

Assessing crowding perceptions and satisfaction among visitors at El Yunque National Forest, Puerto Rico

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Increased visitation is a major concern for many national parks and forests due to its implications for environmental quality and quality of the recreation experience. One could argue that crowding is among the most difficult problems faced by public recreation managers. Determining the level of recreation use beyond which the quality of the experience tends to decrease is a management issue and has received extensive attention in the outdoor recreation literature over the years (Vaske et al., 1986; Shelby et al., 1989; Manning et al., 1999; Boxall et al., 2003; Arnberger et al., 2004). As suggested by Manning et al. (2001), crowding is a normative concept, which is influenced by a variety of conditions, which can be site specific. Crowding norms across social groups are formed as a result of social encounters and interactions occurring during a recreation visit. Without a doubt, continued concern exists over the effects of crowding on the quality of the outdoor recreation experience and visitors' satisfaction with recreation facilities and services.

El Yunque National Forest (EYNF) is the only tropical national forest in the national forest system and receives over one million visits a year. Although the forest managers enact a variety of recreation management actions to ensure recreation use of the forest is sustainable, limited information is collected by the forest in regard to visitation. Thus, the need to further study and explore the current situation as it relates to crowding and visitors' satisfaction with their recreation experiences while at the forest. Consequently, the purpose of this study is to assess visitors' perceptions of crowding and satisfaction with overall recreation experience and the facilities and services available at El Yunque National Forests' major recreation sites. In order to better capture crowding perceptions, the social interactions between the visitors are explored. Considering the variety of visitors the forest receives, the study captures differences between local visitors and tourists as it relates to crowding and satisfaction.

Visitor surveys (both in English and Spanish) were collected from 532 visitors in July 2013 at six different recreation sites within EYNF. Approximately half of the respondents (49.1%) were from Puerto Rico, while the other half were visitors from the United States (48.7%) and other countries (2.2%). The primary purpose for visiting the forest was hiking/walking, nature viewing, and photography. Waterplay was another purpose for visiting the forest frequently chosen by the respondents. However, the local residents chose waterplay 11% more often than tourists.

The study participants were asked to report the extent to which they felt crowded while engaging in recreation at the forest. The majority of the respondents (63.2%) reported not feeling crowded while at the forest, even if more than half of the respondents (60.9%) encountered 31 or more visitors at the recreation site they most recently visited. When asked if the number of encounters at the site influenced their experience, 47.9% of the respondents reported the number of encounters as having no influence on their experience, 46.4% found the number of encounters as having a positive influence on their experience, while for only 5.6% of the respondents the number of encounters had a negative influence on the experience. When further analysing the data, differences could be observed between groups as it relates to the social encounters and interactions experienced during their visit (see Table 1). Primarily, differences based on residence and ethnicity were observed. The results showed the more tolerant groups to be the local visitors and the Hispanic population.

Furthermore, differences on crowding perceptions were observed based on motivations for visiting the forest.

The participants were asked to rate on a scale from 1 to 9 the overall quality of the recreation experience at the site most recently visited. Overall, the participants rated highly the quality of their experience with an average of 8.56. This study did not find a significant relationship between crowding and the overall assessment of the recreation experience. However, when looking at specific items and visitors' satisfaction with various facilities and services at the forest, the respondents reported lower satisfaction levels with maintenance (signs of vandalism being present; clean restrooms), accessibility for people with disabilities, availability of facilities (picnic tables and grills, shelters, water fountains); parking, and signage and information services. Crowding might not have a direct impact on the overall satisfaction with the experience but indirectly contributes to satisfaction reported in relation to various facilities and services available at the forest. For example, parking becomes a major problem at the forest primarily during weekends and holidays when high levels of visitation are occurring. The observed relationships between crowding and satisfaction will be further discussed.

This study did not identify a strong crowding sensitiveness, the majority of the respondents reporting a low to moderate perception of crowding even if the number of encounters was high. Thus, the results re-emphasize the relevance of situational factors and visitor characteristics when examining crowding perceptions (Tarrant et al., 1997; Manning et al., 2001). The results capture significant differences between groups in their assessment of the current situation at the forest, primarily as it relates to social encounters and interactions. Our study complements previous work discussing crowding sensitiveness between different visitor groups (Boxall et al., 2003; Grossmann et al., 2004). This study calls attention to the diversity of groups recreation managers need to take into consideration when addressing crowding issues.

Furthermore, satisfaction with the experience and facilities and services at the forest are not to be ignored. The impacts of crowding can ultimately be translated to how the resource is being used and the extent to which the facilities and services provided are sufficient for the public. Even if the visitors do not necessarily report crowding as impacting their experiences, the indirect implications on facilities and services cannot be neglected. Thus, the social dimensions of outdoor recreation need to be constantly monitored in order to assure an effective management of the resource. Visitation is beneficial to the area but it needs to be managed in a sustainable way that will assure environmental quality and also quality recreation experiences for the visitors.

	Primary Residence (%)				Ethnicity (%)		
	Puerto Rico (N=225)	United States (N=227)	Other (N=11)	Total (N=463)	Hispanic or Latino (N=313)	Not Hispanic or Latino (N=146)	Total (N=459)
Influenced experience in a positive way	56.0	37.8	36.2	46.4	54.0	31.5	46.9

Influenced experience in a negative way	4.4	6.2	18.3	5.7	3.5	8.9	5.2
No influence on experience	39.6	56.0	45.5	47.9	42.5	59.6	47.9
	chi-square=18.342; <i>df</i> =4; <i>p</i> =.001				chi-square=22.351; <i>df</i> =2; <i>p</i> =.000		

Table 1. Perception on Encounters based on Primary Residence and Ethnicity

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