

VISITOR PERCEPTIONS OF CROWDING: AN EXPLORATORY STUDY IN THE MOHONK PRESERVE

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Abstract

The Mohonk Preserve is New York State's largest member and visitor supported nature preserve with over 9,000 members and 150,000 visitors annually. The Preserve has experienced a slow and steady increase of visitors since the 1950s and in response to this increasing use and resource impacts, the Preserve developed a land management plan in 2000, which organized the Preserve into 11 units based on high and low visitor use. The purpose of this research was to identify visitor perceptions of crowding. Visitors were contacted in both high and low use areas of the Preserve to participate in an on-site study which included a field-based interview followed by a visual preference survey showing photographs of varying levels of usage on trails and carriage roads. Results indicated that almost half of respondents perceived crowded conditions at the Preserve. Respondents also indicated they had an awareness of temporal and spatial factors contributing to crowding within the Preserve.

1.0 Introduction

The Mohonk Preserve provides a wealth of recreation opportunities for its members and visitors including rock climbing, hiking, biking, cross-country skiing, snow shoeing, and horseback riding 365 days a year, as well as, a multitude of environmental education programs held at the visitor center and throughout the Preserve. The Shawangunk Mountains or "Gunks", as referred to by locals, are considered one of the premier rock climbing areas in the Northeast as 50,000 climbers annually take advantage of over 5 linear miles of cliff face and access to 1,000 climbing routes. In addition to its spectacular rock climbing, the Preserve maintains an extensive system

of some 40 miles of foot trails and 32 miles of carriage roads. Adding to the Preserve's extensive trail system are two neighbors: the 12,000-acre Minnewaska State Park with annual visitation of 250,000 and 56 miles of hiking opportunities and 25 miles of biking opportunities; and the 2,200-acre Mohonk Mountain House with more than 100,000 overnight guests, 50,000 day visitors (participating in meals or events) annually, and 85 miles of trails and carriage roads. Visitors paying to access any one of the sites have free access to the other two.

Based on its mission, two of the main objectives of the Mohonk Preserve are providing for contemplation, recreation, and visitor use in keeping with the peace and natural beauty of the land and promoting a concerned understanding of the relationship between humans and nature. As visitor numbers to the Preserve have steadily increased over that last few decades, this objective has become increasingly difficult to meet. During the 1950s only 50 climbers visited the Preserve per day while today that number has grown to 500-800 climbers per day. Parking lots at the Preserve, Minnewaska State Park, and the Mohonk Mountain House are typically full by mid-morning and on most weekends and holidays with good weather. These increasing use levels strongly suggest that visitors to the Preserve are being forced to alter the times and places they are recreating at the Preserve and in surrounding areas.

Within less than a 6-hour drive of 20 million people and located in the fastest growing county in New York, the Mohonk Preserve has experienced a slow and steady increase of visitors since the 1950s. Some areas of the Preserve have remained relatively unimpacted, while others such as the Trapps Zone have shown dramatic increases in visitation and use. In response to increasing use and impacts, the Preserve developed a land management plan in 2000, which organized the Preserve into 11 units based on low and high use. The perceptions of Preserve staff are that some of the low use areas are receiving a tremendous amount of visitation, no longer retaining a low use atmosphere.

Research has shown that even as visitation and use increases in many recreation settings, visitors continue to report having a satisfying recreational experience (Manning 1999). The question then is; how are visitors coping with these increases and conditions and what can the Preserve do to lessen these? Visitors to the Preserve who experience crowded parking lots, trails, and carriage roads on weekends may decide to visit the Preserve during the week, recreate in a lesser used area of the Preserve, or leave the Preserve entirely and pursue recreation experiences elsewhere. Preserve visitors may also rationalize their experience with crowded conditions based on the amount of time and money invested in their recreation pursuits. Visitors may also redefine their recreation experience at the Preserve based on the perceived conditions they experience. It is most likely that Preserve visitors are employing one or more of these coping mechanisms in order to maintain a satisfying experience at the Preserve.

Crowding has not only become a major concern of recreation managers, but visitors alike (Manning 1999). It is defined as the negative evaluation of a particular density in a particular setting that exceeds a certain point. Density refers to the number of individuals per unit area (Heberlein 1977; Shelby & Heberlein 1986). Empirical and theoretical studies have shown that significant numbers of visitors to outdoor recreation sites have experienced crowding although it is a difficult entity to measure, as it is not only subjective, but situation specific (Shelby & Heberlein 1986). Early satisfaction models based on the assumed inverse relationship between use level and satisfaction where “increased use causes decreased satisfaction” have yielded mixed results. Researchers and theorists have further suggested that users possess expectations about the kinds of experiences they desire and the amount of social interaction they seek (Stankey 1989). In order to meet those goals, users employ a variety of coping mechanisms to reduce perceptions of crowding (Manning 1999; Stankey 1989; Shelby & Heberlein 1986).

The purpose of the study was to identify variables Mohonk Preserve visitors associate as contributors to their perceptions of crowding and the extent to

which they are employing coping mechanisms to avoid that crowding. In addition, the research focused on identifying implications and recommendations for management strategies associated with crowding and social carrying capacities that can be applied to the Preserve’s Land Management Plan. This paper will examine perceptions of crowding and briefly touch on coping mechanisms employed.

2.0 Methods

The majority of research focused on perceptions of crowding and coping mechanisms has used traditional quantitative research methods, yielding mixed results (Stewart & Cole 1999). As the goals of this study seek to examine perceptions of crowding, coping mechanisms, and social carrying capacity issues; it is based on the positivist approach (seeking the facts or causes of social phenomena apart from the subjective states of individuals) and employs both qualitative and quantitative data collection and analysis techniques (Taylor & Bogdon 1998). This mixed-method approach included in-depth interviews and post interview surveys, based on the Johnson (2001) protocol, which included a series of visual preference photographs based on the Choi (2002) protocol and examples from Manning et al. (1999) as the later examined carriage roads, similar to those found at the Preserve.

Data was collected on-site at multiple locations of the Mohonk Preserve. The sampling protocol was determined through discussions with Preserve staff and SUNY ESF advisors, and included four perceived types of environments based on the Preserve’s land management plan: Group 2 areas (front-country/high use) that are perceived to receive high use; Group 2 areas that are perceived to receive low use; Group 1 areas (backcountry/low use) that are perceived to receive low use; Group 1 areas that are perceived to receive high use.

Interviews were structured with a series of standardized questions in order to provide consistency over the summer-long interviewing process. Interviews allowed participants to further explain their answers and reduce possibilities for misunderstanding between the researcher and participant. The semi-structured

design allowed for follow-up questions, based on the participant responses, in order to gather more detailed information. The interviews were intended to provide a better understanding of visitor perceptions of crowding and types of coping mechanisms employed, as respondents were able to comment on their present recreational experience as opposed to speculating on a past experience through a mail survey. Issues that were addressed included: location visiting from; past recreation experiences at the Preserve; expectations for recreation experience at the Preserve; experiences with crowding; perception of crowding; reactions to crowding; and coping mechanisms employed.

After initial contact with the recreationist, the study and researcher were briefly introduced, but limiting any detailed information about the project in order not to bias responses. After oral consent was obtained from the participant to be interviewed and have the interview recorded, a set of 19 standard questions were asked.

In order to determine if the respondent had any perceptions of crowding at the Preserve, a series of probing, questions were asked. Initial questions focused on Preserve experience including when, where, and how often did the respondent use particular areas of the Preserve. Following questions examined the respondents ideal area in the Preserve and if there are certain areas in the Preserve that the respondent no longer uses and why. At this point respondents were asked: "Have you ever felt crowded in an area of the Preserve and if so, what did you do about it?" Respondents were also asked to identify factors they consider when deciding a trip to the Preserve was ideal or not and if that definition of an ideal trip had ever changed and why. Based on each respondent's answers, qualitative analysis was used to determine each respondent's perceptions of crowding.

Interviews were concluded with a short survey, based on the Choi (2002) protocol, where participants were asked to rate a series of photographs, based on specific attributes of visitor use, showing a range of Preserve users in both number and type. The survey asked the participant to rate two series of photographs based on issues of preference, crowding, coping, and management. Each series contained four photographs of a specific

type of recreationist varying in number and density. The photographs in each series were taken from the same perspective and only varied in the number and type of recreationists shown. Series 1 represented a typical carriage road in a Group 2 area (front-country). The photograph was taken in the Trapps area, which is considered the most popular and crowded in the Preserve and is definitely perceived as having high use. Series 2 represented a typical trail in a Group 1 area (backcountry). The photograph was taken on the High Peters Kill trail and although this area is designated as a low use area, it is a fairly popular hiking trail that leads to the small climbing area of Lost City and eventually Minnewaska State Park.

As a mixed-method study using both qualitative and quantitative methods, this study utilized two types of data analysis. In-depth interviews conducted at the Preserve were first transcribed and then coded, based on emerging themes. Each interview was then carefully read and analyzed multiple times. These themes and data based on the on-site, post interview survey were then analyzed quantitatively using the Statistical Package for the Social Sciences software (SPSS version 13 for Windows). Results were then cross-tabulated and analyzed.

3.0 Results and Discussion

Between June 2004 and October 2004, 105 Mohonk Preserve recreationists were contacted on 50 interviewing days. On five occasions recreationists declined to be interviewed as the common response was: "I'm in a rush." An additional four interviewees declined to take the post interview, visual preference survey after being interviewed, stating similar reasons, for a total of 100 useable interviews. The first 33 respondents received a prototype of the visual preference survey, which contained four series of photographs. This survey was later reduced to two series for the final 67 respondents.

Of the 100 recreationists interviewed, 79 were male and 21 were female. The age of respondents ranged from 19 to 66 with a mean age of approximately 39 years. The majority of respondents were either rock climbers (n=43) or hikers (n=34). An additional 19 respondents considered themselves a multi-sport recreationist.

Seventeen respondents were not residents of New York State and 39 were not members of the Preserve. The majority of respondents (80%) had at least one year of prior experience at the Preserve with 67 respondents visiting the Preserve more than two times a year. Visitation was fairly split between weekdays and weekends as 18 respondents listed weekdays as their primary days of visit, 36 listed weekends, and 33 listed a combination of both weekdays and weekends.

Of the 97 respondents who answered the specific question about crowding in the Preserve, 59 said they had felt crowded in the Preserve at one time or another, while 38 had not. In addition, eight respondents noted that they only felt crowded in the parking lots. When identifying contributing factors in regards to the idealness of a trip to the Preserve, 14 respondents listed solitude and quietness, seven listed available parking, and 22 listed crowdedness or lack of crowds. These results were consistent with two previous visitor surveys conducted at the Preserve. First, Giammatteo et al.'s 1999 telephone survey of 149 members which asked: "to what degree do crowds affect your experience on the land?" of which 29 percent of members felt crowds "highly" affected their visit, 34 percent felt crowds had a "moderately significant" affect, 19 percent felt crowds "slightly" affected their visit, and 18 percent felt crowding was "insignificant". Secondly, Jakus et al.'s 1995 visitor survey included both mailed questionnaires to random members (892 of 2,500 returned) and 398 on-site surveys. When asked about crowding, 50 percent of all users said most trails and carriage roads are crowded on weekends with 25 percent stating that the Preserve was occasionally crowded or the crowds were not that bad. An additional 25 percent of respondents indicated that they have never encountered crowded conditions.

Although this manuscript does not specifically focus on coping mechanisms, it is important to note that of the 100 respondents, 72 had used at least one type of coping mechanism, while 28 had not. When further examining the 28 respondents who did not make use of a coping mechanism, 10 were found to have felt either crowded in general, in the parking lot, or mentioned

Table 1.—Comparison of percentages between perceptions of crowding and Preserve experience.

Preserve experience		Perceptions of crowding	
		No	Yes
	N	10	23
6+ years experience	% within perceptions of crowding	35.7%	59.0%
	N	18	16
<1-5 years experience	% within perceptions of crowding	64.3%	41.0%
	N	28	39
Total	% within perceptions of crowding	100.0%	100.0%

crowding as an important contributing factor to their Preserve experience. Cross-tabulations also provided some interesting results when looking at respondent's answers in regards to perceptions of crowding and whether or not they were using coping mechanisms. Of the 59 respondents who perceived the Preserve to be crowded in some regards, 53 were using at least one type of coping mechanism, while only 19 of 38 respondents who did not perceive the Preserve as crowded employed a coping mechanism.

As with coping mechanisms, one might expect to find some variation in perceptions of crowding in regards to Preserve experience, residency, frequency of visitation, specific days of visitation, type of recreationist, and for different recreation areas of the Preserve.

3.1 Preserve Experience

Those Preserve recreationists who have been recreating in the Preserve for multiple years appear to be more conscious of crowded conditions, thus perceiving crowded conditions more frequently than recreationists with none or minimal experience at the Preserve (Table 1). Chi-square results were 3.53 with 1 degree of freedom and were not significant with $p=0.60$ at α level=0.05.

3.2 Residency

As with Preserve experience it was theorized that Preserve visitors living in close proximity to the Preserve would frequent the Preserve more often than individuals

living substantial distances from the Preserve and again be more conscious of crowded conditions at the Preserve (Table 2). Chi-square results were 2.30 with 2 degrees of freedom and were not significant with $p=0.32$ at alpha level=0.05.

3.3 Days of Visitation

Respondents were asked to identify whether they primarily visit the Preserve on weekdays, weekends, or a combination of the two. Findings were very similar in terms of weekday and weekend users in terms of perceptions of crowding. However, those respondents who indicated that they visited the Preserve on both weekdays and weekends indicated more frequently that they perceived crowded conditions as compared to weekday and weekend users (Table 3). Chi-square results were 2.75 with 2 degrees of freedom and were not significant with $p=0.25$ at alpha level=0.05.

3.4 Type of Recreationist

Preserve estimates are that 50,000 rock climbers, hikers, and bikers respectively recreate in the Preserve per year. Rock climbing in the Preserve is limited to one main area called the Trapps, a secondary area in the Near Trapps, and a small back country area called Lost City. The first two are located in the Trapps management zone, the most heavily visited zone in the Preserve receiving approximately 70 percent of the overall use. As hiking and biking trails and carriage roads are spread throughout the Preserve and rock climbing is limited to a few areas, it was theorized that rock climbers would have greater perceptions of crowding than other types of recreationists (Table 4). Chi-square results were 20.68 with 2 degrees of freedom and were significant with $p=0.00$ at alpha level=0.05.

4.0 Visual Preference Photos

The following are the visual preference photos that were used in the post-interview survey (Fig. 1). Participants were asked to rate a series of photographs, based on

Table 2.—Comparison of percentages between perceptions of crowding and residency.

Residency		Perceptions of Crowding	
		No	Yes
	N	12	26
1-30 miles from Preserve	% within perceptions of crowding	31.6%	44.1%
	N	17	25
>30 miles from Preserve (NYS)	% within perceptions of crowding	44.7%	42.4%
	N	9	8
Non-NYS resident	% within perceptions of crowding	23.7%	13.6%
	N	38	59
Total	% within perceptions of crowding	100.0%	100.0%

Table 3.—Comparison of percentages between perceptions of crowding and predominant days of visit to the Preserve.

Days of Visit		Perceptions of crowding	
		No	Yes
	N	7	11
Weekdays	% within perceptions of crowding	23.3%	19.6%
	N	15	20
Weekends	% within perceptions of crowding	50.0%	35.7%
	N	8	25
Mix (weekends & weekdays)	% within perceptions of crowding	26.7%	44.6%
	N	30	56
Total	% within perceptions of crowding	100.0%	100.0%

specific attributes of visitor use, showing a range of Preserve users in both number and type. The survey asked the participant to rate two series of photographs, with each series containing four photographs of a specific type of recreationist varying in number and density. Series 1 represented a typical carriage road in a Group 2 area (front-country). Series 2 represented a typical trail in a Group 1 area (backcountry).

The first question respondents were asked for the visual preference survey was: “Which photograph shows the highest amount of visitor use that you would prefer to see on the sections of carriage roads and trails?” Of the 67 responses to this question for Series 1, 41 individuals selected photo #1 and 17 selected photo #2 (Table 4). For Series 2, 53 of 67 selected photo #1 with 11 selecting photo #2 (Table 4).

The second question respondents were asked for the visual preference survey was: “Which photograph shows the highest amount of visitor use that you think most other visitors would find acceptable to see on these sections of carriage roads and trails?” These results were practically identical to the results in Table 5.

The third question respondents were asked for the visual preference survey was: “Which photograph shows the amount of visitor use that is so unacceptable that you would no longer use the carriage roads and/or trails or would shift your use of the carriage roads and/or trails to a different location or time?” Of the 67 respondents to this question for Series 1, 21 individuals selected photo #4, 14 selected photo #3 while 30 were unable to make a decision (Table 6). For Series 2, 13 of 67 selected photo #1, 22 selected photo #2 while 22 were unable to make a decision (Table 6).

The final question respondents were asked for the visual preference survey was: “Which photograph shows the highest amount of visitor use that the Preserve should allow on these sections of carriage roads and trails? In other words, at what point should carriage roads and/or trails be closed or visitor use restricted?” Of the 67 respondents to this question for Series 1, 12 individuals selected photo #4, 11 selected photo #3 while 41

Table 4.—Comparison of percentages between perceptions of crowding and type of recreationist.

Type of Recreationist		Perceptions of crowding	
		No	Yes
	N		
Rock climber	% within perceptions of crowding	7 18.4%	35 59.3%
	N		
Hiker	% within perceptions of crowding	22 57.9%	10 16.9%
	N		
Mix (multiple recreation activities) & others	% within perceptions of crowding	9 23.7%	14 23.7%
	N		
Total	% within perceptions of crowding	38 100.0%	59 100.0%

Table 5. Frequency of user preferences for photos in Figure 1 and 2.

Series 1 - Carriage Roads			Series 2 - Trails		
Selection	Frequency	Percent	Selection	Frequency	Percent
Scenario #1	41	61.2%	Scenario #1	53	79.1%
Scenario #2	17	25.4%	Scenario #2	11	16.4%
Scenario #3	6	9.0%	Scenario #3	1	1.5%
Scenario #4	1	1.5%	Scenario #4	0	0.0%
No selection	2	3.0%	No selection	2	3.0%
Total	67	100.0%	Total	67	100.0%

respondents were unable to make a decision (Table 7). For Series 2, 12 of 67 selected photo #4, 14 selected photo #3 while 34 individuals could not make a decision (Table 7).

5.0 Study Implications

With over 50 percent of respondents indicating they had perceived crowded conditions at the Preserve, coupled with the fact that the majority of those respondents who indicated perceiving crowded conditions had made use of coping mechanisms, this indicates a relationship between perceptions of crowding and coping as expected. Although a large percentage of Preserve visitors do in fact perceive the Preserve to be crowded, particularly on weekends and holidays, most continue to visit



Scenario 1



Scenario 2



Scenario 3



Scenario 4

Figure 1.—Carriage Roads in High-Use Areas/Front Country Areas

regardless and are employing a number of coping mechanisms in response to dissatisfying conditions such as crowded parking lots, trails, cliffs, and carriage roads. More experienced visitors were more aware of crowded conditions as were those respondents who lived in close proximity to the Preserve. These visitor groups had more experience at the Preserve and frequently visited the Preserve, thus exposing them to a large and diverse range of social situations at the Preserve. Similarly, rock climbers perceived crowded conditions more than hikers as climbers are confined to particular cliffs typically located in the most heavily used area of the Preserve while hikers have access to numerous trails and carriage roads throughout the Preserve.

Visual preference photographs provided insight into levels of use visitors preferred and what use levels

would displace them from trails and carriage roads. The photographs did lend themselves to some confusion in regard to visitor comprehension of use levels and seemed to be more applicable to destination type settings, such as lookouts or campgrounds. Some respondents were cognoscente that use levels on carriage roads and trails typically fluctuate and are not constant. Use levels may be heavy in certain areas, particularly near trailheads or points of interest, and then tail off in other sections. In this study, photographs of carriage roads provided a more realistic look at use levels in particular, due to the location of the photographs, as opposed to trails. Photographs were taken in the popular climbing area of the Trapps where cliffs are typically accessed directly from carriage roads. On busy weekends sections of this carriage road are extremely crowded with climbers, hikers, and bikers. Thus conclusions would be that visual preference



Scenario 1



Scenario 2



Scenario 3



Scenario 4

Figure 2.—Trails in Low-Use Areas/Back Country Areas

photograph surveys are more useful in high-use areas that see significant amounts of visitors as opposed to infrequently visited areas such as back country trails.

Results of this study support conclusions from other researchers and studies that although recreationists may be satisfied with their recreational experiences, they do perceive crowded conditions and employ coping mechanisms to combat dissatisfying conditions. Differences in responses also vary significantly among demographics and specific recreation groups.

6.0 Acknowledgments

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7.0 Citations

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Table 6.—Frequency of users changing or halting use for photos in Figure 1 and 2.

Series 1 – Carriage Roads			Series 2 - Trails		
Selection	Frequency	Percent	Selection	Frequency	Percent
Scenario #1	0	0.0%	Scenario #1	0	0.0%
Scenario #2	2	3.0%	Scenario #2	10	14.9%
Scenario #3	14	20.9%	Scenario #3	22	32.8%
Scenario #4	21	31.3%	Scenario #4	13	19.4%
No selection	30	44.8%	No selection	22	32.8%
Total	67	100.0%	Total	67	100.0%

Table 7.—Frequency of user selections for restricting use for photos in Figure 1 and 2.

Series 1 – Carriage Roads			Series 2 - Trails		
Selection	Frequency	Percent	Selection	Frequency	Percent
Scenario #1	0	0.0%	Scenario #1	0	0.0%
Scenario #2	3	4.5%	Scenario #2	7	10.4%
Scenario #3	11	16.4%	Scenario #3	14	20.9%
Scenario #4	12	17.9%	Scenario #4	12	17.9%
No selection	41	61.2%	No selection	34	50.7%
Total	67	100.0%	Total	67	100.0%

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