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What explains tourists’ support for snow leopard conservation in the Annapurna Conservation Area, Nepal?

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ABSTRACT
Wildlife tourism is increasingly important for the conservation of threatened species such as snow leopards. However, what tourists know or value about snow leopards, and to what extent they support the conservation of this species, has received limited empirical attention. This paper investigates tourist knowledge about snow leopards, beliefs and values toward the species, and support for its conservation in the Annapurna Conservation Area of Nepal. Survey data were collected from 406 foreign tourists between March and May 2014. Although knowledge about snow leopards varied among respondents, there was widespread support for their conservation. Knowledge about snow leopards was best explained by education level and environmental organization membership. Improved knowledge about the species, and a variety of intrinsic conservation values, were found to increase tourist support for snow leopard conservation. These results provide important insights to help tailor tourism initiatives to support the conservation of snow leopards.

KEYWORDS
Flagship species; Himalayas; knowledge-attitude-practice model; Panthera uncia; protected area management; tourism

Introduction

Can wildlife tourism be a positive force to conserve the threatened snow leopard (\textit{Panthera uncia}) in the Himalayas? Defined as “the experiencing of wildlife by tourists” (Reynolds & Braithwaite, 2001, p. 31), a major rationale for wildlife tourism is that it will not only generate funds for conserving nature, but also promote increased knowledge of, and positive attitudes toward, this goal among both local residents and tourists (Balmford et al., 2009; Buckley, 2010; Newsome, Dowling, & Moore, 2005; Shackley, 1996). Among residents, the mechanism for these positive linkages is often revenue-sharing that is intended to also contribute to local sustainable development (Martin et al., 2011), while mitigating conflicts between communities and conservation (Kala & Maikhuri, 2011). This has been widely noted in Nepal, though not without some limitations, such as increased inequality (Budhathoki, 2004; Daconto & Sherpa, 2010; Nepal, 2002). Among tourists, a positive relationship between tourism activities and conservation knowledge and ethos has also been described, such as with marine conservation in Australia (Zeppel, 2008) and the Galapagos (Powell & Ham, 2008). Other variables positively correlated with increased support for conservation including increased education (Nyhus & Tilson, 2004) and membership in an environmental organization (Fielding, McDonald, & Louis, 2008).
Wildlife tourism has often focused on charismatic megafauna or flagship species (Walpole & Leader-Williams, 2002), capitalizing on their perceived value among tourists rather than local communities (Dickman, Macdonald, & Macdonald, 2011). However, despite the perceived value of flagship species among tourists, research on their conservation has tended to address how locals understand, perceive, and support wildlife conservation (Sekhar, 2003), rather than tourist responses (Ballantyne, Packer, & Hughes, 2009). In addition, even though tourists are a major stakeholder group for conservation, exploring their knowledge of flagship species has also been relatively limited (Ballantyne, Packer, & Falk, 2011). This information gap is particularly the case for more elusive species such as the snow leopard (Hussain, 2000; Namgail et al., 2016; Schutgens, Hanson, Baral, & Ale, 2018).

The snow leopard is a large wild felid inhabiting mountainous regions of 12 Central and South Asian nations (Jackson, Mishra, McCarthy, & Ale, 2010). Recently re-categorized as vulnerable on the International Union for the Conservation of Nature’s Red List (McCarthy, Mallon, Jackson, Zahler, & McCarthy, 2017), the population is estimated between 7367 and 7884 individuals worldwide (McCarthy et al., 2017). This species faces numerous anthropogenic threats including illegal trade in wildlife, climate change, infrastructure development, and competition with local communities for space, prey, and livestock (Jackson, Mallon, Sharma, Suryawanshi, & Mishra, 2013). Given the large territories inhabited by snow leopards, its future persistence must ensure coexistence with humans and their activities both within and outside protected areas (Johansson et al., 2016). Although a number of studies have documented local residents’ attitudes toward the species (Alexander et al., 2015; Bhatia, Redpath, Suryawanshi, & Mishra, 2016; Suryawanshi, Bhatia, Bhatnagar, Redpath, & Mishra, 2014), few have examined tourists’ perceptions.

Given the elusive nature of the species, snow leopard tourism has not developed to the extent that tourism has with other large cat species, such as tigers in India (Rastogi, Hickey, Badola, & Hussain, 2012). Yet, a number of tourism initiatives have emerged that connect tourists directly to snow leopard conservation. These have included homestays in India (Anand, Chandan, & Singh, 2012), handicraft production in Mongolia (Mishra et al., 2003), community-based ungulate trophy hunting programs in Tajikistan (Rosen et al., 2012), and trekking opportunities in Pakistan linked to livestock insurance schemes (Hussain, 2000). More recently, snow leopards in India’s Hemis National Park have been habituated to viewing by tourists in winter (Namgail et al., 2016), but this has not been attempted in Nepal. Various high-level snow leopard conservation strategies also include wildlife tourism promotion, and encourage and include it in national, regional, and local action plans (GSLEP, 2013; Jackson et al., 2013). Nepal’s Snow Leopard Conservation Action Plan (SLCAP), for instance, calls for the promotion of tourism in snow leopard habitats to ameliorate damage done to livelihoods by the species and to engage communities in its management (DNPWC, 2017). However, none of these projects or policies have assessed how tourists themselves understand and relate to snow leopards and their conservation.

**Theoretical framework**

This paper draws upon the knowledge-attitude-practice (KAP) model to derive its theoretical framework, as it quantifies the interactions between these aspects of human
perception and behavior (Rennie, 1995). KAP has been applied practically in fields as diverse as public health (Roelens, Verstrealen, Van Egmond, & Temmerman, 2006), green purchasing (Mostafa, 2007), and environmental conservation (Newhouse, 1990). Here, the model explores whether tourists’ support for snow leopard conservation is dependent on their knowledge about snow leopards, beliefs and attitudes toward this species, and stated values toward the species. There are a number of dimensions to these interactions within a KAP model.

First, there is a strong link between behavioral intention and attitudes (Miller, 2017). For tourists specifically, actual or intended support for conservation can be influenced by attitudes toward conservation (Powell & Ham, 2008). Second, people require knowledge to form opinions, including about wildlife (Zeppel, 2008). Third, attitudes, or specific opinions, toward a species can be complex and influenced by both tangible (e.g., age, gender) and intangible (e.g., perceptions, beliefs) factors (Kansky & Knight, 2014). Knowledge, attitudes, and practices, therefore, interact in the KAP model (Rennie, 1995).

When the benefits of taking action appear to outweigh the costs, people are more likely to take such actions. In turn, these behaviors, as with attitudes, are shaped by a variety of beliefs and values. Within the context of wildlife conservation, use valuation can include a species’ recreational value to tourists, such as via trophy hunting or photographic safaris, that can incorporate both economic and non-economic values (Loomis & White, 1996). A species valuation can also include non-use values, such as existence, bequest, option, and altruistic values (Richardson & Loomis, 2009). Existence value refers to the intrinsic value of a species irrespective of whether it is utilized by humans, whereas bequest value refers to the significance of a species existing for the enjoyment of future generations of humans. Option value involves retaining the possibility of future human uses of the species, and altruistic value infers a strong intrinsic responsibility for conserving biodiversity.

Studies have often explored one aspect of the KAP framework (Miller, 2017). However, this paper explores the relative strengths of competing theoretical propositions in one empirical model. The study therefore sought to answer the following research questions, while considering their wider implications: What are tourist beliefs about endangered species? What values do they hold regarding snow leopard conservation? What knowledge do tourists have about snow leopards and what factors best explain this knowledge? What support do tourists have for snow leopard conservation and what factors best explain this support?

**Methods**

**Study area**

The Annapurna Conservation Area (ACA) covers 7628 km² of Himalayan territory in central Nepal with elevations ranging from 1000 m to over 8000 m (Figure 1). The ACA is home to a wide array of biodiversity including over 1000 plant species, 100 mammal species, and nearly 500 bird species (Bhuju, Shakya, Basnet, & Shrestha, 2007). This area is also considered prime habitat for the snow leopard (Ale, Shrestha, & Jackson, 2014).

The National Trust for Nature Conservation is a Nepali non-governmental organization (NGO) that manages the ACA in partnership with local communities. In these communities, the 2011 census recorded a human population of over 85,000 individuals
(Government of Nepal, 2012), whose main sources of income are derived from tourism and agro-pastoralist activities in the local area (Mishra et al., 2003). The ACA is also a popular trekking destination and records more than 100,000 mostly international tourists per year, with wildlife tourism becoming more popular among these visitors (Baral & Dhungana, 2014). Tourism revenues thus contribute both a large percentage of the ACA’s annual operating budget and a substantial proportion of the region’s economy.

**Questionnaire administration**

After institutional ethical approval and a scoping visit in the Fall of 2013, a questionnaire written in simple English was administered to 406 international visitors between March and May 2014. The Annapurna Circuit was traveled from Jomsom in the west to Chame in the east of the ACA (Figure 1). As most visitors travel the circuit in a counter-clockwise direction, new visitors to interview were encountered on a daily basis. Random cluster sampling of hotels, and of their guests, was employed to ensure a representative composition of visitors in the sample. In total, 33 hotels were surveyed after securing permission from the hotel owners. The administration of questionnaires usually took place in the evenings, when visitors were relaxing in the lobby and other common areas of their accommodation.

Twenty questionnaires printed on A3 laminated paper were used for reducing paper wastage and weight. All visitors were given a short briefing on the nature and objectives of

![Map of study area showing hotel locations and dates sampled.](image)

*Figure 1. Map of study area showing hotel locations and dates sampled.*
the research project, and their verbal consent to participate was requested. Participants were provided with markers to complete the questionnaire, which took 23 minutes on average ($SD = 9.5$; range $= 12$–$55$ minutes; $n = 58$), while the survey team remained nearby to provide any necessary clarification.

Completed questionnaires were photographed and cataloged prior to data entry on an Excel spreadsheet. Once completed, the questionnaires were wiped clean with a cloth and methylated spirits, and then prepared for re-administration to the next prospective participant. In total, 572 international visitors were approached and 406 agreed to participate, yielding a 71% response rate. Of those who provided a reason for not participating, over 50% stated a lack of interest, with language difficulties (15%) and fatigue (11%) being the other main reasons.

**Variable measurement**

**Snow leopard knowledge index**

Respondents were shown pictures of eight large feline species (lion, tiger, jaguar, snow leopard, mountain lion, common leopard, clouded leopard, Eurasian lynx) and asked to identify the snow leopard. They were also asked seven more questions related to various aspects of snow leopard ecology: (a) have you personally observed snow leopards in nature, zoos, or zoological parks; (b) have you ever read a magazine or newspaper article or watched a television program about snow leopards; (c) before today, were you aware that snow leopards are found in the Annapurna Conservation Area; (d) are snow leopards also found in Africa; (e) is the snow leopard considered a charismatic species; (f) are snow leopards easily observed in their natural habitats; and (g) which category best describes the conservation status of snow leopards in the world? The index had eight response items that served as the assessment domain for visitors. Correctly answered questions received a score of 1, whereas incorrect answers were scored as 0. The scores were summed across all eight questions to create a summative knowledge index. Lower scores indicated a low level of knowledge about the snow leopard, whereas higher scores indicated a high level of knowledge. Theoretically, the index value varied from 0 to 8 points, and these extreme values were found in the empirical data.

**Support for snow leopard conservation**

Respondents were asked to read a brief summary of the local Snow Leopard Conservation Action Plan and then indicate how important they felt it was to implement this to protect snow leopards in the ACA. Their responses were recorded on a five-point scale ranging from “not at all important” coded as 1, to “extremely important” coded as 5. In the descriptive analysis, it was found that the lowest category had only two observations, so it was merged with the next category to create a four point ordinal scale. Higher scores on the scale indicated more support for snow leopard conservation.

**Values of snow leopard conservation and beliefs about endangered species**

Five snow leopard conservation value statements were developed, with five-point responses ranging from “not at all important” to “extremely important” (Table 1).
Similarly, seven endangered belief statements were developed. These also used a five-point response scale, ranging from “strongly disagree” to “strongly agree” (Table 2).

**Socio-demographic characteristics**
Socio-demographic variables included gender, age, level of education, participation in labor force, annual financial income (in US dollars), and environmental organization membership.

**Data analysis**
In line with the theoretical framework, a multiple linear regression model and an ordinal regression model were constructed to predict which variables were related to knowledge about snow leopards and support for snow leopard conservation (Field, 2005; Tabachnick & Fidell, 2007). The plot of the knowledge index was symmetrical and appeared to be normally distributed. This speculation was supported by the Shapiro Wilk W test, which failed to reject the null hypothesis that the data were

**Table 1. Visitors’ snow leopard conservation values.**

<table>
<thead>
<tr>
<th>Value statements</th>
<th>Not at all important (%)</th>
<th>Slightly important (%)</th>
<th>Moderately important (%)</th>
<th>Very important (%)</th>
<th>Extremely important (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that snow leopards have a right to exist</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>32</td>
<td>61</td>
<td>4.52</td>
<td>0.68</td>
</tr>
<tr>
<td>I enjoy knowing snow leopards exist in Annapurna even if nobody ever sees one</td>
<td>2</td>
<td>3</td>
<td>14</td>
<td>37</td>
<td>44</td>
<td>4.18</td>
<td>0.92</td>
</tr>
<tr>
<td>I enjoy knowing future generations will get pleasure from snow leopards in Annapurna</td>
<td>2</td>
<td>3</td>
<td>15</td>
<td>37</td>
<td>43</td>
<td>4.17</td>
<td>0.91</td>
</tr>
<tr>
<td>I enjoy knowing other people get pleasure from snow leopards in Annapurna</td>
<td>3</td>
<td>6</td>
<td>17</td>
<td>38</td>
<td>37</td>
<td>4.00</td>
<td>1.02</td>
</tr>
<tr>
<td>I may want to see snow leopards in the future in Annapurna</td>
<td>8</td>
<td>10</td>
<td>18</td>
<td>23</td>
<td>42</td>
<td>3.82</td>
<td>1.28</td>
</tr>
</tbody>
</table>

**Table 2. Visitors’ beliefs about endangered species.**

<table>
<thead>
<tr>
<th>Belief statements</th>
<th>Strongly Disagree (%)</th>
<th>Disagree (%)</th>
<th>Neutral (%)</th>
<th>Agree (%)</th>
<th>Strongly Agree (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endangered species should be preserved to maintain a healthy ecosystem</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>21</td>
<td>74</td>
<td>4.65</td>
<td>0.72</td>
</tr>
<tr>
<td>Economic growth should get priority over endangered species preservation</td>
<td>25</td>
<td>44</td>
<td>20</td>
<td>7</td>
<td>4</td>
<td>2.21</td>
<td>1.03</td>
</tr>
<tr>
<td>Citizens should bear the responsibility of protecting endangered species</td>
<td>1</td>
<td>8</td>
<td>15</td>
<td>47</td>
<td>29</td>
<td>3.94</td>
<td>0.94</td>
</tr>
<tr>
<td>Many plants and animals become rare due to causes beyond the control of humans</td>
<td>6</td>
<td>32</td>
<td>23</td>
<td>26</td>
<td>13</td>
<td>3.08</td>
<td>1.16</td>
</tr>
<tr>
<td>Endangered species have as much right as humans to exist</td>
<td>3</td>
<td>8</td>
<td>13</td>
<td>28</td>
<td>48</td>
<td>4.09</td>
<td>1.10</td>
</tr>
<tr>
<td>There are more important environmental concerns than endangered species preservation</td>
<td>4</td>
<td>16</td>
<td>44</td>
<td>30</td>
<td>6</td>
<td>3.18</td>
<td>0.91</td>
</tr>
<tr>
<td>The economic value of endangered species plays an important role in their preservation</td>
<td>8</td>
<td>20</td>
<td>26</td>
<td>33</td>
<td>14</td>
<td>3.24</td>
<td>1.16</td>
</tr>
</tbody>
</table>
normally distributed (W = 0.99, z = 0.79, p = .216, n = 403). An ordinal least square estimator was used to build a multiple linear regression model by taking the knowledge index as a response variable and the following social-demographic variables as the predictor variables: gender, age, education, participation in labor force, income, and environmental membership.

As the second main response variable, support for snow leopard conservation, was measured on an ordinal scale, this precluded the use of the ordinary least square regression. An ordinal logistic regression model was therefore constructed by taking support for snow leopard conservation as a response variable and the three sets of predictor variables, as the theoretical framework inferred: knowledge about snow leopards, snow leopard conservation values, and beliefs about endangered species. Socio-demographic information was added.

One of the major assumptions underlying ordinal logistic regression is that the coefficients between each pair of outcome categories are the same. Thus, the proportional odds assumption implies that there is the same slope, but different intercepts for outcome categories within a single model. Both the likelihood ratio chi-square test and Brant test were used for testing the null hypothesis that there was no difference in the coefficients between models. The p-values were greater than .05, providing evidence that the proportional odds assumption was met.

**Results**

**Respondent information**

Of the sample, 48% were male and 42% were female. The average age was 32.2 (SD = 11.1) years, with a range from 18 to 73. For education, 23% were educated to high school level or below, 13% to associate degree level, 29% to bachelor’s degree level, 28% to master’s degree level, and 8% to doctoral degree level. A minority, 41%, were active in the labor force meaning that they were employed full-time, part-time, or self-employed, whereas the remainder (59%) were retirees, homemakers, or students who were not active in the labor force. More than half (55%) had an annual household income of less than $40,000, 28% had between $40,000 and $80,000, and 16% had more than $80,000 from all sources before taxes. Membership in any environmental, conservation, or wildlife organizations was held by 17% of respondents. When asked how well-informed visitors felt about flora and fauna in ACA, respondents’ average rating score was 3.84 (SD = 2.17) on a 10 point scale, suggesting that they felt poorly informed.

**Values in relation to snow leopard conservation**

There was broad general support for snow leopard conservation (Table 1), with existence and bequest values having higher means than altruistic and option values. The right of snow leopards to exist, for instance, was the most strongly supported statement, whereas the option of seeing snow leopards in the Annapurna area in the future was least supported. Overall, however, the proportions of respondents who considered all of the snow leopard conservation statements to be very or extremely important varied between 65% and 93%.
Beliefs about endangered species

Respondents had favorable beliefs about endangered species conservation (Table 2). There was also a spread of support for use and non-use valuation. The importance of conserving endangered species to maintain ecosystem functions was the highest scoring response, with 95% of respondents agreeing or strongly agreeing with this statement.

Knowledge about snow leopards

The mean of the snow leopard knowledge index was 3.8 \( (SD = 1.7) \) on the scale of 0 to 8 points. Most respondents (81%) had not personally observed snow leopards in nature, zoos, or zoological parks. Two-thirds (66%) of respondents, however, were able to positively identify the snow leopard from the accompanying photograph identification sheet. The other cat species most commonly misidentified as a snow leopard was the clouded leopard (12%), followed by the Eurasian lynx (8%), puma (7%), jaguar (5%), tiger (1%), common leopard (1%), and lion (<1%). A small number of respondents (1%) stated they did know which photograph represented the snow leopard and chose not to answer the question.

Of those who answered the question about whether they had ever read a magazine or book article, or watched a television program, about snow leopards, 42% had not, 37% had, and 21% were unsure. Three fifths (61%) of those surveyed had been aware that the species was present in ACA, although most (82%) believed that snow leopards were not easily observed in their natural habitat, compared with those who thought they were (2%) or were unsure (16%). Half (50%) of those who completed the questionnaire were unsure whether the snow leopard was found in Africa. This was similar to the proportion (45%) who felt that it was not found there, and considerably more than the percentage who thought it was there (5%). Similarly, 47% felt that the snow leopard was considered a charismatic species, 42% were unsure, and 11% thought it was not. The final question in the section asked which IUCN threat category best described the status of snow leopards in the wild. More than half of respondents (51%) chose critically endangered, whereas the rest were split between the endangered (30%), vulnerable (2%), and don’t know categories (17%).

The demographic variables detailed above were used for assessing which best explained knowledge about snow leopards. Membership in an environmental organization had the strongest statistically significant relationship in the multiple regression model, followed by education (Table 3). Figure 2 shows how these varied. The remaining variables were not statistically significant in the multivariate model, although during bivariate analysis those active in the labor force were found to be more supportive of implementing a SLCAP in ACA \( \chi^2_{3} = 8.33, p = .040, n = 382 \).

Support for snow leopard conservation

Of the 392 tourists who answered the question regarding the importance of implementing a SLCAP in ACA, <1% believed it to be not at all important, 3% to be a little important, 21% to be somewhat important, 54% to be very important, and 21% to be extremely important. The mean score was 3.92 \( (SD = 0.77) \) on the 5-point scale. When analyzed as a
dependent variable, three factors were significantly and positively related to these levels of support for SLCAP (Figure 3 and Table 4). First, those who had more knowledge about snow leopards were 28% more likely to agree that SLCAP implementation was important. Second, those who agreed with the conservation statement that “I believe snow leopards have a right to exist” were 56% more likely to support SLCAP implementation. Third, respondents who agreed that “I enjoy knowing future generations will get pleasure from snow leopards in Annapurna” were 48% more likely to support snow leopard conservation.

Of the seven belief statements about endangered species, only one was significantly, and negatively, associated with support for the SLCAP. Respondents who felt that wildlife declines were due to non-anthropogenic factors were 35% more likely not to support implementation of the SLCAP (Table 4). Unlike in the model predicting knowledge about snow leopards, no demographic variables were significantly associated with SLCAP support in the multivariate or univariate analyses.

**Discussion**

Although knowledge about snow leopards varied among the tourists, support for their conservation and supportive beliefs about endangered species conservation were common. Tourist knowledge about snow leopards was best explained by education level and
environmental organization membership. Improved knowledge about the species and a variety of intrinsic conservation values best explained support for snow leopard conservation. In line with the theoretical framework, the high levels of support for snow leopard conservation, and respondents’ regard for non-monetary values of snow leopards, in this study indicate the need to explore how visitors’ positive beliefs can be translated into meaningful actions for its conservation. Another recent study from ACA, for example, has shown that tourists are willing to pay to financially support snow leopard conservation in the area (Schutgens et al., 2018). Similar connections between attitudes toward wildlife and support for wildlife conservation have been reported from tourists in Australia (Ballantyne et al., 2009; Zeppel, 2008) and in the Galapagos Islands (Powell & Ham, 2008). However, data from Asian contexts appear to be limited.

Surveys of locals residents’ attitudes toward snow leopards have suggested a range of opinions (Alexander et al., 2015; Bhatia et al., 2016; Suryawanshi et al., 2014), although these studies did not assess tourist attitudes. In addition, a study of teacher attitudes toward wildlife and conservation in North-West India found that respondents who were not from the region were significantly more positive toward snow leopards than were local residents (Barthwal & Mathur, 2012). This suggests that tourists may be more supportive than local residents regarding snow leopard conservation, as the majority of costs associated with coexisting with the species are borne locally, whereas much of their value is enjoyed globally, a distributional inequity trend that is common for many large carnivore species (Dickman et al., 2011).

As with tourists’ attitudes toward snow leopard conservation, their knowledge about snow leopards appears not to have been assessed until now. This study shows that tourist knowledge about the species varies considerably, with its IUCN threat status being
overestimated by a majority of respondents, but almost two-thirds of respondents being able to identify it correctly from photographs of various large cat species. Studies from other contexts have shown that tourists can have varying levels of knowledge about wildlife, but these can contribute to support for conservation in conjunction with values and attitudes, as the KAP model suggests (Powell & Ham, 2008; Zeppel, 2008). Yet, the tourists surveyed in ACA felt poorly informed about local flora and fauna, inferring that more could be done to educate them about local biodiversity and its conservation to, ostensibly, increase their support for conservation.

Higher scores on the knowledge index about snow leopards were significantly related to higher levels of education and membership in environmental organizations. The role of education in increasing environmental knowledge, and changing attitudes, is well documented (Nyhus & Tilson, 2004). Other studies have also found environmental membership to be a significant predictor of environmental knowledge, but often in association with other values and activities, as per the theoretical framework (Fielding et al., 2008).

More than three quarters of respondents believed that implementing a SLCAP in ACA was very or extremely important. This level of support demonstrates that tourist support for snow leopard conservation could be a promising strategy for conserving the

<table>
<thead>
<tr>
<th>Support for snow leopard conservation</th>
<th>Coefficient</th>
<th>SE</th>
<th>z</th>
<th>p &gt; z</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge about snow leopard</td>
<td>0.278</td>
<td>0.071</td>
<td>3.90</td>
<td>&lt;.001</td>
<td>0.138</td>
</tr>
<tr>
<td>Values of snow leopards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that snow leopards have a right to exist</td>
<td>0.558</td>
<td>0.217</td>
<td>2.57</td>
<td>.010</td>
<td>0.133</td>
</tr>
<tr>
<td>I enjoy knowing snow leopards exist in Annapurna even if nobody ever sees one</td>
<td>0.321</td>
<td>0.168</td>
<td>1.91</td>
<td>.056</td>
<td>−0.008</td>
</tr>
<tr>
<td>I enjoy knowing future generations will get pleasure from snow leopards in Annapurna</td>
<td>0.478</td>
<td>0.241</td>
<td>1.98</td>
<td>.047</td>
<td>0.006</td>
</tr>
<tr>
<td>I may want to see snow leopards in the future in Annapurna</td>
<td>0.055</td>
<td>0.195</td>
<td>0.28</td>
<td>.776</td>
<td>−0.326</td>
</tr>
<tr>
<td>Beliefs about endangered species</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endangered species should be preserved to maintain a healthy ecosystem</td>
<td>−0.009</td>
<td>0.165</td>
<td>−0.05</td>
<td>.957</td>
<td>−0.333</td>
</tr>
<tr>
<td>Economic growth should get priority over endangered species preservation</td>
<td>−0.054</td>
<td>0.116</td>
<td>−0.46</td>
<td>.645</td>
<td>−0.281</td>
</tr>
<tr>
<td>Citizens should bear the responsibility of protecting endangered species</td>
<td>0.111</td>
<td>0.126</td>
<td>0.88</td>
<td>.382</td>
<td>−0.137</td>
</tr>
<tr>
<td>Many plants and animals become rare due to causes beyond the control of humans</td>
<td>−0.348</td>
<td>0.106</td>
<td>−3.27</td>
<td>.001</td>
<td>−0.556</td>
</tr>
<tr>
<td>Endangered species have as much right as humans to exist</td>
<td>0.128</td>
<td>0.118</td>
<td>1.09</td>
<td>.275</td>
<td>−0.102</td>
</tr>
<tr>
<td>There are more important environmental concerns than endangered species preservation</td>
<td>−0.068</td>
<td>0.135</td>
<td>−0.51</td>
<td>.613</td>
<td>−0.333</td>
</tr>
<tr>
<td>The economic value of endangered species plays an important role in their preservation</td>
<td>−0.007</td>
<td>0.102</td>
<td>−0.07</td>
<td>.942</td>
<td>−0.207</td>
</tr>
<tr>
<td>Socio-demographic characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>−0.035</td>
<td>0.234</td>
<td>−0.15</td>
<td>.882</td>
<td>−0.493</td>
</tr>
<tr>
<td>Age</td>
<td>0.006</td>
<td>0.013</td>
<td>0.51</td>
<td>.612</td>
<td>−0.019</td>
</tr>
<tr>
<td>Education</td>
<td>0.002</td>
<td>0.107</td>
<td>0.02</td>
<td>.984</td>
<td>−0.207</td>
</tr>
<tr>
<td>Active in labor force</td>
<td>−0.338</td>
<td>0.262</td>
<td>−1.29</td>
<td>.197</td>
<td>−0.853</td>
</tr>
<tr>
<td>Income</td>
<td>−0.040</td>
<td>0.051</td>
<td>−0.77</td>
<td>.442</td>
<td>−0.140</td>
</tr>
<tr>
<td>Environmental membership</td>
<td>0.409</td>
<td>0.314</td>
<td>1.30</td>
<td>.194</td>
<td>−0.207</td>
</tr>
<tr>
<td>Cut 1</td>
<td>2.743</td>
<td>1.429</td>
<td>(Ancillary parameters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut 2</td>
<td>5.293</td>
<td>1.442</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut 3</td>
<td>8.556</td>
<td>1.499</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
species, especially if this can be captured financially as well as intrinsically (Schutgens et al., 2018). These findings, therefore, corroborate tourism’s inclusion in various high-level snow leopard conservation strategy documents (GSLEP, 2013; Jackson et al., 2013), as well as Nepal’s nationwide Snow Leopard Conservation Action Plan 2017–2021 (DNPWC, 2017).

Tourist support for SLCAP implementation was significantly associated with higher scores on the knowledge index about snow leopards. The positive correlation between knowledge and environmental attitudes has been studied elsewhere (Barthwal & Mathur, 2012; Kansky & Knight, 2014). Here, it suggests that educating tourists may help to increase their support for snow leopard conservation. In addition, the significant relationship between two snow leopard conservation statements and support for the SLCAP suggests that non-use, or intrinsic worth is particularly important in understanding how tourists value snow leopards. This has been noted with other species (Loomis & White, 1996; Richardson & Loomis, 2009).

These findings show that tourist knowledge about and some beliefs toward snow leopards intersect with the immediate context—the proposed implementation of the SLCAP in ACA—to elicit high levels of support for snow leopard conservation, as per the theoretical framework. This relationship can help to understand and promote tourist engagement with snow leopards and their habitat. It also complements the findings of other studies that have found this to be true in various other conservation and environmental settings (Fielding et al., 2008; Powell & Ham, 2008; Zeppel, 2008). Here, this has been linked with the KAP model to empirically demonstrate the interconnection of knowledge, attitudes, and practice in the context of snow leopard conservation, as noted elsewhere in other contexts (Mostafa, 2007; Newhouse, 1990; Roelens et al., 2006).

Conclusions

Knowledge about, and several intrinsic values in relation to, snow leopards are related to a behavioral intention to support their conservation, which in this context is the implementation of a SLCAP in ACA. The findings also suggest that increasing the levels of tourist knowledge about snow leopards can increase their support for snow leopard conservation, lending weight to the importance of communicating conservation messages to people visiting snow leopard sites and landscapes. These results also provide baseline data on this topic in the Annapurna region of Nepal, and complement recent work in the region on tourist willingness-to-pay for snow leopard conservation (Schutgens et al., 2018). In addition, conservation policies in this area and elsewhere should emphasize the role of extrinsic and intrinsic values, such as existence and bequest values, for protecting the snow leopard.

Given the popularity of ACA as a tourism destination, these findings may not be representative of other protected areas across snow leopard habitats, especially in remote areas where tourist access is limited. Nevertheless, at sites where tourists do visit in sufficient numbers, visitor knowledge of and support for snow leopards and their conservation should be assessed and compared. Similar studies with domestic visitors should also be conducted to compare and contrast the results with international visitors. By providing empirical data on how tourists relate to this iconic species, this study complements existing recommendations in snow leopard conservation policy (DNPWC, 2017;
GSLEP, 2013; Jackson et al., 2013) that wildlife tourism be employed as an important tool to conserve the species.

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**References**


