# Evaluating stakeholder perceptions concerning the free-roaming desert-adapted lions in the Skeleton Coast National Park in Namibia

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# Declaration

I, Josua Kazeurua, student number 2013144965, declare that this assignment is my own work, that it has not been submitted for any other degree, at the University of the Free State or any other university or higher education institution, and that all resources that I have used or quoted are indicated in the text and acknowledged in the list of references.

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# Abstract

This study evaluated the views and possible concerns of the main stakeholders of the Skeleton Coast National Park of the presence of lions through questionnaires.

Any type of human-wildlife conflict, whether from tourism activities or conflict involving local communities, threaten the existence of wildlife. The perceived conflict between fishermen and the lions of the Skeleton Coast National Park can potentially threaten the existence of this species. It is unlikely that this conflict will be totally eliminated, but measures to reduce and control it at a level where local people and visitors to the park can tolerate and co-exist with wildlife, are a necessity.

Although fishermen had a higher sighting frequency of lions than any other group, they had a relatively negative perception of the presence of lions in this area. Tourists had relatively low sightings but had a relatively positive perception of the presence of these lions in the vicinity of the Uniab Delta Waterfall in the Skeleton Coast National Park. In general, one would expect the assumption to be that the more the different groups observed lions, the more positive they would be towards them, but the results of this study indicate otherwise. This is because most Tourists who visit the Park highly want to see lions as there nowhere in the world were free-ranging lions have been observed along a beach or on a sand dune. Lions are prominent features in Namibia and are highly valued for their aesthetic and financial values by the increasing tourism industries.

All groups agreed that lions might injure or kill people utilising the same area and the group that regarded these lions as the most dangerous to co-exist with humans in the area were the fishermen, while the lowest were the tourists. Fishermen regarded the presence of lions in this area as a threat to their angling activities.

For the purpose of creating awareness of the presence of lions in the Skeleton Coast National Park, informational material and leaflets should be developed and displayed at key tourist information centres within the park.

**KEYWORDS:** Skeleton Coast National Park, Uniab Delta Waterfall, lions, tourist perceptions, fishermen's perceptions, human-lion conflict, Terrace Bay, Desert Lion Project, repopulation of lions.

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# Glossary

| | |
|---|---|
| CITES | Convention on International Trade in Endangered Species |
| GPS | Global Positioning System |
| Lions | The term “lions” in this study refers to all free-ranging desert-adapted lions occurring in the study area. |
| Repopulation | The term “repopulation” refers to the decline of the lion’s population during the 1980s to 1990s when they disappeared from the Skeleton Coast National Park altogether and as they repopulate the Skelton Coast National Park, their movements exploring and utilising the various attractions like the Uniab Delta, are referred to as “redistribution”. |
| SADC | Southern African Development Community |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |

# Acknowledgements

A word of gratitude is expressed to my supervisor, Dr Flip Stander, for his significant contributions to this mini-dissertation and the Desert Lion Conservation Foundation for sponsoring my studies.

# Chapter 1
# Introduction

## 1.1 Background

After an absence of more than 20 years, lions are returning to occupy key areas in the Skeleton Coast National Park, which can be attributed to above-average rainfall received during the past decade (Dr Philip Stander 2015c: personal communication). In addition, the formation of communal conservancies and the growing tourism industry have contributed to the increase and expansion of lions into the coastal areas of the Skeleton Coast National Park. Lions from three different prides are currently venturing along the coast at the Ugab River mouth, Koigab River mouth, Uniab Delta, and Hoanib River mouth (Dr Philip Stander 2015c: personal communication). An understanding of how various stakeholder groups perceive wildlife is of the utmost importance for the promotion, management, and conservation of biodiversity, particularly given the main role of keystone species in conservation. Various stakeholders perceive wildlife differently, and this is said to be caused by a difference in social, economic, and cultural backgrounds (Kanagavel *et al*. 2013:45). A study conducted at Valparai, which was aimed at investigating multiple stakeholders' perceptions of wildlife, revealed that such perceptions were to some extent also affected by gender. Various stakeholders do not always have the same views and perceptions of their natural environment and the various species it supports (Engel *et al*. 2014:45).

A study conducted in Brazil on various stakeholder perceptions of a marine protected area and the sea lions that it hosted concluded that there were significant differences between the perceptions of tourists and those of fishermen. Fishermen viewed the marine protected area and sea lions as an obstacle, while tourists favoured them. Even though fishermen had a negative perception of the sea lions, the fishermen were still needed in the decision making of the management of the species and the protected area, as they were the only ones who interacted with the species on a daily basis (Engel *et al*. 2014:45).

## 1.2 Lion conservation and human-lion conflict

Lions are one of the large mammalian species that are considered to be vulnerable in Namibia as they are mainly restricted to larger protected areas. Throughout their distribution and along the length of protected areas, significant and regular human-wildlife conflict between lions and humans occurs, resulting in various forms of losses such as financial losses (Namibia Ministry of Environment and Tourism 2016:2.1).

The Kunene Region is home to the renowned Skeleton Coast National Park, with a unique population of lions. This population occurs mostly outside protected areas, where they share their home ranges with local communities who depend on livestock farming for their livelihoods. Human-lion conflict has escalated since lions prey on livestock (Stander 2010).

Various international accolades (e.g. the Convention on International Trade in Endangered Species [CITES]) received by Namibia in relation to its successful conservation efforts, such as the communal conservancy programme, have helped a number of species to recover remarkably, particularly in arid areas, and this provides testimony of Namibia's successful conservation efforts (Namibia Ministry of Environment and Tourism 2016:2.1).

Due to the growing tourism industry, lions are highly valued in terms of their aesthetic and economic qualities, and for these reasons they are regarded as one of the prominent species in Namibia. Financial benefits to local communities derived from tourism and hunting have boosted the protection and preservation of biodiversity and the natural environment. This can be attributed to simultaneous increases in wildlife populations, tourism, and community-based natural resources conservation in the Kunene Region of Namibia (Stander 2010).

Most protected areas were formerly created for recreational purposes rather than for conservation (Walpole *et al*. 2003:14). According to Roe *et al*. (1997, in Walpole *et al*. 2003:14), unregulated tourism activities in some protected areas are a matter of concern as they resulted in perceived and actual ecological and social effects, ranging from wildlife displacement and disturbance to habitat exploitation and pollution. These impacts are mostly a result of ignorance and ineffective management and control.

Namibia's Nature Conservation Ordinance of 1975 is the major law regulating all national parks in the country, and Regulation 9 of the ordinance prohibits tourists or any visitor to the park to drive off-road or on roads that are not indicated as it will disturb the wildlife. According to this ordinance, the safe viewing distance for wildlife in national parks is 20 metres. In Regulation 36, which is specific to the Uniab Delta Waterfall (study area), the ordinance stipulates that without the written permission of the Executive Committee, no person except an officer acting directly in the execution of his/her duties or in the exercise of his/her powers, shall, "if visiting the Uniab Delta Waterfall, drive a vehicle at any place within the Uniab Delta or walk at any place within the Uniab Delta Waterfall other than within the area demarcated by noticeboards for walking purposes" (Namibia 1975).

A study conducted on tourism impacts in the Masai Mara National Reserve in Kenya revealed that too many vehicles around animals and driving too close to animals were the

most violated regulations. This was more common during lion- and cheetah-viewing events. The second most violated regulations were driving off-road and visitors remaining too long at a particular site (Walpole *et al*. 2003:14).

According to Muthee (1992, in Walpole *et al*. 2003:14), the lack of visitor information centres and infrastructure led to tourist vehicles forming traffic jams around prides of lions in Kenya's protected areas. The study also revealed that lions and cheetahs are sensitive to tourism pressure and regulations in place were meant to minimise disturbances.

Any type of human-wildlife conflict, be it from tourism activities or conflict involving local communities, threaten the very existence of wildlife in the Serengeti-Mara ecosystem (Walpole *et al*. 2003:14).

The perceived conflict between fishermen and lions of the Skeleton Coast National Park can potentially threaten the existence of these lions, and this conflict is unlikely to be completely eliminated but measures to reduce and control it at a level where local people and visitors can tolerate and co-exist with wildlife should still be enforced (Namibia Ministry of Environment and Tourism 2016:2.1).

More data on movement patterns, home ranges, and hotspots should be collected to successfully manage and conserve the lions of the Skeleton Coast National Park.

## 1.3 Research problem

This Research is a result of a tourist who was chased by a lion in the Uniab Delta Waterfall in 2014 (Dr Philip Stander 2014: personal communication). This research aims to identify the nature of human-lion conflict and to find amicable solutions to this problem.

## 1.4 Research question

The main research question of this study is: What are the key activities to consider when managing the repopulation of lions in the Skeleton Coast National Park?

## 1.5 Project objectives

The objectives of the study are:

- to determine the number of tourists visiting the Skeleton Coast National Park and the main reasons for their visits;

- to identify whether these visitors have concerns over the presence of lions and what those concerns are;
- to identify and zone the potential conflict areas and calculate the frequencies with which lions visit these areas; and
- to propose management options to address all possible concerns and to ensure the safety of all staff of and visitors to the Skeleton Coast National Park.

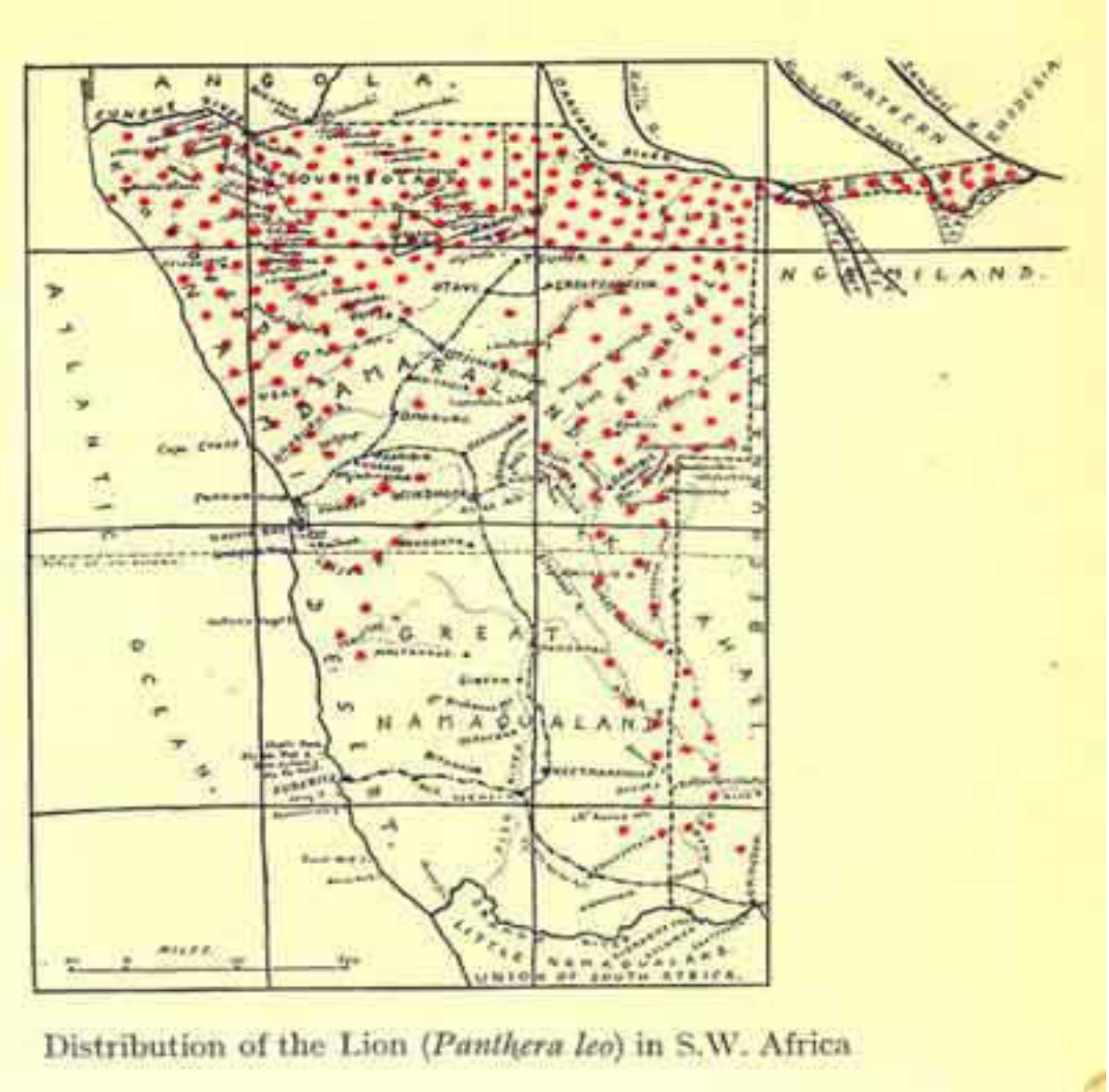
# Chapter 2

# Literature Review

## 2.1 Historical distribution of lions in the Skeleton Coast National Park

Lions have been absent from the Skeleton Coast National Park for almost 20 years until recently. They are now returning to the park and are occupying key areas such as ephemeral rivers and floodplains. This return can be attributed to a number of factors, such as the above-average rainfall received during the past decade, the formation of communal conservancies, and the growing tourism industry. Lion populations have increased and expanded to the coastal areas of the Skeleton Coast National Park. Lions from three different prides are currently venturing along the coast at the Ugab River mouth, Koigab River mouth, the Uniab Delta, and the Hoanib River mouth (Dr Phillip Stander 2015a: personal communication).

The presence of lions in the northern Namib Desert and along the Skeleton Coast dates back to 1943, when lions were observed in the coastal regions, mountains, and ephemeral rivers between the lower Kuiseb River and the Kunene River (Stander, 2006a) It is believed that lion distribution was more towards the Kaokoveld and alongside the Kunene Valley; this is illustrated in Figure 2.1 (Stander 2006a).




Source: Shortridge (1934:77).

Figure 2.1: Map indicating the distribution of lions in Namibia in 1934

From the time of the Skeleton Coast National Park's proclamation in 1967, infrequent lion sightings were recorded in the park. Testimonies from various nature conservation field staff and game rangers based in the park revealed the occurrences of lions in this area (Figures 2.2 and 2.3). Bridgeford (1985) recorded lions feeding on seals and cormorants along the coast and a male lion was photographed feeding on a whale by Steve Braine in 1984 (Stander 2006a).

Source: Bridgeford (1985).

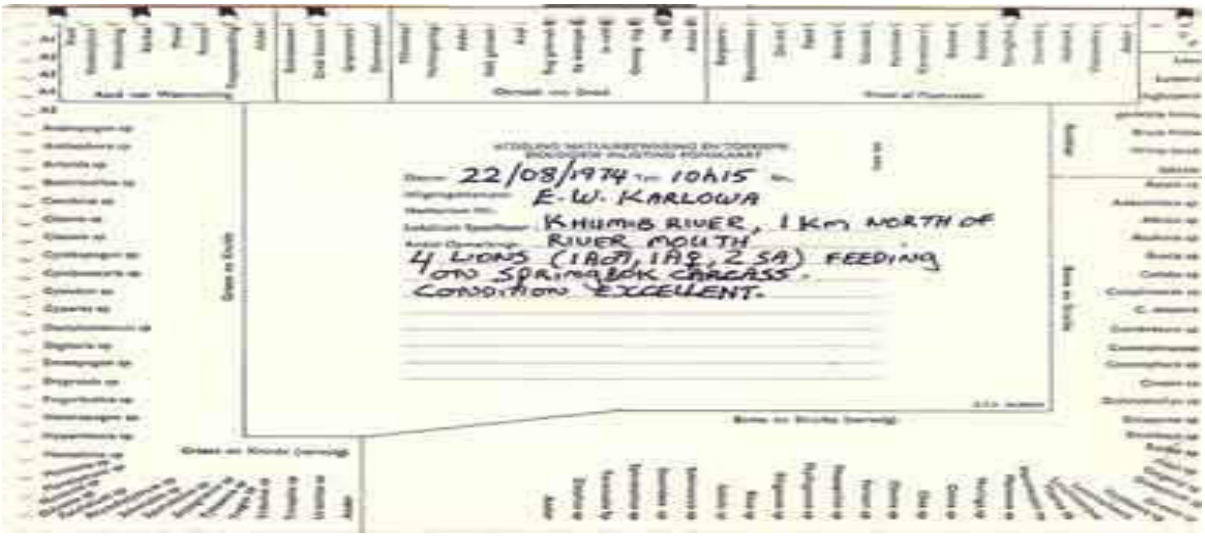
Figure 2.2: A male lion on a beach in the Skeleton Coast National Park

Source: Stander (2010).

Figure 2.3: Photo of previous lion sighting in the Uniab Delta Waterfall

Lion sightings, recorded by field staff and game rangers of the then Department of Nature Conservation, were obtained through game counts and patrols in the Skeleton Coast

National Park and were recorded on punch cards (see Figure 2.4). These data were recorded on a database (Stander 2006a).




Source: Stander (2006a).

Figure 2.4: A specimen of punch cards completed by conservation officials

Table 2.1 indicates the names of people who recorded lions in the Skeleton Coast National Park between 1970 and 1991.

Table 2.1: Lions recorded in the Skeleton Coast National Park (1970-1991)

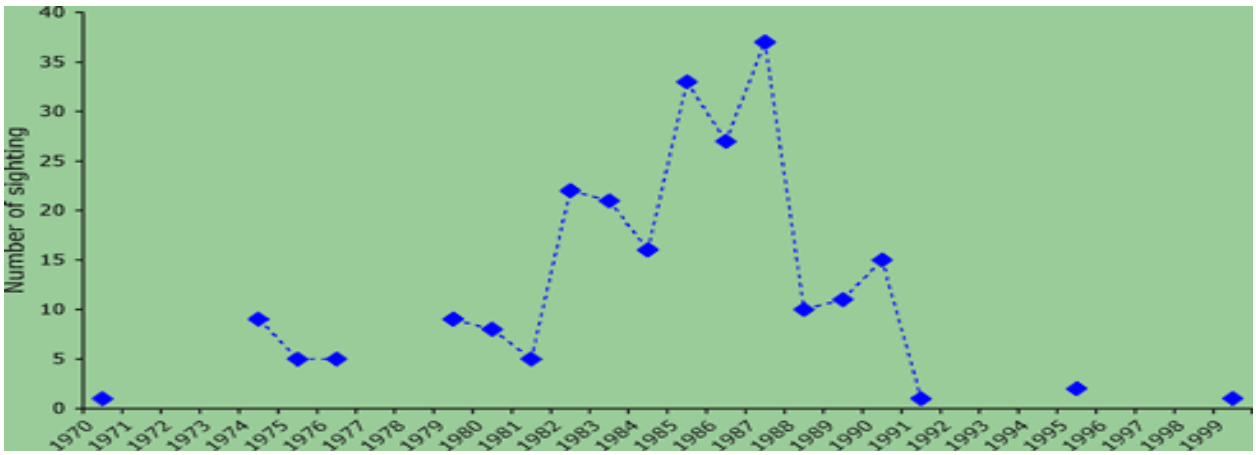
| Observer | No. of records | Period |
|---|---|---|
| Berry, H. | 6 | 1986-1987 |
| Braby, R. | 32 | 1985-1991 |
| Braine, S. | 37 | 1982-1987 |
| Brehem, P. | 3 | 1989-1990 |
| Bridgeford, P. | 19 | 1979-1983 |
| Cooper, T. | 12 | 1974-1976 |
| Davis, R. | 3 | 1990 |
| De Wet, P.F. | 4 | 1974-1975 |
| Erb, K. | 1 | 1983 |
| Hillen, K. | 2 | 1990 |
| Joubert, A. | 5 | 1988-1989 |
| Karlowa, E.W. | 6 | 1970-1976 |
| Kleynhans, J. | 2 | 1987-1989 |
| Loutit, B. | 1 | 1981 |
| Loutit, R. | 31 | 1979-1987 |
| Matthee, A. | 1 | 1988 |
| Meyer, J. | 1 | 1983 |
| Owen-Smith, G. | 1 | 1979 |
| Paterson, J. | 8 | 1983-1990 |

| Observer | No. of records | Period |
|---|---|---|
| Rudman, D. | 1 | 1995 |
| Schoeman, J.L. | 4 | 1982-1987 |
| Stander, P. | 41 | 1984-1990 |
| Tarr, P. | 16 | 1982-1986 |
| Viljoen, P.J. | 1 | 1982 |
| **Total** | **238** | **1970-1991** |

Source: Adapted from Stander (2006a).

As indicated in Table 2.1, between the years 1970 and 1991, 238 lion sightings were recorded. The incidences of observations peaked during the 1980s (as indicated in Figure 2.5), with an average of 18 observations annually (range: 5-37).

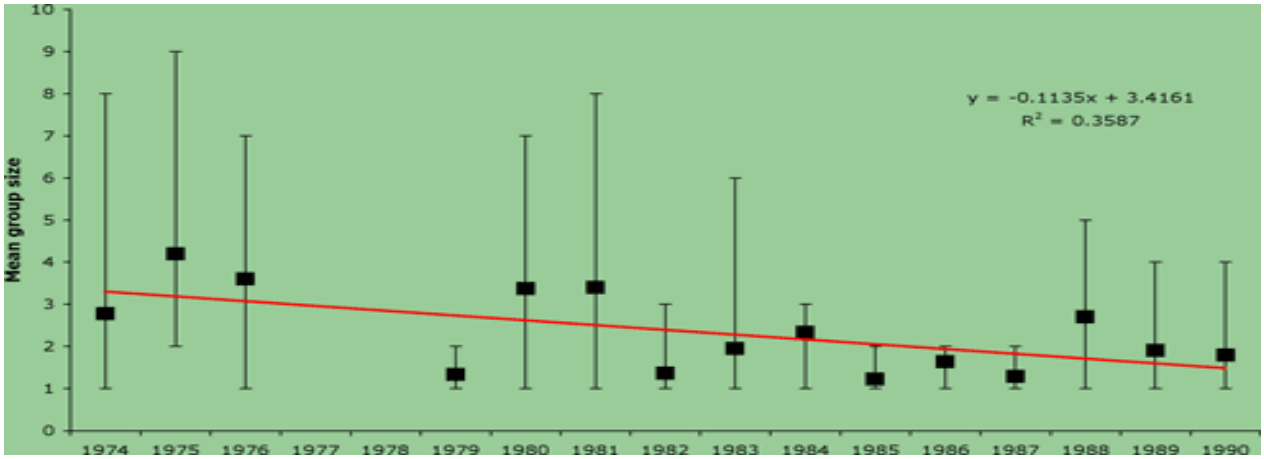
It proved to be impossible to control for the probable bias related with variable effort among years. The substantial peak observed in the number of sightings in the 1980s may be attributed to an increase in patrol efforts and the vigilance of park staff, instead of an increase in the number/density of lions (Stander 2006a) (see Figure 2.4).




Source: Stander (2006a).

Figure 2.5: Lion sightings in the Skeleton Coast National Park (1970-1999)

Figure 2.6 shows the average group size of lions sighted in the Skeleton Coast National park between 1974 and 1999. The minimum and maximum ranges are indicated by error bars.

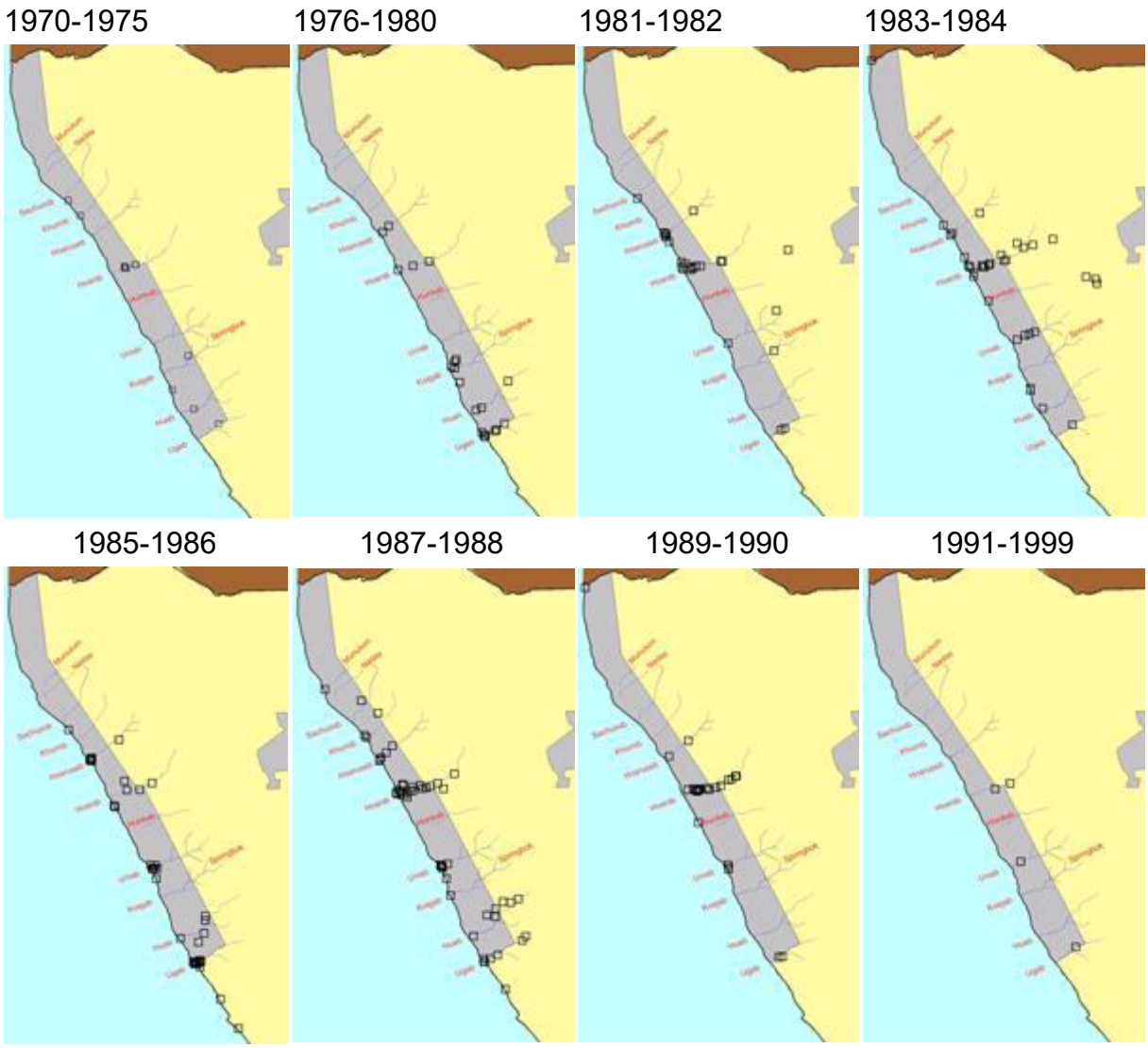



Source: Stander (2006a).

Figure 2.6: Average group size of lions sighted in the Skeleton Coast National Park (1974-1999)

The overall average group size sighted was 2.1 lions (SD = 1.61, range = 1-9). According to Figure 2.6, between 1974 and 1991 the mean annual group size appeared to decrease. The Resource Dispersion Hypothesis (MacDonald 1983:301) supports the phenomenon of constant decreases in the size of the lion population in instances where group sizes are determined by food abundance. Most lion sightings in the Skeleton Coast National Park were made during the dry season (May to October), when the prey animals were concentrated along ephemeral river systems (Stander 2006a).

Figure 2.7 shows the distribution of lion sightings during eight periods in the Skeleton Coast National Park, between 1970 and 1999.




Source: Taken from Stander (2006a).

Figure 2.7: Distribution of lion sightings during eight periods in the Skeleton Coast National Park (1970-1999)

Figure 2.7 shows that lions occurred throughout the entire Skeleton Coast National Park. They were regularly observed at the Hoanib River. Consistent sightings over a period of 22 years recorded the presence of lions in the Ugab, Huab, Koigab, and Uniab rivers systems. The rivers in the northern section of the park (Hoarusib, Khumib, Sekhumib, Nadas, and Monutum) showed a decline in lion distribution towards the end of the 1980s, but of prominent importance is a record of one lion in 1989 at the Kunene River mouth (Stander 2006a).

## 2.2 Relevant studies

A study conducted in Brazil by Engel *et al*. (2014:45) to assess the perception of various stakeholders towards a wildlife sanctuary of Ilha dos Lobos, which is a marine reserve, revealed that different stakeholders had different perceptions of and attitudes towards these wildlife sanctuaries. Non-direct stakeholders were highly supportive of the existence of this reserve and the sea lions it houses (or provides a home/habitat for), while the direct stakeholders perceived it as an obstacle to their angling activities. This revealed that there was a significant difference between stakeholders concerning their attitudes and fishermen's perceptions differed from the rest of the groups .With regard to the permanent presence of sea lions within the protected area, some groups perceived it to be good, while others, such as the fishermen, perceived it to be very bad, although they had a good perception of wildlife sightings.

The motive behind tourists visiting the marine protected area was for its natural beauty and this has been assumed as one of the major reasons for them to support the presence of sea lions in the marine protected area (Engel *et al*. 2014:45). Various schools of thought dictate or determine the assessment of various stakeholder perceptions and attitudes as a crucial strategy to form collaborative management, particularly for local resource users with direct interactions, such as fishermen. Non-direct stakeholders such as school teachers should also be listened to if the purpose is to construct a participatory management plan, this is due to the impact their professional activities might have on the Marine Protected Area. For the purpose of developing and designing a decentralized action plan attitudes and perceptions of different stakeholders should be taken into considerations (Engel *et al*. 2014:45).

The conservation of wildlife is significantly associated with the support it obtains from people (Western 2001:201). For the purpose of gathering effective support via public campaigns, ranging from fundraising to changes in behaviour, the perceptions and attitudes of people towards wildlife should be understood (Walpole & Leader-Williams 2002:543). People have different perceptions of wildlife species, which are influenced by various dimensions such as economic state, lifestyle, and social standards or norms (Schultz 2011). A combination of several functional, consumptive, and cultural dimension factors might to some extent influence people's attitudes towards wildlife species (Fisher & Young 2007:271).

A study conducted by Kaltenborn *et al*. (2007) in Tanzania on local communities' perceptions of wildlife is testimony to the above reference. The study revealed that highly educated people showed a high degree of appreciation of wildlife species compared to those with a low educational level.

In Doñana National Park, a natural protected area in Spain, various groups of tourists had different perceptions of ecosystem services provided by this area and its biodiversity. The conflict in perceptions were said to have been caused by different tourist motives for visiting this protected area (Martin-Lopez *et al*. 2007:215).

# Chapter 3

# Study Area and Methodology

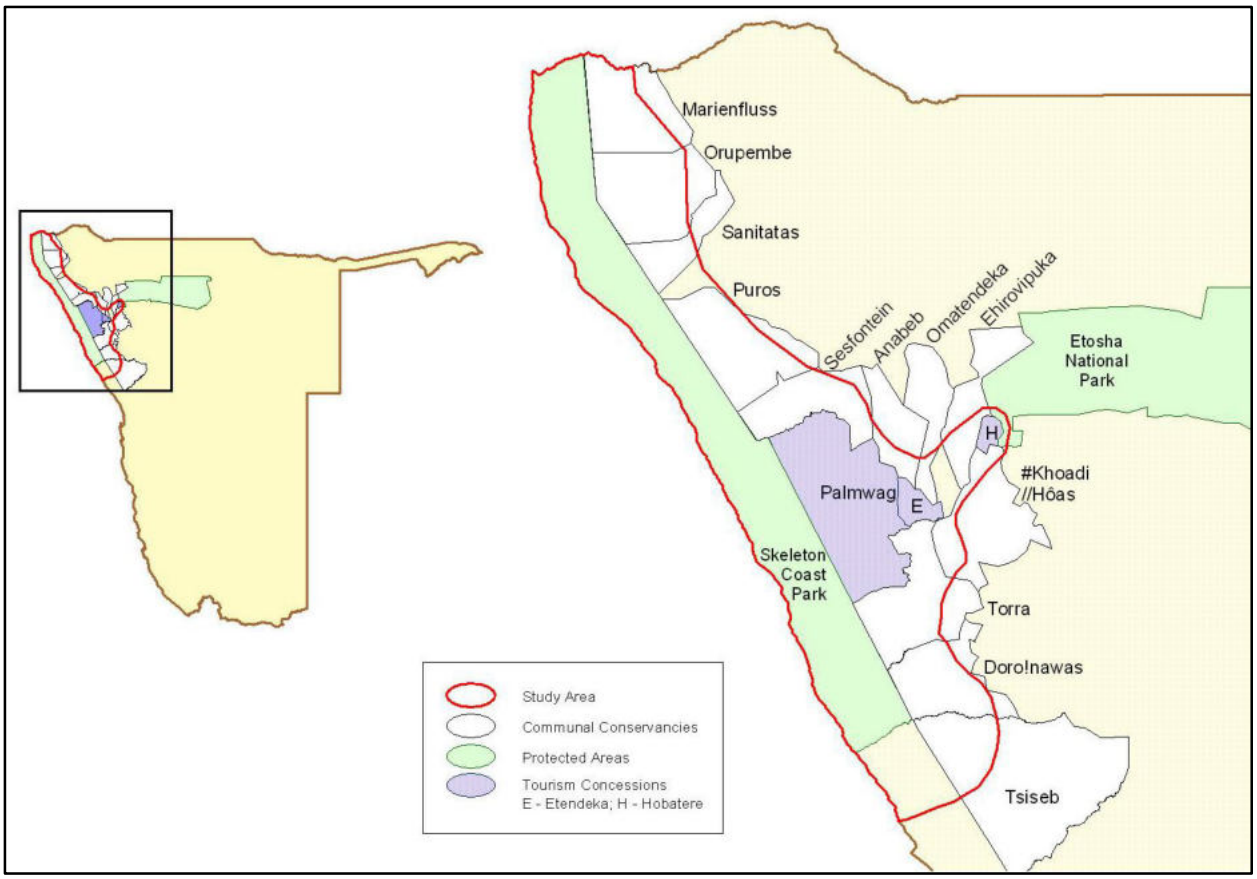
## 3.1 Study area

The Skeleton Coast National Park was proclaimed in its recent form in 1972. The park extends from the Ugab River in the south, 500 km to the Kunene River Mouth in the north, bordering the Iona National Park in Angola. The Skeleton Coast National Park covers an estimated area of 16 500 km$^2$ (see Figure 3.1). The park comprises a marine component measuring 1 km wide and 500 km long, thus an additional 500 km$^2$, which makes the total size of the park 17 000 km$^2$ (Namibia Ministry of Environment and Tourism 2013:1).

The Skeleton Coast National Park aims to manage the coastal and marine resources in order to support restricted and controlled recreational fishing and medium- to high-end tourism for the benefit of present and future generations. The park also aims to conserve specific natural habitats, particularly lichen fields, dune hummocks, and Damara tern breeding zones (Namibia Ministry of Environment and Tourism 2013:1).

The park covers two marine biomes, which include the cold Benguela system in the south and the warmer tropical system in the north. The Skeleton Coast National Park is composed of landscapes of exceptional natural beauty and of geomorphological and geological interest (Namibia Ministry of Environment and Tourism 2013).

The park harbours a variety of habitats, which include major habitats such as the dune fields that are home to a diversity of vertebrates and invertebrates, some of which are endemic to this pristine protected area. At least one-third of all west-flowing ephemeral rivers in Namibia pass through the Skeleton Coast National Park on their way to the sea, and along their length these rivers support wildlife in this dry area (Namibia Ministry of Environment and Tourism 2013:1).




Source: Taken from Stander (2006b).

Figure 3.1: Study area of Skeleton Coast National Park

## 3.2 Study design and data collection

### 3.2.1 Sample population

Data collection took place from 1 October 2015 to 20 November 2015 where every visitor entering the park was targeted. This period has proven to be the peak season for tourists, according to the park gate entrance statistics. All groups of different tourists who visited Terrace Bay during the abovementioned period were surveyed. All residents and employees within the Skeleton Coast National Park were also included in the sample. The number of park visitors who entered the park during the survey is indicated in Table 3.1 (sample size). These are tourists who entered the park for the purpose of visiting Terrace Bay or the Uniab Delta Waterfall area. In Table 3.1, “Namibian” tourists refers to all Namibian nationals, “SADC” to all visitors from the Southern African Development Community (other than Namibians), while “Others” refers to tourists who are not from any of the two abovementioned regions.

Table 3.1: Skeleton Coast National Park gate statistics for October to November 2015

| Tourist nationality | Ugab Gate | Sprinbokwasser Gate |
|---|---|---|
| Namibians | 185 | 33 |
| SADC | 47 | 28 |
| Others | 147 | 63 |
| **Total** | **379** | **124** |
| **Grand total** | **503** | |

Source: Adapted from Namibia Ministry of Environment and Tourism (2015).

### 3.2.2 Research instrument

The views and possible concerns of the main stakeholders in the Skeleton Coast National Park towards the presence of lions in the park were evaluated through questionnaires. A self-administered questionnaire was developed with the aim to:

a) identify the concerns of potential human-lion conflict at the Uniab Delta Waterfall in the Skeleton Coast National Park;
b) assess the different stakeholders' perceptions of the presence of lions at the Uniab Delta Waterfall area;
c) record the impressions of the respondents of lion sightings at the Uniab Delta Waterfall; and
d) determine the best management options of lions at the Uniab Delta waterfall.

The questionnaires were distributed at Terrace Bay, Mowe Bay, Springbokwasser Gate, and Ugab Gate. Apart from a few modifications that were specific to the local residents, the questionnaires were essentially similar for all parties. These modifications were necessary especially to the local resident group as there were questions that were specific to them e.g. How long have worked in the Skeleton Coast Park and their home of origin. Local residents are employees of different stakeholders operating in and adjacent to the study area. And their perceptions were assumed to be affected by the type of industry they work for. Since this modification were group specific there were no need to compare different groups on this basis, comparison in regards was only done among that specific groups.

The stakeholders consisted of:

a) the Ministry of Environment and Tourism;
b) Namibia Wildlife Resort;
c) Namibian Police Force;
d) Ministry of Fisheries;
e) fishermen; and
f) tourists visiting the park.

Tourists were divided into two groups: a) fishermen and b) general tourists. “Fishermen” refers to those tourists who visit the park specifically for recreational angling, while “general tourists” refers to those who visited the park mainly for viewing the wildlife and spectacular scenery. Fishermen were divided into two division, c) Fisherman and d) assistant fisherman. Assistant fisherman refers to fishing guides and consultants operating in the Skeleton Coast Park.

At Ugab Gate and Springbokwasser Gate, the questionnaires were issued upon arrival and received back upon departure. Questionnaires for the local residents were issued directly to them at Terrace Bay, Springbokwasser Gate, Ugab Gate, and Mowe Bay. After completion, the questionnaires were collected from the abovementioned stations respectively.

Questionnaires have proven to be an effective technique when contacting a large number of people at relatively low cost (Research & Consultation Guidelines n.d.: online) and, given the infrastructure, remoteness, and operations of the Skeleton Coast National Park, it was the most appropriate method to deploy.

The questionnaire consisted of both closed-ended and open-ended questions. Open-ended questions were used to generate new information as little information exists on the research topic, specifically on why tourists visit the Skeleton Coast National Park and what they consider to be the main attractions.Open-ended questions gave respondents the opportunity to express their ideas. This form of questioning is more useful in generating new information in cases were little or no information exists and they are less likely to lead or suggest a particular type of answer, which is more common with closed-ended questions (UNESCO 2005).

Open-ended questions are useful as they ensure that a respondent is not limited to a range of possible answers. Although open-ended questions are difficult to convert into a percentage or numerical value, and they are not empirical as opposed to conceptual data, they ensure that one obtains the broader views of the people surveyed (Market Research Society 2011).

Precautions were taken in designing open-ended questions in order to prevent a format that produces a dichotomous yes/no or agree/disagree response (UNESCO 2005).

To minimise the chances of respondents answering questions in very different dimensions, specific instructions were provided in writing on how the questions should be answered (UNESCO 2005).

### 3.2.3 Ethical considerations

It is of paramount importance to consider and address major ethical issues related to a study prior to its commencement (UNESCO 2005). This was especially important to this study as it involved different stakeholders. Meetings were held with representatives of all researched stakeholders, where the project objectives and expected outcomes were presented. The input from stakeholders at these meetings were incorporated in the questionnaire and the necessary adjustments were made to the study design in line with the suggestions received.

Permission to conduct the research was obtained from the Namibia Ministry of Environment and Tourism. Through the questionnaire cover letter, participants were assured that their identity and all their information would be kept confidential (see Appendix 5).

The questionnaires for each group sampled are summarised and presented in Appendices 1, 2, and 3.

## 3.3 Data analysis

A simple chi-square test was used to determine significant differences among different groups' motives to visit Terrace Bay and Uniab Delta Waterfall (Siegel 1956).

# Chapter 4

# Results and Discussions

## 4.1 Main reasons why different groups visit the Skeleton Coast National Park

According to Figure 4.1, the main attractions of the Terrace Bay area in the Skeleton Coast National Park are scenery, fishing, and wildlife viewing.

According to the Terrace Bay Resort Manager, most tourists visit this area for recreational angling activities rather than for wildlife and scenery viewing (Mr Gerhard Kausiona 2015: personal communication). Figure 4.1 indicates that a high number of tourists visited the area for scenery and wildlife viewing purposes other than for fishing and a simple chi-square test shows a significant difference with a p-value of <0.00001 at p<.05 in regards to this.

A senior wildlife ranger based in the Skeleton Coast National Park for the past 27 years suggested that where this study was conducted, the period between October and November historically recorded a higher number of general tourists than fishermen. Fishermen generally enter the park mainly during December and January (Mr Bernard Awob 2015: personal communication). This can be attributed to the opening season of Torra Bay which is a fishing hot spot that operates between December and January.

According to Figure 4.1, fishermen mainly visit Terrace Bay for fishing and wildlife. Only a few fishermen visit this area for the scenery. According to these figures, tourists mainly visit Terrace Bay for scenery and wildlife. Only a few tourists visit the area for angling purposes.

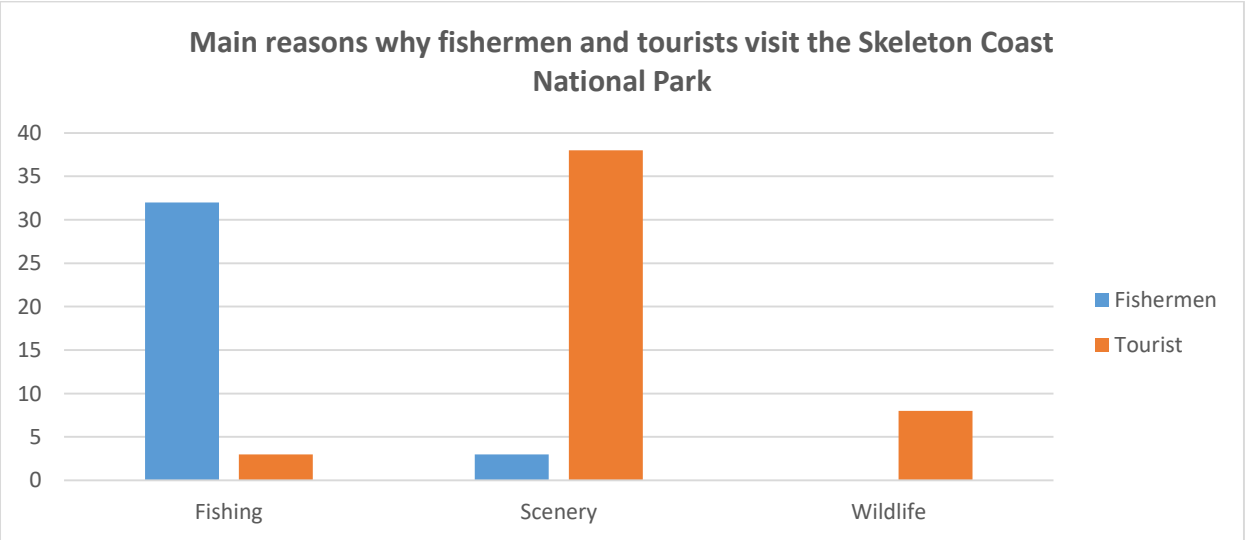



Figure 4.1: Main reasons tourists and fishermen visit the Skeleton Coast National Park

## 4.2 Previous lion sightings at Terrace Bay and Uniab Delta Waterfall

From the time of its proclamation in 1967, infrequent lion sightings were recorded in the Skeleton Coast National Park. Testimonies from various nature conservation field staff and game rangers based in the park revealed the occurrences of lions in this area. Bridgeford (1985) recorded lions feeding on seals and cormorants along the coast, and a male lion feeding on a whale was photographed by Steve Braine in 1984.

Figure 4.2 indicates how many people from the various sampled groups previously saw a lion in the Uniab Delta Waterfall area. Figure 4.3 indicates the perception of these groups of the presence of lions on a scale of 1-5, where 1 is negative (should be relocated) and 5 is positive (enormous attraction).

According to Figure 4.2, fishermen had the highest lion sighting frequency, followed by tourists. This might be because fishermen visit this area more often throughout the year in comparison to tourists and other stakeholder groups. Figures 4.2 and 4.3 show a relationship between lion sightings and the perception of their presence at Uniab Delta Waterfall. Fishermen have the highest frequency of sightings compared to the rest, but have a relatively lower acceptance (perception) of the presence of lions in the area. Tourists have a higher positive perception of the presence of lions at Uniab Delta Waterfall. These can be referred to in Figure 4.1, which shows that a higher number of tourists visit this area for wildlife and scenery viewing compared to fishermen, who visit the area mainly for angling and scenery. In fact, one would expect that the more the different groups observe lions, the more positive they would have been towards them, but the results in Figures 4.2 and 4.3 indicate the opposite (Dr Phillip Stander 2015d: personal communication).

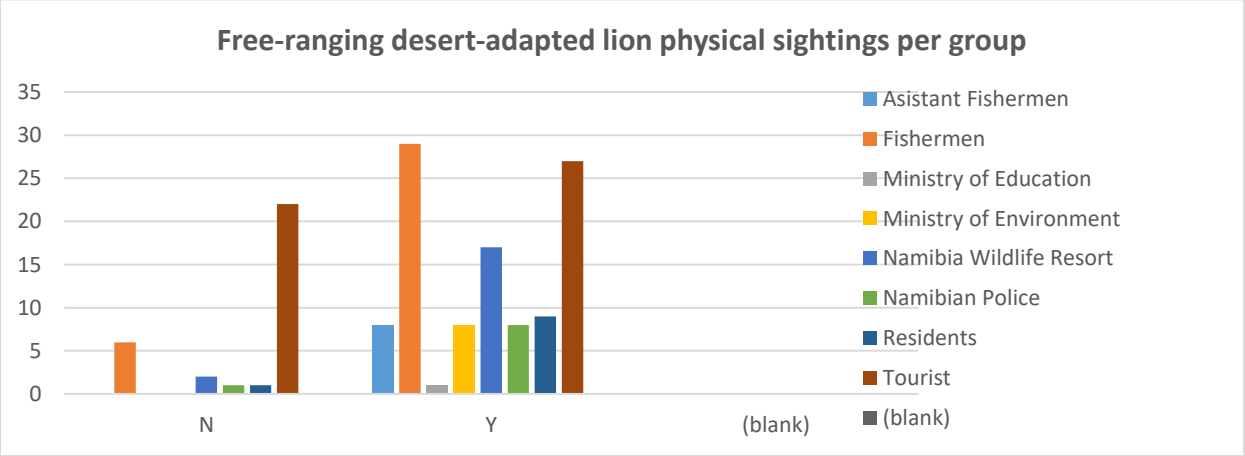



Figure 4.2: Previous lion sightings in the Skeleton Coast National Park, Terrace Bay, and Uniab Delta Waterfall per group

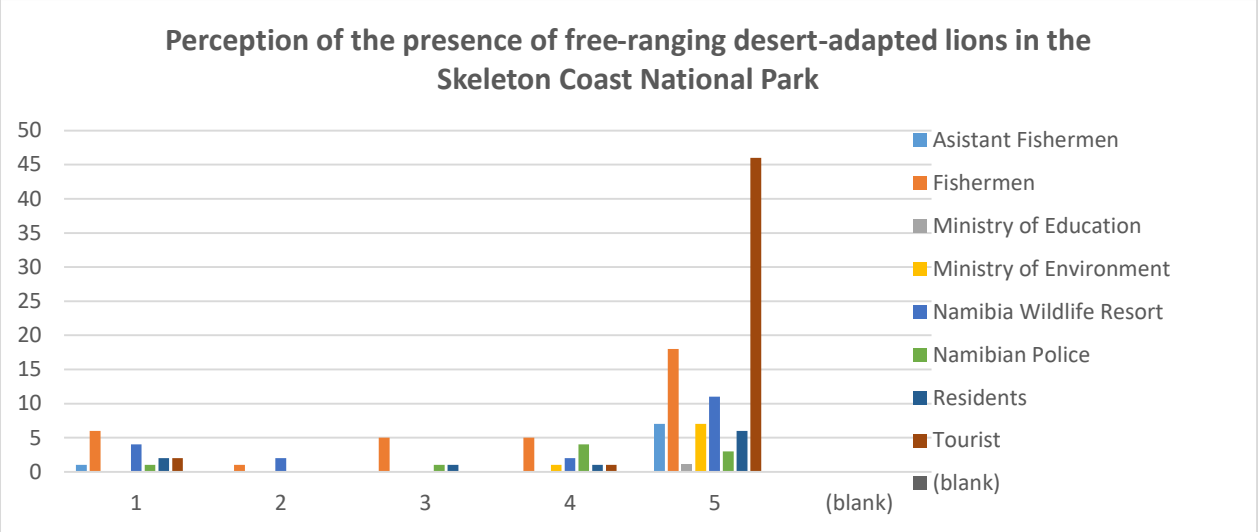



Figure 4.3: Different groups' perceptions of the presence of lions in the Skeleton Coast National Park, Terrace Bay, and Uniab Delta Waterfall area

## 4.3 Different groups' perceptions of lion sightings in Skeleton Coast National Park, Terrace Bay, and Uniab Delta Waterfall

Various stakeholders do not always possess the same type of views and perceptions of their natural environment and the various species it contains, houses, or provides homes for (Engel *et al*. 2014:45).

Figure 4.4 shows the impressions of different stakeholders of the sighting of lions in Terrace Bay and the Uniab Delta Waterfall area and also shows the different groups' perceptions of potential human-lion conflict. The letter Y on the axis is for the groups that perceived potential future human-lion conflict in the study area, while the letter N on the same axis stands for those who did not perceive any human-lion conflict. This figure also shows how different groups reacted when they first observed lions in this area.

Figure 4.4 indicates that a high number of assistant fishermen were highly fascinated by free-ranging lion sightings, followed by Terrace Bay residents, Namibia Wildlife Resort staff, and the Ministry of Environment and Tourism staff. Figure 4.4 shows that all groups, except for the Ministry of Education group, regarded sightings of the free-ranging lions as fascinating. Only the fishermen group regarded these sightings as insignificant. Most fishermen and tourists regarded free-ranging lion sightings as fascinating and interesting. Only a few fishermen, assistant fishermen, and local resident groups regarded these sightings as troublesome.

Figure 4.4 shows that a high number of tourists did not perceive any future human-lion conflict compared to the rest of the groups. The group that perceived the highest human-lion conflict was the fishermen, followed by Namibia Wildlife Resort staff.

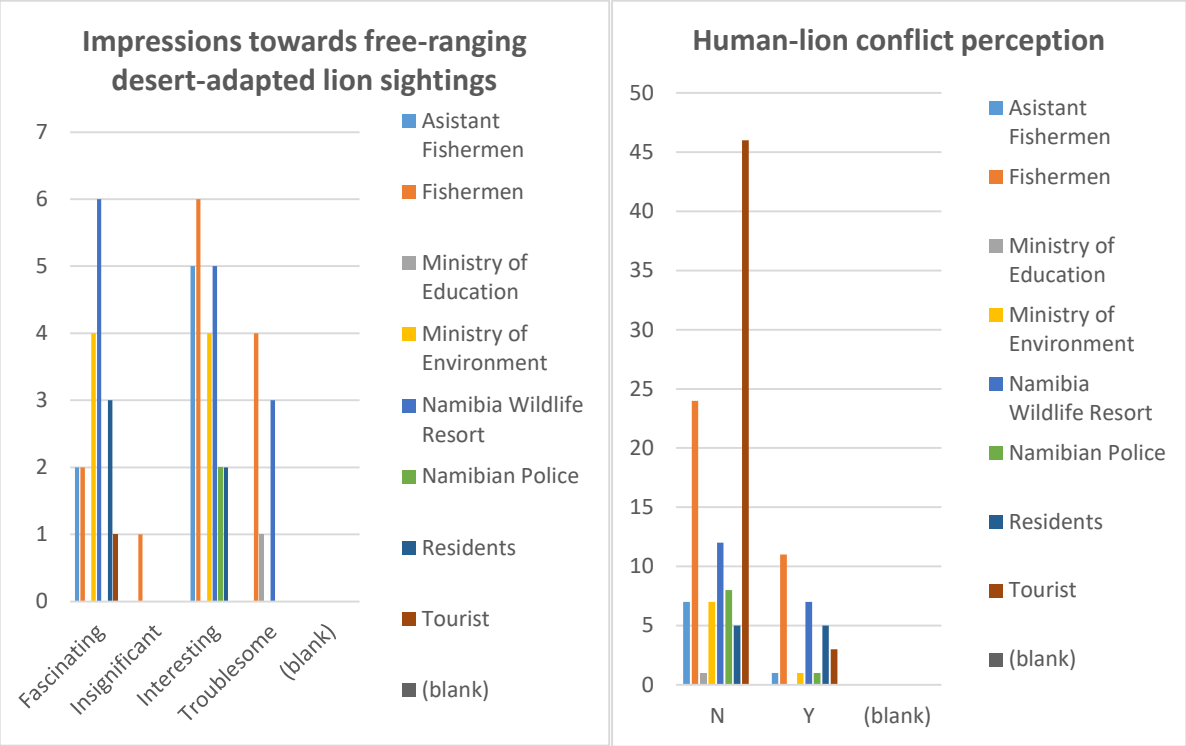



Figure 4.4: Different groups' impressions of lion sightings in the Skeleton Coast National Park, Terrace Bay, and Uniab Delta Waterfall and their perceptions of potential human-lion conflict

## 4.4 Elaboration on perceived human-lion conflict per group

As shown in Figure 4.4, fishermen have the highest concern for human-lion conflict. This section elaborates more on the nature of the perceived conflict. Figure 4.5 elaborates on the perceived human-lion conflict.

Figure 4.5 shows that the highest concern is from fishermen, followed by assistant fishermen and residents. All groups had the same concern towards human-lion conflict and only differed in the usage of their technical terms. All the groups perceived that lions might injure or kill people utilising the same area. The group that perceived lions as the most dangerous to co-exist with human beings in the area were the fishermen, and those with the lowest threat perception were the tourists. The fishermen regarded the presence of lions in the vicinity as a threat to their angling activities.

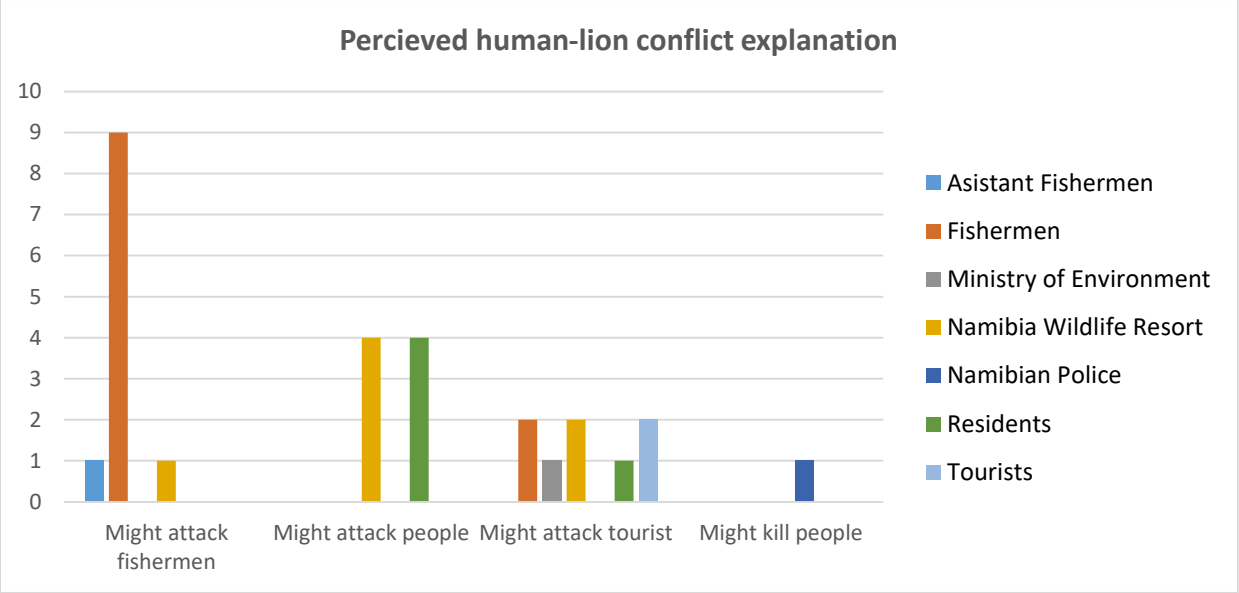



Figure 4.5: Elaboration on the perceived human-lion conflict

## 4.5 Lion contributions to the tourism potential of Terrace Bay and Uniab Delta Waterfall

Figure 4.6 show that a high number of tourists perceived lions as a tool that could boost the tourism potential of Terrace Bay and Uniab Delta Waterfall. Fishermen were the second largest group that supported lions as a tool that could add to the tourism potential of these areas. Only a few fishermen were against this idea, as they perceived lions as dangerous animals that cannot co-exist with people.

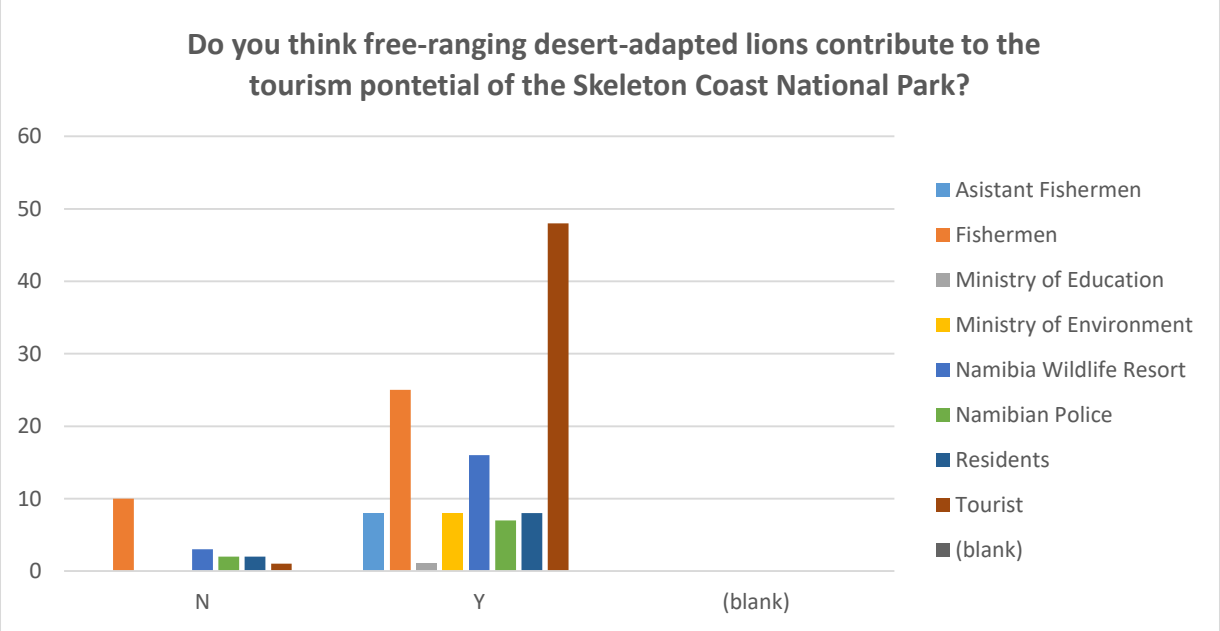



Figure 4.6: Perceptions of the contribution of lions to the tourism potential of the study area

## 4.6 Accessibility of the Uniab Delta Waterfall in the absence of lions

Figure 4.7 shows how different groups would like to access the Uniab Delta Waterfall area in the absence of free-ranging desert-adapted lions. Most tourists opted to walk to the waterfall in the absence of lions in relation to more fishermen who opted to drive in the absence of lions.

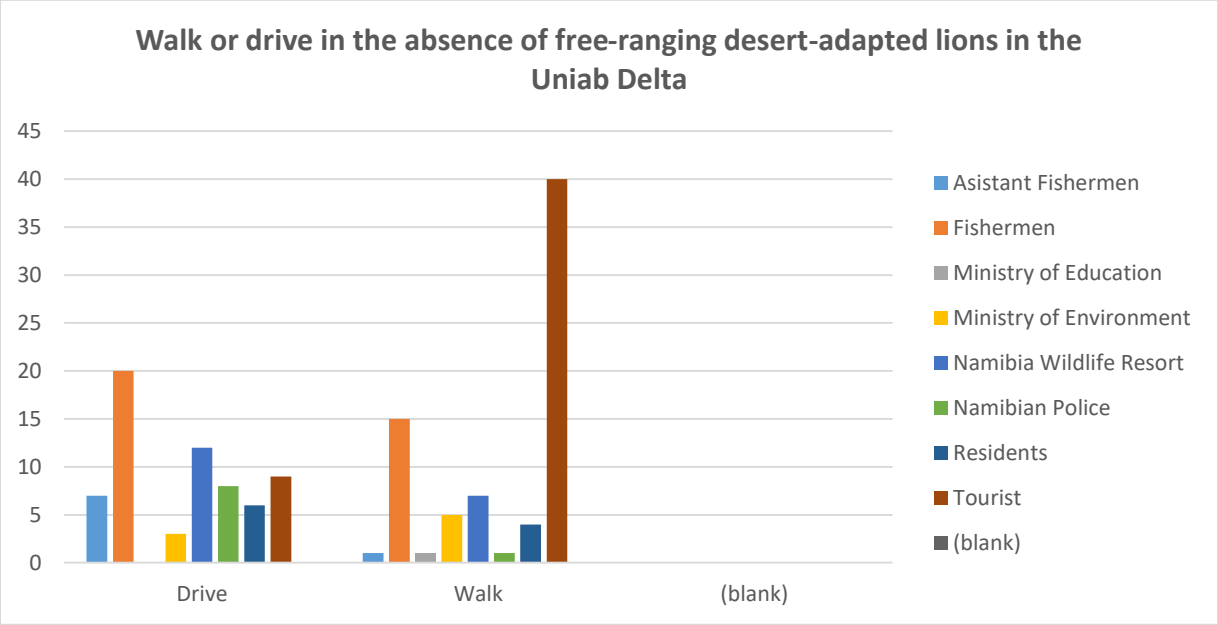



Figure 4.7: Walk or drive in the absence of lions in the Uniab Delta Waterfall area

## 4.7 Accessibility of the Uniab Delta Waterfall in the presence of lions

Figure 4.8 shows how different groups would like to access the Uniab Delta Waterfall area in the presence of lions. Most tourists opted to walk to the waterfall despite the presence of lions, while a high number of fishermen opted to drive. This is the same result as in Figure 4.7, where most groups preferred to drive in the absence of lions.

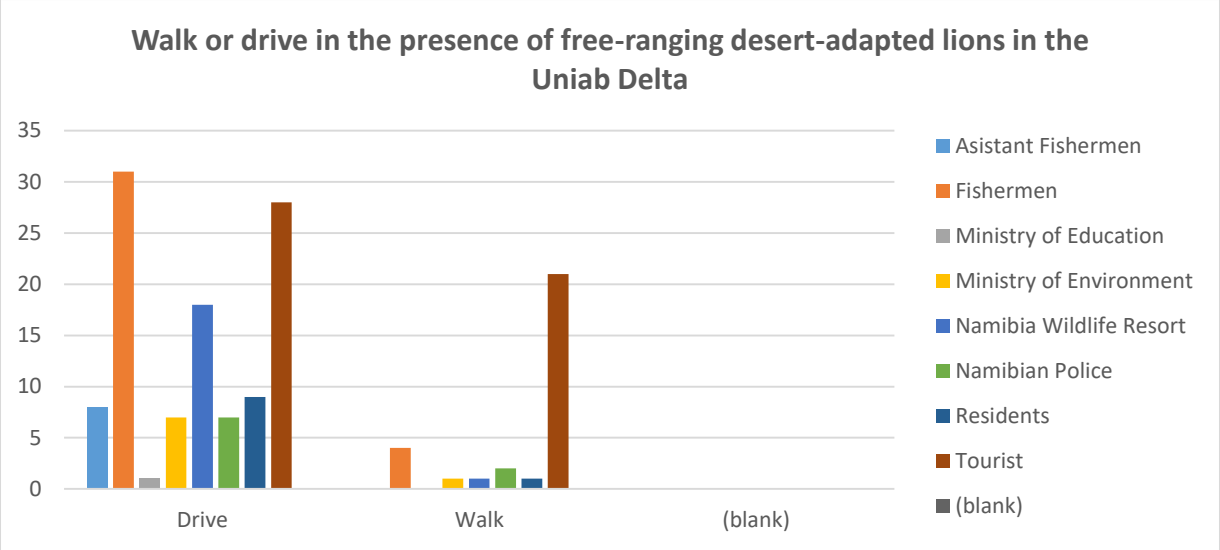



Figure 4.8: Walk or drive in the presence of lions in the Uniab Delta Waterfall area.

## 4.8 The development of tourist facilities at the Uniab Delta Waterfall

Figure 4.9 shows that a high number of groups preferred the construction of wildlife hide at the Uniab Delta Waterfall for the purpose of viewing lions. Tourists were the main supporters of this development, followed by fishermen. Terrace Bay local residents were the least interested in this development, and these could be that they perceived the development to be more tourist oriented. The other assumption is that they have seen lions more often as they are residents of the area.

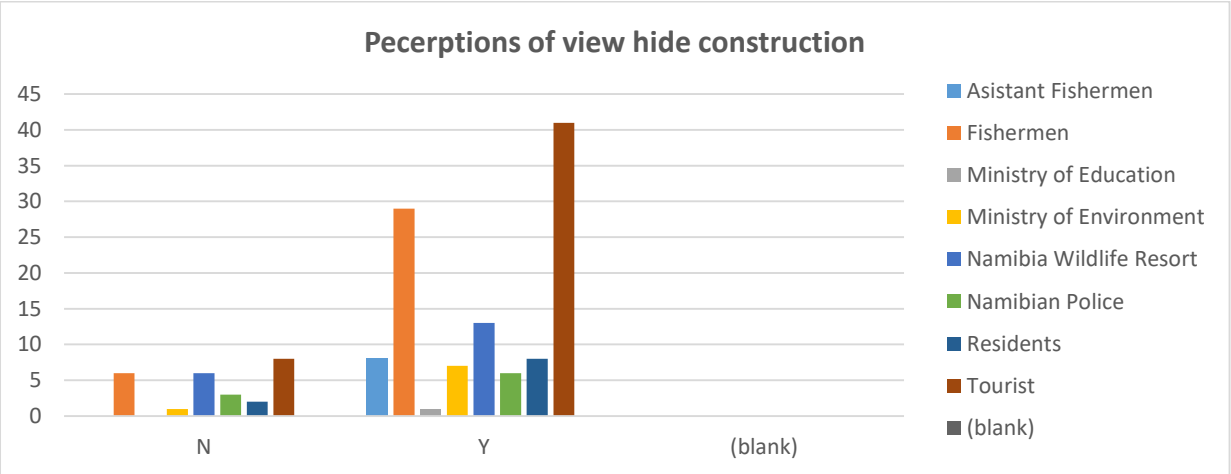



Figure 4.9: Perceptions of the construction of wildlife viewing hides

Figure 4.10 shows that most groups said no to this development; the highest being tourists, followed by fishermen. It is clear from Figures 4.9 and 4.10 that all groups highly favoured the construction of a viewing hide in relation to the construction of parking bay .

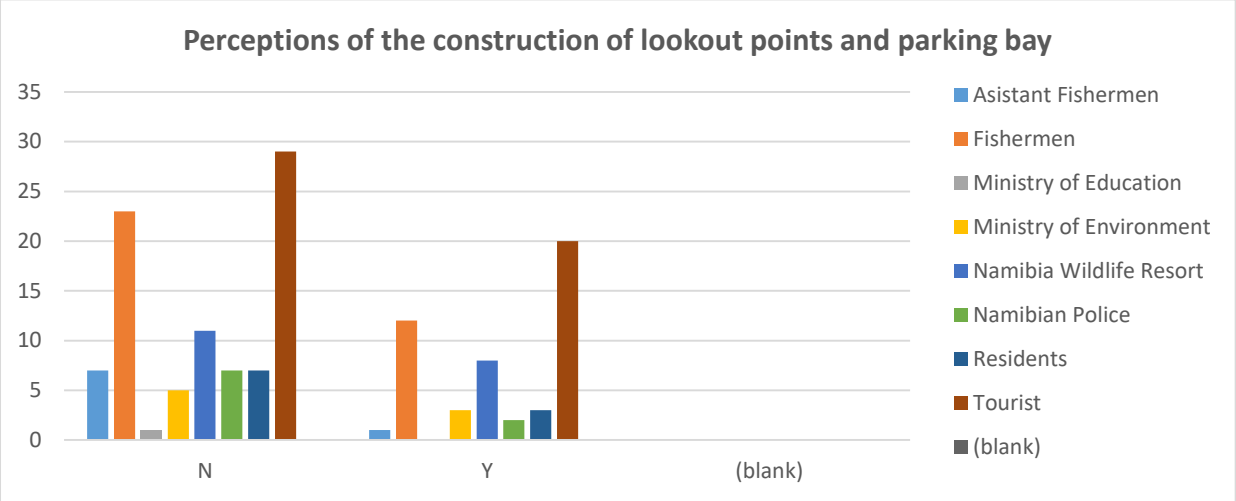



Figure 4.10: Perceptions of the construction of lookout points and parking bays next to the main road to observe lions and other wildlife

# Chapter 5

# Limitations and Challenges, Recommendations, and Conclusions

## 5.1 Limitations and challenges

The study encountered the following limitations and challenges:

- The timeframe of the study was too short and did not include Torra Bay tourists who visit the park only during the festive season, which commences from 1 December up to 31 January every year. The inclusion of Torra Bay tourists in the survey could have added more meaning to the study as they are believed to interact more with lions than any other stakeholder in the park.
- Due to the remoteness and communication limitations of the study area, it was very difficult to obtain expert advice on time. This area have unreliable telephone and internet services, in some areas there were no network at all, so it made it difficult to communicate and get my supervisors advice and input on time.
- Due to limited knowledge on statistical test of significance, data were only analysed to a presentation and interpretation level. The simple chi-square test conducted was not sufficient to provide more meaning to the data collected.

## 5.2 Conclusions and recommendations

The study concluded that different groups visit the Terrace Bay and Uniab Delta Waterfall area for different purposes and motives; most fishermen visit these areas mainly for fishing and wildlife viewing and only a few of them visited for scenery purposes. Tourists mainly visit Terrace Bay and Uniab Delta Waterfall for scenery and wildlife viewing and only a few of this group visit for angling purposes.

Although fishermen had a higher sighting frequency of lions than any other group, they had a relatively negative perception of the presence of lions in this area. Tourists had relatively low sightings but had a relatively high positive perception of the presence of lions in Terrace Bay and Uniab Delta Waterfall. In fact, the expectation should be that the more the different groups observe lions, the more positive they would have been, but the results of this study indicate otherwise. This is because lions are regarded as one of the most sought after wildlife by tourist in Namibia, this type of lions (desert adapted) are special as they survive in the harsh environment of the Skeleton Coast and there is nowhere else in the world were

free ranging lions have been seen among dunes and a long beach. Lions are prominent feature in Namibia and are highly valued for their aesthetic and financial values by the increasing tourism industries.

Most fishermen and tourists regarded lion sightings as fascinating and interesting, with the exception of a few fishermen, assistant fishermen, and local resident groups who regarded these sightings as troublesome.

All groups agreed that lions might injure or kill people utilising the same area, and the group that highly perceived lions as dangerous to co-exist with human beings in the area was the fishermen and the lowest being the tourists. Fishermen regarded the presence of lions in this area as a threat to their angling activities.

Most tourists opted to walk to the waterfall despite the presence of lions, while a high number of fishermen opted to drive.

Tourists highly regarded lions as a tool for boosting the tourism potential of Terrace Bay and Uniab Delta Waterfall. Fishermen were the second largest group that supported lions as a tool that can add value to the tourism potential of these areas, with the exception of a few fishermen who were against this idea, as they perceived lions as dangerous animals that cannot co-exist with people.

Most groups preferred the construction of a wildlife viewing hide at the Uniab Delta Waterfall for the purpose of viewing lions. Tourists were the most fervent supporters of this development, followed by fishermen. Terrace Bay local residents were the least accepting of this idea.

For the purpose of creating awareness on the presence of lions in the Skeleton Coast National Park, information materials and leaflets should be developed and displayed at key tourist centres within the park.

In collaboration with the Desert Lion Conservation Project, regular updates on lion movements should be provided to all stakeholders within the park. Potential conflict zones should be identified, as well as how frequently these lions visit the area. A viewing hide for tourists who would like to view the lions should be constructed at the Uniab Delta Waterfall.

More data on movement patterns, home ranges, and hotspots should be collected to successfully manage and conserve the lions of the Skeleton Coast National Park.

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# Appendices

## Appendix 1: Questionnaire 1 – General Tourists

Title: What are the key activities to consider when managing the repopulation of free-ranging lions to the Skeleton Coast National Park?

I appreciate your visit to the Skeleton Coast National Park, and I understand your time is valuable to you. I would like to invite you to participate in my research project to survey visitors' and tourists' perceptions of the presence of free-ranging desert-adapted lions at Uniab Delta Waterfall.

This research project is conducted in partial fulfilment of a master's degree in Environmental Management at the University of the Free State. The study is conducted in collaboration with and under guidance from the Desert Lion Research Project. The results of this study will help the park management on key activities to be considered when managing free-ranging desert-adapted lions in the park. The information obtained from the survey will be treated confidentially and no-one's identity will be revealed.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Name: | Number: | Origin: | | | | | | |
| 2 | Is this your first visit to Namibia? | | | | | Yes | | No | |
| | If No, state number: | | | | | | | | |
| 3 | Is this your first visit to the Skeleton Coast National Park? | | | | | Yes | | No | |
| | If No, state number: | | | | | | | | |
| 4. | Why did you decide to visit the Skeleton Coast National Park? What do you consider to be the main attractions in this Park? Two points:<br>1.<br><br>2. | | | | | | | | |
| 5. | Are you aware that lions currently inhabit sections of the Skeleton Coast National Park? | | | | | Yes | | No | |
| 6. | How do you perceive the presence of lions in the park? Scale 1-5, where 1 = negative, must be removed & 5 = positive, enormous attraction. | | | | | 1 | 2 | 3 | 4 | 5 |
| 7. | Have you previously seen a lion in the park? | | | | | Yes | | No | |
| | If Yes, state date……....., location……....., and details of sightings – complete carnivore form. | | | | | | | | |
| 8. | What was your impression of these lion sightings? | Troublesome | Insignificant | Interesting | Fascinating | | | | |
| 9. | Do you foresee potential conflict between lions and people in the Skeleton Coast National Park? | | | | | Yes | | No | |

| | | | |
|---|---|---|---|
| | If Yes, describe your concern: | | |
| 10. | Do you think there is a future for lion ecotourism in the Skeleton Coast National Park? | Yes | No |
| 11. | The Uniab Delta Waterfall is a natural phenomenon and a spectacular tourist attraction. Would you, in an ideal world (without lions), prefer to WALK or DRIVE to the waterfall? | Walk | Drive |
| 12. | With the knowledge that lions may be present, would you prefer to WALK or DRIVE to the waterfall? | Walk | Drive |
| 13. | Do you support erecting a strategically placed hide for viewing lions? | Yes | No |
| 14. | Do you support constructing lookout points and parking bays next to the main road to observe lions and other wildlife? | Yes | No |
| 15. | Do you believe that the presence of free-ranging desert-adapted lions in the Skeleton Coast National Park will benefit and improve the tourism potential of the park? | Yes | No |

# Appendix 2: Questionnaire 2 – Fishermen

Title: What are the key activities to consider when managing the repopulation of free-ranging lions to the Skeleton Coast National Park?

I appreciate your visit to the Skeleton Coast National Park, and I understand your time is valuable to you. I would like to invite you to participate in my research project to survey visitors' and tourists' perceptions of the presence of free-ranging desert-adapted lions at Uniab Delta Waterfall.

This research project is conducted in partial fulfilment of a master's degree in Environmental Management at the University of the Free State. The study is conducted in collaboration with and under guidance from the Desert Lion Research Project. The results of this study will help the park management on key activities to be considered when managing free-ranging desert-adapted lions in the park.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Name: | Number: | Origin: | | |
| 2 | Is this your first visit to Namibia? | | | Yes | No |
| | If No, state number: | | | | |
| 3 | Is this your first visit to the Skeleton Coast National Park? | | | Yes | No |
| | If No, state number: | | | | |
| 4. | Why did you decide to visit the Skeleton Coast National Park? What do you consider to be the main attractions in this Park? Two points:<br>1.<br>2. | | | | |
| 5. | Are you aware that lions currently inhabit sections of the Skeleton Coast National Park? | | | Yes | No |
| 6. | Have you previously seen a lion in the park? | | | Yes | No |
| | If Yes, state date……....., location……....., and details of sightings – complete carnivore form. | | | | |
| 7. | What was your impression of these lion sightings? | Troublesome | Insignificant | Interesting | Fascinating |
| 8. | Does the presence of lions in the Skeleton Coast National Park pose a threat to the fishing activities and value offered by the park? | | | Yes | No |
| 9. | If Yes, state two reasons:<br>1.<br>2. | | | | |
| 10. | If Yes (Question 8), suggest one possible solution: | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 11. | How do you perceive the presence of lions in the park? Scale 1-5, where 1 = negative, must be removed & 5 = positive, enormous attraction. | 1 | 2 | 3 | 4 | 5 |
| 12. | Do you foresee potential conflict between lions and people in the Skeleton Coast National Park? | Yes | | | No | |
| | If Yes, describe your concern: | | | | | |
| 13. | Do you think there is a future for lion ecotourism in the Skeleton Coast National Park? | Yes | | | No | |
| 14. | The Uniab Delta Waterfall is a natural phenomenon and a spectacular t attraction. Would you, in an ideal world (without lions), prefer to WALK or DRIVE to the waterfall? | Walk | | | Drive | |
| 15. | With the knowledge that lions may be present, would you prefer to WALK or DRIVE to the waterfall? | Walk | | | Drive | |
| 16. | Do you support erecting a strategically placed hide for viewing lions? | Yes | | | No | |
| 17 | Do you support constructing lookout points and parking bays next to the main road to observe lions and other wildlife? | Yes | | | No | |
| 18. | Do you believe that the presence of free-ranging desert-adapted lions in the Skeleton Coast National Park will benefit and improve the tourism potential of the park? | Yes | | | No | |

# Appendix 3: Questionnaire 3 – Namibia Wildlife Resort, Ministry of Environment and Tourism, and Namibian Police Force Staff

Title: What are the key activities to consider when managing the repopulations of free-ranging lions to the Skeleton Coast National Park?

I appreciate your visit to the Skeleton Coast National Park, and I understand your time is valuable to you. I would like to invite you to participate in my research project to survey visitors' and tourist's perceptions of the presence of free-ranging desert-adapted lions at Uniab Delta Waterfall.

This research project is conducted in partial fulfilment of a master's degree in Environmental Management at the University of the Free State. The study is conducted in collaboration with and under guidance from the Desert Lion Research Project. The results of this study will help the park management on key activities to be considered when managing free-ranging desert-adapted lions in the park.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Name: | Home: | Language: | | | |
| 2 | How long have you worked in the Skeleton Coast National Park? | | | | | |
| 3. | Are you aware that lions currently inhabit sections of the Skeleton Coast National Park? | | | | Yes | No |
| 4. | Have you previously seen a lion in the park? | | | | Yes | No |
| | If Yes, state date……....., location……....., and details of sightings – complete carnivore form. | | | | | |
| 5. | What was your impression of these lion sightings? | Troublesome | Insignificant | Interesting | Fascinating | |
| 6. | Does the presence of lions in the Skeleton Coast National Park pose a threat to the fishing activities and value offered by the park? | | | | Yes | No |
| 7. | If Yes, state two reasons:<br>1.<br><br>2. | | | | | |
| 8. | If Yes (Question 6), suggest one possible solution: | | | | | |
| 9. | How do you perceive the presence of lions in the park? Scale 1-5, where 1 = negative, must be removed & 5 = positive, enormous attraction. | 1 | 2 | 3 | 4 | 5 |
| 10. | Do you foresee potential conflict between lions and people in the Skeleton Coast National Park? | | | | Yes | No |

| | | | |
|---|---|---|---|
| | If Yes, describe your concern: | | |
| 11. | Do you think there is a future for lion ecotourism in the Skeleton Coast National Park? | Yes | No |
| 12. | The Uniab Delta Waterfall is a natural phenomenon and a spectacular tourist attraction. Would you, in an ideal world (without lions), prefer to WALK or DRIVE to the waterfall? | Walk | Drive |
| 13. | With the knowledge that lions may be present, would you prefer to WALK or DRIVE to the waterfall? | Walk | Drive |
| 14. | Do you support erecting a strategically placed hide for viewing lions? | Yes | No |
| 15. | Do you support constructing lookout points and parking bays next to the main road to observe lions and other wildlife? | Yes | No |
| 16. | Do you believe that the presence of free-ranging desert-adapted lions in the Skeleton Coast National Park will benefit and improve the tourism potential of the park? | Yes | No |

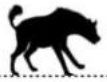
## Appendix 4: Carnivore form

DESERT LION CONSERVATION
www.desertlion.info

### Skeleton Coast Park
### Carnivore Observation Form

| Date | Time | Observer |
|---|---|---|
| | | |
| Location | | |

**Carnivore species** (tick one box)

| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Lion | Leopard | Cheetah | Brown hyaena | Spotted hyaena | Caracal |
|  |  |  |  |  |  |
| Afr wild cat | B-b jackal | Ratel | Aardwolf | Cape fox | Bat-eared fox |

**Numbers & Group structure**

| Adult | | | Sub-adult | | | Young | **Total** |
|---|---|---|---|---|---|---|---|
| ♂ | ♀ | ? | ♂ | ♀ | ? | | |
| | | | | | | | |

**Marked or radio-collared animals**

| |
|---|
| |
| |

**Behaviour & Predation** (a brief description)

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**Reaction of animals to vehicle** (Distance = from you to carnivore)

| Distance (m) | Relaxed | Nervous | Move away |
|---|---|---|---|
| | | | |

**Notes**

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Data form & analysis by: www.desertlion.info

## Appendix 5: Questionnaire cover letter

Title: **EVALUATING THE REPOPULATION AND MANAGENEMT OF FREE-ROAMING DESERT-ADAPTED LIONS IN THE SKELETON COAST NATIONAL PARK – NAMIBIA**

Date: 03 October 2015

Dear: Skeleton Coast National Park Tourist/Visitor/Resident

I am **Josua Kazeurua**, doing a master's degree in Environmental Management at the University of Free State. In partial fulfilment of this master's degree I am assessing visitors', residents', and tourists' perceptions of the presence of free-ranging dessert-adapted lions in the Skeleton Coast National Park, specifically the Uniab Delta and Terrace Bay areas.

I appreciate your visit to the Skeleton Coast National Park, and I understand your time is valuable to you. I would like to invite you to participate in my research project to survey visitors' and tourists' perceptions of the presence of free-ranging dessert-adapted lions in the Skeleton Coast National Park. The following questionnaire will take you approximately 10-15 minutes to complete. The information obtained from the survey will be treated confidentially and no one's identity will be revealed.

There is no known risk associated with the completion of this questionnaire. Completing the questionnaire is voluntary and there is no compensation after completion. If you decide to take part in this study, kindly complete the whole questionnaire and drop it upon departure at the following receptionist points: Terrace Bay Resort, Ugab Gate, or Springbokwasser Gate. Copies of the study will be available upon completion and assessment at the University of Free State Centre for Environmental Management and Dr Stander (project supervisor).

The study is conducted in collaboration and guidance from the Desert Lion Research Project. The results of the study will help the park's management on key activities to be considered when managing free-ranging dessert-adapted in the Park.

**Repopulation** refers to the decline of the lions' population during the 1980-1990s where they disappeared from the Skeleton Coast National Park altogether and as they repopulate the Skelton Coast National Park, their movements exploring and utilising the various attractions like the Uniab Delta, is referred to as "redistribution".

For the purpose of the study **free-ranging desert-adapted lions** refers to all lions occurring or that were previously observed in the Skeleton Coast National Park.

I sincerely thank you for participating in my mini-dissertation and helping me reach my education goals.

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Supervisor: Dr. F. Stander