LETTER

Local economic impact of different forms of nature-based tourism

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Abstract

Tourism has been widely used as a component of conservation interventions which are intended to deliver benefits to local people, thereby contributing to development and creating incentives for conservation. However, a large proportion of total tourist revenue can be lost from the local area as leakage. Nature-based tourism is diverse and little is known about how locally retained revenue varies across different forms of tourism; this is information of great importance to policy makers. This article uses data from tourist interviews and local enterprise surveys to measure the total and locally retained spending from different forms of tourism at Bwindi Impenetrable National Park, Uganda. Whilst total spending increased with higher cost forms of tourism and length of stay, retained spending was predicted only by length of stay. High-cost tourism may therefore be no more effective than other forms of tourism as a tool for generating local benefits from conservation.

Introduction

In the 1980s, a new paradigm of conservation "with a human face" (Bell 1987) emerged, emphasizing the needs of local people affected by conservation interventions (Western & Wright 1994). It held that if conservation projects could deliver benefits to local people, they could contribute to poverty alleviation and compensate for costs associated with conservation actions, thereby providing new local incentives for conservation (Brandon & Wells 1992). To achieve this goal in practice, strategies are required to realize local benefits from biodiversity conservation (Hutton & Leader-Williams 2003). One such mechanism is nature-based tourism, which aims to turn biodiversity into a marketable commodity (Naidoo & Adamowicz 2005), creating new revenue streams for conservation management and benefits for local people (Walpole & Thouless 2005). This vision of tourism as a conservation tool is widely practiced today (Balmford *et al*. 2009), and receives considerable financial backing from donor agencies and conservation organizations (Kiss 2004). However, evidence for its effectiveness has been mixed (Kruger 2005), and its wisdom has been repeatedly called into question (e.g., Kiss 2004). In particular, concerns have been raised over the degree to which local benefits of nature-based tourism translate into conservation outcomes (Emerton 2001; Spiteri & Nepal 2006), and over the extent to which local benefits are reduced by "leakage."

Leakage occurs when revenue leaves the destination as profit to nonlocal businesses or for the purchase of external goods and services (reviewed by Sandbrook 2008). Leakage rates for nature-based tourism at the destination level can be high (e.g., over 60% at Komodo National Park, Indonesia; Walpole & Goodwin 2000), reducing local economic benefits and thereby undermining potential incentives for conservation (Bookbinder *et al*. 1998). However, nature-based tourism is diverse, ranging from backpacking through to luxury safaris. To identify approaches to minimize the problem of leakage it is therefore important to know which types of nature-based tourist and tourism deliver the greatest local economic benefits. Conservation planners have tended to favor a "high-value, low-volume" tourism model because this is expected to maximize the economic returns for conservation (e.g., through gate fees) while minimizing potentially negative environmental impacts by keeping visitor numbers low (e.g., Pawliczek & Mehta 2008). This

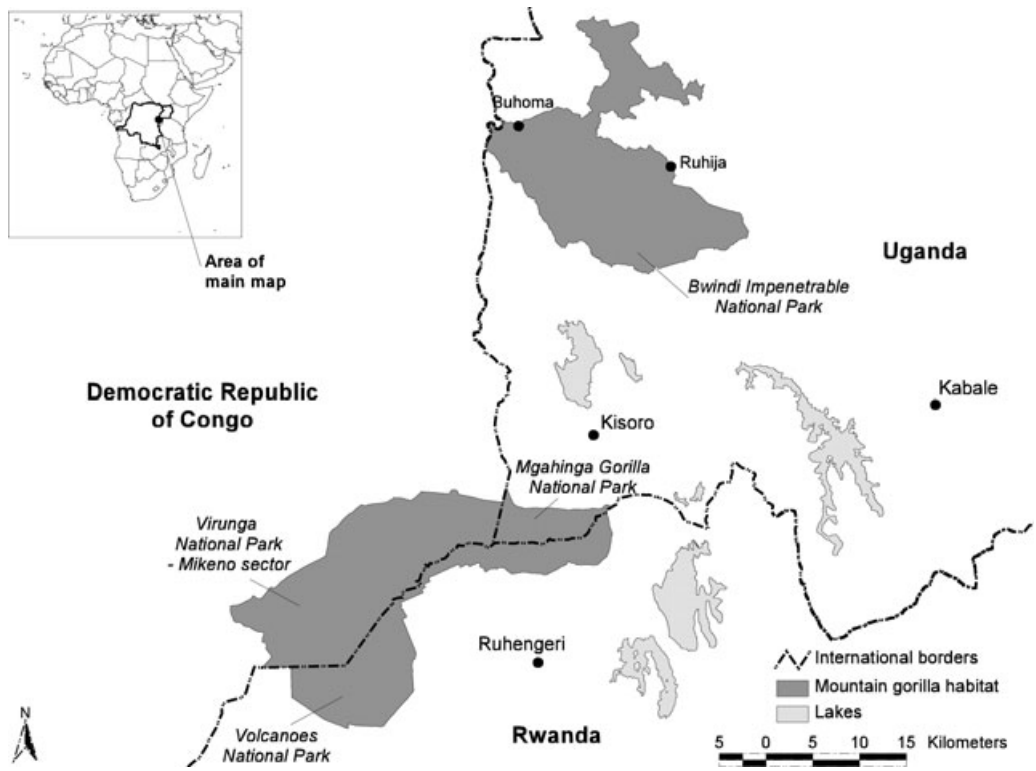

Figure 1 Map showing the mountain gorilla parks of Central Africa (provided by IGCP 2005). Fieldwork was carried out in Buhoma village on the north-west side of Bwindi Impenetrable National Park.

approach has been actively pursued both by countries (e.g., Bhutan; Rinzin *et al*. 2007) and flagship conservation areas (e.g., the Okavango delta, Botswana; Mbaiwa 2005). There is good evidence that low-volume tourism reduces environmental impacts (Roe *et al*. 1997), and that total tourist spending tends to be greater for older, female tourists traveling on tailor-made tours, and increases with price of accommodation, and length of stay (reviewed by Mehmetoglu 2007). However, total spending is not necessarily a good measure of local economic impact at the destination because leakage rates are likely to differ across different types of tourist and tourism.

Leakage can be particularly high in the case of luxury tourism where accommodation and service providers tend to be owned by nonlocal actors (Akama & Kieti 2007; Honey 2008). Some authors have speculated that lower-cost forms of tourism such as backpacking and large-group tours might have more positive local economic impacts because tourists tend to stay longer at the destination and spend more money in locally owned businesses (Hampton 1998, 2005; Scheyvens 2002), resulting in lower leakage rates. However, to date there has not been any study that disaggregates total and retained spending to the individual level, making it possible to test these predictions by linking the characteristics of individual tourists to their local economic impacts. Given the role of tourism in modern conservation practice and ongoing concerns about its effectiveness, addressing this issue is now a priority. This article provides such an analysis, using tourism at Bwindi Impenetrable National Park (Bwindi, hereafter), Uganda, as a case study.

Methods

Study area

Bwindi is a 321-km^2 forested area located on the edge of the Western Rift Valley in southwest Uganda (Figure 1). The park is home to numerous rare and endemic species, including just under half the world population of the critically endangered *Gorilla beringei beringei* (mountain gorilla; Matschie 1914; McNeilage *et al*. 2006). The area immediately outside the forest has been almost entirely cleared for agriculture, and is densely populated by around 160 people per km^2 (Plumptre *et al*. 2004). After Bwindi was gazetted as a National Park in 1991, there was considerable conflict between local people and park authorities. As a result, Uganda National Parks decided to

adopt an Integrated Conservation and Development approach with the aim of sharing benefits with local people and increasing local support for conservation by creating links between conservation and local livelihoods (UWA 2001; Namara 2006). Central to this strategy was the development of gorilla tracking tourism (UWA 2001).

Gorilla tracking tourism began in 1993 (McNeilage 1996) and has grown steadily since, with 6,500 people visiting Bwindi in 2005 (UWA 2008). However, numbers are limited by a permit quota, designed to ensure that gorillas are not exposed to too many tourists (Homsy 1999). Prices for permits have risen over time, reaching US$ 275 per person in 2004, and their current level of US$ 500 in 2007 (UWA 2008). The main entry point for gorilla tracking at Bwindi is from the park headquarters at Buhoma, on the northwest of the forest (Figure 1). Tourism facilities in Buhoma are well-developed and diverse. During fieldwork there were seven accommodation providers, comprising three luxury lodges (charging approximately US$ 300, US$ 130, and US$ 120 per night) owned by non Ugandans, two mid-range lodges (US$ 90 and US$ 75 per night) owned by nonlocal Ugandans and two basic camps (US$ 7 and US$ 4 per night) owned by local people. Other tourism businesses included six handicraft and souvenir shops, and several restaurants that occasionally catered to tourists (Sandbrook 2008). Bwindi provides an ideal site for this study, because tourism there is explicitly intended to create local incentives for conservation through economic benefits (UWA 2001) and because it provides facilities for a wide range of different forms of tourism.

Data collection

The study area selected for this research comprised the six villages closest to the Bwindi headquarters in Buhoma from which gorilla visits began. This local scale of analysis was deliberately chosen because conservation incentives based on tourism are most relevant for people living close to the resource in question. Most studies of leakage operate at a far broader scale (Mitchell & Ashley 2007), reducing their usefulness to answering questions about incentives for conservation. Analyzing the economic impact of different forms of tourism in this area required data on the characteristics of tourists and their trips, and the money they spend. These data were collected through face-to-face interviews with tourists after their gorilla visits, carried out between July and December 2004. Interviews established the age and gender of the respondent, the number of nights they were spending at Bwindi (nights, hereafter), the type of trip they were on (tailor-made tour, scheduled group tour, or independent), the accommodation provider they were using, the tour group in which they were traveling, and their spending in the study area. Spending was broken down into accommodation, activities, "out of pocket" spending (on shopping, handicrafts, tips, and donations), and salaries paid to tour staff (drivers and guides accompanying tour groups).

It is common practice in the tourism industry for operators and agents to subcontract and negotiate discounts with hotels and other actors. These arrangements are typically confidential so establishing precise individual spending on accommodation was not possible. As a result the prices given earlier, estimated on the basis of published rack-rates and the author's personal judgment, were used for analysis. Only data from tourists interviewed on the evening before their departure from Bwindi or later were included, to ensure the fullest possible capture of tourist spending patterns. Spending on gorilla permits was not included as these were bought in Kampala and none of the revenue reached local people as cash.

Data were also collected to estimate how much of each tourist's spending remained in the local economy within the study area, and how much was lost as leakage. To calculate leakage, the ownership of organizations (including businesses) in the study area that received tourist spending was ascertained, along with the proportion of their income that was spent outside the area on items, such as food, or lost as profit to nonlocal actors. These data were collected through interviews with owners or managers, and records of spending kept by their staff. Leakage was then calculated for each organization as the proportion of tourist revenue that did not accrue to a local person at some point, either as a payment or as profit to a locally owned business. Leakage rates for all organizations apart from accommodation providers proved to be negligible, so the retained spending in the study area for each tourist was estimated as their total spending minus the component of their spending with their accommodation provider which was leaked. Further details of leakage calculations used for this study are given in Sandbrook (2008). A local person was defined as any individual who had been resident in the study area for at least 3 years. All financial data are presented in US dollars, using an exchange rate of $1 US = 2000 Uganda Shillings, appropriate in 2004.

Analysis

The relationship between tourists' personal and trip characteristics and their total and retained spending in the study area were investigated with linear mixed models using R 2.9.0 (function lmer, package lme4; R Development Core Team 2009), with the restricted maximum likelihood (REML) method. Linear mixed models

use random effect variables to model data with correlated error terms. In this case, each tourist group was given a unique identifier and the variable "tourist group" was fitted as a random effect to account for potential nonindependence of respondents from the same group. Models were constructed using either total spending (US$) or retained spending (US$) as the response variable. In both cases, the square root of the response variable was used as this gave residuals, which met the model assumptions. On the basis of reviewed literature and plausibility, tourist's age, gender, trip type, price of accommodation, and nights spent at Bwindi were used as candidate explanatory variables. Before fitting these variables into the model, statistical tests were carried out using SPSS 15.0 to ensure that they were independent. Where variables were not independent, individual variables were dropped until only uncorrelated variables remained. Models were then constructed using all combinations of remaining variables. The relative quality of each model was assessed using the Akaike Information Criterion (AIC), a measure of goodness-of-fit, which provides a trade-off between model precision and complexity (Burnham & Anderson 2002). The explanatory power of each model was assessed by calculating the percentage of deviance explained relative to a null model with no fixed effects.

Table 1 Measures of model quality for (a) $\sqrt{}$total spending and (b) $\sqrt{}$retained spending

Model	LL	ΔAIC	%DE
(a) $\sqrt{}$total spending (US$)			
Price + nights	−328.5	0	23.3
Price + gender + nights	−328	1	23.6
Price	−352	45	17.6
Price + gender	−351.6	46.2	17.8
Nights	−404.5	150	3.6
Gender + nights	−404.2	151.5	3.9
Gender	−419.9	180.8	0.2
(b) $\sqrt{}$retained spending (US$)			
Nights	−307.1	0	4.9
Gender + nights	−306.2	0.2	5.2
Price + nights	−310.6	9	5.3
Price + gender + nights	−309.7	9.2	5.8
Gender	−320.7	27.3	0.4
Price + gender	−322.5	32.8	1.6
Price	−351.6	91	0

LL = Log likelihood; ΔAIC = Difference in Akaike Information Criterion between the model in question and the model with the lowest AIC; %DE = % Deviance explained.

Results

Complete spending data were collected from a total of 161 tourists (80 female and 81 male), drawn from 82 different tourist groups. The mean age of respondents was 41.86 (±SD 13.79), and mean length of stay was 2.52 (±SD 0.87) nights at Bwindi. Mean total spending per respondent in the study area was US$ 265.3 (±SD 273.6), and mean retained spending, after allowing for leakage, was US$ 56.95 (±SD 36.3). This is a mean leakage rate of 78.5%.

Analysis of the relationship between candidate explanatory variables for linear mixed model analysis revealed a lack of independence between accommodation price and tourist age (Pearson's $r = 0.365$, $P \leq 0.001$), and between accommodation price and trip type (one way ANOVA $F_{2,158} = 21.82$, $P \leq 0.001$; *post hoc* Tukey tests, tailor-made accommodation price > organized tour (difference in means = 54.02, $P = 0.01$), scheduled tour accommodation price > independent (difference in means = 77.33, $P < 0.01$)). Given these relationships between accommodation price and both age and trip-type, accommodation price can effectively be considered as a surrogate variable for the form of tourism in this study, ranging from budget tourism (basic camps, younger tourists, independent travel) through mid-cost tourism (mid-range camps, older tourists, scheduled tours) to high-cost tourism (luxury camps, older tourists, tailor-made tours). It was therefore decided to drop the variables age and trip type from the analysis. As a result, the linear mixed models tested contained all combinations of the variables accommodation price, gender, and nights.

The total spending model with the lowest AIC included the price of accommodation and the number of nights spent at Bwindi (Table 1). However, the fully fitted model including gender was almost as good (ΔAIC = 1), and explained a greater proportion of model deviance (Table 1). Total spending increased with the price of accommodation and number of nights spent at Bwindi, and was greater for females (Figures 2a–c). The retained spending model with the lowest AIC included only the number of nights at Bwindi, although again the model including gender was almost as good (ΔAIC = 0.2; Table 1). Retained spending again increased with length of stay and was greater for female tourists (Figures 3a–c).

Discussion

This study is the first to link the characteristics of individual tourists to their total and retained spending at a scale relevant to the creation of potential local incentives for conservation. The results show that total tourist spending at Bwindi increased with accommodation price and

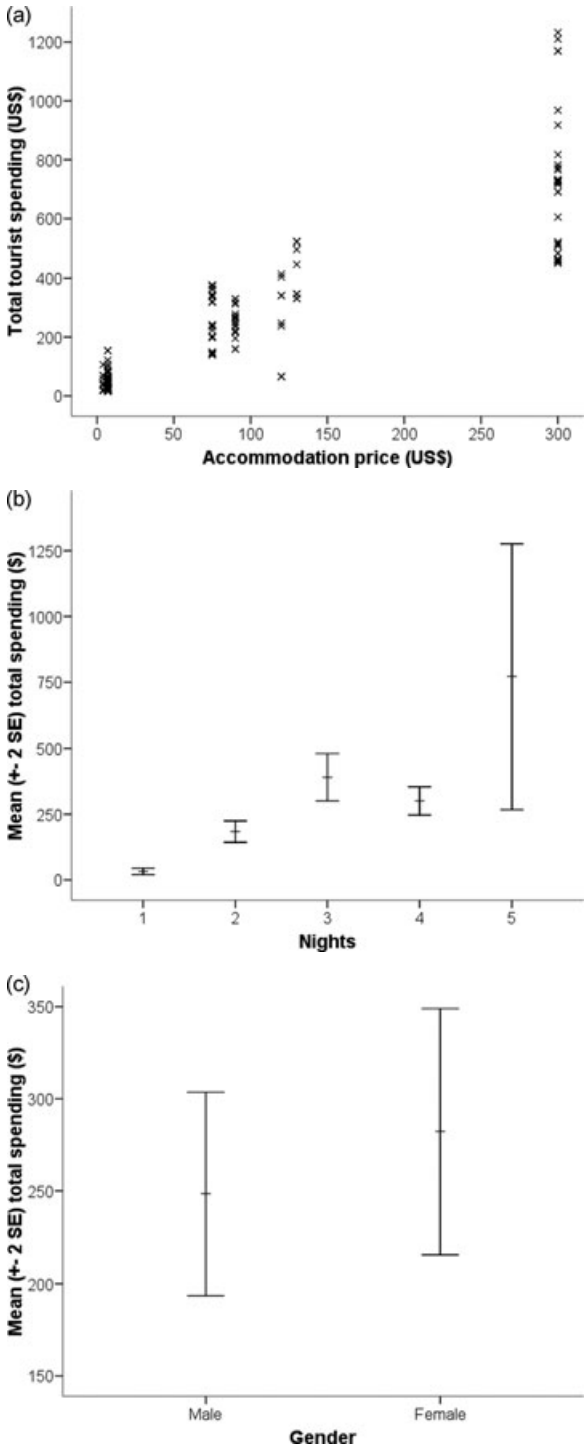

Figure 2 Total tourist spending (US$) by (a) accommodation price, (b) nights spent at Bwindi, and (c) gender.

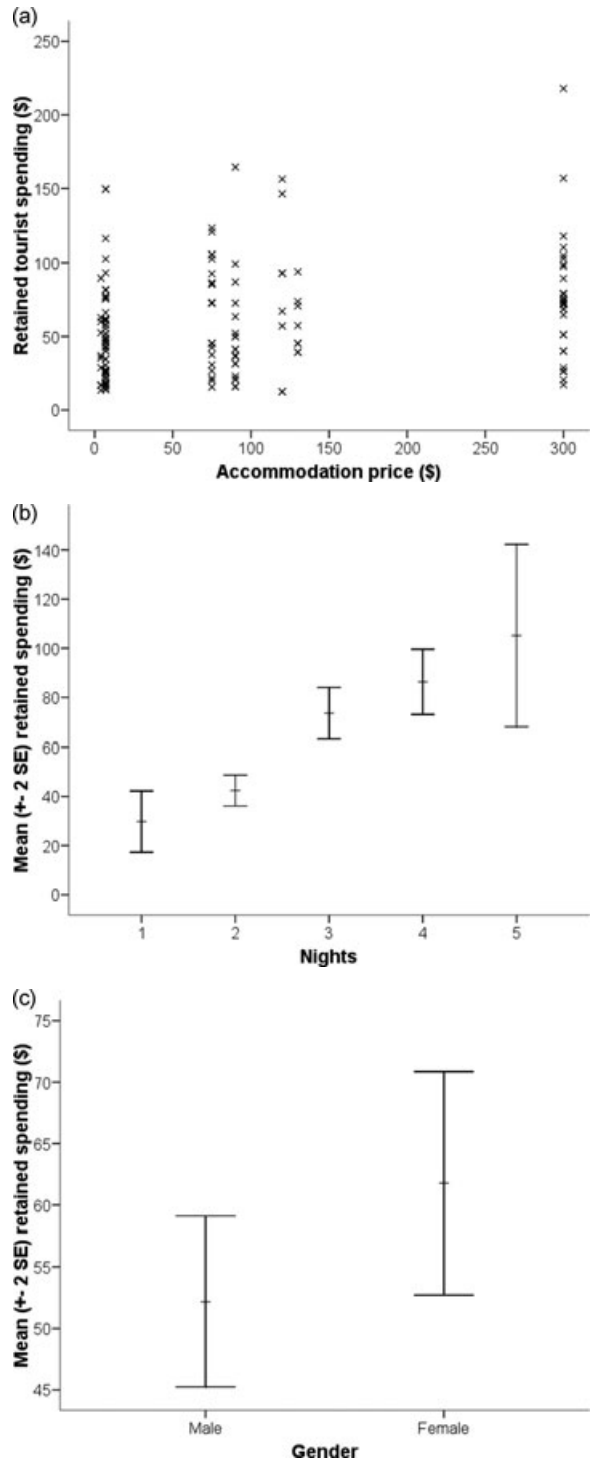

Figure 3 Retained tourist spending at Bwindi (US$) by (a) accommodation price, (b) nights spent at Bwindi, and (c) gender.

length of stay, consistent with expectations. However, once leakage of tourism revenue was taken into account, retained revenue in the study area was predicted only by the duration of stay at Bwindi, and not by other tourist characteristics. In this section, this finding and its policy implications are discussed.

The best model for total tourist spending showed that it increased with the price of accommodation and the

length of the stay. These results can be explained by the large proportion of tourist spending devoted to accommodation, the relationship between tourist age and spending power (Mehmetoglu 2007), the fact that tailor-made tours are more expensive than scheduled tours, which in turn are more expensive than independent travel, and the fact that longer stays give tourists more time to spend money. The model of total spending including gender was almost as good, and suggested that female tourists spent more. This difference can be explained by the fact that female tourists spent more than twice as much as males on purchasing handicrafts, making donations to local organizations, and other shopping (male mean = US$ 6.61, female mean = US$ 14.24; $t = -2.38$, $P = 0.018$). In contrast to total spending, the best models for retained spending did not include accommodation price. They also explained considerably less deviance (5.8% for the fully fitted model of retained spending compared to 23.6% for total spending), indicating that retained spending was poorly predicted by any of the variables tested. The lack of any relationship between accommodation price and retained spending demonstrates that despite a 75-fold difference in price between the cheapest and most expensive accommodation, resulting differences in total spending were smoothed out by leakage, which was far greater from the more expensive tour camps due to nonlocal ownership and the purchase of supplies from outside the study area (Sandbrook 2008).

These results suggest that the high-value, low-volume tourism model often favored as a component of conservation interventions is no more effective than other forms of tourism when it comes to delivering local economic benefits. Instead, in the Bwindi case study such benefits could be maximized simply by encouraging all types of tourist to stay longer, and possibly by increasing the proportion of female visitors. The former might be achieved through developing new attractions at the destination, whereas attempting the latter seems an unrealistic policy goal. Alternatively, efforts could be made to increase locally retained revenue from the high-cost market, for example, by introducing new fees such as bed-night levies or giving local people equity in luxury lodges through some form of public–private partnership. The latter strategy is increasingly popular but evidence of positive outcomes for local people is limited (e.g., Mbaiwa 2005). This is likely to reflect an underlying lack of incentives for change among international tourism operators, exacerbated by inherently uneven power relations between them and local people in remote rural areas (Brockington *et al.* 2008; Honey 2008). In addition, several other noneconomic concerns with high-cost tourism are relevant. First, high-cost tourists may be less likely to travel in the face of risks such as political insecurity at the destination or terrorist incidents (Lepp & Gibson 2003). Second, the locally owned accommodation typical of lower budget tourism gives local people more control over tourism developments, potentially increasing measures of social capital such as self-esteem and community organization (Stronza & Gordillo 2008). Finally, high-cost tourism may not represent good value for money as a conservation investment because of the considerable start-up costs of luxury accommodation (Kiss 2004).

The findings of this study have important implications for the use of tourism as a conservation tool. Policy makers must recognize that tourism is diverse, and that simple indicators such as total spending or accommodation price cannot be used as surrogates for local economic impact. In some cases, lower-cost tourism might be a more effective, robust, and value-for-money approach to creating local economic benefits for the reasons described earlier. However, several caveats to these conclusions must be recognized. First, the link between local benefits and conservation outcomes remains contentious, and will depend on the nature and magnitude of benefits (Emerton 2001), how they are distributed (Spiteri & Nepal 2006), and their impact on attitudes toward conservation (Gillingham & Lee 1999). Second, the results of this study may be unusual, due to specific characteristics of Bwindi such as the permit system. It is important that similar research be carried out at other destinations to test these results and ensure that management decisions reflect local conditions. Finally, other impacts of tourism are relevant to conservation, such as on the environment and as a fund-raising tool for conservation management, and each may be favored by a contrasting form of tourism (Stoeckl *et al.* 2006). Given the diverse costs and benefits of different approaches, encouraging a mix of forms of tourism may be the policy most likely to deliver conservation outcomes.

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