Tourists' perceptions of tourism impacts on the environment: The case of South African National Parks

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ABSTRACT

TOURISTS' PERCEPTIONS OF TOURISM IMPACTS ON THE ENVIRONMENT:
THE CASE OF SOUTH AFRICAN NATIONAL PARKS.

There has been a tremendous growth in the nature-based tourism industry during the past decade, but this growth has not come without problems. The growth in nature-based tourism numbers led to an increase in pressure on the environment. To counter this pressure, a 'greener' form of tourism emerged that aimed to reduce the environmental impacts caused by nature-based tourism on the environment by applying sustainable management approaches. The latter will assist in ensuring that the environment remains conserved and protected for future generations.

Some of the prevailing negative impacts tourism has on the environment are soil erosion, littering, wildlife disturbance, water pollution, ground trampling and the overuse of water and energy. It is important that these impacts are managed in a sustainable manner in order to ensure conservation of the environment. However concerns have been raised regarding the relationship between the growing number of tourists and their effect on the environment, particularly in protected areas such as National Parks. National parks are a centrepiece of conservation, universally acknowledged as the indispensable core of any effort to preserve biodiversity and, more specifically, a high environmental quality. The leaders in nature conservation and ecotourism in South Africa are South African National Parks. As the leaders in conservation, this also underlines the importance that national parks in South Africa are managed in a sustainable (environmentally friendly) manner in order to minimise the adverse effects caused by tourism. A useful indicator which can be used to determine whether environmental impacts occur is to measure the tourists' perceptions thereof. This measurement will enable management to manage National Parks as more sustainable units and be able to reduce the impacts that tourism are known to cause.

The main aim of this study was therefore to determine the perceptions of tourists regarding the environmental impacts of tourism in South African National Parks. This was achieved by identifying different key areas in national parks where tourist activities take place, and to measure tourists' perceptions regarding the impacts they perceived. A non-probability sampling method was followed with a convenience sample drawn. Results were obtained through a web-based survey posted on the official website of South African National Parks. Four hundred and fifty-one (451) completed, usable questionnaires were received. The results were structured into two articles as follows:

Article 1: 'How environmentally friendly are South African National Parks?" The main purpose of this article was to determine those environmental impacts which, as the consequences of nature-based tourism, need management attention to enable South African National Parks to be seen as *being* more environmentally friendly. A factor analysis was used as a tool to achieve the goal. Six factors were identified namely: *Fauna and Flora; Management; Tourism impacts; Aquatic impacts; Tourists trails and routes* and lastly *Tourism development*. The identification of these factors is vital for park managers in order to enforce policies and practices that minimise the environmental impacts caused by tourism to enable South African National Parks to be seen as environmentally friendly.

Article 2: 'Environmental impacts influencing tourists' experience to South African National Parks'. The main purpose of this article was to identify those environmental impacts seen as impacting negatively on tourist experiences in South African National Parks. A factor analysis was conducted to identify the factors influencing tourists' experiences. The five factors identified were: *Pollution; Tourism product offering; Park violation; Environmental management* and *Tourism impact*. An analysis of variance (ANOVA) was conducted to determine whether there is a significant correlation between visitation frequency and the effect environmental impacts have on the tourists' experience. Factors that proved to have a significant value when compared to visitation frequency were: pollution, park violation and tourism impacts. The data revealed that tourists with a high frequency of visitation to South African National Parks experience environmental impacts to a greater extent than tourists with a lower visitation. These results will assist park management to manage the relationship between the environment and tourism, and so provide tourists with a unique nature experiences without compromising the environment.

This research revealed that tourists are of the perception that environmental impacts do, in fact, occur in South African National Parks due to tourism and, further, that these impacts do influence tourist experiences negatively. Environmental impact aspects identified by this research can therefore be used by park management to provide better ecotourism products that are more environmental friendly, as well as providing unforgettable nature experiences for potential tourists to South African National Parks.

***Key words**: South African National Parks; tourism impacts, environmentally friendly; tourists' experience; sustainable.*

UITTREKSEL

TOERISTE SE PERSEPSIES VAN TOERISME-IMPAKTE OP DIE OMGEWING:
DIE GEVAL VAN SUID-AFRIKAANSE NASIONALE PARKE

Daar was in die afgelope dekade 'n geweldige groei in die natuur-gebaseerde toerisme-industrie, maar hierdie groei het nie sonder probleme gekom nie. Die groei in natuur-gebaseerde toerismegetalle het gelei tot 'n verhoogde druk op die omgewing. Om hierdie druk teë te werk, het 'n 'groener' vorm van toerisme ontstaan wat ten doel het om die omgewingsimpakte veroorsaak deur natuur-gebaseerde toerisme op die omgewing te verminder deur die toepassing van volhoubare bestuursbenaderings. Die laasgenoemde sal bydra om te verseker dat die omgewing behoue en beskerm vir toekomstige generasies bly.

Sommige van die heersende negatiewe impakte wat toerisme op die omgewing het, is gronderosie, rommel, die versteuring van wildlewe, waterbesoedeling, grondvertrapping en die oormatige verbruik van water en energie. Dit is belangrik dat hierdie impakte op 'n volhoubare wyse bestuur word om die bewaring van die omgewing te verseker. Kommer is egter uitgespreek aangeaande die verhouding tussen die groeiende getalle toeriste en hul effek op die omgewing, spesifiek in beskermde areas soos die Nasionale Parke. Nasionale parke is die middelpunt van bewaring, universeel erken as die onmisbare kern van enige poging om biodiversiteit te preserveer en, meer spesifiek, 'n hoë omgewingskwaliteit. Die leiers in natuurbewaring en ekotoerisme in Suid-Afrika is Suid-Afrikaanse Nasionale Parke. As leiers in bewaring onderstreep dit ook die belangrikheid dat nasionale parke in Suid-Afrika op 'n volhoubare (omgewingsvriendelike) wyse bestuur word om sodoende die ongunstige effekte veroorsaak deur toerisme te minimaliseer. 'n Bruikbare aanwyser wat gebruik kan word om te bepaal of omgewingsimpakte plaasvind, is om toeriste se persepsies hieroor te meet. Hierdie meting sal bestuur in staat stel om Nasionale Parke as meer volhoubare eenhede te bestuur en sal dit moontlik maak om die impakte wat toerisme veroorsaak te verminder.

Die hoofdoelwit van hierdie studie was dus om die persepsies van toeriste rakende omgewingsimpakte van toerisme in Suid-Afrikaanse Nasionale Parke te bepaal. Dit is gedoen deur die verskillende sleutelareas in nasionale parke waar toeriste-aktiwiteite plaasvind te identifiseer, en om toeriste se persepsies rakende die impakte wat hulle ervaar te meet. 'n Nie-waarskynlikheidsteekproefmetode is gevolg met 'n gerieflikheidsteekproef wat geneem is. Resultate is verkry deur middel van 'n web-gebaseerde opname wat op die amptelike webwerf van die Suid-Afrikaanse Nasionale Parke geplaas is. Vierhonderd-een-en-vyftig (451) voltooide, bruikbare vraelyste is ontvang. Die resultate is soos volg as twee artikels gestruktureer:

Artikel 1: 'How environmentally friendly are South African National Parks?" Die hoofdoelwit van hierdie artikel was om dié omgewingsimpakte te bepaal wat, as die gevolge van natuur-gebaseerde toerisme, bestuursaandag benodig om Suid-Afrikaanse Nasionale Parke in staat te stel om gesien te word as meer omgewingsvriendelik. 'n Faktor-analise is as hulpmiddel gebruik om hierdie doelwit te bereik. Ses faktore is geïdentifiseer, naamlik: *Fauna en Flora; Bestuur; Toerisme-impakte; Akwatiese impakte; Toeriste voetpaaie en roetes* en laastens *Toerisme-ontwikkeling.* Die identifikasie van hierdie faktore is belangrik vir parkbestuurders om sodoende beleide en praktyke wat die omgewingsimpakte deur toerisme veroorsaak te minimaliseer om sodoende Suid-Afrikaanse Nasionale Parke te laat blyk meer omgewingsvriendelik te wees.

Artikel 2: 'Environmental impacts influencing tourists' experience to South African National Parks'. Die hoofdoelwit van hierdie artikel was om dié omgewingsimpakte wat geag word om toeriste se ervarings in Suid-Afrikaanse Nasionale Parke negatief te affekteer, te identifiseer. 'n Faktor-analise is uitgevoer om die faktore wat toeriste se ervaring affekteer te identifiseer. Die vyf faktore wat geïdentifiseer is, is die volgende: *Besoedeling; Toerisme produkaanbieding; Park-skending; Omgewingsbestuur* en *Toerisme-impak*. 'n Variansie-analise (analysis of variance (ANOVA)) is uitgevoer om te bepaal of daar 'n betekenisvolle korrelasie bestaan tussen besoekfrekwensie en die effek wat omgewingsimpakte het op die toeriste se ervaring. Faktore wat geblyk het 'n betekenisvolle waarde te hê wanneer vergelyk word met besoekfrekwensie is: besoedeling, park-skending en toerisme-impakte. Die data het getoon dat toeriste met 'n hoë frekwensie besoeke aan Suid-Afrikaanse Nasionale Parke omgewingsimpakte tot 'n hoër mate ervaar as toeriste met minder besoeke. Hierdie resultate kan parkbestuur help om die verhouding tussen die omgewing en toerisme te bestuur, en so ook aan toeriste 'n unieke natuur-ervaring te bied sonder om die omgewing te komprimeer.

Hierdie navorsing het getoon dat toeriste van mening is dat omgewingsimpakte wel in Suid-Afrikaanse Nasionale Parke, as gevolg van toerisme, plaasvind en verder dat hierdie impakte toeriste-ervarings negatief affekteer. Omgewingsimpak-aspekte deur hierdie navorsing geïdentifiseer kan dus deur parkbestuur gebruik word om beter ekotoerisme-produkte te verskaf, wat meer omgewingsvriendelik is, sowel as om onvergeetlike natuurervarings aan potensiële toeriste na Suid-Afrikaanse Nasionale Parke te verskaf.

***Sleutelwoorde**: Suid-Afrikaanse Nasionale Park; toerisme-impakte, omgewingsvriendelik; toeriste se persepsies; volhoubare.*

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The birds, trees, flowers, animals and plants are like all life forms a temporary manifestation of the One that gives life. May humanity become aware of their actions and realise the consequences there of. Let us rather be present in an unharmed, unspoiled and conserved nature and sense the divine essence of life given to us through nature, by the Creator.

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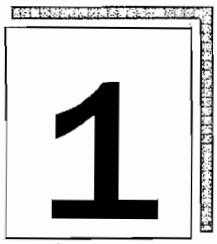


CHAPTER 1

Introduction, problem statement, objectives and method of research

1.1. INTRODUCTION

The special interest in, and appreciation of, the natural environment has resulted universally in a tremendous growth of nature-based tourism. In South Africa specifically, the increase in nature-based tourism has led to an continuous increase in visitors to the South African National Parks (Newsome, Moore & Dowling, 2002:20; SANParks, 2008:17; Moore & Polley, 2007:291; DEAT, 2008). South African National Parks (SANParks) is a public body, working under national management, purposed to protect, conserve and manage twenty-one national parks and defined protected areas, together with their biological diversity. South African National Parks is the largest role player in conservation and nature-based tourism, not only in South Africa but also in Southern Africa, and has conserved nature since 1926 (DEAT, 2008:18 & SANParks, 2008:1). However, there are rising indications that, as tourism increases to natural areas, this increase is accompanied by a consequential increase in environmental effects (Jackson, 2007:35; Chin, Moore, Wallington & Dowling, 2000:20; Farrel and Marion, 2002:31). The consequences of tourism impacts cause not only a threat to the environment but, furthermore, have the ability to diminish the quality of tourists' experiences, if not managed properly (Page & Dowling, 2002:1; Buckley, 2008:10; Lim & McAleer, 2005:1432; Hillery, Nancarrow, Griffen & Syme, 2001:854 & Baysan, 2001:218).

Because South African National Parks are leaders in conservation, it is imperative for park management to be aware of the different environmental impacts caused by tourism. Managed responsibly, nature-based tourism will contribute to the protection of the natural resources and environment. However, inappropriate tourism development, coupled with the rise in the number of tourists, will lead to the destruction of the natural environment if not managed responsibly (Petrosillo, Zurlini, Corliano, Zaccarelli & Dadamo, 2007:29). This latter highlights the need for sustainable tourism management in all the tourism sectors, including both ecotourism and nature-based tourism (Yunis, 2003:12). It is therefore important to develop managerial tools to minimise the impacts of tourism on the environment (Green, 2005:37; Li, Zhang, Liu & Xue, 2006:572; Moore & Polley, 2007:291 & Fearnhead, 2007:301). Furthermore, this will ensure the planning of a sustainable tourism industry as the environment will be well preserved (Hillery *et al.*, 2001:854; Buckley & King, 2003:89). Ahmed, Moodley and Sookrajh (2008:75) motivate the

importance of environmental quality by stating that environmental quality will enhance the competitiveness of a destination.

The aim of Chapter 1 is to formulate the problem statement, to determine the goals and objectives of the study, to discuss the methods of research, and thereafter to give the chapter classifications of the study.

1.2. PROBLEM STATEMENT

Environmental protection became a major issue in the 1990's after the introduction of the concept of sustainable development by the Brundtland Commission in 1987 (WCED, 1987). Swartebrooke (1999:14) and Spenceley (2005:137) explain sustainable tourism development as tourism that is economically viable but that does not destroy the resources on which the future of tourism is dependent, most notably, the physical environment and the social fabric of the host community. Consequently, the core elements of sustainable tourism development are to determine the economic, social and environmental impacts of tourism. Once these have been determined, one can then verify if a product is sustainably managed or not (Geldenhuys, 2009:117). As South African National Parks play such an important role in conservation, it is important to determine their sustainability status in respect of the socio-economic and environmental impacts for future generations to experience the same that is currently provided.

The mission of South African National Parks is to develop and manage a system of national parks that represent the biodiversity, landscapes, and the associated heritage sites of South Africa, for the sustainable use and benefit of all South Africans (Fearnhead, 2007:301 & SANParks, 2008:i). Fundamentally, sustainable park management and planning needs to be implemented to sustain those values for which protected areas, such as South African National Parks, exist (Bushell & Mc Cool, 2007:17 & Saayman, 2009:381).

A number of research undertakings contributing to the literature regarding sustainable tourism development and management of South African National Parks were found, particularly those concerning the socio-economic impacts of tourism. These studies have been conducted at selected, popular, National Parks, such as the Addo Elephant (Saayman and Saayman, 2005), Wilderness (Saayman, Saayman and Van der Merwe, 2008), Karoo (Saayman, Saayman and Ferreira, 2008), Tsitsikamma (Saayman & Saayman, 2008) and at the Kruger National Parks (Slabbert, Saayman & Kruger, 2009). However, little research was found concerning the environmental impacts of tourism in South African National Parks. For national parks in South Africa to be managed effectively and sustainably, data and information in the three areas of

social, economic and environmental sustainability is needed to ensure that the environment, the main attraction for visitors, stays untouched (Spenceley, 2005:137).

Literature regarding the environmental influences of tourism at nature-based tourism destinations has been a subject of universal research (Chin *et al.,* 2000:31; Baysan, 2001:228 & Jackson, 2007:49). These former emphasised the need to acknowledge that tourism cause environmental impacts and so needs attentative management to ensure the sustainability of tourism. Research conducted regarding environmental impacts of tourism include studies by: Turton (2005:140); Ahmed *et al.* (2008:73); Moore and Polley (2007:291); Li *et al.* (2006:572); Sum and Walsh (1998:323); Warnken and Byrnes (2008:99); Smith and Newsome (2002:343); Spenceley (2005:136); Harriot (2004:2); Pickering and Hill (2007:791); Geneletti and Dawa (2009:299); Amo, Lopez and Martin (2006:402); Higham and Bejder (2008:75); Gielen, Kurihara and Moriguchi (2002:419) and Peeters, Szimba and Duijnisveld (2007:83). These authors collectively identified areas such as water, air, biodiversity, natural resources and landscapes that are all sensitive to the impact of tourism (Table 1.1).

Table 1.1: Research regarding thempacts of tourism on the environment

CATEGORY	IMPACTS ON THE ENVIRONMENT
WATER (Gielen *et al.,* 2002:418; Spenceley, 2005:138; Turton, 2005:140; Harriot, 2004:2)	Pollution (introduction of nutrients, minerals, sewage, petrol and toxins), untreated sewerage water. Impacts reduce water quality and pose a threat to fauna and flora.
AIR (Barry & Chan, 2007:303; Gielen *et al.,* 2002:418; Spenceley, 2005:138; Peeters *et al.,* 2007:83)	Impacts of transport and facility power increase the release of carbon dioxide and acidic emissions into the air and therefore contribute to global climate change, while reducing air quality and increasing noise pollution.
BIODIVERSITY (Gielen *et al.,* 2002:419; Warken & Byrnes, 2004:109; Pickering & Hill, 2007:791; Amo *et al.,* 2006:402)	Reduction of species (both endemic and endangered), reduction of plant life and wildlife, wildlife disturbance, disturbance in wildlife breeding, vegetation clearing and damage, spread of weeds and pathogens and soil compaction.
NATURAL RESOURCES (Gielen, *et al.,* 2002:420; Sum & Walsh, 1998:323)	Consumption of wood, cement, steel, water and energy, impacts occur when the resources are used faster than they can be produced naturally.
WASTE (Gielen *et al.,* 2002:418; Ahmed, 2008:73; Harriot, 2004:2; Smith & Newsome, 2002:343)	Waste disposal into the environment.

LANDSCAPES (Gielen *et al.,* 2002: Spenceley, 2005:138; Turton, 2005:140)	Development of infrastructure and roads, impacts on soils and vegetation, as well as the potential to cause visual pollution.

Apart from the forgoing, a distinctive approach in determining tourism impacts on the environment is by analysing visitors' reactions to perspectives of environmental impacts on natural areas. By measuring the perceptions of visitors regarding the environmental impacts of tourism, managers of nature-based tourism products can be provided with information on the extent and existence of environmental impacts. This knowledge will lead to more sustainable management of the natural areas. In addition, this method also supports the notion of using visitor-derived standards as a basis for management of natural areas (Moore & Polley, 2007:291; Hillery *et al.,* 2001:854; Chin *et al.,* 2000:21; Manning, Lawson, Newman, Budruk, Valliere, Laven & Bacon, 2008:259). Successful studies that were carried out using the 'perceptions of visitors' as a measuring tool, were identified through a literature study and are presented in Table 1.2.

Table 1.2: Research concerning perceptions of environmental impacts caused by tourism

Article title	Authors	Country where study took place	Main findings
Perceptions of the environmental impacts of tourism: a comparative study of the attitudes of German, Russian and Turkish tourists in Kemer, Antalya.	(Baysan, 2001:218-235).	Turkey	Visitors perceived the following environmental impacts: sea pollution, littering, too much building construction and the destruction of vegetation.
Tourist perception of environmental impact.	(Hillery *et al.,* 2001:853-867).	Australia	Overcrowding, erosion, rubbish and the lack of educational information were perceived by visitors as a threat to the environment.
Ecotourism in Bako National Park, Borneo: Visitor's perspectives on environmental impacts and their management.	(Chin *et al.,* 2000:20-35).	Borneo	Litter, wildlife attracted to rubbish bins and vegetation damage were perceived as environmental impacts.
Park User Perceptions of Resource and Use Impacts	(Noe, Hammit & Bixler, 1997:323-336).	United States of America	Park users' perceptions and tolerance for impacts varied

Under Varied Situations in Three National Parks.			widely. Visitors also demonstrated different acceptability based on changing situations.
Visitors' perceptions of tourism development in West Virginia.	(Deng & Bender, 2007:181-187)	United States of America	Visitors felt that the environment is well protected and that sustainable tourism management needs to be practiced.
Assessment on and perception of visitors' environmental impacts of nature tourism: a case of Zhangjiajie National Forest Park, China.	(Deng, Qiang, Walker & Zhang, 2003:529)	China	Visitors' perceptions on environmental impacts on soil and vegetation were measured and the results revealed that tourism impacts were unacceptable.
Self-serving bias in visitors' perceptions of the impacts of tourism.	(Van Winkle & MacKay, 2008:69)	Canada	Visitors perceived their own impacts as having an adverse effect on the environment in the areas of water quality, the amount of waste, the level of traffic and the quality of the natural environment.
Tourist perception of recreational environment and management in a marine protected area.	(Petrosillo *et al.*, 2007:29-37).	Italy	Visitors did not perceive a poor state of the environment; however they felt management communication on what is being done needs to be more effective.
Effects of knowledge, personal attribution and perception of ecosystem health on depreciative behaviours in the intertidal zone of Pacific Rim National Park and Reserve.	(Alessa, Bennett & Kliskey, 2003:207-218).	Canada	This study of visitor perceptions found that visitors with who had a higher level of knowledge of intertidal ecology were more likely to engage in damaging behaviours that those visitors who were less knowledgeable.
Tourist perceptions of	(Priskin, 2003:189-204).	Australia	Tourists were aware of the

degradation caused by coastal nature-based recreation.			environmental impacts caused by their own activities and suggested that more severe management actions should be in place.

Based on the findings listed in Table 1.2, it is clear that the perceptions of visitors as a measuring tool to identify environmental impacts can be applied successfully. The main environmental impacts identified by visitors in the above-mentioned studies were litter, erosion and the lack of proper environmental management. No research of this specific kind has been conducted in South Africa, particularly none focussing on South African National Parks. As South African National Parks is the official conservation authority in South Africa, it is therefore necessary to specifically measure the perceptions of environmental impacts of tourism in National Parks in order that management may manage the parks in a more sustainable (environmentally friendly) manner (Moore & Polley, 2007:291 & Chin *et al.,* 2000:20). Three studies have been conducted at Addo Elephant National Park regarding views and perceptions of visitors, even so, none of these was on the specific issue of the environmental impacts of tourism (Boshoff, Landman, Kerley & Bradfield, 2008:326; Boshoff, Landman, Kerley & Bradfield, 2007:189 & Kerley, Geach & Vial, 2003:13).

The value of measuring visitors' perceptions on environmental impacts is emphasised when looking at those aspects that will foster a more successful approach to sustainable tourism management, and to the enhancement of visitor's experience. Deng and Bender (2007:181) believe that the tourists' destination choice is increasingly being influenced by perceptions of sustainability.

So in conclusion, the question to be asked is "What are visitors' perceptions of tourism impacts on the environment in South African National Parks?"

1.3 PRIMARY AND SECONDARY OBJECTIVES

The main goal and objectives of this study are as follows:

1.3.1 Primary objective

To determine tourists' perceptions of tourism impacts on the environment in South African National Parks.

1.3.2 Secondary objectives

In order to reach the main goal of this study, the following secondary objectives were set:

- To determine how environmentally friendly are South African National Parks;
- To determine the influence of environmental impacts on the visitors' experience; and
- To reach conclusions and make recommendations based on the research results.

1.4 METHOD OF RESEARCH

The methodology used in order to reach the goals set by this study will be discussed under the headings of the literature study, and secondly the empiric survey.

1.4.1 Literature study

The literature study consisted of an analysis of environmental impacts of tourism: To gather information on the above subjects, the following resources were consulted:

- Articles on environmental impacts, visitors' perceptions, nature-based tourism and ecotourism were gathered from SA Magazines, SA Newspapers and Scientific Journals.
- Search engines, specifically aimed at accurate research including Library databases, scientific databases and the Internet.
- Thesis and Dissertations on completed studies that support the information sought for the purposes of this study were also consulted.

1.4.2 Empiric survey

1.4.2.1 Research design and method of collecting data

A quantitative research approach was adopted by collecting data *via* questionnaires. Conducting visitor surveys is of high value when developing accurate sets of data that can be interrogated to more identifiable issues such as a demographic profile, visitors' perceptions and experiences (Prideaux & Crosswell, 2006:368). Furthermore, the advantages of a quantitative approach, according to Slabbert (2004:63) and Maree and Pieterson (2007:155), are that the:

- Sample sizes are large;
- Questionnaire is suitable for collecting demographical information, for example, gender, age and province of residence;
- Research is inexpensive to conduct; and that
- It is relatively easy to tabulate and analyse the data collected using statistical software.

The research statistics were descriptive in nature. "Descriptive statistics" is the shared name for a number of statistical methods, which collectively summarise and organise the data in a significant way (Pieterson & Maree, 2007:183).

1.4.2.2 Selection of the sampling frame

The study was carried out using the website of South African National Parks. Successful studies that have used this technique to gather data have been done by Roth (2006:190); Morris, Fenton and Mercer (2004:248) and Brennan, Rae and Parackal (1999:83). Low costs of fieldwork, potentially quick response and the fact that web-based surveys have become easier and more flexible for both the researcher and the respondents makes this method a most desirable one in comparison with the traditional face-to-face interview method of collecting data (Morris *et al.,* 2004:248; Fricker, Galesic, Tourangeau & Yan, 2005:371).

Visitors to South African National Parks who made use of SANParks' website were presented with the opportunity to partake in the survey. Care was taken to ensure that visitors only completed one questionnaire by requesting and capturing their e-mail addresses in a database. From the database, the respondents were limited electronically to permit the completion of one only questionnaire. In addition, an interview conducted on the radio programme 'Ekoforum', on RSG, to inform national park visitors of the survey. The viewers of the popular television nature programme '50/50' were also notified of the survey being conducted and they were encouraged to participate.

A total of 451(n) questionnaires were received electronically which were used for the statistical analysis. This number of questionnaires (n=451) is regarded by Cooper and Emory (1995:207), Buckingham and Saunders (2004:114) and by Floyd and Fowler (2009:41) as representative and can therefore be regarded as valid to use for statistical analysis. Given this validity of the findings, conclusions and recommendations may be confidently drawn from the results.

1.4.2.3 Sampling

A non-probability sampling was followed with a convenience sample and willingness to complete the questionnaire. This sampling method implies that sample members are chosen because they are readily available to complete the questionnaire (Tustin, Ligthelm, Martins & Van Wyk, 2005:346). Completed questionnaires were returned electronically, after which they were analysed statistically. To motivate visitors to the website to participate, respondents completing the questionnaire stood a chance to win a weekend away to a South African National Park. The questionnaire was hosted on the website of South African National Parks during June, July and August 2009. Fricker *et al.* (2005:371); Roth (2006:191) and Brennan *et al.* (1999:4) researched the use of the internet as a successful medium to conduct surveys. Their research revealed that the internet is a highly viable tool to use for research and that the internet holds several advantages for researchers.

1.4.2.4 Development of questionnaire

Two previous studies were taken into account and adapted to develop the questionnaire that was used in this specific study to measure environmental impacts.

Firstly, the study conducted by Hillery *et al.* (2007:855) was analysed, and used as a base to develop the framework for the questionnaire. The research completed by Chin *et al.* (2000:20) provided additional information further to refine the questionnaire that was used to measure perceived environmental impacts.

The questionnaire was divided into three sections:

Section A: The demographic information of respondents was requested;

Section B: The respondents' perceptions of environmental impacts were measured, and;

Section C: Finally, questions were asked on how environmental impacts affected the experience of tourists'.

Questions asked in the questionnaire were measured by a five-point Likert scale. Respondents had the option to indicate how they perceived impacts, ranging from 'almost never' (1), to 'almost always' (5). Questions sought opinions concerning impacts on rest camps and campsites; on tourists' routes; about commercial sectors; about various trails; marine environment and visitor facilities. Likert scales are a very common and useful way to survey what respondents think or feel about a certain subject (Maree & Pietersen, 2007:167). A pilot study was carried out to determine whether the necessary information needed for the study could be obtained from the survey and to identify any problems regarding the survey through the web.

1.4.2.5 Data analysis

After the information needed had been gathered, it was coded and captured on Microsoft© Excel©, after which it was statistically processed on SPSS (The SPSS program is a statistical package designed to process the data of social sciences (Field, 2006:1)). The Statistical Services of the North-West University, Potchefstroom Campus assisted in the processing of the data.

The statistical analysis consists of two parts:

Firstly, a factor analysis was applied in order to synthesize the large amount of data. The purpose of a factor analysis, as described by Pietersen and Maree (2007:222) and by Field (2006:619), is to determine clusters of variables (in this case, environmental impacts). Items measured on a 5-point Likert scale are particularly well suited for this type of analysis (Pieterson & Maree, 2007:219).

Secondly, a one-way analysis of variance (ANOVA) was conducted. The ANOVA is a useful method to use when there are more than two independent groups that need to be compared on a single quantitative measured score (Pietersen & Maree, 2007:229; Altinay & Paraskevas, 2008:216). In this case, the ANOVA test was used to explore whether or not a significant relationship existed between visitor frequency and other measured aspects.

1.5. DEFINING THE CONCEPTS

The following terms are now defined to offer optimal understanding of their meaning in the context of this specific field of research.

1.5.1 Tourist perception

The Oxford English Dictionary (2008) defines the term "perception" as the process of becoming aware or conscious of a thing or things in general. Jackson (2007:38) and Proshansky, Ittelson and Rivlin (1976:1489) amplify this by saying that a person's view of the environment is based on attitudes, value orientations, actual behaviours and behavioural intentions. Therefore, tourists' perceptions are views based on attitudes, value orientations and the processing of information concerning a certain subject, in this case, the environment.

1.5.2 Tourism impacts

The impacts that occur due to any tourism activity can be divided into three categories, economic, social and environmental (Saayman, 2007:24). Tourism impacts on the specific environment, which is the focus of this study are described by Green and Giese (2004:92) as the effect of any tourism activity on wildlife and the natural environment that can vary from mild discomfort or inconvenience to local, or even global, extinction of a species, or disruption of communities and ecosystems in the environment. Environmental impact studies, therefore, attempt to generalise relationships between tourism activities and impacts with respect to specific ecosystems and disturbance characteristics (Spenceley, 2005:137). In this context, impacts means changes which can be beneficial or positive, as well as being detrimental or negative (Mason, 2003:28).

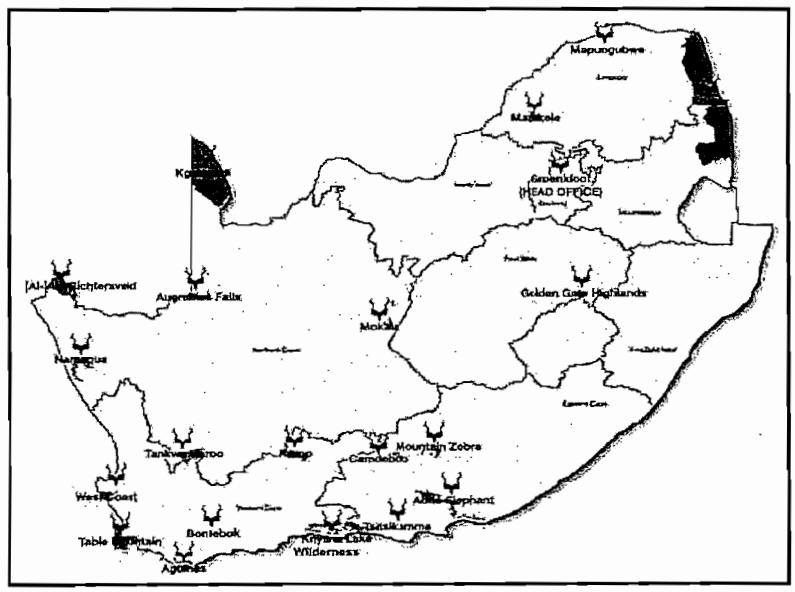
1.5.3 Environmental impacts

Knight and Cole (as cited by Spenceley, 2005:137) described environmental impact studies as an attempt to generalise relationships between tourism activities and impacts with respect to specific ecosystems and disturbance characteristics. Encarta (2008) explains environmental impact as the indirect and direct consequences of human actions on the natural environment.

Based on the latter can environmental impacts be defined as balanced or unbalanced relationship between tourism activities and the effects (positive/negative) thereof on the environment.

1.5.4 South African National Parks

The World Conservation Union defines national parks as *areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources and managed through legal or other effective means* (IUCN, 1994). South African National Parks manages a system of national parks that represent the indigenous wildlife, vegetation, landscape and associated cultural assets of South Africa (SANParks, 2008:i). The objectives of SANParks are to ensure the protection, conservation and management of the protected areas for the purposes they were declared (SANParks, 2009a). The distribution and location of South African National Parks are given in Map 1.



Map 1: Location of national parks in South Africa

1.6 PRELIMINARY CHAPTER CLASSIFICATION

This study consists of four chapters. A brief description regarding the outline of each chapter will be offered next.

Chapter 1: *Introduction and problem statement.*

This chapter aims to give an overview of sustainable tourism management concerning the environment and the problems faced by South African National Parks. It also seeks to emphasise the importance of identifying environmental impacts caused by tourism and the consequences thereof by determining how environmental impacts can affect the experience of visitors negatively. Finally, the mode of research is discussed.

Chapter 2 (Article 1): *How environmentally friendly are South African National Parks?*

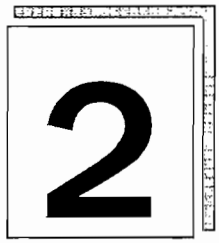
This chapter aims to determine whether tourists are aware of environmental impacts in South African National Parks, and what their views are regarding the management thereof. It further seeks to determine the recurrent impacts on the environment due to tourism activities.

Chapter 3 (Article 2): *Environmental impacts influencing tourists' experience to South African National Parks.*

This chapter aims to determine whether environmental impacts caused by tourism are perceived by visitors to national parks as having an effect on their experience, or not. In addition, this article investigated whether or not those visitors who visit national parks more often, perceive environmental impacts to a greater extent and experience the impacts of tourism as having a negative affect on their experiences.

Chapter 4: *Conclusion and Recommendations.*

The last chapter will draw conclusions concerning the environmental impacts of tourism on National Parks. Resulting fundamental recommendations will be made for developing sustainable environmental strategies.



CHAPTER 2

How environmentally friendly are South African National Parks?

"Sometimes, without warning, the future knocks on our door with a precious and painful vision of what might be" *(Al Gore)*

ABSTRACT

It has been recognised that rising numbers of visitors to nature-based tourism destinations can cause adverse environmental impacts on the environment. This has now resulted in alternative management approaches where tourism is managed with the intention of having minimal impact on the environment. The continuous increase in visitor numbers to South African National Parks (SANParks) raises concern regarding the effect these visitors have, and how environmentally friendly tourism is managed in national parks. In order to accurately determine the above, a survey was conducted that measured visitors' perceptions of the environmental impacts of tourism in South African National Parks. A web-based survey was carried out on the official website of the SANParks to collect data. In total, 451(n) completed questionnaires were returned. A factor analysis was applied to the results of the questionnaires. The results pertaining to the environmental impacts revealed six factors, namely fauna and flora, management, tourism impacts, aquatic impacts, tourists' routes and trails and finally, tourism development. The results of this study will assist the management of South African National Parks in managing the environmental impacts of tourism more effectively and as a result be more environmentally friendly.

Key words: Sustainable tourism, environmental impact, South African National Parks, conservation, park management, factor analysis.

2.1 INTRODUCTION

The post-Second World War period gave birth to a new dimension in tourism, one of industrialisation and the introduction of aircraft as travel modes. The latter assisted in the birth of mass tourism which grew in popularity, and so succeeded in becoming the world's largest industry, touching lives of inhabitants all over the world (Awang, Hassan & Zahari, 2009:67; Narayan, 2005:1157; Patterson, Niccolucci & Marchettini, 2008:407; Mason, 2003:53). Unfortunately, the tourism industry that was once seen as an industry with very few negative effects, quickly became the subject of approbation as people became aware of the significant environmental impacts mass tourism can cause (Jackson, 2007:35; Logar, 2009:125; Spenceley, 2005:137). Previous research undertaken by Berry and Ladkin (1997:434); Jackson (2007:35); Chin, Moore, Wallington and Dowling (2000:20); Baysan (2001:218); Butler (2000:345); Pandey (2008:1543); Farrel and Marion (2002:31) and by Bresler (2007:167) indicates that the increase in tourism, specifically to protected areas such as national parks, is known to cause severe adverse environmental impacts. Poor management of these effects can cause tourism to become a major threat to the environment instead of an opportunity to enhance the protection and conservation of natural areas (Mason, 2005:53; Weaver, 2006:1; Patterson *et al.*, 2008:407).

Alonso (2009:4) stated that if natural areas and their resources are degraded or destroyed, the meaning of sustainable tourism gets lost in the process. The realisation that human (tourism) interaction with the earth causes undesirable impacts to the environment emerged in the formation of the environmental movement or 'green' paradigm shift with a significant change in the way people thought about environmental issues. This also affected the tourism industry as it became aware that tourism activities also needed to be managed in a environmentally friendly manner to permit a country to protect its natural resources (Weaver, 2006:7; Gössling, 2006:13). This lead to a growing demand for nature-based tourism destinations (for example, national parks) to be managed in an environmentally friendly (that is, sustainable) way, whilst simultaneously offering a unique nature experience to visitors (Lim & McAleer, 2005:1432; Eagles, Mc Cool & Haynes, 2002:13).

The first international attempts to change the occurrence of environmental impacts originated from the Brundtland Commission in 1987 (that introduced the concept of sustainability), and at the Earth Summit in Rio de Janeiro during 1992 where principles and guidelines were formulated to guide a more sustainable and environmentally friendly approach to tourism. Added to this, comprehensive research has been conducted on the subjects of environmental sustainability, environmental awareness and ecological impacts of tourism in order that the identified environmental impacts can be prevented and minimised (Alonso, 2009:3; Buckley, 2008; Higham & Bejder, 2008:75; Butler, 2000:337; Lim & McAleer, 2005:1431).

South Africa is no exception when it comes to the protection of the natural environment. In particular, increased caution needs to be taken due to the constant increase in both domestic and international tourists to natural areas. The main contributors to the growth of South Africa's tourism industry are its rich biodiversity (ranked third in the world) and the abundance of nature-based tourism products (Retief, 2006:104; DEAT, 2008:10-14). The leading nature conservation agency in Southern Africa is South African National Parks that represents some of the most pristine fauna and flora in the country, for example Kruger, Tsitsikamma, Addo Elephant and Kgalagadi Transfrontier National Parks. From 2007, the number of visitors to South African National Parks has risen by 7% and, as a result, has increased the pressure on parks management to manage their touristic endeavours without increased impacts on the environment (Eagles, 2009:235; Spenceley, 2005:141; SANParks, 2008:21; PMG, 2009).

With the above in mind, the aim of this article is therefore to determine how environmentally friendly South African National Parks are?

To achieve this, the article is structured as follows: firstly, the literature review will be given and secondly the explanation of the method of research will follow. Thirdly, the results, the findings and implications will be discussed and, finally, conclusions and recommendations will be made.

2.2 LITERATURE REVIEW

The World Conservation Union defines national parks as, *areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources and managed through legal or other effective means* (IUCN, 1994). Since the first national park in the world was established in 1872, with the declaration of Yellowstone National Park in the United States of America, protected areas have since grown to cover close to 11, 5% of the earth's surface. The primary mandate of national parks is the conservation of biodiversity (Eagles *et al.*, 2002:9; Eagles, 2009:231; SANParks, 2009a). National parks are often established in sensitive areas, having important environmental values, and therefore it is of importance to protect national parks for future generations (Bushell, Staiff & Eagles, 2007:1; Pandey, 2008:1544; Eagles *et al.,* 2002:6).

National parks were initially established exclusively for protection and conservation of natural resources (Thomas & Middleton, 2003:4). Tourism was only introduced into these areas afterwards when tourists were given the opportunity to benefit from these conserved areas by visiting them or engaging in some form of activity. Soon park management realized that income generated by tourism can be used in return to manage and conserve natural areas. Today, government funding for national parks in South Africa is becoming less each year, thus making

these funds generated by tourism services a vital supplementary income (Phillips, 2009; Eagles, 2009:235).

Today, tourism has become a major tool in conserving biodiversity in national parks but also plays an important role in the quality of the environment as additional funding is generated which is then used for conservation purposes (Lindsay, Craig & Louw, 2008:730; Bushell & Mc Cool, 2007:12). An ideal sustainable situation, of course, would be to reach a balance between the number of tourists and natures' carrying capacity. This means that decisions in national parks must be made from an environmentally friendly point of view, where the extent of tourism activities is managed without compromising the integrity of the natural environment (Noe, Hammet & Bixler, 1997:323; Marion & Reid, 2007:5; De Oliviera, 2002:1716). Budowski (as cited in Lindsay *et al.,* 2008:730) categorises the relationship of tourism and conservation (such as that within national parks) into three categories. Firstly, there is conflict, where tourism is destructive towards the natural environment. Thereafter, there is coexistence, where tourism activities are in perfect harmony with the surrounding environment with no impact. Finally, there is symbiosis, where tourism enhances conservation values by generating revenues. Dearden, Bennet and Johnston (2005:89) add that tourism in national parks has the potential to attribute to sustainability and conservation only if they are managed in an environmentally friendly manner.

Environmentally friendly tourism implies that tourism are practiced following ecologically sound principles and shifting the global focus from that of mass consumption to one more aligned with our role within larger ecosystems. Some of the areas where tourism causes impacts on the environment consists of ecosystems that would not have been otherwise exposed to humans, which underlines the importance of practising environmentally friendly tourism (Han, Hsu & Sheu, 2009:325; Butler, 2000:344). Management ought to take responsibility and have policies, practices, processes, procedures and resources in place in order to reduce the impact cause by daily operations of tourism (Erdogan & Tosun, 2009:406).

Examples of functioning more environmentally friendly includes: saving water and energy, the reduction of solid waste through recycling, using grey water, the management of trails and routes according to more ecologically sound principles and making use of infrastructure that has a minimal impact on the environment (Erdogan & Tosun, 2009:410; Spenceley, 2005:157; Li, 2004:562; Han *et al.,* 2009:325).

Some of the prevailing environmental impacts of tourism in national parks include littering, visitor crowding, wildlife disturbance, water pollution, soil compaction or erosion, trampling, unauthorised taking of souvenirs, noise and visual impacts, overuse of water and energy,

inappropriate solid waste disposal, and overdevelopment, to name but a few (Farrell & Marion, 2002:32; Marion & Reid, 2007:5; Erdogan & Tosun, 2009:407; Spenceley, 2005:138). Research conducted in national parks specifically concerning the environmental impacts include the works of Erdogan and Tosun (2009:409); Laven, Manning and Krymkowski (2005:168); Turton (2005:145); Moore and Polley (2007:294) and Chin *et al.* (2000:20). Valuable contributions on the subject were also made by Spenceley (2005:138); Jackson (2007:35); Butler (2000:337) and Harriot (2004:18).

Based on environmental friendly principles, management of national parks should ideally aim to manage parks in such a way that tourism (which generates revenues) exists in perfect harmony with the surrounding environment, with little or no impact on the environment (Lindsay *et al.*, 2008:731; Higham & Bejder, 2008:76). One method of achieving this would be through management strategies that focus on those tourism activities that are least likely to cause negative impacts (Higgenbottom, 2004:217).

To address these adverse tourism impacts on the environment, internationally management of national parks has developed several management frameworks which serve as a starting point for national parks to be more environmentally friendly (Boyd & Butler, 1996:559; Moore, Smith & Newsome, 2003:349; Spenceley, 2005:137). The most known management framework is the Limits of Acceptable Change (LAC) framework which identifies appropriate and acceptable resource conditions, and the criteria needed to protect or achieve those conditions. Other frameworks include Visitor Impact Management (VIM) which addresses aspects relating to tourism impacts; Visitor Experience and Resource Protection (VERP) which balances the relationship between a quality visitor experience and the quality of natural resources; Visitor Activity Management Process (VAMP) which is a conceptual planning model used to address appropriate park-related facilities; and the Leave No Trace (LNT) educational programme used to educate visitors about resource impacts. Finally, the Precautionary Principle was initiated for the purpose of encouraging the exercise of prudence in environmental matters and resource protection. This Principle is now being used in more than 40 countries, aiming to reduce the extend of environmental impacts of tourism (Farrell & Marion, 2002:31; Eagles *et al.*, 2002:176; Fennel & Ebert, 2004:462; SANParks, 2006:12; Moore & Polley, 2007:292).

Taking the above into consideration, the management approaches used by South African National Parks regarding the provision of environmentally friendly products was investigated to determine the *status quo.* First, a look was taken at the vision of South African National Parks which states that national parks must be the pride and joy of all South Africans. The just mentioned are supported by South African National Parks mission stating the following: *managing a system of national parks that represents the indigenous wildlife, vegetation,*

landscapes and associated cultural assets of South Africa for the joy and benefit of all (SANParks, 2006:8).

To protect the biodiversity on which the future of tourism in South African National Parks depends, SANParks uses a policy framework as a guideline to the sustainable management of national parks (SANParks, 2006:4). South African National Parks believe that all elements of the natural environment are interrelated and therefore must be taken into account when considering the effects management decisions will have on the environment. This policy leads to the implementation of the best practicable environmentally friendly decisions (SANParks, 2006:29).

Accordingly, management plans and policies are developed by South African National Parks to ensure that management decisions are guided by environmental concern through implementing principles such as: 'touch the earth lightly', purchasing and procuring eco-friendly products and materials, minimising and preventing waste, the conservative use of precious resources such as water and the use of sustainable energy (SANParks, 2006:13). The best practice environmental management is driven by the Adaptive Management Approach which includes the Conservation Development Framework (CDF). Additionally, SANParks has adopted the DEAT-South African National Biodiversity Institute (SANBI) framework for further effective management of biodiversity (DEAT is the abbreviation of the Department of Environmental Affairs and Tourism) (SANParks, 2008:10). Furthermore, national parks are divided into different zones by using a Strategic Environmental Assessment (SEA). This is seen as essential for conservation. Saayman (2009:372); Butler (2000:351) and SANParks (2006:23) clarify that zoning is a tool used to guide and co-ordinate various tourism activities, conservation and visitor experience initiatives in and around the different national parks. The Strategic Adaptive Management approach (SAM) is used to better understand the different ecosystems in national parks (SANParks, 2006:13). For any new development to take place, it is now required that an Environmental Impact Assessment is conducted prior to the development commencing (SANParks, 2006:44).

Based on the latter the questions that can be asked is; considering the just mentioned procurements to manage South African National Parks (environmental friendly) what are the perceptions of tourists regarding how environmentally friendly are South African National Parks managed? Previous research has shown that the perceptions of visitors regarding environmental impacts, and the management thereof, often differs from the perceptions of management regarding the same subject (Hillery, Nancarrow, Griffen & Syme, 2000:853; Priskin, 2003:189; Baysan, 2001:218). Consequently, it is imperative that visitors' perceptions regarding the environmental impacts of tourism are identified and measured in order to create

management strategies to address problem areas and so to ensure the sustainable management of tourism with regard to the environment (Moore, 2004).

2.3 METHOD OF RESEARCH

The necessary data needed to accomplish the goal of this study was gathered by conducting a survey. The methodology of how the latter was achieved will be discussed under the following headings: (i) the research site (ii) the questionnaire, (iii) the sample, and (iii) the method of research.

2.3.1 The research site

South African National Parks is a public entity functioning under National Environmental Management with the mandate to protect, conserve, control and manage national parks that represent the biodiversity, landscapes and associated heritage assets of South Africa for the sustainable use and benefit for all (DEAT, 2008:16; SANParks, 2008:1). During 2008, SANParks attracted approximately 4.7 million tourists to one or more of the twenty-two national parks. Overnight facilities are provided by most parks that, together, offer an unrivalled variety of accommodation in arid, coastal, mountain and 'bushveld' habitats (SANParks, 2008:21; SANParks, 2009b).

2.3.2 The questionnaire

The questionnaire used to survey visitors to South African National Parks was a newly developed one, based on similar studies done by Hillery *et al.* (2007:855) and Chin *et al.* (2000:20). Tourists had the option of choosing between the most frequently visited National Park of their choice. The questionnaire consisted of three sections: in section A, demographic details were surveyed. Section B measured the environmental impacts of tourism under the headings of general management, rest camps and campsites, commercial sector, tourist routes, tourist facilities and the marine environment. Section C of the questionnaire focused on how the tourism impacts on the environment influenced visitors' experiences whilst visiting a National Park. A five point Likert Scale was used as measuring instrument to determine to what degree the visitors perceived environmental impacts (1=almost never; 2=occasionally; 3=often; 4=mostly and 5=almost always). First a pilot study of ten questionnaires was conducted to ensure the reliability of the questionnaire on SANParks' website. For the purposes of this article, the information obtained from Sections A and B is predominantly used.

2.3.3 The sample

A non-probability sampling was followed with a convenience sample and willingness to complete the questionnaire. A total of 451 questionnaires (n) were completed during the survey. This is regarded by Cooper and Emory (1995:207), Buckingham and Saunders (2004:114) and Floyd and Fowler (2009:41) as being representative and adequate for statistical analysis. Visitors to South African National Parks had the opportunity to complete a questionnaire on the website of SANParks during June to August 2009. Web-based surveys have proved to be an objective and reliable instrument for gathering data (Roth, 2006:190; Morris, Fenton & Mercer 2004:248; Brennan, Rae & Parackal, 1999:83). The low costs of data gathering, potentially quick response and because web-based surveys have become easier and more flexible for both the researcher and the respondents, makes this method a most desirable one (Morris *et al.,* 2004:248; Fricker, Galesic, Tourangeau & Yan, 2005:371).

2.3.4 Method

The data capturing was done using Microsoft© Excel©, and an exploratory factor analysis was thereafter conducted by means of SPSS (Statistical Package for the Social Sciences). Tabachnick and Fidell (2001:25) and Field (2006:619) describe a factor analysis as a statistical method used to uncover the dimensions of a set of variables by reducing the large number of variables to a smaller number of factors. An exploratory factor analysis more specifically groups the correlated variables together.

The results of the Principle Component factor analysis using 'Promax' rotation revealed the presence of a six-factor structure with Eigen values greater than 1. Six meaningful factors that emerged from the data were labelled as Fauna and Flora; Management; Tourism Impacts, Aquatic Impacts, Tourist Routes and Trails and Tourism Development. The six factors accounted for 82.82% of the total variances.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was also calculated to confirm if the sample size of this study was adequate for a factor analysis. A score of .928 was reported for the KMO statistic, exceeding the necessary threshold of 0.6 (Field, 2006:640). Cronbach's Alpha coefficients were calculated on the six factors and scores ranged from .827-.931, which are an indication that the reliability of measurement of each of the six factors is extremely high.

2.4 RESULTS

The results will be discussed in two sections. Firstly, an overview of the socio-demographic profile of visitors to national parks will be given, and, secondly, the results of the factor analysis regarding tourism impacts will be discussed.

2.4.1 Socio-demographic profile

Results of the profile of visitors to South African National Parks are presented in Table 2.1:

Table 2.1: Visitor profile

HOME LANGUAGE	English (52%) and Afrikaans (42%) speaking
AGE	35-49 years of age (40%) 50-64 years of age (30%)
MARITAL STATUS	Married (69%)
PROVINCE OF RESIDENCE	Gauteng (52%) Western Cape (19%)
LEVEL OF EDUCATION	Matric (24%) Diploma/Degree (48%) Post-graduate (22%)
OCCUPATION	Professional (19%) Managerial (19%)
FREQUENCY OF VISITS OVER THE PAST THREE YEARS	16 % has visited national parks three times

Based on the results captured in Table 2.1, tourists visit national parks at least once a year (This is based on the fact that tourists visits national parks 3 times in 3 years). These tourists are predominantly married, English speaking and are approximately 44 years old. They originate largely from Gauteng or the Western Cape Province. Visitors are well educated and occupy a professional or managerial position. The results correlate well with previous research done by Saayman, Fouche and Kruger (2008:69); Oberholzer, Kruger and Saayman (2009:20); Du Plessis, Kruger, Van der Merwe and Saayman (2009:25) in South African National Parks, and can therefore be seen as representative.

2.4.2 Factor Analysis

Ninety-nine (99) constructs were used in the factor analysis and from those, six factors were extracted (see Table 2.2 and Table 2.3, respectively).

Table 2.2: Pattern matrix (Factors 1-3)

Impacts	Components		
	Factor 1 Fauna and Flora	Factor 2 Management	Factor 3 Tourism impacts
Mean Values	1.51	2.38	2.65
Cronbach Alpha	.931	.920	.890
Specimen collection (tourist routes)	.784		
Introduction of alien plants and species (trails)	.783		
Introduction of alien plants and species (tourist routes)	.761		
Specimen collection (trails)	.742		
Impact of 'Veld fires' due to tourism	.685		
Impacts of flower collecting	.673		
Design of track and trail not fitting into natural environment	.641		
Wildlife attracted to rubbish bins	.612		
Wood collecting by tourists	.608		
Impacts of plant collecting (routes)	.588		
Feeding of wildlife	.545		
Sewerage systems	.493		
Interference of wildlife feeding	.480		
Inappropriate waste disposal at restaurants		.723	
Restaurants not making use of locally produced products		.712	
Not printing brochures and information booklets on recycled paper		.679	
Impacts of using non-renewable resources		.668	
Lack of energy saving measures		.656	
Use of non-renewable resources (tourist facilities)		.633	
Not using natural products as building material for accommodation facilities		.632	
Lack of energy-saving measures		.607	
Noise pollution		.597	
Inadequate water saving measures		.583	
Too many tourists in the park at a given time		.556	
Human made structures that are not eco-friendly		.526	
Insufficient management of waste		.440	
Pollution at restaurants		.420	
Lack of environmental-friendly transport		.409	
Poaching			.795
Road killings as a result of reckless tourist driving and speeding			.717
Erosion along routes due to tourists			.717
Speeding of staff and delivery vehicles			.690
Wildlife attracted to rubbish bins (rest camps)			.624
Interference of breeding of wildlife			.624
Wildlife attracted to rubbish bins (tourist facilities)			.615
Overcrowding of tourists			.609

Supplementary feeding of wildlife			.542
Litter			.493

Factor 1: Impacts on Fauna and Flora

Impacts on Fauna and Flora include such aspects such as "specimen collection (for example, butterflies and flowers)", "the introduction of alien plants and animal species by tourists", "veld fires" and the "impacts of flower collecting". This factor is confirmed by Pickering, Harrington and Worboys (2003:247); Chin *et al.* (2000:28) and Smith and Newsome (2002:351). This factor scored a mean value of 1.51. In comparison to the other five factors, this factor scored the lowest mean value.

Factor 2: Management

The impacts acquired from factor two, are managerial related aspects such as "inappropriate waste disposal facilities at restaurants", "restaurants not making use of locally produced products", "not printing brochures and information booklets on recycled paper" and "impacts of using non-renewable resources (for example, plastic)". Hillery *et al.* (2001:862); Baysan (2001:228); Buultjens, Ratnayake, Gnanapala and Aslam (2005:738-739); Spenceley (2005:157); Littlefair and Buckley (2008:339); Ma, Ryan and Bao (2009:28) and Boyd and Butler (1996:559) all confirmed the relevance of the above-mentioned factor. The mean value of this factor is 2.33, which is the second highest of the six factors.

Factor 3: Tourism impacts

The third factor named Tourism Impacts scored the highest mean value (2.65) of all six factors. Therefore, this factor represents the most important environmental impacts in national parks. This factor includes impacts such as "poaching", "road killings", "erosion" and "speeding of staff and delivery vehicles". Research done by Noe *et al.* (1997:330); Chin *et al.* (2000:28); Hillery *et al.* (2001:863) and Higham and Bejder (2008:78) support this factor.

Table 2.3: Pattern matrix (Factors 4-6)

Impacts	Components		
	Factor 4 Aquatic Impacts	Factor 5 Tourists trails and routes	Factor 6 Tourism Development
Mean Values	2.18	2.00	1.98
Cronbach Alpha	.928	.927	.827
Litter (in and out of the water)	.911		
Waste discharge of boats	.873		
Uncontrolled fishing	.815		
Wildlife disturbance	.781		
Construction of tourism developments along	.770		

shore/coastline			
Divers and snorkelers	.656		
Whale watching at a too close distance	.578		
Dust caused by tourist vehicles (4x4 routes)		.798	
Erosion along trails		.746	
Fuel and oil leaks of tourists' vehicles		.649	
Tourists wandering off trails		.646	
Speeding of tourists on 4x4 trails		.597	
Tourists using too much artificial light		.514	
Disposal of toxic substances,		.489	
Erosion along trails due to hiking		.440	
Erosion due to tourism development			.596
Visual pollution			.513
Damage to natural vegetation (rest camps)			.501
Lack in the use of environmentally friendly products			.465
Overcrowding of tourists at wildlife sightings			
Camp layout not fitting into the natural setting of the			.439
environment			.432
Damage to natural vegetation (tourists routes)			
Inappropriate waste management - absence of			.421
recycling waste bins			.406

Factor 4: Aquatic Impacts

This factor is based on selected national parks connected with a marine impacts. Important variables are "littering", "waste discharge by boats" and "uncontrolled fishing". This factor is supported by Baysan (2001:228); Harriot (2004:21) and Shafer and Inglis (2000:84) who have all done research on similar subjects. This factor scored a mean value of 2.18, which is the third highest mean value.

Factor 5: Tourist trails and routes

Factor five contains variables concerning tourist routes and trails such as "dust caused by 4x4 vehicles"; "erosion" and "fuel and oil leaks of tourist vehicles". The factor scored a mean value of 2.00, thus ranking fourth out of the six factors. Research done in protected areas by Turton (2005:145), Li, Ge and Liu (2005:286) as well as Davenport and Davenport (2006:288) revealed similar results and therefore confirms the viability of the factor.

Factor 6: Tourism development

Tourism development contains variables such as "erosion due to tourism development"; "visual pollution" and "damage to natural vegetation in rest camps". The importance of environmentally friendly development is underlined by research done by Baysan (2001:228) and Erdogan and Tosun (2009:406). This factor had a mean value of 1.93, ranking it fourth in comparison to the other factors.

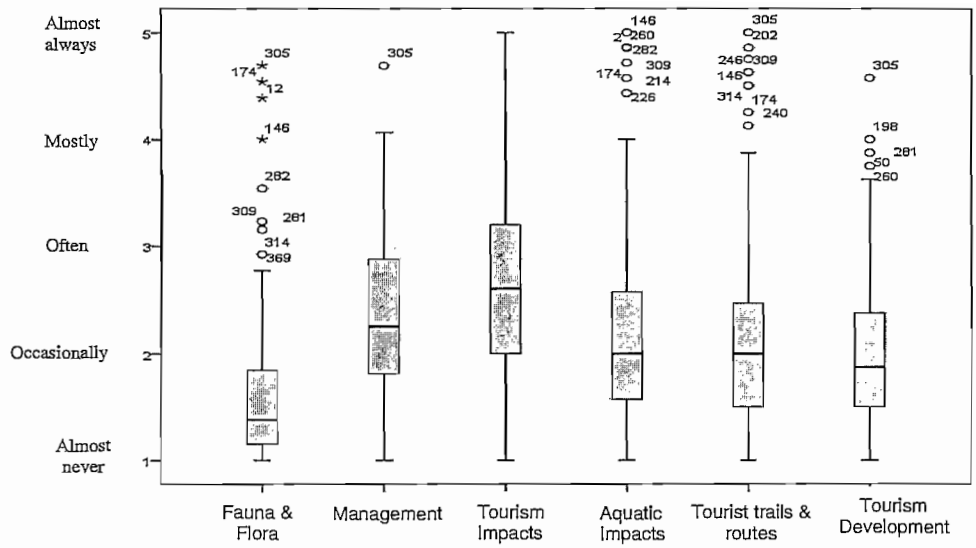


Figure 2.1: Box plot

(The y-axis represents the Likert scale used where 1=almost never; 2= occasionally; 3= often; 4= mostly; 5=almost always)

The Boxplot in Figure 2.1 clearly indicates the position of the six factors in correlation with the five-point Likert Scale used. The factors that lie the closest to option 4 (mostly) and 5 (almost always) on the Likert Scale are those factors perceived by tourists that are most harmful to the environment. The box plot therefore confirms the results obtained from the factor analysis and that the factors "Management" and "Tourism Impacts" need management attention in terms of environmental friendliness.

2.5 FINDINGS AND IMPLICATIONS

The results of this research confirm that visitors are of the perception that environmental impacts do indeed occur in South African National Parks due to tourism. The factor analysis revealed six significant factors that require management attention in order for the National Parks to be more environmentally friendly and, hence, ensure sustainable development. Based on the results, the following findings and implications have emerged.

Firstly, visitors to National Parks perceived that waste management and the recycling of waste in National Parks requires management attention. This is confirmed by Erdogan and Tosun (2009:411); Spenceley (2005:160); Buultjens *et al.* (2005:741) and Lim and Mc Aleer (2005:1434).

The implication is that park management need to implement policies that will address or avoid impacts, and dispose of waste properly. This can be done by:

- Providing bins for recycling, within the accommodation units as well as commercial areas. Three bins, labelled organic, recyclable and non-recyclable waste should be made available to separate the waste prior to disposal. Recycled waste such as paper and glass can be re-used in National Parks;
- SANParks educating both visitors and their staff regarding the proper disposal of waste and the recycling thereof. This can be achieved through educational displays in visitor's areas and hosting workshops for staff. Games should be developed for children specifically in order to teach them the correct disposal of waste from a young age.
- Restaurants also participating in recycling of waste by constructing organic gardens to reduce the production of solid food waste. Furthermore, restaurants should purchase food supplies in bulk to reduce the amount of waste from packaging, preferably from local producers; and by
- Developing a recycling plant to recycle the waste generated by tourists. A pilot project can be launched at the Kruger National Park. Although the recycle plant will be driven by National Parks, the opportunity for the community to manage the project must be encouraged. If this pilot project is successful, it can be implemented in other popular National Parks.

Secondly, SANParks must make greater use of renewable resources, for example, forms of energy other than the increasing scarce (and expensive) thermal electricity. This was confirmed by Erdogan and Tosun (2009:410); Spenceley (2005:157); and by Li (2004:562). The implication of this finding is that Park Management should make use of energy generated by solar, wind, water and wave energy as alternative sources of energy. This can be done by, for example, making use of solar energy for supplying power to accommodation units.

Thirdly, visitors perceived that the use of more environmentally friendly products and procedures must be adopted at South African National Parks. Lim and McAleer (2005:1432) also found this factor to be seen as a problem. Therefore, the implication for park management would be to:

- To supply accommodation units with environmentally friendly products such biodegradable soaps and detergents:
- Use paperless communication and billing systems and, wherever "hard copy" is needed where possible, recycled paper should be used;
- Provide maps, information and marketing material also printed on recycled paper, where aesthetically practical; and
- Encourage the general packaging of products for South African National Parks in an environmentally responsible way.

Lastly, in is perceived that development in National Parks has not reached the ideal status of being environmentally friendly. Therefore, the implication is that the enhancement of a more environmentally friendly approach would imply that any new infrastructure should be developed to have a minimum impact on the environment. This factor supports research done by Shafer and Inglis (2000:81) and Li (2004:563). Examples include the following:

- New infrastructure should be non-permanent (tented-wilderness camps), using natural building materials and consisting of a design that fits into the immediate environment.
- The use of natural light and natural ventilation should be made encouraged to prevent the use of artificial light or air-conditioning.
- Recycled wastewater systems ought to be implemented in the new developments to release recycled water back into the environment (grey water).
- Gardens surrounding the new developments should consist of native vegetation and flora.

2.6 CONCLUSION AND RECOMMENDATIONS

The research question sought to determine how visitors perceived the environmental impacts caused by tourism in South African National Parks. The literature review revealed the paradigm shift taking place in the management of natural areas, specifically with reference to tourism. By recognising the adverse impacts tourism has on the environment led to more environmentally friendly management approaches. The majority of environmental impacts identified from reviewed literature were associated with the impact of tourists and their associated activities on the natural resources of protected areas. This, therefore, highlights the need to manage these impacts and activities in a more environmentally friendly manner. From the six factors identified by the factor analysis, the findings requiring more sufficient waste management, greater use of renewable energy sources, the implementation of more environmentally friendly practices and lastly, more environmentally-friendly future development, were all seen as desirable by the respondents to the survey.

In addition to the above, this research has made the following valuable contributions:

- Tourism impacts on the environment, as perceived by tourists, have been conducted for the first time, not only in South African National Parks but also in South Africa. This research can thus be seen as a benchmark in this field of research and so will greatly contribute to the literature of sustainable management of National Parks in South Africa and to the management of other nature-based tourism enterprises in South Africa.
- The results provide insights into how visitors see the environmental management of South African National Parks. This discovery is important because National Parks are the leaders in conservation and tourism in parks is dependent on the environment.

Further research is needed to determine more specifically (1) the perceptions of environmental impacts within each National Park and, (2) how to educate effectively visitors to National Parks regarding environmental issues, in order to reduce the environmental impacts. A more in-depth understanding of the relationship between tourism and the environment is needed. It is therefore recommended that this type of research ought to be conducted on a continual basis in order to monitor the environmental impacts of tourism in South African National Parks.

3

CHAPTER 3

Environmental impacts influencing tourists' experience to South African National Parks

Life is not measured by the number of breaths we take, but by the moments that take our breath away – G. Carlin

ABSTRACT

National parks in South Africa are popular ecotourism destinations where tourists can experience pristine natural environments. As a result the number of tourists visiting South African National Parks increased, which subsequently leads to pressure on the environment. This continues growth in tourism makes it difficult for park management to strike a balance between environmental protection whilst providing a unique and quality nature experience for tourists. Therefore, the aim of this article is to identify the environmental impacts affecting the experience of tourists to South African National Parks negatively. A web survey was conducted on the official website of South African National Parks (SANParks) where a total of 451(n) questionnaires was completed and received back. A factor analysis was carried out to identify the factors indicating the environmental impacts that had a negative impact on tourists' experience to South African National Parks. Five factors were identified, namely: pollution, tourism product offering, park violation, environmental management and tourism impacts. Thereafter, an ANOVA test was conducted to explore the relationship between tourists' frequency of visitation versus the effect that environmental impacts have on their experience to SANParks. It was found that the more frequently tourists visit SANParks, the more negatively they experience the perceived environmental impacts of tourism. The results of this study will provide SANParks management with information regarding the environmental impacts that needs to be managed more affectively in order to enhance the experience of tourists to South African National Parks.

Key words: *South African National Parks, Tourist Experience, Environmental Impacts, Frequency of visits, Park Management*

3.1 INTRODUCTION

National parks in South Africa are natural attractions providing tourists with unique nature experiences - if managed correctly (Cochrane, 2006:11; Borrie & Birzell, 2001:29; Tonge & Moore, 2007:768; DEAT, 2009). Tourist experiences offered at national parks can be seen as tangible (infrastructure and facilities) or intangible (enhancing the quality of life); with the latter being those experiences that specifically create unforgettable memories for tourists (Harmon, 2004:16). Such experiences include discovery (self-drive safari's, game viewing and bird watching); social dimensions (spending time with friends and family); adventure and physical challenges (guided walks, hiking and mountain biking) and most importantly nature experiences (solitude, remoteness, naturalness, and artifactualism) (Priskin & McCool, 2006:1; SANParks, 2009b).

Apart from providing tourists with unique nature experiences, South African National Parks' primary mandate is to conserve the biodiversity of the country (Shaffer & Inglis, 2000:73; Smith & Newsome, 2002:356). The fact that South Africa's biodiversity is ranked third in the world supports the importance and existence of South African National Parks to protect these valuable and pristine natural areas (Spenceley, 2005:141; Retief, 2006:104). With government funding for conservation becoming less each year, SANParks are becoming correspondingly more dependent on income generated through tourism to support conservation (Phillips, 2009). As a result, SANParks management is being pressured to permit more tourists to enter national parks to cover the shortcomings of government funding that is needed to sustain conservation in the national parks. However, the rising number of tourists to national parks leads to increased environmental impacts (Shafer & Inglis, 2000:73). These environmental impacts not only affect the sustainability of the natural environment but also impacts upon the experience of tourists at national parks themselves (Laven, Manning & Krymkowski, 2005:158; Hillery, Nancarrow, Griffen & Syme, 2001:853; Chin, Moore, Wallington & Dowling, 2000:21).

Consequently, to sustain tourism to national parks it is imperative for the park management to identify environmental impacts caused by tourism that will reflect negatively on the experience of tourists at national parks (Bresler, 2007:167). Identifying these environmental impacts will assist park management to develop appropriate environmental management strategies in order to minimise impacts that negatively affect the tourist experience (Cole, 2001:13; Tonge, Moore, Hockings, Worboys & Bridle, 2005:21). SANParks' management are therefore left with the immense task of reaching equilibrium in protecting the biodiversity of the environment whilst providing a quality and satisfying nature experiences for tourists (Marion & Reid, 2007:5; Moyle & Croy, 2007:519; Bushell & Griffin, 2006:26). From a tourist point of view, a positive nature experience will ensure a high level of satisfaction, return visits and improved tourist loyalty towards

nature and national parks (Alegre & Cladera, 2008:679; Hui, Wan & Ho, 2007:966; McCool, 2006:4; Hammit, Backlund & Bixler, 2004:360).

The aim of this article is to determine the influence of environmental impacts on tourists experience to South African National Parks. To achieve the latter, this chapter is structured by first giving a literature review. This review is followed by a description of the chosen method of research, the results thereof, together with the findings and implications. Finally, conclusions drawn from the research will be presented.

3.2 LITERATURE REVIEW

The increase in nature-based tourism and tourists travelling to protected areas, such as national parks, is based on a higher level of appreciation of the natural environment and the ensuing desire of tourists to engage in rich, quality, nature experiences (Reynolds and Braithwaite, 2001:267; Bresler, 2007:172; Powell and Ham, 2007:7). Chhetri, Arrowsmith and Jackson (2004:33) explain that tourist experiences are created by identifying a variety of sensory information found within natural areas. Furthermore, tourists travelling to national parks carry a perception based on positive feelings from being on holiday and would seek to match these expectations and emotions with just such a positive nature experience (Han & Patterson, 2007:329; Mc Cool, 2006:7; Chhetri *et al.,* 2004:39). Cole (2001:13) refers to the entire tourist experience as an experience where tourists perceive total satisfaction. Consequently, a positive tourism experience will lead to an enhanced level of satisfaction (better quality of life) for the tourists which, in turn, is an important component in nature-based tourism when securing return visits and the sustainability of the tourism product (Yu & Goulden, 2006:1333; Borrie & Birzelll, 2001:29). The provision of quality nature experiences is, therefore, a vital component for park management in order to manage national parks successfully (Buultjens, Ratnayake, Granapala & Aslam, 2005:733; Marion & Reid, 2007:7).

McCool (2006:3) and Chhetri *et al.* (2004:33) define a tourist experience as a social-psychological phenomenon, influenced by expectations tourists carry with them, their standards, the identification of a variety of sensory information found within the natural areas (national parks) and the attributes of the protected areas encountered during a visit. Seeing that national parks are protected areas that preserve the biodiversity and enhance conservation, the expectations of tourists to national parks would be to experience and perceive quality, natural environments. Therefore, environmental impacts that occur in national parks due to tourism have the ability adversely to influence the experience of tourists (Tonge & Moore, 2007:771; Smith & Newsome, 2002:353). The tourist experience offered is one of the key selling features of any tourism product, for a

product without the provision of a tourism experience is considered, at best, tedious (Noe, Hammit & Bixler, 1997:324; Prentice, Witt & Hammer, 1998:2; Yu & Goulden, 2006:1333; Bresler, 2007:166; Lemelin & Smale, 2006:177; Tonge & Moore, 2007:768). Laven *et al.* (2005:167) explain that when tourists perceive that the quality of the environment no longer meets their expectations due to the environmental impacts caused by tourism, they either adjust their standards of quality to match the existing state of the environment, or displacement can take place. The latter refers to the situation where tourists would no longer visit the specific attraction. This, of course, can be fatal for any wildlife destination. It is also the most likely action tourists will take (Laven *et al.*, 2005:162, 167).

Added to the above tourists' experiences (when travelling to natural areas) are affected by a variety of destination attributes, such as managerial, natural and social factors. Nevertheless, the ecological impacts perceived by tourists are rated as the most important factor influencing tourists' experience (Floyd, Jang & Noe, 1997:391). As a result, the environmental impacts of tourism and their effects on the experience of tourists became an important focus of previous research. In Table 3.1, previous research regarding environmental impacts affecting tourists experiences are listed:

Table 3.1: Environmental impacts affecting tourists' experience

IMPACTS	AFFECT ON TOURIST EXPERIENCE
Noise pollution (Buultjens *et al.*, 2005:738; Bresler, 2007:173; Moore & Polley, 2007:295)	• Disturbs the natural sounds of the environment • Reduces satisfaction for tourists
Presence of litter (Tonge & Moore, 2007:771; Moore & Polley, 2007:295; Cole & Hall, 2009:24)	• Loss of amenity • Reduces the quality of the tourists' experience • Reflects a violation of deeply held norms of the Western Society
General environmental condition (Shafer & Inglis, 2000:73 ; Tonge & Moore, 2007:771; Smith & Newsome, 2002:353)	• Impacts on the perception of artifactualism that affect the experience of tourists negatively
Vegetation loss and perceived number of trees damaged (Deng, Qiang, Walker & Zhang, 2003:544; Smith & Newsome, 2002:352, 354; Chin *et al.*,	• Tourists experience a loss in the naturalness of the environment

2000:20)	
Tourist crowding (Yang & Zhuang, 2006:47; Moyle & Croy, 2007:518; Smith & Newsome, 2002:353; Buultjens *et al.,* 2005:738; Cole & Hall, 2009:24)	• Reduces tourist satisfaction due to limited view • Causes discomfort for tourists • Diminish opportunities for solitude
Inadequate disposal of human waste (Moore & Polley, 2007:295)	• Impacts on tourists experience negatively • Leads to dislike of the area • Causes discomfort for tourists

From the information listed in Table 3.1, it is clear that environmental impacts such as waste, pollution, overcrowding and litter, to name but a few, really do affect the experience of tourists in natural settings. These are also influenced by tourists' cultural backgrounds, demographics, travel motives, *frequency (number) of visits* or prior experience of the destination. In addition, the length of stay, quality of the environment, managerial preferences and influences by the media, friends and family (also known as "word of mouth") (Oom do Valle, Correia & Rebelo, 2008:207; Alegre & Cladera, 2008:670; Murphy, Pritchard & Smith, 2000:45; Kozak, 2001:786; Smith & Newsome, 2002:343; Bushell & Griffin), will also play a role in the perceptions of the experiences. It is noted by Deng and Bender (2007:183) that the frequency of visitation of tourists is an important factor in determining the effect that environmental impacts have on tourists' experiences of natural areas.

Research conducted by Anwar and Sohail (2004:165) and Alant and Bruwer (2004:34) showed that first-time tourists to natural areas have a more positive experience concerning the quality of the destination than do those tourists who have visited the same destination more often. The reason for this is that first-time tourists perceive everything as well organised and of a good standard if not well informed about the product. As the number of visits to natural areas increases, the perception of tourists changes according to the knowledge gained during previous experiences, resulting in a more negative image of the destination where negative environmental impacts occur (Hammit *et al.,* 2004:358). Hinds and Sparks (2008:109) indicated that a higher frequency of visitation to national parks leads to pro-environmental behaviours and more environmentally friendly tourism. It therefore implies that tourists who visit national parks more frequently would be more sensitive to any negative environmental impacts caused by tourism. In other words, they will more readily notice negative environmental impacts caused by tourism. This is due to the fact that the more frequently tourists visit national parks, the more they develop a "place attachment" and "a sense of

belonging". This, in turn, makes tourists more environmentally sensitive and thus provides them with the ability to identify key issues such as environmental impacts (Hammit *et al.,* 2004:350). Based on the foregoing, the aim of this article is primarily to determine those environmental impacts perceived by tourists visiting South African National Parks as having a negative impact on their experience. Thereafter, it will be determined if tourists with a higher frequency of visits to national parks actually do experience the negative environmental impacts of tourism differently than those tourists with a lower frequency of visitation to SANParks.

The results obtained from determining the above would provide management of SANParks with valuable insight regarding environmental impacts that need to be managed better to enhance the experience of tourists to SANParks. The results can furthermore be applied to the enhancement of the understanding of nature experiences sought by tourists, as well as better understanding the needs of those tourists with a high frequency of visits to SANParks. Management strategies to address these issues can thereafter be developed to address the potential problems.

3.3 METHOD OF RESEARCH

The necessary data needed to accomplish the goal of this study was gathered by conducting a survey. The methodology will be discussed as (i) the research site, (ii) the questionnaire, (iii) the sample and (iv) the method of research.

3.3.1 The research site

South African National Parks is a public entity functioning under National Environmental Management with a mandate to protect, conserve, control and manage national parks that represent the biodiversity, landscapes and associated heritage assets of South Africa for the sustainable use and benefit for all (DEAT, 2008:16; SANParks, 2008:1). During 2008, SANParks attracted 4.7 million tourists to the 22 national parks respectively. Overnight facilities are provided by most parks that offer an unrivalled variety of accommodation in either arid, coastal, mountain or 'bushveld' habitats (SANParks, 2008:21; SANParks, 2009b).

3.3.2 The questionnaire

The questionnaire used to survey tourists to South African National Parks was newly developed, but was based on similar studies done by Hillery *et al.* (2007:855) and Chin *et al.* (2000:20). Questionnaire respondents had the option of choosing a questionnaire relevant to the most frequently visited National Park of their choice. The questionnaire consisted of three sections: in

section A, demographic details were surveyed while section B measured the environmental impacts of tourism under the headings of general management, rest camps and campsites, commercial sector, tourist routes, tourist facilities and marine environment. Finally, Section C of the questionnaire focused on how tourism impacts on the environment influenced the tourist's experience whilst visiting a national park.

First, a pilot study of ten questionnaires was conducted on SANParks' website to ensure the legitimacy of the questionnaire. For the purposes of this chapter, the information obtained from Sections A and C was predominantly used for the statistical analysis. A five-point Likert Scale was used as the measuring instrument to determine to what degree the environmental impacts perceived by the respondents affected their experiences at South African National Parks (1=very negative; 2=negative; 3=neutral; 4=positive and 5=very positive).

3.3.3 The sample

A non-probability sampling method, that is, a convenience sample and the willingness to complete the survey, was used. Thereafter, 451 (n) questionnaires were completed during the online survey. This is regarded by Cooper and Emory (1995:207), Buckingham and Saunders (2004:114) and by Floyd and Fowler (2009:41) as adequate for a valid statistical analysis. Tourists to South African National Parks had the opportunity to complete a questionnaire on the official website of SANParks during June to August 2009. Roth (2006:190); Morris, Fenton and Mercer (2004:248); Brennan, Rae and Parackal (1999:83) have all successfully used web-based surveys to conduct research previously, and this method is regarded both as an objective and as a reliable instrument to gather data. Low costs of fieldwork, potentially quick response and the fact that web-based surveys have become easier and more flexible for both the researcher and for the respondents makes this method a more desirable one in comparison than the traditional telephonic, or face-to-face, interview method of collecting data (Morris *et al.,* 2004:248; Fricker, Galesic, Tourangeau & Yan, 2005:371).

3.3.4 Method

Once data had been obtained from the survey, it was captured on Microsoft Excel where after it was statistically analysed using the software programme SPSS 16 (Statistical Package for the Social Science) (Field, 2006:1). The data was analysed in two stages in order to obtain the desired results:

Environmental impacts that affect tourists' experience were analysed using an exploratory factor analysis. This analysis revealed six factors. Tabachnick and Fidell (2001:25) and Field (2006:619)

explain that a factor analysis is a statistical method used to uncover the dimensions of a set of variables by reducing the large number of variables to a smaller number of factors and an exploratory factor analysis more particularly groups correlated variables together. To verify whether the number of questionnaires (n=451) used for the factor analysis was adequate, Kaiser-Meyer-Olkin's measure of sampling adequacy was calculated (Field, 2006:642). Furthermore, the Cronbach Alpha's of each factor was then calculated to verify the reliability of the Likert Scale used in the survey (Field, 2006:666).

Following these, an analysis of variance (ANOVA) test was conducted for to provide further statistical analysis. ANOVA is a popular statistical technique used to test for significant mean differences in variables between more than two groups of dependant variables (Altinay & Paraskevas, 2008:216). The variables used in this specific ANOVA test were the environmental impacts that influenced the tourists' experience compared with visitation frequency of tourists to SANParks. In order to identify whether or not the values were relevant, Levene's test of homogeneity was undertaken to test whether the null hypotheses of equal population variances should be rejected. For Levene's test to be significant, the p-value should be less than 0, 05 (results showed a significance of 0. 018; 0. 00 and 0. 036, respectively) to be able to claim a statistically meaningful outcome.

Finally, *Post-hoc* tests (Tuckey's & Tamhane's) were conducted to determine which groups differed significantly (Field, 2006:354; Altinay & Paraskevas, 2008:217).

3.4 RESULTS

The results are presented in two sections. Firstly, the factor analysis completed regarding those environmental impacts that influence tourists experience negatively and secondly, the results of the ANOVA test done regarding the frequency of visitation and environmental impacts experienced.

3.4.1 Factor analysis

The environmental impacts that influence the experience of tourists in SANParks were grouped into five factors using principle components analysis, followed by a promax oblique rotation, as a data reduction strategy. The factors were labelled *'pollution'*, *'tourism product offering'*, *'and park violation'*, *'environmental management' and 'tourism impacts'*. These factors explain 60% of the total variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was .864, exceeding the minimum threshold of .600 (Field, 2006:640). In addition, the Cronbach's Alpha coefficients are presented. These were calculated on the five factors, and achieved scores ranging from 0.607-

0.789, which are an indication that the reliability of measurement of each of the five factors is high, and therefore viable for use. Based on the Likert Scale (where 1 = very negative and 5 = very positive), **the lower** the mean value of the factors, **the more negative** was that environmental impact factor experienced.

Table 3.2: Factor analysis

	Components				
Factor Label	Factor 1 **Pollution**	Factor 2 **Tourism product offering**	Factor 3 **Park violation**	Factor 4 **Environmental management**	*Factor 5* **Tourism impact**
Mean Values	1.96	2.55	1.44	1.84	1.92
Cronbach Alpha	.763	.760	.789	.744	.607
Level of litter	.768				
Litter and pollution from restaurants	.670				
Level of noise in the park	.636				
Waste management	.623				
The overall experience of picnic and day tourist sites		.724			
The overall experience of 4x4 and hiking trails		.634			
Expansion of knowledge regarding plants and animals		.604			
The general management of the environment		.591			
The adequacy of tourist activities available		.535			
The adequacy of tourist facilities		.449			
Seeding of staff and delivery vehicles in national parks			.904		
Speeding of tourists along tourist routes			.888		
Overcrowding of tourists			.652		
Absence of energy saving measures				.957	
Absence of water saving measures				.843	
Building structures that are not eco-friendly				.461	
Erosion and trampling along tourist routes					.321
Alien plant species present					.427

Factor 1: Pollution

'Pollution' consists of 'level of litter', 'litter and pollution from restaurants', 'level of noise in the park' and 'waste management'. This factor had a mean value of 1.96 indicating that tourists see pollution as an aspect that influences the tourist experience negatively. This factor is confirmed in studies previously done by Tonge and Moore (2007:771) and by Buultjens *et al.* (2005:738). This factor had the fourth highest mean value.

Factor 2: Tourism product offering

'Tourism product offering' includes constructs such as 'overall experience of picnic and day tourist sites', 'overall experience of 4x4 trails' and 'the expansion of knowledge concerning plants and animals'. Research by Chin *et al.* (2000:31), Powell and Ham (2008:30), Shafer and Inglis, (2000:81) and by Bresler (2007:172) all confirm this factor. This factor had a mean value (2.55) and is therefore considered to have the least impact on tourists' experience of the five factors.

Factor 3: Park violation

'Park violation' refers to 'speeding of staff and delivery vehicles', 'speeding of tourists' vehicles and 'overcrowding of tourists'. This factor had the lowest mean value of 1.44 indicating it as the factor causing the most negative experiences on tourists to SANParks. This finding is confirmed by Shafer and Inglis (2000:82), Arnberger and Brandenburg (2007:39) as well as by Klar, Herrmann and Kramer-Schadt (2007:631).

Factor 4: Environmental management

'Environmental management' includes 'absence of energy-saving measures', 'absence of water-saving measures' and 'building structures that aren't eco-friendly'. These findings are verified by Buultjens *et al.* (2005:738) and Li (2004:563). This factor had the second lowest mean value of 1.89 indicating that the factor caused the next most negative experiences to tourists visiting South African National Parks.

Factor 5: Tourism impacts

'Erosion and trampling along tourist routes' and 'alien plant species present' are the aspects that are included in Factor 5, "Tourism impacts" Research conducted by Smith and Newsome (2002:352,354), Borrie and Brizell (2001:30) and Deng *et al.* (2007:544) in national parks confirms this factor. This factor had a mean value of 1.92, indicating it as the factor causing the next most negative experiences on tourists visiting South African National Parks.

The results of the ANOVA test will follow:

3.4.2 ANOVA results

Analysis of variance test was conducted to measure the significant difference in the visitation frequency of tourists regarding environmental impacts. For statistical analysis, the number of times tourists have visited SANParks was grouped according to the number of times they have visited over a period of three years. Group 1 is regarded as the low frequency tourists who visited SANParks only 1-3 times over the past three years. Group 2 represents the medium frequency tourists who visited SANParks between 4-8 in the last three years while Group 3 consisted of tourists that visited SANParks nine times or more over the same period and are therefore labelled as the high frequency tourists (Table 3.3).

Table 3.3: Frequency of visits to national parks the past three years

Frequency of visitation to national parks		
1 Time	7%	**group 1**
2 Times	10%	
3 Times	16%	
4 Times	11%	**group 2**
5 Times	10%	
6 Times	8%	
7 Times	5%	
8 Times	5%	
9+ Times	28%	**group 3**

Table 3.4 shows the results of the ANOVA test, comparing visitation frequency with the factors identified that are influential on tourists' experience. For the factors to prove a significant difference when compared to the visitation frequency, the value of p must be (p) $\leq$ 0.05.

Table 3.4: *Anova-test*

		Mean Square	F - ratio	Significance (p-value)
Pollution (factor 1)	Between groups	1.466	4.078	**.018**
	Within groups	.360		
Tourism product Offering (factor 2)	Between groups	.084	.430	.651
	Within groups	.196		
Park violation (factor 3)	Between groups	4.070	12.691	**.000**
	Within groups	.321		
Environmental Management (factor 4)	Between groups	.168	.501	.606
	Within groups	.336		
Tourism impacts (factor 5)	Between groups	1.364	3.347	**.036**
	Within groups	.408		

Factor 1 (pollution), factor 3 (park violation) and factor 5 (tourism impacts) all showed a significant difference when compared to visitation frequency according to Table 3.4. Factor 2 (tourism product offering) and Factor 4 (environmental management), however, showed no significant difference when compared to visitation frequency.

To determine more specifically whether a low, medium or high frequency of visitation to SANParks plays a significant role, the Tukey's - and Tamhane's *Post hoc* tests were done on Factor 1, 3 and 5. Both tests revealed similar results, but because Tukey's tests are predominantly used in the discussion of the multiple comparisons, it was used in this analysis as well (Field, 2006:441). Table 3.5 clearly indicates that each group of frequency variables are compared to the identified factors namely, pollution, park violation and tourism impacts. For each factor, the difference between means of the groups is displayed, together with the standard error of that difference, the significant level of that difference and a 95% confidence interval (Field, 2006:354).

Table 3.5: Multiple comparisons

Environmental Impact factors	Frequency of visitation groups (low/medium/ high)	Mean value	Difference between visitation frequency	Mean difference	Std. Error	Sig. (p-value)	95% Confidence interval	
							Lower Bound	Upper Bound
POLLUTION	1	2.063	1 vs. 2	.10	.07	.292	-.589	.266
	2	1.96	1 vs. 3	**.22***	.08	**.013**	.038	.392
	3	1.84	3 vs. 2	-.11	.07	.273	-.282	.059
PARK VIOLATION	1	1.63	1 vs. 2	**.23***	.07	**.002**	.072	.386
			1 vs. 3	**.35***	.07	**.000**	.181	.516
	2	1.40	2 vs. 1	**-22***	.07	**.002**	-.378	-.071
			2 vs. 3	.12	.07	.167	-.037	.285
	3	1.28	3 vs. 1	**-.35***	.07	**.000**	-.516	-.181
			3 vs. 2	-.12	.07	.167	-.285	.037
TOURISM IMPACTS	1	2.00	1 vs. 2	.06	.07	.682	-.112	.235
			1 vs. 3	**.20***	.08	**.031**	.015	.393
	2	1.95	2 vs. 1	-.06	.07	.682	-.235	.112
			2 vs. 3	.14	.07	.156	-.039	.324
	3	1.80	3 vs. 1	**-.20***	.08	**.031**	-.393	-.015
			3 vs. 2	-.14	.07	.156	-.324	.039

* The mean difference is significant at the 0.05 level

The significant difference between tourists with a high, medium or low frequency of visitations is given in Table 3.5. The mean values are based on the original Likert Scale used in the survey (where 1= very negative and 5= very positive). The implication of the significant difference will be discussed next:

Dependant variable 1: Pollution

From Table 3.5, it is clear that the group difference with a significant value, on a 5% level, was that of group 3 when compared to group 1. It seems, therefore, that environmental impacts such as general waste management, visibility of litter and the levels of noise, affects the experiences of tourists who visits SANParks more frequently (group 3) more than the other two groups. The experience of those tourists with a lower frequency of visitation (group 1) to SANParks was not affected by the presence of environmental impacts represented by the 'pollution' factor. From this, it is clear that the more tourists visit SANParks, the more sensitive they become to environmental impacts and so the more likely it is to impact negative on their tourist experience.

Dependant variable 2: Park violation

Group differences with a significant value (on a 5% level) are shown for all three groups: group 1 compared with group 2 and 3; group 2 compared with group 1; and group 3 compared with group 1. Consequently, environmental impacts such as overcrowding and the speeding of staff and tourists are experienced more negatively by tourists visiting national parks more. Again, conclusions can be drawn that the higher the level of visitation frequency to SANParks are, the more sensitive to tourism impacts on the environment are the tourists themselves.

Dependant variable 3: Tourism impacts

Group differences with significant values are group 1 in comparison with group 3. These results indicate that the higher the frequency of visits to SANParks, the higher the possibility is that the experience of tourists may be influenced negatively by the environmental impacts represented in 'tourism impacts'. These impacts include erosion and trampling along tourist routes, together with the presence of alien plant species.

To conclude, there were a strong linkage between the frequency of visits and the degree to which tourists experienced are affected by environmental in SANParks.

3.5 FINDINGS AND IMPLICATIONS

Based on these results, the following findings and implications are drawn:

Firstly, the research discloses that the higher the frequencies of visits to SANParks, the more sensitive tourists are to environmental impacts. This is supported by the research findings of Oom do Valle *et al.* (2008:215); Alegre and Cladera (2009:679) and of Hammit *et al.* (2004:357). Management implications from this imply that a database should be compiled of high-frequency

visiting tourists who can be surveyed annually regarding their views of the impacts caused by tourism in SANParks. These high frequency tourists will provide management with valuable information regarding perceived negative aspects in national parks. In addition, the proposed survey should determine what influences the experience of tourists positively concerning facilities, services and product offerings, and so could focus management attention to ensure that these experiences are provided. Research has proved that tourists to South African National Parks are loyal to SANParks (Saayman, Fouche & Kruger, 2008:68). Therefore, it is important to maintain high environmental standard to ensure that the experiences of these loyal tourists are optimal.

Secondly, 'tourism product offering' is an important role player when considering how tourists experience environmental impacts in SANParks. The above-mentioned has a direct link with tourist crowding and to exceeding the social carrying capacity. This is supported by Shaffer and Inglis (2000:81); Yang and Zhuang (2006:47); Moyle and Croy (2007:518). This factor was, however, contradictory to the findings of Moore and Polley (2007:295). The implication for SANParks management, then, is to ensure that tourist activities and facilities are sufficient for the number of tourists in each specific park, provide tourists with an opportunity to experience nature on an intimate level, satisfy needs and desires of tourists and lastly, whilst simultaneously ensuring that the activities and facilities are managed in an environmentally-friendly manner. It is therefore vitally important for SANParks management to determine accurately and scientifically the carrying capacity of each national park before development commences.

Thirdly, the results reveal that tourists and staff speeding in SANParks are both impacts that play the largest negative role in affecting the experience of tourists. This is recorded by tourists at all levels of visitation frequency. Klar *et al.* (2007:631) support this finding. Following are some managerial implications for SANParks management regarding the speeding of staff (and tourists) in national parks.

- Tracking devices should be installed on all staff vehicles in order to monitor their movement in order to record occurrences of speeding. The offenders (both staff and contractors) should face severe fines. The staff members of SANParks should set the standard when obeying the Park rules for tourists would be more likely to comply themselves if the staff members were seen to rigorously observe the regulations. The opportunity to provide staff and delivery vehicles with alternative routes, to travel between rest camps and sites, out of site of tourists where possible, should also be explored.

- Higher fines should be issued to tourists for speeding in SANParks. More emphasise should be placed on charts outlining distances and travelling times within national parks, and should be given to tourists upon arrival.

Fourthly, results indicated that SANParks lacking resource-conserving measures, such as water saving techniques, negatively affect tourists' experiences. This is confirmed by Moore, Smith and Newsome (2003:366) and Buultjens *et al.* (2005:739). Management implications thereof include:

- Management should ensure that all leaking taps and water pipes are fixed in order to help conserve water. Furthermore, water saving attachments should be installed on taps and showerheads. Low-flow toilets should be installed. The frequency of replacement of towels and bed-linen for tourists should be reduced as this would decrease both water and detergent use. Storm water runoff should be collected and captured for re-use in gardens and toilets.
- Motion sensors should be installed in tourists' rooms to detect when there is no human activity taking place in order so that appliances such as lights and air-conditioning could be turned off. This is commonplace in some urban establishments and SANParks should surely set an example fro the Tourism Industry. Energy efficient light bulbs should replace traditional bulbs. Opportunities to make use of renewable energy resources should be explored and, where appropriate, implemented.
- Tourists should receive environmental education such as guidelines encouraging them to save water and energy. Information regarding the environmental rewards of economical use of resources should also be made available.

Finally, it was revealed that pollution (waste and noise) also has a negative influence on the experience of tourists at SANParks. This is consistent with research of Spenceley (2005:157); Littlefair and Buckley (2008:339). The management implications are:

- Park management must introduce a "pollution deposit fee" which is payable upon the arrival of the tourist. This would be refundable on departure if tourists could show that they were removing their non-recyclable litter, such as plastic, for disposal outside the Park.
- Management need to monitor the level of noise in SANParks by fining tourists who display no consideration for the rights of others, particularly after a specified time at night.

3.6 CONCLUSION AND RECOMMENDATIONS

The purpose of this article was to identify those environmental impacts that influence the experience of tourists to South African National Parks. Five factors, based on environmental impacts, were identified by the factor analysis as being influential. These factors are pollution, tourism product offering, park violations, environmental management and tourism impacts. In addition, the ANOVA test identified three variables (pollution, park violations and tourism impacts) that were significant with regard to frequency of visits and tourists experience.

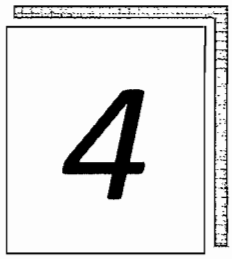
The results furthermore indicate that there is a strong link between the frequency of visits to SANParks and the degree to which tourists experience environmental impacts caused by tourism. A better understanding of the aspects that influence tourists' experiences will assist SANParks management in developing appropriate management strategies to enhance the experience of tourists in national parks. A better response to existing problems regarding tourists' experiences and environmental issues can be addressed.

Along with the above-mentioned, this research has the following valuable contributions:

- The measuring of environmental impacts of tourism and the effect they have on the experience of tourists visiting South African National Parks;
- The relationship between frequency of visitation and the degree to which tourists' experiences are affected by environmental impacts was also determined for the first time in SANParks.
- The perceptions of environmental impacts of tourism in national parks will assist SANParks management to address these issues and so ensure the sustainability of SANParks.

Recommended future research could entail:

- Specific indicators to which level the environmental impacts are acceptable with reference to the tourists themselves; and
- Continuous research of this kind should be undertaken over a number of consecutive years to ensure that management are monitoring environmental impacts with the intention of providing enhanced tourist experiences.



CHAPTER 4

Conclusions and recommendations

4.1 INTRODUCTION

The primary objective of this study was to determine tourists' perceptions of tourism impacts on the environment with regard to South African National Parks. To achieve this aim, the following secondary objectives were outlined in Chapter 1 and achieved as discussed in their respective chapters.

- The first secondary objective was to identify how environmentally friendly South African National Parks are. This was achieved in Chapter 2 (Article 1) of the study. The research identified tourists' perceptions regarding environmental impacts caused by tourism in South African National Parks and which needs to be managed more in a more environmentally friendly manner.

- The second secondary objective was to explore how the environmental impacts, as perceived by tourists, influences their experience within National Parks. This goal was achieved in Chapter 3 (Article 2). Specific environmental impacts were identified that had a negative influence on tourists' experience and, in addition, the relationship between visitation frequency and the perception of environmental impacts was explored.

- The third secondary objective was to draw conclusions and make recommendations concerning research on environmental impacts in South African National Parks. This chapter will conclude the findings of the research and will use the research results from Chapters 2 and 3 to make recommendations concerning future research and concerning sustainable management in South African National Parks.

The research of this study is a first of its kind in South Africa regarding the environmental impacts of tourism and their perception by tourists to South African National Parks. The results will guide management of South African National Parks into specific areas of the national parks which need to environmentally friendly management in order to minimise the impacts caused by tourism. This is also important for sustainable tourism development and its management in South African National Parks. Future management strategies can be developed to address the issues reported by the results. Therefore, the aim of this chapter is to draw conclusions from the research, make recommendations and identify aspects for future research.

4.2 CONCLUSIONS FROM THE RESEARCH

The conclusions of this study are divided into two sections. Firstly, conclusions regarding the literature review will be given, and thereafter, conclusions drawn from the results of the surveys conducted.

4.2.1 CONCLUSIONS WITH REGARD TO THE LITERATURE STUDY

4.2.1.1 Conclusions with regard to the literature of article 1 (How environmentally friendly is South African National Parks?):

- South African National Parks are the leaders in nature conservation, not only in South Africa but in Southern Africa (c.f. 1.1).
- The mission of South African National Parks is to develop and manage a system of national parks that represent the biodiversity, landscapes and associated heritage sites of South Africa for the sustainable use and benefit for all South Africans (c.f. 1.2).
- The tourism industry is experiencing a universal growth in nature-based tourism to protected areas such as national parks (c.f. 1.1).
- National parks are government funded. However as government funding is decreasing each year, national parks are becoming more dependent on tourism to raise the funds needed for conservation (c.f. 2.1).
- Growth in nature based-tourism leads to an increase in environmental impacts that must be managed if the tourism products are to be sustainable (c.f. 1.1; c.f. 2.1).

- Previous research regarding environmental impacts of tourism revealed that litter, erosion, pollution, tourist crowding and the lack of proper environmental management all have an effect on the environment within a national park (c.f. 1.2).
- Human intervention with the environment gave way to a 'green' movement where environmental protection became a vital issue in the sustainable management of tourism destinations such as national parks (c.f. 1.2; c.f. 2.1).
- For tourism to be sustainable, it is necessary to measure the social, economic and environmental impacts that tourism have on the destination (c.f. 1.2).
- Environmentally friendly tourism is tourism that is managed according to ecologically sound principles, managing the effect of tourism on the larger ecosystems (c.f. 2.2).
- Studies regarding sustainable tourism have been conducted in South African National Parks with regard to socio-economic impacts, but little research has been conducted into the environmental impacts of tourism (c.f. 1.2)
- Environmental impact studies of tourism that have been conducted in natural areas revealed that aspects such as water, air, biodiversity, natural resources, waste and landscapes are affected by tourism that is not managed in an environmentally responsible manner (c.f. 1.2).
- Measuring tourists' perceptions of environmental impacts caused by tourism is one method to measure the environmental impacts caused by tourism in order to provide management with information. South African National Parks need this information particularly that regarding the aspects that need to be managed if the South African National Parks are to sustainable (c.f. 1.2).
- Management of national parks, world-wide, have developed management frameworks in order to manage tourism more sustainably by minimising the impacts that tourism has on the environment. These management frameworks include:
    - Limits of Acceptable Change;
    - Tourist Impact Management;
    - Tourist Experience and Resource Protection;
    - Tourist Activity Management Process;

- Leave No Trace; and
- Precautionary Principle (c.f. 2.1).

- South African National Parks has the following policies and guidance structures in place to ensure the sustainable management of tourism with regards to the environment:
  - Conservation Development Framework;
  - DEAT-South African National Biodiversity Institute Framework;
  - Strategic Environmental Assessment;
  - Strategic Adaptive Management Approach; and
  - Environmental Impact Assessment (c.f. 1.2).

4.2.1.2 Conclusions drawn from the literature review of article 2 (Environmental impacts influencing tourists' experience to South African National Parks):

- National parks in South Africa are natural attractions that provide tourists with unique nature experiences (c.f. 3.1).
- A positive tourism experience will lead to an enhanced level of satisfaction for tourists which is important to secure return visits and therefore secure the sustainability of the destination (c.f. 3.2).
- Because national parks are protected areas that preserve the biodiversity and enhance conservation, the expectations of tourists visiting national parks would be that they would experience a quality, and well cared-for, environment (c.f. 3.2).
- The management of South African National Parks is left with the task of reaching equilibrium where the biodiversity of the environment is protected whilst at the same time providing tourists with satisfying nature experiences (c.f. 3.1).
- The rising number of tourists to South African National Parks leads to an increase in the environmental impacts, which in turn affect tourists' experiences (c.f. 3.1).

- Tourists' experiences are affected by aspects such as managerial, natural and social factors where the ecological (natural) impacts are rated as the most important (c.f. 3.2).
- Impacts identified that affect tourists' experiences negatively within National Parks include:
    - Noise pollution;
    - The physical presence of litter;
    - The general condition of the environment;
    - Vegetation loss and perceived number of trees damaged;
    - Visitor crowding; and
    - Inadequate disposal of human waste (c.f. 3.2).
- Tourists perceive the environmental impacts affecting their experiences differently. Their perception differences are based on cultural background, demographic details, travel motive, the frequency (number) of visits paid to South African National Parks, length of stay, quality of the environment, managerial preferences and influences by the media, friends and family (c.f. 3.2).
- Tourists with a higher frequency of visitation to a destination record pro-environmental behaviour and the expectancy of a more environmentally conscious tourism product (c.f. 3.2).

4.2.2 CONCLUSIONS DRAWN FROM THE RESEARCH RESULTS

4.2.2.1 Conclusions drawn from the results in article 1 (*How environmentally friendly are South African National Parks?*):

Ninety-nine constructs (environmental impacts) were used to perform a factor analysis in Article 1. This was done in order to identify the perceptions of tourists regarding the environmental impacts caused by tourism.

The six factors derived from the factor analysis were labelled: Fauna and flora; Management; Tourism impacts; Aquatic impacts; Tourist trails and routes and lastly Tourism development. The factors that scored the highest were Tourism Impacts (Factor 3) and Management (Factor 2). This

serves as an indication to management of South African National Parks as to where the problem areas are (environmental impacts) that needs to be managed more environmentally friendly.

From the six factors, the following findings were concluded:

- Firstly, it is necessary for South African National Parks to give management attention towards recycling and to the proper disposal of waste in South African National Parks (c.f. 2.5).
- Secondly, a certain percentage, an increasing percentage, of energy use within South African National Parks should be based on renewable sources such as wind-, hydro- and solar-energy (c.f. 2.5).
- Thirdly, future development within South African National Parks should be developed in such a manner that it has little or no impact on the natural environment. This would be considerably aided by making full use of environmentally friendly principles (c.f. 2.5).

4.2.2.2 Conclusions drawn from the results in article 2 (*Environmental impacts influencing tourists' experience to South African National Parks*):

A factor analysis was conducted for Article 2, together with an analysis of variance (ANOVA). This was done primarily to identify the environmental impacts that affect the experience of tourists negatively and secondly, to explore the relationship between visitation frequency and the environmental impacts perceived negatively by tourists. Cronbach Alpha values for the factors were between 0,607-0,789. The factor analysis revealed that the following factors: Pollution, Tourism product offering, Park violation, Environmental management and Tourism impacts. The factors that scored the lowest mean value (indicating that tourists' perceive it as negative) were Park violation and Environmental management. Again it is imperative that management of South African National Parks pay attention to the factors that influences tourists experience negatively.

Further to the factor analysis, an ANOVA test was conducted to determine the relationship between visitation frequency of visitors and the extent to which environmental impacts were perceived.

For statistical analysis purposes, the number of times tourists had visited South African National Parks was grouped according to the number of times they have visited over three years, where group 1 represented the low frequency visitors and group 3, the high frequency visitors.

The ANOVA test done on the five factors detailed above compared with visitation frequency of tourists versus environmental impacts perceived to impact negatively on tourists experience, revealed significant differences for factor 1 (pollution), factor 3 (park violation) and factor 5 (tourism impacts). Based on the mean values of these specific factors, a strong correlation was found between high visitation frequency and the extent to which tourist experiences were negatively influenced by environmental impacts caused by the tourism in South African National Parks.

It is therefore imperative for South African National Parks to understand which environmental impacts most negatively affect tourists' experience in South African National Parks. Information obtained from the results can assist Park management in minimising the effects of environmental impact while balancing the dual mandates of South African National Parks (conservation of the natural environment) whilst sustaining quality tourist experiences. Furthermore, the results are a good way of prioritising management actions by providing the desirable experiences for tourists in South African National Parks whilst attempting to minimise the resulting environmental impacts.

4.3 RECOMMENDATIONS REGARDING THE STUDY

The recommendations following are divided according to the recommendations from the respondents and the researcher, respectively.

4.3.1 RECOMMENDATIONS FROM THE RESPONDENTS

The following recommendations have been made from the respondents:

- No further development should take place in popular National Parks such as Kruger and Kgalagadi Transfrontier National Parks. South African National Parks should focus on quality of the product rather than the quantity;
- The towels should not be changed on a daily basis;
- Too much tourism drive and too little environmental drive;
- Request for greater environmental education;

- Recycling ought to be mandatory in South African National Parks;
- More staff should be employed to be the eyes and ears of South African National Parks to further ensure the enforcement of environmentally responsible practices;
- Stricter law enforcement against tourists violating the rules of National Parks such as speeding;
- Restricts the number of tourists to South African National Parks;
- Educational material ought to be put on display in South African National Parks to show tourists the measures they are taking to reduce environmental impacts of tourism in South African National Parks. Furthermore, South African National Parks should provide tourists with information concerning how the tourists can implement environmentally friendly practices at home;
- Make more use of renewable energy sources;
- It is the staff of South African National Parks that is mostly responsible for the noise pollution created at camps during nights, and this is a problem that needs to be addressed; and
- The amount of litter visible in South African National Parks is a matter that needs urgent management attention.

4.3.2 RECOMMENDATIONS FROM THE RESEARCHER

- Effective waste management should be implemented in National Parks through the encouragement of recycling. The opportunity of a recycling plant in Kruger National Park should be explored to manage the waste generated by tourists more effectively. Recycled waste products can then be sold to tourists in Park shops.
- Tourists and staff should receive more environmental education regarding the impacts of tourism on the environment and methods to be used to minimise these impacts. Furthermore, as a conservation priority, training and education should be offered to both staff and the tourists with regards to proper waste disposal and recycling.

- Reviewed policies should be laid down for restaurants and shops in South African National Parks. Aspects that need to be included in the policies are minimising solid food waste through construction of organic gardens, buying food stock in bulk to reduce the amount of waste generated through packaging, making use of local producers and using only organic food where appropriate and available.

- South African National Parks should, as a matter of priority, make greater use of renewable energy sources. The opportunities from energy generated by wind, wave and solar energy should be explored for implementation by South African National Parks. They must determine a certain percentage of energy used at each park that must be based on renewable resources.

- More environmentally friendly practices should be implemented such as paperless communication, recycled paper for marketing material and information booklets, and environmentally friendly soaps and detergents.

- Future development of National Parks should be based on environmentally friendly principles. This would include non-permanent infrastructure (tented and wilderness camps), the use of natural building materials and designs fitting into the environment.

- Water consumption should be taken more seriously in South African National Parks. Leaking taps and water pipes should be repaired. Recycling systems for waste water should be installed in new developments to conserve water usage.

- Motion-detection systems should be installed in accommodation facilities to ensure that when tourists are not present in their accommodation, appliances such as the air-conditioning and lights are switched off.

- Tourist carrying capacity limits for each South African National Park must be determined and managed accordingly.

- The problem of tourists and staff speeding in South African National Parks should be addressed and managed more stringently. This could be done by implementing vehicle tracking devices to monitor the speed of staff, where necessary, disciplinary measures to be taken. Alternative routes for the use of staff and delivery vehicles should be explored. Tourists speeding should receive larger fines and a wall of shame displaying the guilty candidates should be erected at the entrance gates.

- Regulatory management approaches such as the construction of boardwalks through environmental sensitive areas and through areas that carry high numbers of tourists should be implemented.

4.3.3 RECOMMENDED ACTION PLAN

The following are proposed guidelines for South African National Parks in order to reduce the extent of environmental impacts caused by tourism:

1. Provide recycling bins in commercial and accommodation sectors, to encourage the recycling of waste;
2. Limit the number of day visitors during high season, in popular National Parks;
3. Make use of environmentally friendly cleaning products and detergents;
4. Educate tourists and staff alike with regard to water and electricity usage, to use a more economical and sparing use; and
5. Issue speed fines on a daily basis to reduce the speed of tourists and so reduce the prospects of accidental road killing of the Parks' fauna.

4.3.4 RECOMMENDATIONS REGARDING FUTURE RESEARCH

Based on the conclusions listed above and from the research results, the following recommendations can be made regarding future research:

- Future research should be conducted at individual parks regarding the environmental impacts of tourism. This will enable South African National Parks to identify tourism impacts on the environment related to the specific parks and so to develop action plans accordingly aimed at minimising the impacts of tourism on the environment and so ensuring a more sustainable management approach.
- The carbon footprint of tourists to South African National Parks ought to be studied. This will provide information on environmental impacts from another point of view. Information obtained will provide South African National Parks management with areas that need to be

managed more effectively and in a more environmentally conscious manner, so contributing to the fight against climate change.

- Measurement instruments/criteria for nature products should be compiled in order to determine their environmental status, positive or not.
- The environmental impacts of tourism should be measured on other tourism products such as those of the accommodation and events sectors of the industry.

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ADDENDUM A: Questionnaire

E-mail adres: _____

SECTION A: DEMOGRAPHIC DETAIL

1. Home language	English	1
	Afrikaans	2
	Other (Specify)	3
	_____	
2. In which year were you born?	19____	
3. Marital status	Married	1
	Not married	2
	Divorced	3
	Widow/er	4
	Living together	5
4. Country of residence (If outside RSA)?	_____	
5. In which province do you live?	Gauteng	1
	KwaZulu-Natal	2
	Eastern Cape	3
	Western Cape	4
	Northern Cape	5
	Limpopo	6
	Mpumalanga	7
	Free State	8
	North West	9
6. Please indicate your highest level of education	No school	1
	Matric	2
	Diploma, Degree	3
	Post Graduate	4
	Professional	5
	Other	6
	(Specify)	
	_____	
7. Occupation	Professional	1
	Manager	2
	Administrative	3
	Technical	4
	Sales Personnel	5
	Farmer	6
	Mining	7
	Education	8
	Non-profit worker	9
	Self employed	10
	Other	11
	(Specify)	
	_____	
8. How many times have you visited National Parks over the past three years?	_____	

9. Name the National Park most visited over the past three years:

Addo Elephant	1
Agulhas	2
Ai Ais Richtersveld	3
Augrabies Waterfalls	4
Bontebok	5
Camdeboo	6
Golden Gate Highlands	7
Karoo	8
Kruger	9
Kgalagadi	10
Mapungubwe	11
Marakele	12
Mokala	13
Mountain Zebra	14
Namakqua	15
Table Mountain	16
Tankwa Karoo	17
Tsitsikama	18
West Coast	19
Wilderness	20

SECTION B: TOURISM PRODUCT OFFERINGS

Based on your previous experience and visits to a South African National Park, please indicate how you perceived the following aspects regarding ***impacts of tourism and/or tourists on the environment:***

1. GENERAL MANAGEMENT

Almost always	5
Mostly	4
Often	3
Occasionally	2
Almost never	1

	1	2	3	4	5
1.1 Litter	1	2	3	4	5
1.2 Lack of energy saving measures (For ex: energy saving lights, alternative cooling systems and solar panels)	1	2	3	4	5
1.3 Inadequate water saving measures (for ex: frequency of towel changes, shower heads and data available to educate tourists).	1	2	3	4	5
1.4 Visual pollution (for ex: signs/advertising, building structures)	1	2	3	4	5
1.5 Noise pollution (for ex: music, people)	1	2	3	4	5
1.6 Sewerage systems (inappropriate discharge)	1	2	3	4	5
1.7 Inappropriate waste management - absence of recycling waste bins	1	2	3	4	5
1.8 Too many tourists in the park at a given time	1	2	3	4	5
1.9 Lack in the use of environmentally friendly products (for ex: soaps)	1	2	3	4	5
1.10 Not printing brochures and information booklets on recycled paper	1	2	3	4	5

Almost always	5
Mostly	4
Often	3
Occasionally	2
Almost never	1

	1	2	3	4	5
2. REST CAMPS AND CAMPSITES					
2.1 Damage to natural vegetation (in tourist areas) due to trampling	1	2	3	4	5
2.2 Erosion due to tourism development	1	2	3	4	5
2.3 Human made structures that are not eco-friendly	1	2	3	4	5
2.4 Wildlife attracted to rubbish bins (for ex: baboons)	1	2	3	4	5
2.5 Wood collecting by tourists	1	2	3	4	5
2.6 Not using natural products as building material for accommodation facilities	1	2	3	4	5
2.7 Camp layout not fitting into the natural setting of the environment	1	2	3	4	5
3. Commercial Sector (Reception, shops, restaurant)					
3.1 Inappropriate waste disposal at restaurants (for ex: not using organic gardens)	1	2	3	4	5
3.2 Restaurants not making use of locally produced products	1	2	3	4	5
3.3 Impacts of using non-renewable resources (for ex: plastic)	1	2	3	4	5
3.4 Pollution at restaurants	1	2	3	4	5
3.5 Use of food products that aren't organic	1	2	3	4	5
4. TOURISTS' ROUTES					
4.1 Damage to natural vegetation due to uncontrolled tourist behaviour	1	2	3	4	5
4.2 Erosion along routes due to tourists	1	2	3	4	5
4.3 Overcrowding of tourists at wildlife sightings	1	2	3	4	5
4.4 Impacts of wildlife (for ex: baboons) attracted to rubbish bins along tourist routes	1	2	3	4	5
4.5 Impact of 'veldfires' due to tourism negligence	1	2	3	4	5
4.6 Impacts of plant collecting along tourist routes	1	2	3	4	5
4.7 Poaching	1	2	3	4	5
4.8 Introduction of alien plants and species due to tourism	1	2	3	4	5
4.9 Interference of breeding of wildlife due to tourism	1	2	3	4	5
4.10 Interference with feeding of wildlife due to tourism	1	2	3	4	5
4.11 Specimen collection (for ex: butterflies) by tourists	1	2	3	4	5
4.12 Killing of animals for comfort and safety (for ex: spiders, snakes, mosquitoes)	1	2	3	4	5
4.13 Road killings as a result of reckless tourist driving and speeding in the NP	1	2	3	4	5
4.14 Speeding of staff and delivery vehicles in National Parks	1	2	3	4	5
4.15 Lack of environmental-friendly transport	1	2	3	4	5
5. TRAILS (Includes 4x4- and hiking trails)					
5.1 Speeding of tourists on 4x4 trails	1	2	3	4	5
5.2 Dust caused by tourist vehicles along 4x4 routes	1	2	3	4	5
5.3 Disposal of toxic substances, not using eco-friendly soaps and cleaning materials	1	2	3	4	5
5.4 Tourists wandering off 4x4 track and hiking trail (trampling)	1	2	3	4	5
5.5 Fuel and oil leaks of tourists' vehicles	1	2	3	4	5
5.6 Tourists using too much artificial light	1	2	3	4	5
5.7 Erosion along trails	1	2	3	4	5
5.8 Impacts of flower collecting by tourists	1	2	3	4	5
5.9 Tourist interference with breeding of wildlife	1	2	3	4	5
5.10 Feeding of wildlife by tourists	1	2	3	4	5
5.11 Specimen collection (for ex: butterflies) by tourists	1	2	3	4	5

5.12 Introduction of alien plants and species (by tourists)	1	2	3	4	5
5.13 Design of track and trail does not fit into the surrounding natural environment	1	2	3	4	5

Almost always	5
Mostly	4
Often	3
Occasionally	2
Almost never	1

6. TOURIST FACILITIES (hides, view points, picnic and day visitor sites)					
6.1 Waste spillage around waste bins by tourists	1	2	3	4	5
6.2 Interference of wildlife due to noise, cars, people	1	2	3	4	5
6.3 Overcrowding of tourists	1	2	3	4	5
6.4 Visual pollution (for ex: signs and directions)	1	2	3	4	5
6.5 Wildlife attracted to rubbish bins (for ex: baboons)	1	2	3	4	5
6.6 Supplementary feeding of wildlife (for ex: antelope) by tourists	1	2	3	4	5
6.7 Lack of energy-saving measures (for ex: solar panels)	1	2	3	4	5
6.8 Insufficient management of waste (for ex: lack of recycling measures)	1	2	3	4	5
6.9 Use of non-renewable resources (for ex: plastic) by tourists	1	2	3	4	5

7. MARINE ENVIRONMENT

(Only applicable to West Coast,Tsitsikama, Addo Elephant, Agulhas and Wilderness National Parks)

7.1 Construction of tourism developments along shore/coastline	1	2	3	4	5
7.2 Litter (in and out of the water)	1	2	3	4	5
7.3 Waste discharge of boats (by tour operators, tourists)	1	2	3	4	5
7.4 Wildlife disturbance	1	2	3	4	5
7.5 Erosion along trails due to hiking	1	2	3	4	5
7.6 Divers and snorkellers (pollution, damaging coral reefs)	1	2	3	4	5
7.7 Uncontrolled fishing	1	2	3	4	5
7.8 Whale watching at a too close distance	1	2	3	4	5

SECTION C: TOURISTS EXPERIENCE

Please rate how the following influenced your experience during your visit to a South African National Park:

Very positive	5
Positive	4
Neutral	3
Negative	2
Very negative	1

1. Level of litter	1	2	3	4	5
2. Waste management	1	2	3	4	5
3. Absence of energy saving measures	1	2	3	4	5
4. Absence of water saving measures	1	2	3	4	5
5. Level of noise in the park	1	2	3	4	5
6. The general management of the environment	1	2	3	4	5
7. Overcrowding of tourists	1	2	3	4	5
8. Building structures that are not eco-friendly	1	2	3	4	5
9. The adequacy of visitor facilities (for ex: accommodation)	1	2	3	4	5
10. The adequacy of visitor activities available	1	2	3	4	5
11. Litter and pollution from restaurants	1	2	3	4	5

12. Erosion and trampling along tourist routes	1	2	3	4	5
13. Alien plant species present	1	2	3	4	5
14. The physical condition of wildlife	1	2	3	4	5
15. The overall experience of 4x4 and hiking trails	1	2	3	4	5
16. The overall experience of picnic and day visitor sites	1	2	3	4	5
17. Expansion of knowledge regarding plants and animals	1	2	3	4	5
18. Speeding of tourists along tourist routes	1	2	3	4	5
19. Speeding of staff and delivery vehicles in the NP	1	2	3	4	5
20. Lack of quality service	1	2	3	4	5

8. Any suggestions regarding impacts of tourism?

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