

Sensing the Parks: The Importance of Sound, Smell, and Touch to Visitor Experience at Rocky Mountain National Park

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Background

The Wyoming Survey and Analysis Center (WYSAC) recently conducted a study of visitor satisfaction along the eastern boundary of Rocky Mountain National Park (RMNP or “Rocky”). This area is known as the Highway 7 corridor, because Colorado Highway 7 travels from Denver (only two hours southeast) up to the park’s several entrances. With a population of 2.5 million in the Denver metropolitan area, the human impact on the eastern side of the park is considerable. Douglas and Weld counties, two of Denver’s metropolitan counties, grew by 50.0% and 31.9%, respectively, from 2000 to 2006 (U.S. Census Bureau 2007). Moreover, Longs Peak, the only 14,000 foot peak in the park (and a non-technical climb), is primarily accessed from Highway 7. The number of hikers, as well as climbers, visiting this peak is increasing, causing congestion along the trail, and possibly degrading the visitor experience.

To explore the various aspects of the visitor experience in the park, a questionnaire was developed, with review by Park Service personnel. In addition to questions on satisfaction with visitor resources, questions were also asked regarding what visitors expected to experience via their senses while at RMNP, the number and length of visits to the park, and demographic information such as age, education, and ethnicity (WYSAC 2006).

Experiencing the senses

The National Park Service (NPS) operates under a continuing dilemma. It must both “conserve the scenery and the natural and historic objects and the wild life” within the national parks and at the same time “provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (National Park Service Act of 1916; see also Winks 1997). This dilemma is highlighted by at least three factors. First, the increasing U.S. population, especially in areas neighboring on park service land, means that open space is becoming scarce. Indeed when the Park Service was created in 1916, the U.S. population was only 101 million. In 2006, the U.S. population has grown to 298 million. Can a park that was visited by 52,000 people in 1915 (e.g., Yellowstone) provide the same experience as when visited by three million people in 2007? (See Manning and More 2002.)

Second, as we move further in time from our own historical experience of the “frontier,” the desire to retain as much of the natural settings within the parks may also increase (Stegner 1960). Many of the western parks especially provide an experience for their visitors of the western landscape before European settlement and transformation. The idea of west-

ward expansion and the icon of the frontiersman are important in the mythology and ideology of the American experience, especially as it contributes to our modern identities.

Finally, increasing demands for services and access, such as river boat tours and alpine trails, may degrade the wildlife and the space they occupy, as well as infringe on natural and archeological sites. As the NPS provides more access and services, some “taken for granted” resources are noticed just as they seem to be missing. These resources include the sound of the wilderness, the smell of the land, the dark night sky, and the sight of wildlife moving in forests. The recognition that the sights, smells, and sounds of the land are changing has led the Park Service to consider whether the sights, smells and sounds of nature are as much a part of the parks’ resources as artifacts, geological formations, and the flora and fauna.

Administering the questionnaire

Along the eastern border of RMNP and the Highway 7 corridor are three major entry points to the park. From north to south they are Lily Lake, Longs Peak, and Wild Basin. Lily Lake is directly on the highway and has a lake with trails on its western side; on the eastern side of the highway it has a visitor center open only seasonally; and a trail to Twin Sisters Peak (11,288 ft). The Longs Peak trailhead and campground are approximately one mile off the highway, and access is by a narrow steep road which passes a residential area and a music camp. Finally, Wild Basin entry is by dirt road from the highway, and has a ranger hut and kiosk about one and one-half miles into the area.

From October 2004 to October 2005, both volunteer and paid interviewers were stationed at either the parking lots or the trailheads into the areas. At Wild Basin during the winter, interviewers were encouraged to station themselves at the warming hut approximately one-half mile from the parking lot. The interviewers followed a schedule constructed by random drawing of times and days for each week, and were given instructions as to how to vary interviewee selection by gender, ethnicity and age, and the spacing of the visitors as they finished their hike or were returning to the parking lot. The interviewing took place face-to-face 2–3 times per week, in one of three time slots: 7–11 AM, 11–3 PM, and 3–7 PM. These times were compressed for the winter months, from 8 AM to 5 PM, but the interviewing continued for twelve full months. One interviewer even completed three interviews at Longs Peak on New Year’s Day. Approximately 1,371 visitors to RMNP were contacted for interviews, and 1,283 visitors completed the face-to-face interviews, yielding a completion rate of 93%.

The visitors to Rocky were asked a series of questions that focused on their satisfaction with park resources, including: roads into the areas, information about the park, parking, water, toilets, campgrounds, safety, and availability of personnel. There were 21 such questions total. Visitors were asked to rate their satisfaction with these resource items from “very dissatisfied” (scored 1) to “very satisfied” (scored 5). These items were then factor analyzed using SPSS software to determine the underlying dimensions of satisfaction with park resources. The reliability analyses suggested three dimensions to the resource variables. These included: satisfaction with park information, satisfaction with frontcountry park resources, and satisfaction with backcountry resources. The park information factor tapped

those items regarding information about the park and activities within the park including: information kiosks, availability of park personnel, and park programs. The frontcountry satisfaction factor was composed of questions regarding resources visitors used for short day trips: satisfaction with the roads into the area, parking, pedestrian safety in parking lots, picnic areas and facilities, restrooms, facilities for the disabled. Finally, the backcountry factor captured those items which were connected to longer hikes in the backcountry, either as starting points or as items dealing with the trails themselves and include: scenic road pull-offs, trail signs, developed trails, backcountry toilets, and water availability for hikers.

The items for each of these three scales were subjected to a statistical test known as Cronbach’s alpha. This measure, which varies from 0 to 1.0, assesses the extent to which the items are enough like each other to be used together in a scale. For the three scales, park information, frontcountry, and backcountry, the alpha level was .60, .64, and .62, respectively. These measures are considerably above the .5 mark which is generally recognized as a minimum alpha measure.

Investigating the importance of the senses

We report here the results of three questions on measuring the sense of smell, touch, and, especially, sound. The questions were stated as follows: “When you came to the park today, did you come with the expectation that you would notice the (smells, sounds, touch) of nature?” As further explanation, interviewers could prompt the respondents with comments such as: “that you could smell the trees or flowers”; “that you could hear birds or elk”; “that you could dip your feet into a stream or feel the snow crunch.” The answers on the expectation questions ranged from “Yes, I had hoped to” (scored 5 for analysis) to “No, and it doesn’t interest me even now” (scored 1).

First we provide an examination of the univariate distribution of expectations for smell, sound, and touch in Table 1.

Not surprisingly, most of the respondents had expected to smell and hear the life in the park. However, with respect to touch, visitors apparently had not anticipated the feel of nature. In casual conversations with respondents and other visitors, two comments prevailed regarding water and tree moss. Visitors reported that the stream water was colder than they had expected; and that the moss was “spongy” or rubbery.

A higher percentage of visitors expected to hear the park than to smell or touch the park. This is consistent with studies which report that smell has become an underutilized sense

Table 1. Distributions of responses to “When you came to the park today, did you come with the expectation that you would notice the (sounds, smells, touch) of nature?”

Responses (N=1264)	% Responding for each value of:		
	Smell	Sound	Touch
Yes, I was looking forward to it	75.6	86.0	39.2
Yes, and I was still surprised by it	3.7	3.8	4.0
Had not really thought about it	17.1	7.9	28.5
No, and I was completely surprised by it	2.1	1.7	21.8
No, and I don’t find it interesting even now	1.5	0.6	6.5

for humans in comparison to sight and sound (Porter et al. 2006). Moreover, when we computed a difference of means tests we found that the percent who responded that they were expecting to experience the park through sound was significantly different from the percent who expected to experience the park through smell or touch. The percent who expected to experience the park through touch was significantly different from the percent who expected to experience the park through smell or sound. And finally, the percent who expected to experience the park through smell was significantly different than the percent who expected to experience the park through sound or touch. This means that the percentages are tapping different expectations on the part of the park visitors.

That hearing the sounds of the park was expected by 86% of the visitors suggests how important the soundscape is to park visitors, and supports the initiative of the NPS to retain natural soundscapes wherever possible. Nearly 90% of the visitors expected to hear the sounds of the park. Comments on specific sounds mentioned included the wind in the trees (77.9%), the sound of streams (75.4%), the bird songs (74.1%), bugling elk (44.5%), coyote calls (34.7%), rain against the sides of a tent (26.7%), silence (23.9%), and the sounds of horses on the trails (15.7%).

As a further exploration of the role of sound in the visitor experience, we regressed the expectation of hearing the sounds of the park onto a number of predictor variables which could have an effect of one's desire to hear the park. These predictor variables include demographic characteristics: gender, education, ethnicity, and age. Also included were variables related to the other senses: the smell of the park, touch the park, and how crowded their experience of the park. Finally, we included whether the visitor had paid some type of access fee, and how many times the visitor had been to the park in the past year. The results are presented below in Table 2.

The regression analysis suggests that the typical variables important in social science research have no discernable effect on expectation to hear the park. Gender, education, eth-

Table 2. Regression of "hearing the sounds of the park," with predictor variables.

Predictor Variables	Unstandardized Coefficient (B)	Significance Level
Gender	.015	.769
Education	.007	.566
Ethnicity	-.070	.494
Age	.001	.509
Notice the smell	.232***	.000
Touch	.051*	.039
Number of trips	.012**	.010
Paid entrance fee	.157**	
R	.359	
* Statistically significant at the p<.05 level		
** Statistically significant at the p<.01 level		
*** Statistically significant at the p<.001 level		

nicity, and age were not significantly related to the expectation of hearing the sounds of the park. This suggests that sounds in the park are equally important across age, gender, and ethnic groups. The two sets of variables which were statistically related to hearing the sounds were the other sense variables and the measures of importance of the park to the visitor.

Those who expect to hear the sounds of the park may be more likely to equally expect to experience other senses in visiting the parks. The significance levels of .001 and .05 indicate that we would find the relationship of smell and sound in 999 of 1,000 times we measured. For touch, we would find this relationship in 19 times of 20 in which we measured.

Finally, the number of trips to the park in the past year, and whether the visitor had paid some type of entrance fee, were both significantly related to the expectation of hearing the sounds of the park. The more trips a visitor had made to the park in the past year, the more likely that individual was expecting to hear the sounds of the park. And the payment of an entrance fee was also positively related to the expectation of hearing the sounds of the park ($p < .003$). This may suggest that for those visitors for whom the park is worth paying the entrance fee, even though they were at sites which were seldom monitored for entrance fee payment, part of the reason to come to the park was to hear the sounds of nature.

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