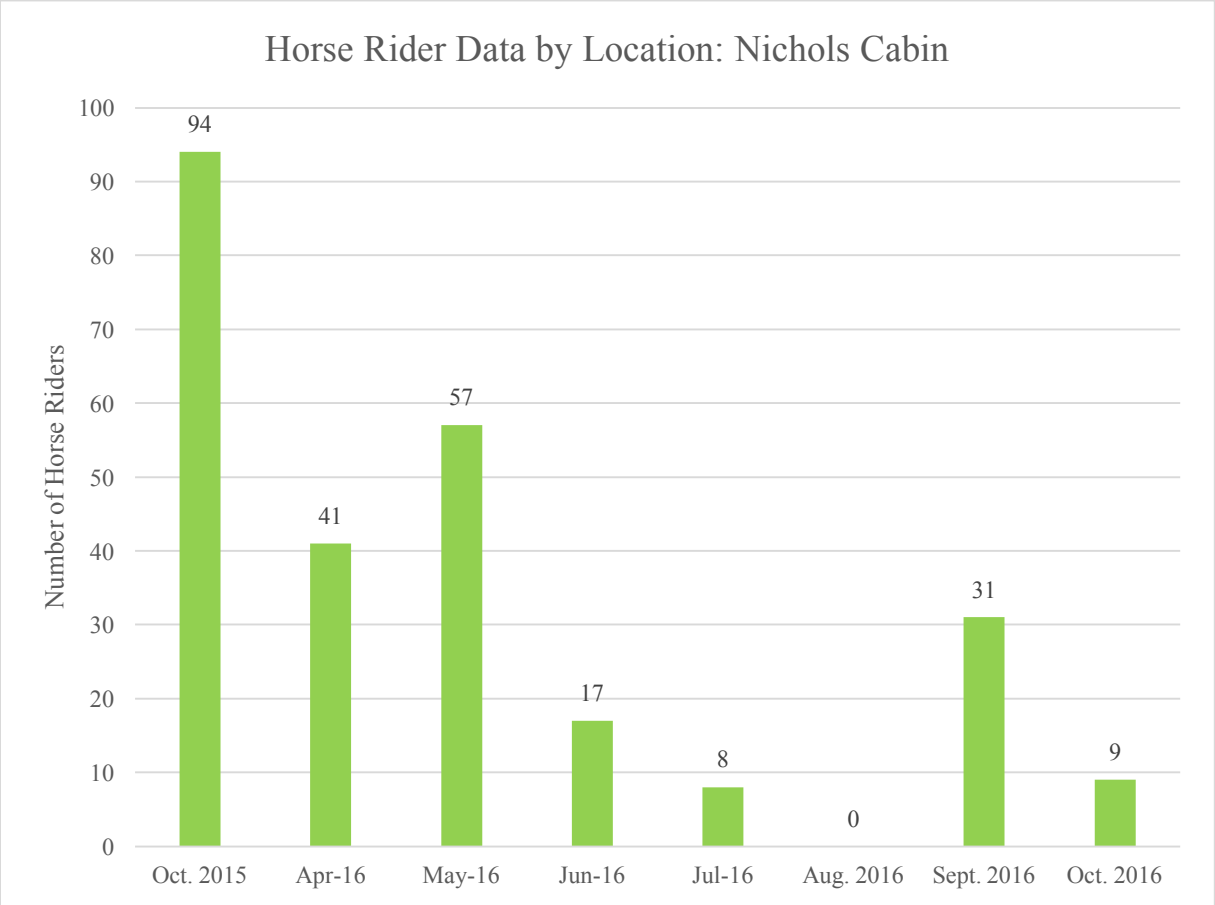

Figure 3.3e. Horse rider data by location: Nichols Cabin

3.4 Weekday and weekend horse and counts

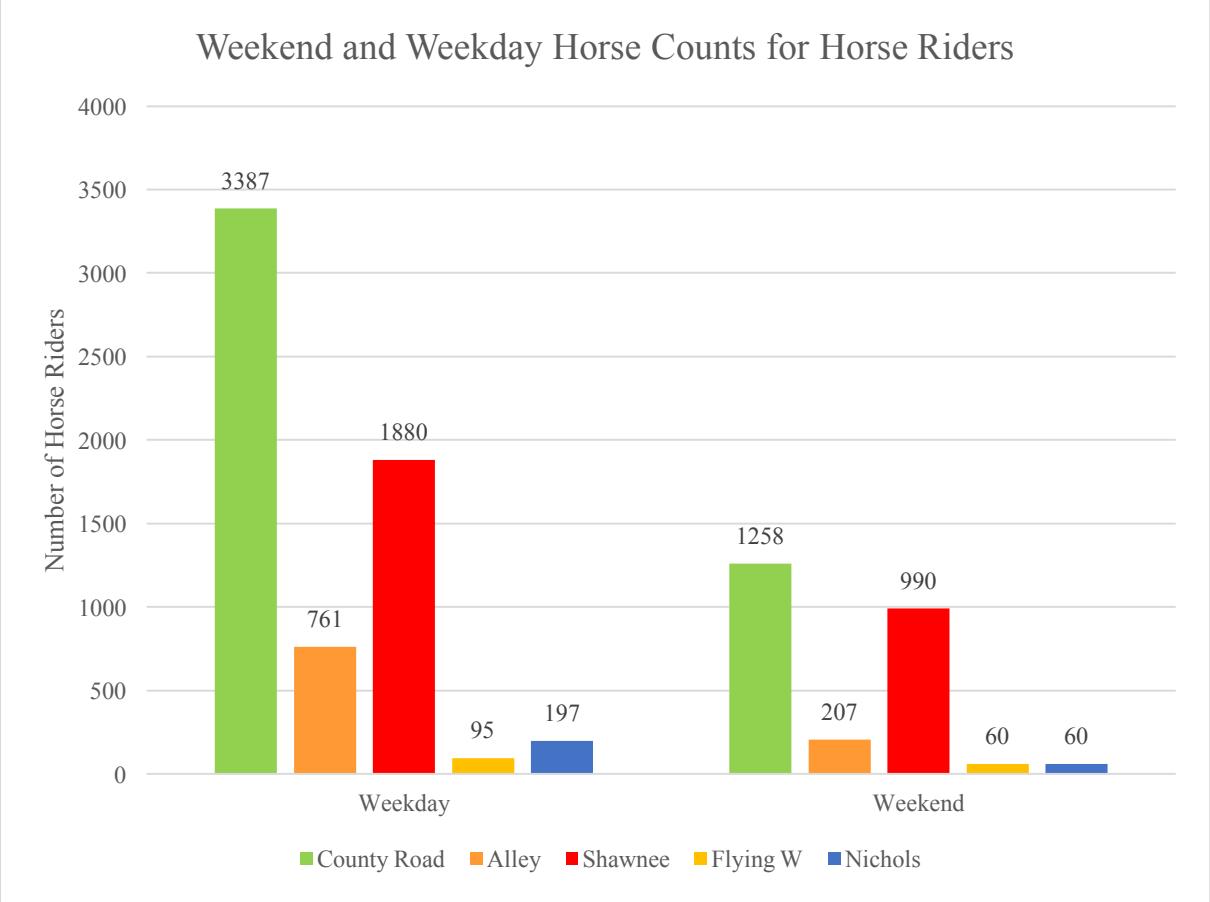

Figure 3.4a. Weekday and weekend horse counts for horse riders

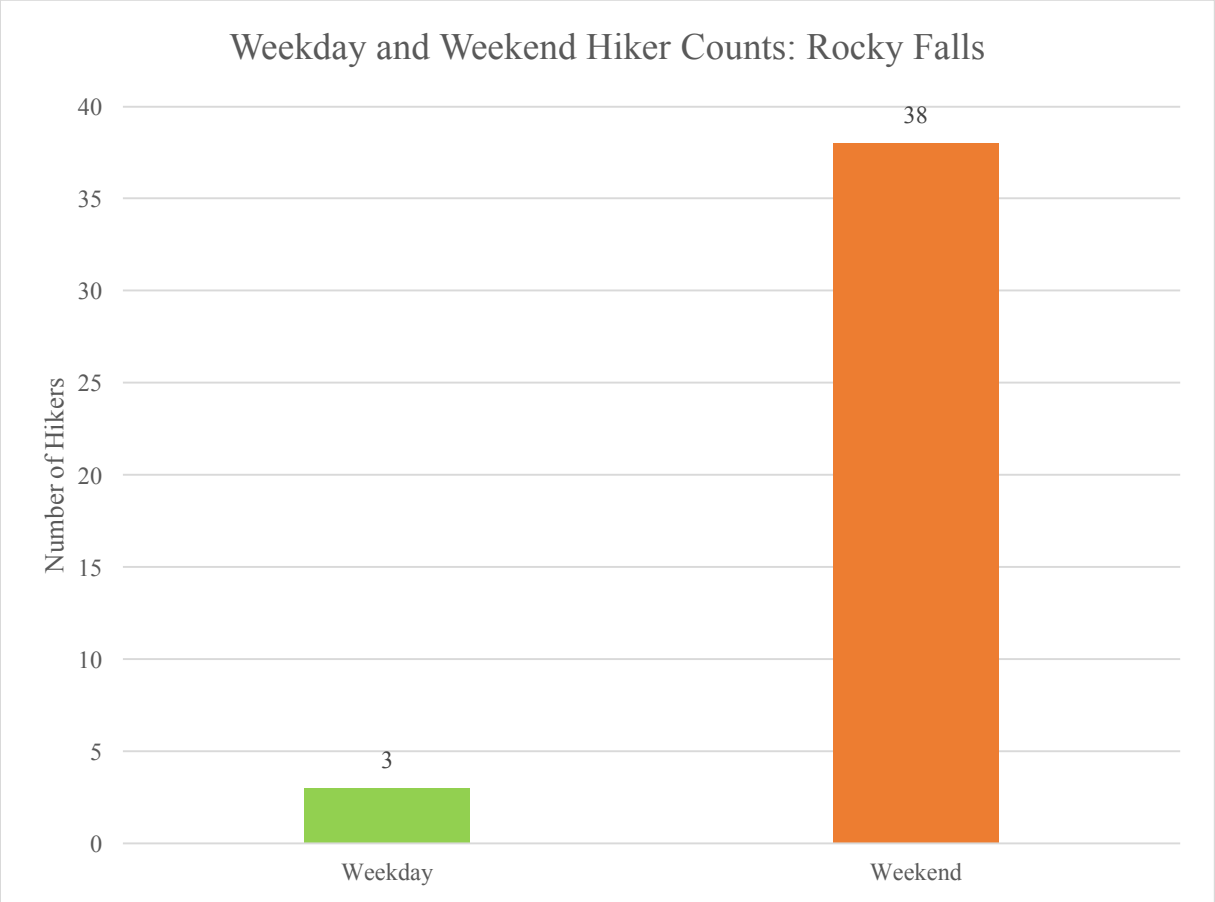

Figure 3.4b. Weekday and Weekend hiker counts at Rocky Falls

3.5 River cross data

Table 3.5a. *River cross data at Powell Crossing*

Month (# of days data were collected)	Total # of Crossings	Number of Evacuations (Urine and Feces) into the River	Percent of Horses Evacuating
October 2015 (10 days)	968	3 (feces) & 2 (urine)	0.5%
August 2016 (4 days)	323	4 (feces)	1.2%
October 2016 (1 day)	170	0	0%

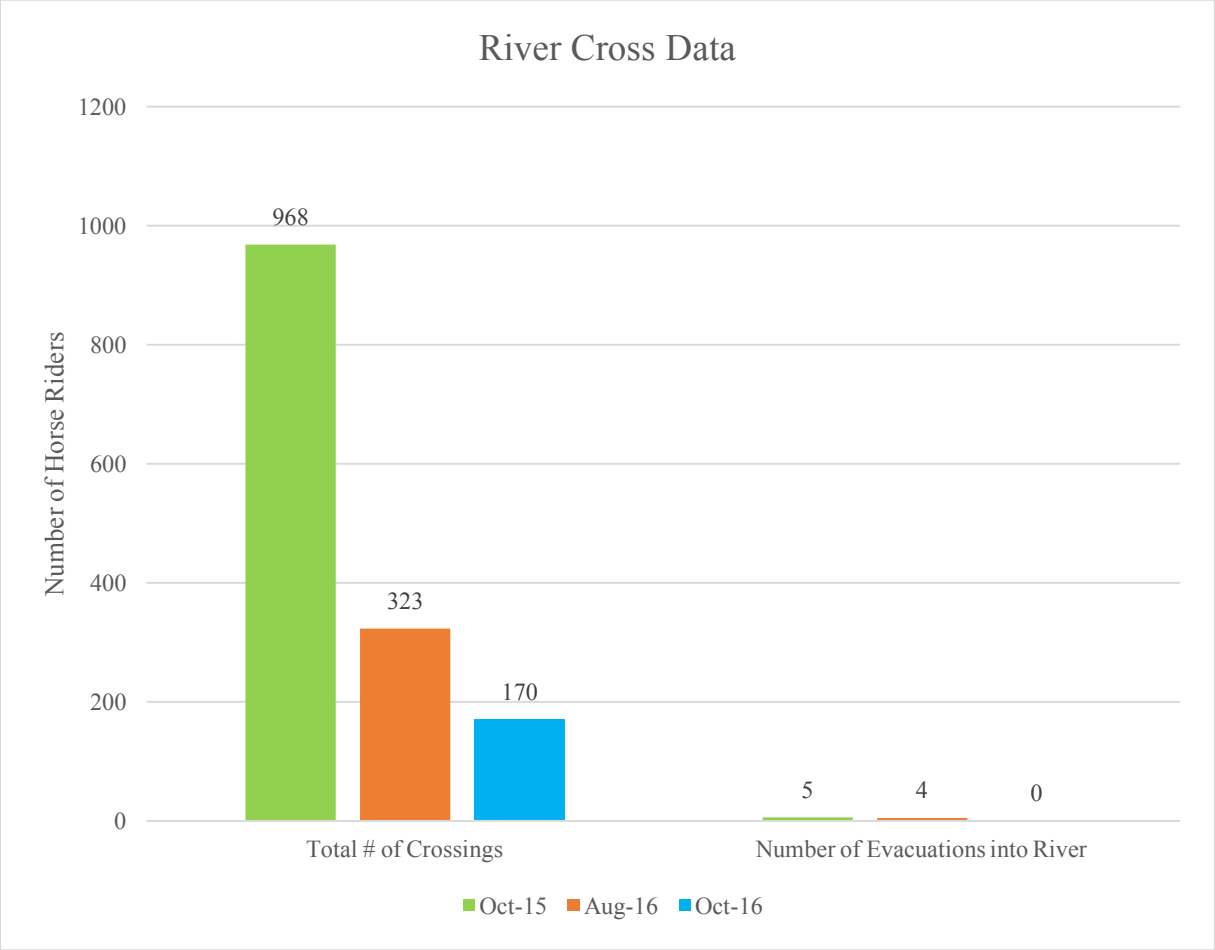

Figure 3.5a. River cross data at Powell Crossing

4.0 Results - Questionnaires

Questionnaire results are presented in subsections 4.1 (response rate and sampling) through 4.18 (the acceptability of encountering other recreationists at OZAR) of this report. Results presented in this report are from the data collected over the specified study periods (i.e., October 2015, and April - October 2016). Results do not reflect or represent use conditions in the late fall, winter, or early spring. Likewise, results may not acutely reflect use in subsequent years, particularly if visitation to the park grows substantially.

4.1 Response rate and sampling

A total of 426 completed questionnaires were analyzed, yielding a 55% response rate. Common reasons for refusal included questionnaire length, insufficient time to complete, not wanting to dismount horse, or that they did not want to share their thoughts with the National Park Service.

Sample demographics

4.2 Age, gender and race of respondents

Table 4.2a. *Respondents' age*

Please indicate your age.

Age Group	Frequency	Percent (%)
80-89	1	0.2
70-79	22	5.1
60-69	86	20.4
50-59	145	34.2
40-49	69	16.3
30-39	44	10.4
20-29	23	5.3
18-19	8	1.7
Total	398	93.6

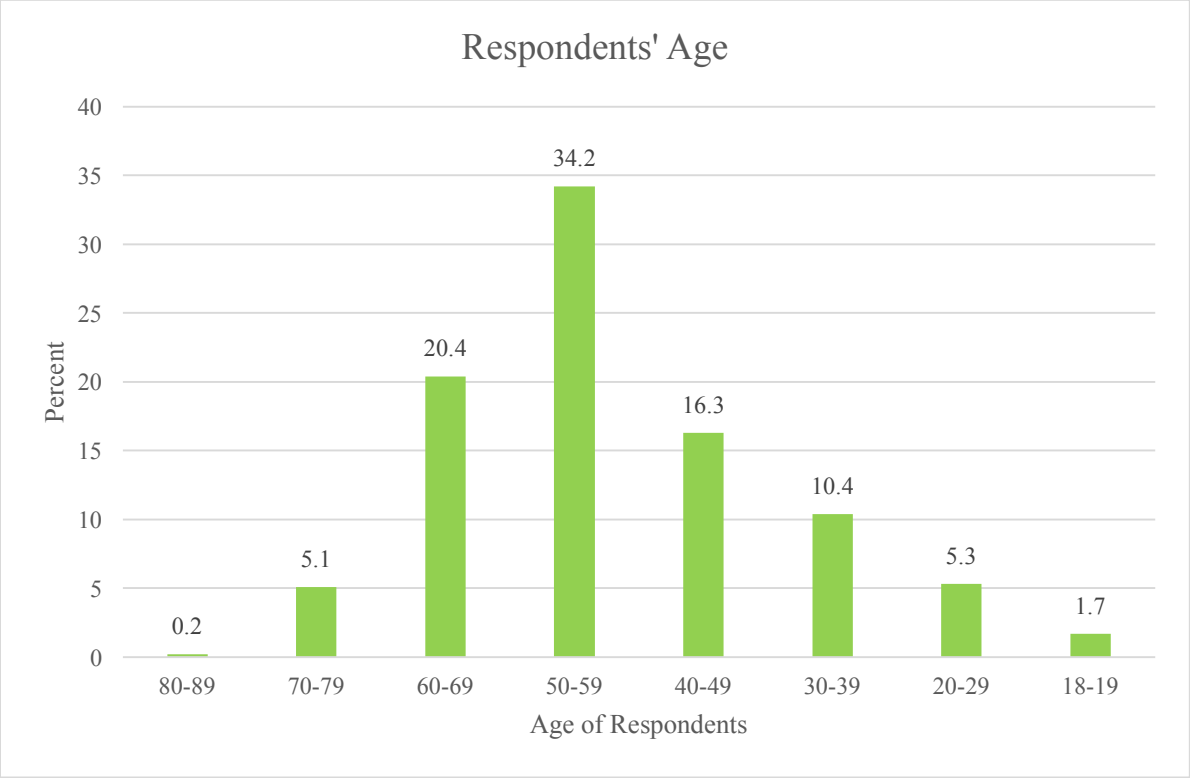

Figure 4.2a. *Respondents' age (%)* (N = 398)

Table 4.2b. *Respondents' gender*

Please indicate your gender.		
Gender	Frequency	Percent
Male	193	45.6
Female	216	51.1
Total	409	96.7

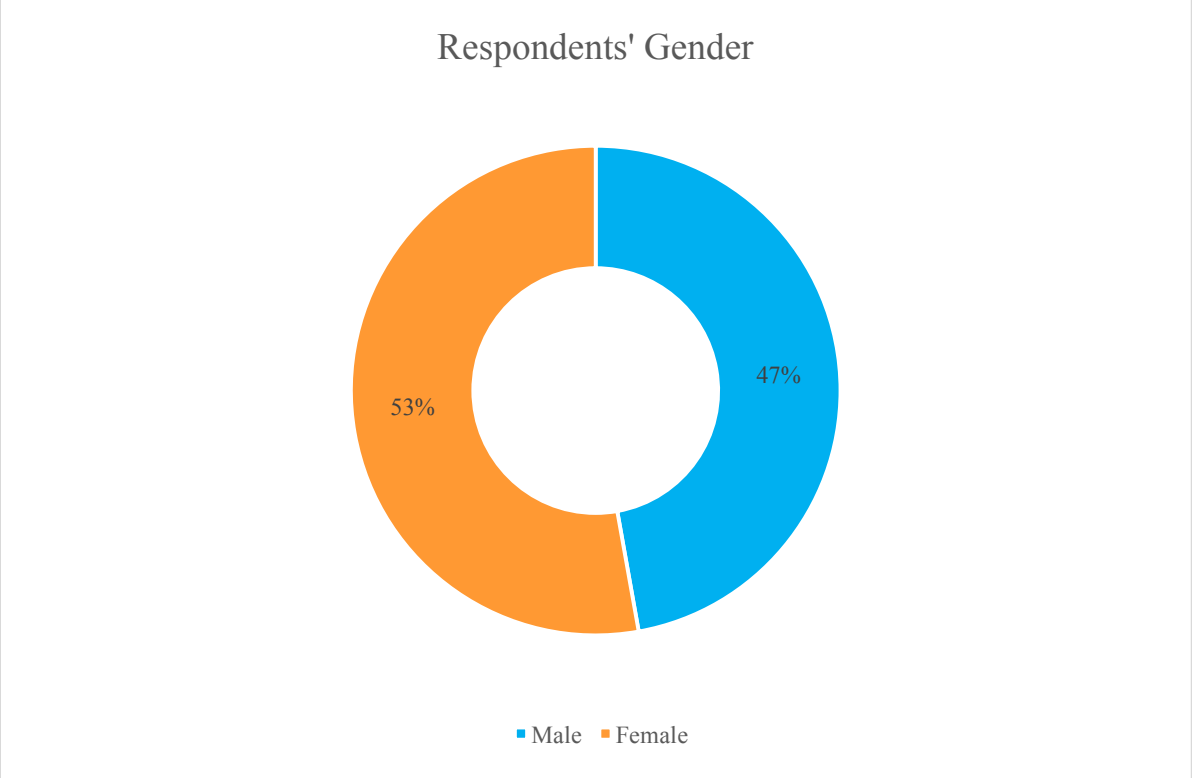

Figure 4.2b. *Respondents' gender (%)* (N = 409)

Table 4.2c. *Respondents' race*

Please indicate your race.		
Race	Frequency	Percent
American Indian or Alaska Native	4	0.9
Asian	3	0.7
White	382	90.3
Do not wish to answer	16	3.8
Total	405	95.7

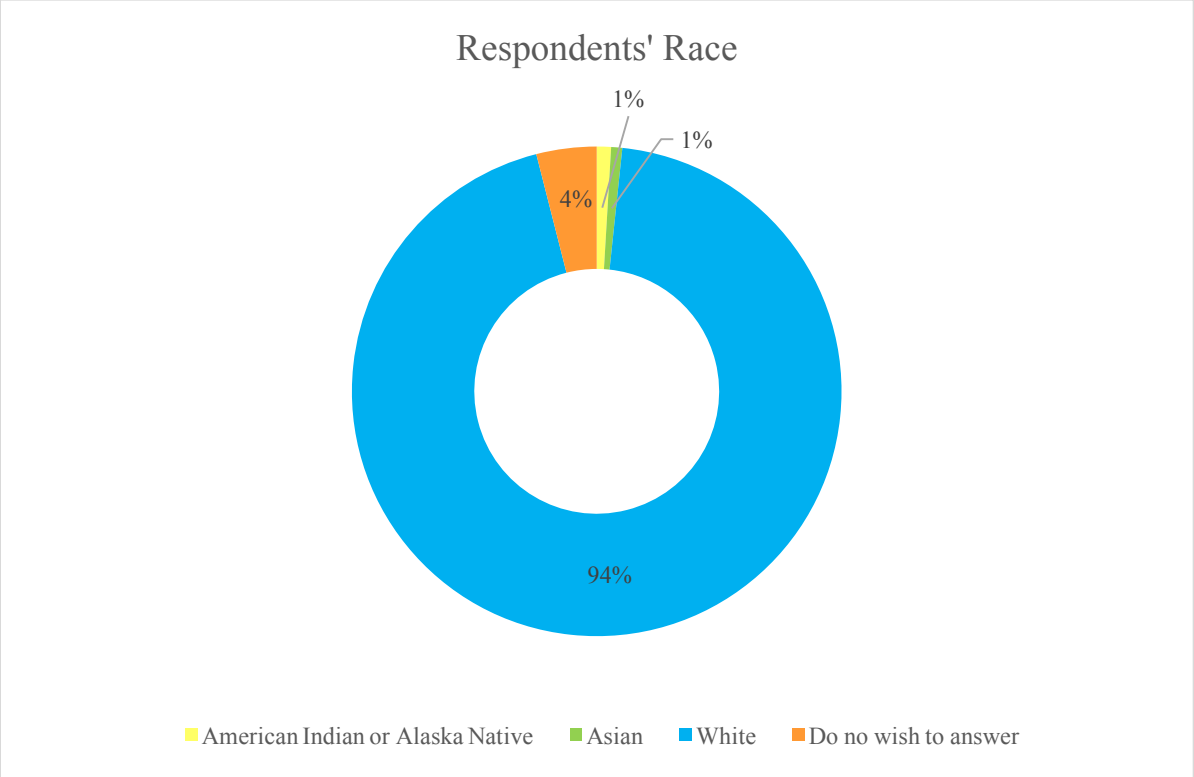

Figure 4.2c. *Respondents' race (%)* (N = 405)

4.3 Annual household income and education of respondents

Table 4.3a. *Annual household income by location*

		Less than $25,000	$25,000 to $34,999	$35,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999	$100,000 to $149,999	$150,000 to $199,999	$200,000 or more	Do not wish to respond	Total
Location	Alley Spring	1	5	10	18	18	17	15	6	19	109
	Shawnee Creek	6	9	18	31	30	37	26	9	42	208
	County Road	1	2	2	7	3	7	0	0	5	27
	Nichols Cabin	2	1	1	2	7	3	1	0	5	22
	Flying W (River Rec)	1	0	0	4	4	2	3	2	3	19
	Rocky Falls	2	1	3	3	1	3	2	3	1	19
Total		13	18	34	65	63	69	47	65	75	404

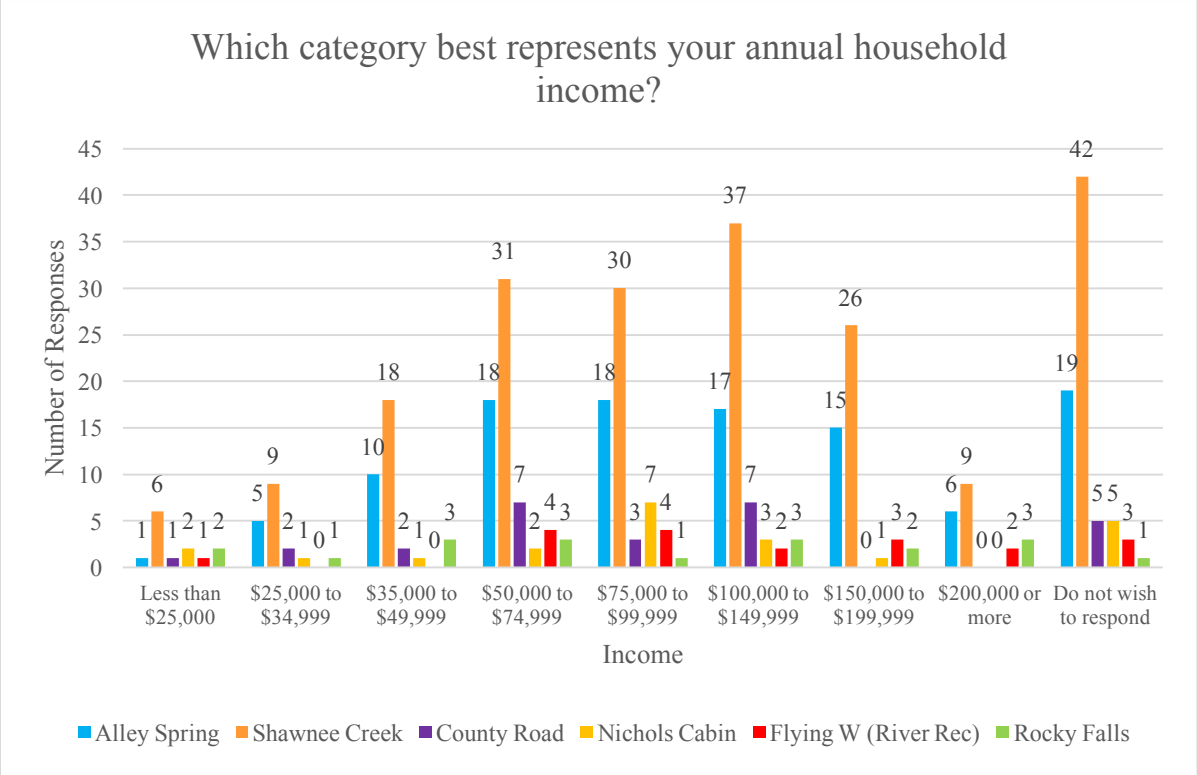

Figure 4.3a. *Annual household income by location* (Alley Spring N = 109; Shawnee Creek N = 208; County Road N = 27; Nichols Cabin N = 22; Flying W N = 19; Rocky Falls N = 19; Total N = 404)

Table 4.3c. *Highest level of education by location*

		Elementary School	High School	Some College or Professional Schooling	Bachelor's Degree	Some Graduate Work	Graduate Degree	Total
Location	Alley Spring	3	37	42	17	2	8	109
	Shawnee Creek	0	58	59	28	12	47	204
	County Road	0	7	6	9	2	3	27
	Nichols Cabin	1	7	7	4	0	2	21
	Flying W	0	3	5	3	1	7	19
	Rocky Falls	0	1	2	6	0	10	19
Total		4	113	121	67	17	77	399

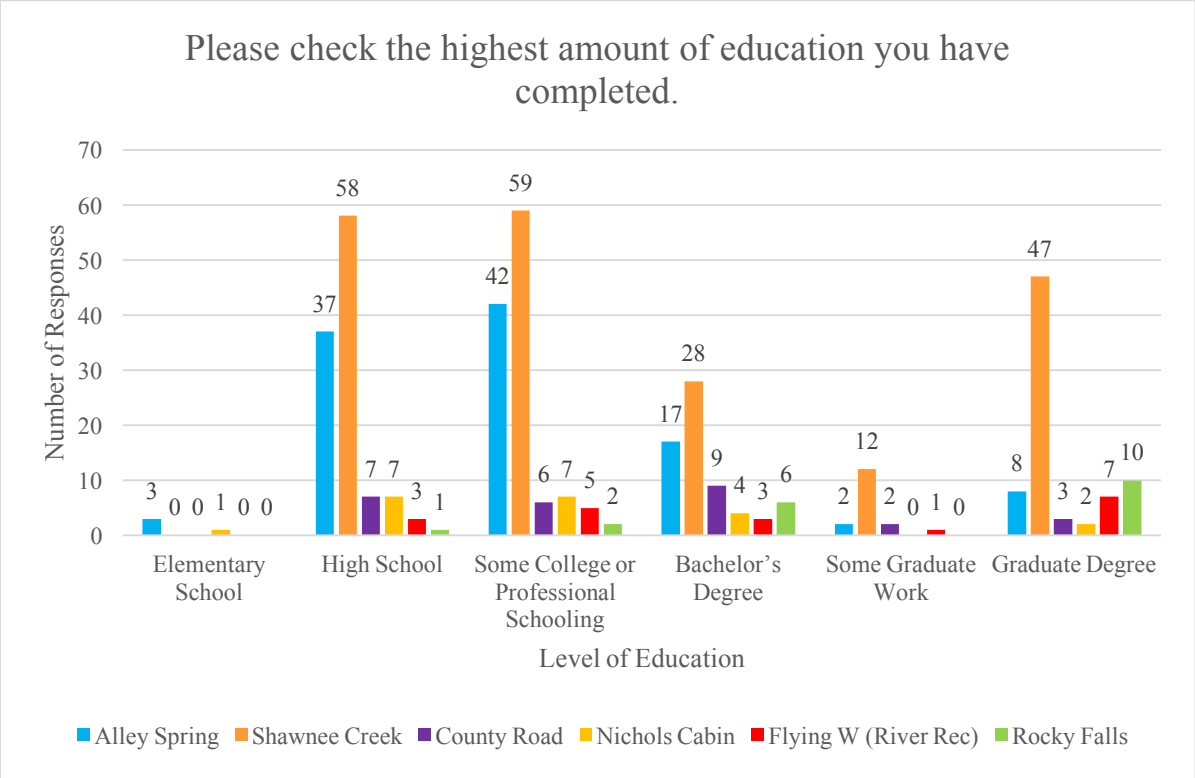

Figure 4.3b. *Highest level of education by location* (Alley Spring N = 109; Shawnee Creek N = 204; County Road N = 27; Nichols Cabin N = 21; Flying W N = 19; Rocky Falls N = 19; Total N = 399)

4.4 Respondents' Location of Residence

Table 4.4a. *Respondents' location of residence*

State	Frequency	State	Frequency
Massachusetts	1	Michigan	2
Pennsylvania	1	Iowa	23
Virginia	1	Wisconsin	10
West Virginia	6	Minnesota	3
North Carolina	5	South Dakota	1
South Carolina	1	Illinois	29
Alabama	1	Missouri	176
Tennessee	15	Kansas	17
Mississippi	1	Nebraska	3
Kentucky	19	Louisiana	2
Ohio	2	Arkansas	11
Indiana	3	Oklahoma	1
New Hampshire	1	Texas	4

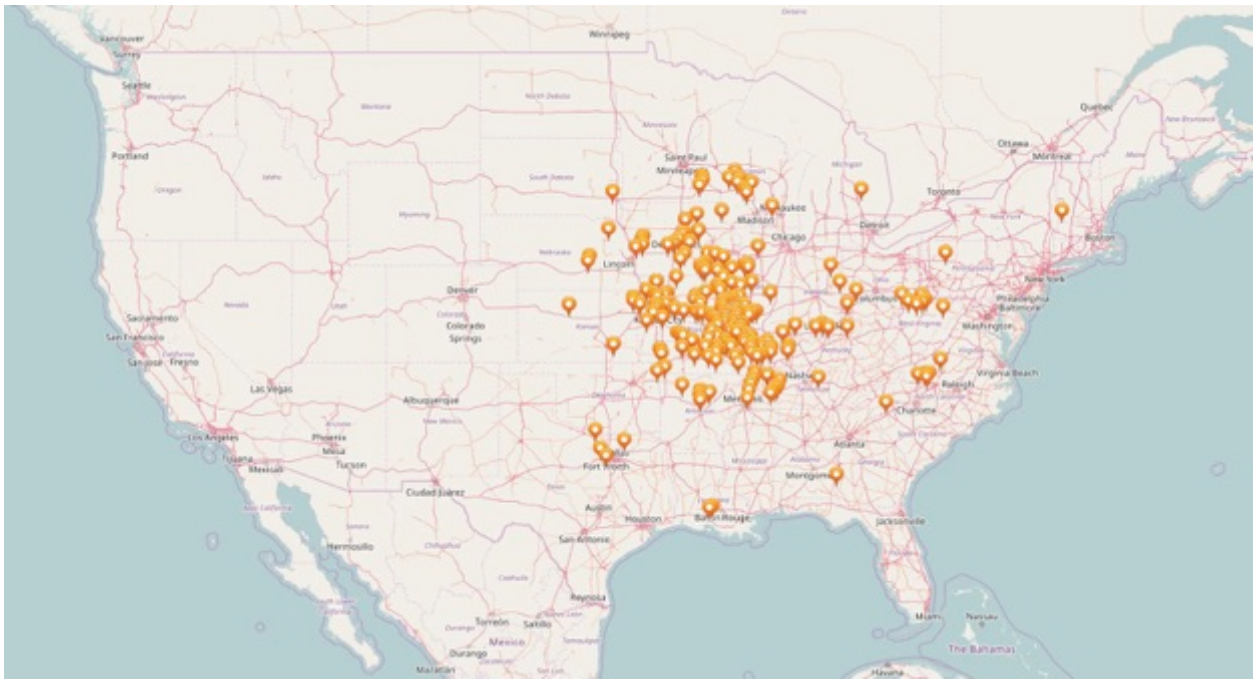

Figure 4.4a. *Visitors reported location of residence* (N = 353)

All respondents reported as residing in the United States. Approximately three-quarters of visitors were from Missouri or Illinois.

4.5 Past-use history

Table 4.5a. *Self-reported past-use history for visiting prior to questionnaire completion*

		Have you visited OZAR before today?		
		Yes	No	Total
Location	Alley Spring	105	10	115
	Shawnee Creek	196	21	217
	County Road	25	3	28
	Nichols Cabin	18	4	22
	Flying W	17	2	19
	Rocky Falls	13	6	19
Total		374	46	420

Table 4.5b. *Self-reported past-use history for OZAR visitation in the past 12 months*

Mean	4.79
Standard Deviation	12.433
N	352
Minimum	0
Maximum	180

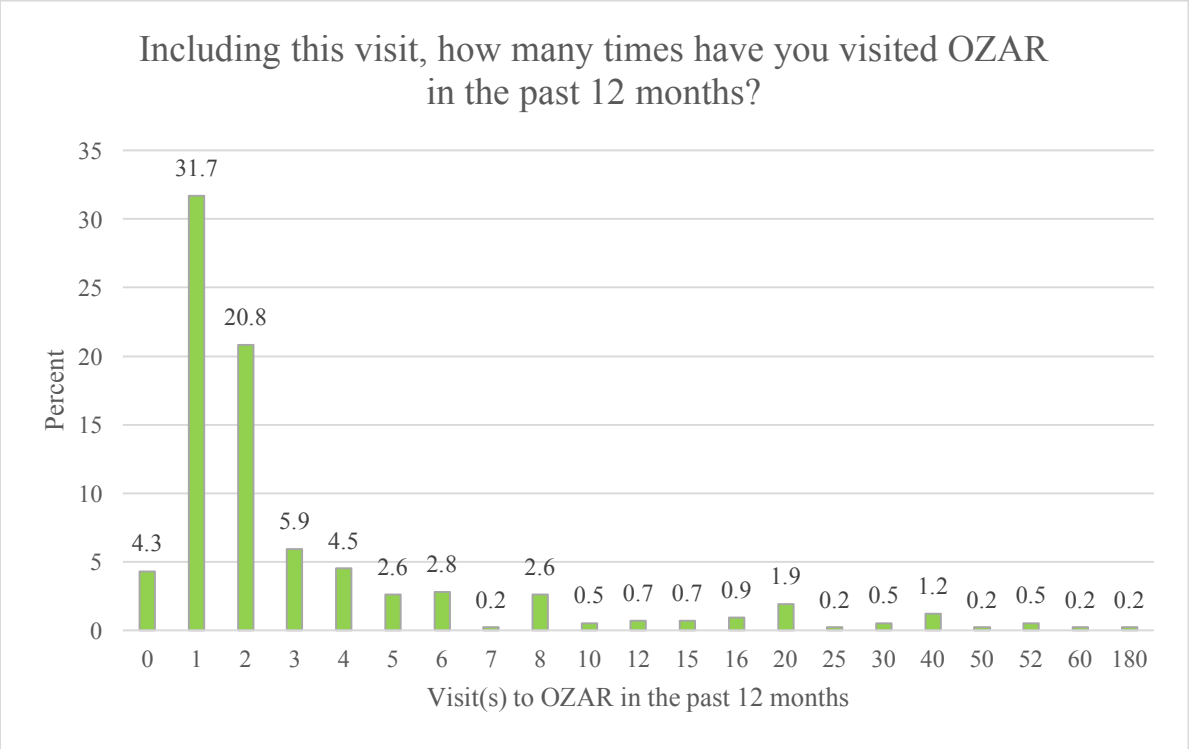

Figure 4.5a. Percent of past-use history for visitation within the last 12 months (%) (N = 352)

Past-use history

Respondents self-reported their number of past visits to OZAR. The aggregated sample from all intercept locations indicates 31.7% of respondents visited once in the past 12 months.

Table 4.6c. *Self-reported past-use history for number of years' respondents have visited OZAR*

Mean	15.99
Standard Deviation	13.492
N	370
Minimum	1
Maximum	60

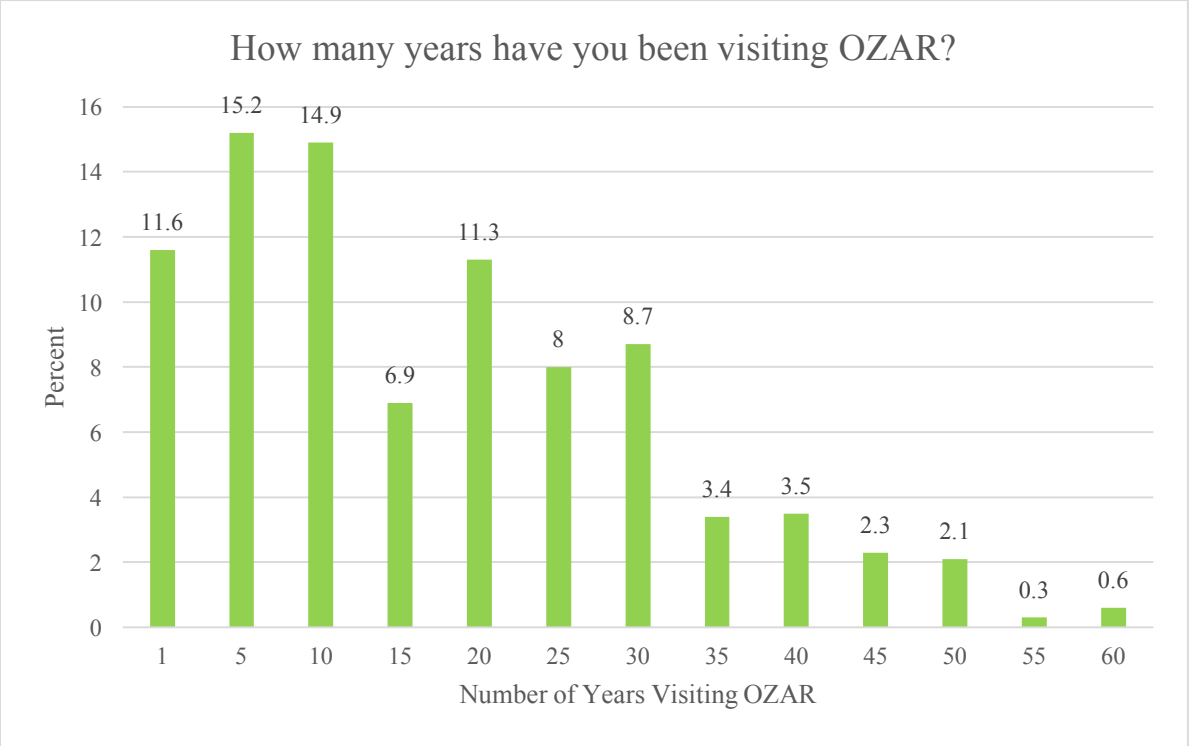

Figure 4.5b. Percent of past-use history for number of years visiting OZAR (%) (N = 370)

Past-use history for number of years visiting OZAR

Only 11.6% of respondents indicated this was their first visit, and/or have been visiting OZAR for one year or less. A majority of the visitors (64%) have been visiting OZAR for 10 years or more and 36% of visitors have been visiting OZAR for 9 years or less. These data suggest that past-use history for repeat visitation is relatively high for OZAR visitors (Sharp, Larson & Green, 2011; Lakes & Sharp, 2015).

Table 4.5d. *Other than OZAR, have you visited any other National Park Service sites in the past 12 months?*

	Yes	No	Not Sure	Total
Other than OZAR, have you visited any other NPS sites in the past 12 months?	273	130	17	420

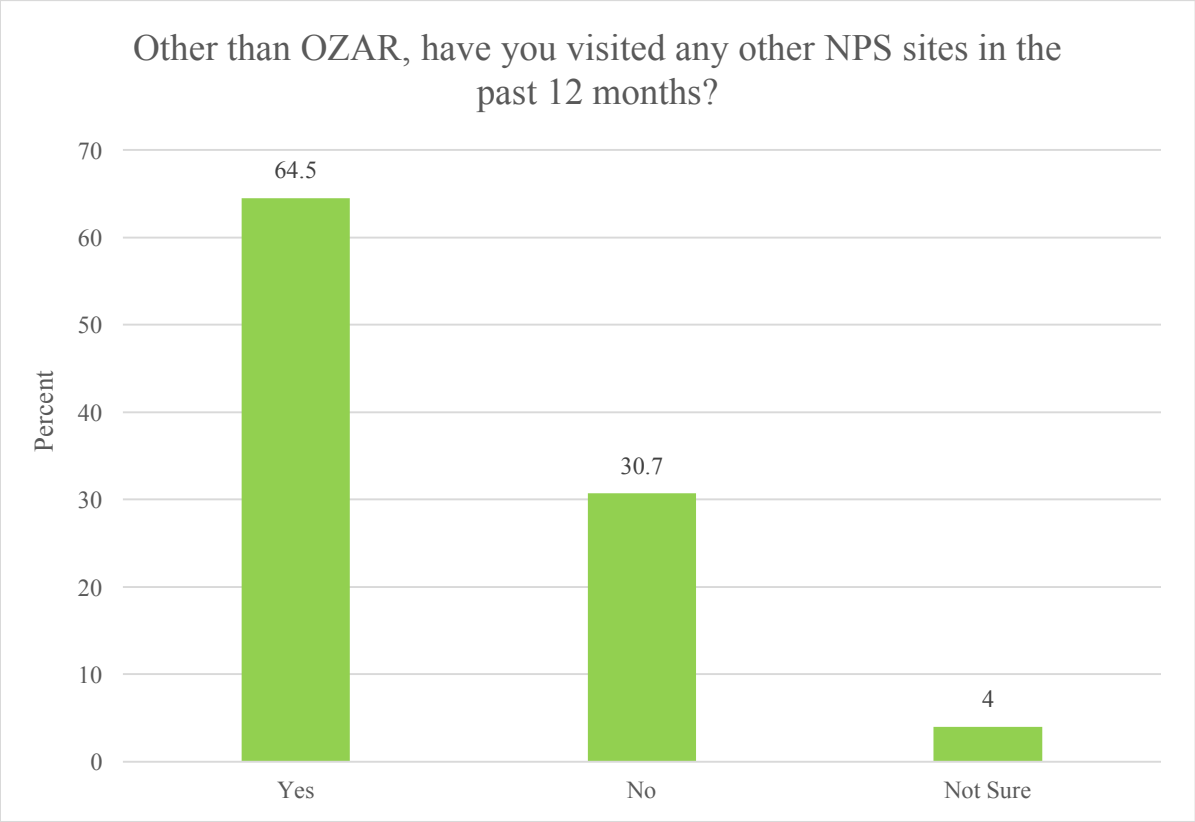

Figure 4.5c. Percent of visitors who have visited other NPS sites other than OZAR in past 12 months *(%)* (N = 420)

4.6 OZAR and the National Park Service (NPS)

Table 4.6a. *Did you know that OZAR is a part of the NPS system of parks and protected areas?*

	Yes	No	Total
Did you know OZAR is a part of the NPS system of parks and protected areas?	352	69	421

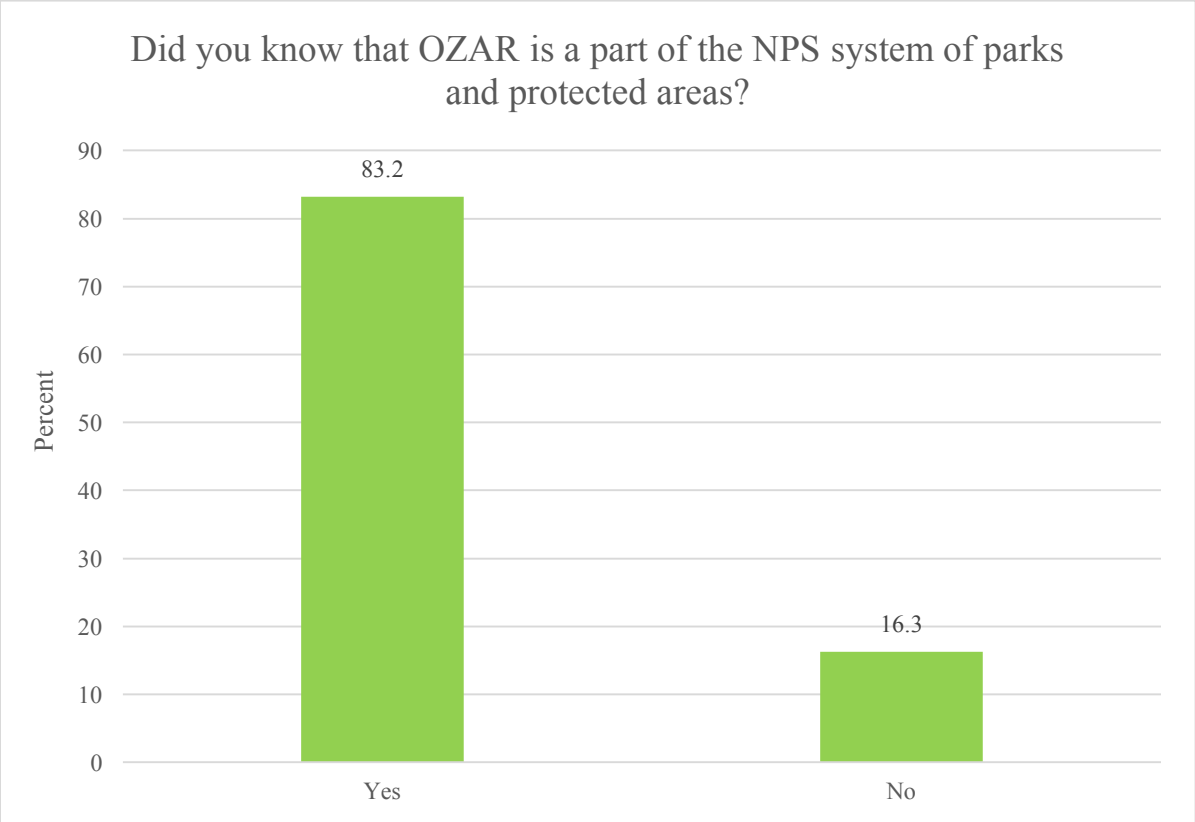

Figure 4.6a. Percent of visitors who know that OZAR is a part of the NPS system of parks and protected areas (%) (N = 421)

Table 4.6b. *Did you know that OZAR was the first federally protected river system in the United States?*

	Yes	No	Total
Did you know OZAR was the first federally protected river system in the US?	156	264	420

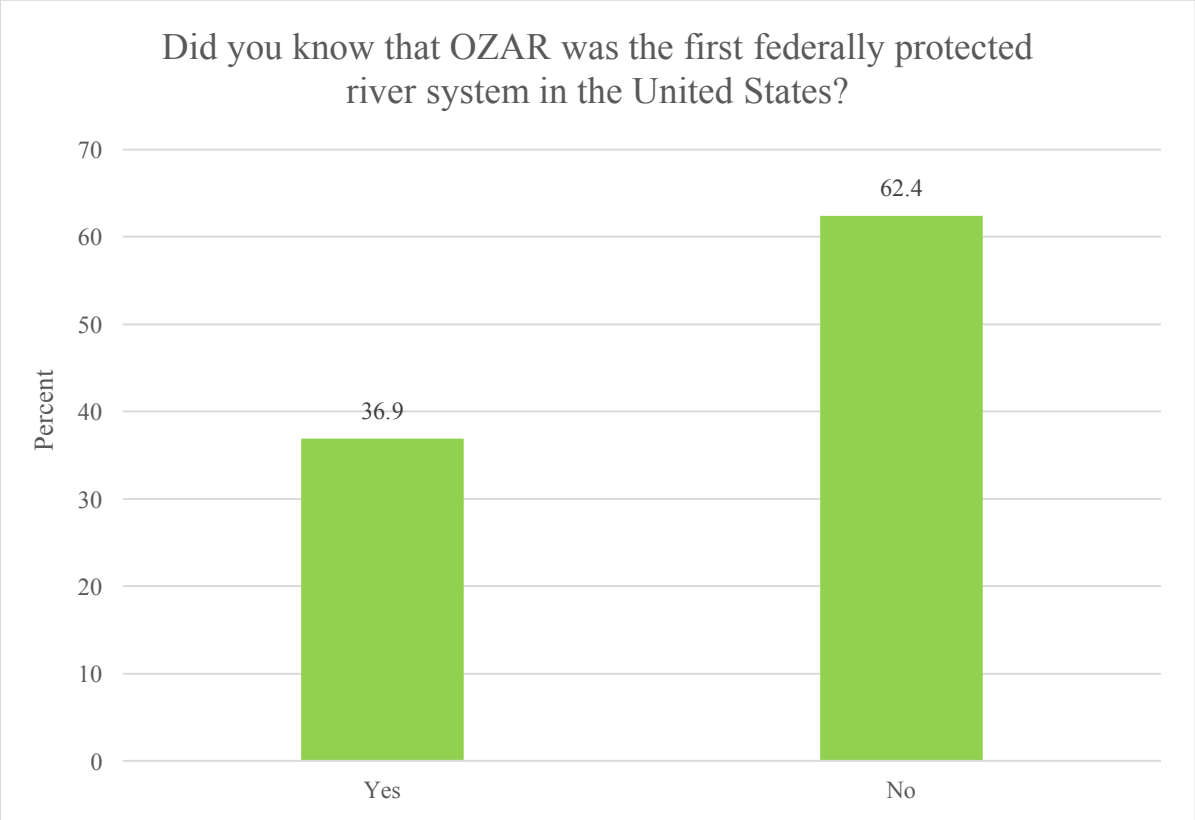

Figure 4.6b. Percent of visitors who know that OZAR was the first federally protected river system in the United States *(%)* (N = 420)

4.7 Reasons for visiting OZAR

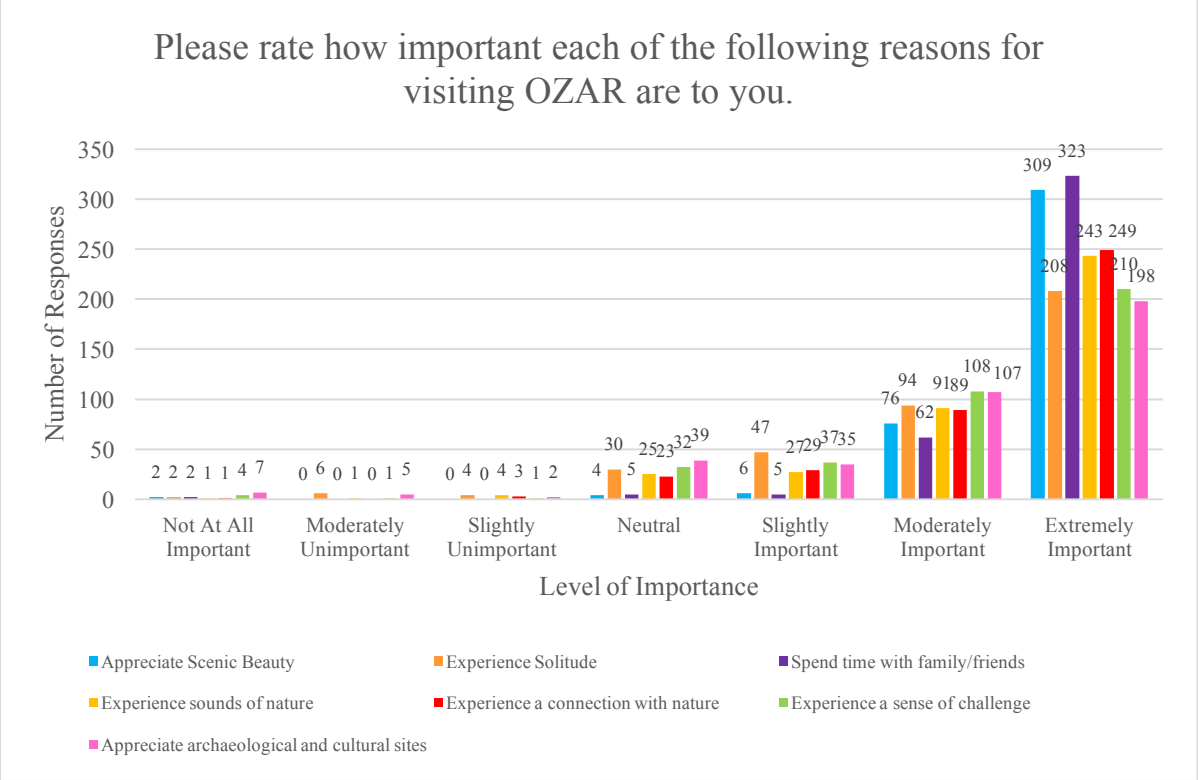

Figure 4.7a. *Visitors' reasons for visiting OZAR (Number of responses)* (Appreciate scenic beauty N = 397; Experience solitude N = 391; Spend time with family/friends N = 397; Experience the sounds of nature N = 392; Experience a connection with nature N = 394; Experience a sense of challenge N = 393; Appreciate archaeological and culture sites N = 393; Total N = 397)

Note: This data exists in Table 4.9c. There was no significant difference between horse riders and hikers.

The most important (extremely important) reason for people to visit OZAR is spending time with family (n=323), and to appreciate scenic beauty (n=309).

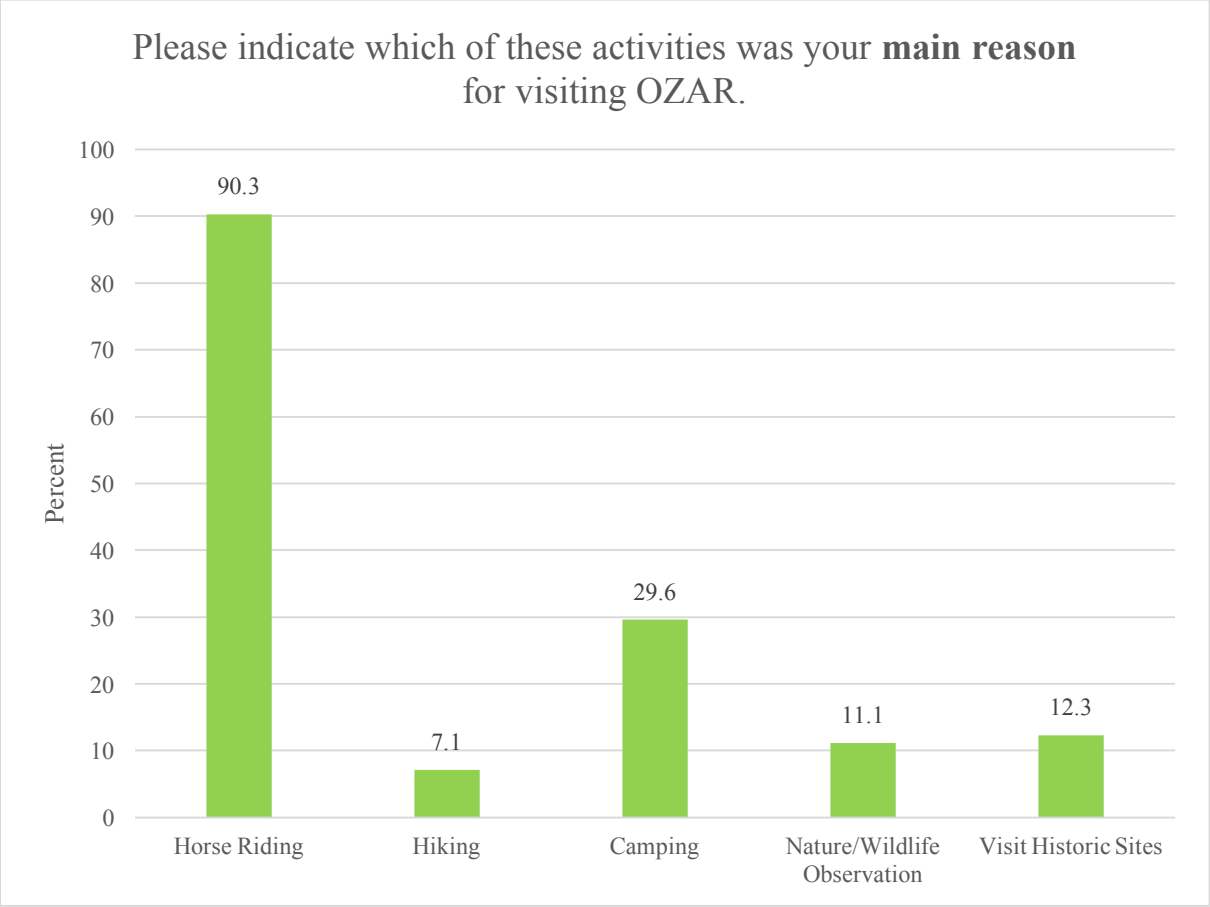

Figure 4.7b. *Visitors' main reason for visiting OZAR (%)* (N = 419)

Note: This data exists in Table 4.9b

Respondents could choose more than one answer, totals exceed 100%.

Main activity (reason) for visiting OZAR

Horse riding, camping, and visiting historic sites were the three activities most reported as the main reason for visiting OZAR.

Table 4.7a. *All reported activities participated in for all visitors' while at OZAR*

	Horse Riding	Hiking	Camping	Nature/Wildlife Observation	Visit Historic Sites
Count	377	62	238	123	131

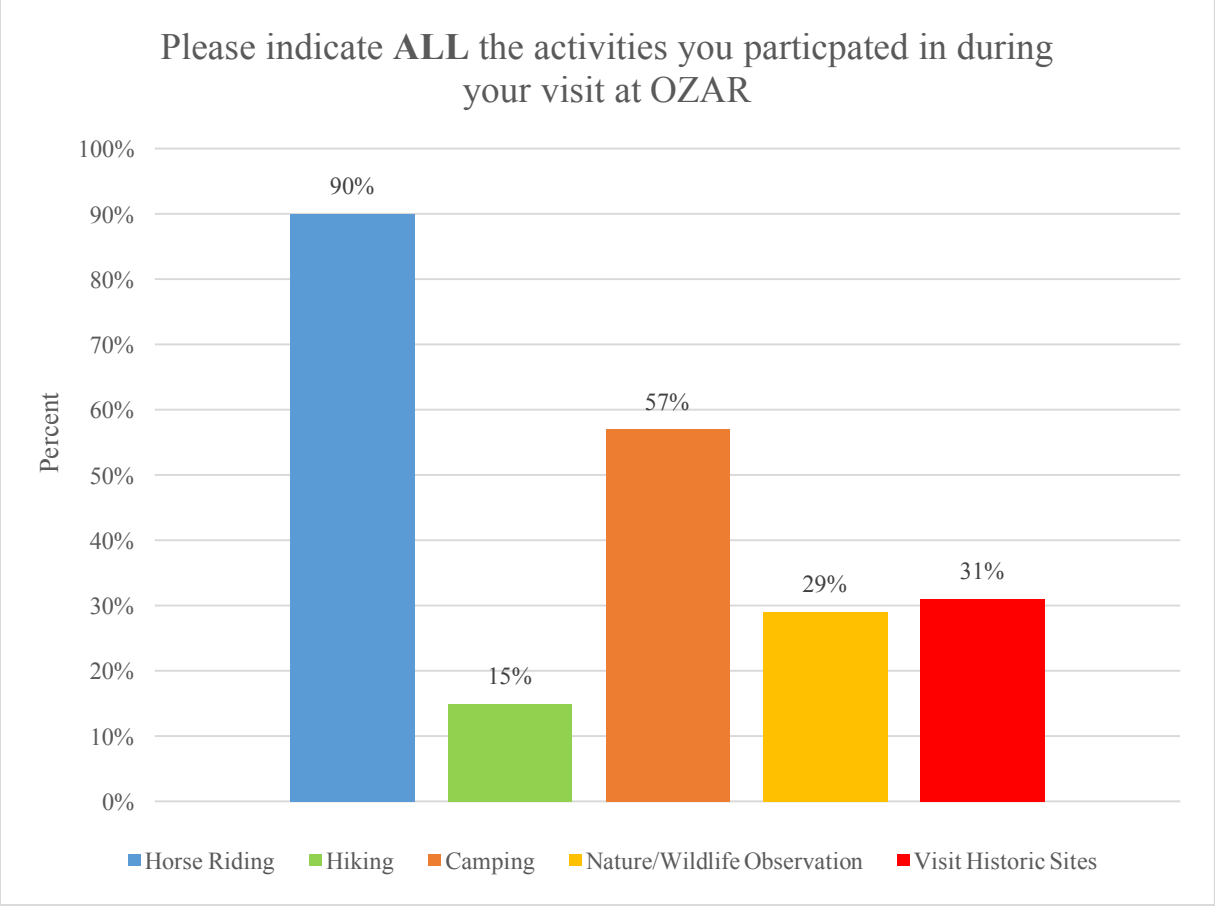

Figure 4.7c. *All reported activities participated in for all visitors' while at OZAR (%)* (N = 417)

Note: Frequencies exceed 100% because visitors were allowed to select more than one activity.

All Activities Participated in while visiting OZAR

Horse riding, camping, and visiting historic sites were the three most reported activities with no significant differences between visitors at different data collection sites. Conversely, only 7% of respondents indicated they participated in hiking.

4.8 Paid guide

Table 4.8a. *Horse riders who used a paid guide*

	Yes	No	Total
Did you use a paid guide?	13	404	417

Figure 4.8a. *Horse riders who used a paid guide (%)* (N = 417)

Of the 12 visitors who used a paid guide, a majority were at Shawnee Creek (n=10), with two at Alley Springs. Of the 417 people who said horse riding was their main reason for visiting OZAR, only 3.1% of horse riders used a paid guide.

4.9 Total sample responses at OZAR by day of use and season of use

Table 4.9a. *Total Sample Responses (mean ± S.D.) at OZAR by Day of Use and Season of Use*

			By Day of Use		By Season of Use	
	Questionnaire Item	Total Sample	Weekday	Weekend	Summer	Fall
Appropriateness of Trail Activities	Horse Riding	6.49 ± 1.14 (*N* = 412)	6.53 ± 1.07 (*N* = 254)	6.44 ± 1.25 (*N* = 158)	6.38 ± 1.28 (*N* = 239)	6.65 ± .900 (*N* = 173)
	Hiking	5.80 ± 1.45 (*N* = 365)	5.79 ± 1.49 (*N* = 217)	5.82 ± 1.39 (*N* = 148)	5.47 ± 1.55 (*N* = 219)	6.30 ± 1.12 (*N* = 146)
	Mountain Biking	4.69 ± 1.88 (*N* = 357)	4.68 ± 1.96 (*N* = 210)	4.71 ± 1.77 (*N* = 147)	4.50 ± 1.83 (*N* = 218)	4.98 ± 1.93 (*N* = 139)
Acceptability of Conditions	Trail Condition	6.32 ± 1.01 (*N* = 416)	6.24 ± 1.14 (*N* = 258)	6.54 ± .692 (*N* = 158)	6.21 ± 1.08 (*N* = 239)	6.54 ± .853 (*N* = 177)
	Marking of Trails	5.57 ± 1.48 (*N* = 401)	5.46 ± 1.54 (*N* = 247)	5.75 ± 1.36 (*N* = 154)	5.52 ± 1.55 (*N* = 235)	5.65 ± 1.37 (*N* = 166)
	Number of Trails	6.23 ± 1.23 (*N* = 398)	6.08 ± 1.33 (*N* = 244)	6.45 ± .991 (*N* = 154)	6.00 ± 1.39 (*N* = 235)	6.56 ± .825 (*N* = 163)
	Water Quality of Rivers and Streams	6.72 ± .694 (*N* = 394)	6.71 ± .755 (*N* = 239)	6.74 ± .590 (*N* = 155)	6.68 ± .764 (*N* = 226)	6.78 ± .583 (*N* = 168)
Reasons for Visiting	Appreciate Scenic Beauty	6.72 ± .667 (*N* = 397)	6.67 ± .690 (*N* = 254)	6.81 ± .616 (*N* = 143)	6.69 ± .695 (*N* = 232)	6.76 ± .626 (*N* = 165)
	Experience Solitude	6.14 ± 1.19 (*N* = 391)	6.07 ± 1.18 (*N* = 248)	6.26 ± 1.20 (*N* = 143)	6.15 ± 1.19 (*N* = 230)	6.12 ± 1.19 (*N* = 161)
	Spend Time with Family & Friends	6.75 ± .663 (*N* = 397)	6.72 ± .685 (*N* = 254)	6.80 ± .623 (*N* = 143)	6.72 ± .686 (*N* = 232)	6.79 ± .630 (*N* = 165)
	Experience Sounds of Nature	6.37 ± 1.00 (*N* = 392)	6.30 ± 1.02 (*N* = 250)	6.50 ± .958 (*N* = 142)	6.35 ± 1.05 (*N* = 231)	6.40 ± .931 (*N* = 161)
	Experience a Connection with Nature	6.41 ± .953 (*N* = 394)	6.32 ± .976 (*N* = 252)	6.56 ± .895 (*N* = 142)	6.40 ± .962 (*N* = 232)	6.41 ± .943 (*N* = 162)
	Experience a Sense of Challenge	6.21 ± 1.11 (*N* = 393)	6.15 ± 1.11 (*N* = 251)	6.32 ± 1.10 (*N* = 142)	6.18 ± 1.10 (*N* = 232)	6.25 ± 1.13 (*N* = 161)
	Appreciate Archaeological and Cultural Sites	6.06 ± 1.30 (*N* = 393)	5.95 ± 1.36 (*N* = 251)	6.26 ± 1.16 (*N* = 142)	6.02 ± 1.33 (*N* = 232)	6.12 ± 1.25 (*N* = 161)

	Questionnaire Item	Total Sample	By Day of Use: Weekday	By Day of Use: Weekend	By Season of Use: Summer	By Season of Use: Fall
Management Scenarios	Free Permit	3.41 ± 2.28 (*N* = 393)	3.26 ± 2.28 (*N* = 252)	3.69 ± 2.27 (*N* = 141)	3.20 ± 2.24 (*N* = 230)	3.72 ± 2.30 (*N* = 163)
	Charge A Fee for a Permit	2.67 ± 2.11 (*N* = 393)	2.44 ± 1.99 (*N* = 252)	3.09 ± 2.24 (*N* = 141)	2.47 ± 1.98 (*N* = 229)	2.95 ± 2.26 (*N* = 164)
	Annual Permit	2.67 ± 2.01 (*N* = 392)	2.51 ± 1.97 (*N* = 251)	2.96 ± 2.06 (*N* = 141)	2.52 ± 1.89 (*N* = 228)	2.88 ± 2.15 (*N* = 164)
	Daily Permit	2.41 ± 1.95 (*N* = 391)	2.24 ± 1.88 (*N* = 250)	2.70 ± 2.03 (*N* = 141)	2.30 ± 1.840 (*N* = 229)	2.56 ± 2.09 (*N* = 162)
	Limit Maximum Group Size	2.37 ± 1.88 (*N* = 389)	2.22 ± 1.80 (*N* = 248)	2.65 ± 1.99 (*N* = 141)	2.41 ± 1.91 (*N* = 227)	2.32 ± 1.85 (*N* = 162)
	Limit Maximum Number of Groups	2.27 ± 1.82 (*N* = 392)	2.18 ± 1.78 (*N* = 251)	2.43 ± 1.88 (*N* = 141)	2.34 ± 1.82 (*N* = 229)	2.17 ± 1.81 (*N* = 163)
	Designate Trails Based on Activity	3.56 ± 2.21 (*N* = 391)	3.47 ± 2.16 (*N* = 250)	3.72 ± 2.29 (*N* = 141)	3.61 ± 2.21 (*N* = 230)	3.48 ± 2.21 (*N* = 161)
	Limit Trail Related River Crossings	2.38 ± 1.87 (*N* = 393)	2.31 ± 1.84 (*N* = 252)	2.50 ± 1.92 (*N* = 141)	2.37 ± 1.82 (*N* = 229)	2.38 ± 1.95 (*N* = 164)
	Require Education on Low Impact Trail Practices	3.03 ± 2.07 (*N* = 393)	2.88 ± 2.03 (*N* = 252)	3.31 ± 2.12 (*N* = 141)	3.11 ± 2.06 (*N* = 229)	2.93 ± 2.09 (*N* = 164)
	Level Crowding Experienced	2.26 ± 1.36 (*N* = 394)	2.23 ± 1.37 (*N* = 252)	2.31 ± 1.34 (*N* = 142)	2.19 ± 1.31 (*N* = 229)	2.35 ± 1.42 (*N* = 165)

Notes for Conditions: Scored on scale 1 (extremely unacceptable) to 7 (extremely acceptable)
Notes for Reasons for Visiting: Scored on scale 1 (not at all important) to 7 (extremely important)
Notes for Management Scenarios: Scored on scale 1 (strongly disagree) to 7 (strongly agree)
Notes for Crowding: Scored on scale 1 (not crowded) to 7 (extremely crowded)

Table 4.9b. *Responses (mean ± S.D.) at OZAR Based on Activity Type*

	Questionnaire Item	Horse Riding	Hiking	Camping	Nature & Wildlife Observation	Visit Historic Sites
Appropriateness of Trail Activities	Horse Riding	6.65 ± .919 (*N* = 371)	5.75 ± 1.71 (*N* = 61)	6.48 ± 1.11 (*N* = 231)	6.47 ± 1.22 (*N* = 121)	6.67 ± .852 (*N* = 128)
	Hiking	5.73 ± 1.48 (*N* = 325)	6.47 ± 1.02 (*N* = 59)	5.85 ± 1.36 (*N* = 209)	6.19 ± 1.24 (*N* = 115)	6.14 ± 1.27 (*N* = 120)
	Mountain Biking	4.62 ± 1.92 (*N* = 317)	4.71 ± 1.90 (*N* = 55)	4.63 ± 1.81 (*N* = 202)	5.13 ± 1.85 (*N* = 112)	5.04 ± 1.84 (*N* = 117)
Acceptability of Conditions	Trail Condition	6.39 ± .983 (*N* = 374)	6.15 ± 1.58 (*N* = 62)	6.33 ± .992 (*N* = 237)	6.32 ± 1.03 (*N* = 123)	6.44 ± .930 (*N* = 131)
	Marking of Trails	5.59 ± 1.49 (*N* = 359)	5.66 ± 1.59 (*N* = 62)	5.60 ± 1.45 (*N* = 229)	5.58 ± 1.63 (*N* = 121)	5.61 ± 1.61 (*N* = 127)
	Number of Trails	6.24 ± 1.24 (*N* = 356)	6.40 ± .931 (*N* = 62)	6.35 ± 1.03 (*N* = 227)	6.23 ± 1.21 (*N* = 120)	6.39 ± 1.03 (*N* = 127)
	Water Quality of Rivers and Streams	6.72 ± .703 (*N* = 355)	6.79 ± .520 (*N* = 61)	6.75 ± .616 (*N* = 224)	6.75 ± .625 (*N* = 120)	6.80 ± .518 (*N* = 128)
Reasons for Visiting	Appreciate Scenic Beauty	6.72 ± .668 (*N* = 353)	6.77 ± .567 (*N* = 57)	6.74 ± .642 (*N* = 221)	6.76 ± .584 (*N* = 114)	6.84 ± .451 (*N* = 119)
	Experience Solitude	6.10 ± 1.21 (*N* = 347)	5.98 ± 1.48 (*N* = 57)	6.23 ± 1.08 (*N* = 218)	6.20 ± 1.20 (*N* = 113)	6.31 ± 1.09 (*N* = 118)
	Spend Time with Family & Friends	6.75 ± .684 (*N* = 353)	6.72 ± .675 (*N* = 57)	6.78 ± .638 (*N* = 221)	6.77 ± .610 (*N* = 114)	6.78 ± .585 (*N* = 119)
	Experience Sounds of Nature	6.35 ± 1.02 (*N* = 349)	6.32 ± 1.11 (*N* = 57)	6.41 ± .946 (*N* = 219)	6.48 ± .927 (*N* = 113)	6.53 ± .834 (*N* = 118)
	Experience a Connection with Nature	6.39 ± .951 (*N* = 350)	6.39 ± 1.07 (*N* = 57)	6.43 ± .888 (*N* = 219)	6.54 ± .846 (*N* = 113)	6.55 ± .758 (*N* = 118)
	Experience a Sense of Challenge	6.22 ± 1.12 (*N* = 349)	6.33 ± .932 (*N* = 57)	6.25 ± .998 (*N* = 219)	6.15 ± 1.12 (*N* = 113)	6.27 ± 1.05 (*N* = 118)
	Appreciate Archaeological and Cultural Sites	6.07 ± 1.29 (*N* = 349)	5.82 ± 1.50 (*N* = 57)	6.08 ± 1.23 (*N* = 219)	6.12 ± 1.28 (*N* = 113)	6.32 ± 1.00 (*N* = 118)

	Questionnaire Item	Horse Riding	Hiking	Camping	Nature & Wildlife Observation	Visit Historic Sites
Management Scenarios	Free Permit	3.28 ± 2.27 (*N* = 350)	3.79 ± 2.27 (*N* = 56)	3.32 ± 2.25 (*N* = 219)	3.24 ± 2.24 (*N* = 113)	3.38 ± 2.30 (*N* = 118)
	Charge A Fee for a Permit	2.55 ± 2.07 (*N* = 350)	3.00 ± 2.17 (*N* = 56)	2.63 ± 2.07 (*N* = 219)	2.59 ± 2.10 (*N* = 112)	2.79 ± 2.05 (*N* = 118)
	Annual Permit	2.58 ± 1.99 (*N* = 349)	2.88 ± 2.01 (*N* = 56)	2.71 ± 2.00 (*N* = 218)	2.72 ± 2.04 (*N* = 111)	2.92 ± 2.05 (*N* = 118)
	Daily Permit	2.31 ± 1.93 (*N* = 348)	2.61 ± 1.85 (*N* = 56)	2.38 ± 1.92 (*N* = 218)	2.33 ± 1.93 (*N* = 111)	2.50 ± 1.89 (*N* = 118)
	Limit Maximum Group Size	2.21 ± 1.81 (*N* = 346)	2.98 ± 1.91 (*N* = 56)	2.35 ± 1.85 (*N* = 218)	2.44 ± 1.81 (*N* = 112)	2.49 ± 1.70 (*N* = 117)
	Limit Maximum Number of Groups	2.13 ± 1.78 (*N* = 349)	2.68 ± 1.75 (*N* = 56)	2.27 ± 1.79 (*N* = 219)	2.33 ± 1.76 (*N* = 112)	2.36 ± 1.68 (*N* = 118)
	Designate Trails Based on Activity	3.37 ± 2.19 (*N* = 348)	4.04 ± 2.04 (*N* = 56)	3.61 ± 2.16 (*N* = 218)	3.72 ± 2.28 (*N* = 113)	3.73 ± 2.09 (*N* = 118)
	Limit Trail Related River Crossings	2.21 ± 1.82 (*N* = 350)	2.71 ± 1.84 (*N* = 56)	2.29 ± 1.77 (*N* = 219)	2.50 ± 1.86 (*N* = 112)	2.40 ± 1.76 (*N* = 118)
	Require Education on Low Impact Trail Practices	2.88 ± 2.04 (*N* = 351)	3.40 ± 2.12 (*N* = 55)	3.04 ± 2.03 (*N* = 218)	3.35 ± 2.13 (*N* = 113)	3.29 ± 1.93 (*N* = 119)
	Level Crowding Experienced	2.20 ± 1.35 (*N* = 351)	2.47 ± 1.42 (*N* = 57)	2.21 ± 1.36 (*N* = 219)	2.21 ± 1.30 (*N* = 112)	2.22 ± 1.32 (*N* = 118)

Notes for Conditions: Scored on scale 1 (extremely unacceptable) to 7 (extremely acceptable)
Notes for Reasons for Visiting: Scored on scale 1 (not at all important) to 7 (extremely important)
Notes for Management Scenarios: Scored on scale 1 (strongly disagree) to 7 (strongly agree)
Notes for Crowding: Scored on scale 1 (not crowded) to 7 (extremely crowded)

Table 4.9c. *Responses (mean ± S.D.) at OZAR Based on Location*

	Questionnaire Item	Alley Spring	Shawnee Creek	County Road	Nichols Cabin	Flying W	Rocky Falls
Appropriateness of Trail Activities	Horse Riding	6.77 ± .660 (*N* = 111)	6.60 ± 1.00 (*N* = 215)	6.36 ± 1.25 (*N* = 28)	6.77 ± .685 (*N* = 22)	5.59 ± 1.54 (*N* = 17)	4.32 ± 1.92 (*N* = 19)
	Hiking	6.14 ± 1.34 (*N* = 81)	5.58 ± 1.51 (*N* = 198)	5.50 ± 1.60 (*N* = 28)	6.05 ± 1.25 (*N* = 22)	6.00 ± 1.37 (*N* = 17)	6.68 ± .582 (*N* = 19)
	Mountain Biking	4.73 ± 1.95 (*N* = 79)	4.56 ± 1.90 (*N* = 196)	3.92 ± 1.93* (*N* = 24)	5.23 ± 1.72 (*N* = 22)	5.41 ± 1.37 (*N* = 17)	5.58 ± 1.43 (*N* = 19)
Acceptability of Conditions	Trail Condition	6.43 ± .880 (*N* = 115)	6.39 ± 1.01 (*N* = 215)	6.07 ± 1.33 (*N* = 27)	6.59 ± .590 (*N* = 22)	5.61 ± 1.50 (*N* = 18)	6.26 ± .653 (*N* = 19)
	Marking of Trails	5.36 ± 1.55 (*N* = 103)	5.60 ± 1.51 (*N* = 212)	5.81 ± 1.11 (*N* = 27)	5.95 ± 1.40 (*N* = 22)	5.17 ± 1.34 (*N* = 18)	6.05 ± 1.22 (*N* = 19)
	Number of Trails	6.20 ± 1.18 (*N* = 101)	6.29 ± 1.25 (*N* = 211)	6.04 ± 1.37 (*N* = 27)	6.45 ± .963 (*N* = 22)	5.28 ± 1.32 (*N* = 18)	6.58 ± .692 (*N* = 19)
	Water Quality of Rivers and Streams	6.75 ± .585 (*N* = 105)	6.70 ± .780 (*N* = 208)	6.77 ± .652 (*N* = 26)	6.86 ± .351 (*N* = 22)	6.50 ± .760 (*N* = 14)	6.74 ± .562 (*N* = 19)
Reasons for Visiting	Appreciate Scenic Beauty	6.75 ± .723 (*N* = 114)	6.69 ± .674 (*N* = 202)	6.76 ± .436 (*N* = 21)	6.73 ± .456 (*N* = 22)	6.63 ± .831 (*N* = 19)	6.84 ± .501 (*N* = 19)
	Experience Solitude	6.06 ± 1.32 (*N* = 110)	6.09 ± 1.17 (*N* = 200)	6.19 ± 1.25 (*N* = 21)	6.32 ± 1.25 (*N* = 21)	6.47 ± .697 (*N* = 19)	6.58 ± .692 (*N* = 19)
	Spend Time with Family & Friends	6.75 ± .738 (*N* = 114)	6.74 ± .693 (*N* = 202)	6.76 ± .436 (*N* = 21)	6.86 ± .351 (*N* = 22)	6.89 ± .315 (*N* = 19)	6.58 ± .607 (*N* = 19)
	Experience Sounds of Nature	6.41 ± .967 (*N* = 111)	6.32 ± 1.02 (*N* = 201)	6.24 ± 1.09 (*N* = 21)	6.36 ± 1.22 (*N* = 22)	6.67 ± .767 (*N* = 18)	6.58 ± .838 (*N* = 19)
	Experience a Connection with Nature	6.42 ± .974 (*N* = 112)	6.38 ± .925 (*N* = 201)	6.24 ± .995 (*N* = 21)	6.41 ± 1.14 (*N* = 22)	6.42 ± 1.12 (*N* = 19)	6.79 ± .631 (*N* = 19)
	Experience a Sense of Challenge	6.32 ± .983 (*N* = 111)	6.16 ± 1.17 (*N* = 201)	6.14 ± 1.11 (*N* = 21)	6.32 ± 1.32 (*N* = 22)	5.79 ± 1.18 (*N* = 19)	6.42 ± .769 (*N* = 19)
	Appreciate Archaeological and Cultural Sites	6.13 ± 1.18 (*N* = 111)	6.00 ± 1.35 (*N* = 201)	5.95 ± 1.53 (*N* = 21)	6.32 ± 1.46 (*N* = 22)	6.05 ± 1.22 (*N* = 19)	6.16 ± 1.07 (*N* = 19)

	Questionnaire Item	Alley Spring	Shawnee Creek	County Road	Nichols Cabin	Flying W	Rocky Falls
Management Scenarios	Free Permit	3.67 ± 2.39 (*N* = 112)	3.12 ± 2.22 (*N* = 201)	3.76 ± 2.43 (*N* = 21)	2.50 ± 1.90 (*N* = 22)	4.58 ± 1.84 (*N* = 19)	4.56 ± 2.06 (*N* = 18)
	Charge A Fee for a Permit	2.78 ± 2.25 (*N* = 113)	2.47 ± 2.01 (*N* = 200)	2.48 ± 2.27 (*N* = 21)	2.32 ± 1.62 (*N* = 22)	3.26 ± 2.05 (*N* = 19)	4.22 ± 2.07* (*N* = 18)
	Annual Permit	2.69 ± 2.14 (*N* = 113)	2.50 ± 1.94 (*N* = 199)	3.19 ± 2.32 (*N* = 21)	2.32 ± 1.59 (*N* = 22)	3.11 ± 1.91 (*N* = 19)	3.83 ± 1.76 (*N* = 18)
	Daily Permit	2.47 ± 2.06 (*N* = 111)	2.25 ± 1.88 (*N* = 200)	2.52 ± 2.29 (*N* = 21)	1.82 ± 1.30 (*N* = 22)	3.42 ± 1.95 (*N* = 19)	3.33 ± 1.72 (*N* = 18)
	Limit Maximum Group Size	2.21 ± 1.88 (*N* = 112)	2.19 ± 1.78 (*N* = 199)	2.65 ± 2.08 (*N* = 20)	1.82 ± 1.30 (*N* = 22)	3.78 ± 2.02 (*N* = 18)	4.44 ± 1.42 (*N* = 18)
	Limit Maximum Number of Groups	2.19 ± 1.89 (*N* = 113)	2.10 ± 1.74 (*N* = 200)	2.50 ± 2.04 (*N* = 20)	1.68 ± 1.13 (*N* = 22)	3.68 ± 1.95 (*N* = 19)	3.72 ± 1.27 (*N* = 18)
	Designate Trails Based on Activity	3.53 ± 2.23 (*N* = 111)	3.34 ± 2.22 (*N* = 201)	3.75 ± 2.10 (*N* = 20)	2.73 ± 1.96 (*N* = 22)	5.00 ± 1.63 (*N* = 19)	5.44 ± 1.15 (*N* = 18)
	Limit Trail Related River Crossings	2.32 ± 1.96 (*N* = 113)	2.10 ± 1.73 (*N* = 200)	3.14 ± 2.18 (*N* = 21)	1.82 ± 1.30 (*N* = 22)	3.79 ± 1.69 (*N* = 19)	4.17 ± 1.38 (*N* = 18)
	Require Education on Low Impact Trail Practices	2.94 ± 2.09 (*N* = 113)	2.82 ± 2.00 (*N* = 202)	3.80 ± 2.29 (*N* = 20)	2.64 ± 2.17 (*N* = 22)	4.22 ± 1.77 (*N* = 18)	4.44 ± 1.62 (*N* = 18)
	Level Crowding Experienced	2.31 ± 1.43 (*N* = 111)	2.20 ± 1.30 (*N* = 202)	2.05 ± 1.20 (*N* = 21)	1.64 ± 1.22 (*N* = 22)	3.16 ± 1.57* (*N* = 19)	2.63 ± 1.21 (*N* = 19)

Notes for Conditions: Scored on scale 1 (extremely unacceptable) to 7 (extremely acceptable)
Notes for Reasons for Visiting: Scored on scale 1 (not at all important) to 7 (extremely important)
Notes for Management Scenarios: Scored on scale 1 (strongly disagree) to 7 (strongly agree)
Notes for Crowding: Scored on scale 1 (not crowded) to 7 (extremely crowded)

4.10 Visitors' enjoyment limited by the action of another group or individual

** 92% of respondents did not experience any actions of other recreationist that limited their enjoyment at OZAR

Table 4.9a. *Horse riders' reasons for actions of another individual or group limiting their enjoyment at OZAR*

	Horse Riding as Main Activity	Horse Riding NOT Main Activity	Total
Actions of another group or individual limit enjoyment	25	3	28
Large Groups	2	1	3
Lack of Trail Etiquette	9	2	11
Littering	23	0	23
Noisy Behavior	3	2	5

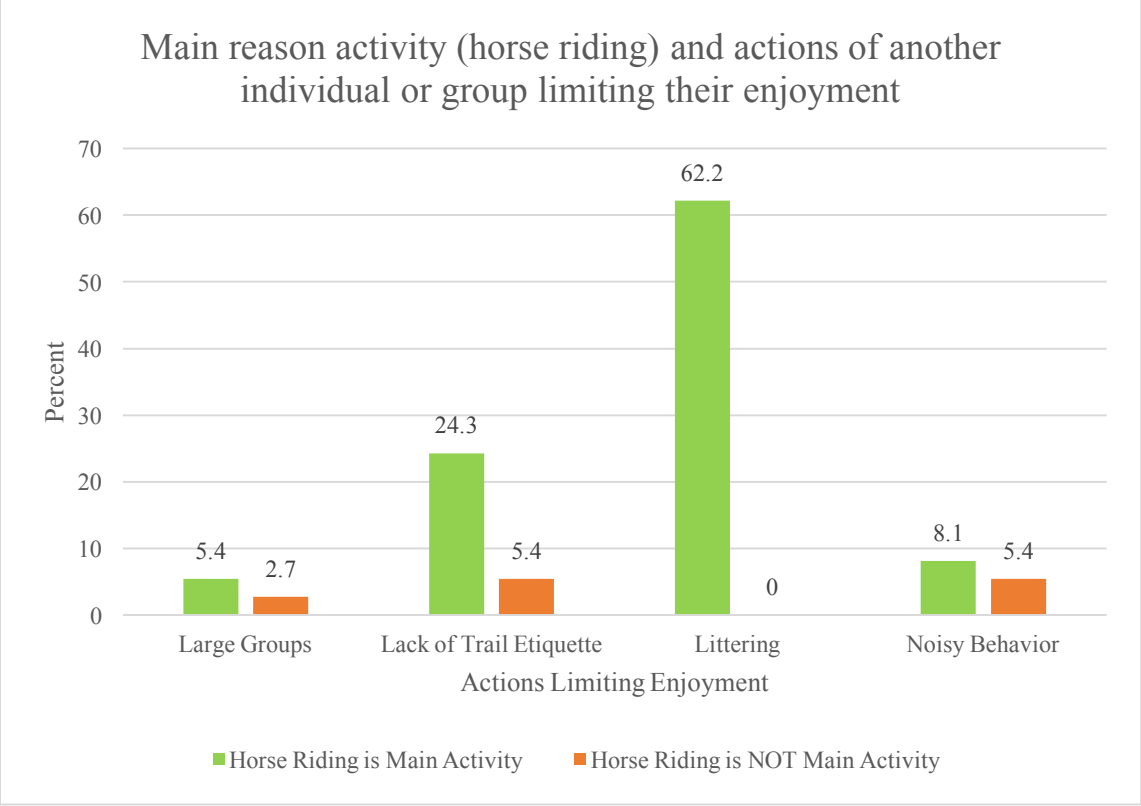

Figure 4.10a. Horse riders' reasons for actions of another individual or group limiting their enjoyment at OZAR *(%)* (Horse riding n = 34; Non horse riding n = 3)

Of horse riders who responded that a group or an individual limited their enjoyment, the most commonly reported activity was littering (62.2%).

Table 4.10b. *Main reason activity (horse riding) and the activities that the individuals or groups were participating in that limited the enjoyment of the horse riders*

	Horse Riding as Main Activity	Horse Riding NOT Main Activity	Total
Hiking	1	0	1
Camping	12	0	12
Horse Riding	37	1	38
River Use (Canoes/Kayaks/Tubers)	13	2	15

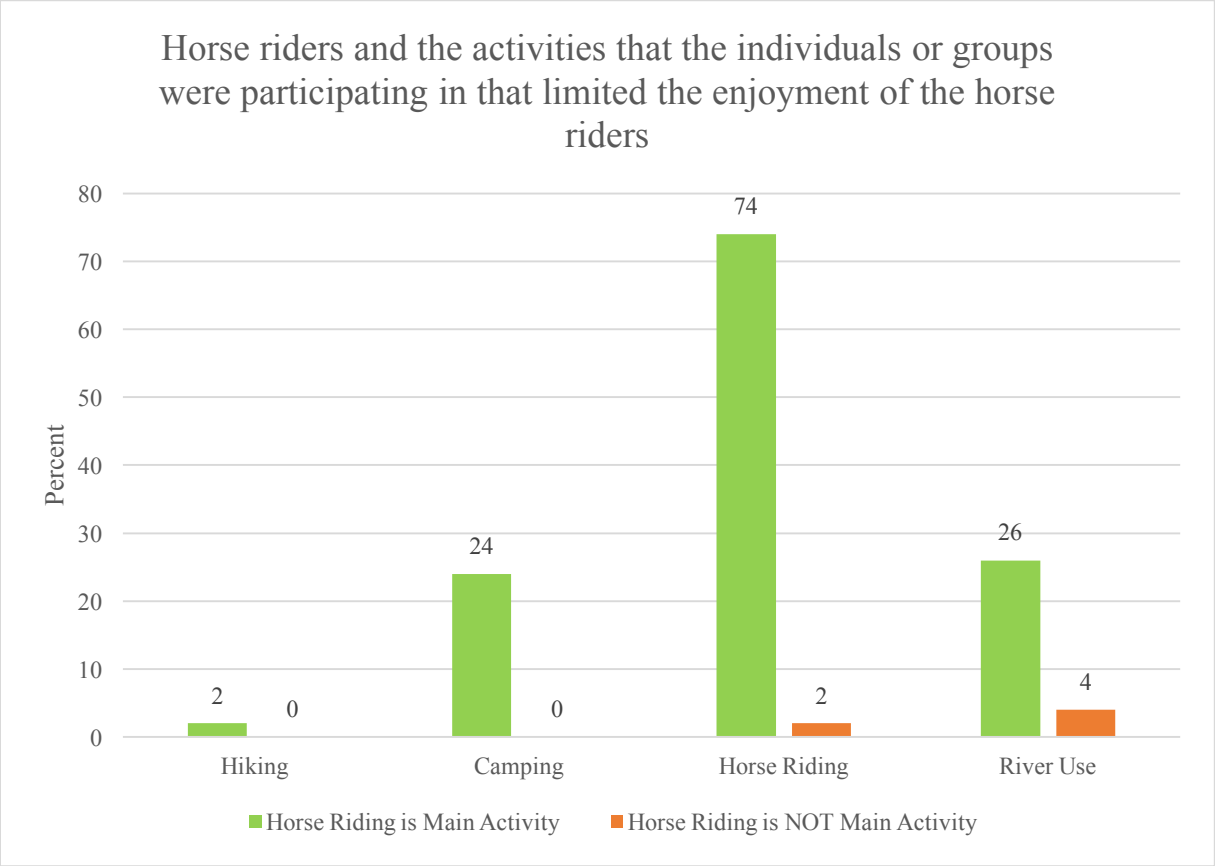

Figure 4.10b. Horse riders and the activities that the individuals or groups were participating in that limited the enjoyment of the horse riders (%) (Horse riding n = 34; Non horse riding n = 3)

4.11 Horse riders' acceptability of other trail activities at OZAR

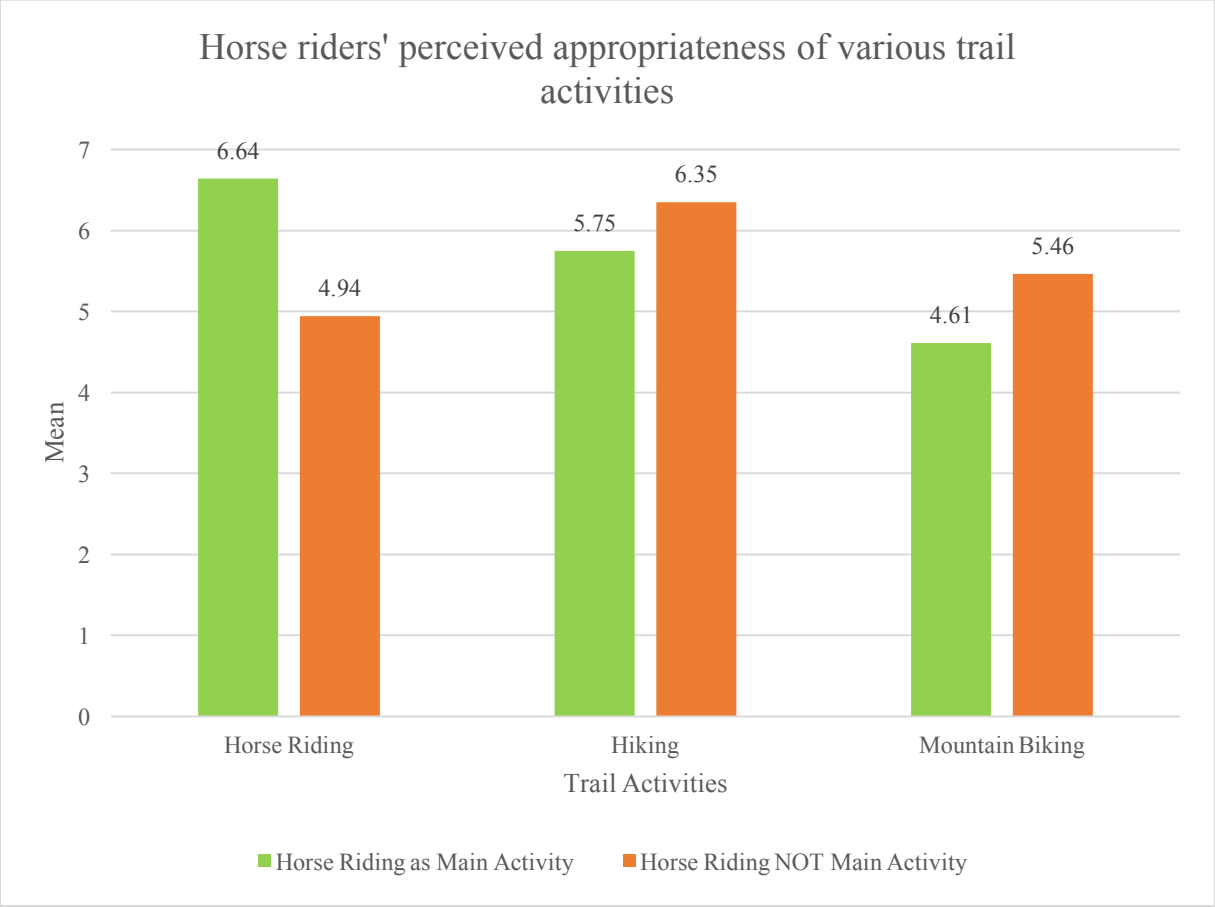

Figure 4.11a. *Horse riders' perceived appropriateness of trail activities* (Horse riding n = 294; Non horse riding n = 11)

Note: This data exists in Table 4.9b

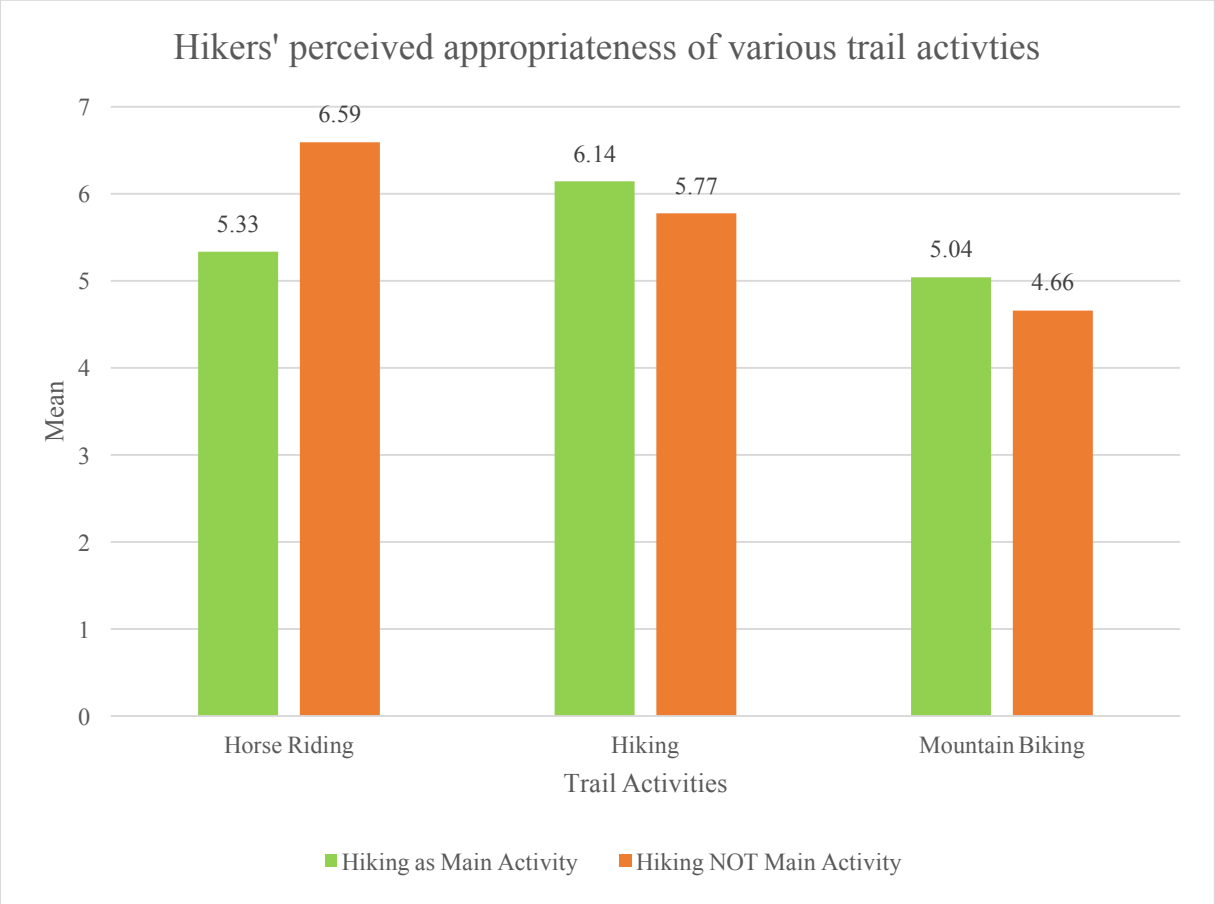

Figure 4.11b. *Hikers' perceived appropriateness of various trail activities* (Hiking n = 13; Non hiking n = 292)

Note: This data exists in Table 4.9b

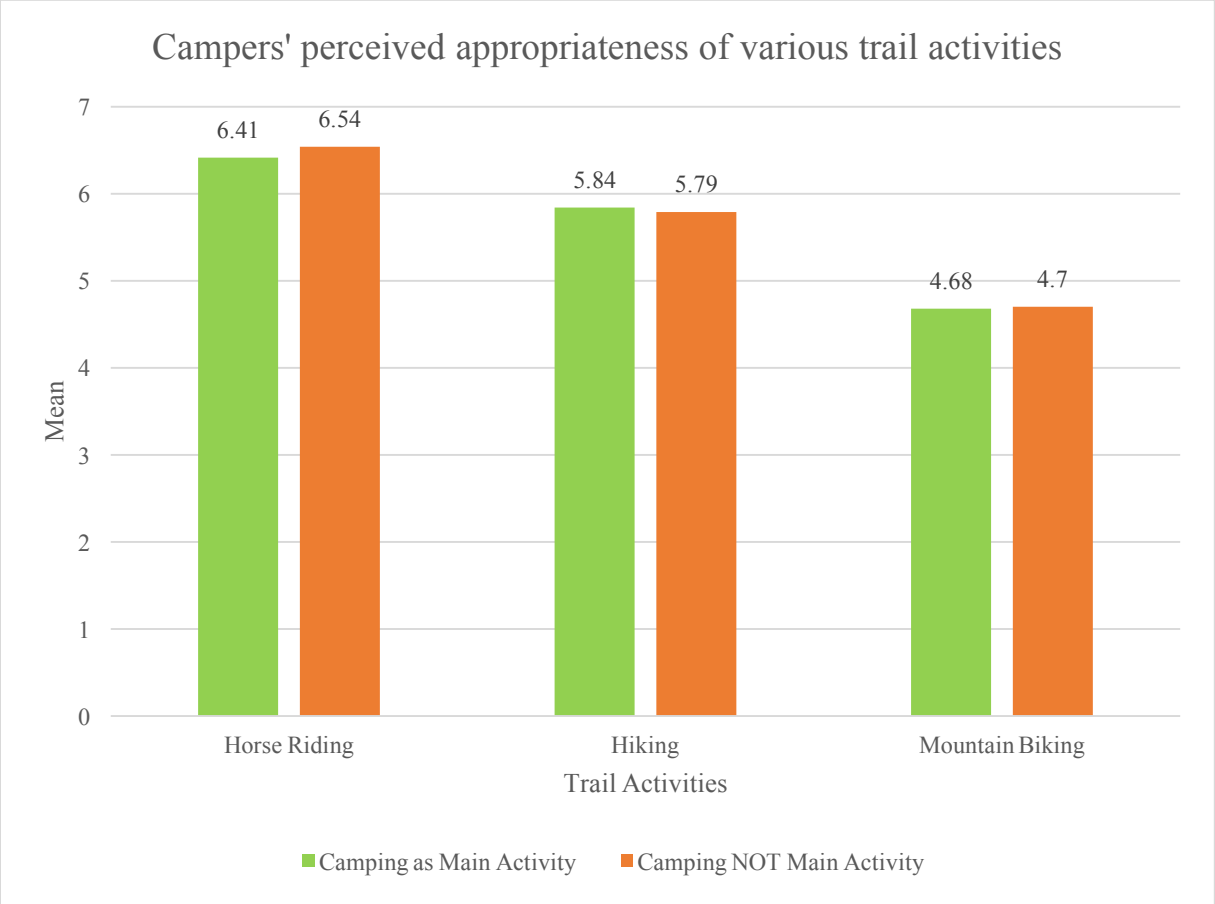

Figure 4.11c. *Campers' perceived appropriateness of various trail activities* (Camping n = 107; Non camping n = 257)

Note: This data exists in Table 4.9b

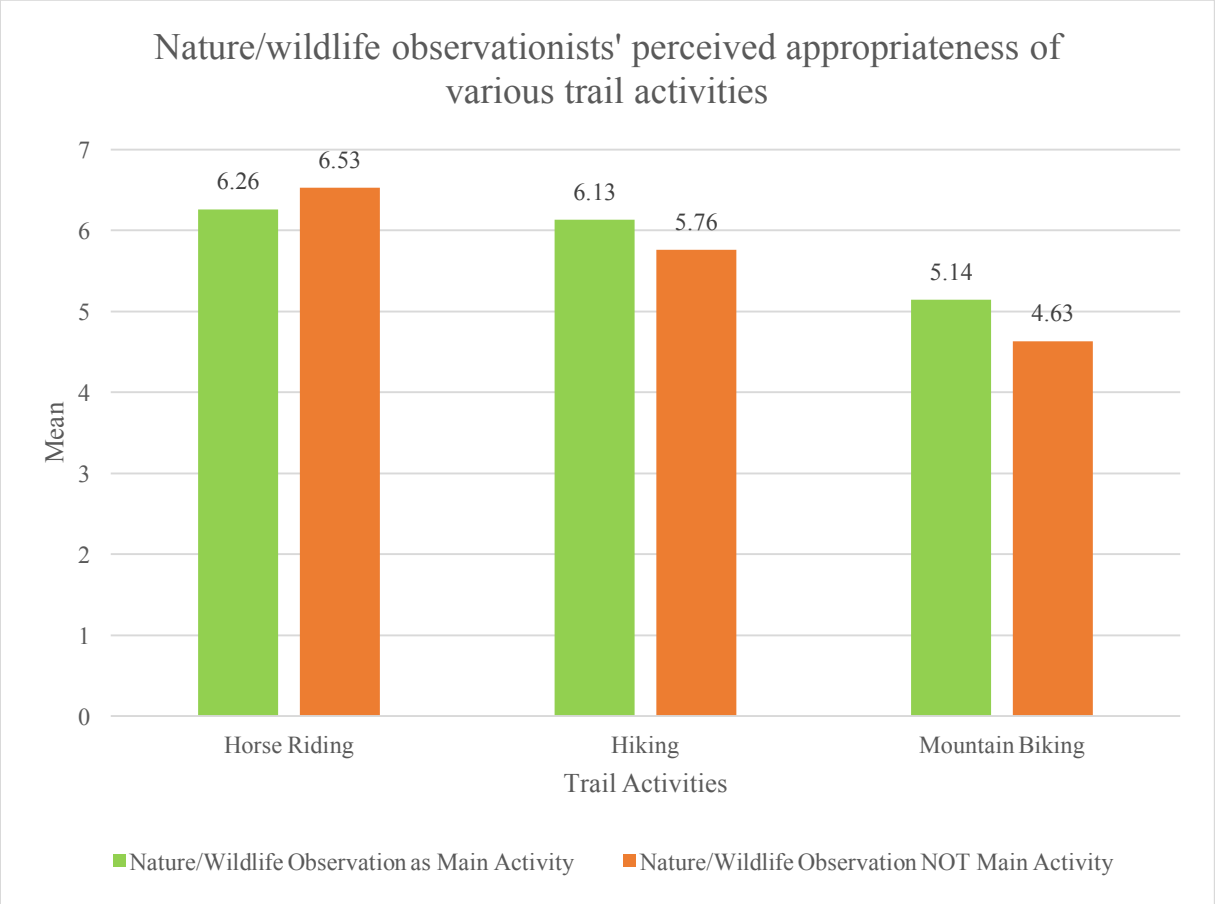

Figure 4.11d. N*ature/wildlife observationists perceived appropriateness of various trail activities* (Nature/wildlife observation n = 47; Non nature/wildlife observation n = 364)

Note: This data exists in Table 4.9b

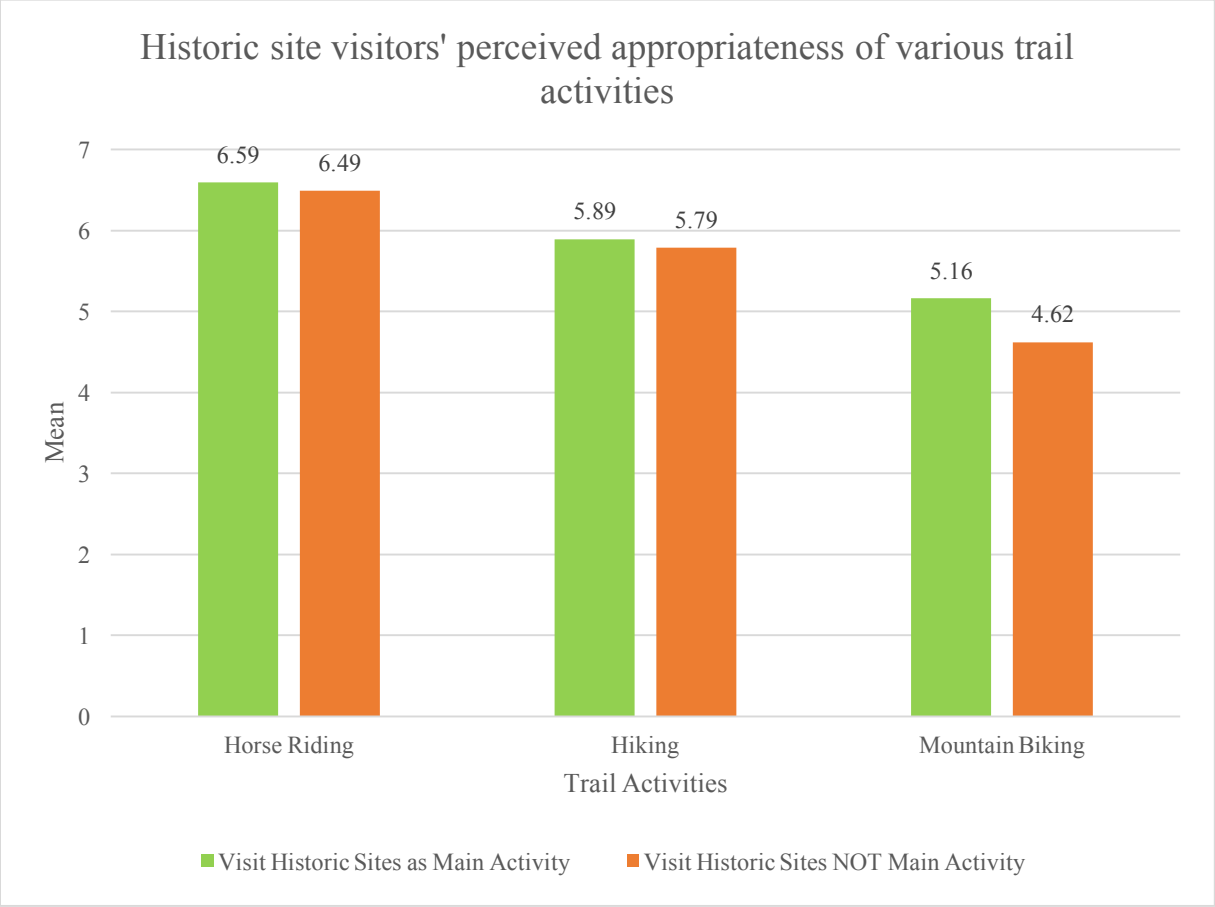

Figure 4.11e. *Historic site visitors' perceived appropriateness of various trail activities* (Historic site visitor n = 51; Non historic site visitor n = 267)

Note: This data exists in Table 4.9b

4.12 The acceptability of various conditions at OZAR

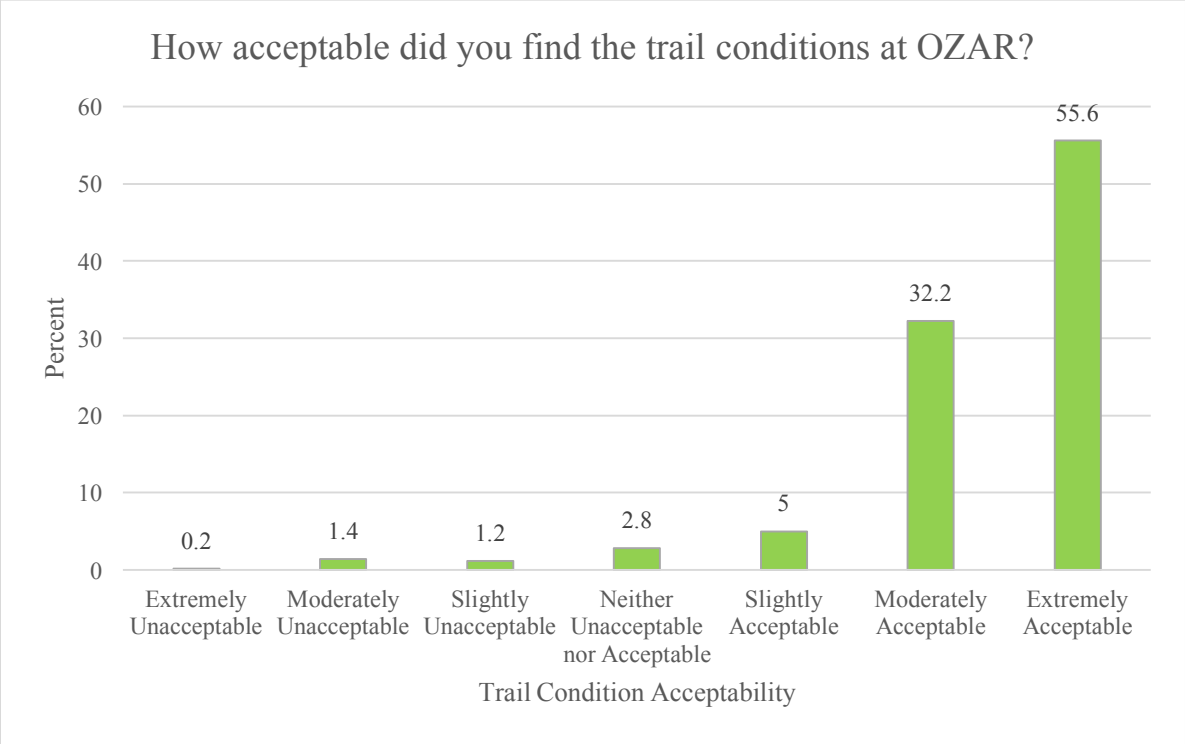

Figure 4.12a. Frequencies for all visitors' acceptability of trail conditions at OZAR *(%)* (N = 416)

Note: This data exists in Table 4.9a

Overall, visitors to OZAR found trail conditions extremely acceptable (n=55.6%).

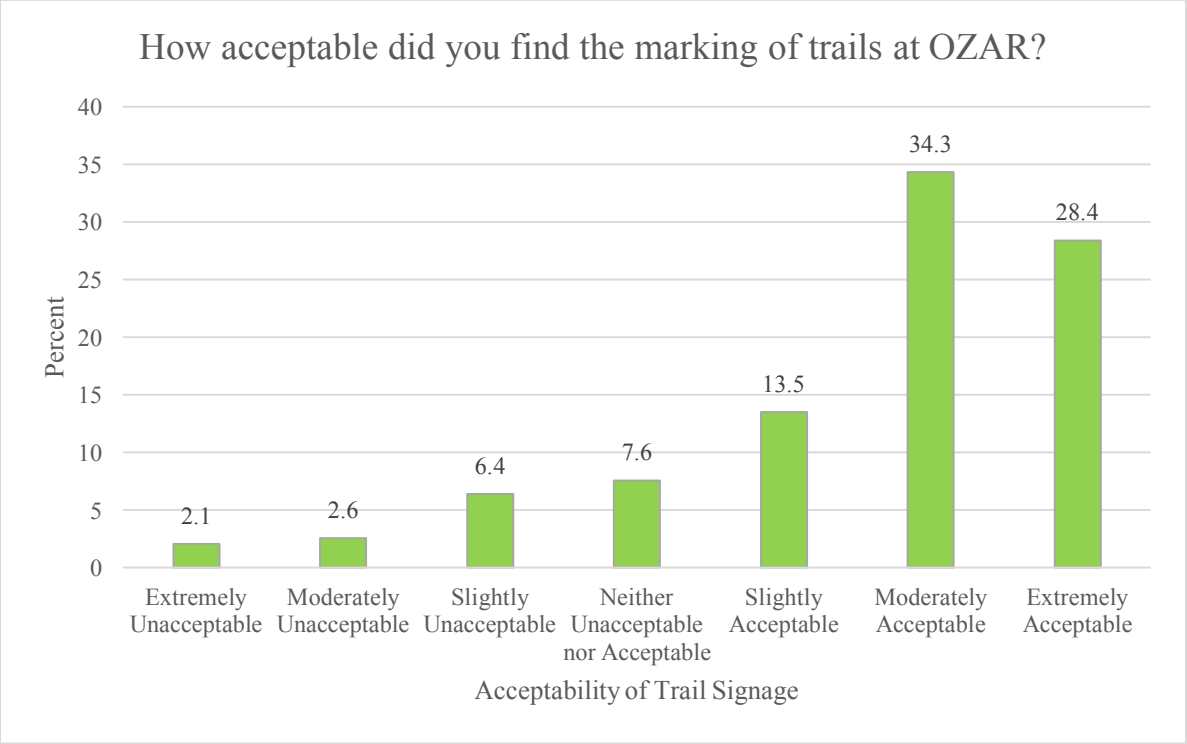

Figure 4.12b. Frequency of all visitors' acceptability of the marking of trails (signs) at OZAR *(%)* (N = 401)

Note: This data exists in Table 4.9a

Most respondents indicated the marking of trails at OZAR are moderately acceptable (n=34.3%).

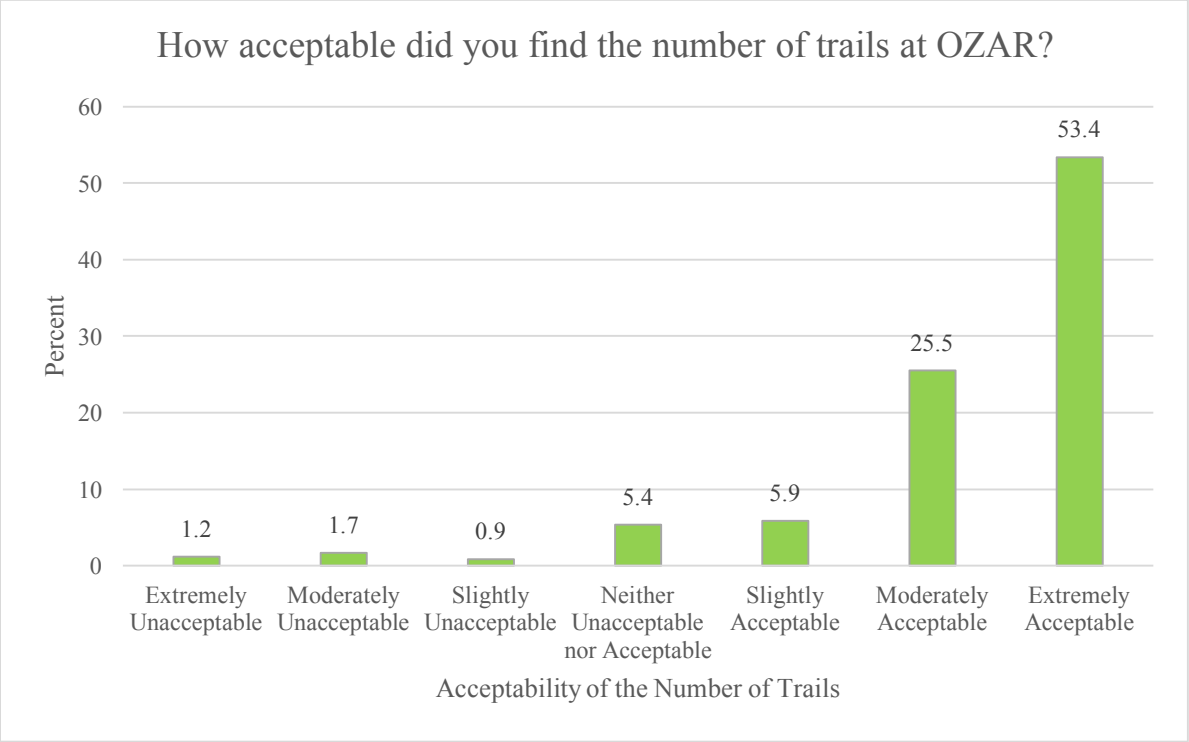

Figure 4.12c. Frequency of visitors' acceptability of the number of trails at OZAR *(%)* (N = 398)

Note: This data exists in Table 4.9a

Over half (n=53.4%) of visitors indicated the number of trails as extremely acceptable at OZAR.

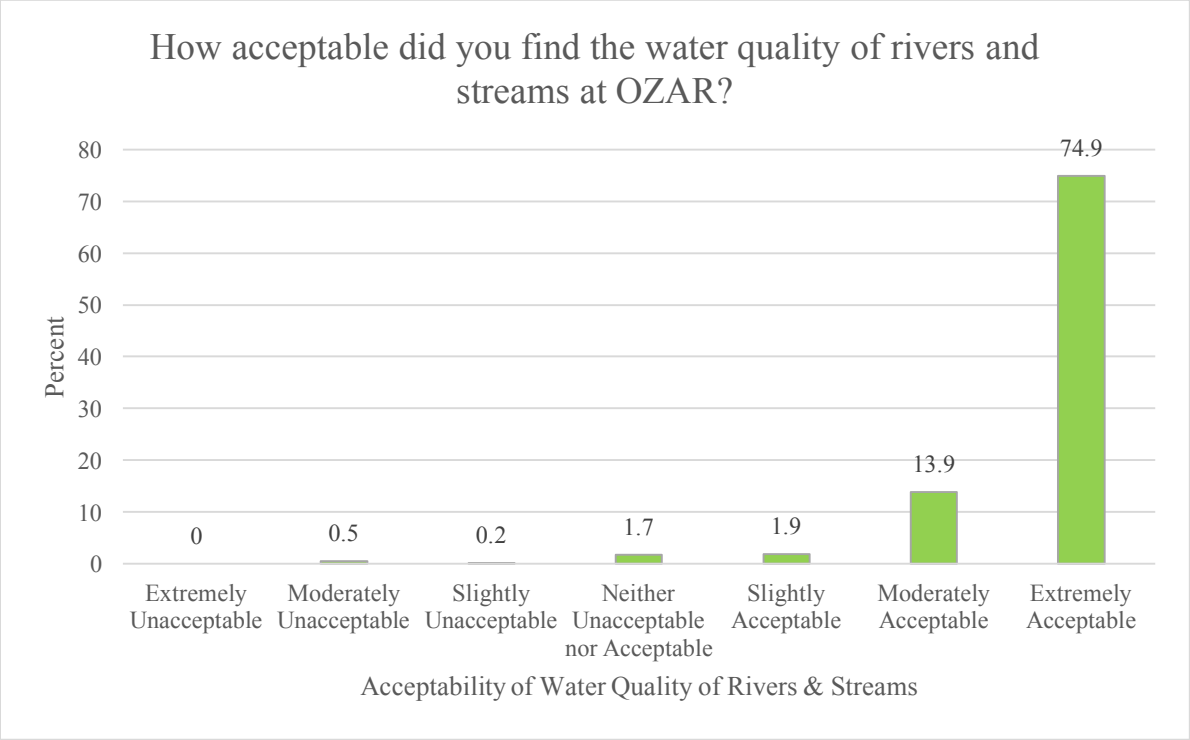

Figure 4.12d. Frequency of visitors' acceptability of water quality of rivers and streams at OZAR *(%)* (N = 394)

Note: This data exists in Table 4.9a

Nearly three-quarters (n=74.9%) of respondents found the water quality of rivers and streams as extremely acceptable at OZAR.

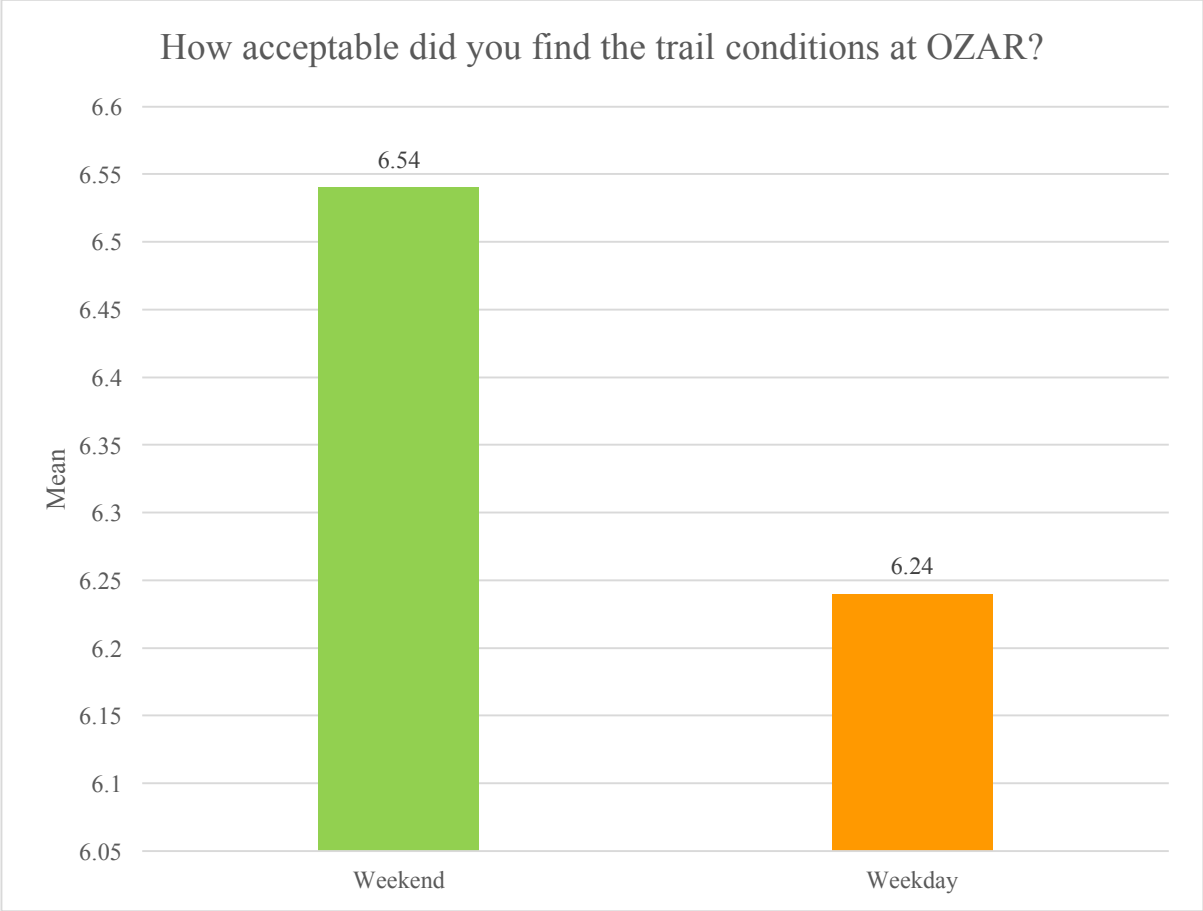

Figure 4.12e. All visitors' acceptability of trail conditions at OZAR by weekend and weekday users (Weekend n = 158; Weekday n = 258)

Note: This data exists in Table 4.9a

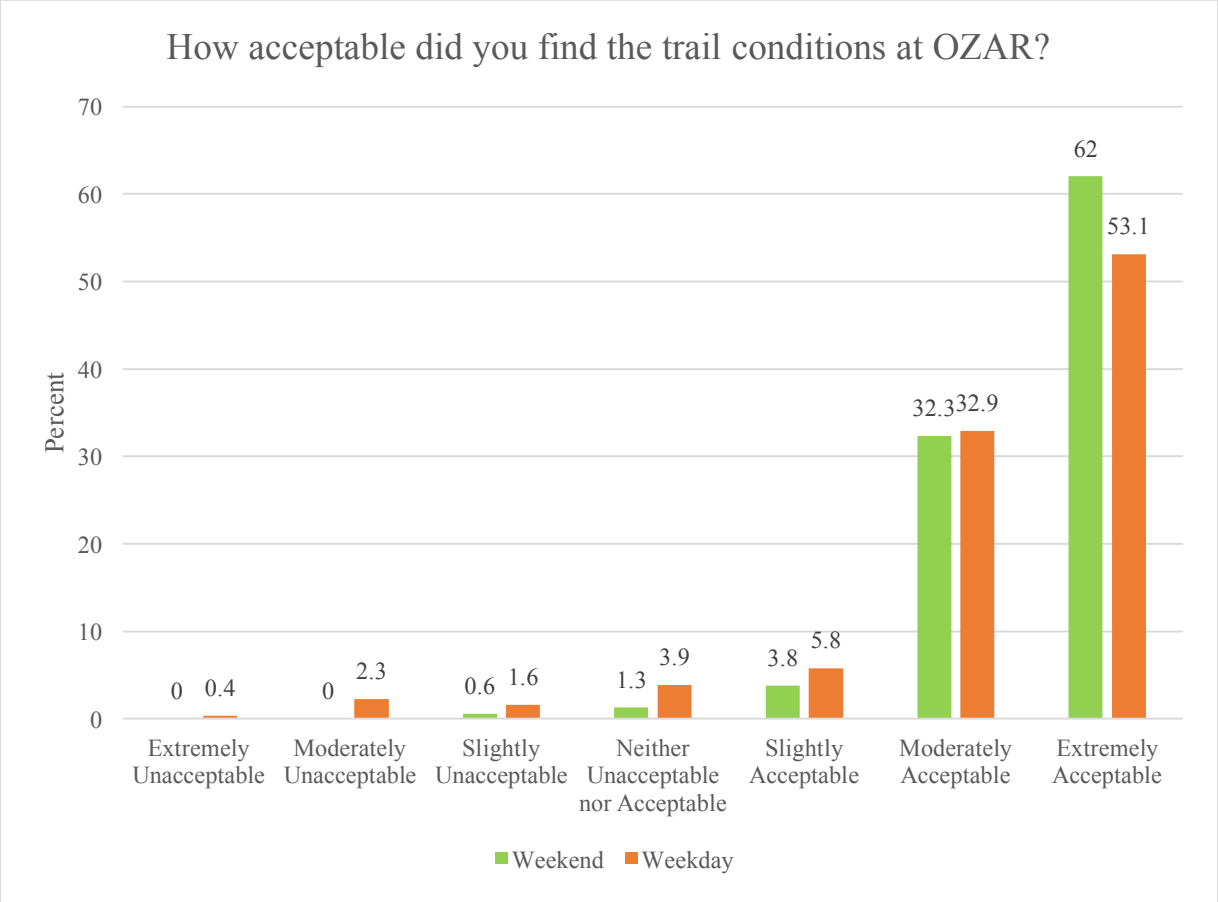

Figure 4.12f. All visitors' acceptability of trail conditions at OZAR by weekend and weekday use *(%)* (Weekend n = 158; Weekday n = 258)

Note: This data exists in Table 4.9a

Weekend users found the trail conditions primarily to be extremely acceptable (62%) and weekday users as well (53.1%). No weekend users found the trail conditions to be extremely unacceptable and only .4% of weekday users found the trail conditions to be extremely unacceptable.

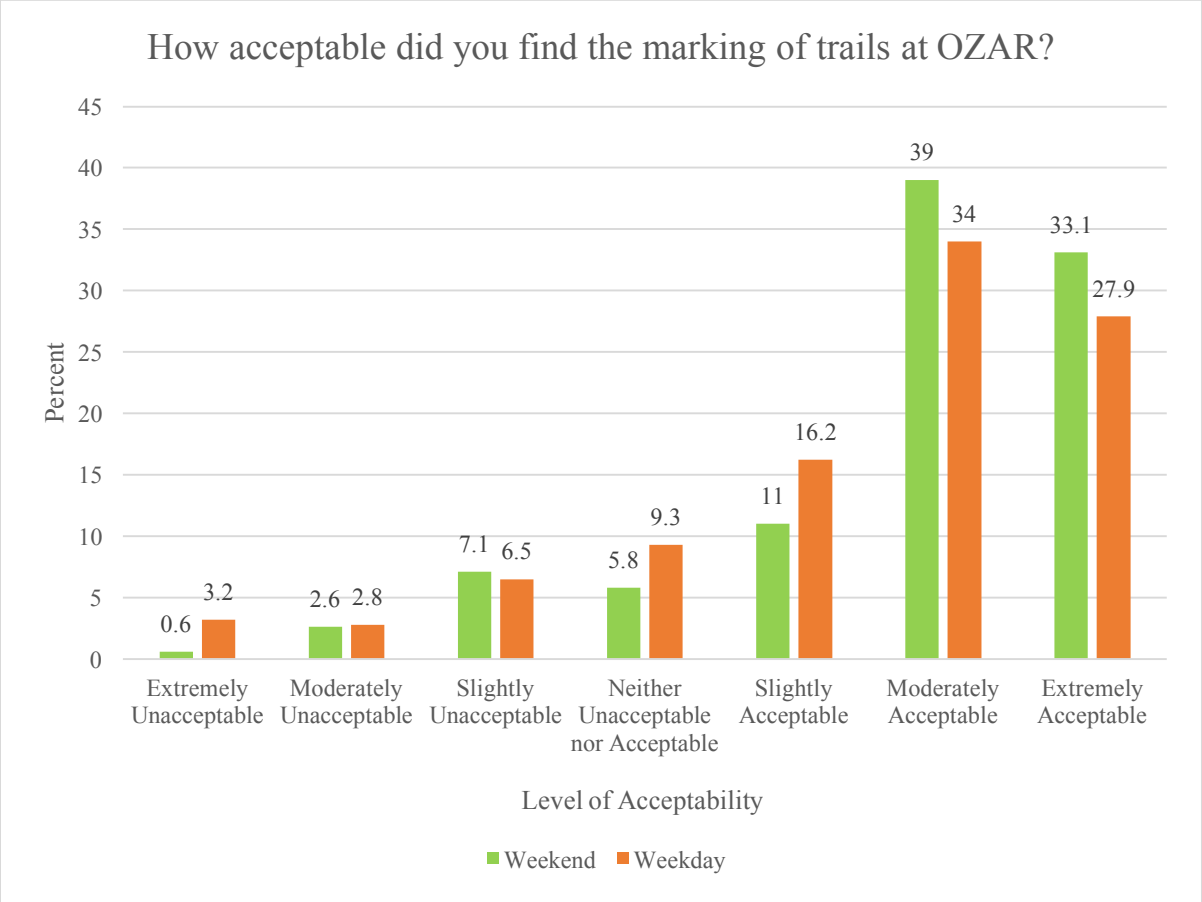

Figure 4.12g. All visitors' acceptability of the marking of trails at OZAR by weekend and weekday use *(%)* (Weekend n = 154; Weekday n = 247)

Note: This data exists in Table 4.9a

Both weekend and weekday users found the marking of trails to be moderately acceptable (39% and 34%, respectively).

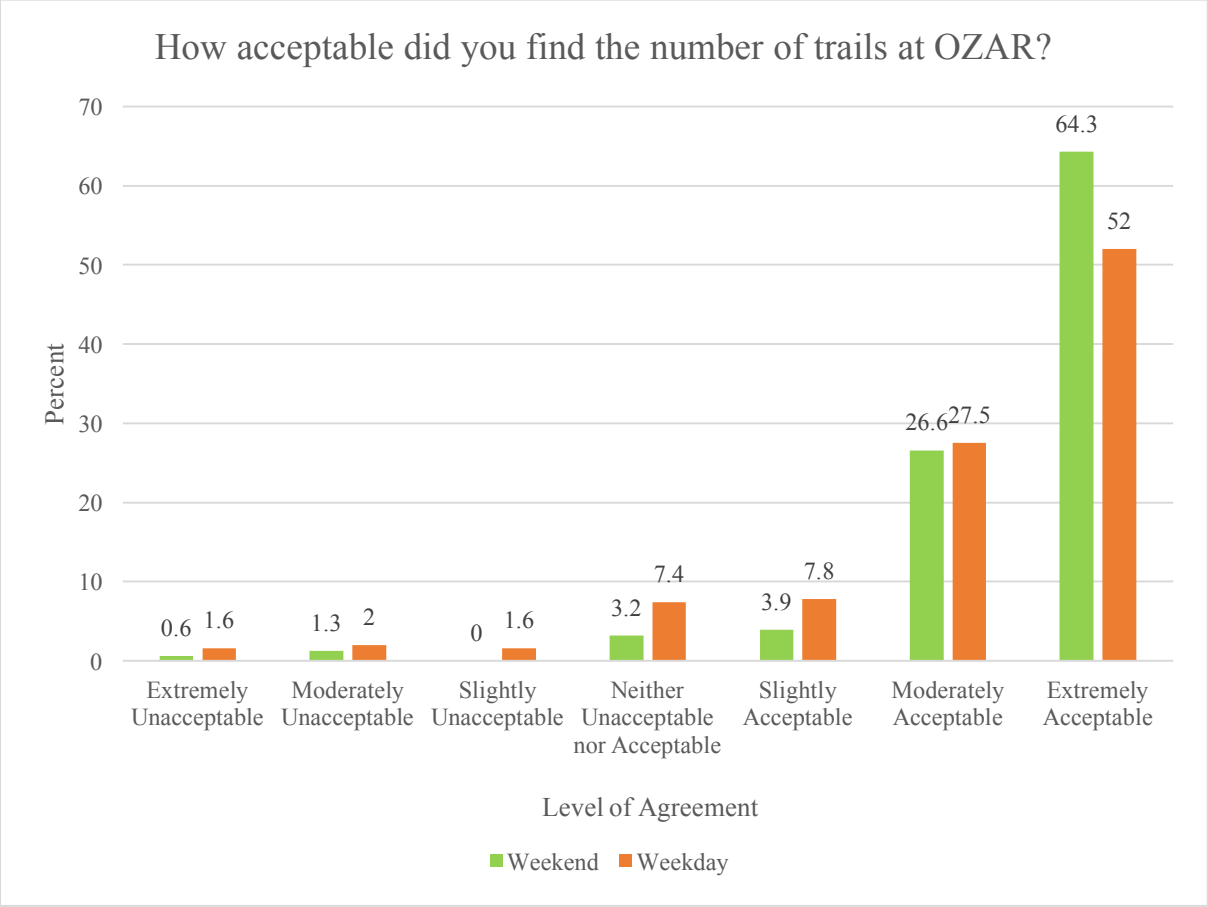

Figure 4.12h. Visitors' acceptability of the number of trails at OZAR by weekend and weekday users *(%)* (Weekend n = 154; Weekday n = 244)

Note: This data exists in Table 4.9a

Weekend and weekday users found the number of trails at OZAR to be extremely acceptable (64.3% and 52%, respectively).

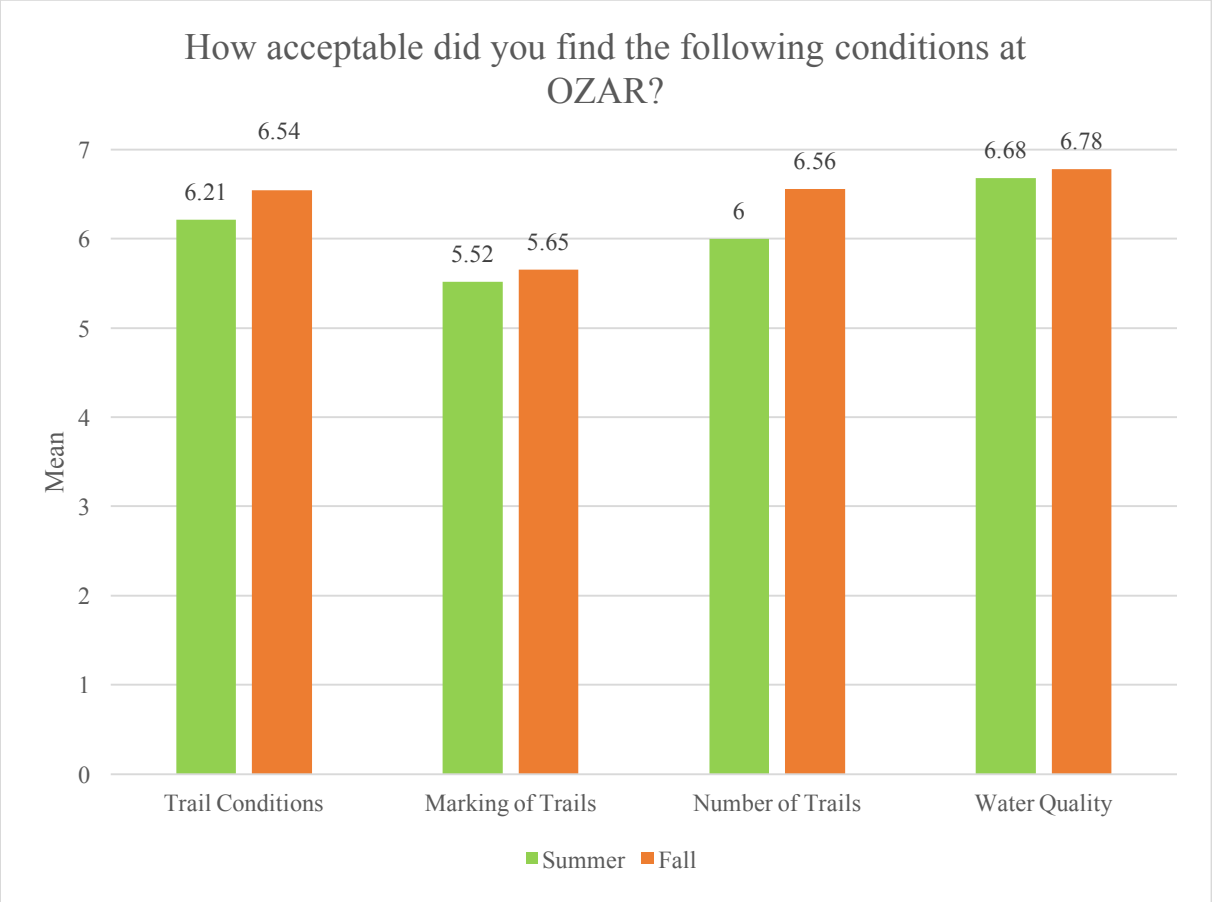

Figure 4.12i. Means for all visitors' acceptability of the following conditions at OZAR by season (Summer n = 235; Fall n = 169)

Note: This data exists in Table 4.9a

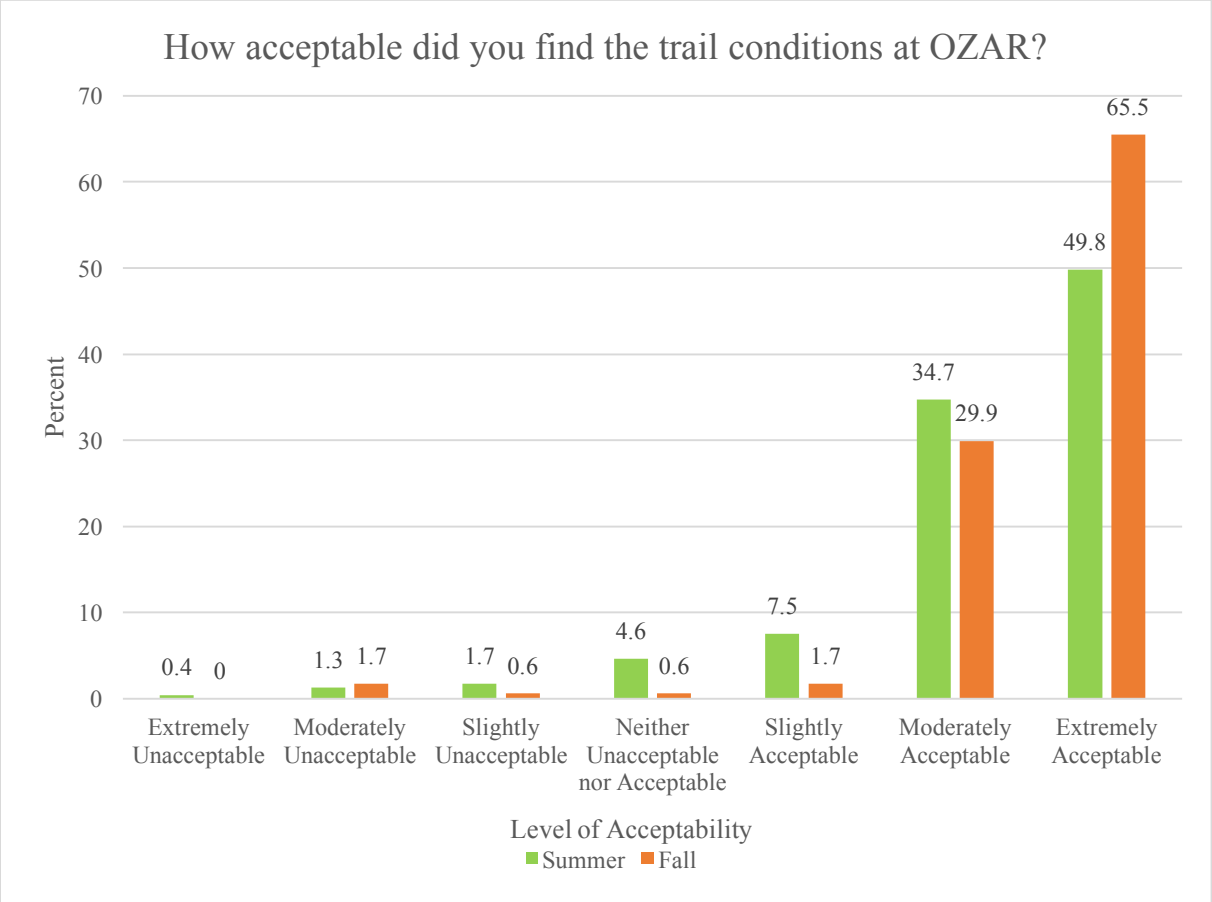

Figure 4.12j. Frequencies of visitors' acceptability of trail conditions at OZAR by season (%) (Summer n = 239; Fall n = 177)

Note: This data exists in Table 4.9a

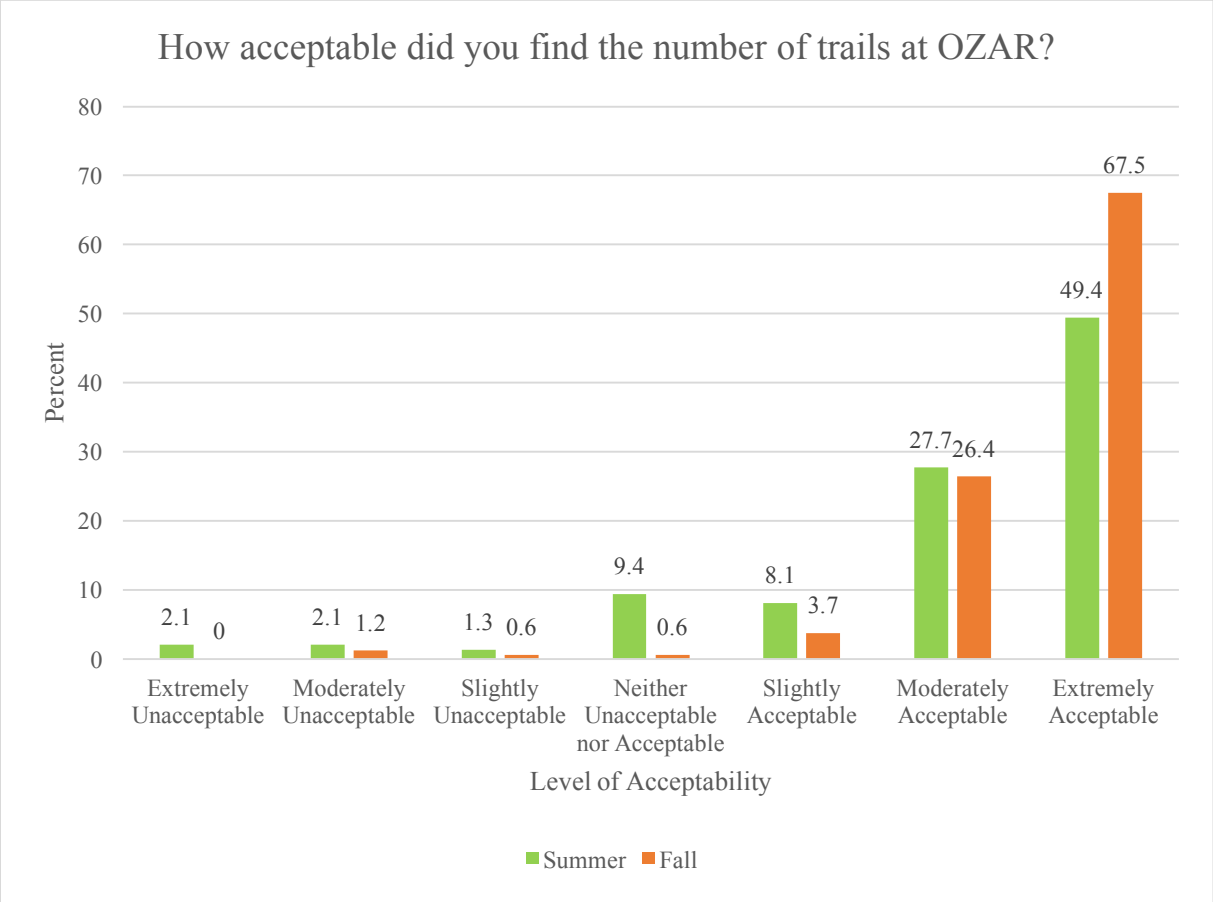

Figure 4.12k. Frequencies of visitors' acceptability of the number of trails at OZAR by season (%) (Summer n = 235; Fall n = 163)

Note: This data exists in Table 4.9a

4.13 The acceptability of a permit system for trails users at OZAR

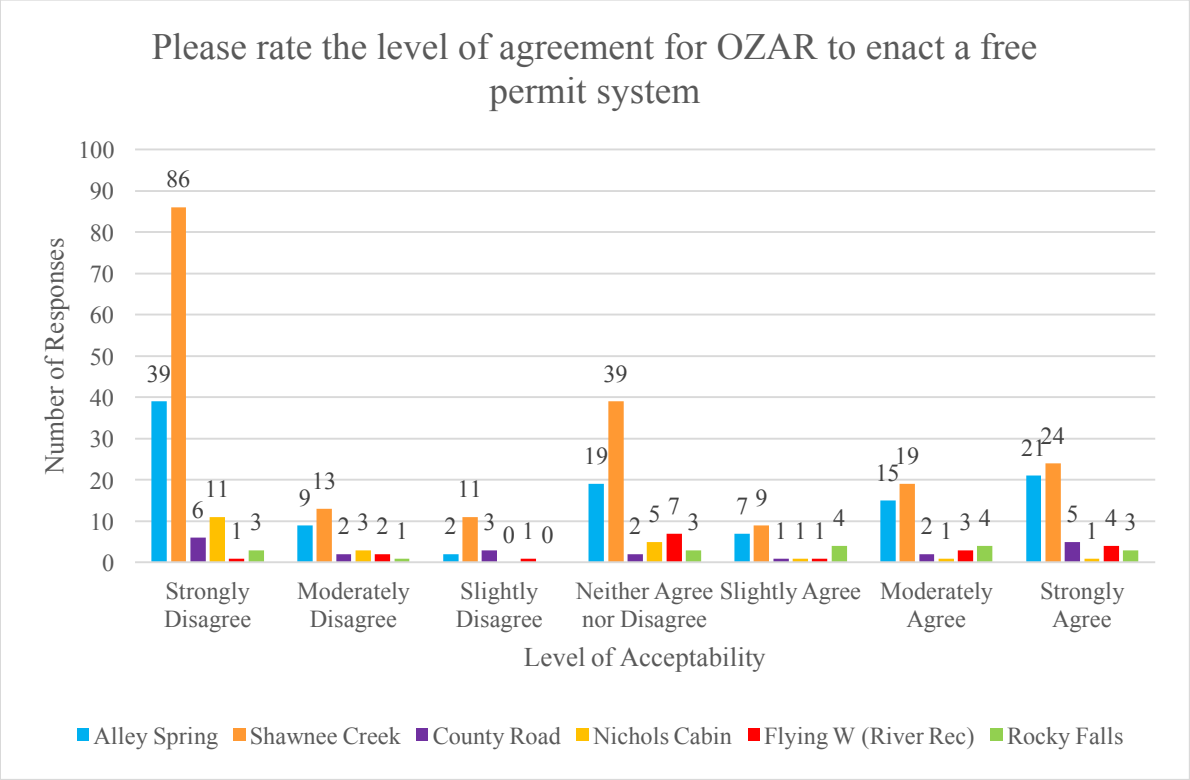

Figure 4.13a. *All visitors' level of agreement for OZAR to enact a free permit system by location (Number of responses)* (Alley Spring n = 112; Shawnee Creek n = 201; County Road n = 21; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

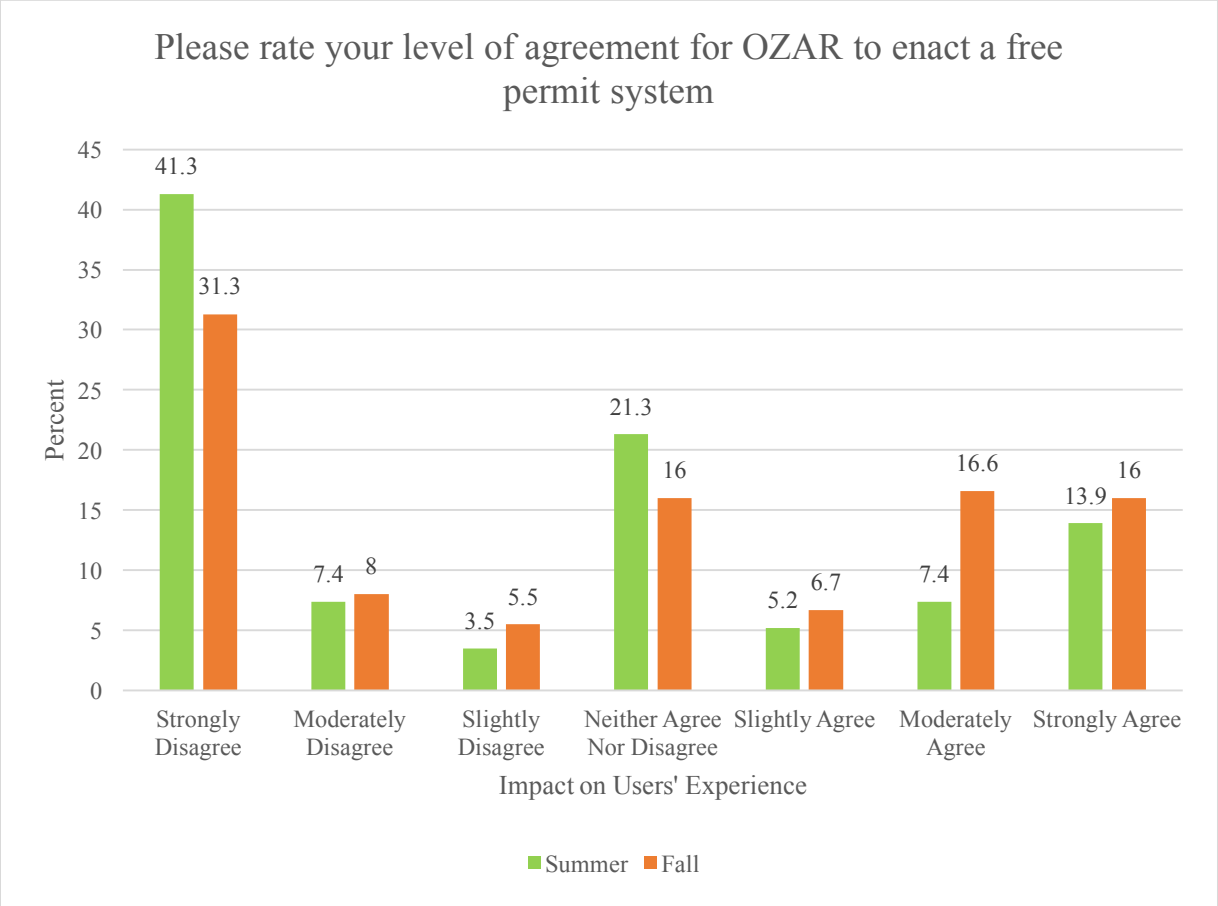

Figure 4.13c. *All visitors' level of agreement for OZAR to enact a free permit system by season (%)* (Summer n = 230; Fall n = 163)

Note: This data exists in Table 4.9a

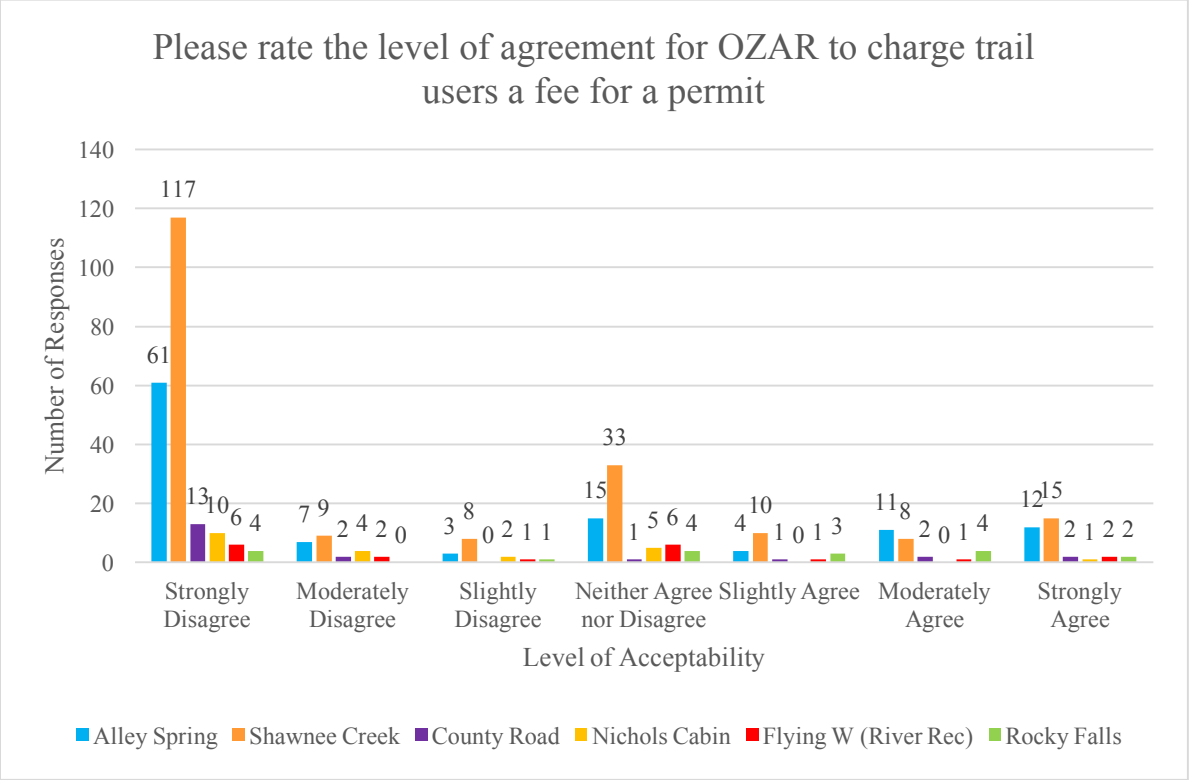

Figure 4.13d. *All visitors' level of agreement for OZAR to charge trail users a fee for a permit by location (Number of responses)* (Alley Spring n = 113; Shawnee Creek n = 200; County Road n = 21; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

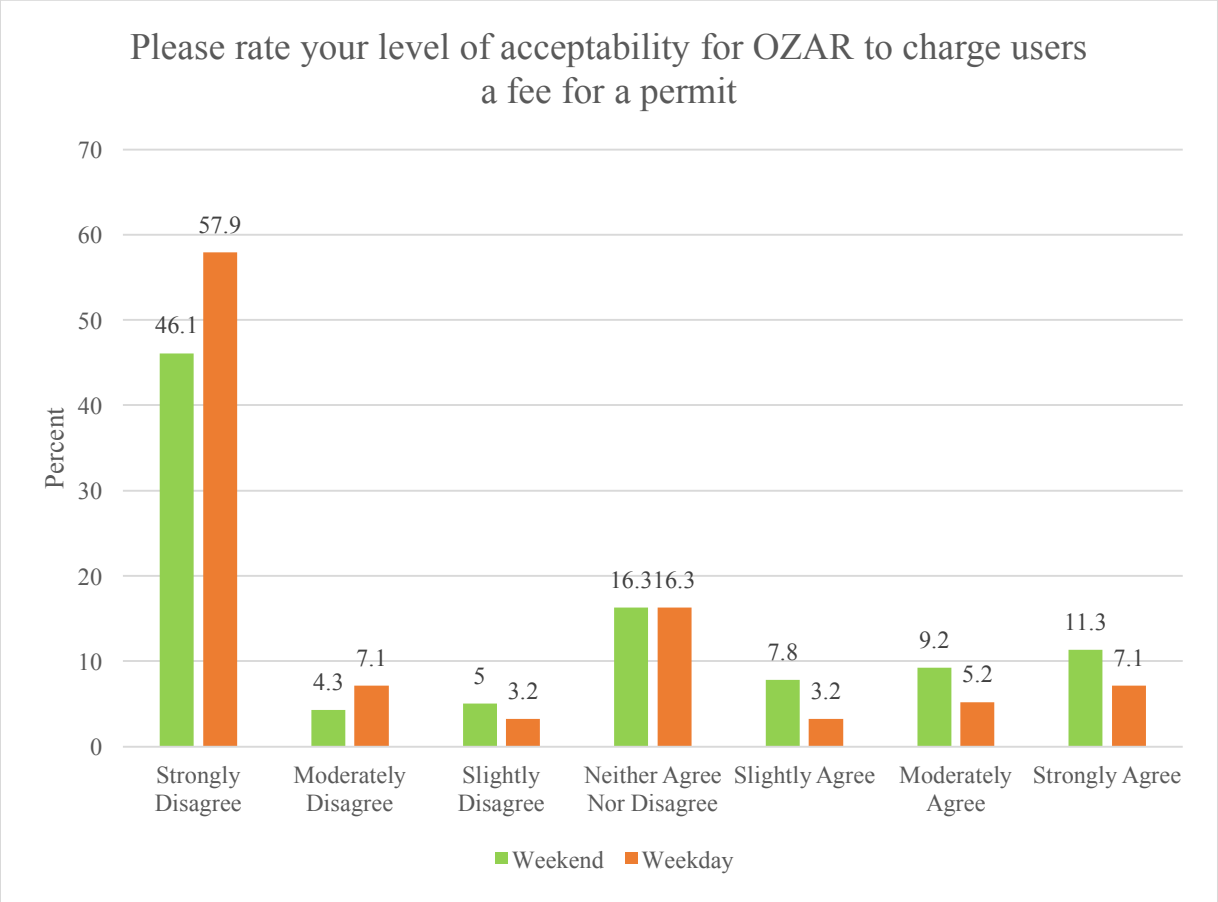

Figure 4.13e. *All visitors' level of agreement for OZAR to charge trail users a fee for a permit by weekend and weekday users (%)* (Weekend n = 141; Weekday n = 252)

Note: This data exists in Table 4.9a

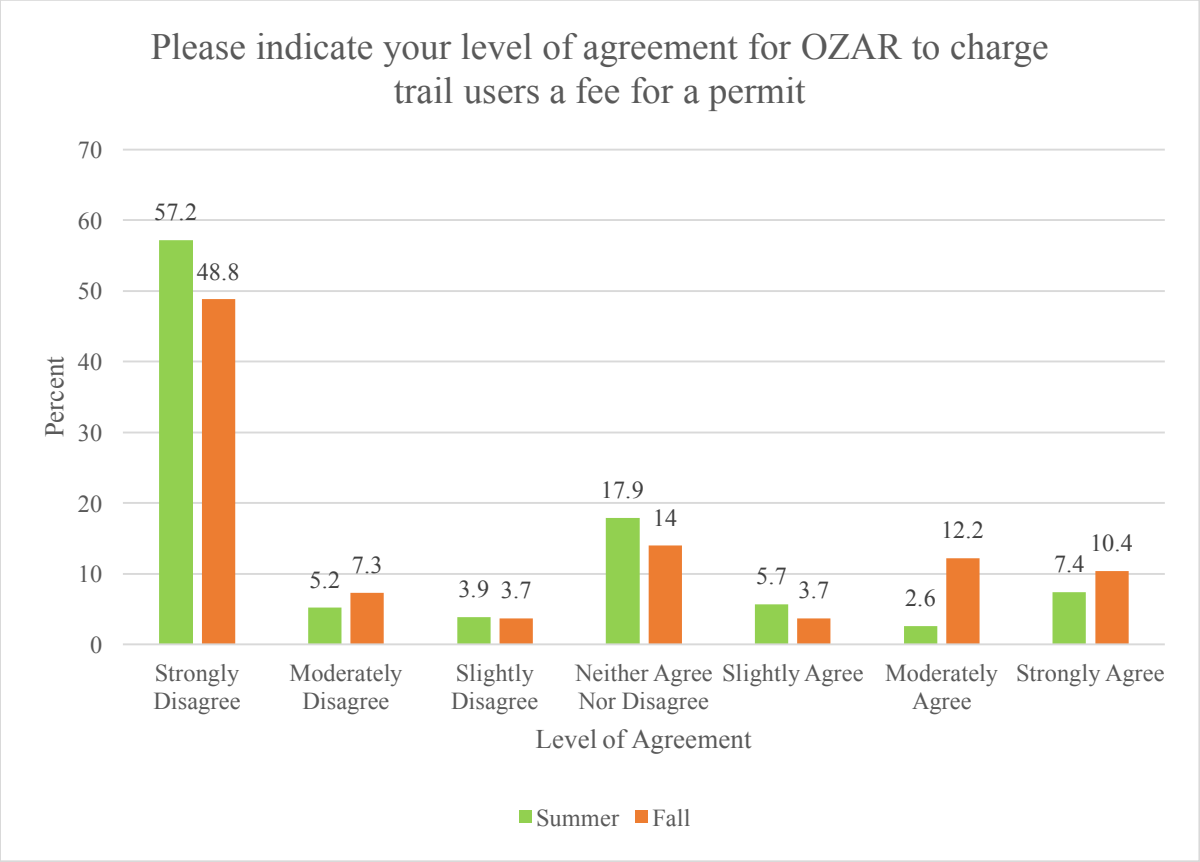

Figure 4.13f. *All visitors' level of agreement for OZAR to charge trail users a fee for a permit by season (%)* (Summer n = 229; Fall = 164)

Note: This data exists in Table 4.9a

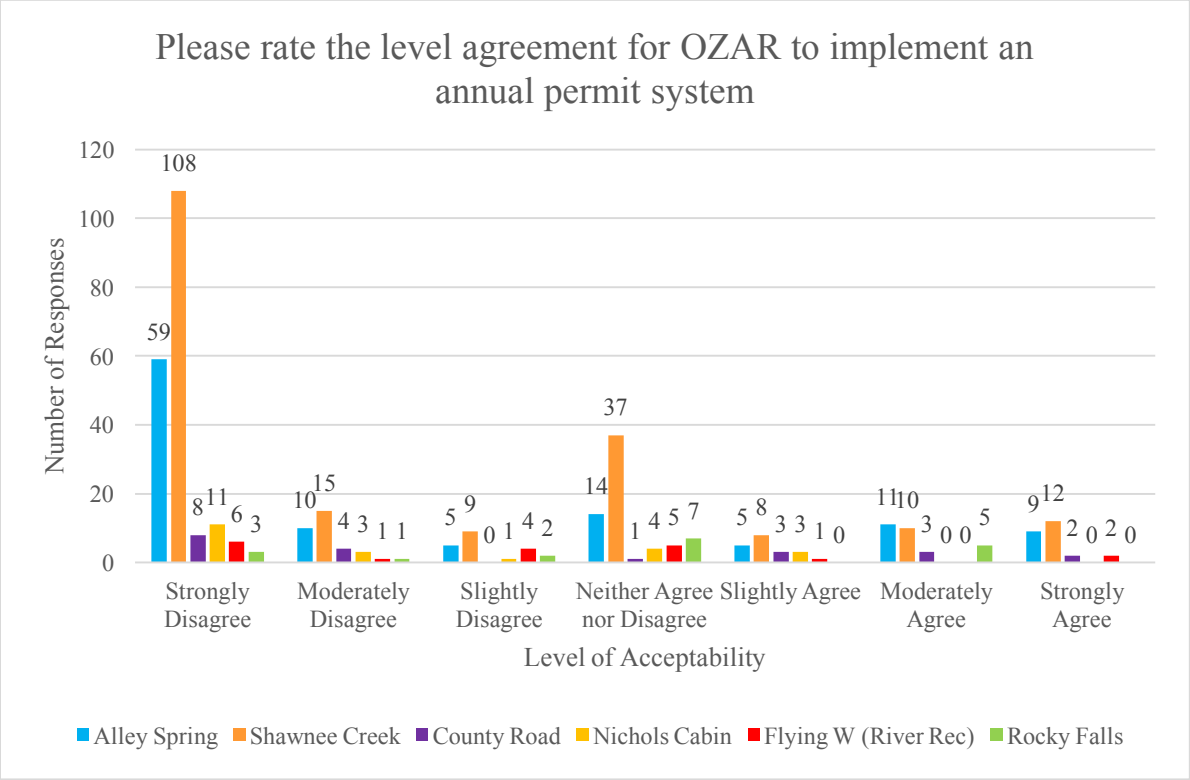

Figure 4.13g. *All visitors' level of agreement for OZAR to implement an annual permit system by location (Number of responses)* (Alley Spring n = 113; Shawnee Creek n = 199; County Road n = 21; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

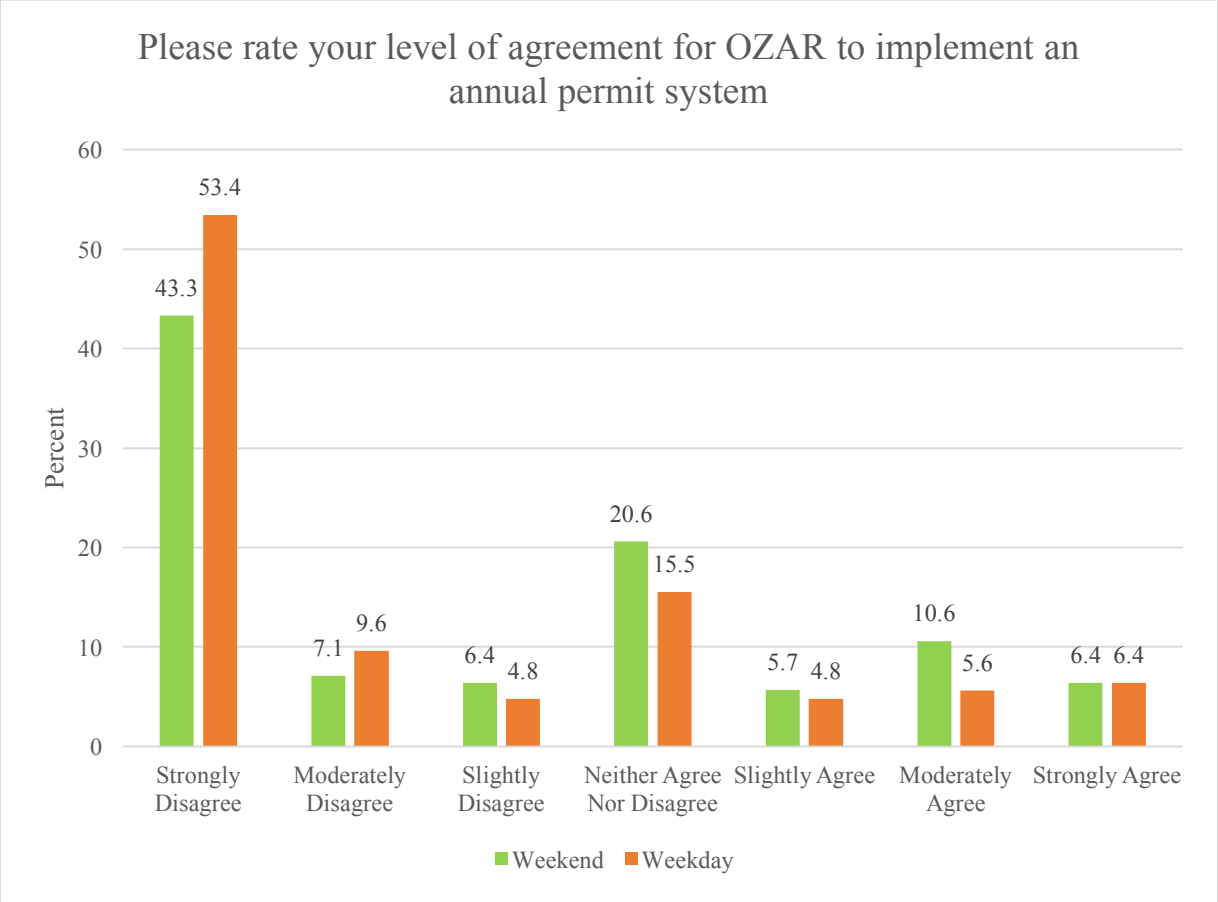

Figure 4.13h. *All visitors' level of agreement for OZAR to implement an annual permit system by weekend and weekday user groups (%)* (Weekend n = 141; Weekday n = 251)

Note: This data exists in Table 4.9a

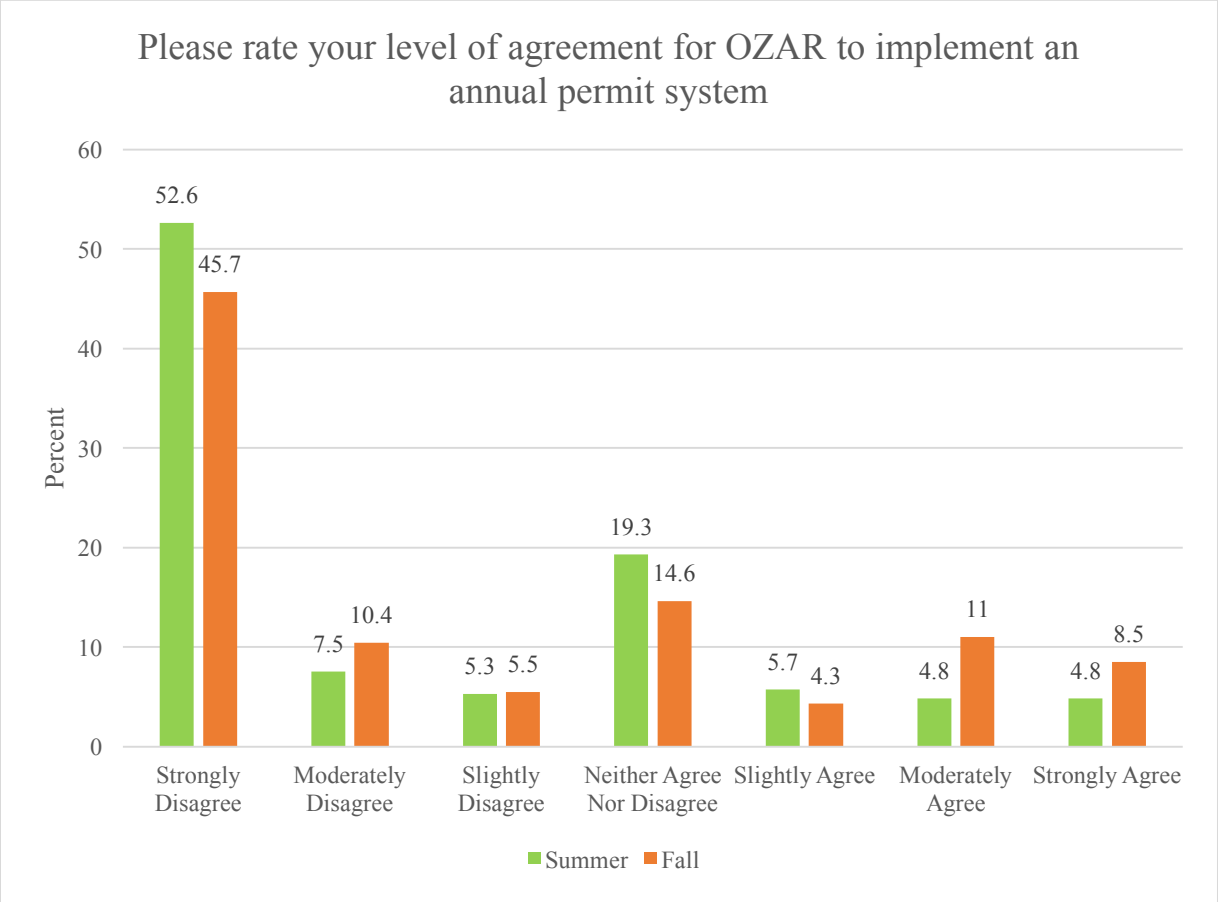

Figure 4.13i. *All visitors' level of agreement for OZAR to implement an annual permit system by season (%)* (Summer n = 228; Fall n = 164)

Note: This data exists in Table 4.9a

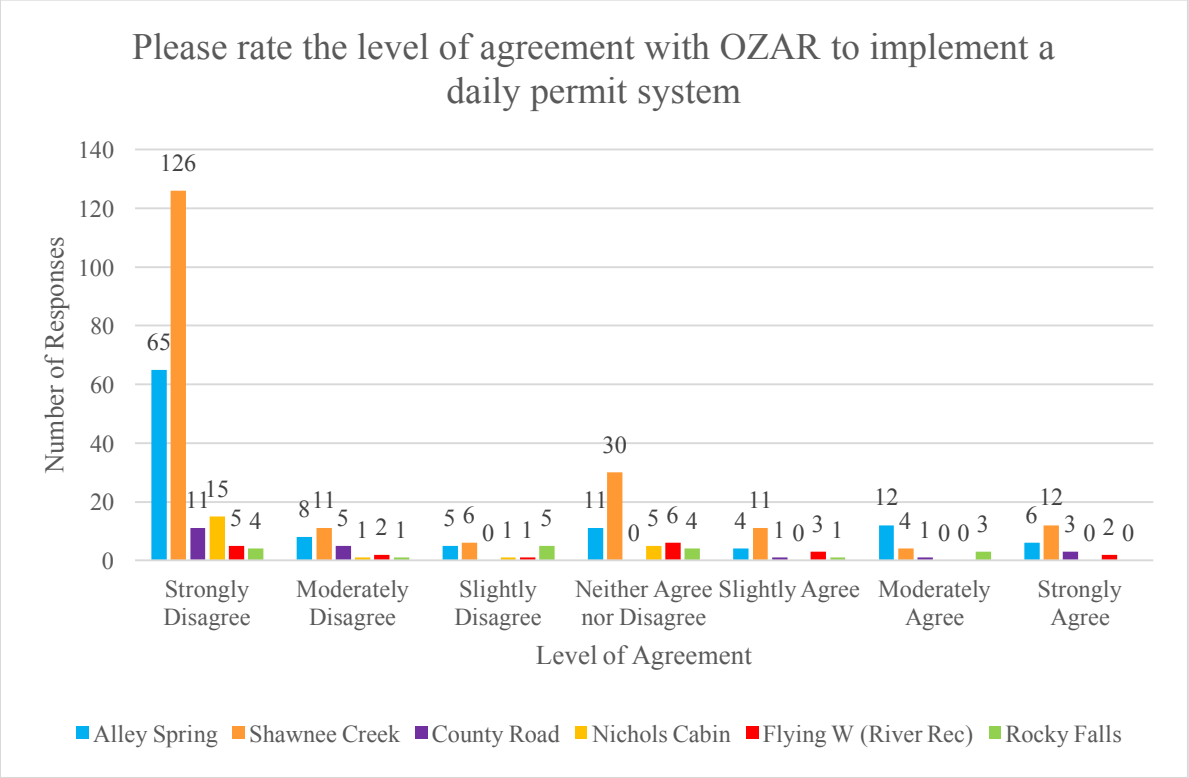

Figure 4.13j. *All visitors' level of acceptability for OZAR to implement a daily permit system by location (Number of responses)* (Alley Spring n = 111; Shawnee Creek n = 200; County Road n = 21; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

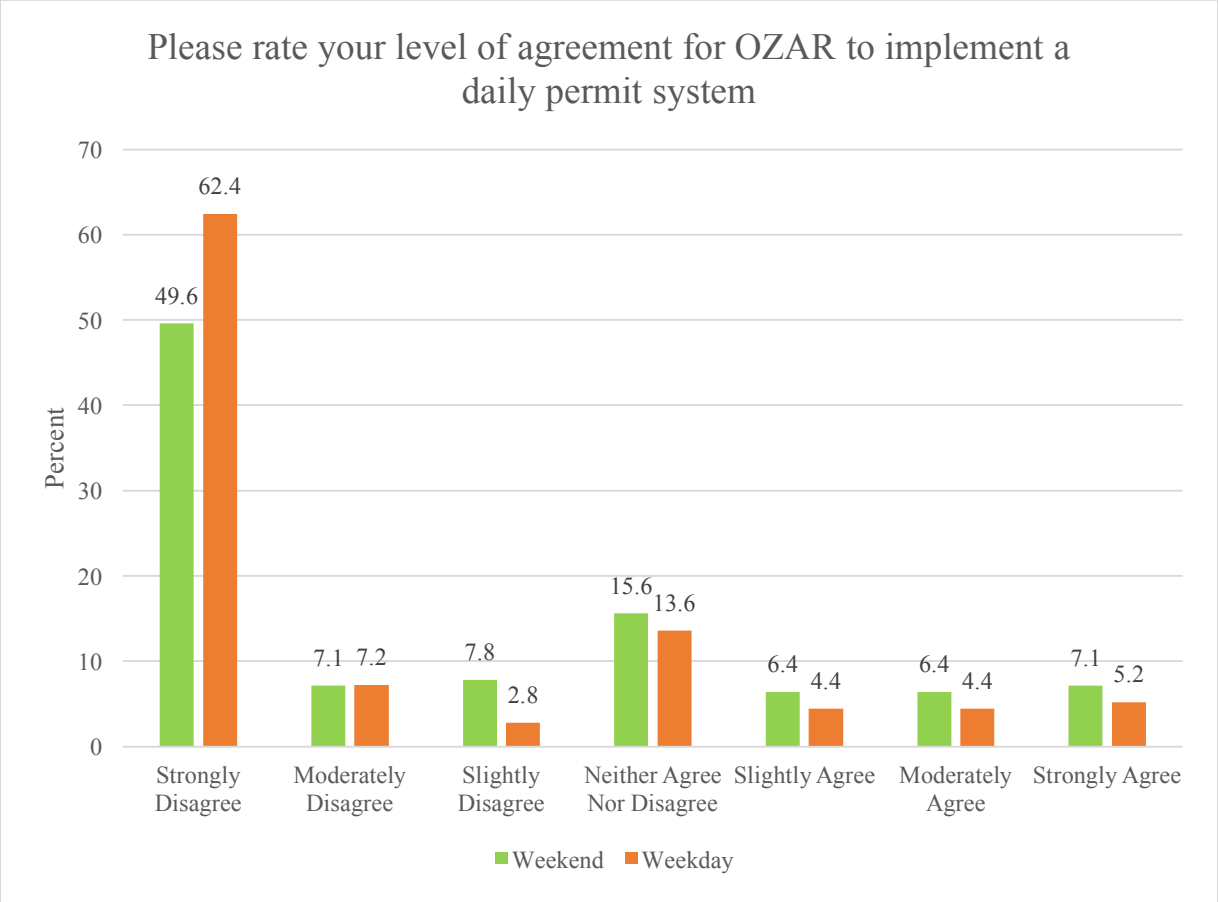

Figure 4.13k. All *visitors' level of acceptability for OZAR to implement a daily permit system by weekend and weekday users (%)* (Weekend n = 141; Weekday n = 250)

Note: This data exists in Table 4.9a

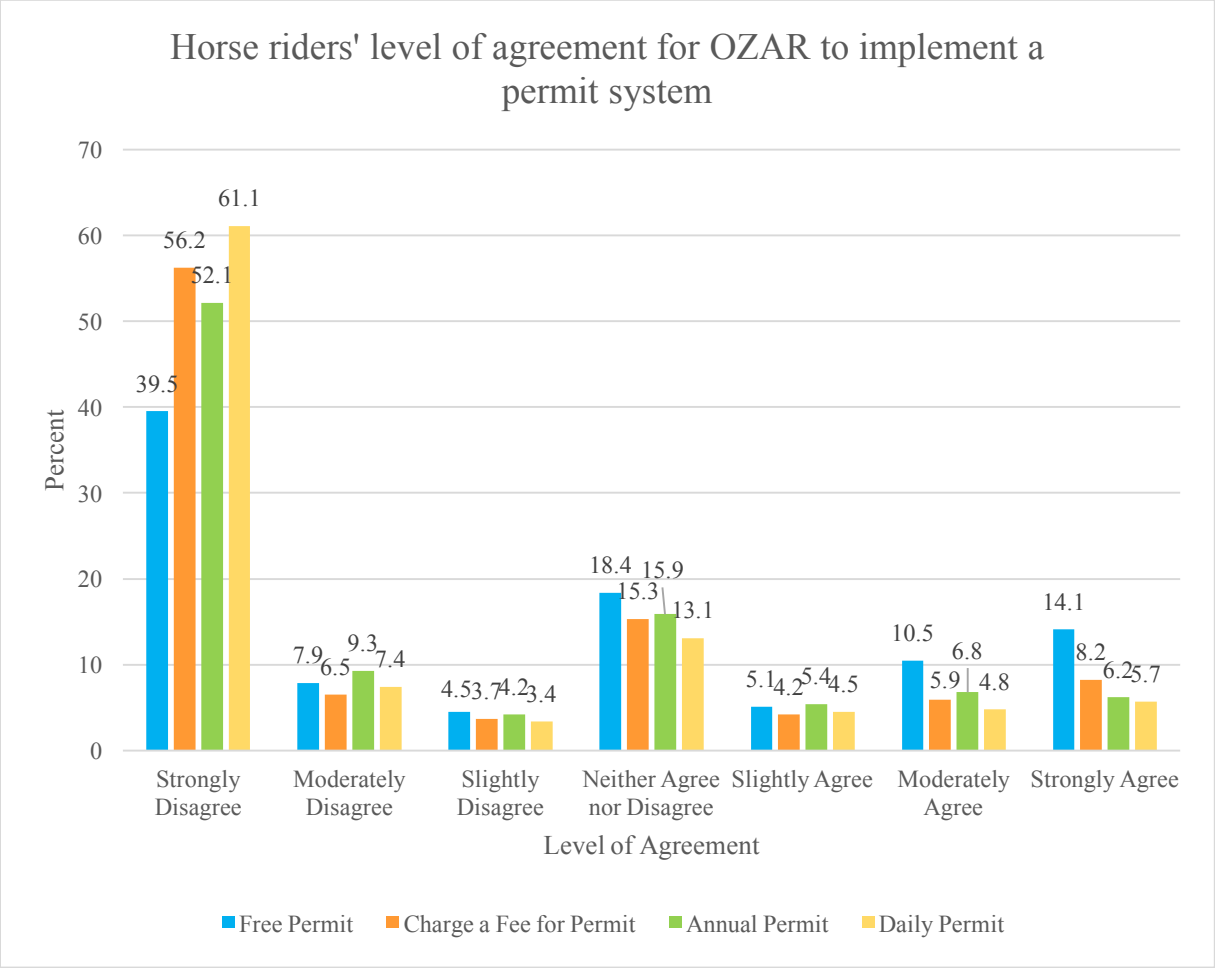

Figure 4.13l. *Horse riders' level of agreement for OZAR to implement a permit system (%)* (N = 353)

Note: This data exists in Table 4.9b

The data suggests that of the management scenarios involving a permit system, the free permit system would be the most acceptable. The least accepted scenario would be the daily permit system.

4.14 The acceptability of limits on group size on trails at OZAR

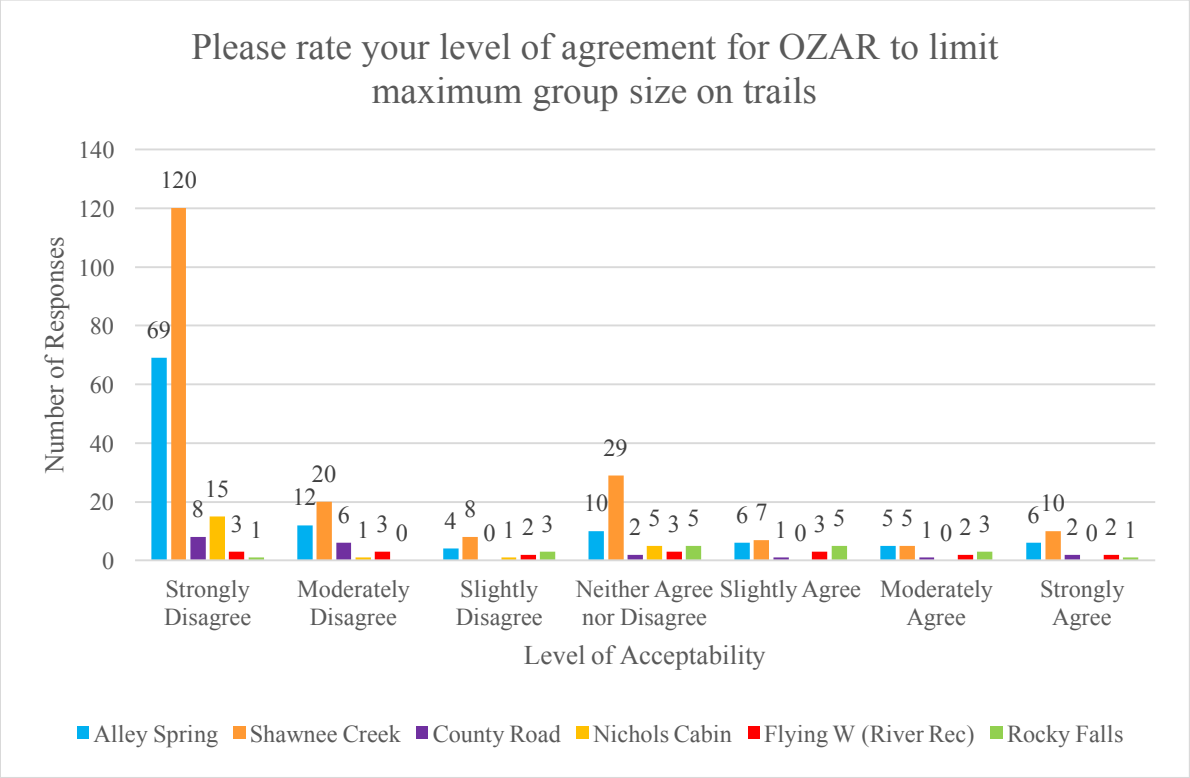

Figure 4.14a. *All visitors' level of agreement for OZAR to limit maximum group size on trails by location (Number of responses)* (Alley Spring n = 112; Shawnee Creek n = 199; County Road n = 20; Nichols Cabin n = 22; Flying W n = 18; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

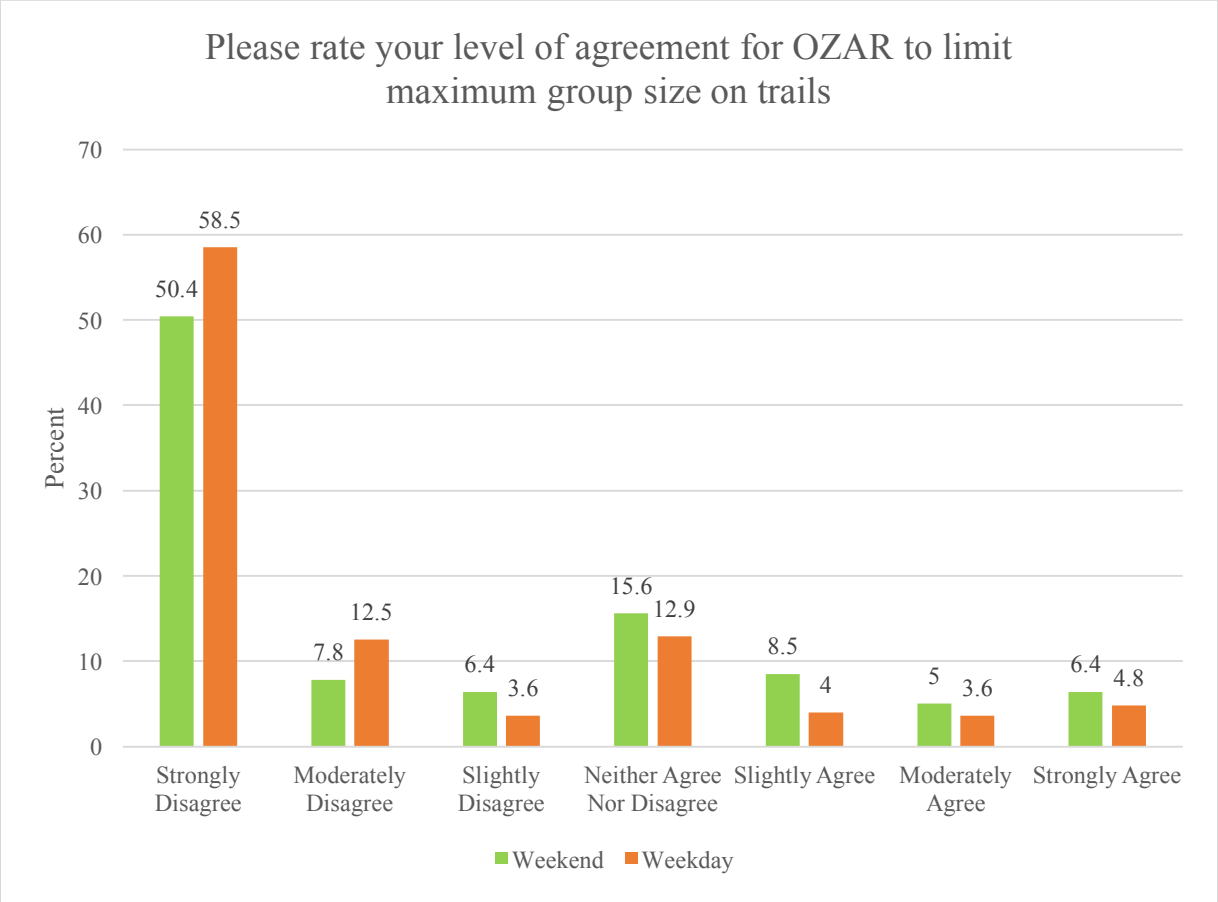

Figure 4.14b. *All visitors' level of agreement for OZAR to limit maximum group size on trails by weekend and weekday users (%)* (Weekend n = 141; Weekday n = 248)

Note: This data exists in Table 4.9a

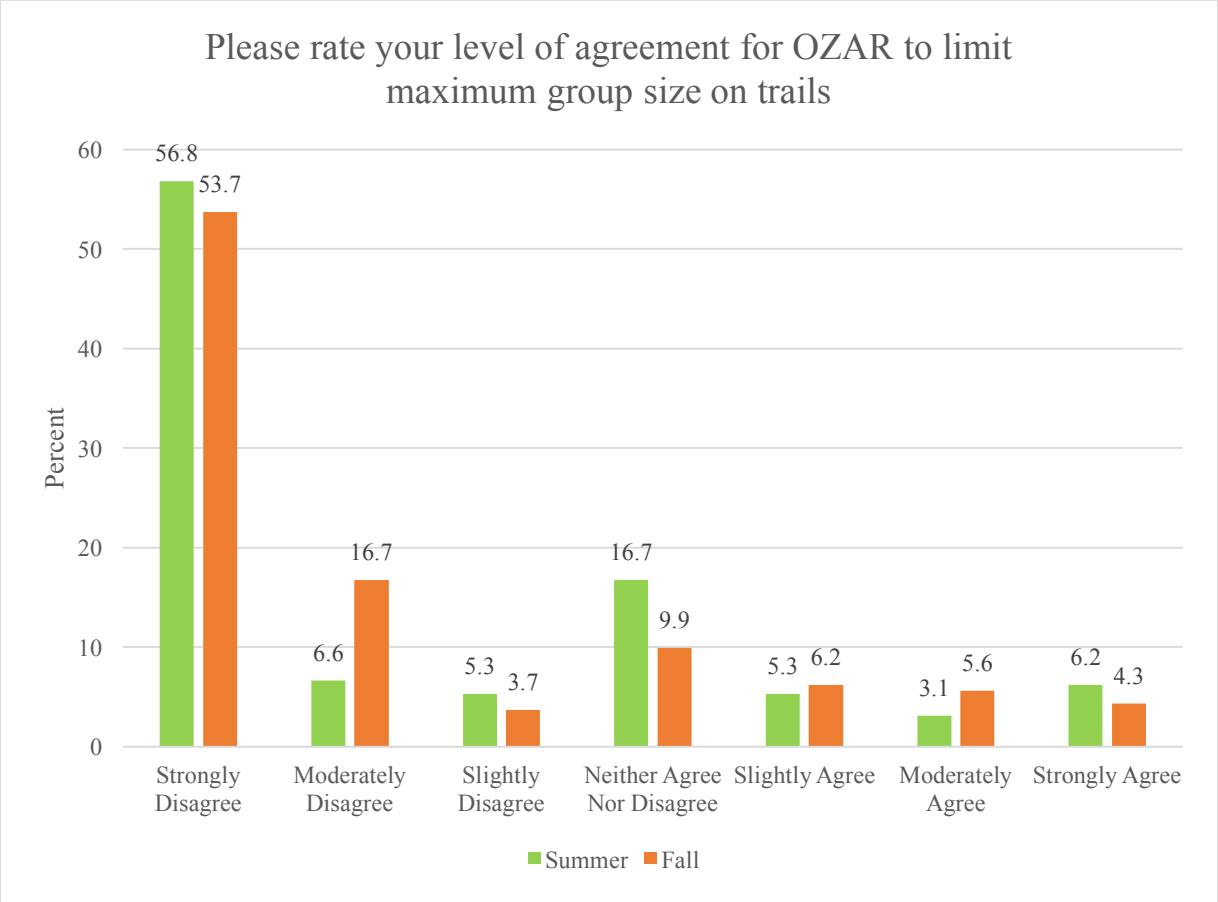

Figure 4.14c. *All visitors' level of agreement for OZAR to limit maximum group size on trails by season (%)* (Summer n = 227; Fall n = 162)

Note: This data exists in Table 4.9a

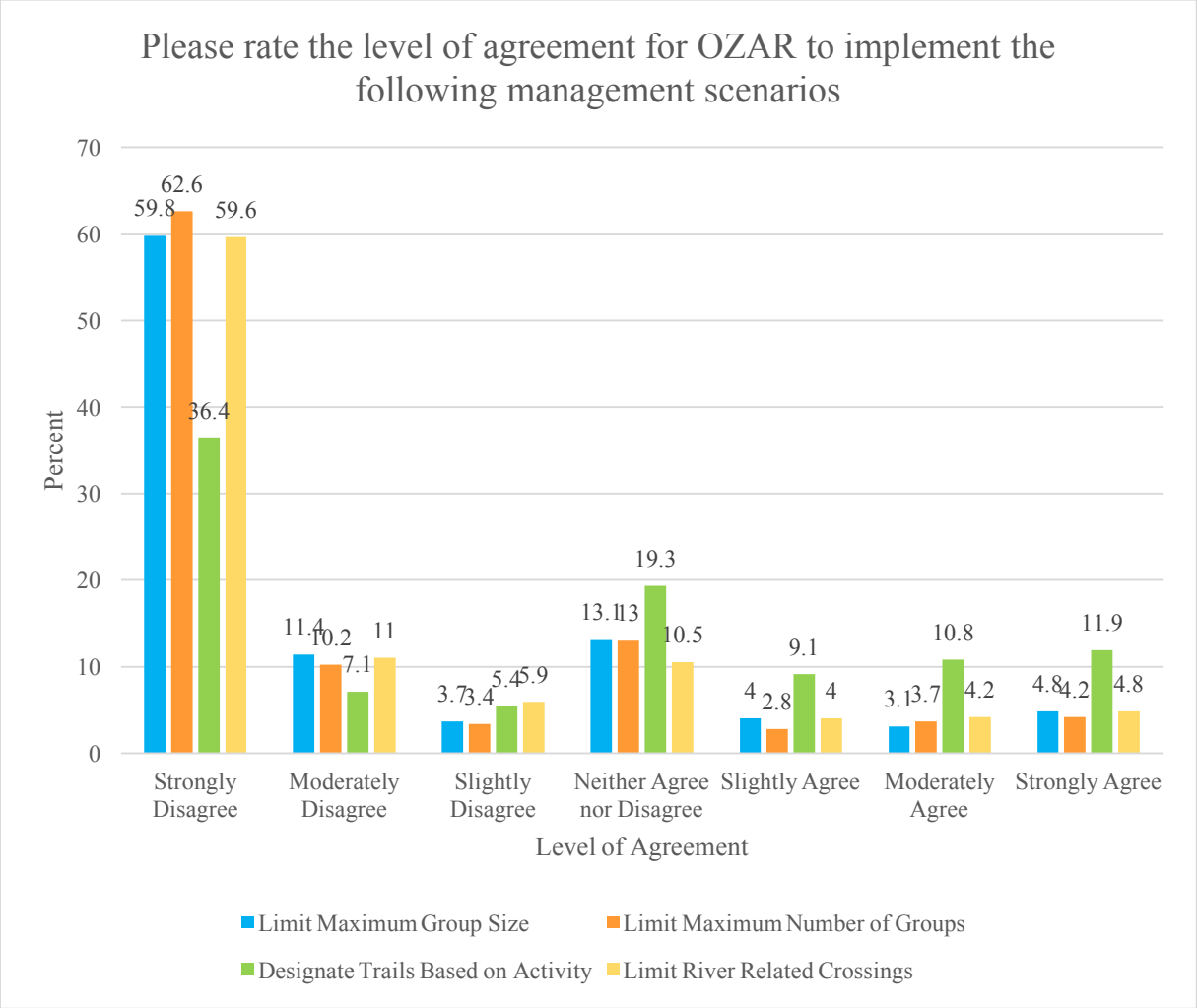

Figure 4.14d. *Horse riders' level of agreement for OZAR to limit maximum group size, to limit maximum number of groups, to designate trails based on activity, and to limit river related river crossings (%)* (N = 390)

Note: This data exists in Table 4.9b

The data suggests that designating trails based on activity would be the most acceptable of these management options and limiting maximum number of groups the least acceptable.

4.15 The acceptability of OZAR limiting the maximum number of groups on the trails

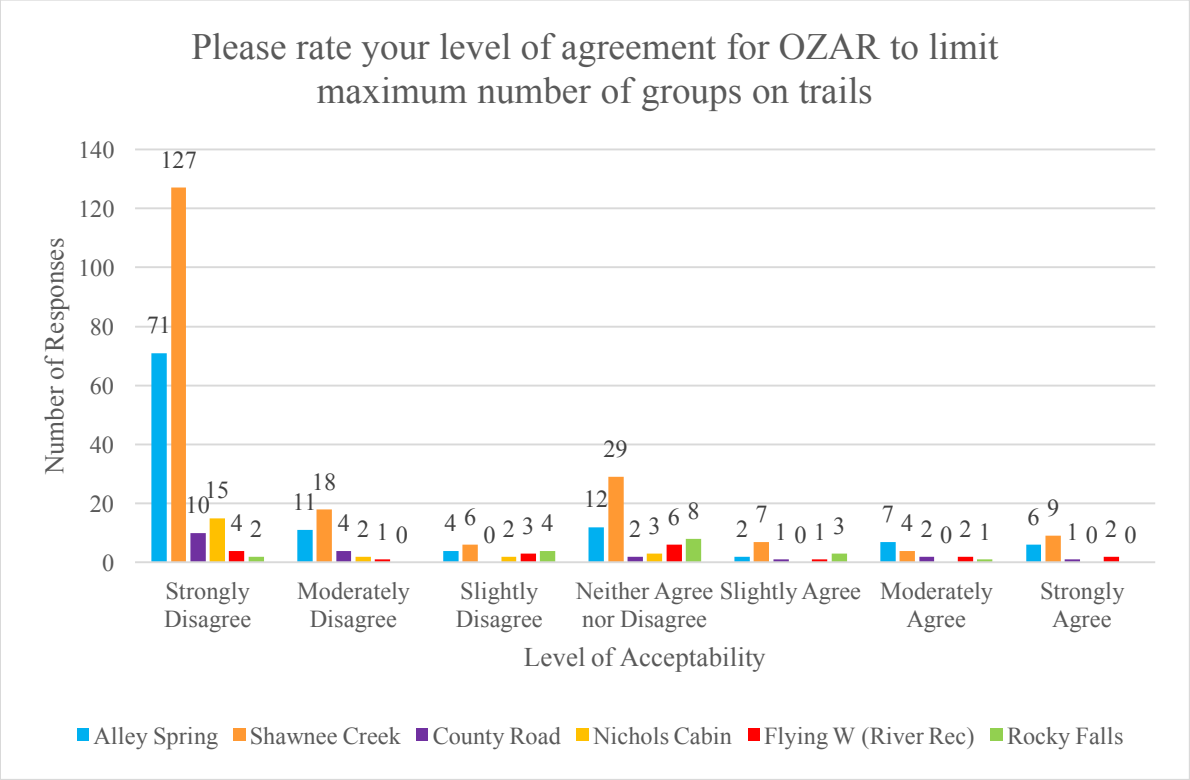

Figure 4.15a. *All visitors' level of agreement for OZAR to limit maximum number of groups on the trails by location (Number of responses)* (Alley Spring n = 113; Shawnee Creek n = 200; County Road n = 20; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

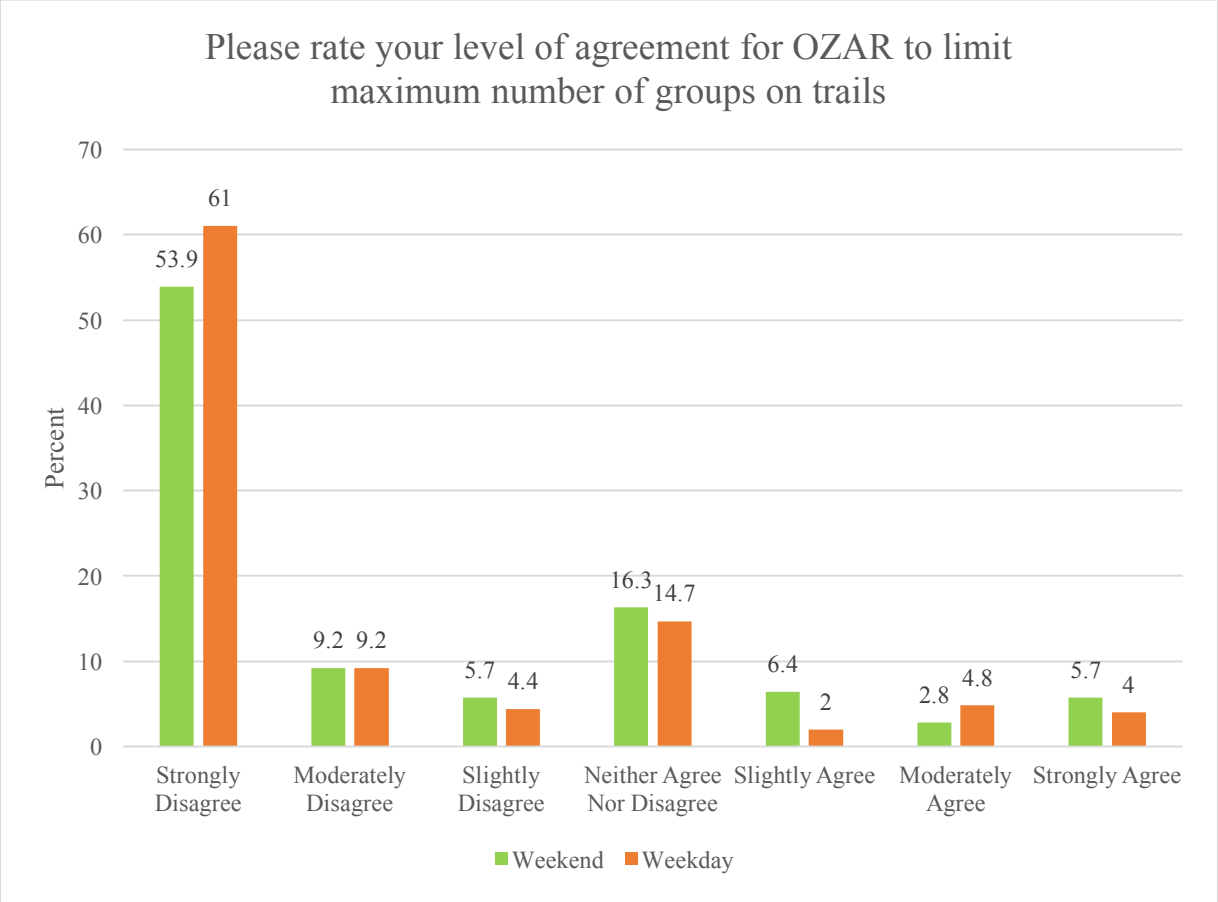

Figure 4.15b. *All visitors' level of agreement for OZAR to limit maximum number of groups on the trails by weekend and weekday users (%)* (Weekend n = 141; Weekday n = 251)

Note: This data exists in Table 4.9a

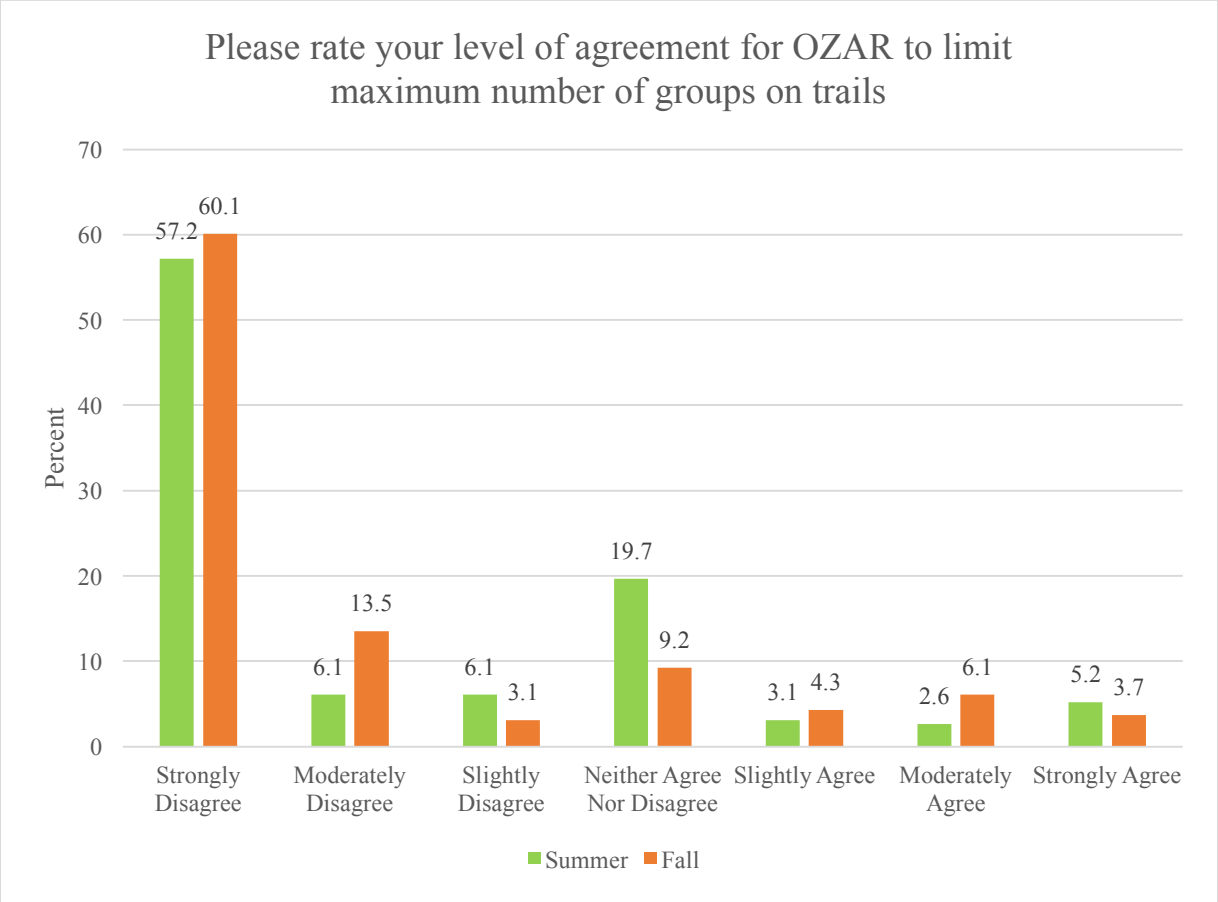

Figure 4.15c. *All visitors' level of agreement for OZAR to limit maximum number of groups on the trails by season (%)* (Summer n = 229; Fall n = 163)

Note: This data exists in Table 4.9a

4.16 The acceptability of requiring education on low impact trail practices

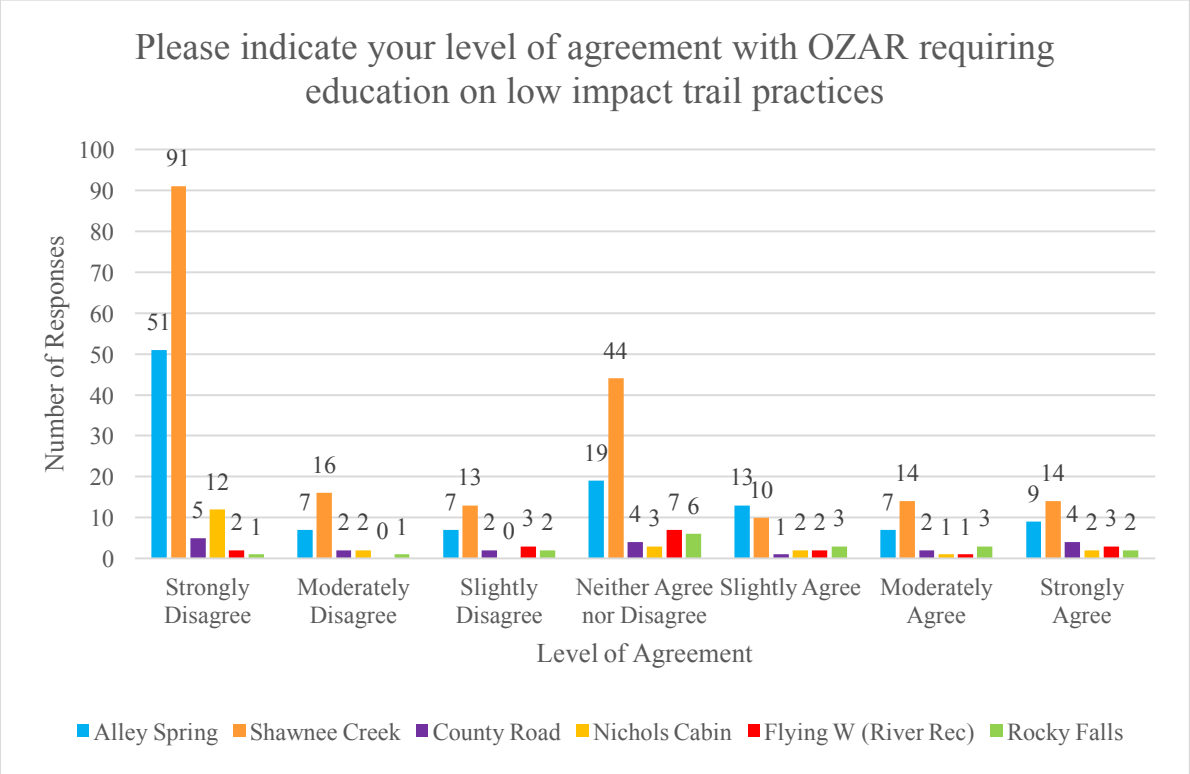

Figure 4.16a. *All visitors' level of agreement for OZAR requiring education on low impact trail practices by location (Number of responses)* (Alley Spring n = 113; Shawnee Creek n = 202; County Road n = 20; Nichols Cabin n = 22; Flying W n = 18; Rocky Falls n = 18)

Note: This data exists in Table 4.9c

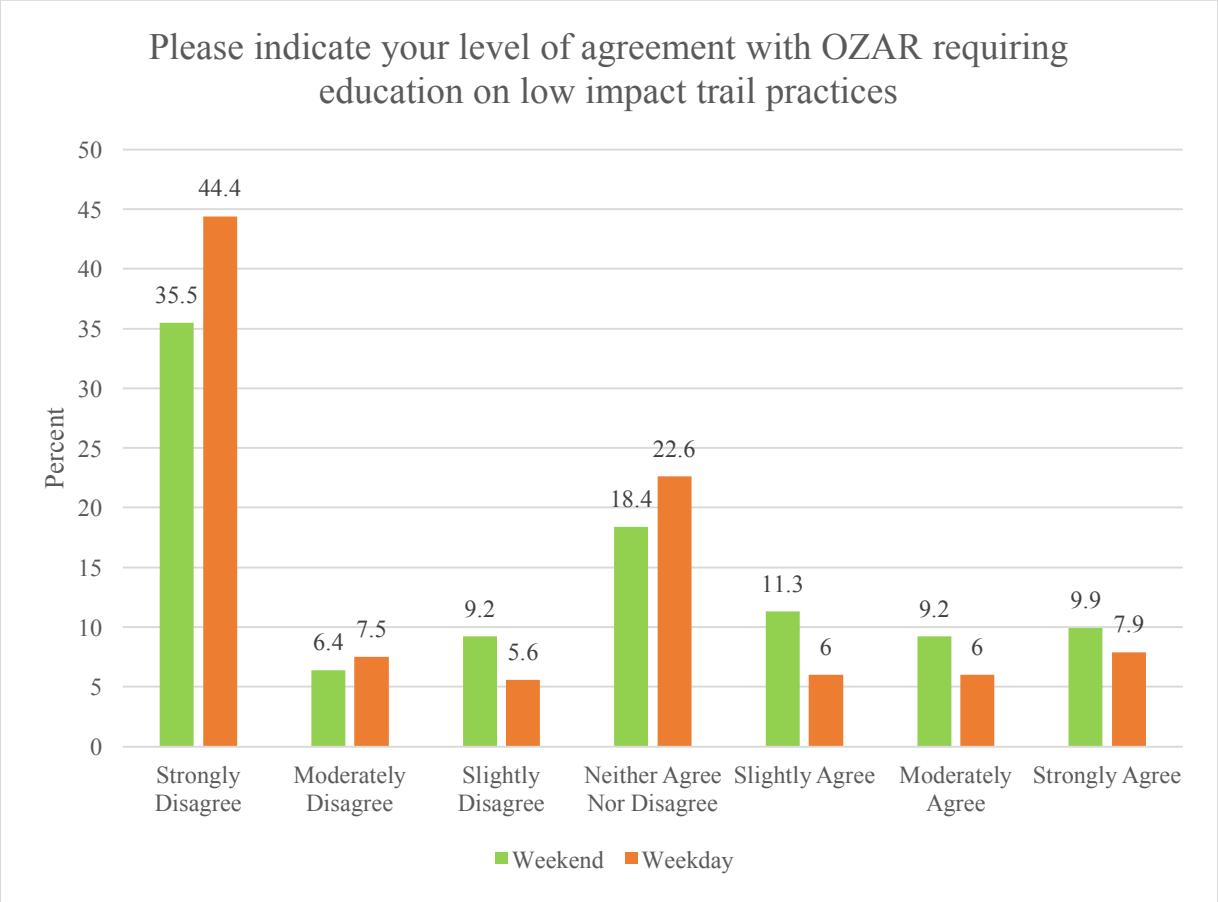

Figure 4.16b. *All visitors' level of acceptability of OZAR requiring education on low impact trail practices by weekend and weekday users (%)* (Weekend n = 141; Weekday n = 252)

Note: This data exists in Table 4.9a

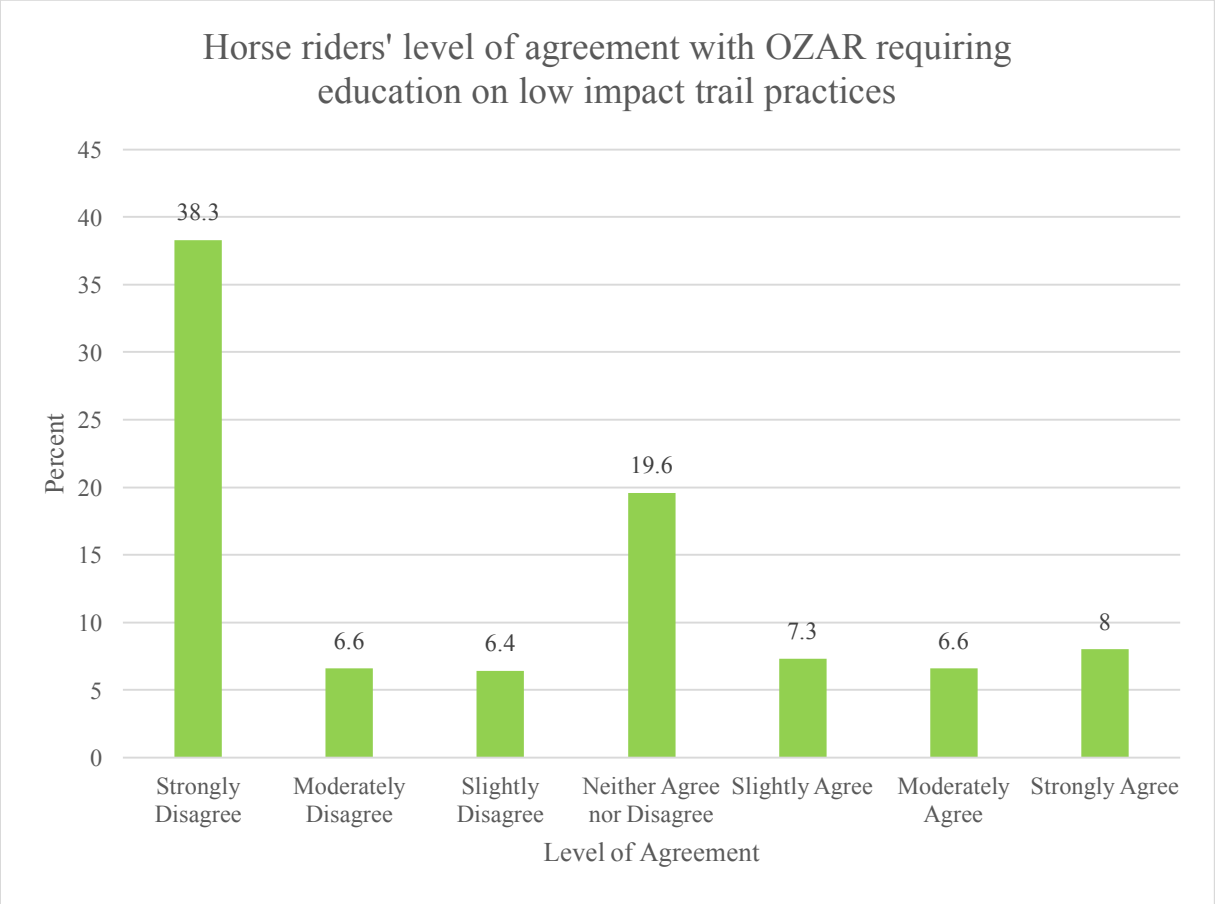

Figure 4.16c. *Horse riders' level of agreement for OZAR to require education on low impact trail practices (Number of responses)* (N = 393)

Note: This data exists in Table 4.9a

4.17 Perceptions of crowding at OZAR

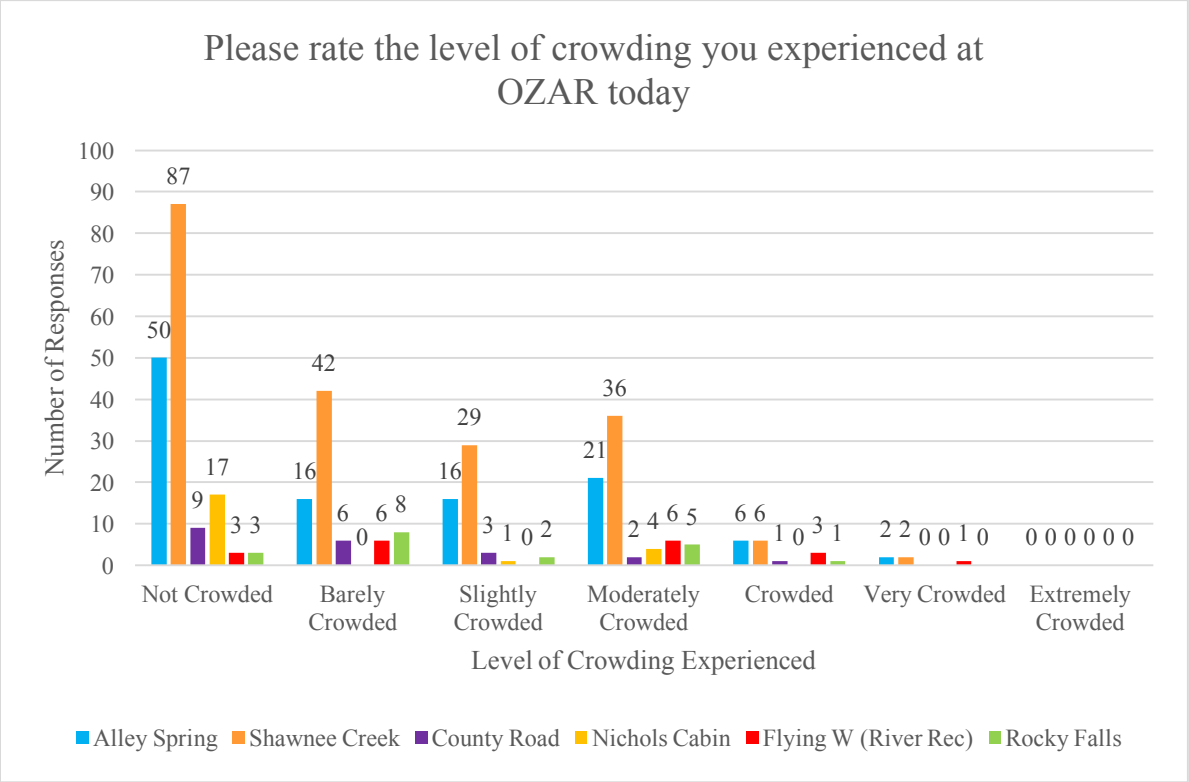

Figure 4.17a. All visitors' perceptions of crowding at OZAR at sampling locations (Number of responses) (Alley Spring n = 111; Shawnee Creek n = 202; County Road n = 21; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 19)

Note: This data exists in Table 4.9c

Over all the sites, respondents found the conditions at OZAR to not be crowded.

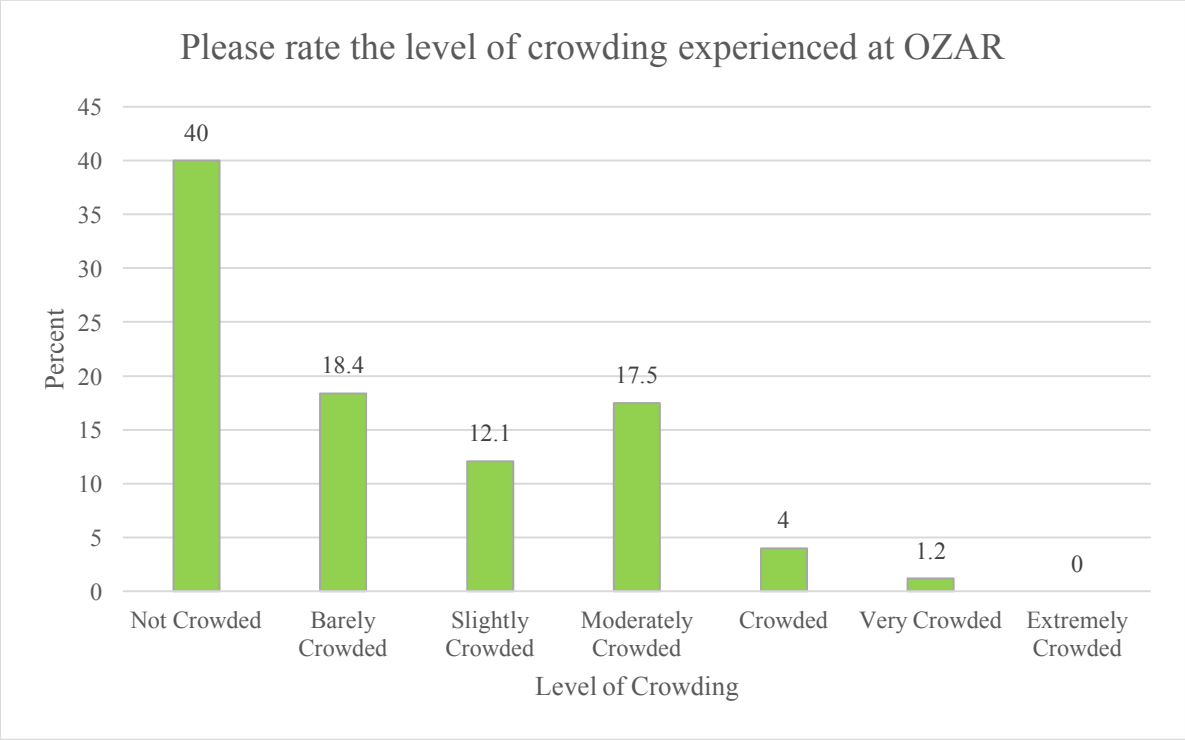

Figure 4.17b. All visitors' overall perceived level of crowding at OZAR (%) (N = 394)

Note: This data exists in Table 4.9a

Table 4.17a. *Time of day visitors felt crowded by location*

		Morning	Afternoon	Evening	I Can't Remember	Total
Location	Alley Spring	12	26	6	35	79
	Shawnee Creek	27	34	4	122	187
	County Road	4	0	1	8	13
	Nichols Cabin	0	2	0	19	21
	Flying W (River Rec)	3	6	1	3	13
	Rocky Falls	1	11	0	5	17
Total		47	79	12	192	330

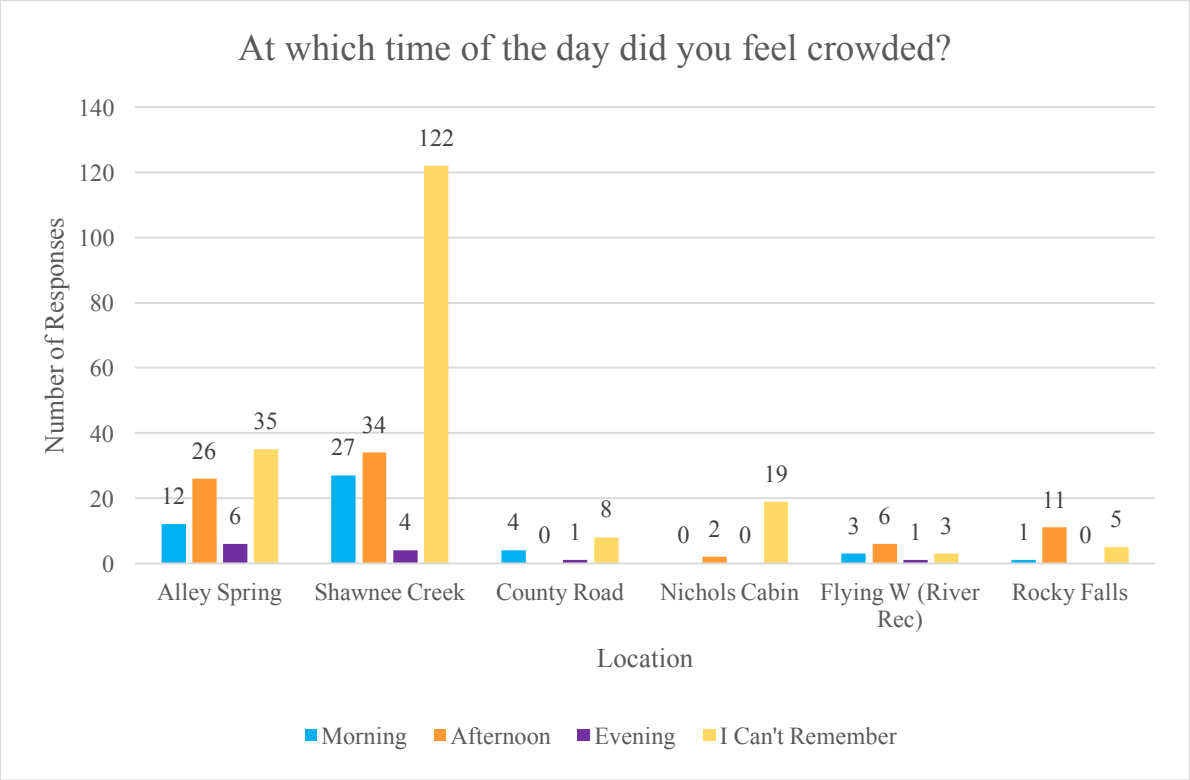

Figure 4.17c. Time of day all visitors felt crowded by location *(Number of responses)* (Alley Spring n = 79; Shawnee Creek n = 187; County Road n = 13; Nichols Cabin n = 21; Flying W n = 13; Rocky Falls n = 17)

Table 4.17b. *Time of day visitors felt crowded at OZAR by weekend and weekday users*

		Morning	Afternoon	Evening	I Can't Remember	Total
User Groups	Weekend	9	34	4	85	132
	Weekday	38	45	8	107	198
Total		47	79	12	192	330

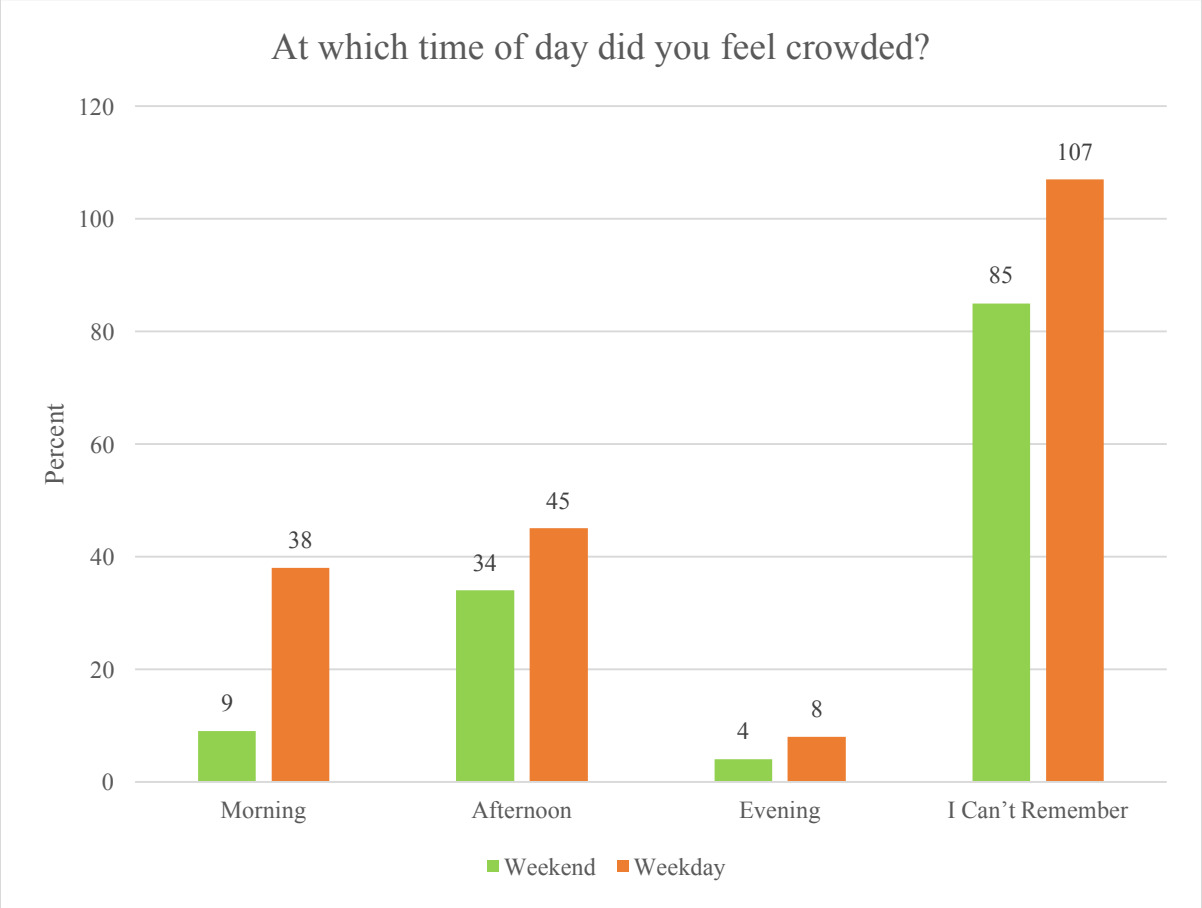

Figure 4.17d. Time of day all visitors felt crowded by season (%) (Weekend n = 132; Weekday n = 198)

Table 4.17c. *Time of day visitors felt crowded at OZAR by season*

		Morning	Afternoon	Evening	I Can't Remember	Total
User Groups	Summer	28	41	5	129	132
	Fall	19	38	7	63	127
Total		47	79	12	192	330

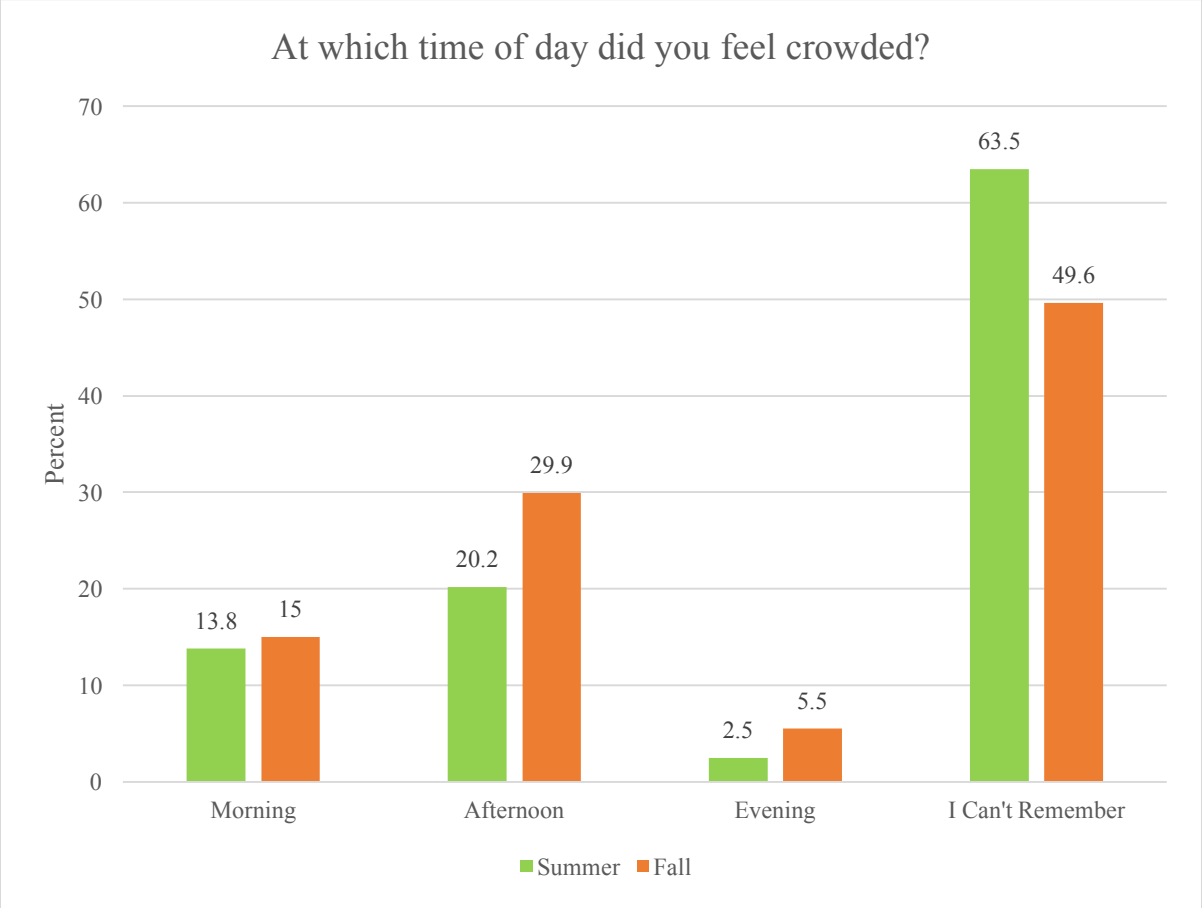

Figure 4.17e. Time of day all visitors felt crowded by season (%) (Summer n = 203; Fall n = 127)

Visitors' perceptions of crowding at OZAR

These data suggest the visitors do not perceive current conditions at OZAR as crowded. Specifically, 40% report feeling *not crowded at all* for all locations listed on the questionnaire. The data indicate visitors experienced the most crowding (*moderately crowded*) at Shawnee Creek, at 9%, and 18.4% over all data collection sites.

4.18 The acceptability of encountering other recreationists at OZAR

Table 4.18a. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR*

		Extremely Negative Impact	Moderately Negative Impact	Slightly Negative Impact	No Impact	Slightly Positive Impact	Moderately Positive Impact	Extremely Positive Impact	Total
Location	Alley Spring	3	1	2	40	5	19	41	111
	Shawnee Creek	8	3	1	98	6	19	76	211
	County Road	0	0	0	10	1	4	12	27
	Nichols Cabin	0	0	0	12	0	2	8	22
	Flying W (River Rec)	1	0	0	16	0	0	1	18
	Rocky Falls	0	0	3	14	0	0	1	18
Total		12	4	6	190	12	44	139	407

Table 4.18b. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR*

How did the number of horse riders you encountered affect your overall experience today?	
Mean	5.15
Standard Deviation	1.595
N	407
Minimum	1
Maximum	7

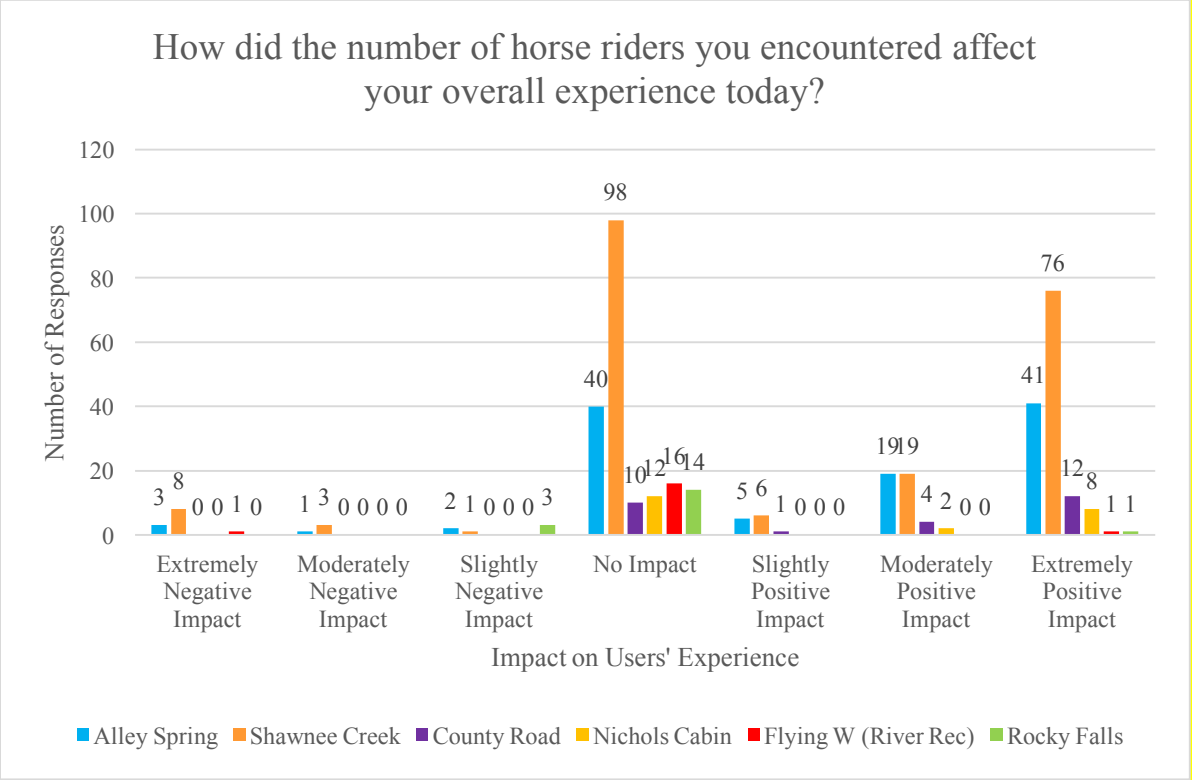

Figure 4.18a. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR (Number of responses)* (Alley Spring n = 111; Shawnee Creek n = 211; County Road n = 27; Nichols Cabin n = 22; Flying W n = 18; Rocky Falls n = 18)

Note: Hikers were surveyed at Rocky Falls only, so the Rocky Falls numbers are the numbers for hikers.

Most visitors found the number of horse riders they encountered either had no impact, or had an extremely positive impact on their experience the day they were intercepted for the questionnaire.

Table 4.18c. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by weekend and weekday user groups*

Please rate the level of acceptability of encountering horse riders on the trails at OZAR		
	Weekday	Weekend
Mean	5.26	4.96
Standard Deviation	1.536	1.679
N		
Minimum	1	1
Maximum	7	7

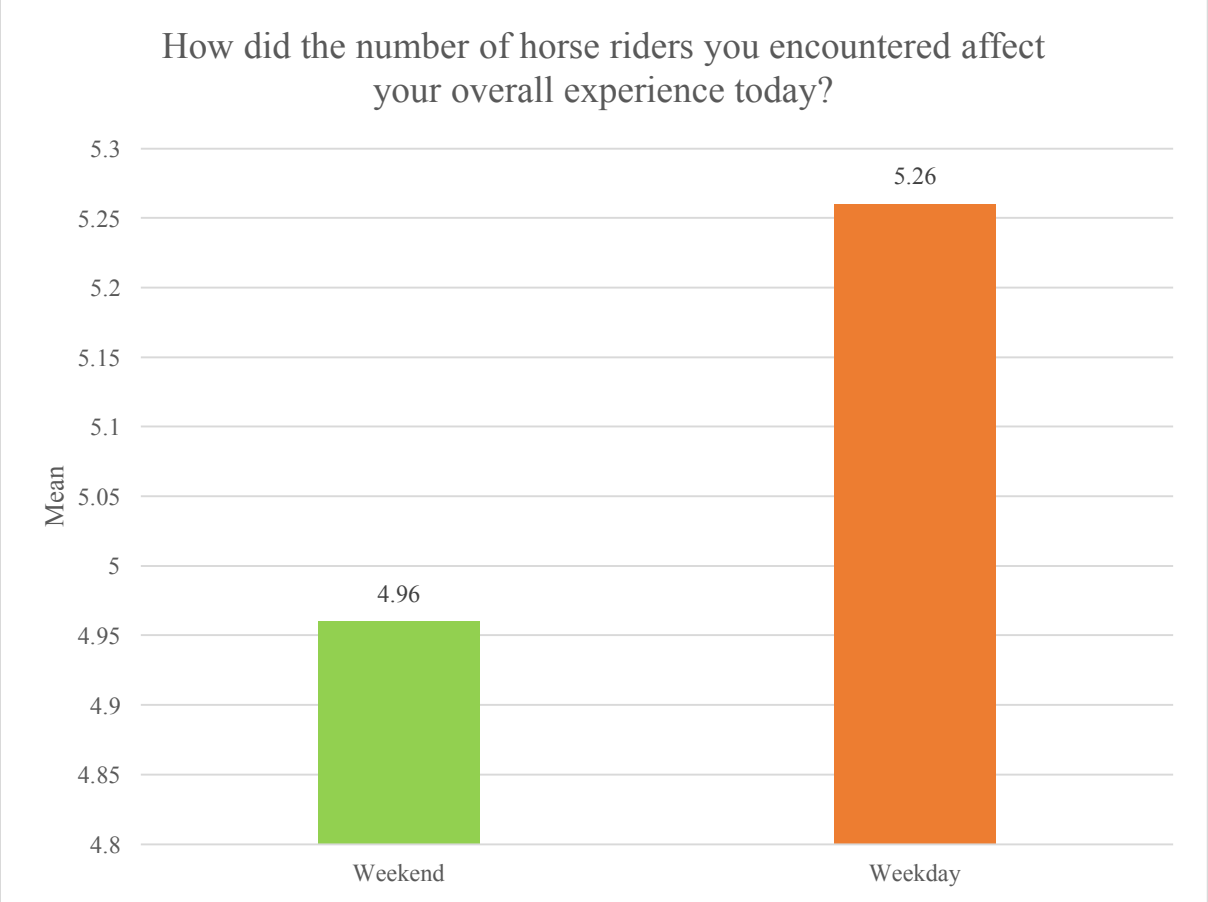

Figure 4.18b. *Visitors' level of acceptability of encountering horse riders on the trails at OZAR by weekend and weekday users* (Weekend n = 152; Weekday n = 255)

Table 4.18d. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by weekend and weekday users*

		Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree	Total
User Groups	Weekend	7	2	3	76	3	12	49	152
	Weekday	5	2	3	114	9	32	90	255
Total		12	4	6	190	12	44	139	407

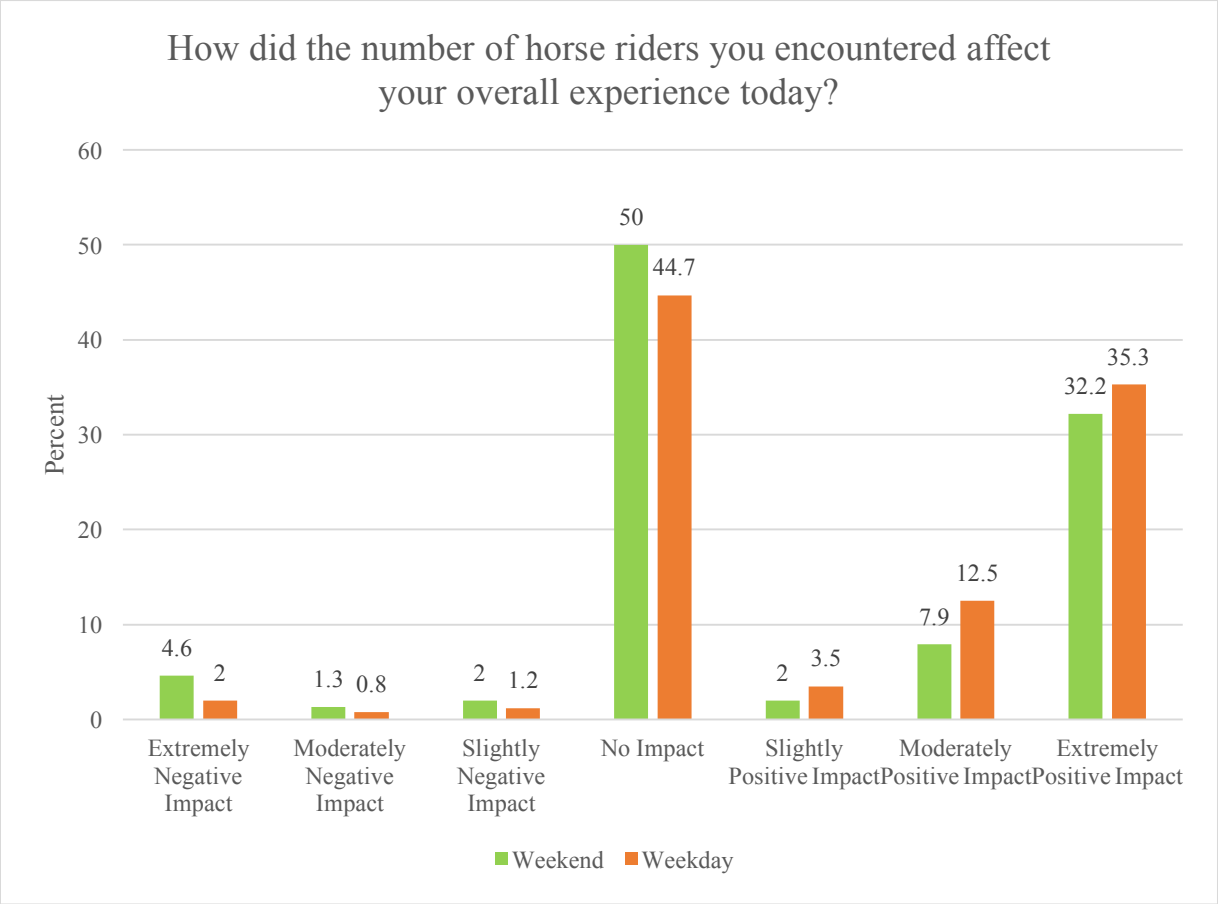

Figure 4.18c. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by weekend and weekday users (%)* (Weekend n = 152; Weekday n = 255)

Table 4.18d. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by season*

	Summer	Fall
Mean	5.00	5.34
Standard Deviation	1.557	1.628
Minimum	1	1
Maximum	7	7

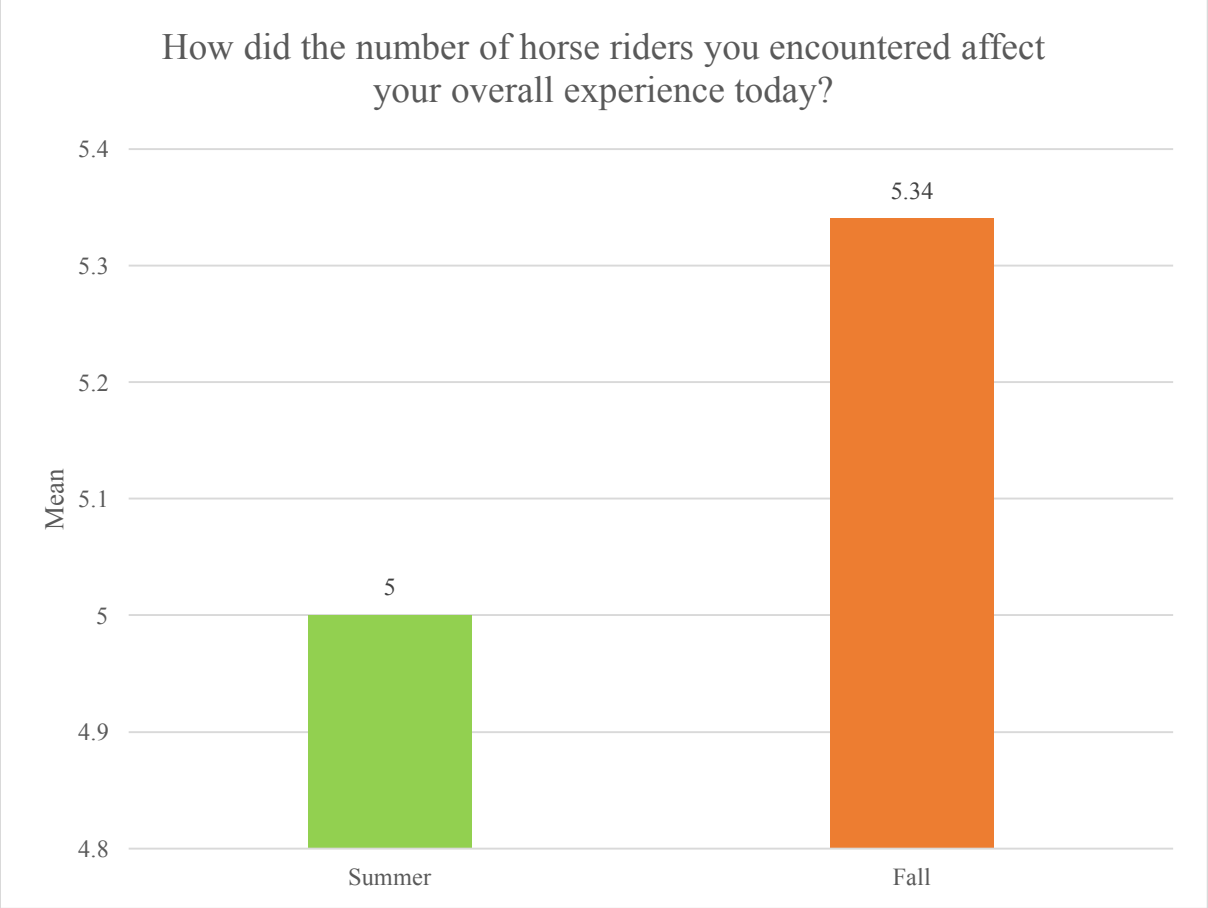

Figure 4.18d. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by season* (Summer n = 232; Fall n = 175)

Table 4.18e. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by season*

		Extremely Negative Impact	Moderately Negative Impact	Slightly Negative Impact	No Impact	Slightly Positive Impact	Moderately Positive Impact	Extremely Positive Impact	Total
Season	Summer	7	1	3	124	7	19	71	232
	Fall	5	3	3	66	5	25	68	175
Total		12	4	6	190	12	44	139	407

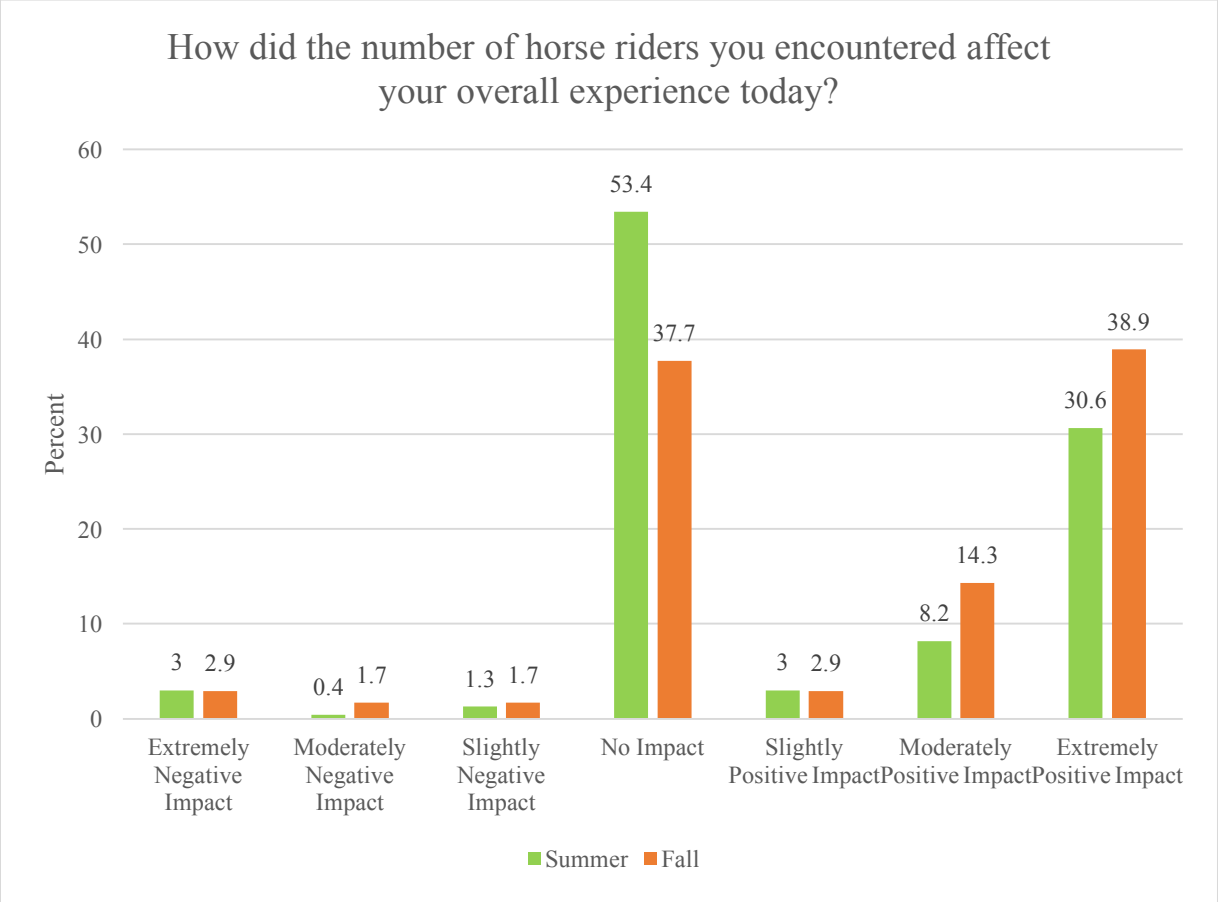

Figure 4.18e. *All visitors' level of acceptability of encountering horse riders on the trails at OZAR by season (%)* (Summer n = 232; Fall n = 175)

Table 4.18f *All visitors' level of acceptability of encountering hikers on the trails at OZAR*

		Extremely Negative Impact	Moderately Negative Impact	Slightly Negative Impact	No Impact	Slightly Positive Impact	Moderately Positive Impact	Extremely Positive Impact	Total
Location	Alley Spring	3	1	0	49	3	8	15	79
	Shawnee Creek	9	2	4	140	6	9	25	195
	County Road	0	0	0	16	0	2	5	23
	Nichols Cabin	0	0	0	14	1	1	6	22
	Flying W (River Rec)	1	0	1	15	0	1	1	19
	Rocky Falls	1	0	2	11	0	3	2	19
Total		14	3	7	245	10	24	54	357

Table 4.18g. *All visitors' level of acceptability of encountering hikers on the trails at OZAR*

Mean	4.46
Standard Deviation	1.362
N	357
Minimum	1
Maximum	7

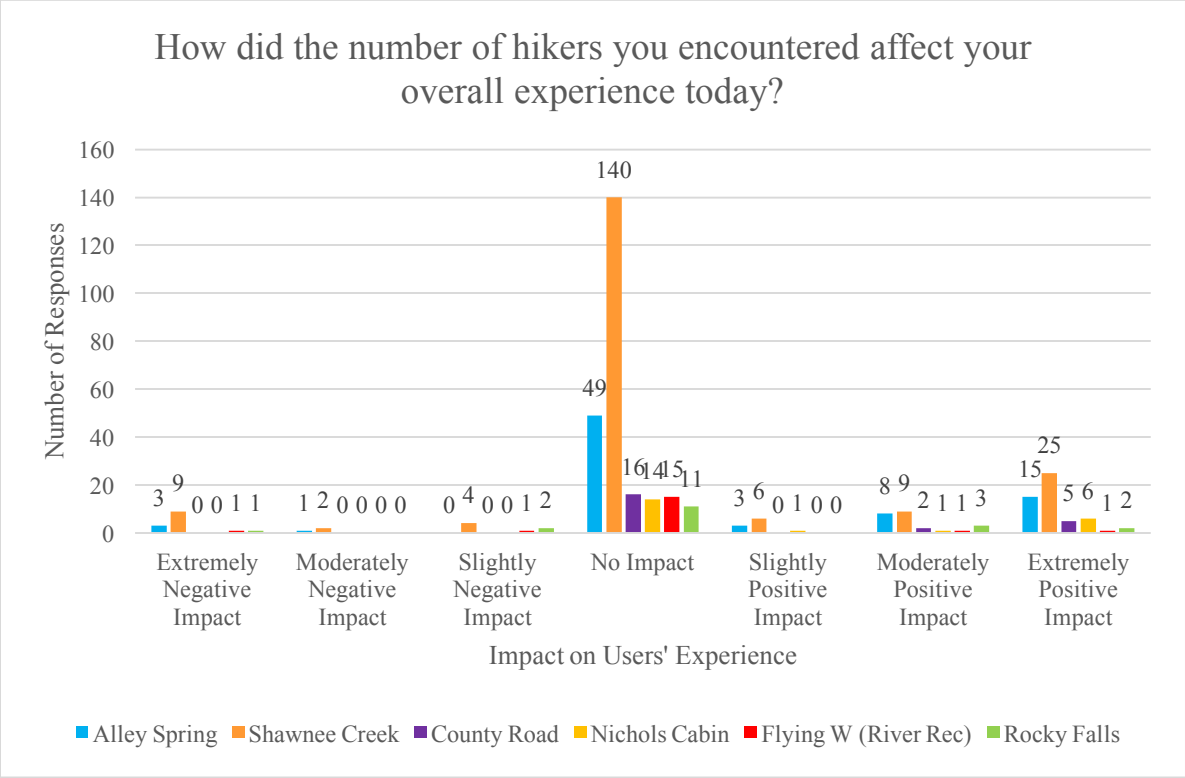

Figure 4.18f. *All visitors' level of acceptability of encountering hikers on the trails at OZAR (Number of responses)* (Alley Spring n = 79; Shawnee Creek n = 195; County Road n = 23; Nichols Cabin n = 22; Flying W n = 19; Rocky Falls n = 19)

The data suggests that most visitors that encountered hikers during their time at OZAR did not have any impact on their experience.

Table 4.18h. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by weekend and weekday user groups*

	Weekday	Weekend
Mean	4.58	4.29
Standard Deviation	1.323	1.405
Minimum	1	1
Maximum	7	7

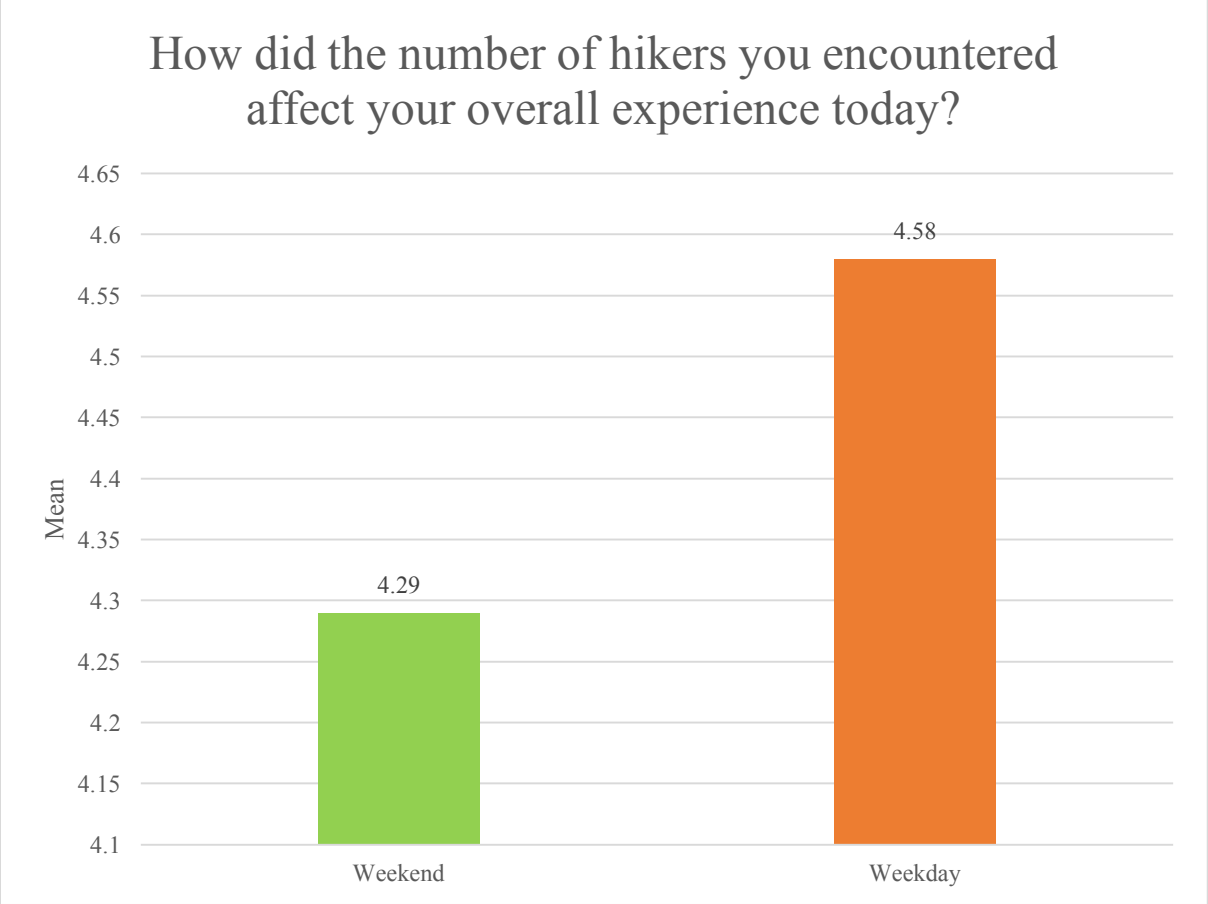

Figure 4.18g. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by weekend and weekday users* (Weekend n = 146; Weekday n = 211)

Table 4.18i. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by weekend and weekday users*

		Extremely Negative Impact	Moderately Negative Impact	Slightly Negative Impact	No Impact	Slightly Positive Impact	Moderately Positive Impact	Extremely Positive Impact	Total
Season	Weekend	9	1	4	103	2	7	20	146
	Weekday	5	2	3	142	8	17	34	211
Total		14	3	7	245	10	24	54	357

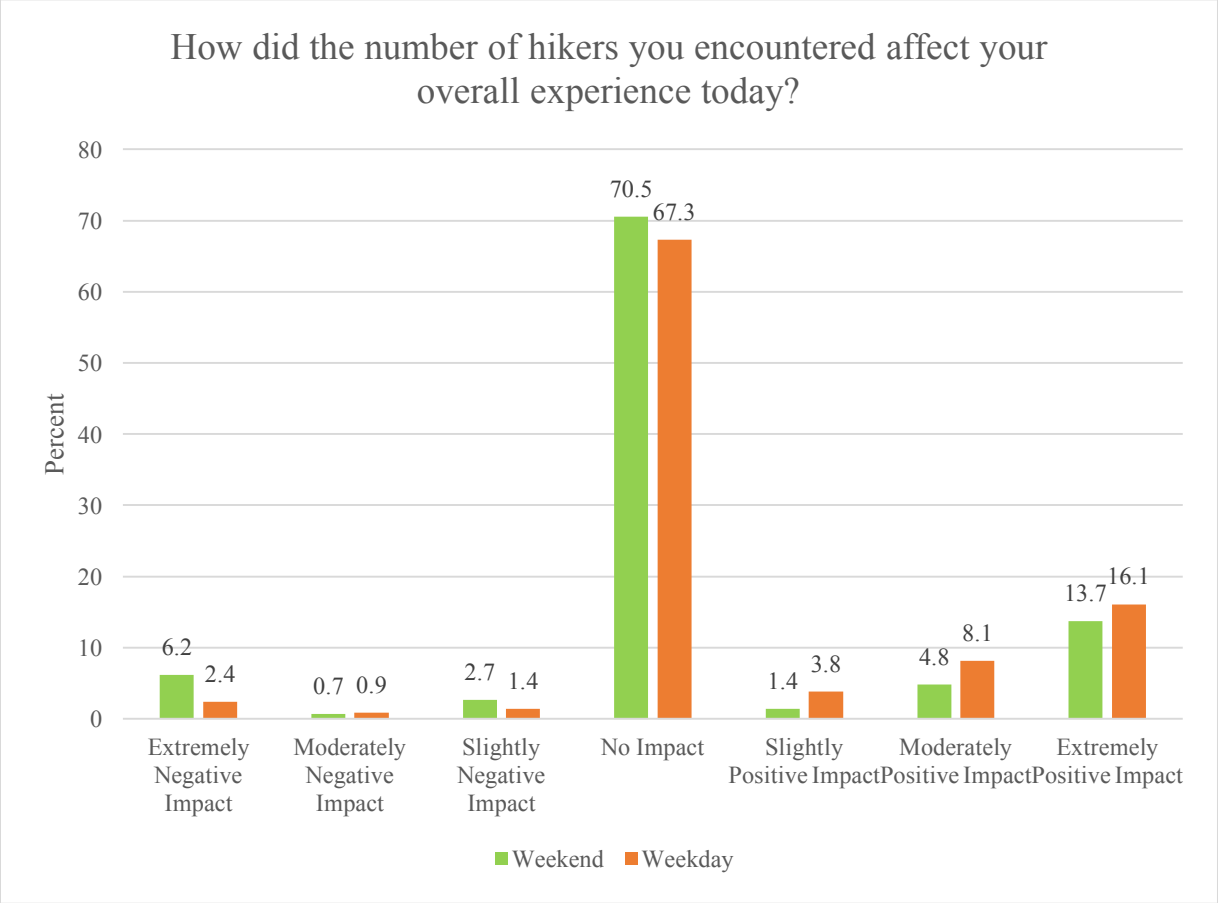

Figure 4.18h. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by weekend and weekday users (%)* (Weekend n = 146; Weekday n = 211)

Table 4.18j. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by season*

	Summer	Fall
Mean	4.39	4.57
Standard Deviation	1.286	1.466
Minimum	1	1
Maximum	7	7

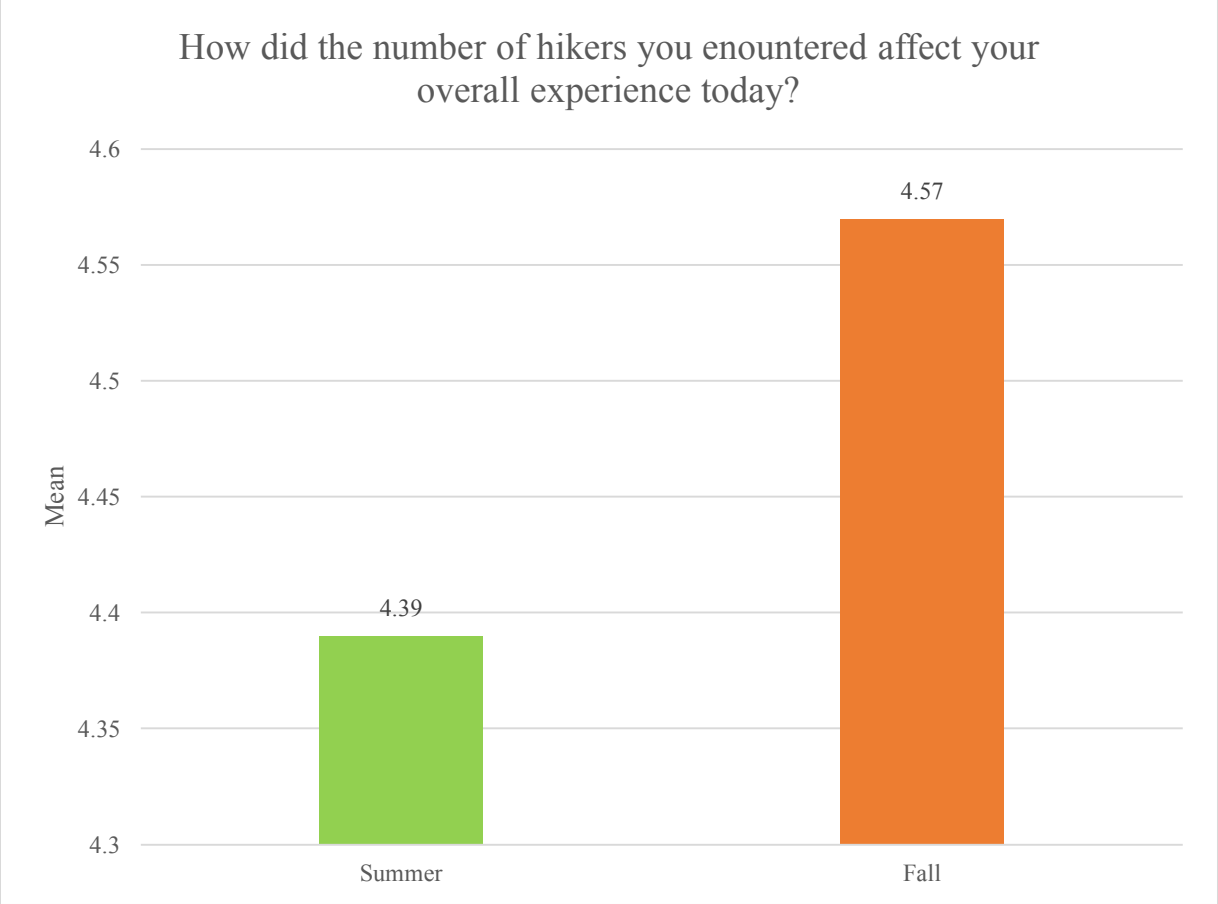

Figure 4.18i. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by season* (Summer n = 213; Fall n = 144)

Table 4.18k. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by season*

		Extremely Negative Impact	Moderately Negative Impact	Slightly Negative Impact	No Impact	Slightly Positive Impact	Moderately Positive Impact	Extremely Positive Impact	Total
Season	Summer	8	0	5	157	2	13	28	213
	Fall	6	3	2	88	8	11	26	144
Total		14	3	7	245	10	24	54	357

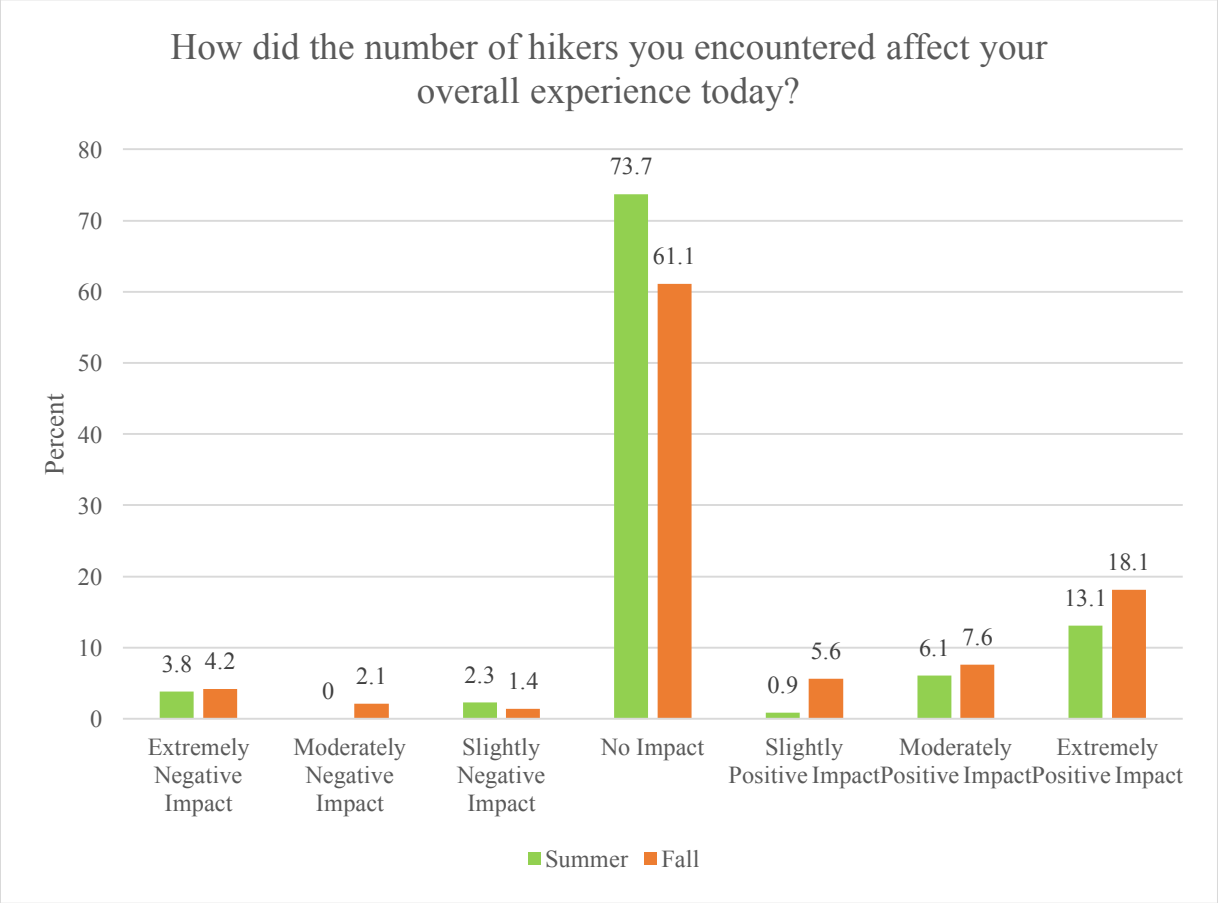

Figure 4.18j. *All visitors' level of acceptability of encountering hikers on the trails at OZAR by season (%)* (Summer n = 213; Fall n = 144)

Table 4.18l. *All visitors' level of acceptability of encountering different numbers of the same recreationists on the trails at OZAR*

		Extremely Unacceptable	Unacceptable	Not Sure	Acceptable	Extremely Acceptable	Total
Number of People	Zero	11	8	39	80	227	365
	1-5	5	6	28	89	220	348
	6-10	5	9	31	92	213	350
	11+	6	14	37	85	234	376
Total		27	37	135	346	894	1,439

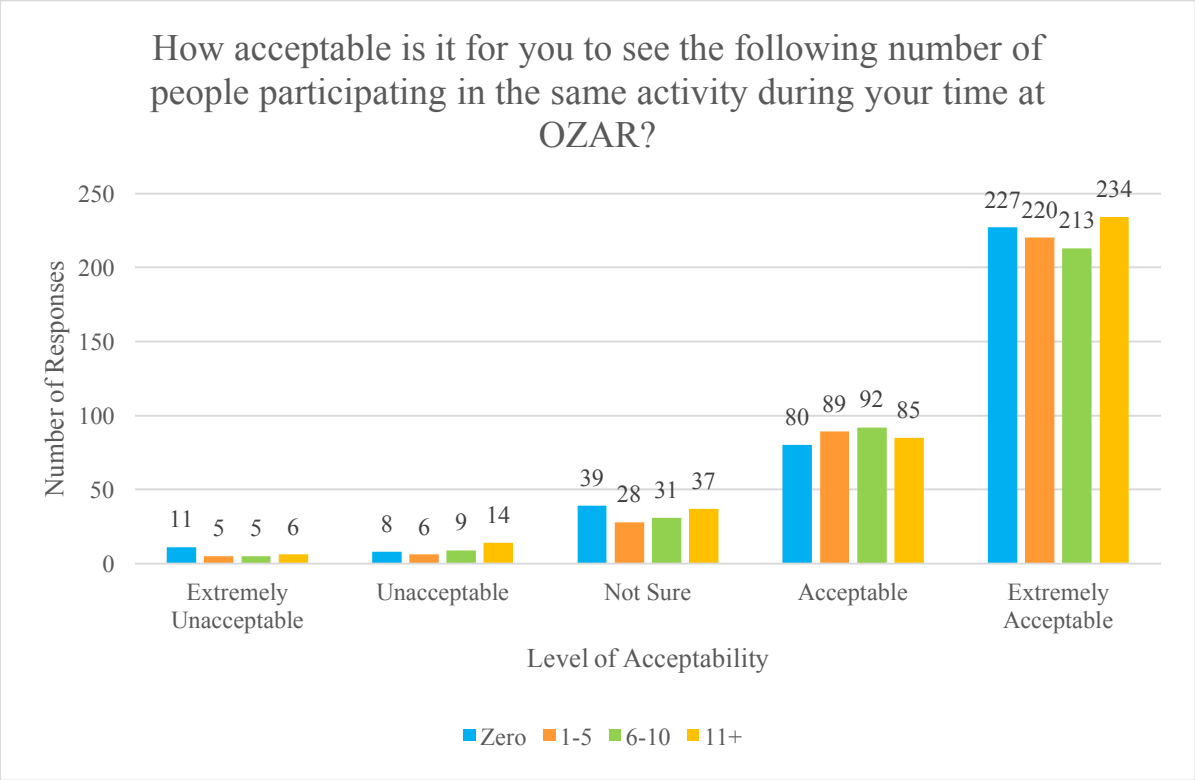

Figure 4.18k. *All visitors' level of acceptability of encountering different numbers of the same recreationists on the trails at OZAR (Number of responses)* (N = 376)

Table 4.18l. *All visitors' level of acceptability of encountering different numbers of the same recreationists on the trails at OZAR by weekend and weekday users*

		Weekday	Weekend
Zero	Mean	4.43	4.30
	Standard Deviation	.888	1.085
1-5	Mean	4.51	4.43
	Standard Deviation	.747	.934
6-10	Mean	4.43	4.41
	Standard Deviation	.841	.902
11+	Mean	4.41	4.39
	Standard Deviation	.913	.913

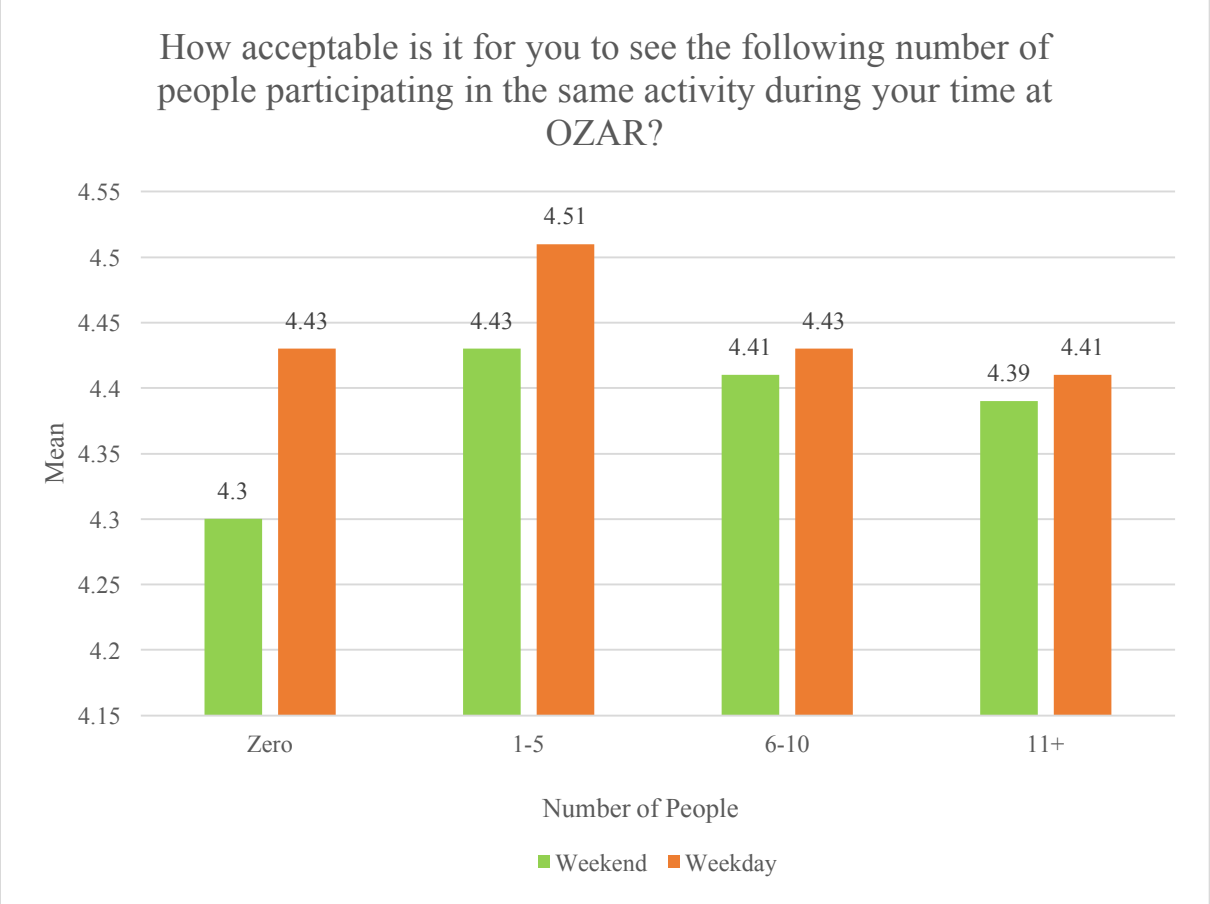

Figure 4.18l. *All visitors' level of acceptability of encountering different numbers of the same recreationists on the trails at OZAR by weekend and weekday users* (Weekend n = 146; Weekday n = 215)

Table 4.18m. *All visitors' level of acceptability of encountering different numbers of the same recreationists on the trails at OZAR by season*

		Summer	Fall
Zero	Mean	4.31	4.49
	Standard Deviation	1.063	.817
1-5	Mean	4.43	4.54
	Standard Deviation	.906	.695
6-10	Mean	4.37	4.50
	Standard Deviation	.950	.716
11+	Mean	4.38	4.44
	Standard Deviation	.967	.861

Figure 4.18m. *All visitors' level of acceptability of encountering different numbers of the same recreationists on the trails at OZAR by season* (Summer n = 215; Fall n = 145)

5.0 Limitations

Research limitations should be considered when reviewing results of any study (Bryman, 2008). Limitations can be attributed to setting and context, measurement, sampling design, and a host of other factors (Vaske, 2008). The ability to generalize these results is statistically supported. Though the number of people questionnaireed fits into acceptable ranges for generalizing to a larger park audience, OZAR visitors may be different from the general public. The uniqueness of the park and the complex issues may not be transferable to the general population.

This questionnaire only targeted visitors from April through October and thus cannot accurately assume that visitors to OZAR in other months would provide similar answers. The weather during the summer and early fall of 2016 was varied (thunderstorms and down trees as a result) and may have impacted the number and type of people who visited the park.

There also may have been self-reporting errors, which is a common limitation for social science questionnaires. Participants were encouraged to answer as truthfully as possible, but this may not have occurred. Some participants may have provided an answer based on what they thought the administrator wanted, i.e., response bias. Participants also might not have been willing to admit that they lacked knowledge in a particular area. Another possible contribution to reporting errors could have resulted from an administrator having an effect on how participants responded, regardless of the principal researcher's efforts to provide a script and to ask the administrators to adhere to it. However, all questionnaire administrators were briefed, trained, and debriefed to ensure consistency.

6.0 Conclusions

Despite relatively high levels of use at Ozark National Scenic Riverways, and related concerns regarding crowding, results from this project indicate that the quality of the visitor experience at the park is high. This conclusion is supported by use conditions that are within the range of acceptability reported by visitors, visitors' high rating for the quality of experiences and natural conditions, and few indications of poor opinions regarding management at OZAR. As with most parks, visitor use peaks on weekends and other isolated times (e.g., trail rides) (Manning, 2011). Although this is the case, most OZAR visitors reported they did not experience crowding while at the park.

The number of repeat visitors is high, which may be partly responsible for the responses to the management questions. The close to 90% of repeat visitors for this study is similar to the number of repeat visitors found in a study of floaters and boaters (Park, 2011). Visitors have a high level of familiarity with the park and thus may have stronger than normal opinions. The horse count data fluctuated based on season, day of the week and whether or not there was a scheduled trail ride during the data collection period, with trail rides seeing the majority of use. Outside the pulses of high use related to the organized trail rides, use appears to be relatively low, which may point to the need for management during peak use times. However, horse riders were not in favor of any permit system. In fact, over a third of horse riders strongly disagreed to the proposal of a free permit. Horse riders were also mostly against limiting group size, the number of groups, limiting river crossings and requiring low impact education. Horse riders and hikers were satisfied with the current ecological and social conditions. Also, nearly half the

horse riders indicated that they were satisfied with the number of people, even during the busiest times at the park.

7.0 Management Implications and Recommendations

These data suggest that throughout the data collection sites, the management option of designating trails based on activity seems to have the highest general consensus among visitors. Although that may be the case, the horse count data suggests that stricter management may be necessary at the locations with high levels of use during the late summer, and fall months.

One of the goals of this study was to gain an understanding of horse riders' perceptions of conditions at OZAR. The following conditions were assessed: trail condition, marking of trails, number of trails, and water quality of rivers and streams. Horse riders were asked to rate how acceptable they found each of the preceding conditions on a scale of 1 (extremely unacceptable) to 7 (extremely acceptable), with 4 being "neither unacceptable or acceptable". Overall, horse riders' levels of acceptability were extremely high. The lowest condition was marking of trails, with an overall mean of 5.57. All other conditions had means exceeding 6, indicating extremely high levels of acceptability.

One potential explanation for the slightly lower scores for marking of trails may be due to the high number of social trails. As these are not marked, but heavily used, there may be confusion among horse riders as to official trails, which warrant signage, and social trails. The lack of signage on social trails may be leading to the misperception of an overall lack of signage. This poses an excellent opportunity for OZAR. By linking the presence of interpretive signage with official trails, horse riders could begin to discern official from social trails. Trails lacking signage would be indicative of social trails. An interpretive campaign explaining the presence of signs on official trails combined with discouraging use of social trails could help to cultivate a new norm of decreased social trail use.

While there are no data to suggest the extremely high levels of acceptability of the other conditions are not valid, there are explanations that could temper these findings. First, the wording of the questions may not have been clear. Respondents were simply asked 'how acceptable they found…' It is unclear if they were basing their answer on a comparison to other sites, past use, the day in question, or a combination of these. Additionally, the question simply asked about 'trail condition'. The respondent was left to interpret which specific conditions to report. For example, some may have responded based on trail width, while others responded based on trail erosion. The question about number of trails assumes respondents can differentiate between official and social trails. While the number of official trails may or may not be sufficient, when combined with social trails, the number seems more than adequate. Finally, the results may be skewed by an inefficient scale and/or questions. The number of mean scores approaching the maximum value can indicate the scale and/or questions were not sensitive enough to capture the variation present. Future work could seek to expand the scale and include more nuanced and polemic questions.

The horse riding experience at OZAR is highly varied. Historically, differences within horse riders have been observed between weekend and weekday users, and summer and fall users; we subdivided respondents based on these categories.

Trail conditions and number of trails were the only two variables to show any difference between groups. Weekend horse riders reported slightly higher levels of acceptability for these two conditions, compared to weekday users. However, means for weekend and weekday users were more than 6. Fall horse riders reported slightly higher levels of acceptability for these two conditions, compared to summer users. Again, however, both means were more than 6, indicating extremely high levels of acceptability. Although significant differences were reported for both types of experience, given the extremely high scores, these do not seem to be meaningful differences. In other words, management does not need to develop different strategies to respond to weekend vs. weekday or summer vs. fall riders.

However, these results may be indicative of a trend that bears monitoring. Weekend and fall use is heavier than weekday and summer use, respectively. Why do users during lower visitation periods report lower levels of acceptability of conditions? Horse riders' attitudes and motivations may help explain these trends. Riders present during lower visitation periods may be intentionally selecting these periods. As such, they may have differing expectations. Future studies could attempt to evaluate attitudes and motivation to determine linkages to perceptions and clarify broader use trends.

The second major objective of this study was to clarify horse riders perceptions of crowding at OZAR. Riders were asked to rate the level of crowding they experienced during their current visit. Scaled responses were from 1 (not crowded) to 7 (extremely crowded), with 4 being 'moderately crowded'. Responses support horse riders do not feel crowding to be an issue. The overall mean was 2.26, and 76% of respondents reported levels of crowding less than 'moderately' crowded. This supports a relatively uniform assessment by all horse riders that crowding is not a significant issue.

One caveat to these results is the large number of social trails. Riders may not feel crowded because use is dispersed over official and social trails. If social trails were unilaterally closed, crowding should be reassessed. Alternatively, managers could seek to strategically phase out social trails over time, thus minimizing crowding and cultivating new norms for levels of use on official trails.

As a corollary to crowding, horse riders were asked to rate how encountering other riders, while at OZAR, affected their overall experience. Scaled responses were from 1 (extremely negative impact) to 7 (extremely positive impact), with 4 being 'no impact'. The overall mean was 5.15, indicating that encountering other riders has a very positive impact on the horse riding experience at OZAR. Using the same scale, horse riders were also asked to rank how encountering hikers affected the experience. The overall mean was 4.46, indicating the presence of hikers on trails has no impact on the overall horse riding experience. Taken in concert, not only do horse riders not feel crowded, they feel the presence of other riders greatly enhances their overall experience. Furthermore, the presence of hikers on trails does not have a negative impact for riders.

The third major objective of this study was to assess horse riders' levels of support for different management scenarios. Riders were presented with four scenarios designed to 'better manage trail conditions'. Respondents were asked to rate their agreement for being required to obtain: a free permit, be charged a fee for permit, an annual permit, or a daily permit. Responses were scaled as 1 (strongly disagree) to 7 (strongly agree), with 4 being 'neither agree nor disagree'. Respondents were not supportive of any permit system. The least objectionable scenario was a

free permit (mean = 3.41). The remaining scenarios all had means less than 3, indicating strong levels of disagreement. These data indicate implementing a permit system, even if free, may produce high levels of conflict with horse riders.

The second set of management scenarios centered on managing use. The same scale was used as in the previous scenarios. Respondents were asked to rate their agreement on requiring education on low impact use, and for limiting: group size, number of groups on trail, river crossings, and trail use by activity. Requiring low impact use education was the least objectionable management strategy (mean = 3.03). All other scenarios had means less than 3, indicating strong levels of disagreement with any management scenario aimed at limiting use.

The results for both types of management scenarios suggest high levels of potential conflict should any scenario be implemented. Management strategies that appear to target restricting and/or reducing use may be met with resistance by horse riders. The strong levels of disagreement for all management scenarios combined with the high levels of acceptability of trail conditions, lack of crowding, lack of conflict with hikers, and the positive impact of the presence of other riders would suggest horse riders do not perceive any need for a change in current management objectives. New management strategies should include a strong interpretive component designed to target attitudes and behaviors. Additionally, management actions and interpretive messaging should be framed in such a way as to be sensitive to the components of the experience contributing to the current high levels of satisfaction. Although there was little support for implementing any management action that may limit type of use or amount of use, there have been recent successful examples of implementing permits, or use limit driven systems in the National Park Service (e.g. Zion National Park Shuttle System, Yosemite National Park Half Dome Hike).

Managers at OZAR may want to consider fully incorporating the results from the Park (2010) study. As mentioned above, visitors did not report any crowded conditions, but this may be related to expectation and perhaps, more so, the number of social trails that visitors are currently utilizing. Park (2010) found that 50% of visitor created horse trails in the study area (Cedargrove, Two Rivers) were a condition class ranging from 0-3. This indicates that many of the visitor created trails are in good standing (e.g. low root exposure, low erosion, etc.). A majority (57%) of visitor created trails inventoried were deemed to be “well drained,” which is another good indicator of suitability for formal trail designation. In fact, 36% (31.6 miles) of visitor created trails inventoried were deemed suitable for formal designation. This may allow managers to provide designated trails that can allow a similar type of social experience that the current visitors rate as acceptable.

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APPENDICES

Appendix A. *Visitor comments on questionnaire*

Comments
We were here solely for a float trip and so didn't experience trails…some answers based on experience at other national parks
Do not erect signs on the highway and have the road locked by landowner like Cedargrove access of k –
The great spirit believes that nature is a master of adaptation, accommodation and self-management, deserving human respect and very limited interference in enjoying it.
I would like to see more people be responsible for their trash!!
1) More shaded hitching rails at campgrounds, etc. 2) More seating at campgrounds, etc.
We want the hamburger ride back in October.
Would like to see more horse trails and river crossings.
I messed up a little.
If these activities are limited etc., I and our groups will go to another state to vacation.
Would NEVER return if any horse activities change.
Wonderful experience for riding horses on trails and cross rivers!
I don't see why charge a permit if the conservation is federally funded.
Horse restrictions will cause tourists/visitors to go elsewhere.
The trail ride is a great experience but its only because of the whole package of riding, hiking, swimming, golfing, canoeing, and tubing…
Keep our horse riding rights
Jim (last name not legible) 573-259-6813
Love the parks
The trails have been here for years and shouldn't be charged for use.
Please keep the trails open. As a horse rider, I appreciate having the trails to enjoy
bucknermj@mst.edu – if have questions and I can help.
We ride year around and also pick up trash during winter season.
Love it here! ☺
Love the Ozark park
I appreciate the park allowing horse riding. I hope they never change that, it is important to the area and to visitors.
Trash on trails, need to have group pick up for community service.
I love this place!!
We love riding these trails! Thanks for the bathrooms, hitching rails and great trails.
First time here and we are loving it!
Need more trails.
We would never do anything that would cause us not to be able to continue to do this.
One of the best rips we make every year. Would do more often if it was closer to home.
Not crowded at all.
Leave as is.
Never crowded.

We enjoy the beauty = better maps – or trail marking would be better – however we love riding here – we wait all year for this vacation. Toilet paper and trash cans
Trails much better than 20 years ago.
Born and raised in area // Should fine those who abuse rules/trails
Tickets for ATV's and trash being left on trails.
Great ride
We love it here!
Need bathroom
Love this part of the country!
Enjoying it
It would be nice to have water hook up at campground.
Water hook up at COUNTY ROAD campground
Love it
Love it here in Eminence.
Best experience ever. Glad to be able to ride these trails.
Nice trails. Enjoy the horse riding here.
People pick up trash
Trash!
Need better maps for the trails. Charge for maps if you want to make some money.
Awesome!
Love the NPS! NPS visitors/trail riders get blamed for trash – reality is it's from the locals.

Appendix B. ***Visitor questionnaire***

OMB Number: 1024-0224
Expiration Date: 12/31/2016

Ozark National Scenic Riverways

Visitor Questionnaire

2016

Past Visitation History

1. Have you ever visited Ozark NSR before today?
□ YES □ NO

1a. If yes how many times in the past 12 months? _____
1b. How many years have you been visiting Ozark NSR? _____ Years
(*please write in number of years; if this was your first visit please enter 1*)

2. Other than Ozark NSR, have you visited any other National Park sites in the past 12 months?
□ YES □ NO □ NOT SURE

3. Did you know that Ozark NSR is a part of the National Park Service system of parks and protected areas?
□ YES □ NO

4. Did you know that Ozark NSR was the first federally protected river system in the United States?
□ YES □ NO

Recreational Activities

1. Below is a list of activities available at Ozark NSR. Please indicate which of these activities was your **main reason** for visiting:
□ Horse Riding □ Hiking □ Camping □ Nature/Wildlife Observation
□ Visit Historic Sites □ Other _____

2. Below is a list of activities available at Ozark NSR. Please indicate **ALL** the activities you participated in during your visit:
□ Horse Riding □ Hiking □ Camping □ Nature/Wildlife Observation
□ Visit Historic Sites □ Other _____

3. For the main reason for your visit to OSNR, please indicate your experience level:
□ Expert □ Intermediate □ Beginner

4. On this visit, did you (or your group) use a paid guide?
□ YES □ NO

5. Did the actions of any other group or individual limit your enjoyment on the park's trails today?
□ YES □ NO

5a. If YES, which action(s) affected your enjoyment the most? *(please select all that apply)*
□ Large groups □ Lack of trail etiquette □ Littering □ Noisy behavior □ Other _____
5b. Which activity(ies) was the other group or individual participating in? *(please select all that apply)*
□ Hiking □ Camping □ Horse Riding □ River use (canoes/kayaks/tubers)
□ Other _____

6. Please rate how appropriate you feel the following types of trail activities are at Ozark NSR.

	Extremely Inappropriate	Moderately Inappropriate	Slightly Inappropriate	Neither Inappropriate nor Appropriate	Slightly Appropriate	Moderately Appropriate	Extremely Appropriate
Horse Riding	-3	-2	-1	0	1	2	3
Hiking	-3	-2	-1	0	1	2	3
Mountain Biking	-3	-2	-1	0	1	2	3

7. Please indicate how acceptable you found the following conditions at Ozark NSR:

	Extremely Unacceptable	Moderately Unacceptable	Slightly Unacceptable	Neither Unacceptable nor Acceptable	Slightly Acceptable	Moderately Acceptable	Extremely Acceptable
Trail condition	-3	-2	-1	0	1	2	3
Marking of trails (ex. signs)	-3	-2	-1	0	1	2	3
Number of trails	-3	-2	-1	0	1	2	3

8. Please rate how important each of the following reasons for visiting Ozark NSR are to you:

	Not At All Important	Moderately Important	Slightly Important	Neutral	Slightly Important	Moderately Important	Extremely Important
Appreciate scenic beauty	-3	-2	-1	0	1	2	3
Experience solitude	-3	-2	-1	0	1	2	3
Spend time with family/friends	-3	-2	-1	0	1	2	3
Experience sounds of nature	-3	-2	-1	0	1	2	3
Experience a connection with nature	-3	-2	-1	0	1	2	3
Experience a sense of challenge	-3	-2	-1	0	1	2	3
Appreciate archaeological and cultural sites	-3	-2	-1	0	1	2	3

Perceptions of Management Scenarios

1. Please indicate your level of agreement with the following management scenarios at Ozark NSR:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
To better manage trail conditions, require trail users to obtain a free permit	-3	-2	-1	0	1	2	3
To better manage trail conditions, require trail users to be charge a fee for a permit	-3	-2	-1	0	1	2	3
To better manage trail conditions, implement an annual permit system for trail use	-3	-2	-1	0	1	2	3
To better manage trail conditions, implement a daily permit system for trail use	-3	-2	-1	0	1	2	3
Limit maximum group size on the trails	-3	-2	-1	0	1	2	3
Limit maximum number of groups on the trails	-3	-2	-1	0	1	2	3
Designate trails based on type of activity	-3	-2	-1	0	1	2	3
Limit trail related river crossings	-3	-2	-1	0	1	2	3
Require education on low impact trail practices	-3	-2	-1	0	1	2	3

Perceptions of Crowding

1. Using the scale below, please rate the level of crowding you experienced at Ozark NSR today. Please circle the number that best matches your response:

Not Crowded	Barely Crowded	Slightly Crowded	Moderately Crowded	Crowded	Very Crowded	Extremely Crowded
-3	-2	-1	0	1	2	3

2. At which times of day did you feel crowded? Please select all that apply.

□ MORNING (8am-Noon) □ Afternoon (Noon-5pm) □ Evenings (5pm to 9pm) □ I can't remember

3. How did the number of trail users you encountered affect your overall experience today? (*Select one response*)

	Extremely Negative Impact	Moderately Negative Impact	Slightly Negative Impact	No Impact	Slightly Positive Impact	Moderately Positive Impact	Extremely Positive Impact
Horse Riding	-3	-2	-1	0	1	2	3
Hiking	-3	-2	-1	0	1	2	3

4. During your experience on the trail today, how acceptable is it for you to see the following number of other people participating in the same activity during your time at Ozark NSR?

# of other people	Extremely Unacceptable	Unacceptable	Not Sure	Acceptable	Extremely Acceptable
Zero	1	2	3	4	5
1-5	1	2	3	4	5
6-10	1	2	3	4	5
11+	1	2	3	4	5

Demographics

1. In what year were you born? _____

2. Please check the highest amount of education you have completed:
□ elementary school □ high school □ some college or professional schooling
□ Bachelor's degree □ some graduate work □ graduate degree

3. What is your gender?
□ Male □ Female

4. Please select the choice below that best describes your travelling party. (Please select only one)
□ Individual □ Family only □ Friends only □ Family plus friends □ Tour or other group

4a. How many people are in your group? _____

5. Which of these categories best indicates your race? Answer only for yourself. Please select one or more.
□ American Indian or Alaska Native □ Asian □ Black or African American
□ Native Hawaiian or other Pacific Islander □ White □ Do not wish to answer

6. What is the ZIP Code of your primary residence? ____ ____ ____ ____ ____

7. Which category best represents your annual household income? Please select only one.

□ Less than $25,000	□ $75,000 to $99,999	□ $25,000 to $34,999
□ $100,000 to $149,999	□ $35,000 to $49,999	□ $150,000 to $199,999
□ $50,000 to $74,999	□ $200,000 or more	□ Do not wish to respond

COMMENTS?

Thank you for your help with this questionnaire! Please return it to the person who gave it to you.

PAPERWORK REDUCTION ACT statement: The National Park Service is authorized by 54 USC 100101 to collect this information. This information will be used by park managers to better serve the public. Response to this request is voluntary and anonymous. Your name will never be associated with your answers, and all contact information will be destroyed when the data collection is concluded. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

BURDEN ESTIMATE STATEMENT: Public reporting burden for this form is estimated to average 10 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to: Russell Runge, Deputy Superintendent, Ozark National Scenic Riverways, Van Buren, MO 63965 or russell_runge@nps.gov (e-mail).