

Research to Support Application of the Visitor Experience and Resource Protection Framework at Zion National Park

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Introduction

As the name suggests, the national park system contains natural and cultural resources of national, and increasingly, international significance. Units of the national park system contain natural and cultural resources of great importance to the nation and, in many cases, to the international community. Given the significance of this resource base, public demand to see and experience these areas is not surprising. Data on visitation to the national park system dramatically support this premise. Visits to the national park system are approaching 300 million per year.

The increasing popularity of the national park system presents substantial management challenges. Too many visitors may cause unacceptable impacts to fragile natural and cultural resources, and may also cause crowding and other social impacts which degrade the quality of the visitor experience. How many visitors can ultimately be accommodated in a park or related area? How much resource and social impact should be allowed? These and related questions are commonly referred to as carrying capacity (Manning 1999; Stankey and Manning 1986; Shelby and Heberlein 1986; Graefe et al. 1984).

Zion National Park is a good example of the issues noted above. This unit of the national park system contains significant natural and recreational resources. The area draws increasing number of visitors, and this can result in significant resource and social impacts. How much and what types of visitor use can ultimately be accommodated in Zion National Park? This question is of special urgency in the backcountry/wilderness portion of the park for which a management plan is now being formulated.

Visitor Experience and Resource Protection: A Carrying Capacity Framework

Several years ago, the National Park Service began developing a carrying capacity framework titled Visitor Experience and Resource Protection (VERP) (National Park Service 1997). As the name suggests, this planning framework is aimed at maintaining the quality of the visitor experience and protecting natural and cultural resources in the face of increasing visitor use. VERP is built upon the same basic principles and concepts that drive other contemporary carrying capacity and related planning/management frameworks, including Limits of Acceptable Change (Stankey et al. 1985), and Visitor Impact Management (Graefe et al. 1990).

VERP contains several critical steps that can be supported by research. The first is collecting baseline data on visitor use and associated resource and social impact. How many and what types of visitor uses are occurring where, and what resource and social impacts are associated with such use? The second step is identification of indicators and standards of quality for natural/cultural resources and the visitor experience. Indicators of quality are measurable, manageable variable that help define the quality of natural/cultural resources and the visitor experience. Standards of quality

define the minimum acceptable condition of indicator variables. Research suggests that visitors often have norms or standards about the resource and social conditions acceptable in a park or related area, and that such norms can be useful as a means of formulating indicators and standards of quality (Shelby and Heberlein 1986; Shelby et al. 1992; Manning et al. 1996a; Manning et al. 1996b). The third step is monitoring of indicator variables. When monitoring demonstrates that indicator variable are no longer within acceptable standards, carrying capacity has been exceeded, and management action is required. The fourth step is selecting and implementing management actions. Management of visitor use can take many forms, but management actions should be both effective and as acceptable as possible to visitors.

VERP was initially applied to Arches National Park as a test case and a model for other units of the national park system (Hof et al. 1994; Manning et al. 1996b; Manning et al. 1993; Lime et al. 1994; Manning et al. 1995). This application resulted in a carrying capacity management plan that has now been implemented at that park (National Park Service 1995). A second application of VERP resulted in a carrying capacity management plan of the carriage roads at Acadia National Park (Jacobi and Manning 1997; Manning et al. 1998; Jacobi and Manning 1999). Additional applications of VERP are now proceeding at selected units of the national park system.

Study Objectives

The overall purpose of this study was to gather information that will help support application of VERP to the backcountry/wilderness portion of Zion National Park. In particular, study objectives focused on the four elements of the VERP framework that

can benefit the most from empirical data: 1) collecting baseline data on visitor use and associated resource and social impacts, 2) identifying indicators and standards of quality, 3) monitoring indicator variables, and 4) management of visitor use to ensure that the standards of quality are maintained. Specific study objectives were as follows:

1. Determine baseline conditions of visitor use levels, types and locations, and associated resource and social impacts. Carrying capacity frameworks, including VERP, should be as informed as possible regarding current visitor use and related resource and social impacts. Data were gathered on visitor use levels, activities, and locations, the type and degree of related resource and social impacts, including trail and campsite degradation and crowding and conflicting uses.
2. Identify indicators and standards of quality. As described above, indicators of quality are measurable, manageable variables that help define the quality of natural/cultural resources and the visitor experience. Standards of quality represent the minimum acceptable conditions of indicator variables. Data were gathered from visitors to help managers identify indicators and standards of quality for natural/cultural resources and the visitor experience in the backcountry/wilderness portion of Zion National Park. Where appropriate, a visual approach using simulated photography was used to measure visitor norms for both resource and social conditions.

3. Study the relationship between use levels and potential indicators of quality.

Better understanding of the relationship between use levels of Zion National Park and potential indicators of quality can be useful in monitoring and managing visitor use. This objective focused on determining the relationship between the number of visitors at one time to selected areas within Zion National Park and potential indicators of quality, such as selected measures of crowding and congestion. This relationship was studied by means of computer-based simulation models of visitor use.

4. Explore the acceptability of alternative visitor management practices. VERP requires that management actions be undertaken to ensure that standards of quality are maintained. A study of visitor attitudes toward potential management actions was conducted to ensure that management actions implemented are as acceptable as possible to those who will be most directly affected.

Study Report

Research methods to accomplish the study objectives noted above, along with study findings derived from these methods, are outlined in this report. The report is designed as a reference manual for park planners and managers. Each of the following sections of the report outline the study objectives, methods and findings from each component of the study. The report is assembled in a three-ring binder so that additional materials developed from study findings (e.g., papers delivered at

conferences and symposia, graduate student theses, scholarly journal articles) can be added as they become available.

5. ZION DAY USE (NON-PERMITTED) BACKCOUNTRY SURVEY – 2002

Purpose:

- Collect baseline data on visitor use and users
- Identify indicators of quality for the visitor experience
- Identify standards of quality for trail encounters and group size
- Measure visitor attitudes about selected management issues

Methods:

- On-site surveys of a representative sample of 357 visitors (80% response rate) as they exited the Weeping Rock, Grotto and Narrows trailheads during July and August of 2002.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- The results of several open-ended and close-ended questions designed to probe visitors for indicators of quality show that issues of maintaining natural conditions, crowding, and peacefulness/quiet are potentially important indicators of quality.
- Data about the number of encounters with other persons/groups experienced, preferred and expected and the acceptability of group sizes are also presented.
- An “importance-performance analysis” for selected park issues is presented.

Frequency Tables

Response by location

	Frequency	Percent
Weeping Rock	89	24.9
Narrows	121	33.9
Grotto	147	41.2

N = 357

Q1. Group size

	Frequency	Percent
1	33	9.3
2	155	43.8
3	33	9.3
4	58	16.4
5	15	4.2
6	12	3.4
7	10	2.8
8	4	1.1
9	8	2.3
10	5	1.4
11	4	1.1
12	6	1.7
13	1	0.3
14	1	0.3
15	1	0.3
More than 15	8	2.4

N = 354; Mean = 4.0; Median = 2

Q2. Group type

	Frequency	Percent
Family	217	64.2
Friends	63	18.6
Family and friends	22	6.5
Organized group	14	4.1
Commercial group	7	2.1
Other	15	4.4

N = 338

Q3. Residence

	Frequency	Percent
U.S.	278	80.1
International	69	19.9

N = 347**Q3A. State of residence**

	Frequency	Percent
California	76	27.3
Utah	25	9.0
Nevada	20	7.2
New York	20	7.2
Arizona	13	4.7
Michigan	11	4.0
Pennsylvania	10	3.6
Virginia	9	3.2
New Jersey	8	2.9
North Carolina	8	2.9
Texas	8	2.9
Colorado	7	2.5
Florida	6	2.2
Georgia	5	1.8
Maryland	5	1.8
Massachusetts	5	1.8
Minnesota	4	1.4
New Mexico	4	1.4
Washington	4	1.4
Connecticut	3	1.1
Illinois	3	1.1
Kansas	3	1.1
Wisconsin	3	1.1
Arkansas	2	0.7
Idaho	2	0.7
Montana	2	0.7
Oregon	2	0.7
Alabama	1	0.4
District of Columbia	1	0.4
Indiana	1	0.4
Kentucky	1	0.4
Louisiana	1	0.4
New Hampshire	1	0.4
North Dakota	1	0.4
Ohio	1	0.4
Rhode Island	1	0.4
Tennessee	1	0.4

N = 278

Q3B. Country of residence

	Frequency	Percent
Germany	11	15.9
United Kingdom	10	14.5
France	9	13.0
Netherlands	8	11.6
Switzerland	5	7.2
England	4	5.8
Spain	3	4.3
Canada	3	4.3
Japan	2	2.9
Czech Republic	2	2.9
Belgium	2	2.9
Mexico	1	1.4
Tunisia	1	1.4
Ireland	1	1.4
Poland	1	1.4
Italy	1	1.4
New Zealand	1	1.4
Australia	1	1.4
Israel	1	1.4
Austria	1	1.4
Paraguay	1	1.4

N = 69**Q4. Enjoyed most**

	Frequency	Percent
Scenery/ views/ natural beauty	216	61.0
Being outdoors/ in nature/ natural surroundings	56	15.8
Facilities/ resource condition	34	9.6
Weather	17	4.8
Quiet/ peacefulness/ solitude/ uncrowded	23	6.5
Recreation/ exercise/ challenge/ adventure	66	18.6
Social interaction	5	1.4
Transportation services/ no cars	19	5.4
Wildlife	26	7.3
Miscellaneous	15	4.2

N = 354

Q5. Enjoyed least

	Frequency	Percent
Weather/ heat/ insects	82	38.5
Crowds/ noisy people	48	22.5
Personal preparedness/ difficulty/ strenuousness	34	16.0
Facilities/ Services/ trail conditions/ information	29	13.6
Miscellaneous	22	10.3

N = 213**Q6. Suggestions for management**

	Frequency	Percent
Nothing/ don't change/ keep as is	102	38.3
More or better facilities/ services/ development	98	36.8
More or better information/ signs	43	16.2
Miscellaneous	23	8.6

N = 266**Q7A. First visit**

	Frequency	Percent
Yes	223	65.2
No	119	34.8

N = 342**Q7B. Changed for the better**

	Frequency	Percent
Bus/ transportation services/ fewer cars/ less traffic	66	65.3
Same/ nothing changed	21	20.8
Better trails/ improved facilities	13	12.9
Fewer people	5	5.0
Miscellaneous	4	4.0

N = 101**Q7C. Changed for the worse**

	Frequency	Percent
Nothing	29	39.2
Crowds/ more people	27	36.5
Transportation services/ traffic	11	14.9
Miscellaneous	8	10.8
Facilities/ development	5	6.8

N = 74

Q7D. Have you changed the way you hike?

	Frequency	Percent
Yes	31	26.3
No	87	73.7

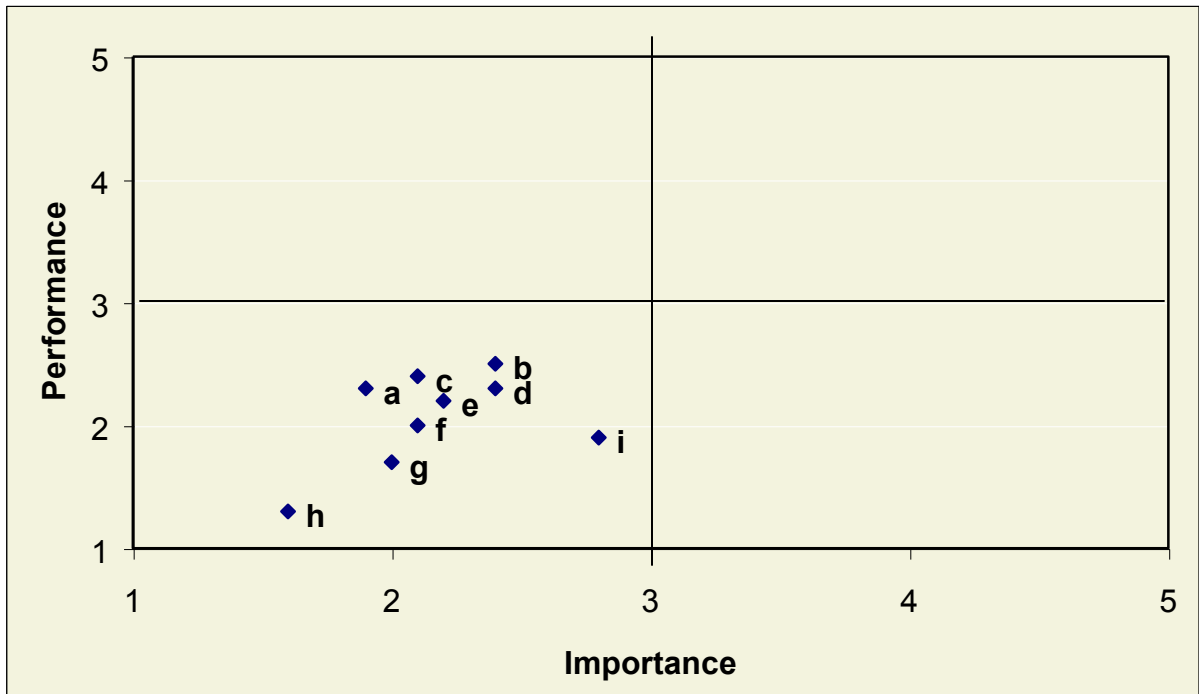
N = 118**Q7E. How and why have you changed the way you hike?**

	YES		NO	
	Frequency	Percent	Frequency	Percent
I hike less often because of increased crowding	12	27.3	32	72.7
I hike less often because of environmental deterioration of trails	1	2.3	43	97.7
I hike different trails because of increased crowding	29	61.7	18	38.3
I hike different trails because of deterioration of trails	4	8.9	41	91.1
I hike during less busy times (e.g., week days, off-season) because of increased crowding	31	70.5	13	29.5
I changed the way I hike at Zion in some other way	11	36.7	19	63.3

Q8. Importance-Performance

	IMPORTANCE						PERFORMANCE					
	Very Important (1)	Important (2)	Neither Important nor Unimportant (3)	Unimportant (4)	Very Unimportant (5)		Excellent (1)	Good (2)	Satisfactory (3)	Poor (4)	Very Poor (5)	
	Percent					Mean	Percent					Mean
a. Opportunity to experience solitude while hiking	36.0	45.5	15.6	2.3	0.6	1.9	19.3	40.7	29.2	9.0	1.9	2.3
b. Opportunity to see few other visitors while hiking	17.3	43.1	28.3	6.9	4.3	2.4	12.0	37.8	36.3	11.1	2.8	2.5
c. Opportunity to avoid seeing large groups of visitors while hiking (groups greater than 12 visitors)	34.2	37.4	19.1	7.0	2.3	2.1	21.0	36.1	28.4	10.8	3.7	2.4
d. Opportunity to avoid seeing organized groups of visitors while hiking (e.g. clubs, scouts)	24.6	32.1	30.6	8.7	4.0	2.4	21.1	37.9	31.7	6.5	2.8	2.3
e. Opportunity to avoid seeing commercial groups of visitors while hiking (i.e., groups where visitors pay to participate)	32.2	34.5	22.6	7.2	3.5	2.2	28.1	35.6	28.7	5.4	2.2	2.2
f. Opportunity to use trails that do not show a lot of recreation-related impact	31.3	40.1	22.8	3.5	2.3	2.1	27.8	44.6	23.7	2.5	1.3	2.0
g. Opportunity to avoid seeing and/or hearing aircraft	39.1	33.3	18.6	4.9	4.1	2.0	52.2	31.4	13.0	2.2	1.2	1.7
h. Opportunity to use the park's shuttle bus system to get to and from trailheads	61.2	26.2	7.9	2.3	2.3	1.6	76.4	14.7	7.7	0.6	0.6	1.3
i. Opportunity to avoid seeing evidence of recent fires (either naturally ignited fires or management prescribed burns)	15.8	21.7	37.8	13.4	11.3	2.8	41.2	37.5	17.2	1.4	2.7	1.9

Q8. Importance-Performance



Q9A. Number of groups encountered

	Frequency	Percent
0-5	140	44.9
6-10	77	24.7
11-15	28	9.0
16-20	25	8.0
21-25	7	2.2
26+	35	11.2

N = 312; Mean = 13.2; Median = 6

Q9A. Number of people encountered

	Frequency	Percent
1-5	13	4.6
6-10	17	6.1
11-15	28	10.0
16-20	24	8.6
21-25	12	4.3
26-30	24	8.6
31-35	5	1.8
36-40	18	6.4
41-45	3	1.1
46-50	33	11.8
51+	103	36.8

N = 280; Mean = 103.2; Median =40

Q9B. Expectations for encounters

	Frequency	Percent
Fewer than expected	79	23.2
More than expected	96	28.2
About the number I expected	166	48.7

N = 341

Q9C. Preferences for encounters

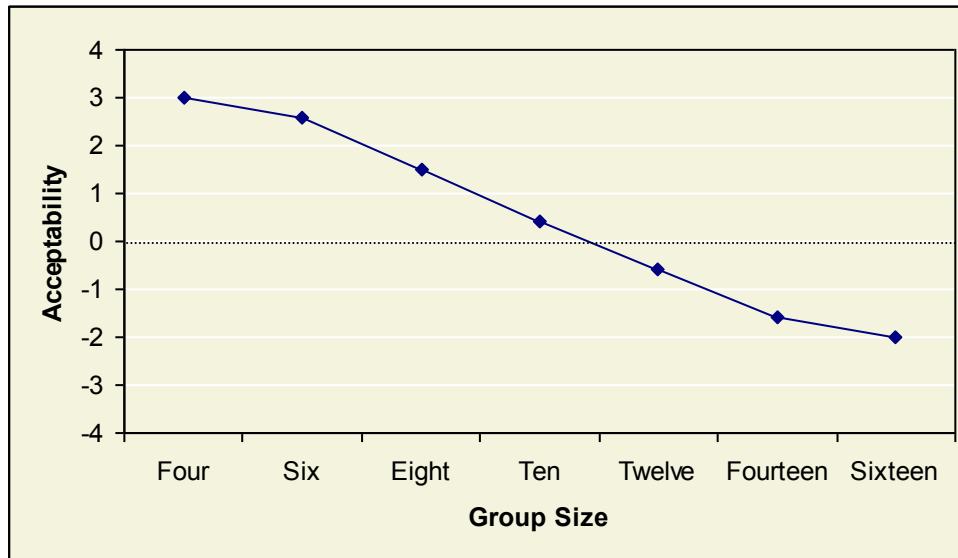
	Frequency	Percent
Fewer than preferred	15	4.5
More than preferred	170	51.2
About the number I preferred	147	44.3

N = 332

Q10. Acceptability of group size

	Very Unacceptable					Very Acceptable					Mean
	-4	-3	-2	-1	0	1	2	3	4		
Four	5.9	0.3	1.0	0.3	3.9	2.3	3.3	9.5	73.4	3.0	
Six	4.4	1.3	1.7	1.7	7.4	3.4	9.7	20.8	49.7	2.6	
Eight	6.4	3.0	5.4	3.7	13.5	8.4	16.6	14.5	28.4	1.5	
Ten	12.4	4.3	7.7	10.7	13.7	13.0	12.7	9.7	15.7	0.4	
Twelve	19.9	7.7	17.2	8.4	14.1	9.4	5.1	7.1	11.1	-0.6	
Fourteen	31.8	16.9	14.5	7.1	8.1	5.4	4.7	3.4	8.1	-1.6	
Sixteen	50.8	8.9	9.2	3.0	8.9	4.3	3.0	2.6	9.2	-2.0	

Q10. Norm Curve for group size



Q11A. Gender

	Frequency	Percent
Female	157	46.9
Male	178	53.1

N = 335

Q11B. Age

	Frequency	Percent
Under 20	9	2.7
20-25	36	10.8
26-30	49	14.7
31-35	42	12.6
36-40	46	13.8
41-45	53	15.9
46-50	49	14.7
51-55	28	8.4
56-60	10	3.0
61-65	7	2.1
Older than 65	5	1.5

N = 333; Mean = 44.5; Median = 39

Q11C. Education

	Frequency	Percent
Some high school	5	1.5
High school graduate or GED	16	4.8
Business school, trade school, some college	45	13.4
College graduate	96	28.6
Some graduate school	37	11.0
Masters, doctoral, or professional degree	137	40.8

N = 336**Q11D. Income**

	Frequency	Percent
Less than \$20,000	32	10.0
\$20,000 to \$39,999	33	10.3
\$40,000 to \$59,999	50	15.6
\$60,000 to \$79,999	53	16.5
\$80,000 to \$99,999	52	16.2
\$100,000 or more	101	31.5

N = 321

ZION DAY USE (PERMITTED) BACKCOUNTRY SURVEY – 2002

Purpose:

- Collect baseline data on visitor use and users
- Identify indicators of quality for the visitor experience
- Identify standards of quality for trail encounters and group size
- Measure visitor attitudes about selected management issues

Methods:

- Mailback survey of a representative sample of 204 visitors (78% response rate) receiving permits to hike in backcountry canyons from July through October of 2002.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- The results of several open-ended and close-ended questions designed to probe visitors for indicators of quality show that issues of maintaining natural conditions, crowding, and peacefulness/quiet are potentially important indicators of quality.
- Data about the number of encounters with other persons/groups experienced, preferred and expected and the acceptability of group sizes are also presented.
- An “importance-performance analysis” for selected park issues is presented.

Frequency Tables

Q1. Group size

	Frequency	Percent
1	14	7.0
2	61	30.3
3	27	13.4
4	22	10.9
5	18	9.0
6	14	7.0
7	5	2.5
8	8	4.0
9	9	4.5
10	7	3.5
11	6	3.0
12	10	5.0

N = 201; Mean = 4.6; Median = 3

Q2. Group type

	Frequency	Percent
Family	60	30.9
Friends	62	32.0
Family and friends	52	26.8
Organized group	13	6.7
Other	7	3.6

N = 194

Q2. Other

	Frequency	Percent
Alone	6	85.7
Couple	1	14.3

N = 7

Q3. Residence

	Frequency	Percent
US resident	187	94.0
Non-US resident	12	6.0

N = 199

Q3A. State of residence

	Frequency	Percent
Utah	105	56.1
California	22	11.8
Colorado	7	3.7
Nevada	6	3.2
Arizona	5	2.7
Vermont	5	2.7
Washington	4	2.1
Idaho	3	1.6
Michigan	3	1.6
New Jersey	3	1.6
Oregon	3	1.6
Florida	2	1.1
Maryland	2	1.1
Massachusetts	2	1.1
Montana	2	1.1
Ohio	2	1.1
Illinois	1	0.5
Kansas	1	0.5
Louisiana	1	0.5
Minnesota	1	0.5
New Mexico	1	0.5
New York	1	0.5
Pennsylvania	1	0.5
South Carolina	1	0.5
Virginia	1	0.5
Wisconsin	1	0.5
Wyoming	1	0.5

N = 187**Q3B. Country of residence**

	Frequency	Percent
Canada	8	66.7
Germany	2	16.7
Czech Republic	1	8.3
United Kingdom	1	8.3

N = 12

Q4. Enjoyed most

	Frequency	Percent
Scenery/ views/ beauty/ natural features	159	80.7
Adventure/ activity/ challenge/ recreation	66	33.5
Few people/ un-crowded/ solitude	51	25.9
Peace/ quiet	13	6.6
Camaraderie/ friendly people	11	5.6
Miscellaneous	8	4.1
Wildlife	7	3.6
Facilities/ services/ cleanliness	6	3.0
Undeveloped/ wildness	6	3.0

N = 197**Q5. Enjoyed least**

	Frequency	Percent
Too many people/ crowds	32	17.9
Nothing	31	17.3
Lack of or condition of facilities/ services	23	12.8
Personal preparedness	21	11.7
Litter/ un-cleanliness	18	10.1
Weather/ insects/ rodents	17	9.5
Management practices/ policies	14	7.8
Information/ education/ signs	11	6.1
Miscellaneous	9	5.0
Transportation/ parking	8	4.5

N = 179**Q6. NPS recommendations**

	Frequency	Percent
Mentions need for more or better info/ education/ signs	48	27.4
Nothing/ keep up the good work	40	22.9
Mentions concern for management practices/ polices	35	20.0
Mentions need for more, better, or change in facilities/ development/ services	29	16.6
Mentions need to limit number of people	25	14.3
Miscellaneous	9	5.1

N = 175**Q7A. First permit**

	Frequency	Percent
Yes	101	50.5
No	99	49.5

N = 200

Q7B. Changed for the better

	Frequency	Percent
No change/ same	42	50.0
More facilities/ services/ development	13	15.5
Miscellaneous	12	14.3
Transportation/ shuttle	7	8.3
Management practices/ policies	6	7.1
Fewer people	5	6.0

N = 84**Q7C. Changed for the worse**

	Frequency	Percent
Nothing	30	35.7
Mentions condition of resources	23	27.4
Mentions crowds/ number of people	13	15.5
Mentions management practices/ policies	10	11.9
Mentions condition of facilities/ services	7	8.3
Miscellaneous	4	4.8

N = 84**Q7D. Changed visitation**

	Frequency	Percent
Yes	37	40.2
No	55	59.8

N = 92**Q7E. How and why changed visitation**

	Yes		No	
	Frequency	Percent	Frequency	Percent
1. I visit less often because of increased crowding	37	40.2	55	59.8
2. I visit less often because of environmental deterioration	7	18.9	30	81.1
3. I visit different canyons because of increased crowding	26	66.7	13	33.3
4. I visit different canyons because of environmental deterioration	9	24.3	28	75.7
5. I visit during less busy times (e.g., week days, off-season) because of increased crowding	36	85.7	6	14.3
6. I have changed how I visit this canyon in some other way.	12	44.4	15	55.6

Q7E. Other

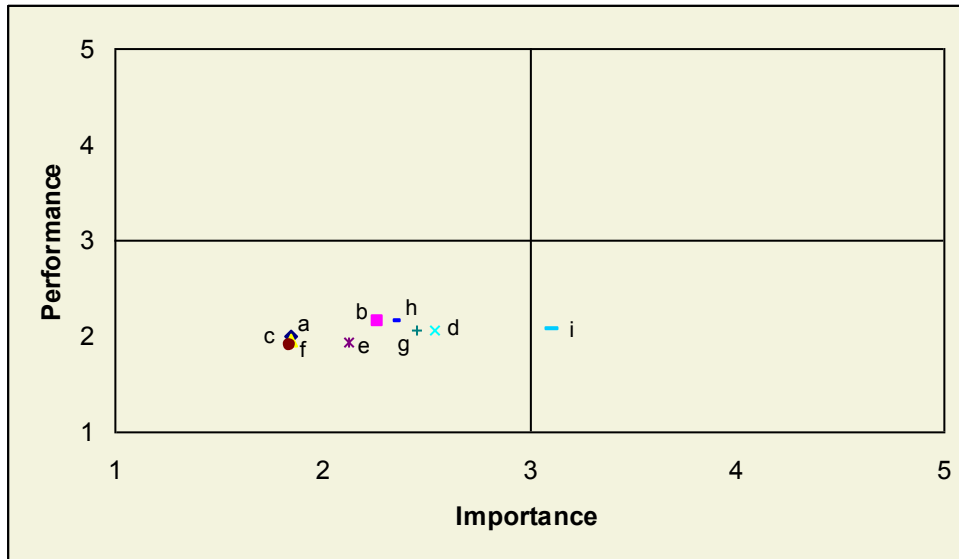
	Frequency	Percent
Prices/ permit system/ regulations	9	50.0
Different times	3	16.7
Different activities	2	11.1
Different locations	1	5.6
Different friends	1	5.6
Smaller groups	1	5.6
Miscellaneous	1	5.6

N = 18

Q8. Importance – Performance

	Very Important	Important	Neither Important nor Unimportant	Unimportant	Very Unimportant	Excellent	Good	Satisfactory	Poor	Very Poor
	Percent					Percent				
a. Opportunity to experience solitude in the canyon	40.9	39.9	13.6	4.5	1.0	35.7	36.7	21.9	4.1	1.5
b. Opportunity to see few other visitors	24.2	42.4	19.7	9.6	4.0	28.4	35.1	30.4	5.2	1.0
c. Opportunity to avoid seeing large groups of visitors in the canyon (groups greater than 12 visitors)	52.3	23.4	14.2	7.1	3.0	42.6	31.3	16.9	7.2	2.1
d. Opportunity to avoid seeing organized groups of visitors in the canyon (e.g., clubs, scouts)	29.6	18.9	29.1	12.2	10.2	34.4	34.4	23.3	6.3	1.6
e. Opportunity to avoid seeing commercial groups of visitors in the canyon (i.e., groups where visitors pay to participate)	45.2	18.8	20.3	9.1	6.6	42.7	26.6	25.5	3.6	1.6
f. Opportunity to avoid seeing a lot of recreation-related impact in the canyon	49.0	28.8	13.1	6.6	2.5	36.8	43.0	15.5	3.6	1.0
g. Opportunity to avoid seeing and/or hearing aircraft	26.0	29.1	25.5	11.7	7.7	36.6	27.7	30.4	4.2	1.0
h. Opportunity to use the park's shuttle bus system to get to and from trailheads	28.6	30.7	24.5	8.9	7.3	40.4	21.9	25.1	7.1	5.5
i. Opportunity to avoid seeing evidence of recent fires (either naturally ignited fires or management prescribed burns)	11.4	14.0	43.0	15.0	16.6	31.9	32.4	34.1	1.1	0.5

Figure 2. Importance-performance graph



Q9A. Number of groups encountered

Number of groups	Frequency	Percent
0	33	17.4
1	29	15.3
2	29	15.3
3	34	17.9
4	25	13.2
5	15	7.9
6	4	2.1
7	2	1.1
8	1	0.5
9	1	0.5
10	5	2.6
12	2	1.1
15	1	0.5
20 or more	9	4.7

N = 190; Mean = 9.8; Median = 3

Q9A. Number of people encountered

Number of people	Frequency	Percent
0	26	13.5
1	4	2.1
2	6	3.1
3	6	3.1
4	11	5.7
5	6	3.1
6	15	7.8
7	6	3.1
8	3	1.6
9	3	1.6
10	15	7.8
11	2	1.0
12	6	3.1
13	1	0.5
14	3	1.6
15	8	4.2
16	4	2.1
17	1	0.5
18	1	0.5
19	1	0.5
20	19	9.9
More than 20	45	23.4

N = 192; Mean = 27.5; Median = 10

Q9B. Expected

	Frequency	Percent
Fewer than expected	71	36.4
More than expected	28	14.4
About the number expected	96	49.2

N = 195

Q9C. Preferred

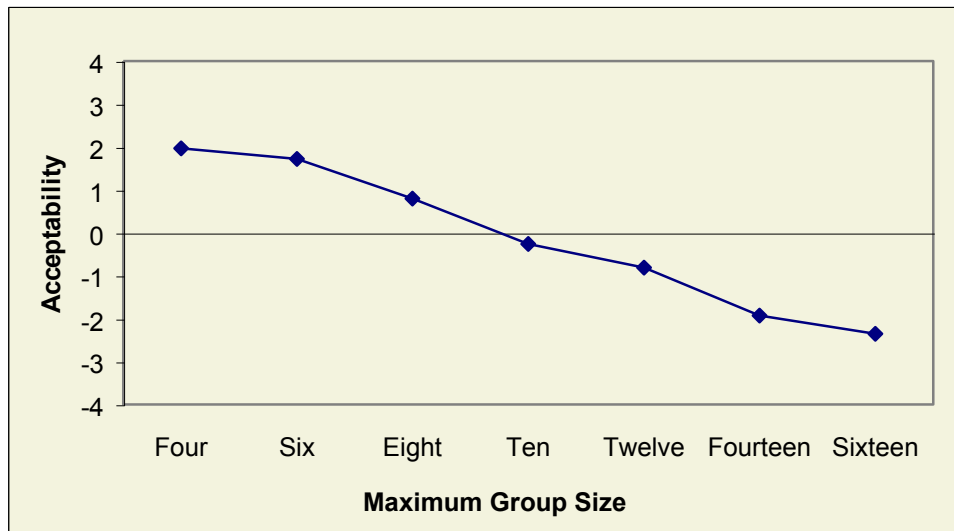
	Frequency	Percent
Fewer than preferred	17	8.9
More than preferred	59	30.7
About the number preferred	116	60.4

N = 192

Q10. Acceptability of maximum group size

	N	Very Unacceptable					Very Acceptable				
		-4	-3	-2	-1	0	+1	+2	+3	+4	
a. Four	194	20.6	1.0	0.0	0.5	3.1	1.0	3.6	6.2	63.9	
b. Six	195	14.4	3.1	2.1	1.5	8.2	5.1	5.1	13.3	47.2	
c. Eight	195	14.9	4.6	4.6	7.2	10.8	10.3	11.3	9.2	27.2	
d. Ten	193	22.3	8.3	8.8	7.3	13.5	6.2	10.4	7.8	15.5	
e. Twelve	194	33.5	5.2	11.3	4.6	13.9	4.6	6.2	4.1	16.5	
f. Fourteen	193	49.2	8.8	10.4	4.7	6.7	4.7	3.6	3.6	8.3	
g. Sixteen	194	63.4	4.6	4.6	4.6	5.7	4.6	3.1	2.1	7.2	

Figure 2. Norm curve maximum group size



Q11A. Gender

	Frequency	Percent
Female	42	21.2
Male	156	78.8

N = 198

Q11B. Age

	Frequency	Percent
Under 20	4	2.0
20-29	58	29.1
30-39	48	24.1
40-49	51	25.6
50-59	36	18.1
Over 60	2	1.0

N = 199; Mean = 37.8; Median = 37

Q11C. Education

	Frequency	Percent
Some high school	1	0.5
High school graduate or GED	7	3.6
Business school, trade school, some college	44	22.4
College graduate	67	34.2
Some graduate school	17	8.7
Masters, doctoral, or professional degree	60	30.6

N = 196**Q11D. Income**

	Frequency	Percent
Less than \$20,000	19	9.9
\$20,000 to \$39,999	37	19.4
\$40,000 to \$59,999	34	17.8
\$60,000 to \$79,999	29	15.2
\$80,000 to \$99,999	26	13.6
\$100,000 or more	46	24.1

N = 191

ZION OVERNIGHT BACKCOUNTRY SURVEY – 2002

Purpose:

- Collect baseline data on visitor use and users
- Identify indicators of quality for the visitor experience
- Identify standards of quality for trail encounters and group size
- Measure visitor attitudes about selected management issues

Methods:

- Mailback survey of a representative sample of 133 visitors (74% response rate) receiving permits for overnight hikes in the park's backcountry from July through October of 2002.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- The results of several open-ended and close-ended questions designed to probe visitors for indicators of quality show that issues of maintaining natural conditions, crowding, and peacefulness/quiet are potentially important indicators of quality.
- Data about the number of encounters with other persons/groups experienced, preferred and expected and the acceptability of group sizes are also presented.
- An "importance-performance analysis" for selected park issues is presented.

Frequency Tables

Q1. Group size

Group size	Frequency	Percent
1	18	13.7
2	74	56.5
3	15	11.5
4	12	9.2
5	4	3.1
More than 5	8	6.1

N = 131

Q2. Group type

	Frequency	Percent
Family	57	45.6
Friends	49	39.2
Family and Friends	5	4
Organized group	2	1.6
Other	12	9.6

N = 125

Q2. Other

	Frequency	Percent
Alone	10	83.3
Couple	2	16.7

N = 12

Q3. Residence

	Frequency	Percent
US resident	124	95.4
Non-US resident	6	4.6

N = 130

Q3A. State of residence

	Frequency	Percent
California	27	21.8
Utah	23	18.5
Texas	7	5.6
Oregon	7	5.6
Florida	5	4.0
Washington	5	4.0
Montana	4	3.2
Virginia	4	3.2
Arizona	3	2.4
Georgia	3	2.4
Idaho	3	2.4
Michigan	3	2.4
Nevada	3	2.4
North Carolina	3	2.4
Ohio	3	2.4
Pennsylvania	3	2.4
Massachusetts	2	1.6
Wisconsin	2	1.6
Colorado	1	0.8
Connecticut	1	0.8
District of Columbia	1	0.8
Kentucky	1	0.8
Maine	1	0.8
Maryland	1	0.8
Minnesota	1	0.8
Nebraska	1	0.8
New Hampshire	1	0.8
New Mexico	1	0.8
New York	1	0.8
Oklahoma	1	0.8
Rhode Island	1	0.8
Vermont	1	0.8

N = 124**Q3B. Country of residence**

	Frequency	Percent
Canada	3	50.0
United Kingdom	2	33.3
Netherlands	1	16.7

N = 6

Q4. Enjoyed most

	Frequency	Percent
Scenery/ views/ beauty/ natural features	92	71.3
Few people/ un-crowded/ solitude	49	38.0
Facilities/ services/ cleanliness	28	21.7
Adventure/ activity/ challenge/ recreation	17	13.2
Peace/ quiet	16	12.4
Miscellaneous	15	11.6
Undeveloped/ wildness	9	7.0
Camaraderie/ friendly people	7	5.4
Wildlife	5	3.9

N = 129**Q5. Enjoyed least**

	Frequency	Percent
Too many people/ crowds	20	17.5
Resource condition	16	14.0
Weather/ insects/ rodents	15	13.2
Lack of or condition of facilities/ services	15	13.2
Personal preparedness	14	12.3
Shuttle service/ transportation/ parking	11	9.6
Management practices/ policies	10	8.8
Nothing	8	7.0
Miscellaneous	5	4.4
Un-cleanliness/ litter	3	2.6
Aircraft over-flights	2	1.8

N = 114**Q6. NPS recommendations**

	Frequency	Percent
Mentions need for more, better, or change in facilities/ development/ services	29	27.4
Mentions need for more or better info/ education/ signs	24	22.6
Nothing/ keep up the good work	18	17.0
Mentions concern for management practices/ policies	16	15.1
Mentions need to limit number of people	12	11.3
Miscellaneous	11	10.4

N = 106**Q7A. First overnight trip**

	Frequency	Percent
Yes	101	77.1
No	30	22.9

N = 131

Q7B. Changed for better

	Frequency	Percent
Nothing	11	44.0
Shuttle system	5	20.0
Change in policies	2	8.0
Fewer people	2	8.0
Information/education	2	8.0
Less traffic	1	4.0
Facilities/services	1	4.0
Miscellaneous	1	4.0

N = 25**Q7C. Changed for worse**

	Frequency	Percent
Nothing	7	33.3
Number of people	4	19.0
Management practices/policies	4	19.0
Miscellaneous	4	19.0
Level of impact	2	9.5

N = 21**Q7D. Changed visitation**

	Frequency	Percent
Yes	15	55.6
No	12	44.4

N = 27**Q7E. How and why changed visitation**

	Yes		No	
	Frequency	Percent	Frequency	Percent
1. I visit less often because of increased crowding	4	26.7	11	73.3
2. I visit less often because of deterioration of trails and/or campsites	1	6.3	15	93.8
3. I visit different areas of the backcountry because of increased crowding	11	68.8	5	31.3
4. I visit different areas of the backcountry because of deterioration of trails and/or campsites	3	18.8	13	81.3
5. I visit during less busy times (e.g., week days, off-season) because of increased crowding	10	62.5	6	37.5
6. I have changed how I visit in some other way	5	41.7	7	58.3

Q7E. Other

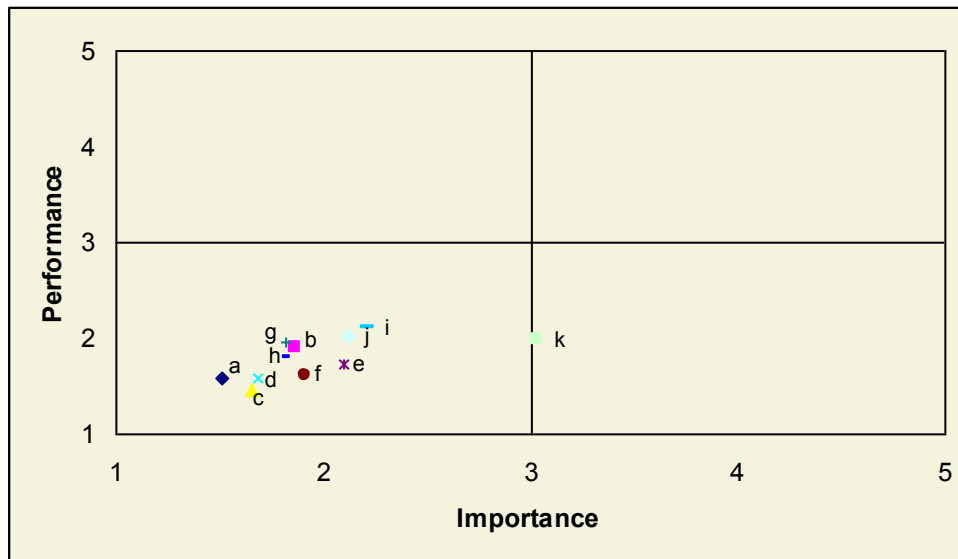
	Frequency	Percent
Away from RV users	1	25.0
I visit in a drier season	1	25.0
More canyoneering for challenge and solitude	1	25.0
Time of year due to weather conditions	1	25.0

N = 4

Q8. Importance – Performance

	Importance					Performance				
	Very Important	Important	Neither Important nor Unimportant	Unimportant	Very Unimportant	Excellent	Good	Satisfactory	Poor	Very Poor
a. Opportunity to experience solitude	53.0	43.2	3.8	0.0	0.0	53.5	36.2	7.9	2.4	0.0
b. Opportunity to see few other visitors while hiking	36.4	47.7	9.1	6.1	0.8	41.7	33.1	19.7	5.5	0.0
c. Opportunity to see or hear few other groups camped around you	56.1	31.1	6.8	3.8	2.3	66.4	23.4	7.8	1.6	0.8
d. Opportunity to avoid seeing large groups of visitors (groups greater than 12 people)	50.0	35.6	12.1	0.8	1.5	59.1	26.0	12.6	2.4	0.0
e. Opportunity to avoid seeing organized groups of visitors (e.g. clubs, scouts)	36.6	27.5	27.5	6.1	2.3	50.0	29.4	18.3	2.4	0.0
f. Opportunity to avoid seeing commercial groups of visitors (i.e., groups where visitors pay to participate)	44.7	27.3	22.7	2.3	3.0	57.9	26.2	14.3	1.6	0.0
g. Opportunity to use trails that do not show a lot of recreation-related impact	41.7	38.6	16.7	2.3	0.8	36.0	36.8	22.4	4.8	0.0
h. Opportunity to use campsites that do not show a lot of recreation-related impact	41.7	40.2	15.2	1.5	1.5	45.2	33.3	18.3	3.2	0.0
i. Opportunity to avoid seeing and/or hearing aircraft	31.1	33.3	22.0	10.6	3.0	32.5	34.9	23.0	7.9	1.6
j. Opportunity to use the park's shuttle bus system to get to and from trailheads	35.9	32.1	21.4	6.1	4.6	50.4	17.9	15.4	11.1	5.1
k. Opportunity to avoid seeing evidence of recent fires (either naturally ignited fires or management prescribed burns)	9.8	18.9	41.7	17.4	12.1	38.4	28.8	30.4	1.6	0.8

Figure 1. Importance-performance graph



Q9B. Number of groups encountered

		N	Mean	Median
Day/Night 1	Hiking	127	3.3	2
	Camping	123	0.2	0
Day/Night 2	Hiking	84	14.5	3
	Camping	40	0.6	0
Day/Night 3	Hiking	19	2.5	2
	Camping	11	0.2	0
Day/Night 4	Hiking	7	19.0	3
	Camping	3	0.0	0

Q9C. Hiking expectations

	Frequency	Percent
Less than expected	64	50.4
More than expected	13	10.2
About the number expected	50	39.4

N = 127

Q9D. Hiking preferences

	Frequency	Percent
Less than preferred	6	4.7
More than preferred	37	28.9
About the number preferred	85	66.4

N = 128

Q9E. Camping expectations

	Frequency	Percent
Less than expected	75	59.1
More than expected	9	7.1
About the number expected	43	33.9

N = 127

Q9F. Camping preferences

	Frequency	Percent
Less than preferred	8	6.4
More than preferred	8	6.4
About the number preferred	109	87.2

N = 125

Q10A. Off-trail hiking

	Frequency	Percent
Yes	46	35.7
No	83	64.3

N = 129

Q10B. Number of people seen while hiking off-trail

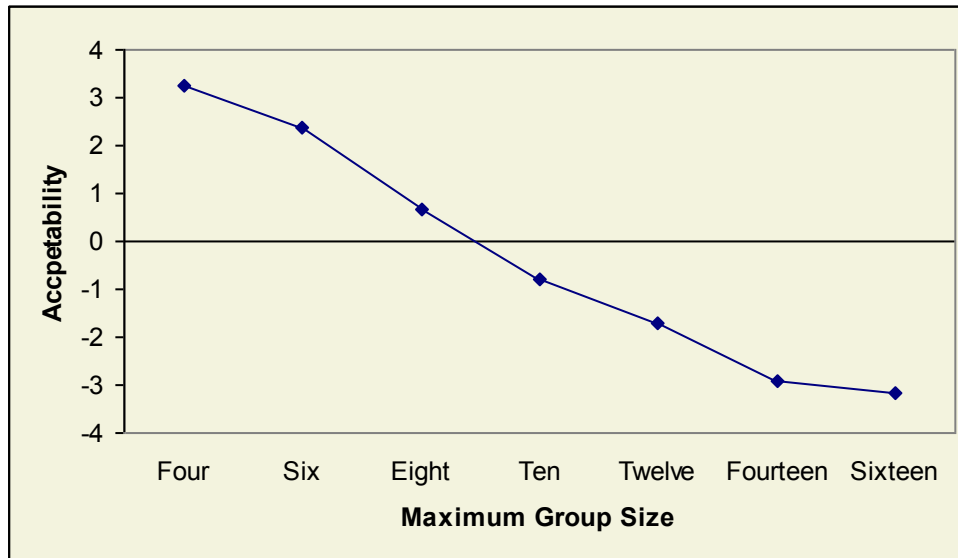
Number of people	Frequency	Percent
0	31	62.0
1	2	4.0
2	5	10.0
3	3	6.0
4	6	12.0
6	1	2.0
10	1	2.0
11	1	2.0

N = 50

Q11. Acceptability of maximum group size

	N	Very Unacceptable					Very Acceptable				
		-4	-3	-2	-1	0	1	2	3	4	
a. Four	126	5.6	0.8	0.0	0.8	1.6	0.8	4.8	4.8	81.0	
b. Six	127	3.9	1.6	0.8	0.8	11.0	8.7	13.4	14.2	45.7	
c. Eight	126	12.7	2.4	4.0	7.1	18.3	18.3	8.7	11.9	16.7	
d. Ten	126	26.2	4.8	9.5	10.3	20.6	8.7	7.1	5.6	7.1	
e. Twelve	125	38.4	7.2	16.8	8.8	12.8	3.2	2.4	4.0	6.4	
f. Fourteen	126	63.5	11.9	7.1	7.1	4.0	0.8	2.4	0.0	3.2	
g. Sixteen	125	72.8	6.4	8.8	3.2	2.4	2.4	1.6	0.0	2.4	

Figure 1. Norm curve for maximum group size



Q12A. Gender

	Frequency	Percent
Female	47	35.9
Male	84	64.1

N = 131

Q12B. Age

	Frequency	Percent
Under 20	3	2.3
20-29	45	34.4
30-39	50	38.2
40-49	19	14.5
50-59	12	9.2
60 or older	2	1.5

N = 131

Q12C. Education

	Frequency	Percent
Some high school	1	0.8
High school graduate or GED	4	3.0
Business school, trade school, some college	26	19.7
College graduate	52	39.4
Some graduate school	10	7.6
Masters, doctoral, or professional degree	39	29.5

N = 132

Q12D. Income

	Frequency	Percent
Less than \$20,000	19	15.0
\$20,000 to \$39,999	21	16.5
\$40,000 to \$59,999	19	15.0
\$60,000 to \$79,999	20	15.7
\$80,000 to \$99,999	17	13.4
\$100,000 or more	31	24.4

N = 127

COMPUTER SIMULATION MODEL OF VISITOR USE – 2002

Purpose:

- Collect detailed measures of trail use in the Weeping Rock area
- Develop a computer-based simulation model of visitor use in the Weeping Rock area.
- Determine the effect of increased use levels on visitor encounters

Methods:

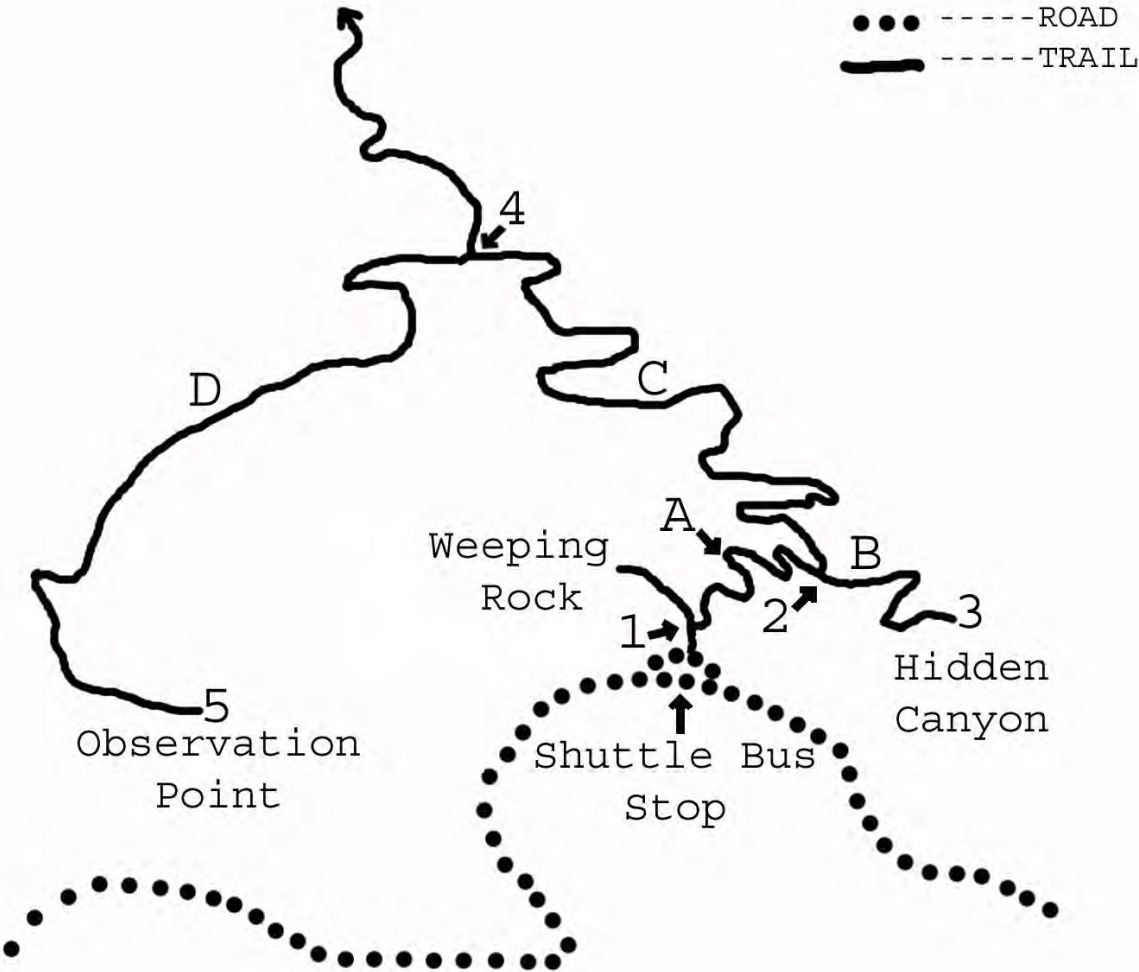
- Visitor hiking routes and times on each portion of the trail system were sampled using a map and diary survey during July and August, 2002. A total of 106 map and diary surveys were completed and useable for a response rate of 58%.
- Counts of visitors entering the Weeping Rock area on 5 days in July and August 2002.
- Directional counts of the number of visitors getting on and off shuttle buses at the Weeping Rock stop for 3 days in July, 2002.

Findings:

- Data on sections of trail used by visitors, number of visitor arrivals during each half hour of the day, and shuttle bus embarkation and debarkation are presented in the tables below.
- A computer simulation model of the Weeping Rock area was developed
- Encounters levels on each section of trail based on survey data are presented in tables below.

- Model output of number of simulated encounters are presented for four different total use levels.

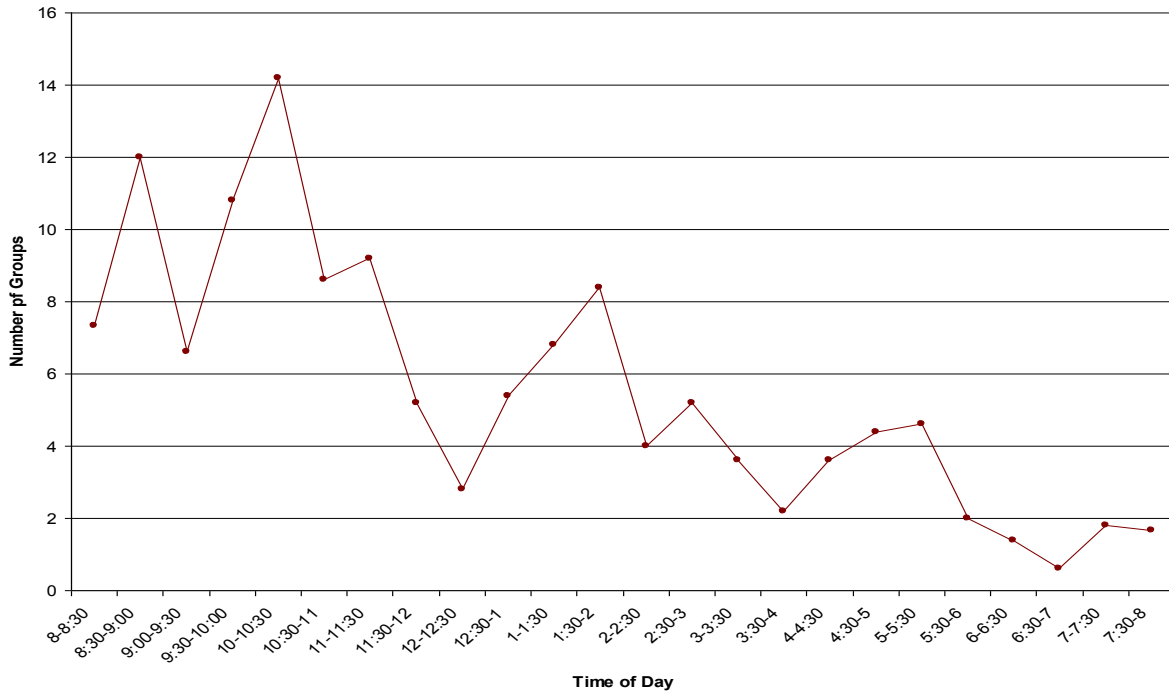
Weeping Rock Day Hiker Survey Map



Daily Use of Weeping Rock Area Across Five Days

	July 6	July 12	July 15	July 23	August 4	Average
8-8:30		10	8	4		7.3
8:30-9:00	3	30	0	15	12	12.0
9:00-9:30	2	4	5	7	15	6.6
9:30-10:00	14	13	13	2	12	10.8
10-10:30	15	14	9	5	28	14.2
10:30-11	9	20	0	13	1	8.6
11-11:30	11	9	5	13	8	9.2
11:30-12	3	5	7	0	11	5.2
12-12:30	2	2	0	5	5	2.8
12:30-1	5	9	0	6	7	5.4
1-1:30	1	16	9	3	5	6.8
1:30-2	3	15	12	0	12	8.4
2-2:30	8	2	6	3	1	4.0
2:30-3	0	13	7	1	5	5.2
3-3:30	0	4	10	0	4	3.6
3:30-4	2	0	2	1	6	2.2
4-4:30	3	3	5	2	5	3.6
4:30-5	8	5	2	0	7	4.4
5-5:30	7	2	11	0	3	4.6
5:30-6	0	2	2	6	0	2.0
6-6:30	0	4	0	0	3	1.4
6:30-7	2	0	0	1	0	0.6
7-7:30	2	0	0	7	0	1.8
7:30-8		2	1		2	1.7
Total	100	184	114	94	152	132.4

Average Number of Groups Starting Hikes in the Weeping Rock Area



Route Survey Results

Average Hiking times

	N	Average Hiking Time (minutes)
Trail Section A	212	19.0
Trail Section B	135	21.9
Trail Section C	61	46.3
Trail Section D	50	45.8

Average Number of Encounters

	N	Average Number of Encounters
Trail Section A	192	9.4
Trail Section B	129	10.2
Trail Section C	66	7.4
Trail Section D	48	9.0

Simulation model outputs based on 10 days at each use level

Summary Outputs for All the Trails				
Total Use	64.8	130.9	261.2	512.6
Approximate Proportion to 2002 Mean (128 people per day)	0.5	1	2	4
Encounters per visitor per trip				
Mean	17.6	35.1	70.9	137.1
Std. Dev.	8.8	15.5	30.7	57.6
Encounters per visitor per hour				
Mean	11.0	22.4	46.7	90.8
Std. Dev.	7.2	14.3	29.4	55.0

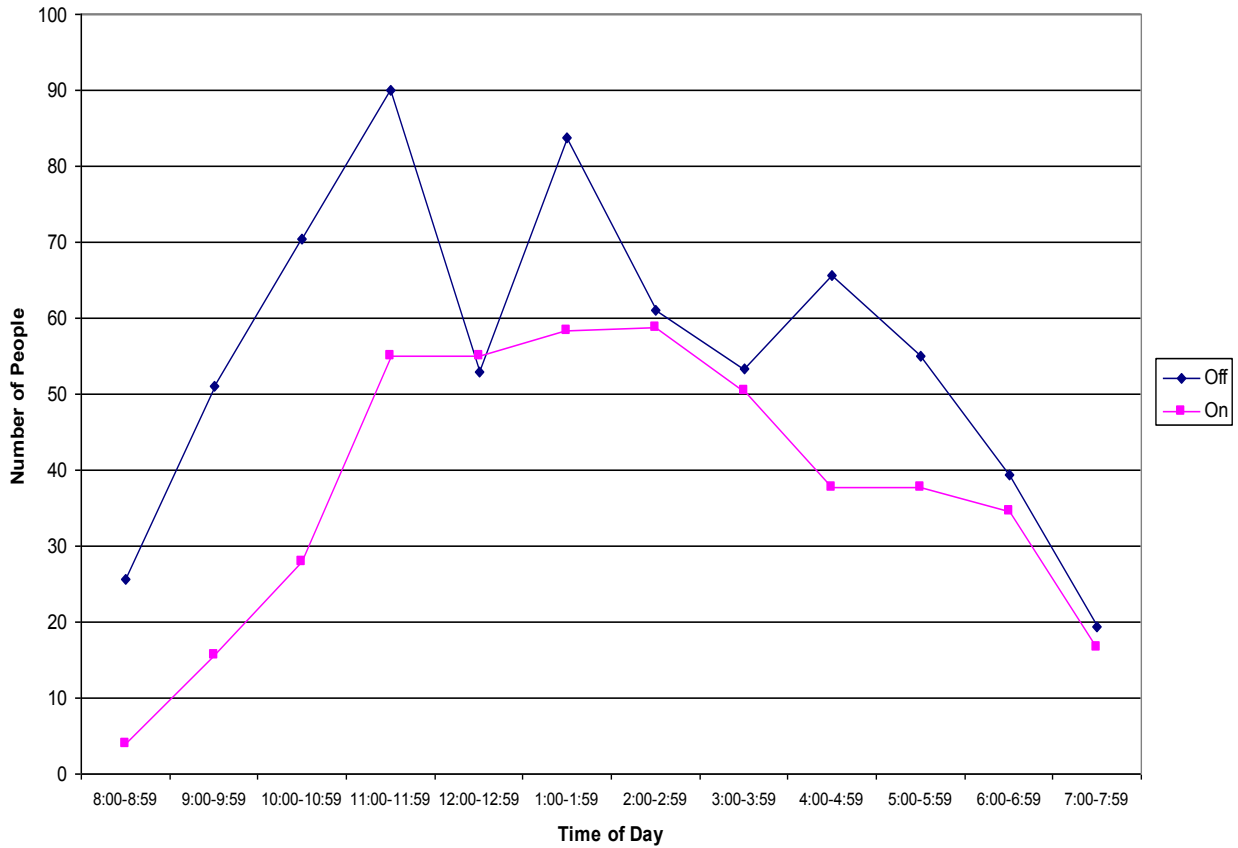
Average Encounters per Visitor per Pass, by Segment				
	Total Uses			
	64.8	130.9	261.2	512.6
Trail Section A	4.3	8.6	17.8	34.3
Trail Section B	4.2	8.3	16.7	32.3
Trail Section C	3.1	6.3	12.5	24.7
Trail Section D	2.7	5.6	11.1	21.2

Average Segment Use per Day				
	Total Uses			
	64.85	130.9	261.25	512.6
Trail Section A	129.7	261.8	522.5	1025.2
Trail Section B	88.9	175.9	348.5	683.2
Trail Section C	40.6	82.5	161.2	317.6
Trail Section D	31.1	63.8	125.9	241.4

Daily Use of Shuttle Bus at Weeping Rock - Northbound

	July 7	July 7	July 12	July 12	July 15	July 15
	Off	On	Off	On	Off	On
8:00-8:59	5	0	44	7	28	5
9:00-9:59	56	11	48	17	49	19
10:00-10:59	44	10	99	36	68	38
11:00-11:59	83	49	93	67	94	49
12:00-12:59	61	70	47	51	51	44
1:00-1:59	90	45	82	54	79	76
2:00-2:59	62	83	45	48	76	45
3:00-3:59	69	56	38	35	53	60
4:00-4:59	56	36	90	36	51	41
5:00-5:59	80	43	42	44	43	26
6:00-6:59	42	44	32	21	44	39
7:00-7:59	18	20	19	16	21	14
Total	666	467	679	432	657	456

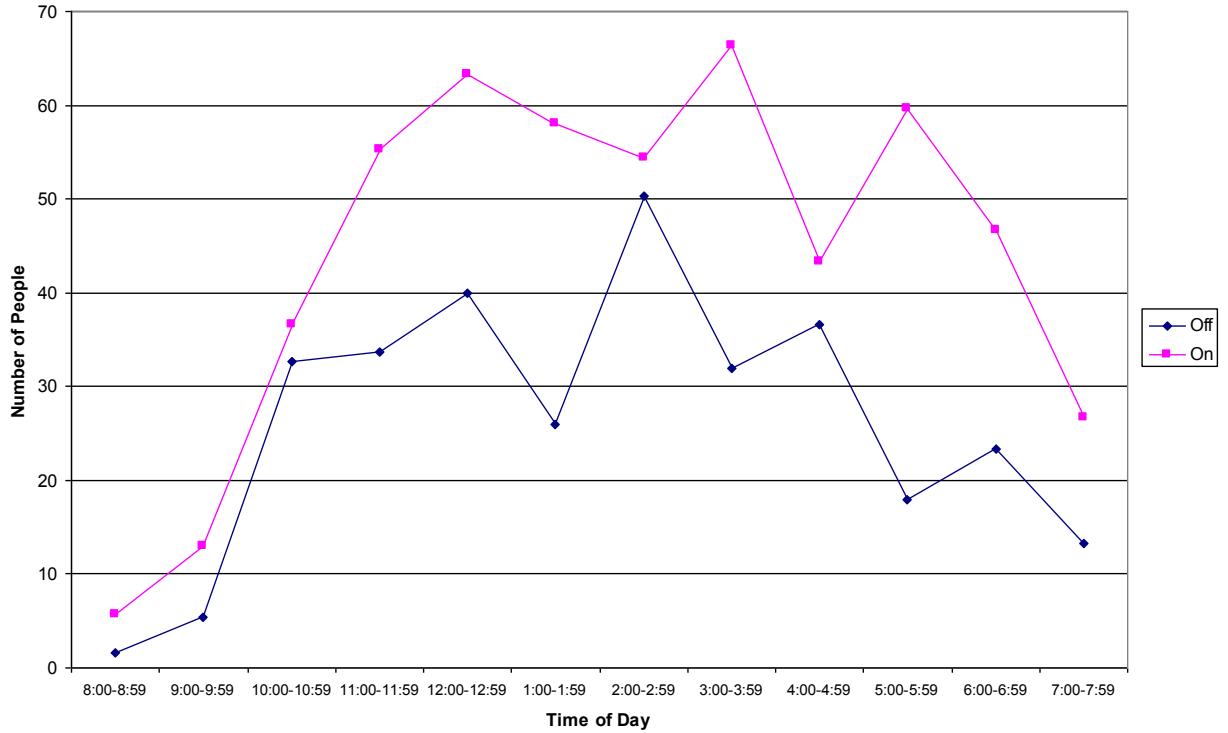
Average Shuttle Bus Use - Northbound



Daily Use of Shuttle Bus at Weeping Rock - Southbound

	July 7	July 7	July 12	July 12	July 15	July 15
	Off	On	Off	On	Off	On
8:00-8:59	2	2	0	13	3	2
9:00-9:59	4	8	6	13	6	18
10:00-10:59	33	46	39	40	26	24
11:00-11:59	27	60	19	41	55	65
12:00-12:59	42	89	20	48	58	53
1:00-1:59	11	39	47	64	20	71
2:00-2:59	31	29	32	61	88	73
3:00-3:59	34	61	23	29	39	109
4:00-4:59	46	54	15	23	49	53
5:00-5:59	25	67	4	37	25	75
6:00-6:59	29	57	16	44	25	39
7:00-7:59	8	22	20	34	12	24
Total	292	534	241	447	406	606

Average Shuttle Bus Use - Southbound



ZION DAY USE (NON-PERMITTED) THE GROTTO – 2003

Purpose:

- Collect baseline data on visitor use and users
- Determine standards of quality for selected indicator variables
- Measure visitor attitudes toward selected management actions

Methods:

- On-site survey of a representative sample of 159 visitors (80% response rate) as they exited the Grotto trailhead during July and August of 2003.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- A range of potential standards of quality for relevant indicator variables are shown in the tables below

**Zion National Park Backcountry Visitor Survey 2003
Grotto (On-Site Survey)**

Q1 How many people are in your group today?		
	Frequency	Percent
1	13	8.2
2	83	52.5
3	17	10.8
4	21	13.3
5	3	1.9
6	3	1.9
7	4	2.5
8	4	2.5
9	3	1.9
10	2	1.3
12	2	1.3
14	1	0.6
15	1	0.6
28	1	0.6

Mean = 3.4

Median = 2.0

Q2 Which of the following best describes your group?		
	Frequency	Percent
Family	93	59.6
Friends	29	18.6
Family and friends	11	7.1
Organized group	4	2.6
Commercial group	7	4.5
Other	12	7.7

Q3A Do you live in the United States?		
	Frequency	Percent
Yes	122	78.7
No	33	21.3

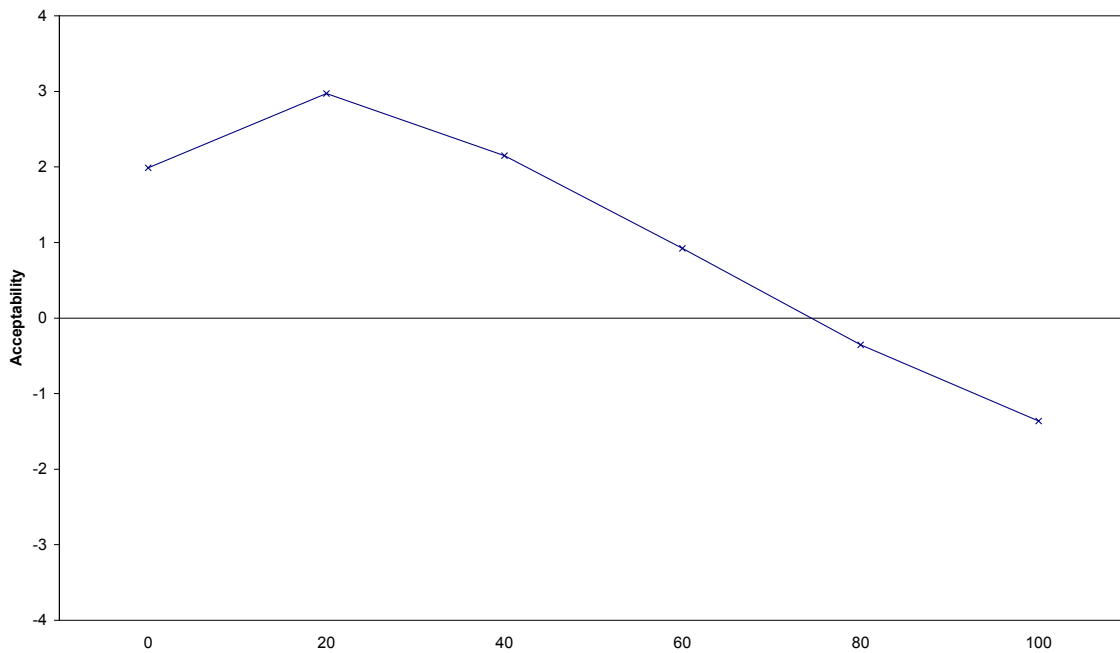
Q3B If yes, which state do you live in?		
	Frequency	Percent
Alaska	1	0.8
Arizona	5	4.0
California	25	20.0
Colorado	4	3.2
Florida	4	3.2
Georgia	2	1.6
Illinois	2	1.6
Indiana	1	0.8
Iowa	1	0.8
Kentucky	1	0.8
Maryland	8	6.4
Massachusetts	2	1.6
Michigan	1	0.8
Minnesota	1	0.8
Nevada	7	5.6
New Mexico	3	2.4
New York	8	6.4
North Carolina	3	2.4
Ohio	1	0.8
Pennsylvania	7	5.6
South Carolina	1	0.8
Tennessee	2	1.6
Texas	4	3.2
Utah	25	20.0
Virginia	2	1.6
Washington	2	1.6
Wisconsin	2	1.6

Q3C If no, what country do you live in?		
	Frequency	Percent
United Kingdom	2	6.7
Canada	1	3.3
Germany	11	36.7
Netherlands	1	3.3
France	4	13.3
Ireland	2	6.7
Italy	1	3.3
Switzerland	1	3.3
Holland	1	3.3
Australia	1	3.3
Austria	1	3.3
Spain	1	3.3
New Zealand	2	6.7
Kazakhstan	1	3.3

Q4A1 We would like to know how many other hikers you think it is acceptable to see without this trail being too crowded. Please rate the acceptability of each of the following numbers of other hikers seen per day along this trail. A rating of “-4” means the number of other groups seen is very unacceptable, and a rating of “+4” means the number of other groups seen is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
See no hikers	8.9	4.4	7.4	3.7	0.7	3.7	9.6	3.0	58.5	2.0
See up to 20 hikers	0.0	1.4	0.0	3.5	5.7	3.5	11.3	19.1	55.3	3.0
See up to 40 hikers	2.8	1.4	2.1	2.8	10.6	7.7	19.0	22.5	31.0	2.2
See up to 60 hikers	4.3	2.9	10.0	7.9	15.7	17.1	14.3	11.4	16.4	.9
See up to 80 hikers	11.3	11.3	11.3	11.3	8.8	8.2	11.9	8.2	6.3	-.4
See up to 100 hikers	31.4	8.2	8.2	8.8	8.8	5.0	8.2	3.8	5.7	-1.4

Social Norm Curve for Number of Hikers Seen per Day



Q4B What is the number of other hikers per day that you would prefer to see along this trail?

	Frequency	Percent
0	4	2.7
1	1	0.7
2	1	0.7
5	2	1.4
6	2	1.4
10	12	8.1
12	1	0.7
15	7	4.7
20	24	16.2
25	9	6.1
30	13	8.8
35	1	0.7
40	30	20.3
41	1	0.7
50	11	7.4
60	8	5.4
70	1	0.7
80	3	2.0
100	11	7.4
150	3	2.0
200	1	0.7
250	1	0.7
1,000	1	0.7

Mean = 47.1

Median = 30.0

Q4C What is the maximum number of other hikers per day that you think you could see before you would no longer hike this trail? If you would continue to hike this trail regardless of the number of other groups seen, you may indicate that.

	Frequency	Percent
15	1	0.7
20	2	1.3
25	1	0.7
40	3	2.0
50	9	6.0
60	7	4.7
70	1	0.7
75	1	0.7
80	9	6.0
90	1	0.7
100	28	18.7
150	8	5.3
200	16	10.7
210	1	0.7
250	2	1.3
300	1	0.7
400	2	1.3
500	2	1.3
I would continue to hike this trail regardless of the number of other hikers seen.	55	36.7

Mean = 126.7

Median = 100.0

Q4D What is the maximum number of other hikers seen per day that the National Park Service should allow on this trail? In other words, at what point should visitors be restricted from hiking this trail? If the number of hikers should not be restricted, you may indicate that.

	Frequency	Percent
4	1	0.7
20	1	0.7
30	2	1.4
40	2	1.4
45	1	0.7
50	3	2.0
60	2	1.4
70	2	1.4
80	6	4.1
99	1	0.7
100	17	11.5
150	3	2.0
180	1	0.7
200	10	6.8
250	1	0.7
300	4	2.7
400	3	2.0
500	2	1.4
600	2	1.4
1000	1	.07
The number of hikers on this trail should not be restricted.	83	56.1

Mean = 175.1

Median = 100.0

Q4E What is the approximate number of other hikers you saw today while hiking this trail?

	Frequency	Percent
1	1	0.7
2	1	0.7
5	1	0.7
7	1	0.7
8	1	0.7
10	3	2.0
20	15	9.8
25	3	2.0
30	15	9.8
35	2	1.3
39	1	0.7
40	16	10.5
45	2	1.3
50	33	21.6
60	16	10.5
61	1	0.7
65	1	0.7
70	3	2.0
75	3	2.0
80	8	5.2
85	1	0.7
100	14	9.2
120	1	0.7
150	5	3.3
160	1	0.7
200	3	2.0
500	1	0.7

Mean = 59.7

Median = 50.0

Q4: Summary Table

	Mean	Median
Acceptability	73.8	
Preference	47.1	30.0
Displacement	126.7	100.0
Management Action	175.1	100.0
Typically Seen	59.7	50.0

Q4F Approximately how long did you spend hiking on this trail today?

Minutes	Frequency	Percent
3	4	2.6
5	1	0.6
15	1	0.6
20	1	0.6
21	1	0.6
24	3	1.9
30	3	1.9
45	1	0.6
60	3	1.9
90	2	1.3
105	1	0.6
120	7	4.5
130	2	1.3
135	1	0.6
150	15	9.7
165	2	1.3
168	1	0.6
179	1	0.6
180	35	22.6
190	2	1.3
200	1	0.6
202	1	0.6
205	1	0.6
210	16	10.3
225	1	0.6
240	27	17.4
265	1	0.6
270	8	5.2
280	1	0.6
300	7	4.5
320	1	0.6
360	1	0.6
420	1	0.6
450	1	0.6

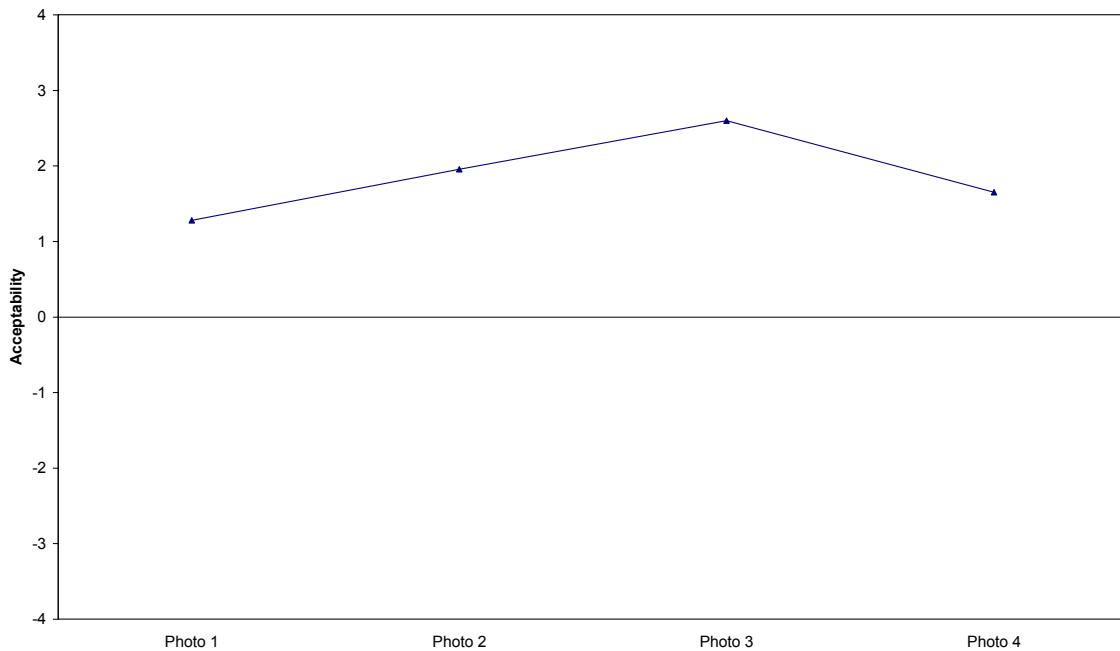
Mean = 184.6

Median = 180.0

Q5A1 The National Park Service can develop and maintain trails at different levels to accommodate more hikers and minimize environmental impacts of hiking. We would like to know what level of trail development/maintenance would be acceptable on this trail. To judge this, we have a series of photographs that show different levels of trail development/maintenance. Please rate each photograph by indicating how acceptable you find it based on the level of trail development/maintenance shown. A rating of “-4” means the level of trail development/maintenance is very unacceptable, and a rating of “+4” means the level of trail development/maintenance is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	9.7	6.5	6.5	3.2	9.0	7.7	9.7	16.1	31.6	1.3
Photo 2	2.0	3.3	2.6	8.5	9.2	9.8	12.4	17.0	35.3	2.0
Photo 3	1.3	0.0	0.7	3.3	5.3	12.5	14.5	21.7	40.8	2.6
Photo 4	4.6	6.6	5.9	1.3	11.2	8.6	13.2	13.2	35.5	1.7

Social Norm Curve for Level of Trail Development/Maintenance



Q5B Which photograph shows the level of trail development/maintenance that you would prefer to see on this trail?

	Frequency	Percent
1	14	9.7
2	38	26.4
3	52	36.1
4	40	27.8

Mean = 2.8

Median = 3.0

Q5C Which photograph shows the level of trail development/maintenance that is so unacceptable that you would no longer hike on this trail? If none of the photographs represents this condition, you may indicate that.

	Frequency	Percent
1	17	11.1
2	3	2.0
3	0	0
4	11	7.2
None of the photographs are so unacceptable that I would no longer hike on this trail.	122	79.7

Mean = 2.2

Median = 1.0

Q5D Which photograph shows the highest level of trail development/maintenance that the National Park Service should allow on this trail? In other words, at what point should people be restricted from hiking this trail instead of developing/maintaining the trail to a higher level? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
1	2	1.4
2	7	5.1
3	29	21.0
4	31	22.5
None of the photographs show a high enough level of trail development/maintenance to restrict people from hiking this trail.	37	26.8
The number of people hiking this trail should not be restricted	32	23.2

Mean = 3.3

Median = 3.0

Q5E Which photograph looks most like the level of trail development/maintenance you typically saw today on this trail?

	Frequency	Percent
1	3	2.1
2	6	4.3
3	14	9.9
4	117	83.0

Mean = 3.8

Median = 4.0

Q5: Summary Table		
	Mean	Median
Acceptability	N/A	
Preference	2.8	3.0
Displacement	2.2	1.0
Management Action	3.3	3.0
Typically Seen	3.8	4.0

Q6 How crowded did you feel on this trail today?		
	Frequency	Percent
1 (Not at all crowded)	31	20.0
2	28	18.1
3	31	20.0
4	22	14.2
5	16	10.3
6	16	10.3
7	8	5.2
8	3	1.9
9 (Extremely crowded)	0	0

Mean = 3.4

Median = 3.0

Q7A We are interested in the type of management you think is appropriate on this trail. Please indicate the degree to which you support or oppose the following management actions for this trail.

	Strongly oppose (1)	Oppose (2)	Support (3)	Strongly support (4)	Don't Know	Mean
Increase trail markers to <i>make route finding easier</i>	12.6	33.3	32.1	10.1	8.8	2.5
Increase trail markers to <i>reduce shortcutting and other impacts to natural resources</i>	8.8	18.9	35.8	27.7	6.3	2.9
Pave or apply gravel to trails to <i>reduce resource impacts</i>	10.7	27.0	32.7	18.9	6.9	2.7
Pave or apply gravel to trails to <i>allow more hikers to use the trail</i>	22.6	35.8	25.2	8.2	6.3	2.2
Restrict visitor use through a permit system to <i>ensure opportunities for solitude</i>	32.1	37.1	14.5	6.3	6.9	1.9
Restrict visitor use through a permit system to <i>protect natural resources</i>	17.6	34.6	27.7	11.3	5.7	1.4
Implement short-term area closures for the <i>protection of sensitive resources</i>	10.7	13.8	45.9	23.3	5.0	2.9

ZION DAY USE (NON-PERMITTED) NARROWS – 2003

Purpose:

- Collect baseline data on visitor use and users
- Determine standards of quality for selected indicator variables
- Measure visitor attitudes toward selected management actions

Methods:

- On-site survey of a representative sample of 213 visitors (88% response rate) as they exited the Narrows trailhead during July and August of 2003.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- A range of potential standards of quality for relevant indicator variables are shown in the tables below

**Zion National Park Backcountry Visitor Survey 2003
Virgin River Narrows (On-site Survey)**

Q1 How many people are in your group today?		
	Frequency	Percent
1	4	1.9
2	92	43.2
3	28	13.1
4	40	18.8
5	18	8.5
6	11	5.2
7	5	2.3
8	4	1.9
9	2	0.9
10	3	1.4
12	1	0.5
18	1	0.5
19	1	0.5
20	1	0.5

Mean = 4.0

Median = 3.0

Q2 Which of the following best describes your group?		
	Frequency	Percent
Family	139	66.8
Friends	38	18.3
Family and friends	19	9.1
Organized group	3	1.4
Commercial group	9	4.3

Q3A Do you live in the United States?		
	Frequency	Percent
Yes	166	79.4
No	43	20.6

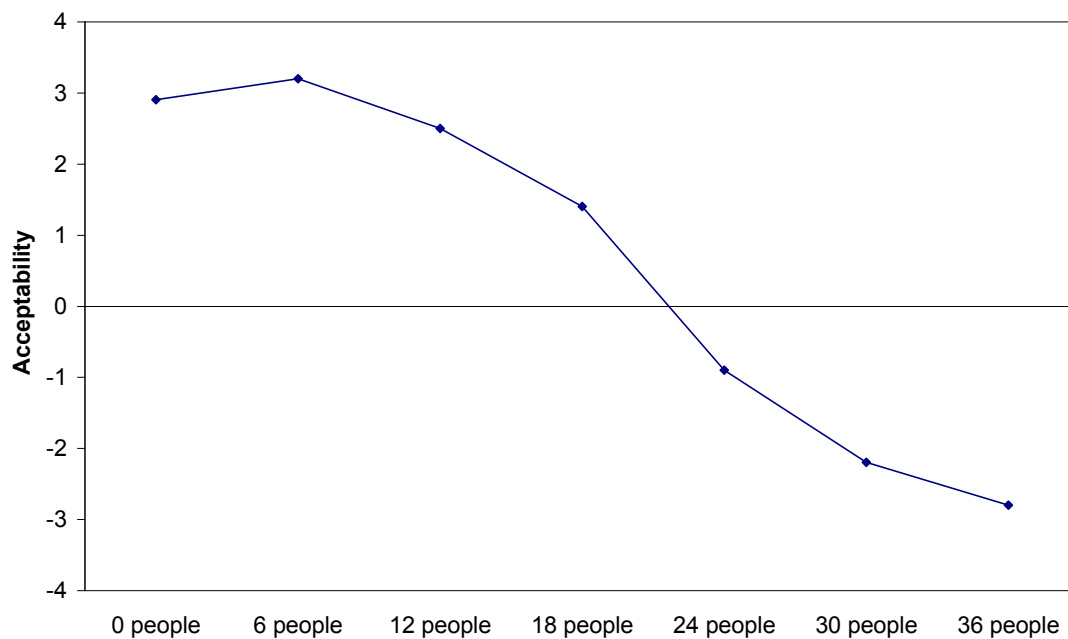
Q3B If yes, which state do you live in?		
	Frequency	Percent
Alabama	1	0.6
Alaska	1	0.6
Arizona	10	6.2
California	31	19.3
Colorado	2	1.2
Connecticut	3	1.9
Florida	9	5.6
Georgia	4	2.5
Hawaii	1	0.6
Illinois	1	0.6
Indiana	3	1.9
Kansas	1	0.6
Maine	1	0.6
Maryland	3	1.9
Massachusetts	5	3.1
Michigan	6	3.7
Minnesota	1	0.6
Montana	5	3.1
Nevada	13	8.1
New Hampshire	1	0.6
New Jersey	2	1.2
New Mexico	1	0.6
New York	6	3.7
North Carolina	3	1.9
Oregon	2	1.2
Pennsylvania	3	1.9
South Carolina	1	0.6
South Dakota	1	0.6
Tennessee	2	1.2
Texas	4	2.5
Utah	26	16.1
Virginia	5	3.1
Washington	3	1.9

Q3C If no, what country do you live in?		
	Frequency	Percent
United Kingdom	3	6.7
Korea	1	2.2
Canada	3	6.7
Germany	9	20.0
Netherlands	8	17.8
France	5	11.1
Italy	1	2.2
Mexico	1	2.2
Switzerland	1	2.2
Belgium	1	2.2
Holland	3	6.7
Australia	1	2.2
Isreal	1	2.2
Austria	1	2.2
England	2	4.4
Czech Republic	1	2.2
Spain	1	2.2
New Zealand	1	2.2
China	1	2.2

Q4A1 We would like to know how many other hikers you think it is acceptable to see in the Zion Narrows without it being too crowded. To help judge this, we have a series of photographs that show different numbers of hikers in this area. Please rate each photograph by indicating how acceptable you find it based on the number of people shown. A rating of “-4” means the number of people is very unacceptable, and a rating of “+4” means the number of people is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1 (0)	6.6	1.4	2.8	0.5	3.3	0.9	4.2	4.2	75.9	2.9
Photo 2 (6)	0	0.9	1.9	0.9	1.9	3.8	5.2	25.1	60.2	3.2
Photo 3 (12)	0.5	0.0	2.4	2.4	7.7	8.6	19.1	24.4	34.9	2.5
Photo 4 (18)	4.3	0.9	6.2	6.6	15.2	15.6	13.7	18.5	19.0	1.4
Photo 5 (24)	17.4	11.1	18.4	14.0	11.6	7.7	9.7	5.8	4.3	-0.9
Photo 6 (30)	17.4	11.1	18.4	14.0	11.6	7.7	9.7	5.8	4.3	-2.2
Photo 7 (36)	62.5	13.0	7.7	3.4	4.3	2.4	1.0	1.4	4.3	-2.8

Social Norm Curve for Number of Hikers Seen



Q4B What photograph shows the number of people that you would prefer to see in this area?

	Frequency	Percent
Photo 1 (0)	33	16.3
Photo 2 (6)	75	37.1
Photo 3 (12)	50	24.8
Photo 4 (18)	35	17.3
Photo 5 (24)	4	2.0
Photo 6 (30)	0	0
Photo 7 (36)	5	2.5

Mean = 2.6 (9.6 people)

Median = 2.0 (6 people)

Q4C Which photograph shows the number of people that is so unacceptable that you would no longer hike in this area?

	Frequency	Percent
Photo 1 (0)	4	2.1
Photo 2 (6)	0	0
Photo 3 (12)	1	0.5
Photo 4 (18)	9	4.7
Photo 5 (24)	55	28.5
Photo 6 (30)	27	14.0
Photo 7 (36)	58	30.1
None of the photographs are so unacceptable that I would no longer hike in this area.	39	20.2

Mean = 5.8 (28.2 people)

Median = 6.0 (30 people)

Q4D Which photograph shows the highest number of people that the National Park Service should allow in this area? In other words, at what point should people be restricted from hiking in this area?

	Frequency	Percent
Photo 1 (0)	0	0
Photo 2 (6)	1	0.5
Photo 3 (12)	11	5.7
Photo 4 (18)	37	19.2
Photo 5 (24)	62	32.1
Photo 6 (30)	22	11.4
Photo 7 (36)	14	7.3
None of the photographs show enough hikers to restrict people from hiking in this area.	18	9.3
The number of people hiking this trail should not be restricted.	28	14.5

Mean = 4.9 (23.4 people)

Median = 5.0 (24 people)

Q4E Which photograph looks most like the number of hikers you typically saw today in this area?

	Frequency	Percent
Photo 1 (0)	2	1.0
Photo 2 (6)	26	13.3
Photo 3 (12)	51	26.0
Photo 4 (18)	72	36.7
Photo 5 (24)	30	15.3
Photo 6 (30)	12	6.1
Photo 7 (36)	3	1.5

Mean = 3.8 (16.2 people)

Median = 4.0 (18 people)

Q4: Summary Table

	Mean	Median
Acceptability	21.6 people	N/A
Preference	9.6 people	6 people
Displacement	28.2 people	30 people
Management Action	23.4 people	24 people
Typically Seen	16.2 people	18 people

Q5A How crowded did you feel in this area today?

	Frequency	Percent
1(Not at all crowded)	26	12.9
2	37	18.3
3	39	19.3
4	35	17.3
5	22	10.9
6	20	9.9
7	15	7.4
8	6	3.0
9 (Extremely crowded)	2	1.0

Mean = 3.8

Median = 3.0

Q6 Please indicate the degree to which you support or oppose the following management actions for this trail.

	Strongly oppose (1)	Oppose (2)	Support (3)	Strongly support (4)	Don't Know	Mean
Restrict visitor use through a permit system to <i>ensure opportunities for solitude</i>	18.9	32.5	34.5	8.3	5.8	2.3
Restrict visitor use through a permit system to <i>protect natural resources</i>	8.9	16.3	47.3	22.7	4.9	2.9
Implement short-term area closures <i>for the protection of sensitive resources</i>	13.8	15.8	40.9	26.6	3.0	2.8

ZION DAY USE (NON-PERMITTED) WEEPING ROCK – 2003

Purpose:

- Collect baseline data on visitor use and users
- Determine standards of quality for selected indicator variables
- Measure visitor attitudes toward selected management actions

Methods:

- On-site survey of a representative sample of 138 visitors (87% response rate) as they exited the Weeping Rock trailhead during July and August of 2003.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- A range of potential standards of quality for relevant indicator variables are shown in the tables below

**Zion National Park Backcountry Visitor Survey 2003
Weeping Rock (On-Site Survey)**

Q1 How many people are in your group today?		
	Frequency	Percent
1	21	15.2
2	63	45.7
3	14	10.1
4	18	13.0
5	11	8.0
6	4	2.9
7	3	2.2
8	1	0.7
15	1	0.7
16	1	0.7
25	1	0.7

Mean = 3.1

Median = 2

Q2 Which of the following best describes your group?		
	Frequency	Percent
Family	77	57.9
Friends	30	22.6
Family and friends	7	5.3
Organized group	4	3.0
Other	15	11.3

Q3A Do you live in the United States?		
	Frequency	Percent
Yes	105	79.0
No	28	21.1

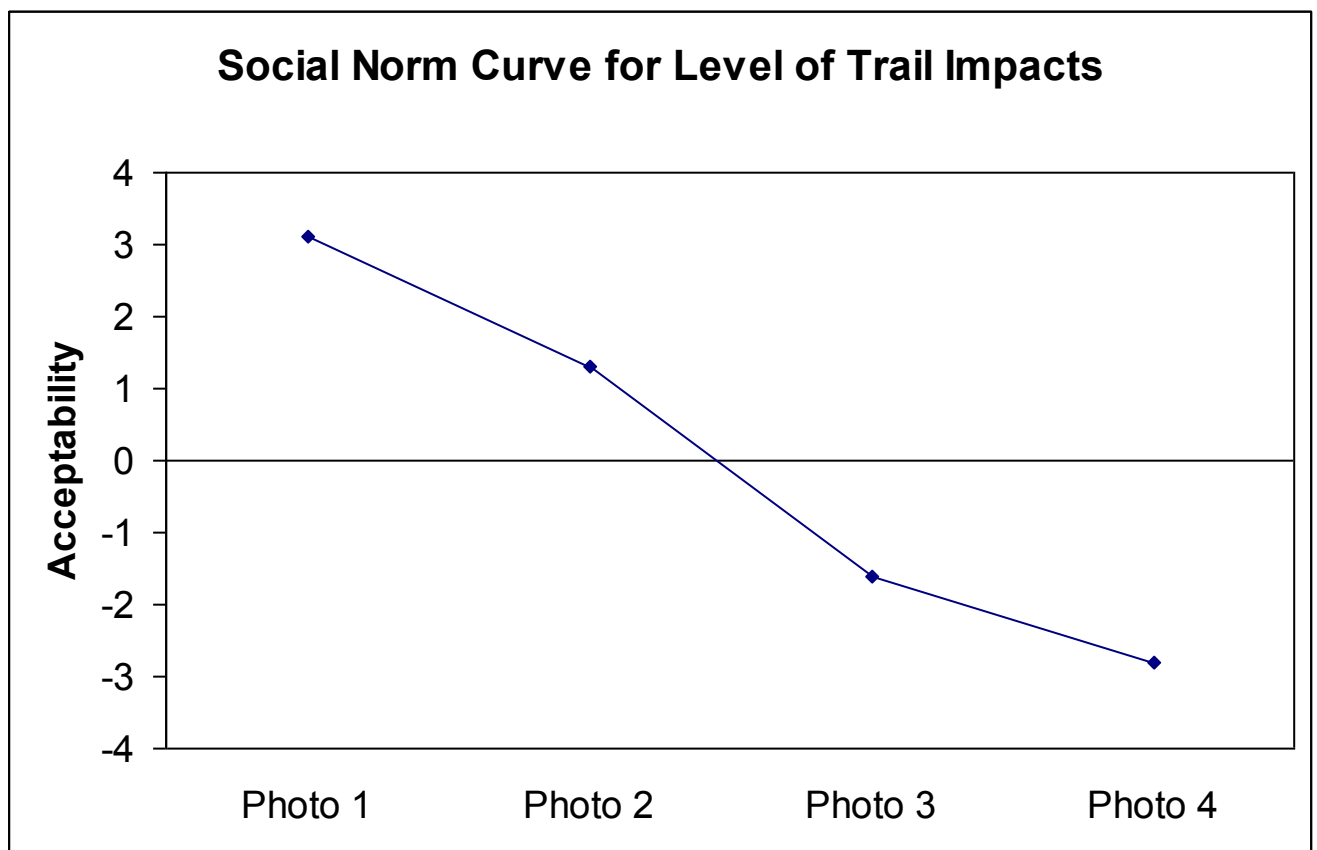
Q3B If yes, which state do you live in?		
	Frequency	Percent
Arizona	8	8.3
California	22	22.7
Colorado	1	1.0
Connecticut	2	2.1
Florida	3	3.1
Hawaii	1	1.0
Illinois	3	3.1
Indiana	1	1.0
Kansas	1	1.0
Maryland	1	1.0
Massachusetts	2	2.1
Michigan	1	1.0
Minnesota	3	3.1
Mississippi	1	1.0
Missouri	1	1.0
Montana	2	2.1
Nevada	6	6.2
New Hampshire	1	1.0
New Jersey	2	2.1
New York	5	5.2
North Carolina	3	3.1
North Dakota	1	1.0
Ohio	2	2.1
Oklahoma	2	2.1
Pennsylvania	4	4.1
Texas	1	1.0
Utah	11	11.3
Virginia	3	3.1
Washington	1	1.0
Wisconsin	2	2.1

Q3C If no, what country do you live in?		
	Frequency	Percent
United Kingdom	2	7.1
Canada	3	10.7
Germany	9	32.1
Netherlands	1	3.6
France	1	3.6
Italy	2	7.1
Belgium	1	3.6
Australia	2	7.1
Austria	1	3.6
England	2	7.1
Czech Republic	1	3.6
Denmark	1	3.6
Costa Rica	1	3.6
Columbia	1	3.6

Q4A When visitors hike, they can cause impacts to soil and vegetation. We would like to know how much impact is acceptable to see on the trail you just hiked. To help judge this, we have a series of

photographs that show different levels of impact to trails. (Please look at the photographs in Panel A.) Please rate each photograph by indicating how acceptable you find it based on the amount of impact shown. A rating of “-4” means the amount of impact is very unacceptable, and a rating of “+4” means the amount of impact is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	0	2.2	0.7	0.7	1.5	7.4	7.4	23.5	56.6	3.1
Photo 2	1.5	1.5	8.2	4.5	11.9	21.6	22.4	15.7	12.7	1.3
Photo 3	18.5	19.3	24.4	11.9	10.4	3.0	5.9	3.7	3.0	-1.6
Photo 4	64.0	11.8	5.9	2.9	5.2	2.2	1.5	5.2	1.5	-2.8



Q4B Which photograph shows the amount of environmental impact you would prefer to see on this trail?

	Frequency	Percent
1	107	83.6
2	14	10.9
3	3	2.3
4	4	3.1

Mean = 1.3

Q4C Which photograph shows the amount of environmental impact that is so unacceptable that you would no longer hike on this trail at Zion? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
1	2	1.6
2	2	1.6
3	21	16.9
4	50	40.3
None of the photographs are so unacceptable that I would no longer hike on this trail in Zion.	49	39.5

Mean = 3.6

Q4D Which photograph shows the highest level of environmental impact you think the National Park Service should allow on this trail at Zion? One way to limit the amount of environmental impact to trails is to limit the amount of use they receive. Which photograph shows the highest level of environmental impact you think the National Park Service should allow before it restricts people from hiking this trail? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
1	14	11.5
2	61	50.00
3	29	23.8
4	11	9.0
None of the photographs show a high enough level of environmental impact to restrict people from hiking this trail.	3	2.5
The number of people hiking this trail should not be restricted.	4	3.3

Mean = 2.3

Q4E Which photograph looks most like the amount of environmental impact you typically saw today on the trail?

	Frequency	Percent
1	75	61.5
2	36	29.5
3	7	5.7
4	4	3.3

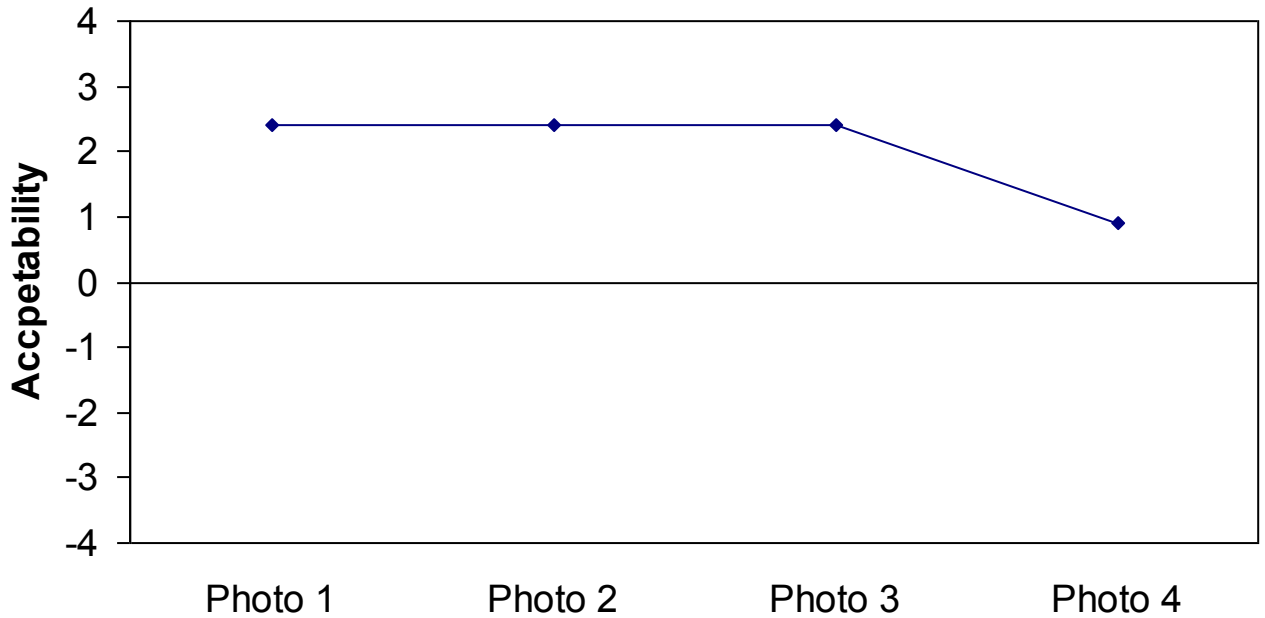
Mean = 1.5

Q4: Summary Table		
	Mean	Median
Acceptability	2.5	
Preference	1.3	1.0
Displacement	3.6	4.0
Management Action	2.3	2.0
Typically Seen	1.5	1.0

Q5A The National Park Service can develop and maintain trails at different levels to accommodate more hikers and minimize environmental impacts of hiking. We would like to know what level of trail development/maintenance would be acceptable on this trail. To help judge this, we have a series of photographs that show different levels of trail development/maintenance. (Please look at the photographs in Panel B.) Please rate each photograph by indicating how acceptable you find it based on the level of trail development/maintenance shown. A rating of “-4” means the level of trail development/maintenance is very unacceptable, and a rating of “+4” means the level of trail development/maintenance is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	0.8	3.9	3.9	4.7	2.4	13.4	7.9	14.2	48.8	2.4
Photo 2	1.6	1.6	3.2	1.6	5.6	9.6	18.4	20.8	37.6	2.4
Photo 3	0.8	1.6	0.8	3.2	6.4	9.6	16.0	36.0	25.6	2.4
Photo 4	8.7	8.7	8.7	3.2	11.9	11.9	8.7	8.7	29.4	0.9

Social Norm Curve for Level of Trail Development/Maintenance



Q5B Which photograph shows the level of trail development/maintenance that you would prefer to see on this trail?

	Frequency	Percent
Photo 1	25	20.3
Photo 2	43	35.0
Photo 3	37	30.1
Photo 4	18	14.6

Mean = 2.4

Q5C Which photograph shows the level of trail development/maintenance that is so unacceptable that you would no longer hike on this trail? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
Photo 1	3	2.3
Photo 2	4	3.1
Photo 3	4	3.1
4	12	9.4
No photographs are so unacceptable that I would no longer hike.	105	82.0

Mean = 3.0

Q5D Which photograph shows the highest level of trail development/maintenance that the National Park Service should allow on this trail? In other words, at what point should people be restricted from hiking this trail instead of developing/maintaining the trails to a higher level? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
Photo 1	7	5.7
Photo 2	16	13.1
Photo 3	30	24.6
Photo 4	15	12.3
No photograph shows high enough development to restrict hikers.	44	36.1
No photographs are so unacceptable that I would no longer hike.	10	8.2

Mean = 2.8

Q5E Which photograph looks most like the level of trail development/maintenance you typically saw today on this trail?

	Frequency	Percent
Photo 1	10	8.6
Photo 2	18	15.4
Photo 3	19	16.2
Photo 4	70	59.8

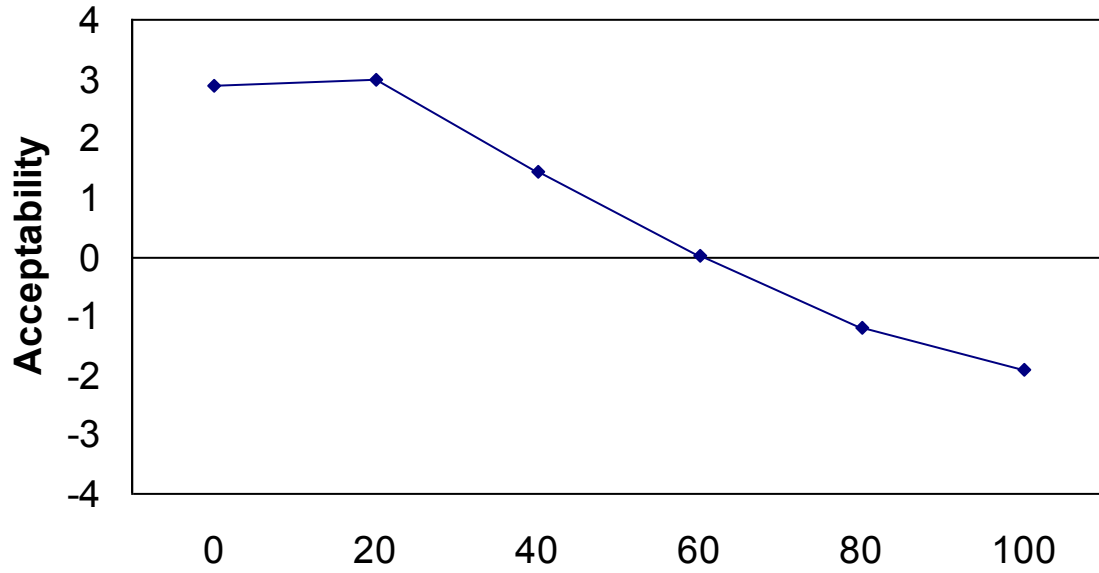
Mean = 3.3

Q5: Summary Table		
	Mean	Median
Acceptability	N/A	
Preference	2.4	2.0
Displacement	3.0	3.5
Management Action	2.8	4.0
Typically Seen	3.3	4.0

Q6A We would like to know how many other hikers you think it is acceptable to see without this trail being too crowded. Please rate the acceptability of each of the following numbers of other hikers seen per day along this trail. A rating of “-4” means the number of other groups seen is very unacceptable, and a rating of “+4” means the number of other groups seen is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
See no hikers	3.1	1.6	4.7	0.8	6.3	2.3	2.3	6.3	72.7	2.9
See up to 20 hikers	0.8	0.00	0.8	0.8	3.8	6.9	10.7	29.0	47.3	3.0
See up to 40 hikers	6.3	1.6	0.00	5.5	13.4	18.1	19.7	20.5	15.0	1.4
See up to 60 hikers	13.8	1.6	11.4	13.8	12.2	18.7	11.4	8.9	8.1	0.0
See up to 80 hikers	22.7	13.3	15.6	12.5	13.3	7.0	5.5	4.7	5.5	-1.2
See up to 100 hikers	44.6	10.0	15.4	6.2	10.8	2.3	3.1	1.5	6.2	-2.1

Social Norm Curve for Number of Hikers Seen per Day



Q6B What is the number of other hikers that you would prefer to see along this trail?		
	Frequency	Percent
0	14	10.8
1	1	0.8
2	2	1.5
3	1	0.8
5	2	1.5
6	2	1.5
7	1	0.8
10	16	12.3
15	5	3.8
20	48	36.9
25	4	3.1
30	9	6.9
34	1	0.8
40	14	10.8
50	2	1.5
60	4	3.1
80	2	1.5
100	2	1.5

Mean = 21.8

Median = 20.0

Q6C What is the maximum number of other hikers you could see before you would no longer hike this trail? If you would continue to hike this trail regardless of the number of other hikers seen, you may indicate that.

	Frequency	Percent
6	1	0.8
10	1	0.8
20	5	3.8
25	1	0.8
30	3	2.3
40	13	10.0
50	6	4.6
60	16	12.3
75	1	0.8
80	10	7.7
100	19	14.6
120	1	0.8
150	1	0.8
200	4	3.1
237	1	0.8
300	2	1.5
1000	1	0.8
I would continue to hike this trail regardless of the number of other hikers seen.	44	33.8

Mean = 89.3

Median = 60.0

Q6D What is the maximum number of other hikers seen per day that the National Park Service should allow on this trail? In other words, at what point should visitors be restricted from hiking this trail? If the number of hikers should not be restricted, you may indicate that.

	Frequency	Percent
20	4	3.3
25	2	1.6
30	2	1.6
40	7	5.7
50	6	4.9
51	1	0.8
60	7	5.7
80	4	3.3
100	19	15.6
160	1	0.8
200	4	3.3
237	1	0.8
300	2	1.6
500	2	1.6
1000	1	0.8
The number of hikers on this trail should not be restricted.	59	48.4

Mean = 115.2

Median = 80.0

Q6E What is the approximate number of other hikers you saw today while hiking this trail?

	Frequency	Percent
3	2	1.5
5	4	3.0
6	4	3.0
8	2	1.5
9	1	0.7
10	11	8.2
12	8	6.0
14	1	0.7
15	9	6.7
16	1	0.7
17	1	0.7
20	40	29.9
22	2	1.5
25	9	6.7
30	18	13.4
34	1	0.7
35	1	0.7
40	9	6.7
50	2	1.5
55	1	0.7
60	1	0.7
70	1	0.7
75	1	0.7
80	1	0.7
100	1	0.7
125	1	0.7
200	1	0.7

Mean = 25.1

Median = 20.0

Q6: Summary Table		
	Mean	Median
Acceptability	60	
Preference	21.8	20.0
Displacement	89.3	60.0
Management Action	115.2	80.0
Typically Seen	25.1	20.0

Q6F Approximately how long did you spend hiking on this trail today?

Minutes	Frequency	Percent
20	1	0.8
25	1	0.8
30	2	1.5
45	1	0.8
50	1	0.8
60	6	4.5
75	2	1.5
90	11	8.3
120	27	20.3
150	11	8.3
180	19	14.3
207	1	0.8
210	3	2.3
224	1	0.8
240	18	13.5
270	10	7.5
285	1	0.8
300	9	6.8
330	2	1.5
380	1	0.8
420	2	1.5
450	1	0.8
540	1	0.8
700	1	0.8

Mean = 185.3 Median = 180

Q7 How crowded did you feel along this trail today?

	Frequency	Percent
1 (Not at all Crowded)	65	49.2
2	39	29.5
3	12	9.1
4	10	7.6
5	1	0.8
6	4	3.0
7	1	0.8
8	0	0.0
9 (Extremely crowded)	0	0.0

Mean = 1.9 Median = 2.0

Q8 We are interested in the type of management you think is appropriate on this trail. Please indicate the degree to which you support or oppose the following management actions for this trail.

	Strongly Oppose (1)	Oppose (2)	Support (3)	Strongly Support (4)	Don't know	Mean
Increase trail markers to make route finding easier.	12.6	31.1	37.8	13.3	5.2	2.6
Increase trail markers to reduce short-cutting and other impacts to natural resources.	4.5	18.7	39.6	35.1	2.2	3.1
Pave or apply gravel to trails to reduce resource impacts.	9.8	22.6	51.1	13.5	3.0	2.7
Pave or apply gravel to trails to allow more hikers to use the trail.	23.5	34.1	32.6	6.8	3.0	2.2
Restrict visitor use through a permit system to ensure opportunities for solitude.	23.5	47.0	18.2	6.1	5.3	2.1
Restrict visitor use through a permit system to protect natural resources.	13.5	34.6	33.1	12.8	6.0	2.5
Implement short-term area closures for the protection of sensitive resources.	5.3	13.5	49.6	27.1	4.5	3.0

ZION DAY USE (PERMITTED) OVERNIGHT – 2003

Purpose:

- Collect baseline data on visitor use and users
- Determine Visitor standards of quality for the visitor experience
- Measure visitor attitudes about selected management actions

Methods:

- Mail-back survey of a representative sample of 91 visitors (44% response rate) who received a permit for an overnight hike in the summer and fall of 2003.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- The results of several close-ended questions designed to establish standards of quality for trail encounters, resource impacts, and appropriateness of different management actions are shown in the tables below.

**Zion National Park Backcountry Visitor Survey 2003
Overnight (Mail-back Survey)**

Q1 How many people are in your group today?		
	Frequency	Percent
1	20	22.0
2	56	61.5
3	5	5.5
4	4	4.4
5	4	4.4
7	1	1.1
8	1	1.1

Mean = 2.2

Median = 2.0

Q2 Which of the following best describes your group?		
	Frequency	Percent
Family	38	44.2
Friends	27	31.4
Family and friends	5	5.8
Organized group	0	0
Commercial group	0	0
School group	0	0
Other	16	18.6

Q3A Do you live in the United States?		
	Frequency	Percent
Yes	81	89.0
No	10	11.0

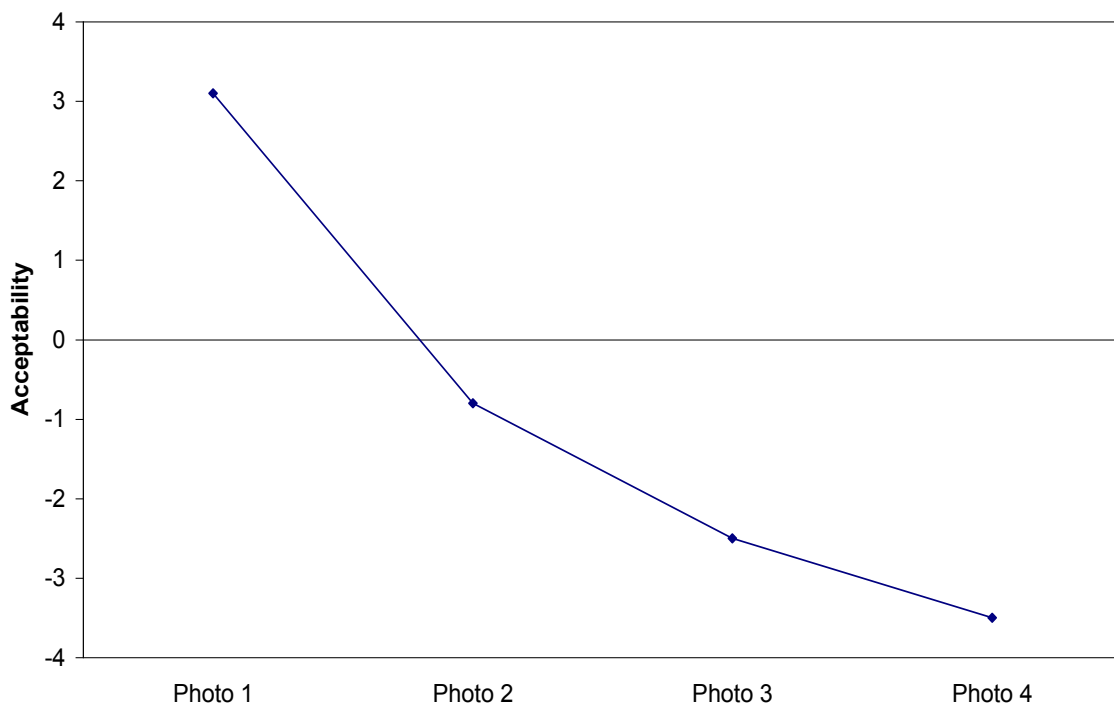
Q3B If yes, which state do you live in?		
	Frequency	Percent
Alaska	1	1.4
Arizona	2	2.7
California	11	15.1
Connecticut	1	1.4
Georgia	3	4.1
Idaho	1	1.4
Illinois	3	4.1
Indiana	1	1.4
Kansas	1	1.4
Maine	1	1.4
Maryland	1	1.4
Massachusetts	2	2.7
Montana	2	2.7
Nevada	3	4.1
New Mexico	1	1.4
New York	7	9.6
Ohio	1	1.4
Oregon	4	5.5
Texas	4	5.5
Utah	16	21.9
Washington	5	6.8
West Virginia	1	1.4
Wisconsin	1	1.4

Q3C If no, what country do you live in?		
	Frequency	Percent
United Kingdom	1	11.1
Canada	3	33.3
Germany	1	11.1
Netherlands	2	22.2
Switzerland	1	11.1
Czech Republic	1	11.1

Q4A When visitors hike, they can cause impacts to soil and vegetation. We would like to know how much impact is acceptable to see on the backcountry trails you hiked. To help judge this, we have a series of photographs that show different levels of impact to trails. (Please look at the photographs in Panel A.) Please rate each photograph by indicating how acceptable you find it based on the amount of impact shown. A rating of “-4” means the amount of impact is very unacceptable, and a rating of “+4” means the amount of impact is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	0	1.1	0	1.1	2.2	2.2	15.4	27.5	50.5	3.1
Photo 2	17.6	12.1	13.2	14.3	8.8	13.2	9.9	8.8	2.2	-0.8
Photo 3	41.8	20.9	16.5	7.7	2.2	3.3	4.4	2.2	1.1	-2.5
Photo 4	81.3	7.7	4.4	0	0	4.4	1.1	0	1.1	-3.5

Social Norm Curve for Trail Impacts



Q4B Which photograph shows the amount of environmental impact you would prefer to see on backcountry trails?

	Frequency	Percent
Photo 1	85	98.8
Photo 2	1	1.2
Photo 3	0	0
Photo 4	0	0

Mean = 1.0

Q4C Which photograph shows the amount of environmental impact that is so unacceptable that you would no longer hike on backcountry trails at Zion? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
Photo 1	0	0
Photo 2	4	4.7
Photo 3	21	24.4
Photo 4	34	39.5
None of the photographs are so unacceptable that I would no longer hike on backcountry trails at Zion.	27	31.4

Mean = 3.5

Q4D Which photograph shows the highest level of environmental impact you think the National Park Service should allow on backcountry trails at Zion? One way to limit the amount of environmental impact to trails is to limit the amount of use they receive. Which photograph shows the highest level of environmental impact you think the National Park Service should allow before it restricts people from hiking backcountry trails? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
Photo 1	31	36.0
Photo 2	37	43.0
Photo 3	10	11.6
Photo 4	3	3.5
None of the photographs show a high enough level of environmental impact to restrict people from hiking backcountry trails.	3	3.5
The number of people hiking backcountry trails should not be restricted.	2	2.3

Mean = 1.8

Q4E Which photograph looks most like the amount of environmental impact you typically saw on backcountry trails?		
	Frequency	Percent
Photo 1	76	87.4
Photo 2	10	11.5
Photo 3	0	0
Photo 4	1	1.1

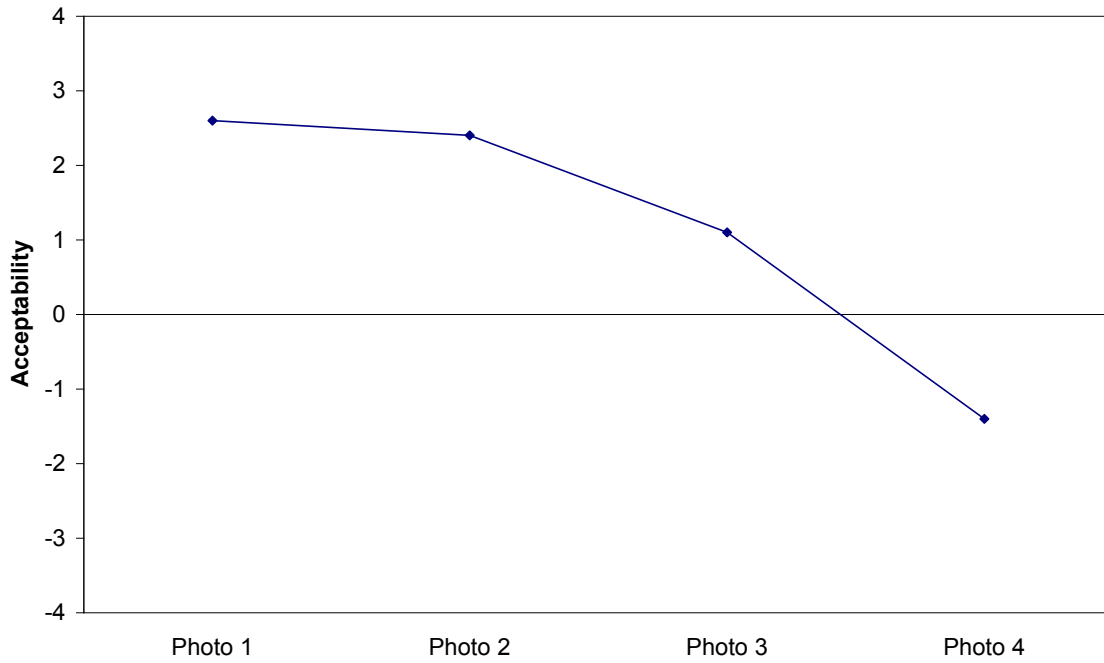
Mean = 1.2

Q4: Summary Table		
	Mean	Median
Acceptability	1.8	
Preference	1.0	1.0
Displacement	3.5	4.0
Management Action	1.8	2.0
Typically Seen	1.2	1.0

Q5A . The National Park Service can develop and maintain trails at different levels to accommodate more hikers and minimize environmental impacts of hiking. We would like to know what level of trail development/maintenance would be acceptable on backcountry trails in Zion. To help judge this, we have a series of photographs that show different levels of trail development/maintenance. (Please look at the photographs in Panel B.) Please rate each photograph by indicating how acceptable you find it based on the level of trail development/maintenance shown. A rating of “-4” means the level of trail development/maintenance is very unacceptable, and a rating of “+4” means the level of trail development/maintenance is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	0	1.1	4.4	1.1	11.0	2.2	9.9	24.2	42.9	2.6
Photo 2	1.1	1.1	0	5.5	6.6	12.1	7.7	34.1	28.6	2.4
Photo 3	3.3	8.8	5.5	8.8	11.0	13.2	13.2	13.2	20.9	1.1
Photo 4	30.8	18.7	5.5	6.6	8.8	8.8	5.5	4.4	7.7	-1.4

Social Norm Curve for Trail Development/Maintenance



Q5B Which photograph shows the level of trail development/maintenance that you would prefer to see on backcountry trails?

	Frequency	Percent
Photo 1	27	32.1
Photo 2	34	40.5
Photo 3	22	26.2
Photo 4	1	1.2

Mean = 2.0

Q5C Which photograph shows the level of trail development/maintenance that is so unacceptable that you would no longer hike on backcountry trails at Zion? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
Photo 1	2	2.3
Photo 2	1	1.1
Photo 3	3	3.4
Photo 4	33	2.3
None of the photographs are so unacceptable that I would no longer hike on backcountry trails at Zion.	49	55.7

Mean = 3.7

Q5D Which photograph shows the highest level of trail development/maintenance that the National Park Service should allow on backcountry trails? In other words, at what point should people be restricted from hiking backcountry trails instead of developing/maintaining the trails to a higher level? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
Photo 1	2	2.3
Photo 2	22	25.6
Photo 3	32	37.2
Photo 4	8	9.3
None of the photographs show a high enough level of trail development/maintenance to restrict people from hiking backcountry trails.	15	17.4
The number of people hiking backcountry trails should not be restricted.	7	8.1

Mean = 2.7

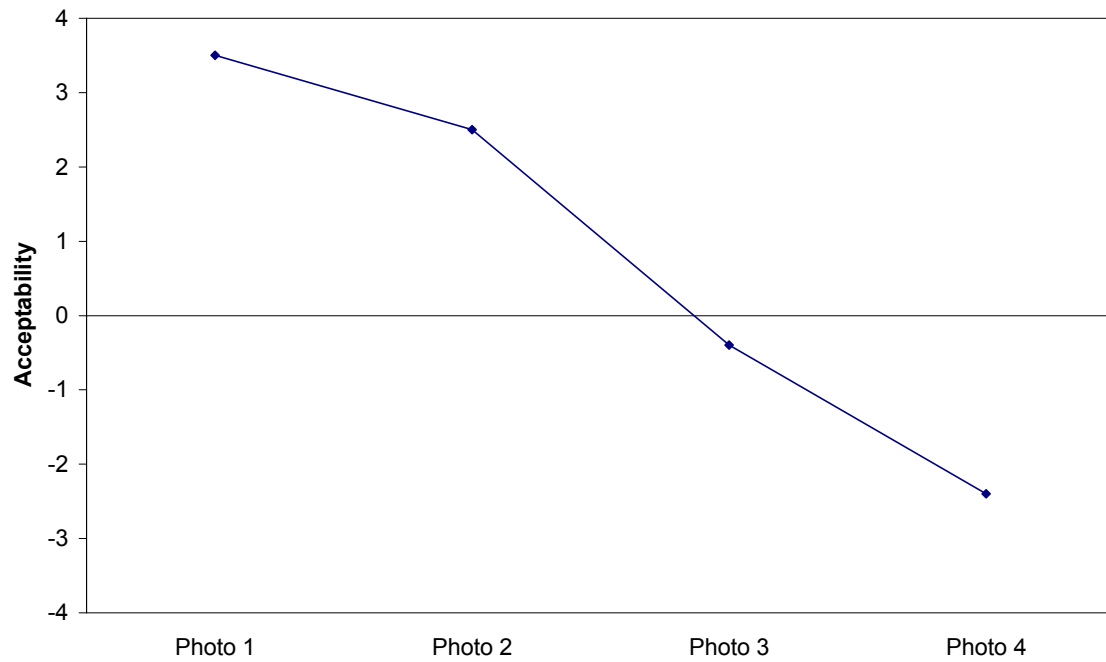
Q5E Which photograph looks most like the level of trail development/maintenance you typically saw on backcountry trails?

	Frequency	Percent
Photo 1	33	40.2
Photo 2	36	43.9
Photo 3	9	11.0
Photo 4	4	4.9

Mean = 1.8

Q5: Summary Table		
	Mean	Median
Acceptability		3.4
Preference	2.0	2.0
Displacement	3.7	4.0
Management Action	2.7	3.0
Typically Seen	1.8	2.0

Social Norm Curve for Campsite Impacts



Q6A When visitors camp, they can cause impacts to soil and vegetation. We would like to know how much impact is acceptable to see in the backcountry campsites you used. To help judge this, we have a series of photographs that show different levels of impact to campsites. (Please look at the photographs in Panel C.) Please rate each photograph by indicating how acceptable you find it based on the amount of impact shown. A rating of “-4” means the amount of impact is very unacceptable, and a rating of “+4” means the amount of impact is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	0	1.1	1.1	0	1.1	2.2	6.6	15.4	71.4	3.5
Photo 2	1.1	0	2.2	2.2	4.4	8.8	15.4	35.2	28.6	2.5
Photo 3	7.7	8.8	19.8	16.5	8.8	17.6	6.6	7.7	4.4	-.4
Photo 4	51.6	11.0	8.8	8.8	4.4	5.5	3.3	3.3	2.2	-2.4

Q6B Which photograph shows the amount of environmental impact you would prefer to see at backcountry campsites?

	Frequency	Percent
Photo 1	65	73.9
Photo 2	19	21.6
Photo 3	2	2.3
Photo 4	2	2.3

Mean = 1.3

Q6C Which photograph shows the amount of environmental impact that is so unacceptable that you would no longer use backcountry campsites at Zion? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
Photo 1	1	1.1
Photo 2	1	1.1
Photo 3	16	18.0
Photo 4	29	32.6
None of the photographs are so unacceptable that I would no longer use backcountry campsites.	42	47.2

Mean = 3.6

Q6D Which photograph shows the highest level of environmental impact you think the National Park Service should allow at backcountry campsites in Zion? One way to limit the amount of environmental impact to campsites is to limit the amount of use they receive. Which photograph shows the highest level of environmental impact you think the National Park Service should allow before it restricts people from using backcountry campsites? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
Photo 1	4	4.8
Photo 2	39	46.4
Photo 3	21	25.0
Photo 4	9	10.7
None of the photographs show a high enough level of environmental impact to restrict people from using backcountry campsites.	8	9.5
The number of people using backcountry campsites should not be restricted.	3	3.6

Mean = 2.5

Q6E Which photograph looks most like the amount of environmental impact you typically saw at backcountry campsites?

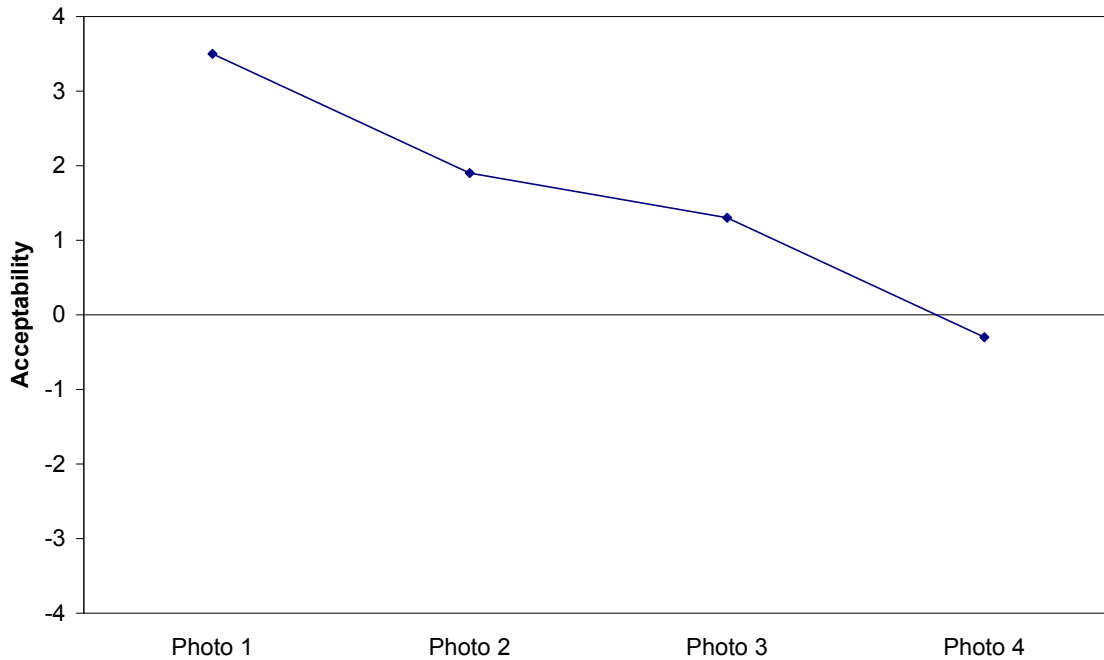
	Frequency	Percent
Photo 1	16	19.0
Photo 2	50	59.5
Photo 3	15	17.9
Photo 4	3	3.6

Mean = 2.1

Q6: Summary Table

	Mean	Median
Acceptability	2.9	
Preference	1.3	1.0
Displacement	3.6	4.0
Management Action	2.5	2.0
Typically Seen	2.1	2.0

Social Norm Curve for Campsite Development/Maintenance



Q7A The National Park Service can develop and maintain campsites at different levels to accommodate more hikers and minimize environmental impacts. We would like to know what level of campsite development/maintenance would be acceptable in the backcountry of Zion. To help judge this, we have a series of photographs that show different levels of campsite development/maintenance. (Please look at the photographs in Panel D.) Please rate each photograph by indicating how acceptable you find it based on the level of campsite development/maintenance shown. A rating of “-4” means the level of campsite development/maintenance is very unacceptable, and a rating of “+4” means the level of campsite development/maintenance is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1	0	1.1	0	0	2.2	1.1	7.9	18.0	69.7	3.5
Photo 2	3.3	2.2	3.3	4.4	4.4	12.1	22.0	23.1	23.1	1.9
Photo 3	5.5	3.3	5.5	7.7	7.7	14.3	15.4	18.7	5.5	1.3
Photo 4	16.5	9.9	9.9	13.2	6.6	15.4	6.6	7.7	12.1	-0.3

Q7B Which photograph shows the level of campsite development/maintenance that you would prefer to see at backcountry campsites?

	Frequency	Percent
Photo 1	62	72.9
Photo 2	14	16.5
Photo 3	9	10.6
Photo 4	0	0

Mean = 1.4

Q7C Which photograph shows the level of campsite development/maintenance that is so unacceptable that you would no longer use backcountry campsites? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
Photo 1	0	0
Photo 2	2	2.2
Photo 3	4	4.4
Photo 4	8	8.8
None of the photographs are so unacceptable that I would no longer use backcountry campsites.	77	84.6

Mean = 3.4

Q7D Which photograph shows the highest level of campsite development/maintenance that the National Park Service should allow at backcountry campsites? In other words, at what point should people be restricted from using backcountry campsites instead of developing/maintaining campsites to a higher level? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
Photo 1	15	17.9
Photo 2	12	14.3
Photo 3	25	29.8
Photo 4	5	6.0
None of the photographs show a high enough level of campsite development/maintenance to restrict people from using backcountry campsites.	24	28.6
The number of people using backcountry campsites should not be restricted.	3	3.6

Mean = 2.4

Q7E Which photograph looks most like the level of campsite development/maintenance you typically saw at backcountry campsites?

	Frequency	Percent
Photo 1	56	63.6
Photo 2	24	27.3
Photo 3	8	9.1
Photo 4	0	0

Mean = 1.5

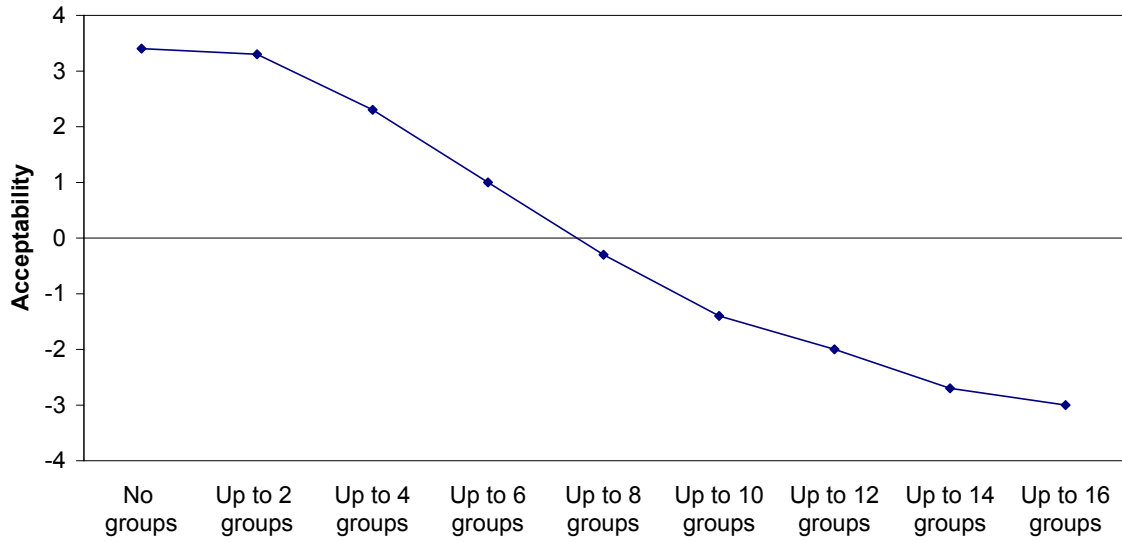
Q7: Summary Table

	Mean	Median
Acceptability	3.8	
Preference	1.4	1.0
Displacement	3.4	4.0
Management Action	2.4	3.0
Typically Seen	1.5	1.0

Q8A We would like to know how many other groups of hikers per day you think it is acceptable to see without backcountry trails being too crowded. Please rate the acceptability of each of the following numbers of other groups seen per day along backcountry trails. A rating of “-4” means the number of other groups seen is very unacceptable, and a rating of “+4” means the number of other groups seen is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
No other groups	2.2	0	0	1.1	3.3	2.2	5.5	0	80.2	3.4
Up to 2 other groups	1.1	1.1	0	0	2.2	2.2	6.6	24.2	57.1	3.3
Up to 4 other groups	0	2.2	1.1	2.2	6.6	15.4	14.3	31.9	22.0	2.3
Up to 6 other groups	2.2	3.3	4.4	8.8	16.5	24.2	9.9	14.3	11.0	1.0
Up to 8 other groups	12.1	5.5	14.3	13.2	14.3	11.0	11.0	6.6	6.6	-3
Up to 10 other groups	28.2	12.9	10.6	16.5	14.1	2.4	5.9	5.9	3.5	-1.4
Up to 12 other groups	35.2	12.1	17.6	7.7	4.4	7.7	5.5	1.1	2.2	-2.0
Up to 14 other groups	51.2	18.6	9.3	5.8	4.7	5.8	2.3	1.2	1.2	-2.7
Up to 16 other groups	65.1	9.3	9.3	4.7	4.7	3.5	1.2	2.3	0	-3.0

Social Norm Curve for Number of Hiking Groups Seen



Q8B What is the number of other groups per day you would prefer to see?

Number of other groups	Frequency	Percent
1	28	38.4
2	4	5.5
3	17	23.3
4	6	8.2
5	5	6.8
6	3	4.1
7	6	8.2
8	1	1.4
9	1	1.4
10	2	2.7

Mean = 2.3

Median = 2.0

Q8C What is the maximum number of groups per day you think you could see before you would no longer hike backcountry trails? If you would continue to hike backcountry trails regardless of the number of other groups seen, you may indicate that.

Number of other groups	Frequency	Percent
2	1	1.2
4	1	1.2
5	1	1.2
6	7	8.5
8	11	13.4
9	1	1.2
10	20	24.4
12	5	6.1
14	2	2.4
15	3	3.7
16	1	1.2
20	3	3.7
30	2	2.4
35	1	1.2
I would continue to hike backcountry trails regardless of the number of other groups seen.	23	28.0

Mean = 11.1

Median = 10.0

Q8D What is the maximum number of other groups seen per day that the National Park Service should allow on backcountry trails? In other words, at what point should visitors be restricted from hiking backcountry trails? If the number of groups should not be restricted, you may indicate that.

Number of other groups	Frequency	Percent
2	1	1.3
3	1	1.3
4	3	3.8
5	1	1.3
6	8	10.3
8	12	15.4
9	2	2.6
10	23	29.5
12	4	5.1
15	4	5.1
20	2	2.6
30	2	2.6
The number of groups on backcountry trails should not be restricted.	15	19.2

Mean = 9.9

Median = 10.0

Q8E What is the approximate number of other groups per day <u>you saw</u> while hiking backcountry trails?		
Number of other groups	Frequency	Percent
0	4	5.3
1	15	19.7
2	22	28.9
3	10	13.2
4	11	14.5
5	3	3.9
6	2	2.6
7	1	1.3
8	3	3.9
9	1	1.3
10	3	3.9
20	1	1.3

Mean = 3.3 Median = 2.0

Q8: Summary Table		
	Mean	Median
Acceptability	7.5	
Preference	2.3	2.0
Displacement	11.1	10.0
Management Action	9.9	10.0
Typically Seen	3.3	2.0

Q9 How crowded did you feel along the backcountry trails?		
	Frequency	Percent
1 (Not at all crowded)	51	60.7
2	19	22.6
3	8	9.5
4	3	3.6
5	0	0
6	1	1.2
7	1	1.2
8	1	1.2
9 (Extremely crowded)	0	0

Mean = 1.7 Median = 1.0

Q10 We are interested in the type of management you think is appropriate on backcountry trails. Please indicate the degree to which you support or oppose the following management actions for backcountry trails.

	Strongly oppose (1)	Oppose (2)	Support (3)	Strongly support (4)	Don't Know	Mean
Increase trail markers to <i>make route finding easier</i>	11.6	31.4	38.4	12.8	5.8	2.6
Increase trail markers to <i>reduce short-cutting and other impacts to natural resources</i>	0	16.3	47.7	34.9	1.2	3.2
Pave or apply gravel to trails to <i>reduce resource impacts</i>	26.7	25.6	38.4	5.8	3.5	2.4
Pave or apply gravel to trails to <i>allow more hikers to use the trail</i>	40.0	40.0	18.8	1.2	0	1.8
Restrict visitor use through a permit system to <i>ensure opportunities for solitude</i>	8.3	13.1	44.0	33.3	1.2	3.0
Restrict visitor use through a permit system to <i>protect natural resources</i>	5.8	9.3	34.9	50.0	0	3.3
Implement short-term area closures for the <i>protection of sensitive resources</i>	4.7	8.1	44.2	40.7	2.3	3.2

ZION DAY USE (PERMITTED) THE NARROWS – 2003

Purpose:

- Collect baseline data on visitor use and users
- Determine Visitor standards of quality for the visitor experience
- Measure visitor attitudes about selected management actions

Methods:

- Mail-back surveys of a representative sample of 80 visitors (67% response rate) who received a permit for day hiking the Virgin River Narrows during the summer and fall of 2003.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- The results of several close-ended questions designed to establish standards of quality for trail encounters, resource impacts, and appropriateness of different management actions are shown in the tables below.

**Zion National Park Backcountry Visitor Survey 2003
Virgin River Narrows (Mail-back Survey)**

Q1 How many people are in your group today?		
	Frequency	Percent
1	4	5.1
2	29	36.7
3	17	21.5
4	10	12.7
5	5	6.3
6	4	5.1
7	3	3.8
8	1	1.3
9	1	1.3
10	1	1.3
11	1	1.3
12	3	3.8

Mean = 3.8

Median = 3.0

Q2 Which of the following best describes your group?		
	Frequency	Percent
Family	25	32.1
Friends	32	41.0
Family and friends	11	14.1
Organized group	5	6.4
Other	5	6.4

Q3A Do you live in the United States?		
	Frequency	Percent
Yes	75	97.4
No	2	2.6

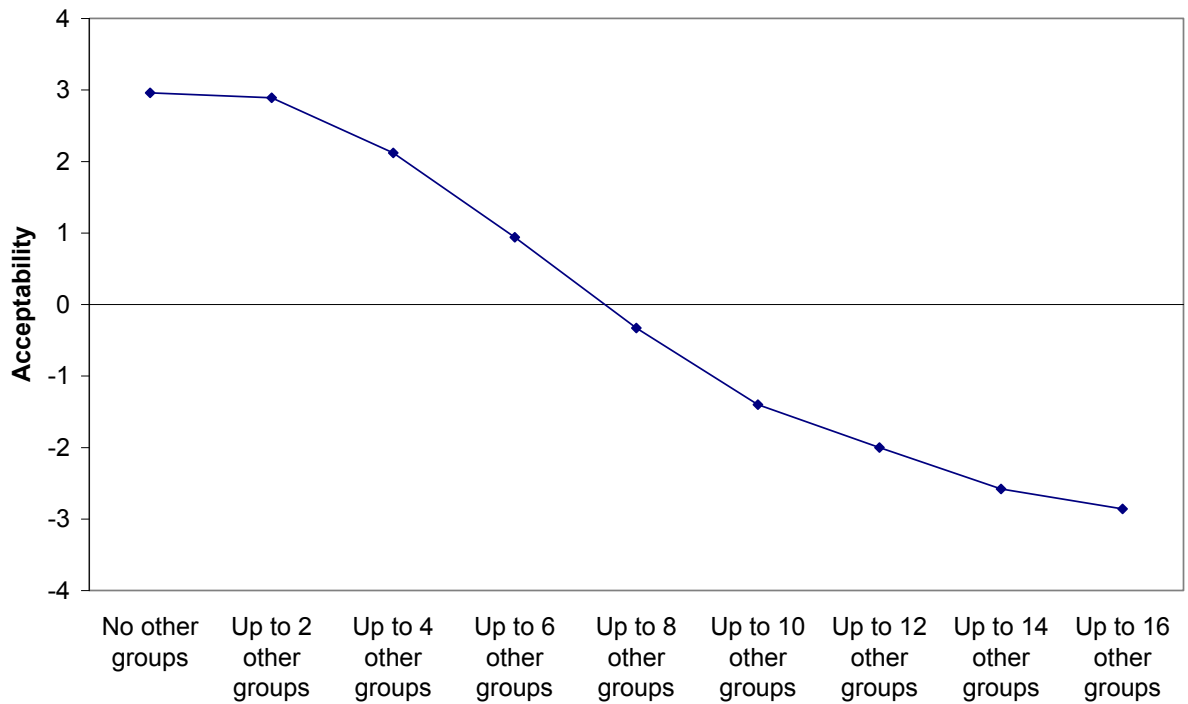
Q3B If yes, which state do you live in?		
	Frequency	Percent
Alaska	1	1.5
Arizona	2	3.0
Arkansas	1	1.5
California	8	12.1
Colorado	2	3.0
Dist. of Columbia	1	1.5
Georgia	2	3.0
Illinois	2	3.0
Maryland	1	1.5
Massachusetts	1	1.5
Minnesota	1	1.5
Montana	1	1.5
Nevada	2	3.0
New Hampshire	1	1.5
New Jersey	1	1.5
New York	1	1.5
Pennsylvania	1	1.5
Tennessee	1	1.5
Utah	32	48.5
Vermont	1	1.5
Washington	3	4.5

Q3C If no, what country do you live in?		
	Frequency	Percent
United Kingdom	1	50.0
Netherlands	1	50.0

Q4A1 We would like to know how many other groups you think it is acceptable to see on this hike (between the head of the Virgin River Narrows and Orderville Canyon) without this area being too crowded. Please rate the acceptability of each of the following numbers of other groups seen in this area. A rating of “-4” means the number of other groups seen is very unacceptable, and a rating of “+4” means the number of other groups seen is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
No other groups	5.6	0.0	1.4	4.2	2.8	4.2	1.4	4.2	76.4	2.96
Up to 2 other groups	1.4	1.4	1.4	2.8	2.8	6.9	6.9	22.2	54.2	2.89
Up to 4 other groups	0.0	0.0	4.1	5.4	10.8	6.8	25.7	21.6	25.7	2.12
Up to 6 other groups	5.6	4.2	6.9	5.6	13.9	19.4	18.1	12.5	13.9	.94
Up to 8 other groups	14.3	7.1	12.9	11.4	18.6	12.9	7.1	7.1	8.6	-.33
Up to 10 other groups	22.9	17.1	10.0	17.1	15.7	5.7	2.9	5.7	2.9	-1.40
Up to 12 other groups	35.7	17.1	17.1	8.6	7.1	4.3	1.4	4.3	4.3	-2.00
Up to 14 other groups	53.5	19.7	7.0	4.2	2.8	4.2	0.0	4.2	4.2	-2.58
Up to 16 other groups	71.0	4.3	7.2	4.3	1.4	2.9	2.9	1.4	4.3	-2.86

Social Norm Curve for Number of Other Groups Encountered



Q4B What is the number of other groups that you would prefer to see?

	Frequency	Percent
0	9	14.3
1	4	6.3
2	9	14.3
3	10	15.9
4	10	15.9
5	7	11.1
6	5	7.9
7	2	3.2
8	2	3.2
10	1	1.6
11	1	1.6
12	2	3.2
18	1	1.6

Mean =4.0

Median = 3.0

Q4C What is the maximum number of groups you think you could see before you would no longer hike in this area? If you would continue to hike in this area regardless of the number of other groups seen, you may indicate that.

	Frequency	Percent
1	1	1.4
2	1	1.4
4	5	6.8
5	2	2.7
6	9	12.3
7	2	2.7
8	5	6.8
10	12	16.4
11	1	1.4
12	8	11.0
14	1	1.4
15	2	2.7
16	5	6.8
20	3	4.1
25	1	1.4
40	1	1.4
I would continue to use this area regardless of the number of other groups seen.	14	19.2

Mean =10.5

Median =10.0

Q4D What is the maximum number of other groups seen that the National Park Service should allow in this area? In other words, at what point should visitors be restricted from hiking in this area? If the number of groups should not be restricted, you may indicate that.

	Frequency	Percent
4	2	2.8
5	2	2.8
6	8	11.3
7	1	1.4
8	6	8.5
10	14	19.7
11	1	1.4
12	7	9.9
14	1	1.4
15	1	1.4
16	2	2.8
17	1	1.4
20	6	8.5
25	2	2.8
30	1	1.4
35	1	1.4
130	1	1.4
The number of groups in this area should not be restricted.	14	19.7

Mean =14.0

Median = 10.0

Q4E What is the approximate number of groups you saw today while hiking in this area?		
	Frequency	Percent
0	1	1.4
1	4	5.7
2	17	24.3
3	10	14.3
4	9	12.9
5	7	10.0
6	6	8.6
7	3	4.3
8	4	5.7
10	1	1.4
12	3	4.3
14	1	1.4
20	1	1.4
30	1	1.4
40	2	2.9

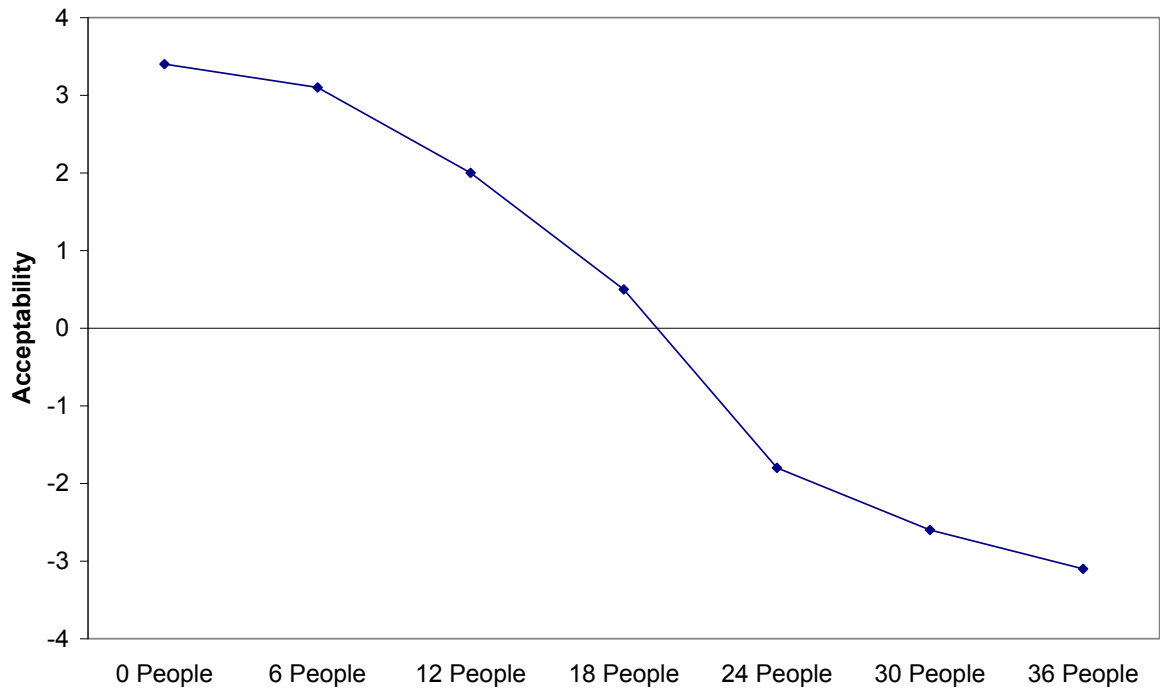
Mean =6.0 Median = 4.0

Q4: Summary Table		
	Mean	Median
Acceptability	7.5	
Preference	4.0	3.0
Displacement	10.5	10.0
Management Action	14.0	10.0
Typically Seen	6.0	4.0

Q5 How crowded did you feel between the head of the Virgin River Narrows and Orderville Canyon?		
	Frequency	Percent
1 (Not at all crowded)	31	41.3
2	19	25.3
3	6	8.0
4	7	9.3
5	1	1.3
6	5	6.7
7	5	6.7
8	1	1.3
9 (Extremely crowded)	0	0.0

Mean =2.6 Median = 2.0

Social Norm Curve for Number of Other People Seen



Q6A1 We would like to know how many other people you think it is acceptable to see on the section of Virgin River Narrows from Orderville Canyon to the beginning of the paved trail. To help judge this, we have a series of photographs that show different numbers of people in this area. (Please look at the photographs in Panel A.) Please rate each photograph by indicating how acceptable you find it based on the number of people shown. A rating of “-4” means the number of people is very unacceptable, and a rating of “+4” means the number of people is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
Photo 1 (0)	4.4	0.0	1.5	0.0	1.5	0.0	2.9	4.4	85.3	3.4
Photo 2 (6)	1.5	0.0	1.5	0.0	3.0	4.5	10.4	26.9	52.2	3.1
Photo 3 (12)	0.0	0.0	4.5	1.5	10.4	19.4	22.4	19.4	22.4	2.0
Photo 4 (18)	4.4	5.9	11.8	11.8	13.2	17.6	10.3	16.2	8.8	0.5
Photo 5 (24)	40.3	9.0	10.4	13.4	7.5	6.0	4.5	4.5	4.5	-1.8
Photo 6 (30)	53.7	11.9	17.9	3.0	3.0	0.0	4.5	3.0	3.0	-2.6
Photo 7 (36)	76.1	6.0	4.5	1.5	3.0	0.0	3.0	4.5	1.5	-3.1

Q6B Which photograph shows the number of people that you would prefer to see in this area?

	Frequency	Percent
Photo 1 (0)	21	32.3
Photo 2 (6)	17	26.2
Photo 3 (12)	15	23.1
Photo 4 (18)	10	15.4
Photo 5 (24)	1	1.5
Photo 6 (30)	1	1.5
Photo 7 (36)	0	0.0

Mean =7.9 People

Q6C Which photograph shows the number of people that is so unacceptable that you would no longer hike in this area? If none of the photographs represent this condition, you may indicate that.

	Frequency	Percent
Photo 1 (0)	0	0.0
Photo 2 (6)	0	0.0
Photo 3 (12)	2	2.9
Photo 4 (18)	13	19.1
Photo 5 (24)	21	30.9
Photo 6 (30)	8	11.8
Photo 7 (36)	12	17.6
None of the photographs are so unacceptable that I would no longer hike in this area.	12	17.6

Mean =25.6 People

Q6D Which photograph shows the highest number of people that the National Park Service should allow in this area? In other words, at what point should people be restricted from using this area? If visitor use should not be restricted at any point represented in the photographs, or not restricted at all, you may indicate that.

	Frequency	Percent
Photo 1 (0)	0	0.0
Photo 2 (6)	2	2.9
Photo 3 (12)	7	10.1
Photo 4 (18)	21	30.4
Photo 5 (24)	11	15.9
Photo 6 (30)	8	11.6
Photo 7 (36)	6	8.7
None of the photographs show enough hikers to restrict people from hiking in this area.	4	5.8
The number of people hiking this trail should not be restricted.	10	14.5

Mean =21.6 People

Q6E Which photograph looks most like the number of hikers you typically saw today in this area?

	Frequency	Percent
Photo 1 (0)	3	4.6
Photo 2 (6)	8	12.3
Photo 3 (12)	20	30.8
Photo 4 (18)	20	30.8
Photo 5 (24)	8	12.3
Photo 6 (30)	5	7.7
Photo 7 (36)	1	1.5

Mean =15.6 People

Q6: Summary Table

	Mean
Acceptability	19.3
Preference	7.9
Displacement	25.6
Management Action	21.6
Typically Seen	15.6

Q7 How crowded did you feel between Orderville Canyon and the beginning of the paved trail?

	Frequency	Percent
1 (Not at all crowded)	6	8.1
2	12	16.2
3	7	9.5
4	10	13.5
5	7	9.5
6	6	8.1
7	12	16.2
8	10	13.5
9 (Extremely crowded)	4	5.4

Mean = 4.9

Q8 We are interested in the type of management you think is appropriate in the Virgin River Narrows. Please indicate the degree to which you support or oppose the following management actions for this area.

	Strongly oppose (1)	Oppose (2)	Support (3)	Strongly support (4)	Don't Know	Mean
Restrict visitor use through a permit system to <i>ensure opportunities for solitude</i>	9.6	17.8	35.6	34.2	2.7	3.0
Restrict visitor use through a permit system to <i>protect natural resources</i>	4.0	12.0	34.7	45.3	4.0	3.3
Implement short-term area closures <i>for the protection of sensitive resources</i>	14.1	21.1	38.0	21.1	5.6	2.7

ZION DAY USE (PERMITTED) CANYONS – 2003

Purpose:

- Collect baseline data on visitor use and users
- Determine Visitor standards of quality for the visitor experience
- Measure visitor attitudes about selected management actions

Methods:

- Mail-back surveys of a representative sample of 169 visitors (65% response rate) who received a permit for day use of selected canyons requiring a permit during the summer and fall of 2003.

Findings:

- Data on group size and type, state or country of residence, and socio-demographic information are presented in the tables below.
- The results of several close-ended questions designed to establish standards of quality for trail encounters, resource impacts, and appropriateness of different management actions are shown in the tables below.

**Zion National Park Backcountry Visitor Survey 2003
Canyoneering (Mail-back Survey)**

Q1 How many people are in your group today?		
	Frequency	Percent
1	4	2.4
2	53	31.5
3	39	23.2
4	19	11.3
5	16	9.5
6	10	6.0
7	3	1.8
8	2	1.2
9	4	2.4
10	10	6.0
11	1	0.6
12	7	4.2

Mean = 4.2

Median = 3.0

Q2 Which of the following best describes your group?		
	Frequency	Percent
Family	50	29.9
Friends	76	45.5
Family and friends	32	19.2
Organized group	5	3.0
Other	4	2.4

Q3A Do you live in the United States?		
	Frequency	Percent
Yes	162	97.0
No	5	3.0

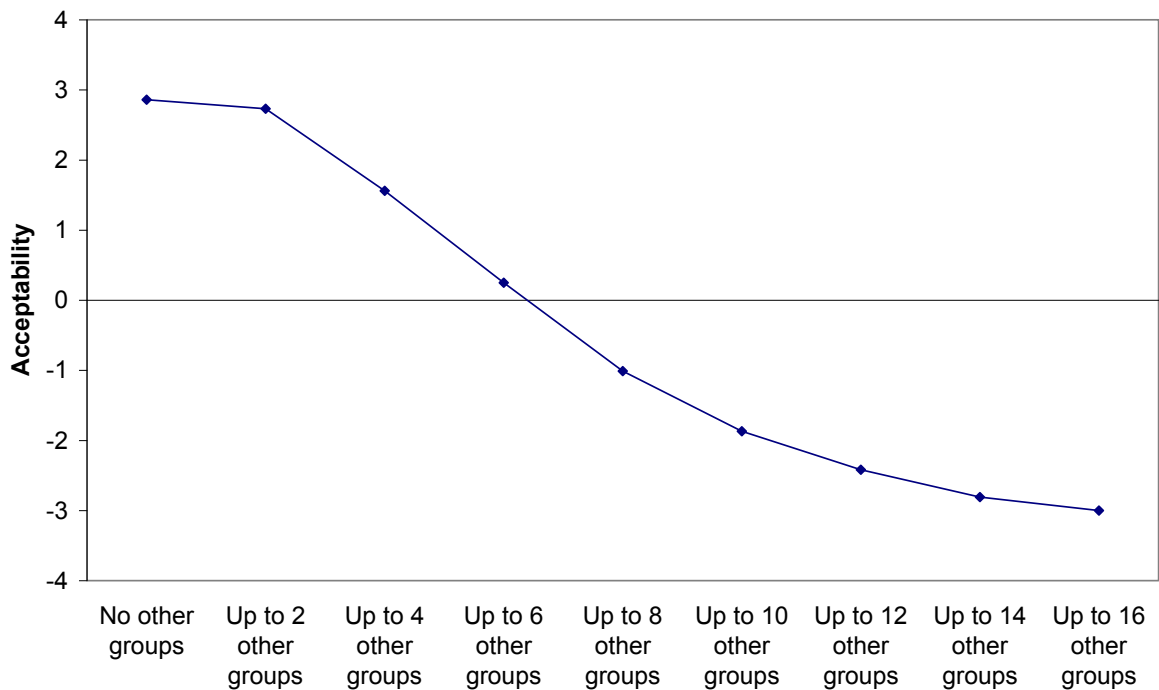
Q3B If yes, which state do you live in?		
	Frequency	Percent
Alaska	1	0.7
Arizona	4	2.7
California	17	11.3
Colorado	6	4.0
Florida	1	0.7
Idaho	2	1.3
Illinois	4	2.7
Indiana	1	0.7
Kansas	1	0.7
Massachusetts	3	2.0
Michigan	3	2.0
Minnesota	2	1.3
Missouri	1	0.7
Montana	2	1.3
Nevada	4	2.7
New York	1	0.7
North Carolina	1	0.7
Oregon	2	1.3
South Carolina	1	0.7
Tennessee	1	0.7
Texas	3	2.0
Utah	86	57.3
Washington	2	1.3
Wisconsin	1	0.7

Q3C If no, what country do you live in?		
	Frequency	Percent
Korea	1	16.7
Canada	2	33.3
Germany	2	33.3
England	1	16.7

Q4A1 We would like to know how many groups you think could use the canyon for which you obtained a permit without it being too crowded. How many other groups do you think it is acceptable to see and/or hear in the canyon for which you received a permit? Please rate the acceptability of each of the following numbers of other groups seen and/or heard in this canyon. A rating of “-4” means the number of other groups seen/heard is very unacceptable, and a rating of “+4” means the number of other groups seen/heard is very acceptable.

	-4	-3	-2	-1	0	1	2	3	4	Mean
No other groups	7.1	1.3	1.3	0.0	6.5	1.3	3.9	2.6	76.1	2.86
Up to 2 other groups	4.5	0.6	0.0	0.6	7.0	3.8	9.6	25.5	48.4	2.73
Up to 4 other groups	7.2	2.6	3.9	4.6	11.8	5.9	22.2	12.4	29.4	1.56
Up to 6 other groups	17.5	4.5	7.1	10.4	11.7	9.7	12.3	7.8	18.8	0.25
Up to 8 other groups	31.1	7.9	9.9	7.9	14.6	7.3	6.6	3.3	11.3	-1.01
Up to 10 other groups	46.7	10.7	7.3	8.0	8.7	4.0	3.3	2.0	9.3	-1.87
Up to 12 other groups	57.0	10.6	6.6	6.0	5.3	6.0	1.3	1.3	6.0	-2.42
Up to 14 other groups	68.4	7.2	7.2	1.3	6.6	1.3	0.7	1.3	5.9	-2.81
Up to 16 other groups	77.0	3.3	3.3	3.3	5.3	0.7	0.7	0.7	5.9	-3.00

Social Norm Curve for Acceptability of Other Groups Seen/Heard



Q4B What is the number of other groups that you would prefer to see/hear?

	Frequency	Percent
0	30	22.1
1	14	10.3
2	31	22.8
3	11	8.1
4	23	16.9
5	4	2.9
6	13	9.6
7	2	1.5
8	1	0.7
10	3	2.2
12	1	0.7
14	1	0.7
15	1	0.7
100	1	0.7

Mean =3.6

Median = 2.0

Q4C What is the maximum number of other groups that you think you could see/hear before you would no longer use this canyon? If you would continue to use this canyon regardless of the number of other groups seen/heard, you may indicate that.

	Frequency	Percent
2	7	4.5
3	5	3.2
4	17	10.8
5	7	4.5
6	16	10.2
7	3	1.9
8	12	7.6
10	27	17.2
12	7	4.5
14	3	1.9
15	2	1.3
16	2	1.3
17	1	0.6
20	6	3.8
25	2	1.3
30	1	0.6
I would continue to use this area regardless of the number of other groups seen/heard.	39	24.8

Mean =8.6

Median = 8.0

Q4D What is the maximum number of other groups seen/heard that the National Park Service should allow in this canyon? In other words, at what point should visitors be restricted from using this canyon? If the number of groups should not be restricted, you may indicate that.

	Frequency	Percent
1	3	2.1
2	4	2.8
3	7	4.9
4	15	10.4
5	7	4.9
6	18	12.5
7	2	1.4
8	11	7.6
9	3	2.1
10	25	17.4
12	15	10.4
14	3	2.1
15	5	3.5
20	6	4.2
30	3	2.1
50	2	1.4
The number of groups in this canyon should not be restricted.	15	10.4

Mean =9.5

Median = 8.0

Q4E What is the approximate number of other groups you saw and/or heard today in this canyon?

	Frequency	Percent
0	34	21.8
1	35	22.4
2	20	12.8
3	23	14.7
4	16	10.3
5	8	5.1
6	8	5.1
7	1	0.6
8	4	2.6
10	3	1.9
12	2	1.3
20	2	1.3

Mean =2.8

Median = 2.0

Q4: Summary Table		
	Mean	Median
Acceptability	6.4	
Preference	3.6	2.0
Displacement	8.6	8.0
Management Action	9.5	8.0
Typically Seen/Heard	2.8	2.0

Q5 How crowded did you feel in this canyon today?		
	Frequency	Percent
1 (Not at all crowded)	95	59.0
2	33	20.5
3	16	9.9
4	6	3.7
5	2	1.2
6	4	2.5
7	4	2.5
8	1	0.6
9 (Extremely crowded)	0	0.0

Mean = 1.9 Median = 1.0

Q6 Please indicate the degree to which you support or oppose the following management actions for this canyon.						
	Strongly oppose (1)	Oppose (2)	Support (3)	Strongly support (4)	Don't Know	Mean
Restrict visitor use through a permit system to ensure opportunities for solitude	9.1	14.5	37.6	37.6	1.2	3.1
Restrict visitor use through a permit system to protect natural resources	4.8	4.8	42.4	47.9	0.0	3.3
Implement short-term area closures for the protection of sensitive resources	13.4	21.3	34.1	28.7	2.4	2.8
Install artificial anchors to avoid creation of paths around the small obstacles to movement up and down the canyon.	10.4	20.2	41.7	19.6	8.0	2.8