

Visitors' views on alien animal species in national parks: a case study from South Africa

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LITTLE INFORMATION EXISTS GLOBALLY on the levels of awareness of visitors to national parks about the role of these parks, in part, to protect ecosystems. An exploratory study, involving a questionnaire survey, supported by interviews, examined visitors' views on the hypothetical presence of alien (that is, non-indigenous) animal species in the Addo Elephant National Park (AENP), South Africa. Correlations between responses and respondents' country of origin, level of education and age were investigated. The majority (c. 62%) of the respondents, who interpreted the questions correctly, were not aware of the fact that the presence of alien species would be at odds with the vision of the AENP, insofar as it refers to protecting the integrity of its ecosystems; this indicates the need for a focused education campaign for park visitors. Foreign respondents, and those who possessed a high level of tertiary education, were more opposed to the presence of alien species than South African respondents and those with lower levels of education. Respondents opposed to such a presence (c. 38%) form a relatively large segment of the growing ecotourism market in South Africa; research needs to be conducted to determine whether this group may be lost to the industry if alien species continue to be stocked in some state-run and private conservation areas. Little progress appears to have been made in the past 25 years in South Africa regarding the level of knowledge of park visitors about alien species, ecological and environmental interrelationships and the goals of park management.

Introduction

National parks are created and managed by government conservation agencies as IUCN Category II protected areas, which are managed mainly for ecosystem protection and recreation.¹ They are defined further as 'natural areas of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and

(c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible'.¹

In this regard, it is pertinent to question the degree to which visitors to national parks are aware of their role, as defined by the IUCN. This paper reports on a survey of visitor opinions regarding the conservation role of the Addo Elephant National Park (AENP), which is some 80 km ENE of Port Elizabeth, in South Africa's Eastern Cape province. According to its vision, the AENP serves, in part, to '...conserve and enhance the characteristic terrestrial and marine biodiversity, ecological processes ... representative of the Eastern Cape ... for the appreciation and benefit of present and future generations'. (www.sanparks.org/parks/addo/)

A key objective of our exploratory study was to obtain visitors' views on the desirability of the hypothetical presence of alien (that is, non-indigenous) animal species in the AENP (note, no alien animal species are present). More specifically, this component of the study was designed to obtain their views on the likely impact of the presence, or absence, of alien species on the quality of their visit, and to gauge their level of support for the introduction of these species to the park in the future. This was motivated by the high frequency with which alien animal species are stocked in some state-run and private conservation areas,² and the fact that introduced animals are widely recognized as being a leading cause of vertebrate extinctions.³ We were unable to locate any references dealing with visitors' opinions and perceptions regarding the presence of alien species in national parks, anywhere in the world.

Methods

A two-page questionnaire was handed by park staff to visitors entering the AENP main entrance gate, over two periods: August to October 2004, and January to March 2005. A total of 2500 questionnaires

was handed out during each of these two periods. The questionnaire was not pre-tested prior to distribution. No attempt was made to stratify the sample, that is, questionnaires were presented to all visitors until the supply was exhausted. Completed forms were returned prior to respondents leaving the park, or were mailed after their departure. The questionnaire included, in an amended layout format, the following two questions:

1. All the types of animals that are now present in Addo Elephant National Park are natural to the area—they occurred in the park and surrounding areas thousands of years ago. If animals that do not occur in the area naturally (i.e. they come from other parts of South Africa or Africa) had been present in the park during your visit, would this have (a) diminished your experience in the park?, (b) not affected your experience in the park?, or (c) improved your experience in the park?
2. Would you support the introduction of animals into the Addo Elephant National Park that are not natural to the area?

To enable the compilation of a personal profile of the respondents, the questionnaire requested the following information: home language, gender, age, town and country of origin, and highest educational qualification. Some of these data were used to elucidate response patterns to the two questions mentioned above.

A preliminary analysis of response patterns to the questions dealing with alien animal species revealed possible confusion in the minds of some respondents, specifically regarding the meaning of the term 'alien species' as defined in the above questions. For example, a high proportion of respondents (>35%) indicated that their visit would have been adversely affected by the presence of alien species in the park, but then supported the introduction of these species (that is, a contradictory response). Consequently, 100 randomly selected visitors were personally interviewed (on a one-to-one basis) by trained park staff, using exactly the same two questions. Questions dealing with respondents' profiles were included in the interviews, which were conducted during late September and early October 2005.

Chi-squared goodness-of-fit and contingency tables (with Yates correction for continuity⁴) were used to test for associations between responses and respondents' country of origin, highest educational qualification and age (grouped into 8 age-classes from 11–91). Significance was assessed at the 95% confidence level.

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Results

A total of 853 (34%) of the 2500 questionnaires given out in 2004, and 828 (33%) of the 2500 given out in 2005, were completed and returned. These totals represent 3% and 1.9% of the total number of visitors to the park over these periods, respectively, realizing a margin of error of below 3%. Not all respondents answered all the questions in the questionnaire; because the analyses were conducted on a question-by-question basis, incomplete questionnaires were included in the analyses. Following the results of a homogeneity analysis,⁴ response data for the 2004 and 2005 sampling periods were combined, and are further reported and interpreted as pooled data.

There are two forms of a contradictory response: a respondent may indicate, in response to the first question, that his or her experience in the park would have been diminished by the presence of alien animal species, but then indicates that he or she would support the introduction of such species, or *vice versa*. The proportion of contradictory responses decreased from 36.6% for the questionnaire data to 20% for the interview data (Table 1). Within the 'contradictory responses' category, the majority of respondents in the questionnaire data set (75%), and in the interview data set (65%), indicated that aliens (had they been present) would not have affected their experience, but were opposed to the introduction of aliens.

The breakdown of non-contradictory responses ($n = 963$ – questionnaires; $n = 80$ – interviews) to the two questions is illustrated in Fig. 1. Similar proportions of responses ($\chi^2_1 = 0.04$; $P = 0.83$) were obtained for both the questionnaire data (61.9%; $n = 596$) and the interview data (64%; $n = 51$) for respondents indicating that the introduction of alien animal species would have no effect on their experience (aliens acceptable), and those indicating that their experience would have been enhanced by aliens (aliens acceptable).

Respondents who were opposed to the introduction of alien animals formed c. 38% of all respondents in the non-contradictory group, with the questionnaire ($n = 367$) and interview ($n = 29$) data providing similar ($\chi^2_1 = 0.04$; $P = 0.83$) results (Fig. 1).

In the questionnaire data, non-South African respondents (41.9%) were more likely ($\chi^2_1 = 5.22$; $P = 0.02$) to be opposed to the presence of alien animal species than South African respondents (32.4%). In the interview data, these proportions were higher in the case of non-South

Table 1. Breakdown of contradictory and non-contradictory responses to the two questions (see Methods for definitions) in the questionnaire and interview data.

Category	Questionnaires ($n = 1520$)		Interviews ($n = 100$)	
	No.	%	No.	%
Contradictory responses	557	36.6	20	20
Non-contradictory responses	963	63.4	80	80

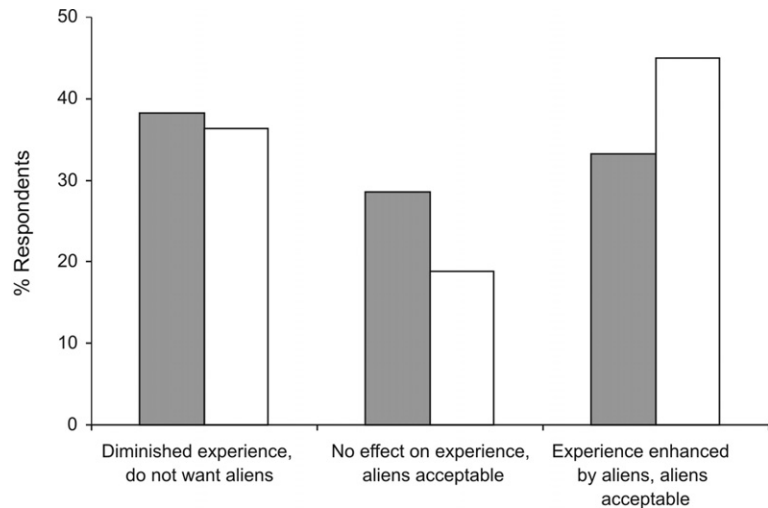


Fig. 1. Breakdown of non-contradictory responses to the question 'how would the presence of species that did not occur in the area naturally (i.e. aliens) affect your experience in the park?' Shaded bars – questionnaire data ($n = 963$), unshaded bars – interview data ($n = 80$).

Africans (47.1%), and lower in the case of South Africans (28.3%).

Overall, in the questionnaire ($\chi^2_3 = 14.2$; $P = 0.003$) and the interview ($\chi^2_3 = 6.20$; $P = 0.10$) data, respondents in the 'Bachelor's or post-graduate degree' category were more opposed to the introduction of alien animal species, when compared with respondents with lower levels of education. This indicates a positive interaction between the level of education of respondents and their opposition to the presence of alien animals.

A similar proportion of questionnaire ($\chi^2_7 = 2.04$; $P = 0.96$) and interview respondents ($\chi^2_7 = 7.19$; $P = 0.41$), per age class, indicated their opposition to the presence of alien animals

Discussion

Overall, about 64% of the respondents gave a non-contradictory response. We contend that the relatively high proportion of contradictory responses (36%) is largely a reflection of the level of misunderstanding among respondents of the

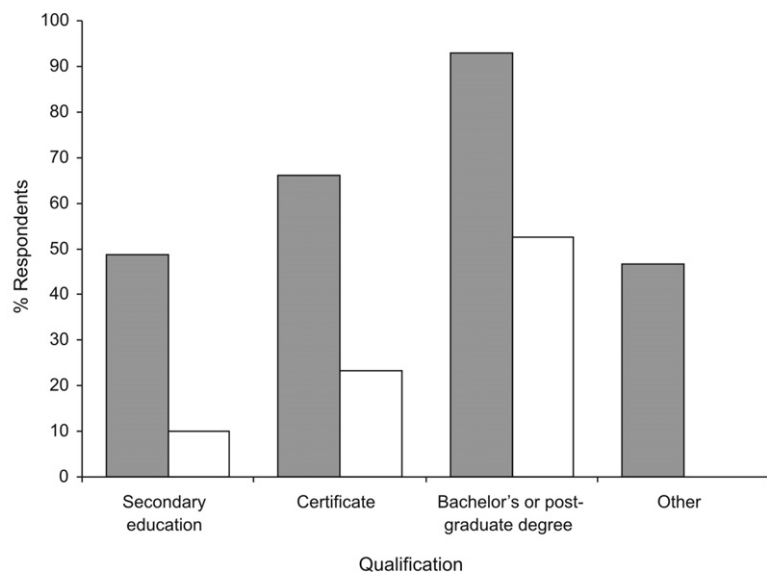


Fig. 2. Proportion of respondents not in favour of the presence of alien animal species, according to educational qualification, for the questionnaire data (shaded bars) and interview data (unshaded bars).

key issue at hand (that is, alien versus indigenous species), rather than a fundamental flaw in the design of the questionnaire. The reduction in the proportion of contradictory responses in the interview data set (to 20%) accords with the known phenomenon that more accurate results are obtained from one-on-one interviews than from self-completed questionnaires.^{5,6} Although the questionnaire was not pre-tested, this is not considered to have detracted from the findings of the study as the post-questionnaire interview process provided, overall, highly similar results.

The majority of the respondents (62%) did not appear to be aware of the issue of indigenous versus non-indigenous (that is, alien) species and the role of national parks, in part, to protect the former, or the risk that alien species pose to indigenous plants and animals. This is despite the fact that introduced species are considered to be one of the top three threats to the persistence of the world's biodiversity (including South Africa^{7,8}), and are responsible for nearly 75% of recorded vertebrate extinctions in the world.³ Given that visitors to national parks are probably likely to be more aware of, and in tune with, conservation issues, we predict that the average citizen is even more ignorant of the risk of alien species, and the role of national parks, in this regard.

Non-South African visitors appear to possess a higher awareness, than do South Africans, of one of the main reasons for the existence of national parks—namely, to protect ecosystems. Consequently, South African National Parks, other formal conservation authorities in South Africa and the South African National Biodiversity Institute, need to address this issue through an intensified and appropriate awareness campaign, aimed especially at South Africans. The analysis further revealed a positive correlation between educational level and degree of support for management of national parks in accordance with international biodiversity conservation principles and practices; in other words, the higher the level of education, the higher the state of awareness that national parks protect ecosystems. Other studies have shown a positive relationship between level of education and knowledge of, or attitudes towards, environmental issues,

including protected area management.^{9,10}

Assuming that the findings obtained above for the AENP are applicable to other conservation areas in South Africa, a large proportion of visitors, especially the foreign and more educated ones, is opposed to the presence and introduction of alien species. Ecotourism, based on spectacular ecosystems (biodiversity and landscapes), is a rapidly growing industry in South Africa, especially in the Eastern Cape.¹¹ However, many reserves, both privately and state owned, have introduced and maintain alien wildlife species.^{2,11} The motivation for this is apparently to improve the attractiveness of the operations to tourists.² Although our results suggest that the stocking of non-indigenous species may reduce the attractiveness of parks and reserves to the growing ecotourism market, the extent to which this may happen requires further research.

Although the two studies are not directly comparable, our findings and those of Preston and Fuggle¹² suggest that little progress has been made in the past 25 years regarding the level of knowledge of park visitors about alien species; in the latter study, conducted in 1982, only 10% and 53% of respondents commented upon the presence of alien birds and alien mammals, respectively, in three South African nature reserves. From their data, Preston and Fuggle¹² concluded that 'visitors understanding of reserve management is particularly limited' and recommended that interpretation programmes in nature reserves should include 'intensive efforts to ... integrate ecological and environmental interrelationships...'. Our results indicate that there is still much to be achieved in this regard.

Our findings enable us to support the plea by Kerley *et al.*¹³ for the importance and value of biodiversity (including ecosystems) in protected areas, including national parks, to be aggressively promoted to visitors and society at large. Given that ecosystem protection is an important function of the AENP (and other South African national parks and conservation areas), we recommend that a prominent expanded statement to this effect be included in the documentation that is handed to all visitors. It is cause for concern that so many respondents provided contradictory responses, suggesting a

lack of understanding of the issue at hand. This strongly indicates that further research in this field, and education of visitors, is required.

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