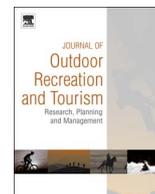




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Demand for bear viewing hikes: Implications for balancing visitor satisfaction with safety in protected areas

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ABSTRACT

Wildlife viewing is a popular activity in wilderness recreation areas. However, a desire to avoid human–wildlife conflicts often results in trail restrictions; though meant to safeguard visitor safety, these restrictions can curtail park visitors' opportunities to see wildlife against their wishes and limit a park's economic benefits for the local community. Visitor demand for wildlife viewing must be balanced against the need for public safety. Little research has been conducted on the balance between wildlife-viewing opportunities and human safety. This study uses a discrete choice experiment to quantify park visitors' willingness to pay to view brown bears (*Ursus arctos*) on hiking trails in Japan's Daisetsuzan National Park. A latent class model is applied to capture preference heterogeneity among park visitors. The results reveal that two visitor groups—non-local and local—are involved. Non-local visitors evince significant demand for bear viewing and bear-related lectures from trained guides. They also prefer group tours and round-trip hikes that include currently restricted areas. On the other hand, local visitors are not interested in either bear viewing or group tours; they do not want extra information from the guide but prefer to hike to the closest destination from the trailhead. These results suggest that implementing a variety of zoning management practices and well-designed nature-based tours in bear habitat areas can improve visitor satisfaction and provide new economic benefits while also protecting visitors from bear attacks.

Management implications:

- The present study has shown that the introducing organized bear viewing tours can create a win-win situation for park visitors and a local community.
- This study has demonstrated that bear viewing tours do not only satisfy with visitors' demand for bear viewing but also enhance their safety by promoting group-hiking in a bear habitat.
- This study strengthens the idea that bear viewing tours provide new economic benefits to the local community while avoiding unexplained trail restrictions.

1. Introduction

Most parks and protected areas have the dual goals of biodiversity conservation and the provision of recreational opportunities (Hammit, Cole, & Monz, 2015). These areas must strike a difficult balance: as their natural assets attract an increasing number of visitors, this could negatively affect biodiversity (e.g., Pickering & Hill, 2007). Hence, devising novel ways to protect conservation while supporting recrea-

tional opportunities is very important in park management.

Nature-based (NB) tourism is one prominent way to balance biodiversity conservation with the provision of recreational activities in protected areas. Naidoo & Adamowicz (2005a, 2005b) showed that improved biodiversity encouraged more people to participate in tours of conservation areas; the revenue from the tours could then be used to promote biodiversity conservation. Furthermore, NB tourism can provide opportunities to educate participants on environmental topics

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and encourage them to conserve natural resources (Finger, 1994; Hungerford & Volk, 1990; Miller, 2005). Tourism can also provide economic benefits for local communities (Andam, Ferraro, Sims, Healy, & Holland, 2010; Spiteri & Nepal, 2008). Hence, NB tourism offers one option for strengthening the sustainable use of natural parks and protected areas over the long term.

Wildlife viewing is one of the most popular forms of NB tourism (Leonard, 2008; Shutt et al., 2014; Vaske, Hardesty, & Sikorowski, 2003). In particular, the opportunity to view large carnivores attracts many visitors. In Yellowstone National Park, for example, almost all park visitors expected to see bears and were willing to pay an additional \$41 in entrance fees to maintain roadside bear-viewing opportunities (Richardson, Rosen, Gunther, & Schwartz, 2014). However, large carnivore viewing can result in incidents involving close encounters between humans and large carnivores (Herrero, Smith, DeBruyn, Gunther, & Matt, 2005; Lalasz, 2013). For example, a backpacker was injured by a grizzly bear in Denali National Park in 2012 after he approached the bear to photograph it (CNN, 2012; NPS 2012). Managers of protected areas are thus considering ways to provide visitors with adequate opportunities to view wildlife while minimizing conflicts between humans and large carnivores.

The introduction of mechanisms for encouraging group hiking is one promising way to provide safe yet satisfying wildlife viewing. Studies have shown that hiking in larger groups decreases the risk of dangerous encounters with bears (Herrero et al., 2005; Herrero, 2003). For example, Banff National Park prohibits non-group access to some trails to protect visitors' safety around summer. In addition, since Herrero et al. (2005) showed that controlled and predictable visitor behavior decreases the risk of fatal attacks involving bears, hiking with trained guides is also recommended and applied in park management (e.g., at Shiretoko National Park, Japan). However, very few empirical studies have examined the feasibility of multi-participant bear viewing tours as a means of balancing visitors' satisfaction with their safety. Such viewing tours would satisfy demands for bear viewing and, if conducted in large groups, would also reduce risks. However, little is known about whether visitors who wish to view large carnivores would actually prefer to hike in larger groups. To fill this gap, this study considers NB tours as a way of balancing bear-viewing preferences with visitors' safety.

The study quantifies park visitors' willingness to pay (WTP) for brown bear viewing and evaluates visitors' preferences for tour group size as a way of balancing visitors' satisfaction with their safety. Using a discrete choice experiment (DCE), the research elicits not only the level of bear-viewing demand but also other tour conditions: destination, group size, and provision of information. Opinions on NB tourism vary (e.g., Di Minin, Fraser, Slotow, & MacMillan, 2013; Fairweather & Swaffield, 2001), suggesting preference heterogeneity among visitors. To capture this variance, a latent class model (LCM) was applied to a novel set of survey data. Based on these newly captured visitor preferences, the paper will discuss the balance between wildlife viewing and visitor safety. Many local Japanese communities face human–bear conflicts, producing damage to agriculture and property as well as human injuries and deaths (Japan Bear Network, 2011; MAFF, 2013). Thus, many consider bears as nuisance animals rather than tourism resources. Understanding visitor demand for bear viewing in Japan can thus provide useful information to decision-makers such as local government officials and park and wildlife managers.

2. Materials and methods

2.1. Research site

The research was conducted on the Numameguri Hiking Trail (NHT) in Daisetsuzan National Park on the islands of Hokkaido, Japan (see Fig. 1). Brown bears are distributed widely throughout the islands, with a population possibly exceeding 10,000 (Hokkaido Research

organization, 2015). Daisetsuzan National Park is one of the main brown bear habitats in the islands, and the NHT is known to offer frequent bear sightings (MOE, 2007). Since the NHT is also a popular hiking trail, receiving 10,000 visitors annually (Kubo, Shoji, & Tsuge, 2011), human–bear conflict must be minimized. To this end, an information center was established at the trailhead to provide information about trail conditions, bear behavior, and techniques for managing bear encounters. In addition, park wardens patrol the trail and impose trail restrictions as required by the bear situation. No human injuries or deaths caused by brown bears have been reported on the NHT, and close encounters with visitors are rare, though a few fatal brown bear attacks occur on the Hokkaido islands each year (Hokkaido Prefecture, 2015). However, frequent bear appearances often cause partial trail closures, especially during the summer. Bears are thus not considered tourism resources but rather barriers to tourism, potentially curtailing park visitors' hiking opportunities. However, park wardens report being able to see bears from the trail with binoculars or telescopes on about 80% of days in July and August. Hence, the trail offers untapped potential for providing safe hiking tours with opportunities for bear viewing.

2.2. Survey design

To quantify visitors' demand for bear viewing and evaluate their preferences for tour components, we designed, through discussions with park wardens, a DCE survey comprising the following five attributes: tour destination, group size, provision of information, bear viewing opportunities, and tour fees. The tour destination attribute consists of three options. As depicted in Fig. 1, Midori Pond is a short-distance destination; Daigaku (Kogen) Pond is a middle-distance destination; and the hiking circuit is a long-distance trip. Because of frequent bear appearances, park wardens often close the section of the trail after Daigaku Pond (i.e., the northern two-thirds of the circuit). Hence, the study regards Daigaku Pond as the current situation. Second, group size was defined as having four tour participant levels—0, 5, 10, and 15 participants—excluding the tour guide, the respondent, and the respondent's friends and family members on the same tour.

The third attribute, provision of information, was defined as information provided by a guide to participants during a tour, excluding the level of information provided at the information center. It consists of four levels: no additional information, information about bears, information about flora and fauna (including bears), and viewing videos in addition to accessing other forms of information about flora and fauna ("video viewing" hereafter). The chance of viewing a bear was described as the probability that a participant would see a bear on a given tour; thus, a 20% chance means that a participant would see a bear on 20 out of 100 tours. The chances were 20%, 40%, 60%, and 80%. Finally, the tour fee was defined as the per-person cost to participate in the tour: 1000 JPY, 2500 JPY, 5000 JPY, 7500 JPY, or 10,000 JPY (1000 JPY = 9.36 USD on September 2008).

Each questionnaire had six choice sets consisting of three tour profiles and a non-choice option. Two of these tour profiles were randomly chosen from among 25 profiles created by applying an orthogonal main-effect design (Louviere, Hensher, & Swait, 2000). The third profile reflected the existing situation, whereby visitors hike without a guide to Daigaku Pond, there are no other participants, no additional information, a 20% chance of bear viewing, and the hike is free.

2.3 Econometric model

The DCE is based on the random utility model, which assumes that individuals make choices to maximize their utility. According to McFadden (1974), the probability of respondent n choosing profile i in the conditional logit model is described as follows:

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