NORMATIVE STANDARDS FOR WILDLIFE VIEWING IN PARKS AND PROTECTED AREAS

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Abstract.—With increasing public interest in wildlife watching, there is a need to develop methods to inform the management of high-quality viewing opportunities. In this study, normative methods using indicators and standards of quality were applied at a national park in Alaska and a wildlife refuge in New Hampshire. Four potential indicators of quality are identified that can be used to help define and manage wildlife viewing opportunities, and a range of potential standards of quality are developed for these indicator variables. In general, normative standards of visitors to the two study areas were salient and moderately to highly crystallized. Study findings indicate that visitors are currently experiencing high-quality wildlife viewing at both sites.

INTRODUCTION

In 2006, nearly a third of U.S. residents age 16 or older participated in some form of wildlife watching. Approximately 23 million people traveled a mile or more from home to view wildlife (National Fishing, Hunting and Wildlife Associated Recreation 2006). Nationwide, the activity increased 8 percent between 2001 and 2006, outstripping participation rates in hunting and fishing (Reed 2008). As public involvement grows, providing wildlife-viewing opportunities has become an increasingly important component of outdoor recreation planning and management.

Normative methods (i.e., indicators and standards of quality) provide one approach to understanding the components of satisfying wildlife viewing experiences. Indicators and standards are central to carrying-capacity frameworks that address questions about how many people and what types of activities parks can accommodate without creating unacceptable social and ecological changes. Indicators are defined as "measureable, manageable variables that help define the quality of parks and outdoor recreation areas and opportunities", while standards define "the minimum acceptable condition of indicator variables" (Manning 2007, p. 27).

Normative methods were applied to wildlife viewing in a study at Katmai National Park, Alaska. Visitors were asked to specify the acceptable number of people on bear-viewing platforms (Whittaker 1997). Results indicated that wildlife-viewing experiences could be maintained while increasing capacity through the addition of several small platforms, but not through the addition of a few large platforms. Two studies in Colorado asked residents to evaluate the acceptability of a range of management actions in response to the behaviors of three wildlife species. Normative standards varied based on the species type, animal behavior, and proposed management response (Whittmann et al 1998, Zinn and Manfredo 1998).

Good wildlife viewing indicators should be specific and related to human use; be sensitive to changes; occur over relatively short time periods; be compatible with management objectives; and be of importance to visitors, managers, and stakeholders (Manning 1999, Manfredo 2002). With these guidelines in mind, this paper reviews indicators and standards of wildlife viewing developed at a national park in Alaska and a wildlife refuge in New Hampshire.

2.0 METHODS

Data were collected at two diverse parks/protected areas: Lake Umbagog National Wildlife Refuge ("Lake Umbagog") in New Hampshire and Denali National Park and Preserve ("Denali") in Alaska. Established in 1992, Lake Umbagog provides important habitat for wetland species and migratory birds. Among the species living around the lake are bald eagles, common loons, great blue herons, hooded mergansers, and osprey. The refuge is a prime location for moose viewing (Lake Umbagog Area Chamber of Commerce, n.d.).

Visitors to Lake Umbagog were surveyed in 2006 and 2007 from July to August. Surveyors were stationed at the refuge's four primary access points during daylight hours on preselected random survey days. They approached each group as it left the refuge. The self-administered questionnaires included open- and close-ended questions about indicators and standards of quality at each location. One hundred ninety-seven questionnaires (77-percent response rate) were collected for the 2006 survey, which focused primarily on indicators. For the 2007 survey, which focused on standards, 193 questionnaires (76-percent response rate) were completed.

Among the many species of wildlife found at Denali National Park are moose, caribou, Dall sheep, wolves, and grizzly bears. Visitors reach the park, and views of wildlife, via the park's only road. At 91 miles in length, the Denali Park Road is accessible only by bus. Shuttle buses and interpretive bus tours are run by park concessionaires (Denali National Park and Preserve, n.d.).

Visitors to the Denali Park Road were surveyed in 2006 and 2007 from July to August. Data on indicators of quality were collected in 2006 through semi-structured qualitative interviews. One hundred twenty-six interviews and two focus-group sessions were recorded, transcribed, and analyzed to identify potential indicator variables. Data on standards of quality were collected the following year via self-administered questionnaires. Five types of bus users were targeted: those riding on general shuttle buses, camper shuttle buses, Kantishna Lodge buses, and two types of tour buses. Visitors were approached as they disembarked from buses during normal times of return. Seven hundred and seven questionnaires (78-percent response rate) were completed.

3.0 RESULTS

3.1 Lake Umbagog Indicators and Standards

Wildlife viewing emerged as an important indicator of quality at Lake Umbagog. In an open-ended question about the three things participants most enjoyed about their visit to the refuge, they most often mentioned interactions with wildlife, eagles, loons, and fish (22 percent of respondents), ahead of the recreational activity participated in (21 percent of respondents), the quiet, tranquil, and relaxing atmosphere of the refuge (13 percent), and the natural environment and scenery (13 percent). Regarding activities participated in, more than 85 percent of visitors spent time viewing loons, ducks, eagles, and other birds on or near the water (88 percent in 2007), while 52 percent spent time photographing wildlife (44 percent in 2007), and 34 percent watched moose (73 percent in 2007). Visitors considered these activities to be moderately to extremely important (Table 1). When given a list of 12 potential items that could be important to determining the quality of their experience at the refuge, visitors evaluated the two items related to wildlife the most highly (Table 2). Visitors were asked about the minimum acceptable percentage of visitors who would get to see species identified as important indicators. Standards for wildlife viewing ranged from 43.8 percent (SD=33.7) for moose to 50.6 percent (SD=33.7) for ospreys, 51.5 percent (SD=34.6) for eagles, 61.7 percent (SD=34.1) for loons, and 67.8 percent (SD=32.4) for other waterfowl.

3.2 Denali Indicators and Standards

Wildlife viewing also emerged as an important indicator of quality along the Denali Park Road. When asked to list the three things most enjoyed about their trip along the road, interviewees most frequently mentioned wildlife (69 percent of 126 participants), followed by scenery and mountains (66 percent), and information provided by the bus driver (39 percent). When visitors were asked what they expected their trip along the road would be like, seeing plenty of wildlife (18 percent) or seeing more wildlife than they actually saw (27 percent) were the most

Table 1.—Importance of wildlife-viewing activities to Lake Umbagog visitors

Activity	Importance				
	Not at all Important (%)	Somewhat Important (%)	Moderately Important (%)	Extremely Important (%)	Mean
Viewing loons, ducks, eagles, ospreys, and other birds on or near the water	0.6	6.9	26.9	65.7	3.6
Viewing moose	6.3	13.9	29.1	50.6	3.2
Wildlife photography opportunities	4.7	10.4	29.2	55.7	3.4

Table 2.—Importance of activities in determining the quality of Lake Umbagog visitor experience

Activity	Importance				
	Not at all Important (%)	Somewhat Important (%)	Moderately Important (%)	Extremely Important (%)	Mean
Seeing wildlife	4.0	7.6	21.2	67.2	3.52
Visitors disturbing loons, eagles, and other wildlife	7.6	7.6	14.6	70.2	3.47
The noise of boats	8.7	13.8	20.9	56.6	3.26
The speed of boats	9.6	12.7	23.9	53.8	3.22
The number of motor boats on the lake/rivers	10.2	17.3	26.0	46.4	3.09
The number of boats on the lake/rivers	11.2	19.9	39.3	29.6	2.87
Parking at access sites	14.9	26.3	34.5	24.2	2.68
The number of visitors to the refuge	10.2	26.4	36.5	26.9	2.80
Large groups of visitors/boats	13.6	25.8	32.8	27.8	2.75
Catching fish	31.5	21.8	20.8	25.9	2.41
Congestion at popular fishing spots	32.0	26.8	18.6	22.7	2.32
The number of canoes/kayaks on the lake/rivers	41.1	31.8	17.7	9.1	1.94

frequently mentioned items. Seeing more or less wildlife than expected were the reasons most often listed by respondents who felt that their trip was better or worse than expected. When asked about stopping to observe wildlife, visitors responded that stopping and taking adequate time to enjoy wildlife (44 percent) was the most important aspect in the quality of their experience, followed by the bus driver's providing information and assistance with wildlife viewing (17 percent).

Based on the indicators identified in the qualitative interviews, standards were measured for three dimensions of wildlife viewing: (a) the number of buses seen along the road at wildlife stops, (b) the waiting time to see wildlife (as buses queued at wildlife stops), and (c) the percent chance of seeing a grizzly bear.

To measure standards for the number of buses seen along the road at wildlife stops, respondents were presented with a series of eight photographs in which the number of buses varied from 0 to 12 (Fig. 1). Respondents were asked to rate the acceptability of each photograph on a 9-point scale ranging from -4 = "very unacceptable" to +4 = "very acceptable." Visitors were then asked to

Figure 1.—Sample of study photographs showing different use levels at wildlife stops along the Denali Park Road.

choose the photograph that showed the use level they (a) would prefer to see, (b) would find so unacceptable that they would no longer visit, (c) thought was the highest level of use that the National Park Service (NPS) should allow, and (d) thought looked most like the level of use they experienced during their visit. Acceptability ratings decreased as the number of buses at wildlife stops increased, as shown in the social norm curve in Figure 2. Van der Eijk's measure of agreement (Krymkowski et al., in press) ranged from 0.19 for four buses to 0.86 for 12 buses, indicating moderate to high levels of crystallization (i.e., amount of variance around each measure). The social norm curve crossed the neutral point of the acceptability scale (i.e., fell out of the acceptable range and into the unacceptable range) at 4.7 buses at one time. Visitors preferred to see an average of 1.6 buses, felt the NPS should take management action (i.e., limit use of the road) at 5.5 buses, would be displaced at 7.9 buses, and typically saw an average of 2.8 buses.

To determine the normative standard for the waiting time to see wildlife, respondents were asked to rate the acceptability of waiting times from 0 to 15 minutes. Acceptability levels decreased as the waiting time increased, as shown in the social norm curve in Figure 3. Van der Eijk's measure of agreement ranged from 0.07 for waiting times of 5 minutes to 0.90 for no waiting time, indicating moderate to high levels of agreement. The social norm curve crossed the neutral point of the acceptability scale at 4.63 minutes.

Similarly, to measure the standard for chance of seeing a grizzly bear, respondents were asked to rate the acceptability of five chances, ranging from a 100-percent chance to a 0-percent chance. Acceptability levels decreased as the chance decreased, as shown in the social norm curve in Figure 4. Van der Eijk's measure of agreement ranged from 0.09 for a 25-percent chance of seeing a grizzly bear to 0.67 for a 100-percent chance of seeing a grizzly bear, indicating moderate to high levels of agreement. The social norm curve crossed the neutral point of the acceptability scale at just under a 25-percent chance of seeing a grizzly bear. A high percentage of visitors (83 percent) indicated that they saw a grizzly bear during their trip along the Denali Park Road.

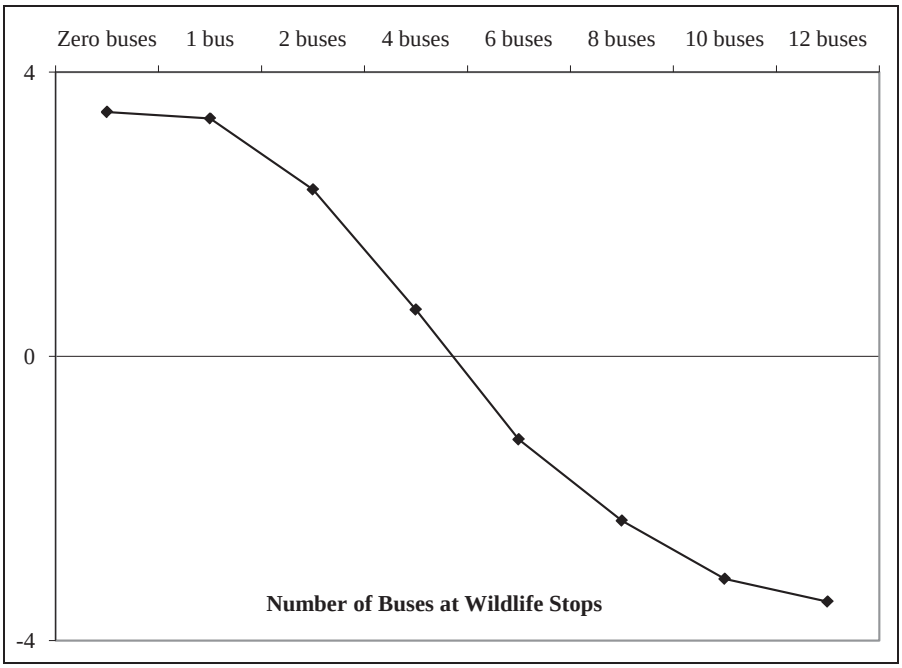

Figure 2.—Acceptability of buses at wildlife stops. *Mean values and Van der Eijk's agreement scores were 3.44, 0.80 (0 buses); 3.35, 0.83 (1 bus); 2.35, 0.58 (2 buses); 0.66, 0.19 (4 buses); -1.17, 0.29 (6 buses); -2.31, 0.58 (8 buses); -3.13, 0.78 (10 buses); and -3.45, 0.86 (12 buses).

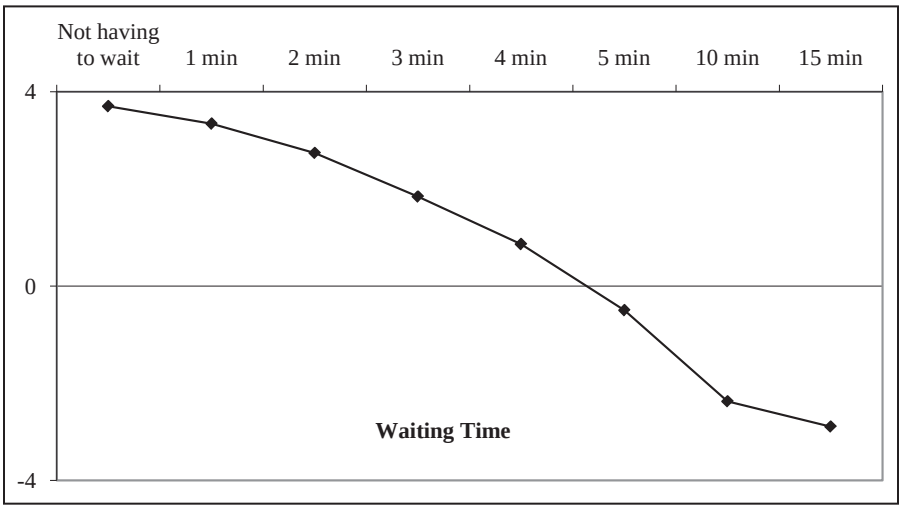

Figure 3.—Acceptability of waiting to see wildlife. * Mean values and Van der Eijk's agreement scores were 3.70, 0.90 (not having to wait); 3.34, 0.83 (1 minute); 2.74, 0.67 (2 minutes); 1.84, 0.45 (3 minutes); 0.86, 0.17 (4 minutes); -0.50, 0.07 (5 minutes); -2.37, 0.57 (10 minutes); and -2.89, 0.70 (15 minutes).

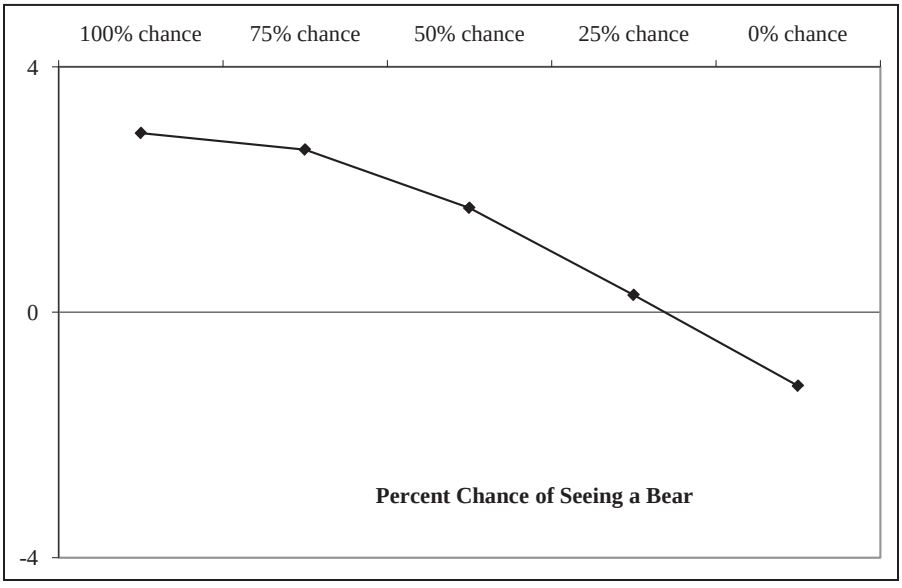

Figure 4.—Minimum acceptable chance of seeing grizzly bear. * Mean values and Van der Eijk's agreement scores were 2.92, 0.67 (100% chance); 2.65, 0.65 (75% chance); 1.70, 0.39 (50% chance); 0.28, 0.09 (25% chance); and -1.20, 0.18 (0% chance).

4.0 DISCUSSION

Visitor surveys and interviews indicated that wildlife viewing is an important component of the visitor experience at two diverse natural areas. Based on study findings, we identified four wildlife-viewing indicators and developed normative standards for these indicators.

Two of the indicators and standards measured in the Denali study related to visitor experiences upon encountering wildlife. Visitors found up to 4.7 buses at wildlife stops and waiting times of up to 4.6 minutes to see wildlife to be acceptable. High norm intensities (i.e., strength of feeling) for both variables suggest that these two indicators are important to the quality of the visitor experience. Results for the different evaluative dimensions used for the former variable indicate that the park is now providing a high-quality experience with regard to the number of buses at wildlife stops. While visitor preferences were lower than the number of buses typically seen, acceptability-, management action-, and displacement-based norms were all higher than the number of buses typically seen. Agreement, or crystallization, scores averaged 0.61 for the number of buses and 0.55 for waiting times, suggesting that social norms for these two indicator variables are robust.

Findings related to chances of seeing wildlife varied based on the species. At Lake Umbagog, the minimum acceptable percentage of visitors to see wildlife ranged from 49 percent for moose to 72 percent for waterfowl. At Denali, a 25-percent chance of seeing a grizzly bear was minimally acceptable. To a certain extent, these differences may reflect realistic expectations for seeing wildlife. For example, moose are most likely to be active at dawn or dusk. During warm summer days, moose are likely to be found in shaded forest areas, away from roads and other clearings. Waterfowl, on the other hand, are most abundant at the refuge during summer months (Lake Umbagog Area Chamber of Commerce, n.d.). Given that visitors completed surveys during the day in the summer months of July and August, they probably had a smaller chance of seeing moose than waterfowl. Data from the 2006 survey support a difference in viewing opportunities between the two species; while more than 85 percent of visitors said that they saw loons, ducks, eagles, and other birds during their visit, just 34 percent said that they saw moose.

On the other hand, the relatively low standard of a 25-percent chance of seeing a grizzly bear at Denali does not match up with the reality at the park. More than 82 percent of visitors reported seeing a grizzly bear during their trip. Agreement scores for the percent chance of seeing a grizzly bear were all above zero (average=0.40), suggesting that social norms for this variable are highly shared among visitors. At the same time, a moderately low norm intensity raises the question of whether this variable is a good indicator of quality for the visitor experience. Possibly the type of encounter (e.g., number of buses at wildlife stops, waiting time to see wildlife) is more important to visitors than the percent chance of encounter. Other characteristics of wildlife encounters, including proximity to the wildlife, sense of security while viewing, and the length of the view, could be considered in future studies seeking to develop standards for wildlife viewing.

5.0 CONCLUSIONS

Findings from these studies provide guidance about the range of conditions for wildlife viewing that would be acceptable to visitors at a well known national park in Alaska and a lesser-known wildlife refuge. Wildlife-viewing indicators and standards applied well at both locations. Four potential indicators of quality are identified that can be used to help define and manage wildlife-viewing opportunities. A range of potential standards of quality is developed for these indicator variables. Normative standards of visitors to the two study areas were found to be generally salient and moderately to highly crystallized. Respondent self-reports of existing conditions for these indicator variables provide a convenient and useful way to monitor the condition of indicator variables as called for by contemporary park and outdoor recreation management frameworks. Findings from the studies reported here suggest that visitors currently enjoy fairly high quality wildlife-viewing experiences.

6.0 CITATIONS

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