



# Tourists' perceptions of off-road driving in the Makuleke Contractual Region of Kruger National Park

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## Abstract

This study investigated the relationship between environmental impact and eco-tourists' perceptions of it, in the Makuleke Contractual Park (MCP), Kruger National Park. The emphasis was on environmental damage caused by game drive vehicles driving off-road. The study was based on 112 completed visitor questionnaires, with an equal number of foreign and local tourists who completed the questionnaire. Tourists had significantly variable demographic characteristics. Tourists' environmental perceptions varied, but a significant majority of tourists agreed that off-road driving has a negative impact on the environment. Contradictions exist between what they know or perceive as being damaging and what they prefer to act on. Results indicate a need for improved visitor education on the possible negative impacts of demands for off-road driving. Visitors were required to complete the first section regarding their demographics, followed by indicating their perceptions in sections two to five of the questionnaire on Likert-type scales. The questions were structured in such a way that it would be possible to draw correlations between the tourists' environmental values and their perceptions on off-road driving.

**Keywords:** eco-tourism, off-road driving, perceptions, tourist impact, Makuleke Contractual Park

## Introduction

Eco-tourism activities have been found to sometimes have negative impacts on the environment. Driving in dirt tracks (ungravelled natural soil) or off-road driving (ORD) has been observed to be one such a recreational activity which has severe negative environmental impacts (Nortjé, 2014). Although eco-tourism is perceived not to have any negative impacts on the environment, this is not always the case. Eco-tourism does have negative environmental impacts, and sometimes it is the eco-tourists' themselves who are ignorant regarding their impacts on the natural environment (Nortjé, 2014).

The International Ecotourism Society (TIES) (1990) as well as Lindberg & Hawkins (1993) classifies ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of the local people". Allcock *et al.* (1994) and Tickel (1994) stated that "Ecotourism is nature-based tourism that involves education and interpretation of the natural environment and is managed to be ecologically sustainable".

Ceballos-Lascuráin (1998) believes that the term ecotourism should only be used if tourism activities take place in a natural environment, encourage conservation and help society achieve sustainable development.



Eagles & Cascagnette (1995) define an eco-tourist as an adult who travels with the intent of observing, experiencing and learning about nature, while the Office of National Tourism (1997) mentioned that eco-tourists generally appear to be seeking travel experiences that involve areas or attractions of natural beauty, small groups and being away from crowds, some level of interaction with the environment, interaction with other people (preferably like-minded and compatible), some degree of information and learning, and enjoyment.

No definition of ecotourism excludes the fact that the environment must sustain the tourists' recreational activities. "Sustain", meaning that the environment must not degrade beyond the point of recovery while continuing to allow for tourists' recreational activities. There exist some studies about the profile of eco-tourists, most of them limited to visitors to specific areas. For example, Saayman & Slabbert (2004) analysed tourists visiting the KNP. The study found that the majority of tourists had high education levels.

The majority of tourists (84%) were either in possession of a degree, a diploma or matric (grade 12) qualification. Genders were distributed unevenly (65% male; 35% female). Most were married (81.5%) and the majority (44% to 57%) were in the professional and managerial occupational group. The majority travelled in groups of between three to four people. In a study by Wight (1996) of the North American ecotourism market, it was found that experienced eco-tourists are found in all age groups, but most (76%) are between 15 and 54 years old. They have high educational levels and the genders are distributed equally. The majority also like to travel either as couples or as family.

The most attractive activities are wilderness experience, wildlife viewing, hiking, canoeing/kayaking and casual walking (Wight, 1996). The North American eco-tourists' preferred travel motivations are scenery/nature, new experiences/places, wildlife viewing, wilderness and uncrowded places. Van der Merwe & Saayman (2008) found the travel motivations of tourists to the KNP, South Africa could be divided into six factors namely, nature (to see wildlife), activities (conferences, wilderness hiking), attractions (the park itself-nature), nostalgia (family time, experience wildlife), novelty (explore new destinations) and escape from routine (relaxation). Eagles (1992) and Eagles & Cascagnette (1995) investigated the profile and travel motivations of Canadian eco-tourists.

Results indicate that Canadian eco-tourists have a high education level, can be of any age, but tend to be older and have a higher than average income level. Their principle travel motivations include wilderness, nature and landscapes, which reveal an eco-logicistic [ecological/ecologic] attitude. The MCP was formally established in 2000 when the Makuleke community entered into a concession agreement with a Joint Management Board, consisting of three partners, namely the Makuleke community, the KNP and Wilderness Safaris (ecotourism operator).

In this study in the Makuleke Contractual Park, off-road driving (ORD) has been found to be associated with a range of negative impacts (Nortjé, Van Hoven & Laker, 2012). Negative impacts include soil erosion, soil surface crusting, soil compaction, vegetation damage and disturbance of wildlife (Bhandari, 1999; Nortjé et al., 2012). Even low-frequency ORD (one vehicle pass) can be damaging, as the first pass over the soil surface produces the most compaction. Repetitive ORD prevents the soil and natural environment from recovering and over time the damage can be permanent.

On this basis, ORD is extremely damaging. These problems are widespread, as most, if not all private nature reserves and even National Parks in South Africa allow ORD to attract tourists and, thus, enhance economic returns (Nortjé, 2005). It has also been observed that



ORD is sometimes instigated by tourists demanding ORD to see certain animal species at close quarters (Nortjé, 2005).

Although ORD has probably been going on for decades, the practice of the activity has never been officially recognised and addressed in South Africa. That only happened in 2000 with the commercialization program of the South African National Parks (SANParks) when commercial concessions were granted in the parks and concession holders received permission to conduct ORD. Since then, the practice grew exponentially. This also coincided with the exponential growth in, so called, eco-tourism or nature-based tourism to remote and wildlife rich places in Africa, and increased ORD in those areas (Bhandari, 1998). The perception that tourists demand sightings of the so called 'Big 5', namely elephant, buffalo, rhino, lion and leopard, at close range is the cause of the problem.

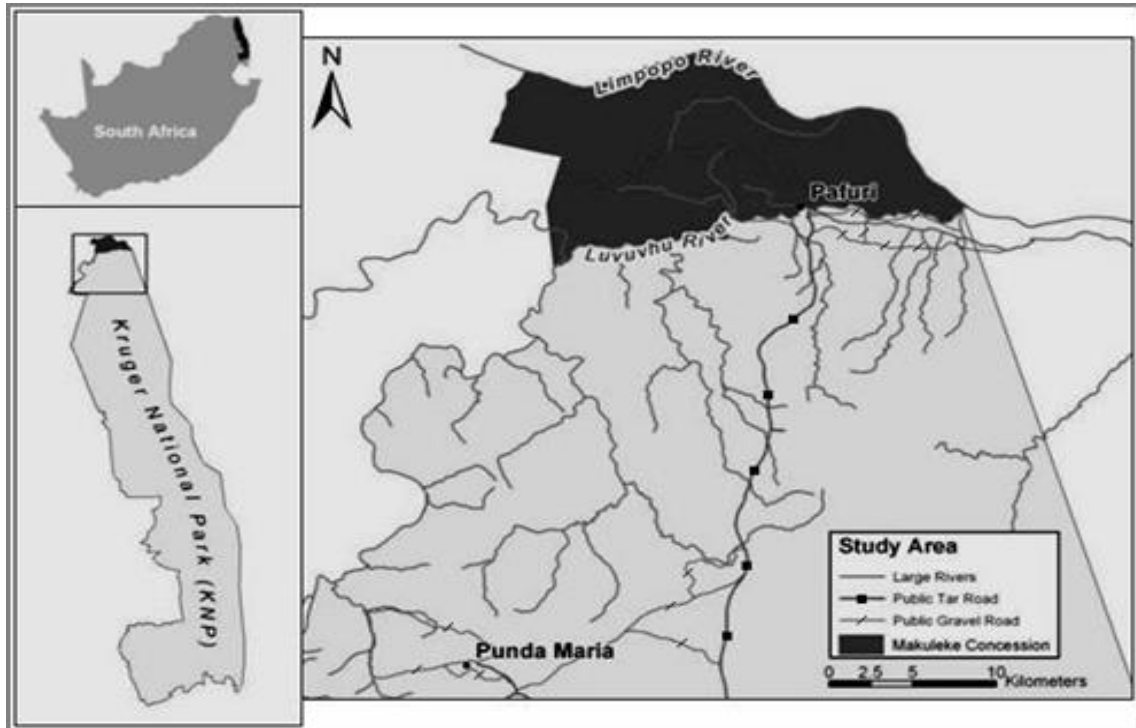
Tourism operators say they compete for high-paying eco-tourists to visit their specific conservation areas that it is a business and, therefore, they need to fulfil the needs and requirements of their guests or clients (Bonham-Whetham, pers.comm, 2013). Otherwise, clients will just make use of other operators or reserves which conduct ORD. The result will be that those who do not engage in it will lose business (Naylor, pers.comm, 2013). In some cases, prospective tourists are lured by advertisements in the media and on the internet that promise them close encounters with the "Big 5".

The author's personal experience is that eco-tourists are mostly ignorant (uninformed), not knowledgeable and misled by some tourism operators. Because the tourists do not know the facts they do not realise that due to participating in and/or demanding an activity like ORD, they may be promoting serious damage to the environment. Another factor is that game drive guides are pressured by management and guests to drive off-road for certain animals, no matter what the possible negative impacts may be. Such situations have been observed in some private concession areas in the KNP (Nortjé, 2005; Nortjé et al., 2012). It has also been observed by the authors that during game drives that there is general ignorance among tourists regarding the negative environmental impacts of certain activities.

This study was designed to address eco-tourists' perceptions in the MCP focussing on some specific questions: (1) to collect information on the tourists' demographics; (2) to determine the tourists' motivations for visiting the MCP; (3) to understand the tourists' views regarding selected environmental and tourism issues better; (4) to determine the tourists' views and perceptions regarding off-road driving (ORD) specifically; (5) to explore what perception they had of the environmental impacts due to their activities, and : (6) to draw correlations between the tourists' environmental values and their perceptions on off-road driving.

The study was conducted in this area because of its management's willingness to participate in it. The MCP is situated between the Limpopo and Luvuvhu Rivers in the northern sector of the KNP (Figure 1). This 24,000 hectare area is recognised as one of the most diverse and scenically attractive areas in the KNP and is called either the Pafuri triangle or the Makuleke Concession- as it is the ancestral home of the Makuleke people (Pafuri factsheet 2011).

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**Figure 1.** Locality of the Makuleke Contractual Park in the Pafuri region of the Kruger National Park

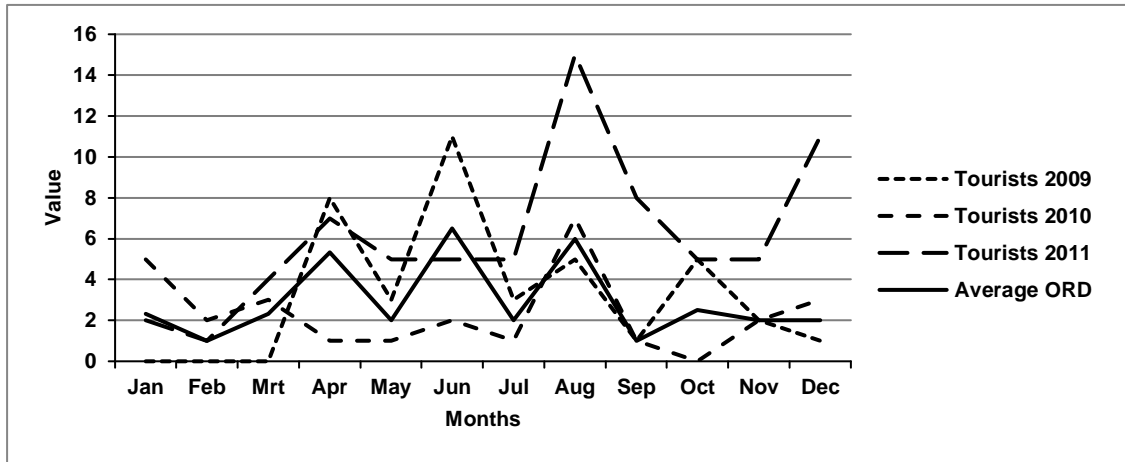
## Methodology

Data were collected by means of a structured visitor questionnaire administered through personal interviews during two peak tourist periods (Moore et al., 2008). A pre-coded questionnaire constituted five sections was used during each interview lasting between 20 to 30 minutes. The first section was structured in order to characterize visitors' profile in terms of age, gender, nationality, occupation, and educational level. Motives, views on selected environmental and tourism issues, views on issues related to off-road driving, and a rating of the MCP as an environmentally friendly tourism destination, were rated using 3-point-, five-point-, five-point, and five-point Likert scales respectively.

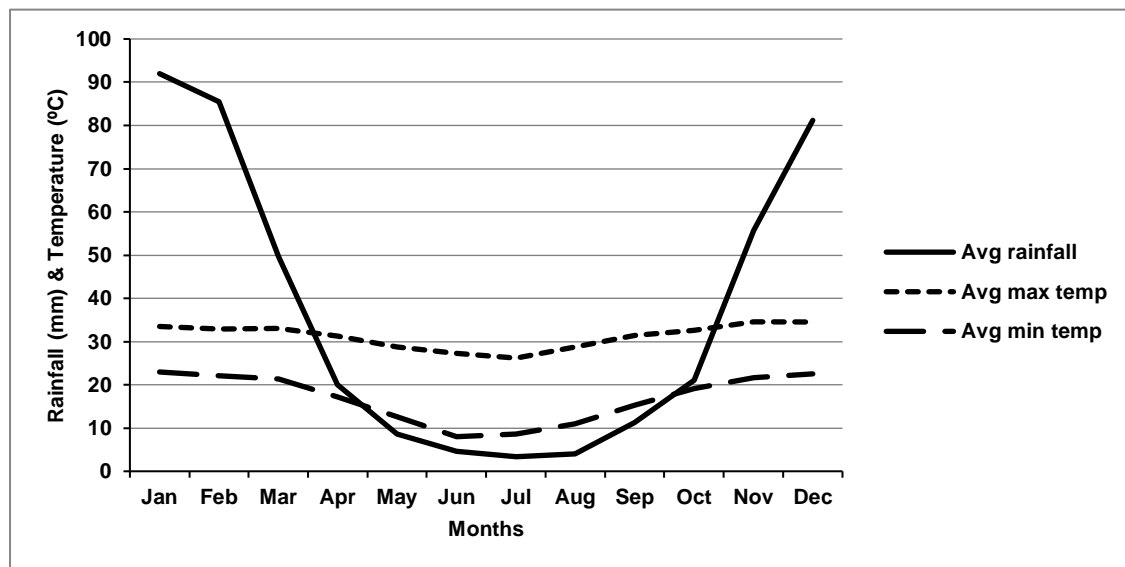
Tourists were surveyed during their visit at the park. No differentiation was made between individual tourists and those as part of a tour group, as opposed to what was done in the survey of Priskin (2003). Visitors were approached randomly without consideration of any of their characteristics, time of day, or behaviour (Priskin, 2003). This was done during their stay (before or after brunch or before or after dinner). People were very cooperative with no refusals. They were also very interested in the study and shared their own ideas freely.

The survey was conducted over a four months period during winter (June-July) and spring (August-September) 2011. This period was selected because these months represented the peak visitor periods during previous years, with isolated peaks in April and December (Figure. 1). Behe & Bruyere (2007) also did their survey during a peak time of tourists visit. Most ORD also occurred during the period June to September (Figure. 2). ORD incidence levels are a function of visitor numbers and relatively low rainfall (Figure. 2 and 3). Foreign visitors to the area are generally sparse during the summer months in the area, due to the hot conditions (Figure. 2 and 3). A total of 112 questionnaires were administered during the four-month period. Once data had been obtained from the survey, it was captured on Microsoft excel

where after it was statistically analysed using the software SPSS 16 (Statistical Package for the Social Science).



**Figure 2.** Correlation between tourist bed nights and three-year average ORD incidents



**Figure 3.** Climate (average rainfall and temperature) data for the Pafuri Camp

Something interesting happened during the period July to December 2011, where higher than normal visitor numbers were realised. Visitor numbers were much more than during the same period the previous two years. The reason for this was that the tourism operator opened up accommodation at special rates during many weekends in this period. Most ORD also occurred during the period June to September (Figure. 1).

**Results:** There were 112 usable completed questionnaires received for this study. That is a 100% return was achieved.

### Tourists' demographic profiles

The ages of persons who completed questionnaires ranged from 12 to over 60 years old. Persons in older age groups constituted the largest proportion of the tourists, with a total of 42.9% of visitors being 60 years and older (Figure. 4). With the age group 50-59, representing

15.2% of the tourists, it means that 58.1% of the tourists were 50 years and older. This fits in with the finding that about 50% of respondents were retired people (discussed later). In the younger age groups representation increased with increasing age, as could probably be expected, with the age group 12-19 making up 1.8%, the age group 20-29 making up 9.8% and the age group 30-39 representing 18.8%. Surprisingly, the contribution by the age group 40-49 years decreased sharply, compared with the 30-39 years age group to only 11.6%. The contribution of males who completed the questionnaire were 51.8% compared to 48.2% females.

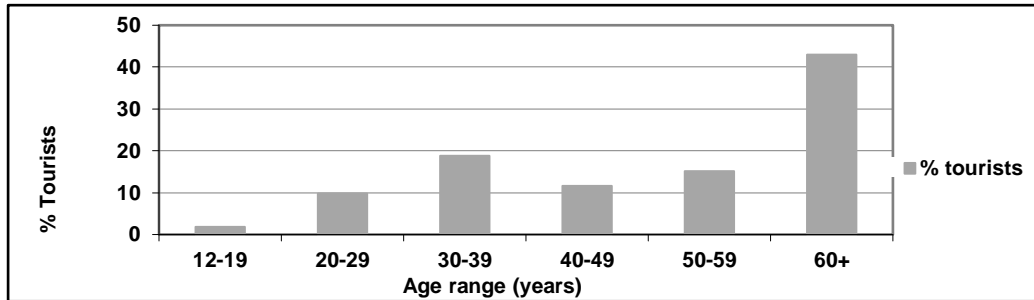


Figure 4. Age distribution of Pafuri tourists

A large majority of the visitors (62.5%) are in the occupation category 'professional' and 'managerial' or were in it before retirement. The 37.5% of respondents in the category 'other' include persons in retirement or already retired from a wide variety of occupations, including the professional category (Figure. 5). About half (49.5%) of the respondents were retired persons.



Figure 5. Occupation distribution of Pafuri tourists

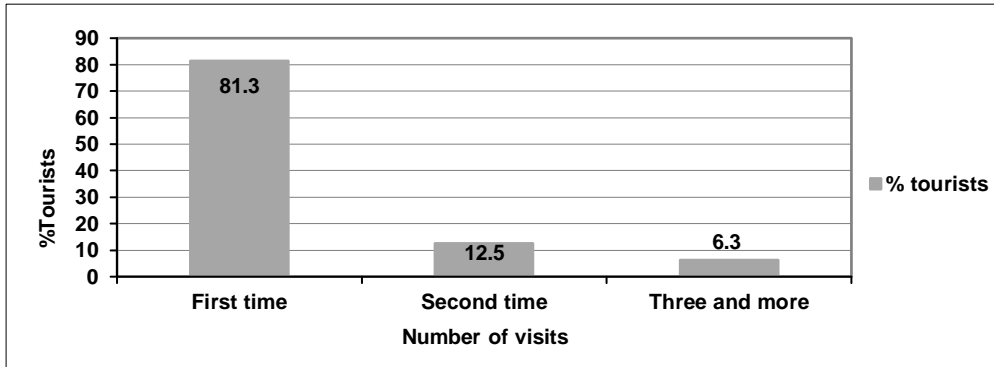
In the 'income' category, it was decided that it would be better not to ask for specific income ranges, but rather use the following categories: self-paid holiday, family gift, work and other. Asking the respondents to answer these questions would be much less intrusive and make them keener to complete this question. 71.4% of respondents indicated that they paid themselves for their visit to the park (Table 1). This could be mainly related to the fact that 49.5% were retired and 62.5% are currently or were previously managers or professional people with higher income levels.

Table 1. Who pays for this holiday?

Who pays for this holiday?	Number of tourists (%)
Own holiday	71.4
Family gift	0.9
Work	23.2
Other	4.5

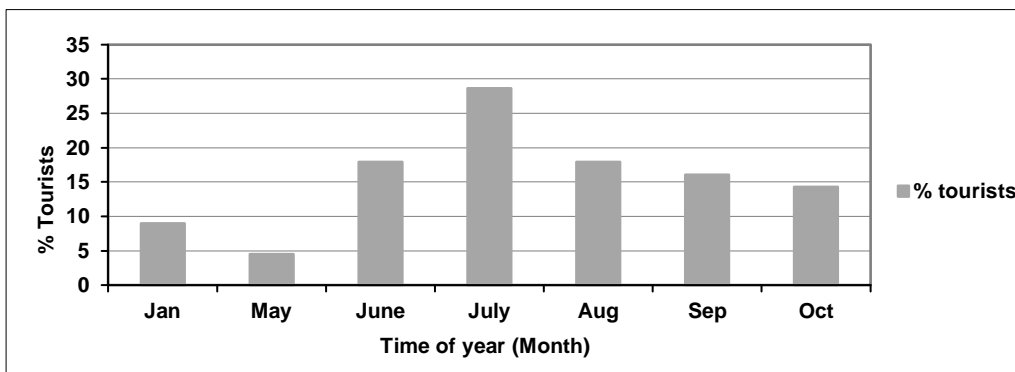


81.3% of respondents were first time visitors to Pafuri Camp (Figure. 6). Tourists probably tend to visit different areas during successive visits to game parks. However, in this case an important contributing factor is probably that this concession and camp opened only in 2001 and was previously relatively unknown in the market. From July 2011 there was suddenly a sharp increase in visitor numbers compared with the relatively static 2009 and 2010 (Figure. 1).



**Figure 6.** Visitor frequency distribution to Pafuri

The largest group of respondents indicated that they would prefer to visit Pafuri Camp during July (28.6%). Respondents indicating that they would prefer visits during June or August (both 17.9%) were the second most common group (Figure. 7). Visitors who preferred to come during September (16.1%) and October (14.3%) were the third and fourth most common groups, whereas the fifth and six most common groups were those tourists preferring to visit during January (9%) and May (4.5%). It should be noted that these indicated preferences do not agree with the actual facts regarding visitor numbers depicted in Figure. 1, especially with regards to the peaks in December (2010 and 2011) and in April (2010) or March (2011).



**Figure 7.** Tourists preferred time of year visit

### Tourists' motivates for visiting Pafuri Camp and the Makuleke Contractual Park

The responses of respondents regarding their reasons for visiting Pafuri Camp are summarised in Table 2.

**Table 2.** Tourists' motivations for visiting Pafuri Camp

Reasons for visit	% of respondents		
	Very important	Somewhat important	Not important
Gain new knowledge	<b>51.8</b>	41.1	7.1
Outdoor activities	<b>88.2</b>	10.0	1.8
Nostalgia	10.1	22.9	67.0
Novelty	31.5	37.0	31.5
Escape & relaxation	<b>49.1</b>	31.8	19.1
Photography	<b>41.7</b>	41.7	16.7
Wilderness experience	<b>87.4</b>	9.9	2.7
Seeing predators	<b>53.2</b>	32.4	14.4
Explore new locations	<b>66.1</b>	27.5	6.4
Socializing	17.3	41.8	40.9

The following categories were indicated to be very important motives for most visitors: 'outdoor activities', as in game drives and game-walks (88.2%); and 'wilderness experience' (87.4%). Reasons that were very important for a moderate number of visitors include: 'exploring new locations' (66.1%); 'gaining new knowledge' of the environmental, ecological and historical aspects (51.8%); 'seeing the major predators' at close range, including by means of ORD (53.2%); 'escape and relaxation' (49.1%) and 'photography' (41.7%).

Reasons that were very important for only a small number of visitors include: 'nostalgia' (10.1%); 'novelty' (31.5%) and 'socializing' (17.3%). These findings correspond well with those of Van der Merwe & Saayman (2008), Kruger & Saayman (2010), and Kruger et al (2017). However, some major differences were also found between the findings in this study and those of van der Merwe & Saayman (2008), most importantly the following:

- "Outdoor activities" and "wilderness" were rated very high in this study. In contrast, nature was rated quite moderate and activities very low in the study by van der Merwe & Saayman (2008);
- "Escape" was rated very moderate in this study, but very high (>80%) in the study of van der Merwe & Saayman (2008);
- "Nostalgia" was rated very low in this study, but second highest (nearly 70%) in the study of van der Merwe & Saayman (2008).

Van der Merwe & Saayman (2008) included some wildlife aspects erroneously in their "nostalgia factor", which may explain some of the above-mentioned differences.

These results indicate that the majority of tourists visiting Pafuri Camp enjoy the outdoors and would like to take part in activities which bring them in closer contact with the wildlife and nature. These data correspond very well with the results of the study by Onyeanusu (1986). On the negative side, this may also mean that they would be willing to take part in any activities that would contribute to satisfying their needs, even ORD. The fact that more than two thirds (68.7%) of the respondents were willing to make definite statements (positive or negative) regarding the question whether ecotourism has negative impacts, is somewhat alarming in view of the fact that less than one third (32.1%) disagreed or strongly disagreed with the



statement that "most eco-tourists have poor knowledge and grasp of ecological facts". In other words, quite a number took definite standpoints purely on "gut feelings" or perceptions. This is in contrast to findings by Priskin (2003).

A principle component analysis of the visitor responses revealed that the 10 different motivation factors (Table 3) grouped the visitors into three distinct visitor segments. The three segments or component factors in this study were grouped as follows: Factor 1, "wildlife/nature"; Factor 2, "relaxation/get-away" and Factor 3, "seeing the major predators/socializing". The motives of tourists visiting Pafuri Camp are thus very specific and well defined (Table 3).

**Table 3.** Component matrix

Motivation factors		Component factors			
		Factor 1	Factor 2	Factor 3	Factor 4
2.9	Explore new locations	.693	.239	-.043	-.268
2.7	Wilderness experience	.580	-.250	-.287	-.014
2.2	Outdoor activities: game drives, game walks, etc.	.567	-.401	-.155	.449
2.1	Expand/gain new knowledge on various environmental, ecological, historical, etc., aspects	.544	-.168	.053	-.376
2.4	Novelty (uniqueness)	.489	.307	-.261	-.296
2.3	Nostalgia (reminiscence)	.308	.665	.073	.302
2.5	Escape and relaxation	.320	.618	-.269	.317
2.8	Seeing the major predators (lion, leopard, cheetah), at close range by means of ORD	.469	-.205	.658	-.226
2.10	Socializing	-.009	.593	.606	.038
2.6	Photography	.394	-.388	.365	.509

Extraction Method: Principal Component Analysis / a. 4 components extracted

Factor 4 was rejected but "photography" was grouped under Factor 1. The reason for rejecting the component Factor 4 and regrouping "photography" under component Factor 1 is because it is something like "activities", since it has a fair correlation with "outdoor activities". "Seeing the major predators" and "socializing" were grouped together because it was reasoned that the most important part of socializing after game drives was talking and discussing sightings or close sightings of the major predators (Nortjé 2009-2012 pers obs).

Component Factor 2 ("relaxation/get-away") was strongly positively correlated with "nostalgia", "escape and relaxation" and "socializing", which is logical. Very noteworthy it was negatively correlated with most other "motivation factors". It was most strongly **negatively** correlated with "physical" motivation factors, like "outdoor activities" and "photography". This component factor was also negatively correlated with "wilderness experience", "gaining new knowledge" on environmental and related aspects, and even "seeing the major predators" at close range.

It seems as if there is a group of eco-tourists that can basically be described as "passive tourists". They are possibly the ones with the least negative impacts on the environment, since they seem the least likely to demand activities like ORD, game walks, etc. Van der Merwe & Saayman (2008) found that "nostalgia" had weak negative correlations with all other "motivation factors", with the strongest against "nature" and that "escape" had a weak negative correlation with "activities".

### Tourists' environmental views

In this section of the survey where the respondents' perceptions on general environmental and tourism issues were tested (Figure. 8). The majority of respondents 'agreed' or 'strongly agreed' with the following statements: 'the present generation should ensure the environment in eco-tourism areas is maintained for future generations' (100%); 'eco-tourists have a responsibility to acquire correct knowledge of ecological facts, in order to do correctly what they can, to protect the environment' (90.2%); 'negative impacts of eco-tourism on the environment are aggravated by the actions and demands of eco-tourists with poor knowledge and grasp of ecological facts' (70.5%); and 'negative impacts of eco-tourism on the environment are aggravated by the actions of irresponsible eco-tourism operators who offer environmentally harmful packages to ill-informed eco-tourists' (60.9%).

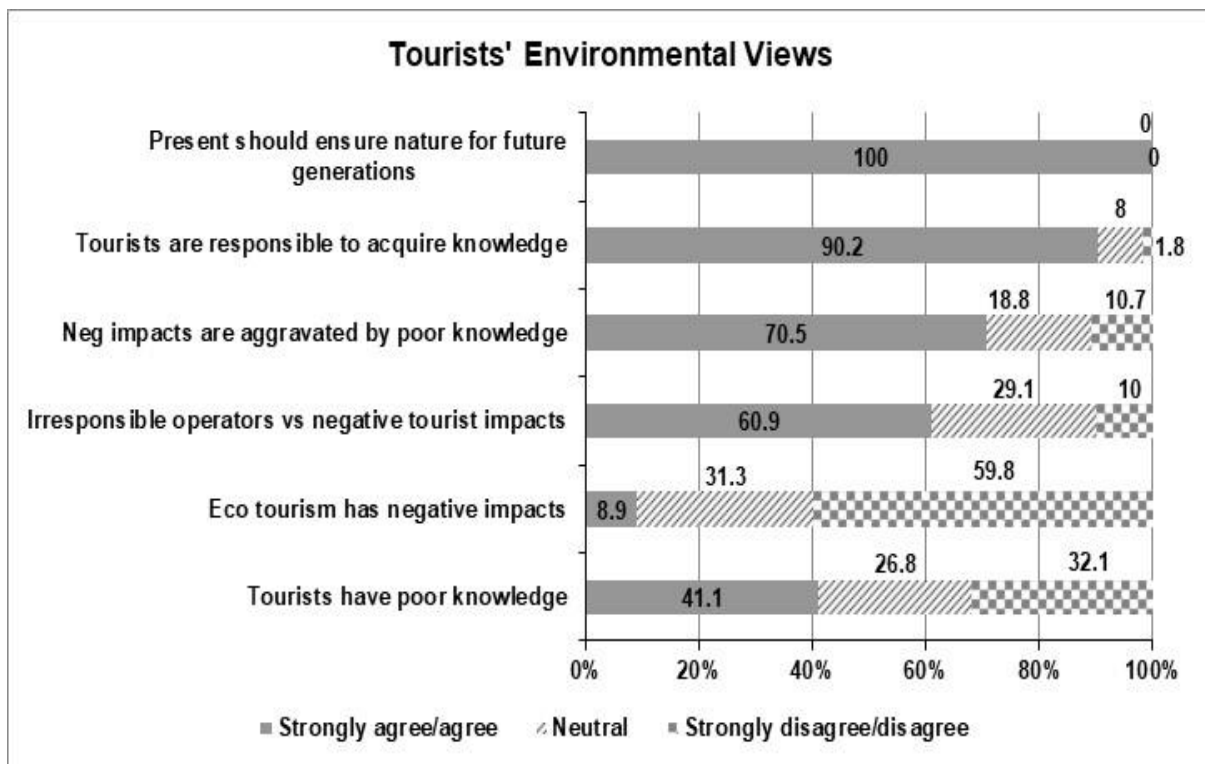


Figure 8. Tourists' Environmental views/perceptions

A majority of respondents (59.8%) disagreed with the statement that 'eco-tourism has negative impacts on the environment'. Almost one third (31.3%) of respondents, were neutral and, thus, felt uncertain regarding this statement. Only 8.9% of respondents 'agreed' or 'strongly agreed' that eco-tourism has negative impacts on the environment. The fact that more than two thirds (68.7%) of the respondents were willing to make definite statements (positive or negative) regarding the question whether 'eco-tourism has negative impacts' is somewhat disturbing in view of the fact that only 32.1% 'disagreed' or 'strongly disagreed' with the statement that 'most eco-tourists have poor knowledge and grasp of ecological facts'.

In other words, quite a number took definite standpoints purely on "gut feelings" or perceptions. Most disturbing, in view of this, is that such a large proportion was of the opinion that eco-tourism does not have negative impacts, without actually knowing whether this is the case. In response to the statement that 'most eco-tourists have poor knowledge and grasp of

ecological facts', a significant proportion (26.8%) of the respondents was neutral, possibly because they felt uncertain.

### Tourists' views regarding ORD

Regarding ORD in general, visitors had significantly different perceptions about the impact of ORD (Table 4). Hillery, Nancarrow, Griffin & Syme (2001) found similar results with the evaluation of tourists' perceptions of their environmental impact. The majority of respondents agreed that off-road driving has negative impacts on the environment. The statements, with regards to the perceptions of tourists to ORD, showed that on most questions, where the negative impact of ORD was stressed, the respondents agreed.

**Table 4.** Tourists' general ORD perceptions

ORD perceptions	% of respondents		
	Strongly agree/agree	Neutral	Strongly disagree/disagree
ORD has no negative impacts	11.0	17.4	<b>71.6</b>
ORD causes compaction	<b>61.8</b>	<b>26.4</b>	11.8
ORD causes erosion	<b>52.7</b>	<b>32.1</b>	15.2
Benefits of ORD > damage by ORD	27.9	28.8	43.2
ORD has negative impact on wildlife	38.0	28.7	33.3
ORD does not cause vegetation damage	11.7	11.7	<b>76.6</b>
ORD damage takes long to recover	<b>57.1</b>	<b>22.3</b>	<b>20.5</b>

The majority of respondents agreed that ORD has 'negative impacts' on the environment in the form of causing 'vegetation damage' (76.6%), 'no negative impacts' to the environment (71.6%), 'soil compaction' (61.8%), and 'soil erosion' (52.7%). But an interesting finding by Noe, Hammitt, & Bixler (1997) indicates that tourists visiting different National Parks in the United States rate soil erosion only as "slightly unacceptable". This is reason for concern.

The above-mentioned results are consistent with findings by Chin, Moore, Wallington, & Dowling (2000) in Bako National Park, in Malaysia, which showed that environmental conditions of greatest influence on visitors' experiences included litter and biophysical conditions, such as soil erosion and vegetation damage.

The responses, regarding the first two ('negative impacts' and 'vegetation damage'), were clear-cut, but the latter two ('soil compaction' and 'soil erosion') less so. In the case of soil compaction, 26.4% were neutral and for soil erosion 32.1%, indicating uncertainty, probably due to a lack of knowledge. It is generally found that people have very little knowledge about soils and their role in the environment (Laker, pers.comm, 2012). The majority (57.1%) were also of the opinion that damage caused by ORD takes long to recover, but 20.5% disagreed with this opinion and 22.3% remained neutral.

Respondents were strongly divided regarding whether ORD has negative impacts on wildlife and whether the benefits of ORD outweigh damage caused by it. In total, 72.3% of respondents experienced ORD at Pafuri, with more than two thirds (67.9%) having had previous experience of ORD (Table 5). It is noteworthy that, in contrast to the sub-section on ORD in general, in this sub-section respondents expressed definite opinion in terms of their perceptions of ORD. Virtually no respondents remained neutral or undecided. Furthermore'

with regards to their experience of ORD at Pafuri, their responses clearly contradict their above-mentioned perceptions for ORD in general.

**Table 5** Tourist perceptions of ORD at Pafuri

Perceptions of off-road driving at Pafuri	% of respondents		
	Yes	No	Do not know
Experienced ORD at Pafuri	<b>72.3</b>	27.7	0.0
Was ORD explained before the incident?	45.8	54.2	0.0
Did the ORD generate negative emotions in you?	13.6	<b>86.4</b>	0.0
Are you attracted to areas where ORD is practised	<b>45.8</b>	51.4	2.8
Soil & vegetation recovers after ORD	<b>76.4</b>	20.0	3.6
ORD should be allowed for people who never saw certain animals	<b>56.3</b>	40.2	3.6
Any previous experience of ORD	<b>67.9</b>	31.3	0.9

For no less than 86.4% of the respondents, their off-road experience did not stir any negative emotions in them. In addition, 56.3% were of the opinion that ORD should be allowed in order to accommodate specific tourists and situations. Almost 46% of respondents are attracted to areas where ORD is practised. More than three quarters (76.4%) were of the opinion that soil and vegetation recover after ORD.

## Discussion

The results on respondents' demographics indicated that Pafuri Camp is mainly visited by retired, professional/managerial people and it can be argued, well-informed. Well-informed meaning in this context in relation to the environment in general and tourists impacts specifically.

July was indicated as being the most popular month for visits to the Makuleke Contractual Park, with 28.6%, with of respondents indicating that they would prefer to visit Pafuri Camp during July. Respondents indicating that they would prefer visits during June or August (both 17.9%) were the second most common group (Figure. 5). Climate wise, June, July and August are favourable months, with pleasant temperatures and low rainfall. June and July fall within the winter holiday period in South Africa and June to August the summer holiday period for visitors from the northern hemisphere. Visitors who preferred to come during September (16.1%) and October (14.3%) were the third and fourth most common groups. This indicates that the tourist survey was done during a time that most tourists preferred to visit the area. There is a strong correlation between number of visitors and the time of year they visit the area, as well as a strong correlation between number of visitors and number of off-road incidents (Figure. 1).

From a soil conservation perspective, the above-mentioned results are positive in the sense that most tourists visit the area during the dry season (June-September), when the soil is less susceptible to crusting and sub-soil compaction than during the wet season. However, it must be kept in mind that results of the other part of this study show that serious damage to soils and vegetation also occurs under dry soil conditions (Nortjé et al., 2012).

With regards to tourists' motives for visiting Pafuri Camp, the most important categories were 'outdoor activities', like game drives and game-walks (88.2%), and 'wilderness experience' (87.4%). These results indicate that the majority of tourists visiting Pafuri Camp enjoy the outdoors, and would like to take part in activities which bring them in closer contact with the



wildlife and nature. On the negative side, this may also mean that they would be willing to take part in any activities in order to satisfy their needs, even ORD. The fact that more than two thirds (68.7%) of the respondents were willing to make definite statements (positive or negative) regarding the question whether eco-tourism has negative impacts, is somewhat disturbing in view of the fact that less than one third (32.1%) disagreed or strongly disagreed with the statement that 'most eco-tourists have poor knowledge and grasp of ecological facts'. In other words, quite a number took definite standpoints or perceptions. This is in contrast to findings by Priskin (2003).

The outcomes of the two sub-sections of the questionnaire on ORD are quite disturbing. Results with regards to the tourist's views on specifically ORD indicate wide disparities and contradictions between their attitude towards ORD, in general, and their attitude when it comes to their personal participation in it. Hillery et al. (2001) found similar results. It seems that a great majority of the respondents understand that ORD has negative environmental impacts, in general, and on vegetation, in particular. A majority also acknowledge damage to soil and that damage caused by ORD takes long to recover. The moment it involves them personally they make a complete turnaround, with significant numbers indicating that ORD should be allowed for certain purposes and/or that they personally would prefer visiting areas where ORD is offered. These findings concur with literature which shows tourists shared the beliefs that the environment should be protected, but are not really always willing to act accordingly, also indicating that there is a clear contradiction in terms with regards to what tourists know and how they are prepared to act (Tartaglia, 2009; Hillery et al., 2001; Dalton, Lockington, & Baldock, 2008).

Either they simply do not care and/or they are selfish, wanting to have the experiences that ORD offer, although they overall believe that it will cause damage that will take long to recover. If this was representative of eco-tourists in general, then typical human nature of selfishness comes to the fore: "We know it is bad, but it is so exciting". The implication of this is that if a tourism operator would unilaterally decide not to do ORD because they care for the environment they would go out of business.

The above-mentioned means that strong legal measures by government and strict rules by SANParks will have to be put in place and enforced to curb this. Factual proofs, based on scientifically researched data, such as those that have been collected in the other part of this study are required to alert government and SANParks of the potential dangers of ORD and enable them to put appropriate laws and rules in place. Such data should also be used to convince tourists and tourism operators of the potential long-term implications for future tourists and for tourism operators by means of a strong campaign of educating eco-tourists and tourism operators.

Game guides could play a major role in communicating these important messages (Peake, Innes, & Dyer, 2009; Randall & Collins, 2009). Findings by Ballantyne, Packer & Hughes, (2009) suggest that when tourists are included as conservation partners in the conservation management of a protected area, and conservation messages are communicated to them on a regular basis, they are very receptive to messages which include restrictions on specific tourist activities, especially with regards to activities which may have negative impacts on the environment. Spenceley (2005) identified certain environmental factors which are "compatible" or "essential" with sustainable nature-based tourism in Transfrontier Conservation Areas (TFCA's). A few important "essential" factors related to this study are: management that incorporates ecological and conservation principles, sustainable levels of natural resource use, a balance between the need for conservation and the economic need for tourism and environmental mitigation plans designed to deal with negative environmental impacts from tourism.

Environmental factors which are "incompatible" with sustainable nature-based tourism and related to ORD are: use of non-renewable resources that exceeds the rate at which





replacement of the resource can be created, the renewable resources (soil) are used at a rate higher than their regeneration rates, disappearance of fragile plant and animal species because of tourism disturbance, negative impacts of plant germination, establishment and growth due to tourism disturbance and possible changes in the behaviour of wild animals due to tourism disturbance.

## Conclusion

The results of this study indicate a need for improved visitor/eco-tourist education on the possible negative impacts of demands for ORD, and a need for government intervention with regards to the enforcement of legal measures to control ORD. Self-regulation by the tourism industry is the ideal. The results also indicate that game guides and tourism operators can play a major role in educating the eco-tourist. The results demonstrate that both an understanding of the chemical and physical factors influencing soil compaction, as well as tourists' environmental views are important in formulating a management strategy to control and manage these impacts.

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## References

- Ballantyne, R., Packer, J. & Hughes, K. (2009). Tourists' support for conservation messages and sustainable management practises in wildlife tourism experiences. *Tourism Management*, 30: 658-664.
- Behe, A. & Bruyere, B.L. (2007). Segmentation by visitor motivation in three Kenyan national reserves. *Tourism Management*, 28:1464-1471.
- Bhandari, M. (1998). *Assessing the impact of off-road driving on the Masai Mara National Reserve and Adjoining Areas, Kenya*. International Institute for Aerospace and Earth Sciences (ITC), Environmental System Monitoring and Analysis (ESM-2), The Netherlands.
- Bhandari, M. (1999). *Tourism Raised problems in Masai Mara National Park, Narok, Kenya*. APEC, Nepal.
- Chin, C.L.M., Moore, S.A., Wallington, T.J. & Dowling, R.K. (2000). Ecotourism in Bako National Park, Borneo: Visitors' perspectives on environmental impacts and their management. *Journal of Sustainable Tourism*, 8(1): 20-35.
- Dalton, G.J., Lockington, D.A. & Baldock, T.E. (2008). A survey of tourist's attitudes to Renewable energy supply in Australian Hotel accommodation. *Renewable Energy*, 33: 2174-2185.
- Hillery, M., Nancarrow, B., Griffin, G. & Syme, G. (2001). Tourist perception of environmental impact. *Annals of Tourism Research*, 28(4):853-867.
- Kruger, M & Saayman, M. (2010). Travel motivations of tourists to Kruger and Tsitsikamma National Parks: A comparative study. *South African Journal of Wildlife Research*, 40(1): 93-102.
- Kruger, M., Viljoen, A., and Saayman, M (2017). Who visits the Kruger National Park, and why? Identifying target markets. *Journal of Travel & Tourism Marketing*, 34(3): 312-340.





Moore, S.A., Crilley, G., Darcy, S., Griffin, T., Taplin, R., Tonge, J., Wegner, A & Smith, A. (2008). *Designing and Testing a Park-based Visitor Survey*. Sustainable Tourism - CRC.

Noe, F.P., Hammitt, W.E. & Bixler, R.D. (1997). Park User Perceptions of Resource and Use Impacts under Varied Situations in Three National Parks. *Journal of Environmental Management*, 49: 323-336.

Nortjé, G.P. (2005). *The impacts of off-road driving and other concessionaire activities on physical soil degradation*. M-thesis, Centre for Wildlife Management, University of Pretoria.

Nortjé, G.P. (2014). *Studies on the impacts of off-road driving and the influence of tourists' consciousness and attitudes on soil compaction and associated vegetation in the Makuleke Contractual Park, Kruger National Park*. Unpublished PhD Thesis, Centre for Wildlife Management, University of Pretoria

Nortjé, G.P., van Hoven, W. & Laker, M.C. (2012). Factors Affecting the Impact of Off-Road Driving on Soils in an Area in the Kruger National Park, South Africa. *Environmental Management*, 50: 1164-1176.

Peake, S., Innes, P. & Dyer, P. (2009). Ecotourism and Conservation: factors influencing effective conservation messages. *Journal of Sustainable Tourism*, 17(1): 107-127.

Priskin, J. (2003). Tourist perception of degradation caused by coastal nature-based recreation. *Environmental Management*, 32(2):189-204.

Randall, C. & Rollins, R.B. (2009). Visitor perceptions of the role of tour guides in natural areas. *Journal of Sustainable Tourism*, 17(3): 357-374.

Spenceley, A. (2005). Nature-based Tourism and Environmental Sustainability in South Africa. *Journal of Sustainable Tourism*, 13(2): 136-170.

Tartaglia, S. (2009). *Comparison of tourists' environmental beliefs and environmental behaviour*. Department of Tourism and Environment, Brock University. Ontario, Niagara Falls.

Van der Merwe, P. & Saayman, M. (2008). Travel motivations of tourists visiting Kruger National Park. *Koedoe*, 50(1): 154-159.