Estimating the value of natural characteristics of a National Park: the case of Mokala National Park in South Africa

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Declaration of Plagiarism

I, Carel Johannes Kriek declare that the mini-dissertation, which I hereby submit for the degree MSc Agric Agricultural Economics degree at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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Abstract

Due to the extreme decimation of species worldwide, there is a need to conserve and protect more natural areas and biodiversity. A way to ensure species' survival across areas, is to rewild a protected area or nature reserve by reintroducing regionally extinct fauna and flora, or removing invasive species. In developing countries, these protected areas are generally underfunded and underdeveloped, and therefore may have limited capacity to conserve the wildlife, and/or rewild the park to its previous natural state. This study utilised a discrete choice experiment to determine the preferences and 'appreciative value' tourists place on different natural characteristics of the park, in the context of rewilding. This study analysed the responses of 288 tourists from Mokala National Park in the Northern Cape, South Africa, using online questionnaires. The respondent's preferences were drawn from the completed questionnaires by the tourists who have visited the park since its inception in 2007. The natural characteristics ranged from (1) reintroducing carnivores such as lions or cheetahs back into the park, (2) removing non-native species, whether threatened or non-threatened, and (3) boosting endangered species populations such as roan antelope, black rhino and tsessebe. A latent class model was created to identify heterogeneity in the preferences amongst the sampled population. It was determined that there is heterogeneity and that the sampled tourists had varying preferences to rewild the national park to its previous biological state. Respondents of the four classes, strongly preferred reintroducing cheetahs back into the park above a pride of lions. All classes had significant preference for boosting the numbers of endangered black rhinos compared to the status quo. Only 11.20% of the respondents wanted to completely rewild the park by removing the non-native species and reintroducing all the other species identified. Thus, 88.20% of respondents did not support removing the non-native species regardless of their status, either threatened (sable antelope) or non-threatened (impala, nyala and waterbuck). The results provide a basis that rewilding improvements could be initiated, and better park management policies could be implemented, to attract tourists and more successfully rewild the park . Yet, tourists had an affinity for more species diversity in the park above protecting the natural ecosystem. Further research can be done to expand on whether there is a preference for species based on their status, such as being endangered, iconic, carnivore, or megafauna.

Key Words: Choice experiment, rewilding, Mokala National Park, reintroduce, non-native species, willingness to pay, latent class model

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GLOSSARY

Rewilding: "a comprehensive conservation effort focused on restoring sustainable biodiversity and ecosystem health by protecting core wild/wilderness areas, or reintroducing keystone species" (Barkham, 2017).

Species reintroduction: "Returning a wild animal or plant species back into their natural environment or habitat."

Carnivore: "An animal that gets its caloric intake by feeding on other animals."

Big 5: The "Big 5" is a term that is predominantly used in Africa to refer to five very well-known animals namely the African elephant, lion, leopard, rhino and Cape buffalo."

Megafauna: "Species that are visible with the naked eye that are very large such as elephants, rhinos, lions etc."

Endangered species: "Indicates to species that are threatened of endangerment and potential extinction." (Dublin, 2022)

Indigenous species: "A species that occurs naturally in an area without human intervention." (USGS, 2022)

Native species: "An animal or plant species that are indigenous to an area, they originate from that area." (USGS, 2022)

Non-native species: "An animal or plant that is not indigenous to an area, being introduced by humans." (USGS, 2022)

Keystone species: "A keystone species is a species that has a disproportionate effect on its immediate environment." (Cristancho & Vinnig, 2004)

Choice Experiment: "A survey technique to distinguish respondents' preferences from two or more discrete alternatives." (Tietenberg, 2014)

Latent Class Model: “It is a technique to identify unobserved groupings in data, by relating a set of observed variables to a set of latent variables.” (Boxall & Adamowicz, 2002)

Conditional Logit Model: “A model that allows logistical regression with the subjects being subject to different situations before they express their opinions.” (McFadden, 1973)

LIST OF ABBREVIATIONS

SANParks	South Africa National Parks
MNP	Mokala National Park
DCE	Discrete Choice Experiment
CE	Choice Experiment
LCM	Latent Class Model
CLM	Conditional Logit Model
IUCN	International Union for Conservation of Nature
RUT	Random Utility Theory

CHAPTER ONE: INTRODUCTION

1.1 Background

Biodiversity, the diversity of plant and animal species that occupy the world or a particular natural habitat, is essential for the well-being of humans and the planet, as it supplies vital ecosystem services and natural resources like water, oxygen, and food. Certain components of the biodiversity within a particular area, such as wildlife, can provide for human needs from economic and cultural benefits to offering entertainment opportunities through activities like ecotourism (e.g., viewing wildlife and natural scenery for pleasure). The planet's biodiversity is immense and reaches all corners of the globe with scientists estimating that only 1.3 million of the estimated 8.7 million species have been discovered (Camps, 2018). However, the world is currently in the Anthropogenic era—the current geological age where *human* activity on the environment has been dominant—leading to biodiversity destruction and land change that is spreading rapidly across the globe, with approximately 66% of all land vertebrates having disappeared since 1970 (WWF, 2016). Thus, indicating the ever-changing nature of the world and the natural landscape.

In light of these threats, areas of land are being set aside for nature conservation and preservation in regions all across the world. Protecting areas of land is driven by conservation efforts to preserve biodiversity, along with harnessing the benefits that emerge from such conservation. Such efforts are evident on the African continent in establishing national parks and nature reserves, particularly in Southern Africa (Briggs et al., 2008). Reasons for the demise of biodiversity on the continent include poaching, human activity, and land change (WWF, 2016). Even though there are many national parks and reserves across Africa, the quality of these parks and the biodiversity within their boundaries are declining, primarily due to brutal acts of poaching (Woods, 2016). Examples of parks of immense size that has fell victim to these threats are Chinko National Park at 17,600 km^2 in the Central African Republic and the Democratic Republic of Congo's Garamba National Park at approximately 5,133 km^2.

Within these parks and nature reserves, factors such as the lack of proper governance structures and social or physical infrastructure that are needed to make conservation areas work are possibly leading to this decline in quality (Pettorelli et al., 2019). Evidence from national parks,

such as Kruger National Park in South Africa, demonstrates that most of its rhinos in the park have been lost to poaching, with an estimated 75% decline in white rhino numbers and 51% decline in black rhino numbers in the past decade (Africa Geographic, 2022). Another example can be found within Indonesia's Bukit Barisan Selatan National Park where human encroachment of up to 100,000 coffee farmers and loggers in and around the park is reducing the size of the wilderness area in the park (Hance, 2012). Preservation, protection and proper management of these conservation areas are vital to ensure the parks play their part in addressing the threats of the anthropogenic era. In addition to this critical role, these national parks and reserves are not only crucial to the protection of biodiversity within an area or country but create an opportunity to harness the natural resources and generate revenue for the surrounding area. The current global threat to wildlife is a significant challenge, not only in protecting and preserving the species but also in better capturing the potential economic benefits from such natural resources. A way that this could be done is through ecotourism, which is the *responsible* travel to natural areas that conserve and protect the natural environment (UNWTO, 2021). In this regard, several countries including South Africa, use ecotourism to boost their tourism industries and implement new initiatives to preserve and grow the natural environment— one such initiative is 'rewilding'.

Rewilding is defined as "a comprehensive conservation effort focused on restoring sustainable biodiversity and ecosystem health by protecting core wild/wilderness areas, or reintroducing keystone species" (Barkham, 2017). To be able to fully rewild these national parks and other natural landscapes, governments and organisations try to help the parks naturally regenerate the lost biodiversity through direct and indirect actions. This could be done by reintroducing species, removing invasive species, and reducing human activity to support the regeneration of the natural landscape to its state prior to disruptive human activity.

In Africa, rewilding has commenced in national parks and private game reserves where organisations are bringing back wildlife of this kind, as in Zakouma Natural Park in Chad and Akagera National Park in Rwanda (African Parks, 2020). Governments and private organisations such as African Parks are at the forefront of rewilding efforts where wildlife has been lost or the state of a national park or natural area has been vastly reduced from its historical biological state. For example, the wildlife organisation African Parks takes legal control of national parks from countries, in collaboration with the government, for a limited time to rewild them and upgrade their infrastructure (African Parks, 2020); this is to ensure the sustainability

of wildlife, ecosystems and revenue generated from tourism. Another example is that of Zinave National Park (in Mozambique) where park management (associated with the Peace Parks Foundation) aims to rewild the park with up to 7000 animals from elephants to impalas (Peace Parks Foundation, 2022). Rewilding models and practices can range anywhere from reintroducing and safeguarding species in established national parks (such as across Africa) to regenerating rural land that has been abandoned after human activity (currently preferred across Europe), such as reintroducing extirpated fauna and flora (Rewilding Europe, 2022).

Rewilding has also been ensuing in South Africa through private and public parks, such as national parks and private game reserves including the Samara Private Game Reserve and Karoo National Park (Samara, 2022). In the Karoo National Park, species such as lions and cheetahs have been reintroduced in the past decade, after years of being non-existent within park boundaries (News24, 2013).

The aim of rewilding is to restore the natural biodiversity of the parks; however, to ensure successful rewilding efforts it is also necessary to ensure the upgrade of infrastructure, improve governance structures, enhance management practices, and build conservation strategies to fulfil their mandate. Such improvements are dependent on financial resources and as a result, nature reserves are often reliant on tourism to reduce their dependence on external aid or governmental subsidies (International Union for the Conservation of Nature, 2021). For parks to become sustainable, they need to generate sufficient revenue and become self-sustaining, which requires an increased number of tourists willing to pay for the attractions and experiences offered by the park. It is therefore crucial that before rewilding efforts can commence, parks must establish the best practices for increasing their economic potential through increasing the number of visiting tourists in a sustainable manner. In this regard, it becomes critical to determine *how* to attract more tourists to a national park by establishing the economic value of different natural aspects (e.g., megafauna, flora, ecosystem protection or iconic landscapes) and tourists' preferences. For example, rewilding of certain megafauna and/or observing non-native megafauna found in the park can present value. Thus, determining this economic value aims to assist organisations involved in rewilding efforts across Africa to determine what tourists regard as valuable and are willing to pay for, resulting in greater revenue from visitors.

It is evident that rewilding and ecotourism (based on willingness to pay (WTP)) are interlinked. If parks want to become fully or partially independent of aid and governmental support, then

tourists are their primary source of income for this venture. Where rewilding efforts occur, it is critical to ensure that these efforts allow for maximum economic value to be extracted and to determine which natural aspects or services of the park tourists would value more than others. Thus, it is necessary to determine the economic value of the natural aspects (e.g., different megafauna, flora, ecosystem protection or iconic landscapes) that these parks derive from tourists in order to obtain sustainable revenues. Knowing this economic value can assist in the rehabilitation of park biodiversity and allows for the park to ensure the ecosystem can be restored to the predetermined biological levels prior to human activity and intervention.

As mentioned above, as organisations across Africa develop and rewild nature reserves, it is not evident what natural aspects draw these tourists to the parks. Hence, it is important to identify what tourists value the most. Understanding the values and preferences of tourists, in combination with other complex ecosystem dynamics of a park, can provide effective means of finding solutions for rewilding efforts. By placing value on different natural aspects, parks can focus their attention on upgrading or emphasising the elements with the most significant impact in reaching their strategic aims. As noted by (Meyer, 2015) if tourists value megafauna such as an endangered mountain zebra more than the actual leisure or scenery of the park experience, the park would need to reintroduce these mountain zebras first to attract more tourists, which would consequently lead to improving marketing or visibility of the park, thereby increasing revenue generation. As a result of attracting more tourists to the parks, there will also be positive spill over effects from the park into the local area and country as a tourist destination. By strategically choosing which attributes to focus on, parks can sooner achieve their ultimate goal of rewilding the whole area and becoming financially sustainable.

In 2007, South African National Parks (SANParks) officially established the Mokala National Park (MNP) in the Northern Cape Province (Spies, 2017). An area of 32,500 hectares was set aside, which most of the land was poorly managed by the previous private owners who utilised it for farming and as a hunting concession over several decades. Due to these harmful man-made interactions with nature, the natural biodiversity of the park was greatly reduced. Shortly after its establishment, efforts to rewild the park were initiated by reintroducing wildlife. The park has also begun rehabilitating the land back to its previous natural state by removing invasive species. However, the rewilding process has not been completed and there is still a long way to go for the park to be fully rewilded to its natural state prior to human activity. Thus, for the park to reach its fullest potential offered by rewilding, the economic benefits of this process must be optimised—particularly in determining what is valued by tourists and their

WTP for those various alternatives. To enable this, the park needs to decide which species to introduce or reintroduce within the park to benefit the complete restoration of the park's ecosystem for the future but also to attract more tourists. Therefore, there is a need to investigate how rewilding can be used to restore the ecosystem and/or boost revenue. In an effort to guide MNP's rewilding process and influence tourism policy, this study will use non-market valuation techniques to determine the value tourists place on the natural aspects found within the park. Further, a choice experiment (CE) will be used to determine the WTP for various alternatives to assist MNP with their rewilding efforts.

1.2 Problem Statement

As rewilding is taking place across the African continent, there seems to be no systemic approach guiding this process that considers the economic value of these biological processes. It must be noted that the main purpose of rewilding is to fully regenerate the native landscape and biodiversity back to its state before human activity. Thus, while the aim is to increase tourism revenue, parks, governments and organisations do not fully "know" the value that potential tourists attach to parks or the biodiversity and scenery of the parks (Saayman, 2013). Despite the fact that ecotourism is the economic lifeline for conservancies, parks and other wildlife areas (Pettorelli et al., 2019), there has been limited research on the "appreciative value" of wildlife and types of wildlife to parks; however, several valuation studies have looked into select national parks (Abu Baka, 2008; Han et al., 2011; Baral et al., 2008; Saayman, 2013; Dumalisile et al., 2005). Thus, there is a need for research that investigates the value of parks and their natural aspects by determining what respondents value most, thereby supporting the park in aligning their strategic process in terms of rewilding those species or natural aspects (Saayman, 2013).

In recent years, rewilding has become an incentive for tourism. For example, in Limpopo, South Africa, farmers started converting cattle farms into game farms enabling the slow return of the ecosystem back to its previous natural state (Hoogendoorn et al., 2019). Rewilding landscapes in Europe such as reintroducing European bison into Romania has shown a positive public perception of these efforts because of prevailing views that reintroduction of these species will increase local income sources, increase tourism and improve economic development (Vasile, 2018). Although there are still contentious views about reintroducing

carnivore species such as wolves and bears, back into European countries due to their perceived and actual threat to livestock (Vasile, 2018).

Similarly, the MNP, which does not make a profit but is dependent on governmental budgets for its operations (Spies, 2017), can benefit from such studies. During the financial year of 2019/2020, MNP had the fourth-lowest number of guests to the park compared to the other twenty national parks under SANParks management. Additionally, the park had a 50.6% unit occupancy rate (excluding camping) which is below the SANParks average of 69.4%, and is the seventh-lowest amongst all the parks measured (South African National Parks, 2020). This creates an incentive for park management of MNP to identify types of natural characteristics or aspects of the park that tourists are more attracted to and what value they place on these characteristics. Examples in MNP include:

i. Introduction of carnivore species such as lions and cheetahs, since both species occurred previously in the area but have been hunted to regional extinction—reintroducing them would play a crucial role in the ecosystem;
ii. Restoration of the ecosystem by looking at removing species that occur within the park that are not native to the region but are to South Africa;
iii. Protecting locally endangered species by boosting their numbers within the park;
iv. Impact of park fees on tourists' decisions, to determine not only if park fees can be increased but the valuation of the different natural aspects.

However, park management of MNP does not currently know the value placed on such attributes and, therefore, does not necessarily know how to prioritise interventions to optimise rewilding efforts and generate sustainable revenue. The use of non-market valuation studies can help guide the park towards identifying whether there can be changes based on tourists' preferences for certain rewilding characteristics and determining a potentially change in park fee structure. Overall, it is hoped that determining the value that visitors place on these chosen attributes will contribute to the rewilding strategy of the park.

In order to evaluate ecotourism and its economic potential for development, many studies use CE techniques for example, Di Minin et al. (2012), Baral et al. (2008), Van Tonder, et al. (2013); Lee et al. (2010) and Juutinen (2011). A study using a CE technique in Finland found that improper management of protected areas and biodiversity management can cause conflicting welfare effects (Juutinen, 2011). Additionally, a study in South Korea determined that bird watchers would be willing to pay more if bird-watching ecotourism resources

increase, such as bird diversity (Lee et al., 2010). These types of studies can aid this research paper in determining the value that tourists attach to certain natural aspects of MNP. Similarly, by using this environmental valuation technique through the use of econometric models, economic values will be determined.

1.3 Objectives and research questions of the study

1.3.1 Main research objective

The main research objective of this valuation study is to determine visitors', preferences for different characteristics of MNP's rewilding strategy. There are three sub-objectives that further describes this objective deeper.

Sub-objectives:

i. Investigate tourists' preferences for the reintroduction of carnivores, the restoration of the parks ecosystem and the protection of threatened species currently inhabiting MNP.

ii. Investigate if there is heterogeneity between preferences and amongst the respondents when it comes to the valuation of different natural characteristics.

iii. Determine the economic value that tourists place on certain ecosystem services (i.e. keystone species, and endangered species) specific to MNP by estimating their WTP for these natural characteristics.

1.3.2 Research Questions

This paper aims to conduct a valuation study on rewilding MNP, due to the literature gap in the valuation of natural characteristics for rewilding and park management purposes. Identifying what different natural aspects tourists value the most, therefore, the study seeks to determine the WTP and if there is heterogeneity in the population regarding these choices for specific natural characteristics. The study aims to address the following research questions:

i. What are the tourists' preferences for the reintroduction of carnivores, the restoration of the parks ecosystem and the protection of threatened species currently inhabiting MNP?

ii. Is there heterogeneity between preferences and amongst the respondents when it comes to the valuation of different natural characteristics?

iii. What is the economic value that tourists place on certain ecosystem services (i.e. keystone species, and endangered species) specific to MNP by estimating their WTP for these natural characteristics.

These questions are important for the management of the park as findings from this study would guide the park management authority to identify the relevant policy interventions to improve rewilding in the park. Ultimately, resulting in an increase in revenue to reap higher returns from tourists and to ensure sustainability in the future.

1.4 Significance of the study

This study fills a gap in the debate on how to prioritise certain rewilding efforts in national parks and identifies knowledge regarding the visitors' WTP which can contribute to the total economic value of the national parks. Ultimately, this contribution can aid park management in identifying economic value that helps to inform decisions such as, but not limited to: determining the types of species to be reintroduced; the type of wildlife diversity to prefer; and how to utilise other natural and cultural attractions. Gathering information on these values is beneficial in that park management will be able to recognise which natural aspects, such as which type of megafauna (i.e., determining which type of megafauna), should be prioritised for investment that leads to an increased number of tourists and consequently, more sustainable revenue streams. Since tourists are a major source of revenue for parks, it is important to understand their preferences and the value they place on specific natural aspects (wildlife, ecosystem restoration, etc.); the value of seeing a certain type of animal compared to other species; or the differing preferences between the natural aspects of the park. It is important to note that this study does not aim to place value on nature or animals but merely aims to determine the differentiating value that tourists place on certain natural aspects to support MNP in their efforts to effectively rehabilitate and rewild for the long term and obtain sustainably-sourced financial resources.

1.5 Delimitations of the study

The delimitations of the study are the boundaries and parameters set for the study since these limits inhibit the results to be generalised to the overall population and represent the chosen constraints to the study (Simon & Goes, 2013). This study's research perception, preferences,

and WTP are related to a single national park, specifically MNP. The study is also limited to domestic tourists who have visited the park before. Furthermore, the study limits the investigation of the ecological viability of the different species that could be reintroduced and introduced within the park to two types of carnivore species and chosen threatened species and non-native species. These species were selected at the discretion of the author based on the literature review and in consultation with experts including park management.

1.6 Structure of the study

Chapter 1 presents an introduction to the study that includes background information, the research problem, questions and objectives, and points to delimitations and describes the significance of the study. Chapter 2 comprises a review of relevant literature. This review offers a comprehensive overview of research to identify the specialised role and the problem that this study needs to cover. It includes nature and humanity; rewilding; financial aid; and natural characteristics that could be valued, including carnivore, iconic, endangered, and non-native species. Lastly, a review of valuation methods such as the total economic use value and the stated preference method that the study will utilise are offered. In Chapter 3, the Research Methodology is presented, providing the setting of the study as the MNP and introducing critical considerations regarding the park which are relevant to the study. It also gives a more in-depth analysis of the CE method that is used and describes subsequent formulas and the questionnaire that was used. Additionally, it points to limitations and biases that this study will face and explains the data collection process and how the data was cleaned and analysed

Chapter 4 presents the results of the CE and the other three sections of the questionnaire, which covers tourists' environmental management preferences, debrief questions on the CE and socio-demographic questions. Importantly, it explains and presents the conditional logit model and latent class model (LCM) created from the results. The penultimate Chapter 5 presents the discussion and a more in-depth analysis of the results that was identified in Chapter 4 and the implications thereof and future research that could further enhance the current research

Lastly, the paper concludes with Chapter 6, which summarises the study findings and provide recommendations to park management. The last section of the study presents the bibliography and appendices, including the questionnaire.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction to the literature review

The literature review will start with the impact that humanity has on the natural environment and the loss of ecosystem services. This will be followed by global efforts on sustainability and land restoration. The chapter will then present both the concept and different models of rewilding that have developed over the years as well as how these models have been implemented across continents, such as in Africa. The review then divulges into the natural characteristics to value in national parks in the context of rewilding with specific reference to MNP. Different characteristics are discussed including fauna, endangered species, flora, scenery and community involvement. It further discusses whether more specific aspects should be clustered (e.g., types of animals, like the big five, non-native species or looking at groups of animals, such as carnivores). This will be followed by an overview of models that are needed to incorporate financial support for conservation and national parks; information on how parks are financially reliant; followed by the tourism sector and its influence on the financial needs of national parks and conservation initiatives. Lastly, the chapter will cover the types of environmental valuation techniques and background to non-direct use-value and stated preferences as these economic techniques will be utilised in the research instrument of the study.

2.2 Introduction to humanity's impacts on nature and the loss of ecosystem services

Previous studies (e.g., Naggs (2017), Pimm (2014) and Ceballos & Erchling (2020)) contend that the sixth major extinction event is currently underway. This drastically influences all types of natural life with a large decline in species population and extirpations from their historical ranges with a resultant negative impact on ecosystem functions and services (Ceballos et al., 2017). Human activities are causing the rise in the extinction of species across the world, with the extinction rate over the past 200 years being more than a hundred times higher than in the past 2 million years (Ceballos et al., 2015; Pimm, 2014). As much as 50% of all animals' populations, which constitutes billions of populations of wildlife, that existed alongside mankind on Earth are gone (Ceballos, et al., 2017). These extinctions and decimation rates are linked to human activities such as land change; overexploitation; climate disruptions; and

invasive species introduced by humans. Human activity has converted up to 75% of the earth's surface from natural landscapes to agricultural, urban, and other types of land (Ripper, 2020). To prevent this decline of biodiversity, conservation efforts and nature preservation activities must be intensified. Biodiversity loss is not the only impact of an ever-changing landscape, but that of the contribution to climate change and the dire threats it presents to the globe. According to the United Nations Intergovernmental Panel on Climate Change report that was released in 2018, humans have already caused approximately 1 degree Celsius of global warming above pre-industrial levels (Intergovernmental Panel on Climate Change, 2018). Further increase in global temperature is likely, with negative effects across the globe such as an increase in droughts, flooding, heat waves and potentially making large swaths of land uninhabitable. Anthropogenic climate change has been massively fuelled by the burning of fossil fuels which release huge amounts of carbon dioxide and other greenhouse gases into the atmosphere. Other notable human activities such as deforestation due to the utilisation of wood resources, agricultural land expansion and human population growth have had an immense effect on the global climate (IPCC, 2018). Deforestation limits the ability of ecosystems to provide useful services such as carbon sequestration, resulting in an increase of carbon dioxide into the atmosphere on a global scale. Deforestation can also cause the land surface to have an albedo effect - the surface's ability to reflect sunlight (Okia, 2012). The natural environment provides valuable ecosystem services to the planet and to humans (Millennium Ecosystem Assessment, 2005). These services provide clean air, water, cultural and economic benefits, as well as the ability to sequester carbon thus mitigating the effects of climate change. There has also been great pressure on these ecosystems either through direct or indirect actions by people across the globe. These actions that are similar to those contributing to climate change range from an ever increase in land change for farming, urban areas, and infrastructure mostly due to population growth, technological advancements, and unsustainable economic growth at the cost of the natural environment (MEA, 2005).

A way to reduce the pressure on ecosystems and biodiversity and encourage nature to thrive is by formally protecting land and marine areas. Based on the World Database on Protected Areas (WDPA), 15,79% of all terrestrial land has some form of formal protected status whilst 8,09% of marine areas are formally protected (Protected Planet, 2022). This shows that nature needs its space to thrive to enable biodiversity to exist for the long-term, sustainably benefiting human wellbeing. Therefore, by creating more national parks or protected areas, these areas of nature conservation can be used to ensure the sustainable management and utilisation of natural

resources. This will allow the natural areas to continue providing services to the ecosystem unrestricted and mostly unaffected by human activity. This will also allow humankind to enjoy the benefits of wildlife recreation through visits to these parks and areas. Thus, it is crucial to allow for a more holistic view and management styles of nature and the environment to be integrated within human society in order for natural landscapes to return in order to benefit not only nature but people as well.

2.3 Global Efforts on Sustainability and Land Restoration

2.3.1 The Sustainable Development Goals (SDGs)

Across the globe, individual countries and intergovernmental initiatives are being established to ensure sustainable development, protection and survival of biodiversity, all whilst tackling climate change. However, arguably the most critical of these efforts is the establishment of the United Nations' Sustainable Development Goals (SDGs). SDGs that were initiated by the United Nations are a set of 17 goals incorporated into the 2030 Agenda for Sustainable Development and was adopted by all the United Nation Member States in 2015 (United Nations, 2020). These goals which are for all developed and developing nations are there to recognise and eliminate poverty and other destitutions. It also provides strategies to improve health, education, and economic growth. More importantly, within this context, it provides strategies to tackle the challenge of climate change and the preservation and conservation of the oceans and land, and as such the biodiversity these areas carry. The two SDGs most directly associated with efforts to restore nature are, namely, Goal 14 (″Life Below Water″) and Goal 15 (″Life on Land″). "Life Below Water" can be defined as "*Conserve and sustainably use the oceans, seas and marine resources for sustainable development*". Whilst "Life on Land" can be defined as *"Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss"* (United Nations, 2022).

These two goals highlight the need to protect, sustainably harvest and utilise the oceans and marine resources, but also to conserve, restore and promote sustainable use of terrestrial ecosystems (Economic and Social Council, 2019). Preservation of natural areas, by setting aside land for nature conservation, is a key tool to help to reach these goals. In particular, the targets and indicators of the goals are the restoration, conservation and sustainable use of all

ecosystems including forests, inland wetlands, and mountains. This study looks at the restoration of ecosystems and wildlife resources using non-market valuation techniques.

Various means and attempts have been offered to assist in reaching these goals including efforts to try and not only halt the ecological loss across the globe but to reverse it. Examples include halting the degradation of natural habitats and stopping the loss of biodiversity as well as preventing the extinction of threatened species. This can be done by creating more protected areas where human activity is not allowed or at least limited, such as nature reserves or marine parks. This leads to areas gaining protection from human activity but also the ability to rewild natural landscapes and reintroduce regionally extinct species in order to protect them and thus increase the biodiversity of the area and enhance the ecological services.

2.3.2 Efforts on land Restoration

Several efforts to preserve natural areas by governments and conservation groups have been initiated to limit the impact of this human destruction. A recent example is the United Nations Climate Change Conference (COP) held in 2021. Goals that were identified at this gathering of nations were to secure global net-zero emissions by 2050 and to limit destruction of the planet. This was supported by the recommendations to adopt and protect communities as well as their natural habitats through the commitment to mobilise millions of dollars for these initiatives (COP26, 2022). This shows that there have been particular efforts and interest to set aside land for nature conservation and addressing these issues has attracted global interest. Among these is the designation of the 2020s being the *Decade of environmental restoration* by the United Nations. This is amplified by the creation of the *Global Goal for Nature*, which seeks to halt and reverse nature loss by 2030 (Nature Positive, 2022). The aim is to allow nature to fully recover by 2050 so that ecosystems and nature-based solutions continue to support society and future generations. This initiative aims to influence governments, society, businesses, and global organisations like the UN Convention on Biological Diversity. As shown in Figure 1, the goal of restoring nature is to stop the decline of biodiversity by 2030 and have a nature-positive world outlook beyond 2030.

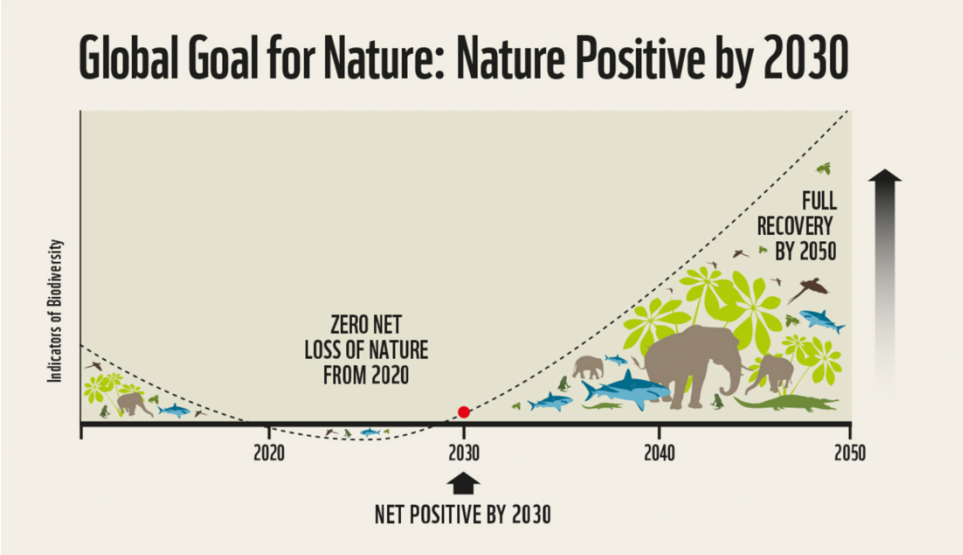

Figure 1: Global goal for Nature (Nature Positive, 2022)

A further example of initiatives to address land restoration includes intergovernmental initiatives like the High Ambition Coalition. This was established in 2014 by the Republic of the Marshall Islands, which initially aimed to commit nations to advance progressive proposals on climate change. It later adopted the goal to formally protect at least 30% of terrestrial land and 30% of marine areas by 2030. By the beginning of 2022, seventy countries had signed up to support the initiative, by formally protecting more areas of land and oceans and designating them as nature reserves or national parks (Rosane, 2021).

There has also been interest from private organisations and companies to instil restoration and conservation over large areas. An example is the Yellowstone to Yukon Conservation Initiative, where over 460 partner groups have joined forces to commit to protect and connect the Yukon-Yellowstone habitats which stretch over 3400km to allow humans and nature to thrive (Yellowstone to Yukon, 2022). This is supported by the Centre for Large Landscape Conservation which over ten years and across four continents has financially supported research and initiated dialogues to try and allow humans and wildlife to thrive in connected ecosystems (Centre for Large Landscape, 2021).

It is clear from this section that there is a distinct international drive towards the sustainable use of natural resources and sustainable development to benefit people and all biodiversity on the planet. There is a definite need for research to determine the best ways to ensure how this

unfolds in the most effective and practical manner. There is not only a global decrease in biodiversity, but the current state of South Africa's conservation initiatives could be improved.

2.3.3 State of conservation in South Africa

Natural and protected areas are also integral to South African society. South Africa can be classified as one of the 17 megadiverse countries, a designation by the World Conservation Monitoring Centre that identifies countries that hosts the largest indices of biodiversity (Iberdrola, 2022). South Africa represents close to 2% of the planet's terrestrial territory but it harbours close to 10% of the world's floral species and 7% of its bird, mammal, and reptile species (Convention on Biological Diversity, 2022). It also has numerous types of biomes and eco-regions that harbour different types of fauna and habitats for these species. Examples include the Cape Floral region; the Karoo; and Highveld, with all of these areas showing endism and high biodiversity (Convention on Biological Diversity, 2022). The country has a high variety of National Parks, provincial parks, ten biosphere reserves and other natural areas such as private game reserves. These protected areas cover 11,280,684 hectares which comprise 9.8% of the country's mainland surface area (Statistics South Africa, 2021). The private sector also plays a major role in South African society regarding conservation and biodiversity protection.

As the country's population grows and development quickens, a large expanse of natural areas are continuously being converted into other types of land use resulting in the dramatic decline of biodiversity across the country (Convention on Biological Diversity, 2022). Most notably this has led to the reduction of species habitats and consequently decreased the number of species with the resultant extinction of certain species and sub-species (e.g., bluebuck, quagga, and cape lion). It has also pushed numerous species closer to extinction resulting in a dramatic number of animals becoming endangered such as the African wild dog, cheetah, black rhinoceros, mountain reedbuck, and riverine rabbit. Floral species have also been under pressure, especially the endemic fynbos kingdom in the Cape regions. Therefore, it is clear there is a need to conserve biodiversity and bring these species back from the brink of extinction (Convention on Biological Diversity, 2022).

The private sector also plays a major role in South African society regarding conservation and biodiversity protection. In some parts of the country, there has been a transition towards nature-based utilisation of the land such as the Waterberg District Municipality in Limpopo. This area

is the biggest District Municipality in the Limpopo Province which boasts up to 80% of its land as game reserves or natural areas. These parks predominantly participate in nature-based tourism as well as hunting activities for domestic and international tourists. This shows that there is at times a transition from agriculture to conservation, especially in areas that are not well supported for long-term agricultural practices.

It leads to the conclusion that there is a need for these game reserves or areas that are in transition to better understand the dynamics and appreciative values of tourists for natural aspects. This can be done to better incorporate all-natural ecosystems to improve their functioning and preserve the natural area. The restoration process can then be done in a manner to best financially support the nature reserve or game reserve to become financially independent and sustainable. One way that this transformation can be realised is by rewilding areas of human land and ensuring such rewilding occurs in the already established protected areas but also in the best manner possible.

2.4 Rewilding:

2.4.1 Core concept of Rewilding

The concept of rewilding areas came about in the last century, as a way to restore the biological richness of areas. In the 1980s rewilding efforts started across the European continent but only in the 1990s did the efforts of these reintroduction schemes became known as ‘rewilding’ (Carey, 2016). According to Jorgenson (2015), six types of rewilding can be distinguished, namely: (1) Cores, corridors and carnivores; (2) Pleistocene megafauna replacement; (3) Island taxon replacement; (4) Landscape through species reintroduction; (5) Productive land abandonment, and lastly;(6) Releasing captive bred animals. They all have their respective justification and place in conservation and have attracted interest as a research field. Reviewing the literature, the most mentioned and common types of rewilding are (1) Landscapes through species reintroduction and (2) Pleistocene megafauna replacement (Jorgenson, 2015). Both refer to reserves or organisations reintroducing wildlife into areas where species have been exterminated by people. This is important as it shows that rewilding is a growing field and shows that there is a need to reintroduce wildlife back to natural areas. The Pleistocene era (which started 2.6 million years ago and ended about 11,700 years ago) is regarded as the last “wild” era before humankind changed the natural landscape (Zimmermann, 2017). Thereafter,

the man-made extinction of megafauna, as well as regional extinction, occurred across all the continents. The impact of this era is substantial with, for example, Australia losing 85% of its terrestrial fauna with a mass larger than 44kg (with humans playing a direct and indirect role in most of these) (Wroe & Field, 2006). Rewilding is being advocated by researchers to bring back megafauna to places they have not been for centuries or by restoring the landscape back to what it was before human activity (Donlan et al., 2006).

Rewilding can therefore be defined as "a comprehensive conservation effort focused on restoring sustainable biodiversity and ecosystem health by protecting core wild/wilderness areas, or reintroducing keystone species" (Barkham, 2017). Through direct and indirect actions by organisations and governmental agencies, these natural landscapes can be helped to regenerate to their biological state before human activity. This could be done through reintroducing species and removing invasive alien species but also by allowing the natural flow of biodiversity into the area to regenerate the area naturally.

2.4.2 Global rewilding efforts Rewilding in parks and reserves

Rewilding has often been applied in parks and reserves. One such example is the reintroduction of wolves into the Yellowstone National Park in the United States of America (Farquhar, 2019). These wolves were regionally extinct for centuries but after a few years of reintroduction, there were significant changes in the landscape of the park. This was due to prey animals adapting their behaviour. These changes led to growth in forest areas and even a change in the park's river flow (Farquhar, 2019). Furthermore, a number of studies such as Edwards (1998) focus on holistic landscape restoration based on animal reintroduction, that is similar to the Yellowstone example. This indicates research interest in the potential and need for rewilding through wildlife reintroduction with studies looking at how to return keystone species (e.g., elephants or lions) that have become extinct due to human pressure in a particular area. Other notable examples if rewilding are the reintroduction of Eurasian beavers back into Britain in 2010, after being hunted to extinction in the region over 400 years ago (Rewilding Britain, 2022). For years there has been a push against the reintroduction due to the fear of the impact they would have on native fish populations, even though European beavers are herbivores. Their populations have rebounded and spread to multiple sites, and their impact on the different ecosystems is already notable due to their construction of dams and the change in watercourses that they create in the wetlands and rivers have managed to reduce flood flows by up to 60%

(Graham et al., 2020). Another example, was areas being fenced off in Southern Australia, allowing scientists to reintroduce the largest carnivorous marsupial onto the mainland of Australia in 3000 years, the Tasmanian devil. Tasmanian devils have been restricted to the island of Tasmania after being hunted and exterminated on the mainland of Australia (Stevens, 2022). Their presence will ultimately influence the behaviour of prey and will benefit the ecosystem as a whole.

Even more radical rewilding projects are underfoot such as the reintroduction of animals that resemble their extinct relatives that lived during the Pleistocene era. A 144km^2 park in Siberia has been reintroducing camels, bison, horses, moose, reindeer, and muskox to regenerate the landscape to its prior mammoth steppe biome (Pleistocene Park, 2022). This will help the landscape with permafrost carbon preservation, albedo effect of the surface and further carbon sequestration (Pleistocene Park, 2022). It can therefore be concluded that rewilding by the introduction, reintroduction and removal of species is a global phenomenon with various success stories.

2.4.3 Rewilding in areas outside of parks and reserves

Rewilding is not only limited to national parks and established conservation areas, that are experiencing a decline in biodiversity. For example, in Europe, due to depopulated lands and land abandonment nature has started to overtake these landscapes. Allowing nature to reclaim the land, that has been abandoned primarily from farmland has resulted in areas that have been under mass human activity for long periods of time to slowly starting to go wild again (Eda Ustaoglu, 2018). In this regard, a European company called “Rewilding Europe” had started a cross-continental initiative to allow nature to reclaim land and rewild them back to its natural biological state- either through direct or indirect action. Direct actions include reintroducing wildlife (e.g., European bison) to areas where they have been extinct for centuries (Rewilding Europe, 2022). The organisation has identified nine landscape sites across Europe where they actively work to regenerate the native landscape as well as introduce wildlife tourism activities. A further example includes the establishment of the European Rewilding Network with 77 rewilding initiatives across 37 countries, covering up to 5 million hectares of land (Rewilding Europe, 2022). It has been identified by (Pereira & Navarro, 2015) that up to 20 million hectares of farmland will be released across Europe between 2000 and 2030. This provides an abundance of land to be reclaimed back into natural areas based on its historical baseline.

2.5 Rewilding in Africa

2.5.1 Introduction to rewilding efforts within Africa

The continent of Africa boasts an immensely rich array of biodiversity with approximately a quarter of global biodiversity being situated on the continent. Not only does Africa support the biggest diversity of megafauna on the globe but it maintains the ecological networks and links to sustain large free-roaming populations in certain countries (UNEP, 2016). More and more pressure is being placed on the continents' fragile and diverse ecosystems. This is due to the unmatched population growth, agricultural development, and urban expansion (UNEP, 2016). Yet, the conservation and protection of ecosystems have shown success with the rewilding of keystone species occurring in a variety of countries- in both the public and private sectors. Examples include Akagera National Park in Rwanda and Majete National Park in Malawi. Both these two parks have undergone rewilding initiatives over the past decade and are the only two parks that have the Big five (African elephants, lions, rhinoceroses, leopards and cape buffalo) and other keystone species together in one park in their respective countries (African Parks, 2020). These reintroduction efforts include relocating rhinos, elephants, and lions back into these parks. Between 2016 and 2017, 520 elephants were relocated from Liwonde National Park and Majete National Park to Nkhotakota Wildlife reserve, alongside 2000 other animals (Gibbens, 2017). All of these species were eradicated after years of poaching in these countries (African Parks, 2020).

Certain parks in South Africa started the process of rewilding fauna in parks where the native fauna has been locally extinct for decades due to human activity. This includes the Karoo National Park which has over the past two decades started to slowly reintroduce regionally extinct fauna. Similar success has been recorded in the Addo-Elephant National Park where carnivores have been reintroduced in the past two decades including hyenas and lions (Hayward et al., 2007).

2.5.2 Defining paper parks

Rewilding has especially emerged in so-called "paper parks". This term refers to protected areas that legally exist to support or protect wildlife or a natural area (e.g., national parks or nature reserves) but in reality there are very limited infrastructure, governance due to

corruption or maladministration. But there is also a scarcity of wildlife this could be due to poaching or human-wildlife conflict (Slezak, 2014). Across Africa and the rest of the world, there are numerous protected parks for nature preservation for ecotourism reasons. A significant number of these have deviated into this paper park status as the existing wildlife is often reduced by poaching, poor governance, and deteriorating infrastructure, leaving the area barren of wildlife and functioning ecosystems. An example of this trend is a recent assessment of marine protected areas in the Mediterranean that found less than 1% prevented fishing and fully promoted fishing bans (McVeigh, 2020). The International Union for Conservation of Nature (IUCN) report found that in 644 sites investigated in Eastern and Southern Africa, the mean effectiveness management score was 49%, which is below the world mean of 53%. Simply put, less than half of all those parks had effective management (ESARO, 2020). Yet, recent developments show that different organisations have started to rewild and develop these paper parks back to their former glory or into new pristine nature reserves (African Parks, 2020).

2.5.3 South African National Parks

The SANParks group has a strategic approach to biodiversity that is aligned with its policies and the principles of strategic adaptive management. For each park under the control of SANParks, there are programmes ranging from biodiversity management to tourist and community development. It can be noted that under SANParks goal for sustainable conservation a prominent objective is to effectively and sustainably manage ecosystems, species and cultural heritage biomes (SANParks, 2019). As a new park is established it undergoes a process of rewilding to bring back all the local fauna and flora that is extinct in the area in order to rehabilitate and rewild the land. This is very clear in Marakele National Park which was established in 1986 and has effectively reintroduced all major types of fauna back to the park and has undergone a process of natural reinvigoration and healing. The fauna includes black rhinoceros, elephants, zebras, lions, buffalo, roan, sable, and plains zebra (Novellie & Spies, 2014). Parks such as the Karoo National Park and Mountain Zebra National Park have started to reintroduce carnivores into the parks such as lions and cheetahs (News24, 2013).

2.5.4 Mokala National Park

Mokala National Park (the setting of the current study) was established as a national park in 2007. The park already started the process of rewilding the land and reintroducing specific species as well as developing the park into a well-developed tourist area (Spies, 2017). The four programmes that allow the park to achieve its vision and objectives which are in line to achieve the desired state of the park are biodiversity; responsible tourism as a manifestation of nature-based tourism; constituency building and sharing in benefits amongst all stakeholders; and lastly, effective park management. The biodiversity programmes include programmes such as rehabilitation, invasive and alien species removal, replenishment of the park's freshwater ecosystems, herbivore management, and managing species of special concern along with specific reintroduction programmes (Spies, 2017). All of these fall under the concept of rewilding the park back to its natural complete biological state. Rewilding that has started to occur in the park ranges from reintroducing megafaunas such as giraffes, rhinos, eland, tsessebe, roan antelope, sable antelope, and even red-billed oxpeckers. The park maintains that the reintroduction of large carnivores is still anticipated (Spies, 2017).

It can therefore be surmised that rewilding is a unique and vital tool to help dwindling biodiversity across the globe. Rewilding projects are becoming more and more frequent and being initiated across continents. Rewilding is becoming a vital tool for African parks and nature reserves to coordinate their approach to regenerating and reintroducing wildlife into natural areas. More importantly, it is a tool that SANParks are applying especially in newly created national parks such as MNP to regenerate the landscape from previous human activity.

2.6 Natural characteristics to value

2.6.1 Introduction

Research has been done on how tourists or individuals value wildlife or nature in a non-consumptive manner (e.g., Di Minin et al. (2012), Van Tonder et al. (2013), Abu Baka (2008), Baral et al. (2008), Emang (2020) and Nir Becker (2005)). However, "*there is still very little known about non-consumptive behaviour*" (Van Tonder et al., 2013). This clearly indicates that the 'appreciative' value of wildlife has not been comprehensively researched. This is important as millions of tourists around the globe are constantly involved in nature-based tourism and

wildlife viewing. This points to a need for this type of research that could have far-reaching benefits to the protected areas and the nature industry alike. It is also specified that more research should be done on the WTP to view specific animals or to determine the "value" of these species (Kruger, 2005). This study found that when an attractive flagship species is not present (e.g., lion or cheetah) the market for ecotourism is severely limited, even if there is potential for large revenues through other activities.

It is therefore important to pinpoint which type of natural characteristics or which specific wildlife roaming protected areas should be used to determine value. This can be done by analysing the variables that previous researchers utilised to accurately define clusters to use or whether to analyse a singular, specific cluster. These clusters include keystone species of fauna that could be divided into more defined groups (e.g., carnivores or threatened species). Alternatively, natural characteristics such as the ecosystem integrity of the national park or community interaction and involvement could be used for their attraction for tourists to a rewilded natural setting.

2.6.2 Wildlife species

a. Introduction

Analysing a discrete CE research paper that utilised a CE to identify the heterogeneity of tourists for big game species, it could be concluded that individual species and pairings are crucially important in the decision-making and thought process of tourists (Di Minin et al., 2013). This is supplemented by a study done by Abu Baka (2008) which studied the preferences of tourists in Malaysia and used a questionnaire that includes the characteristic 'wildlife' as a factor and concluded that the respondents' most preferred attribute was indeed this wildlife attribute. This indicates that wildlife is a significant driver to attract tourists and is usually the most valued natural characteristic of parks. Therefore, the value put on the natural environment acts as a major force to motivate for protection of parks. Wildlife species, ecosystems, and the general biodiversity are further components that protected nature reserves and national parks aim to conserve. These species have a direct impact on whether tourists are attracted to national parks or not and thus it is vital for park management to identify whether it should focus on the attraction value of individual species; clusters of species; or a specific type of species like carnivores or endangered species.

b. Clusters of species

A different approach clusters species together and evaluates their value as a collective. For instance, Van Tonder et al. (2013) and Saayman (2013) cluster the so-called "Big five" which consists of the African elephant, lions, leopard, rhino, and African buffalo. These studies set out to determine the 'appreciative value' of the big five and big seven (adding the great white shark and southern right whale in addition to the big five) in Addo-Elephant National Park (Saayman & Saayman, 2014). This approach chose an iconic cluster of animals that are well-known and compared their value as a collective. This is beneficial as it shows that this study chose the wildlife that it wanted in order to determine the value based on international fame, as all the wildlife are widespread throughout Africa and are part of an international brand for tourists coming to African parks. Grouping species can be useful for research to identify general topics and types of species that tourists might be attracted to. This could include but is not limited to carnivore species, threatened or non-threatened species, nocturnal or diurnal species etc.

c. Individual species

Various studies (e.g., Engelbrecht (2015), Dumalisile et al., (2005), Nir Becker (2005)) have focused their attention on a particular or key species that are endemic to specific protected areas. Meyer (2015) analysed the effect that the reintroduction of endangered mountain zebras into the Mountain Zebra National Park had on tourists. Nir Becker (2005) and Dumalisile et al. (2005) determined what value two rare species would have on a park, with the Cape-clawless otters in the Eastern Cape, South Africa, and Griffon vultures in Israel being studied. These studies sought to determine the value that these particular species provided to tourists visiting the park and potential changes in the park fee structure.

Wildlife species (whether they are an iconic, endangered or rare type of species) can be the main focus of attraction to the park for tourists. It is recognised that there is a need to develop a study based on a specific animal or group of animals rather than generalise fauna as a collective. This helps the researcher to determine specific megafauna to which people are more attracted (and consequently value more) in natural parks. These species can be considered keystone species given their appeal of them as individual types. This allows for fragmenting group aspects or collective attributes by focusing attention on grouping species such as carnivores but being able to focus on individual species types. This provides an opportunity to value individual species against one another within a specific group, for example, comparing

carnivore species. Simultaneously enabling the touristic preference and value of individual carnivore species can be determined.

It was also determined in a study by Di Minin et al. (2013) that a park that can market broader biodiversity opportunities than just the Big Five can create the opportunity to substantially increase the range of local stakeholders who can benefit from ecotourism. This is a vital piece of information that enhances the position to choose a broader range of wildlife to analyse in this study.

d. Threatened species

Research analysing the WTP of tourists to view Asian elephants in a protected area in Sri Lanka confirms that such WTP is greater where there are higher numbers of endangered species or subsequently the rarer the species is (Bandara & Tisdell, 2004). It determines that the WTP increased with a reduction in elephant numbers, but the WTP decreased with an increase in their numbers. This points to a diminishing marginal utility of the population of a species (Bandara & Tisdell, 2004) and is crucial when considering rewilding of individual species into a protected area. The introduction of a species that is reintroduced doesn't necessarily ensure it will be encountered by tourists when visiting a natural park. This can indicate that rarer species are more valuable in lesser numbers and that there could potentially be a higher appreciative value for iconic species that are endangered or in low numbers in the park.

A further example of value put on endangered species related to tourists' behaviour refers to its link with the preservation of sharks in a Costa Rican marine reserve. Berrios (2017) found tourists were willing to pay more than ten times the value of sharks on offer in a seafood market in order to conserve shark populations in Costa Rica. The seafood market is the main driver for the eradication and overconsumption of shark species. This shows that tourists place value on individual species and the knowledge of them being part of the natural ecosystem (Berrios, 2017).

Mokala National Park has 34 terrestrial mammals within its boundaries, with roan antelope, black rhino and tsessebe classified as endangered and vulnerable within the region of South Africa (Emslie & Adcock, 2016; Kruger et al., 2016; Nel et al., 2016). Determining tourists' WTP for these species allows for research to determine tourists' WTP for encountering endangered species and their willingness to have threatened species numbers increased by the introducing more of them. To ensure the preservation and growth of the

endangered species within the park, park management can actively contribute to the increase in their respective populations. This allows the global and national population to increase and benefits not only the security of the species but the genetic pool of the animals within the park.

As it has been determined that tourists are attracted to the rarity and presence of endangered species (Bandara & Tisdell, 2004). It is also in the interest of national parks to preserve and grow the populations of threatened species native to South Africa. Determining tourists' preferences in how they value different endangered species could provide valuable information to park management in their conservation initiatives.

e. Carnivore species

Van Tonder et al. (2013), determined that in a study regarding tourists' preferences for seeing the Big 5, both carnivore species (lion and leopard) were the most preferred and most valued by tourists. The value attributed to each species was determined by analysing total spending cost and respondents' species preferences. This indicates that since carnivores have the highest preference, inclusion thereof into rewilded parks should be considered when determining tourists' WTP for a particular park.

Carnivore species could be the keystone species in a park or rewilded area, to maintain a healthy ecosystem in the long term. Keystone species are those that have a disproportionately large effect on the ecology of an area that they are a part of. The disappearance and reappearance of these species can cause large-scale changes in the area's biodiversity and ecology, this specifically applies to carnivore species (Thompson, 2020). The reintroduction of carnivores can be important for the maintenance of a healthy ecosystem, it was pointed out by Hayward et al. (2007), that the reintroduction of iconic predators will have an impact on the prey species and that careful consideration needs to be given before their reintroduction. This is information that needs to be curated in the CE to show that iconic herbivore species numbers could be reduced due to predators being introduced and that only a specific number of carnivores should be considered.

Supplementing the information on carnivores, a study done by Hayward & Somers (2009) identified that the general public is more attracted to carnivores and iconic species. This is one of the main reasons to reintroduce these types of species into parks. This is supported by Lindsey et al. (2007) who showed that the top three animal species for visitors to the Addo Elephant National Park were lion, leopard and cheetah. This is vital for the current study as

there are key carnivore species not currently habituating MNP. Potential carnivore species that could thus be reintroduced into the park based on historical occurrences are lion (*Panthera pardus*) and cheetah (*Acinonyx jubatus*). To support the importance of carnivores in nature reserves Hayward & Somers (2009) indicated that the reintroduction of species such as large carnivores is becoming increasingly more important for conservation management.

Since MNP being relatively recently established, no mega carnivore species have been reintroduced into the park, and thus the park lacks the presence of mega carnivores such as African lions, cheetahs, leopards and African wild dogs. Instead, types of smaller-sized carnivore endemic to the area are present such as black-backed jackal, bat-eared foxes, various species of mongoose, felines and even otters (Spies, 2017). Due to the free-roaming nature of wild dogs and leopards, it is very difficult and complex to try and maintain populations within parks. Therefore, like other national parks, the two most popular options would be to consider reintroducing lions or cheetahs. It is necessary for park management to identify which of these species are valued the most by tourists.

2.6.3 Ecosystem integrity, landscape, and invasive species

a. Introduction

For purposes of the current study, a further element of value that should be considered, is termed ecosystem integrity; this includes natural scenery, invasive species (including fauna and flora) and community involvement. Whilst parks draw the attention of tourists due to their exotic wildlife or biodiversity. People are also motivated by parks' natural beauty, appealing scenery and ecosystems.

b. Natural scenery and Invasive species

Abu Baka (2008) points out how different aspects of a park's natural scenery impact value assessment, through the inclusion of variables, such as rainforest, aboriginal artefacts, scenic beauty, recreation, and wildlife in a contingent valuation method study. Supporting their analyses was a study done in Nepal that generalised its characteristics into clusters that include the protection of nature, forests, wildlife, ecosystems, and the environment. Indicating that the ecosystems, scenery, and environment plays an important role for tourists (Lamsal et al., 2016).

Regarding the WTP for beach scenery and its preservation in Italy, it was found that there is a direct correlation between the scenery assessment of the respondents and their judgment of the landscape (Rodella et al., 2020). Landscapes (including that of the floral landscape and biomes of the natural area) are at risk of degeneration through challenges such as soil erosion, invasive species, and land change (including mining and agriculture activities) that can have a drastic impact on the natural landscape. This influences tourists' evaluation of value due to their assessment of the area's ecosystem integrity. Thus, it can be concluded that the protection and restoration of ecosystems could be utilised as a natural characteristic. Tourists would value the integrity of the ecosystem and nature area that they are going to, not just for the keystone species or wildlife, but for the environment itself.

Mokala National Park's land area has been significantly impacted by mining and previous agricultural practices (Spies, 2017). The park is also subject to numerous invasive species. A total of 27 alien plant taxa have been recorded within the park. In addition to the alien flora, there are four extralimital (species not being present in that geographical area (Dictionary.com, 2022)) mammal species and one insect species that have been recorded within the park. The majority of the alien plants were introduced for agricultural activity of the previous land owners (Spies, 2017). Some of these floral species, such as oleander, fountain grass and Red-river gum eucalyptus plants, have been identified as having a high threat to the park. Whilst invasive floral species do not always result in massive damage to the park, they can compete against local plant species by dominating the landscape as well as absorbing more water and littering the ground with foreign plant matter (Spies, 2017). Mokala National Park already has an ongoing alien species eradication program; it does so on a limited capacity depending on funds as well as due to the immediate damage that the species can cause.

The four extralimital mammal species are the sable antelope, impala, nyala and waterbuck. Although their current perceived levels of threat are low, having species not originally native or indigenous to the area puts pressure on the native ecosystem, where these species compete with other mammal species for food and water in the arid region. The park is mandated to preserve the natural area and rehabilitate the environment back to its old natural state by removing alien species that could upset the balance of the ecosystem. It could also result in a false representation of the native fauna to the area to tourists. Based on the Endangered Wildlife Trust's classifications, of the four extra-limital species, all except the sable antelope are not considered threatened within South Africa (Spies, 2017).

This creates an interesting opportunity to determine how tourists perceive these species within the park and could indicate how they value extra-limital species and whether they should be removed from the park. For example, when the threatened status of the sable antelope is compared to three alternative antelope species that are not threatened, it adds an additional complexity to valuing natural characteristics. Considering whether a species should be removed or not will assist in determining whether tourists value the protection of the local ecosystem more than that of the species not native to the area.

c. Community interaction

There is a scarcity of research on the value that tourists place on the community adjacent to or integrated in the park. This forms an integral part of valuing the area's ecosystem. This is because a community has its own economic system, and activity of such a community provides a source for cultural interaction between tourists visiting a park and the community. Furthermore, the park could benefit from community involvement in ecotourism and conservation as, for example, it could include hiring people for the park or producing a "spill-over effect" by the park and tourists to the community (Dumalisile et al., 2005). Furthermore, tourists are motivated by factors related to social conscience, as indicated by the study of Baral et al. (2008), wherein the contingent valuation component of the survey is required to indicate respondents' WTP for an increase in park fees relating to enhanced experience through cultural preservation and economic development of the area. Dumalisile et al. (2005) investigated how much more tourists are willing to pay to see an otter in a park in the Eastern Cape, specifically if they were led by a guide. There was an emphasis that this guide must be from the local community and that the WTP for a guide will lead to local job creation.

Cultural heritage tourism has been determined to be a major source of income for certain communities in developing countries. Demand for cultural heritage sites is influenced by the willingness and viability of these services by the local community to cooperate to influence tourism (Abouamoud et al., 2014). This is an indicator that tourists are willing to pay for cultural and community interaction and experience when they visit natural parks. (Duffus & Dearden, 1990) also note that "*many places of natural and social science knowledge must be successfully integrated to fully understand non-consumptive wildlife use".* This shows that community and the environment are related, and this aspect does drive tourism and the demand for non-consumptive wildlife use. These studies indicate that there is an opportunity to determine the impact of cultural and community factors on tourists' WTP.

2.6.4 Summary

The literature points to the various alternatives that impact the value individuals place on experiencing a natural resource or park. This could be the valuation of a specific animal species or in combination with the other natural aspect clusters. The value placed on an ecosystem's integrity also allows for a group of species to be considered (e.g., predator species or endangered iconic species) in order to attain their 'appreciative value'. In addition, the inclusion of the floral landscape, as indicated by determining the value of removing species not indigenous to the area to help regenerate the native landscape, should also be considered.

In this regard Baral et al. (2008) and Abu Baka (2008) point to instances where scenery and flora (e.g., rainforest elements) were included in determining value. This shows that an element of natural beauty and scenery could be used as a variable in the study. The complex interaction between mountains, rivers, or a specific biome that impacts people, also plays a part as a factor indicating potential value. These studies also indicate that there is an opportunity to include cultural and community factors as a question to tourists.

2.7 Financial support for conservation and national parks

2.7.1 Global view

Parks need to generate revenue to keep themselves operational and even begin to try to develop and expand in some instances. There are various ways to generate revenue for parks, such as park fees, recreational activities, selling produce from the park resources, allowing agricultural activities in and around the park, hospitality activities and other wildlife activities such as viewing wildlife and nature (Font, 2004). All of these are self-reliant methods to generate revenue. This is crucial as the majority of nature reserves and national parks rely on governmental funding and international aid to supplement or fully provide for the park's finances. James et al. (1999) makes the critical point that in developing countries, including all Sub-Saharan countries, protected areas receive, on average, less than 20% of their total funding required for the essential maintenance and management of the park.

Furthermore, Dublin et al. (1995) analysed developing countries' budgets, and due to political or financial challenges within those countries, more often than not, funding to protected areas is reduced by more than 50%. This shows there is already a challenge for governmental funding

with additional pressure due to maladministration and potential corruption within these parks. The report also indicates a steady decline in international funding for biodiversity since the 1992 Earth Summit (Spergel, 2001). This leads to many parks and protected areas in developing countries becoming mere "paper parks" (those lacking sufficient funding to maintain and manage the parks properly), ultimately leading to the deterioration of the park's ecosystem and infrastructure. Furthermore, there is a global conservation funding gap of US$ 200-300 billion per year (IUCN, 2021), with fewer than 6% of the countries analysed reporting that they have adequate resources for protected areas (IUCN, 2021).

These issues collectively show a clear need for better conservation management that allows for the sustainable generation of revenue. This could potentially include rewilding nature in certain protected areas to enable potential growth in revenue generation. As Edwards & Cyrus (1998) state, this conservation management should be combined with an all-inclusive approach that emphasises preservation of biodiversity whilst simultaneously allowing human activity, especially tourism, to help generate funding for these areas. According to Pettorelli et al. (2019) this combination of rewilding and tourism is relatively new to research. As of yet, not a lot of research has been done on the combination of these two factors. Literature reveals that there should be a way for protected areas to generate funding by themselves (e.g., through tourism). Therefore, the current study would highlight the link between the value of rewilding and the natural aspects that are being rewilded for tourists.

2.7.2 South Africa context

In the South African context, SANParks reported in 2017 that only five of the country's twenty-two national parks are financially viable and made a surplus (Spies, 2017). These parks (including MNP) are dependent on SANParks' government-determined budgets rather than sustaining themselves and generating surplus revenue. This is highlighted by the fact that 77% of tourists who visited SANParks parks were hosted by only two parks namely Kruger National Park and Table Mountain National Park (IUCN, 2021). Although governments have mandates and budgets to support national parks, parks should find ways to support themselves partially or fully at times.

Conservation and tourist industries are vulnerable to major international events and influences, such as the covid-19 pandemic. SANParks in the year 2019/2020 already had a 41% reduction

in surplus due to an ever-increasing expenditure bill and only a mild 5% growth in total revenue (South African National Parks, 2020). Furthermore, the pandemic greatly influenced tourist activities, resulting in a further 21% drop in total revenue due to a 66.4% year-on-year decline in tourism (South African National Parks, 2021).

It is essential to identify how to generate revenue for parks and wildlife areas and, perhaps more crucially in what context it must occur. Are natural areas just set aside for tourists and tourist activities or must there be a balance between human activity and nature? These factors also impact MNP and its rewilding efforts. The annual budget of MNP in 2017/2018 indicated that only 0.8% of the park's expenditure was on reintroduction, while the overwhelming majority was on responsible tourism at 31.6% (Spies, 2017). This indicates that there are limited financial grounds for reintroducing species. Thus, there needs to be an effective plan to enable the most preferred and "valuable" species from a tourist viewpoint. This creates an incentive for the current research study to be done in order to attract more tourists as there is a low revenue base and low tourist rates. Therefore, park management can benefit from studies such as this.

2.7.3 Future steps

According to Jorgenson (2015), the organisation "*Rewilding Europe",* whose main aim is landscape restoration, "the process of rewilding is not about going back in time, but instead, the focus is on giving room to allow nature to develop spontaneously, in a modern society".

Therefore, rewilding is about moving forward and combining human activity and nature in a sustainable manner (Edwards & Cyrus, 1998). This is a critical point of view for national parks and nature reserves that try to balance preservation and biological restoration with human development, such as park infrastructure and tourist activities. This links with the studies of Edwards & Cyrus (1998) and Verbic & Slabe-Erker (2009), both point out how the value of diversity is crucial for the survival of humanity and the benefits it provides for human wellbeing. Whilst their aim is also for protecting and enhancing nature, they still advocate for a new type of conservation model that incorporates people and nature. Pettorelli et al. (2019) cover an extensive amount of work on this new concept and its biological implications that it has across the world. The study highlights an essential point regarding protected parks in Africa, when describing that not all African countries have the proper governance structures and social or physical infrastructure to make conservation areas work. It continues to explain

that ecotourism is the economic lifeline for conservancies, parks, and other wildlife areas. Ecotourism also greatly benefits people living adjacent to these wildlife areas (Pettorelli et al., 2019). This indicates that there should be a balance to better develop parks from a biological perspective, such as rewilding them to ensure adequate infrastructure to allow nature-based tourism or ecotourism to promote revenue and job creation.

Separating man from land is perceived as a colonial concept that would not necessarily be the best option going forward, especially in the continent of Africa. Thus, National Parks that allow tourists and the public to view their natural environment are crucial for developing and protecting more natural land. This is vital to how rewilding parks should be considered in Africa. In view of this, the current study aims to incorporate the biological elements back into these natural parks being rewilded but maintain a sustainable and cohesive relationship with development within it. Therefore, the park should satisfy the needs of people in the area without endangering the future of the natural environment (Edwards & Cyrus, 1998).

More holistic views of natural resources management need to be integrated within human society where natural landscapes can return to benefit nature and people. Therefore, nature needs its space to thrive and for biodiversity to exist and help mitigate climate change such as supporting national parks.

2.8 Tourism

2.8.1 Tourism as an Economic Sector

Tourism is one of the main economic sectors across the globe, with the tourism industry contributing up to 10.4% of the world's GDP in 2017, and a large number of countries rely heavily on tourism (UnitingTravel, 2018). Tourism employs a large number of people, especially in developing countries, as it is part of the service sector and a significant source of income and revenue for many regions and countries. The World Tourism Organisation defines it as being “limited to holiday activity only, where people travel and stay in places that are outside their environment that is not longer than a year, yet longer than 24 hours” (UNWTO, 2021). International tourism is defined as tourism that crosses national borders, as opposed to domestic tourism, which is tourism that involves residents of a country only travelling within that country (UNWTO, 2021). International tourist arrivals, described as overnight visitors that cross national borders grew 4% in 2019, the year before the covid-19 pandemic and reached

one and a half billion arrivals reported by destinations across the world (Blackall, 2019). Despite the growth in international tourism the Covid-19 pandemic had a severe impact on the international tourism industry, travel restrictions were implemented resulting in a low demand of traveling across the globe. The United Nations World Tourism Organisation reported that international tourist arrivals across the globe will decrease between 58% and 78% in 2020 and would result in up to 0.9 - 1.2 trillion American dollars' worth of international tourism receipts being lost. Major tourist-dependent cities worldwide reported that planned travel was reduced to up to 90%. This significant drop in international tourism did result in nations encouraging domestic tourism to provide help for their local tourism sectors.

Tourism is a generic term that could include various types i.e., agritourism, culinary tourism, cultural tourism, sports tourism, ecotourism, wildlife tourism, geotourism, medical tourism, wellness tourism and nautical tourism (UNWTO, 2021). The current study focuses on *Nature-based tourism* and defines it as ″any type of tourism that relies on the tourist directly experiencing natural attractions; this includes ecotourism, wildlife tourism and nature retreats″. Nature-based tourism can offer a mixture of conservation and tourism.

Nature-based tourism directly depends on natural resources in a relatively undeveloped state, including scenery, water features, vegetation, and wildlife (Job & Paesler, 2013). Ecotourism is the main form of nature-based tourism that is significantly intertwined with conservation and conservation efforts. This type of tourism is a form of nature-based tourism that does not have a significant negative impact on the environment. Ecotourism encompasses a sustainable kind of tourism that does not damage the environment but can actually benefit it in the long run. Activities include, viewing wildlife and natural scenery to boost tourism industries and preserve biodiversity. Wildlife tourism is a primary subsidiary of ecotourism, principled around observing and interacting with wild animals in their natural habitat. This could be active involvement such as hunting or a passive involvement like wildlife watching and photography. Wildlife tourism can also include viewing the environment and natural scenery rather than just a case-specific animal. This includes tourists visiting national parks or game reserves to observe animals in their natural habitat (UNWTO, 2021).

Nature-based tourism can also positively impact local, regional, and national economies since it creates certain economic benefits supporting wildlife conservation (Job & Paesler, 2013). Therefore, it can be concluded that protected areas are a major tourist attraction source. As

international tourists pay in foreign currency, it could be an excellent way to generate additional revenue and protect nature.

2.8.2 Effects of tourism on human-nature interaction

According to Tapper (2006), if adequately managed, wildlife tourism can be a tool for enhancing and protecting biodiversity. Thereby, allowing tourist activities in the area, will contribute to the conservation of biodiversity. It must be noted that tourism can threaten the integrity of ecosystems and could influence the wildlife populations' behaviour within these parks (Steven & Castley, 2013). As significant progress in rewilding efforts continue alongside the development of nature-based tourist activities, one contentious issue remains: What should humans' role in relation to such rewilded spaces be? In this regard, it is necessary to indicate the links between natural spaces and human interaction and the role of tourism in this interaction. Research suggests that a range of opinions exists, from the complete separation between humans and nature in protected areas to a variety of views on what interaction should be allowed. For example, George Monbiot, in his seminal book *Feral: The case for rewilding,* emphasises the Pleistocene rewilding ideology and favours the complete separation of nature from people in protected areas whilst reintroducing species that resembled those from that era (Monbiot, 2013). Whilst he is an avid supporter of nature, he is part of a chorus of calls for nature and humans to be completely separate at times. Indicative of this view is the definition that the IUCN has for its strictest type of protected area (i.e., category 1a), reading: “protected areas should be set aside for biodiversity protection and that human visitation and use is strictly controlled” (Pettorelli et al., 2019: 26). This implies that there should be limited to no human activity in these natural areas. Other, less extreme views include various degrees of interaction. IUCN Protected Area Categories is a case in point, and it classifies protected areas according to their management objectives. The following table provides an overview of these different types of protected areas, by providing the IUCN classification and definitions of these different protected areas shown by their different levels :

Table 1: IUCN classification of different protected areas

Ia) Strict Nature Reserve	Human visitation, use and impacts are strictly controlled and limited to ensure protection.
Ib) Wilderness Area	Areas are largely unmodified or slightly modified without permanent or significant human habitation.
II) National Park	Areas that are set aside to protect large-scale ecological processes but provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational and visitor opportunities.
III) Natural Monument or feature	Areas set aside to protect a specific natural monument; these areas usually have high visitor value.
IV) Habitat/Species Management Area	To protect particular species or habitats usually active management and intervention is required as the areas may not be self-sustaining.
V) Protected Landscape/ Seascape	Protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural, and scenic value.
VI) Protected are with sustainable use of natural resource	Areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems.

Source: (IUCN, 2021)

The various types of protected areas and their levels of interaction indicate that the idea of a protected area is not one-dimensional but rather complex. Some allow for human interaction, while in others, it is discouraged. This is, therefore, important to distinguish levels of how nature should be treated from a human activity perspective and to determine how humans and wildlife should coexist and in what form. For example, whether there should be areas of strict nature reserves or allowing humans to enjoy nature in national parks. Tourism and utilising tourists' preferences can ensure the various types of interaction.

There needs to be sustainable and ecologically viable management of the parks, as merely reintroducing certain non-native species or keeping them captivated in a fenced-off area can adversely affect the land and the natural biodiversity. This can be seen in the Kruger National

Park, where the creation of man-made watering holes resulted in vegetation clearance in the areas surrounding these watering facilities. This led to the populations of certain species such as roan antelope or mountain reedbuck diminishing because they were easy prey to predators when they went to drink in these open spaces (Hayward et al., 2007). This point is reinforced by Leader-Williams (2003), who highlighted the fact that in protected areas' where tourism activities are dependent on charismatic megafauna (e.g., lions or elephants). Park management priorities and policies might be altered, which may negatively influence the biodiversity and conservation activities of the park negatively. Thus, careful consideration should be given to aligning tourists' preferences and conservation imperatives.

2.8.3 Drivers of tourism

Rewilding as a means to direct nature-human interaction can be a valuable guide to conservation efforts. In particular to assist in generating revenue through tourism to the area. It is therefore critical to investigate tourists' attitudes towards parks and attractions at parks. For example, based on the study from Boshoff et al. (2007), it can be concluded that the views of tourists to national parks supply crucial information to guide park planners and managers. This is key to the current research as it acknowledges that the views of the tourists are important and that based on their needs, and whether they could be met, potentially resulting in an increase in tourism growth to a park. Identifying the motives and demographic factors of nature-based tourists can assist in identifying the correct parameters and natural characteristics that need to be valued for rewilding purposes. Lindsey et al. (2007), states that international nature-based tourists that visit South Africa are mainly interested in viewing large predators in their natural environments as opposed to seeing the fauna in zoos or domesticated forms. Therefore, it can be determined that tourists appreciate animals in their natural habitats and observe their natural behaviour (Tapper, 2006). Although it is important to note that domestic tourists had a more diversified view which included avifauna diversity, flora diversity and scenery and are less interested in high-profile animal species. Tapper (2006), also shows a significant increase in wildlife tourism that could either be consumptive or non-consumptive. There is also an increase in demand for wildlife tourism which primarily includes animals that are endangered or unusual (Rodger et al., 2007), as well as non-captive animals that are attractive and interesting.

This further expands into the need for parks to incorporate financial generation methods for the park to become partially or wholly financially sustainable and potentially independent from governmental and foreign aid. To assist in how tourists' views can be used to increase financial contributions, it is helpful to determine the role of motivating and demographic factors in their evaluation of the nature-human interaction. This is a crucial potential for MNP, which hosts a wide array of endangered species and iconic herbivores such as black rhino, white rhino, roan antelope, and sable antelope.

a. Motivating factors

For tourists to travel outside of their home environment, they need intrinsic travel motivations to push them to go off to different destinations. Travel motivation for tourists to protected parks can be numerous and complex such as, different types of attractions and destinations can drive other travel motives (Saayman, et al., 2010; Van Tonder et al., 2013). Meyer (2015) deduced that the main types of motives are education about nature, self-actualisation, participation in recreation and social contact. Tourists have different reasons to visit different areas of attraction, including enjoying nature and activities, culture, relaxation, novelty, escape from routine, education, and family.

Meng et al. (2006), measured tourist's satisfaction by attribute and motivation and concluded that the quality of service and lodging was quite important. Still, the *location* had more significant importance in the satisfaction evaluation. This is crucial as it shows that tourists that arrive at the park are already motivated to be there due to its location. This means that instead of the park focusing exclusively on the responsible tourism aspect, other themes could attract tourists more such as the reintroduction of wildlife and the rewilding of the park's natural scenery. It was also determined that there is a link between the sustainability of a park and whether or not a flagship species (e.g., a particular mammal or bird), was present. If a flagship species was present, it led to a higher chance of the park being sustainable (Kruger, 2005), as it addresses tourists' motivation to visit the park with a resultant increase in visitors and revenue.

b. Socio-demographic factors

Another point that is highlighted by similar research is the socio-demographic factors for example; age, income level, gender, education, and family size or number of people that influence the valuation of the parks (Van Tonder et al., 2013). These variables could contribute

to understanding the reasons offered on why tourists go to protected areas. This is relevant to the current study as it could assist in identifying differences in preferences between various demographic groups. It should support research in the study by being incorporated as potentially extra information that could be analysed further in the econometric models. This could help identify which type of characters value whichever aspects the most.

For example, recent studies have distinguished that in protected areas in South Africa, wealthier and less experienced tourists were primarily interested in charismatic megafauna. Yet, the opposite was true for more experienced tourists and those that fall under a lower income bracket as they preferred a broader range of species (Di Minin, 2012). This is further highlighted in that in protected areas, the Big Five species, as well as other iconic and endangered species, such as the African wild dog and cheetahs, have significant financial benefits to local stakeholders (Di Minin, 2012). This is supported by Leader-Williams & Dublin (2000) showing that there is a narrow viewing preference for species classified as charismatic. Previous studies have also determined that the types of tourists involved in nature-based activities tend to be older, with higher income and education levels compared to the general public (Meric & Hunt, 1998). This study will utilise these socio-economic variables and determine to what extent they influence the valuation preferences of visitors to MNP.

2.9 Review of Valuation Methods

The review of valuation methods will firstly discuss the total economic value and WTP. Following will be the topics of economic methods for measuring environmental and resource value i.e., revealed and stated preference, and their subsequent methods will be addressed. This will determine what type of methods has been used in previous studies and why CE, a stated preference method will be chosen for this study.

2.9.1 Total Economic Value

In economic theory, the economic value of a resource can be broken down into two parts: use value and non-use value (Tietenberg, 2014). Together these two values create the total WTP of an individual, for a resource. Use value can further be split into direct and indirect use, as well as option use-value. Direct use value: can be defined as the actual use of that resource, like the water component used in manufacturing and agriculture or the value of wood in the

logging industry. Indirect value: is the value from a resource that an economic agent is experiencing indirectly, such as ecosystem services, the value that an ecosystem gives by cleaning the air that a company nearby benefit from. Indirect use-value could also be a source of income, such as wildlife watching and going to natural sceneries. The third type of use value is the option value. Option value: is the opportunity to use the resource in the future if it is not utilised at the moment. Such as a nearby forest that could potentially be used for logging in the future (Tietenberg, 2014).

Non-use value comprises of two different types of values namely bequest and existence value (Tietenberg, 2014). These are subjective values and are difficult to determine. Bequest value: indicates the WTP for knowing that future generations can experience this resource. Whilst existence value is the WTP, to have this resource continue existing even if the individual never experiences it. This, for example, is knowing the Amazon rainforest exists, and you value it even though you will never see it or experience it.

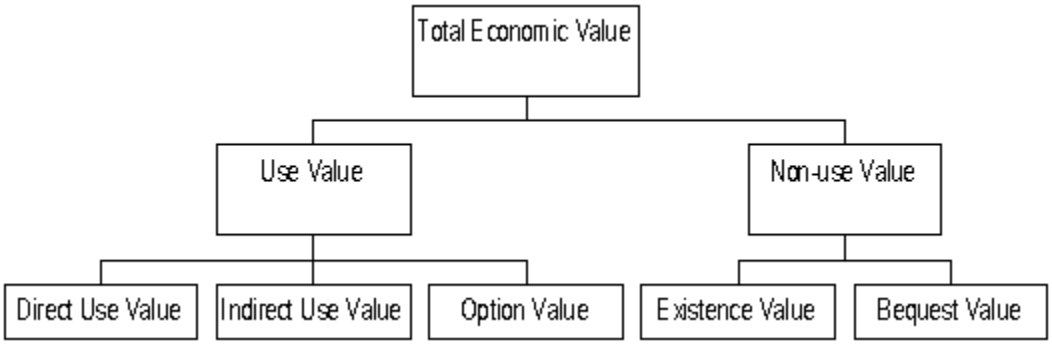

Figure 2: Total Economic Value (Turker, Ozturk, & Pak, 2020)

As mentioned, the indirect use value, otherwise known as non-consumptive use, can be utilised for certain economic activities such as wildlife watching. Yet, it has been shown that determining the monetary value of wildlife in their natural environment is very difficult. This, for example, is to determine the monetary terms that a visitor would value the sighting of a particular species in its natural environment, such as a national park. According to the research done by Hay & McConnell (1979), back then in 1979, no study determined the net economic value of wildlife watching and research was still limited.

This point is reinforced by Wagner (1989), who states that more research needs to be done to understand the non-consumptive value of different species better. The payment of park fees

from tourists can also be further analysed as an indirect cost component to determine the value of sighting specific wildlife. This is due to the subjective influence in calculating the different prices for each exact species that is viewed.

According to Driml (2010), knowing the economic value of change in an environment is essential because it can help determine a cost and benefit analysis that could be linked with the specific natural environment. Therefore, understanding the economic value derived from wildlife tourism and all the variables and factors influencing the visitors' WTP for a particular animal or predator can assist the management in prioritising which species to rewild, to attract more tourists.

The WTP for market goods is determined by using microeconomic theory that can be based on the values of real-life demand and supply. The WTP for nonmarket goods is more complicated and includes a complex process to elicit these values. It requires the study of behaviour or deductions from consumers' demand of a specific good or even through an individual's response to questionnaires and surveys that utilises a hypothetical market (Tietenberg, 2014). These values can be determined by using environmental valuation techniques.

2.9.2 Ethicality of valuing nature and wildlife

Ethical issues have been raised with valuing non-marketed goods due to the perverse nature of putting a price on the value of life and specific natural resources (Conniff, 2012). In the context of this study, it is not done to value the animal or natural aspect for human use purely, but to provide a monetary perspective of the value that certain species, ecosystems, or the environment can provide. This valuation can also be used to determine the damages humans enact on the environment. Such as determining the damage that an oil spill can have on a certain ecosystem or local environment, thus identifying the reparations that the company must pay for the damages. This is shown in the BP Deepwater Horizon oil spill in 2010 in the Gulf of Mexico, resulting in up to 17.2 billion dollars in environmental damage (Gaworecki, 2017). It can be further used in tourism, such as the study done by Saayman & Saayman (2014), to determine the WTP and human behaviour to elicit a better understanding of human actions and their preferences. It has also been noted that whilst the environment can be given a monetary value, people can misuse this by simply paying for environmental damages if their benefits outweigh the costs. This, for example, allows certain wealthy companies or individuals to easily choose between developing a factory in a rare natural area if they can afford the costs.

This still results in the natural area being destroyed, and the natural value of the environment is lost. Essentially what is being determined is how much we should pay to destroy the environment, including living creatures and cultural and unknowing systems of life. Therefore, it should be noted that ecosystems can also provide invaluable services that cannot be measured through an economic lens. This is because these services are not substitutable and cannot purely be replaced with capital or investments into other man-made services. Therefore, they would have a non-consumptive value that would be higher than what economic use value could be elicited.

2.9.3 Environmental Valuation Methods

a. Introduction: Revealed and Stated Preferences

There are two broad groups of valuation methods; revealed preference and stated preference methods. Revealed preferences include market price, which is easily distinguished and utilised for marketable goods. Revealed preference also includes indirect methods of estimation such as hedonic price valuation and travel cost (Tietenberg, 2014). Stated preferences offer a simplistic version of this method and ask individuals in a research instrument such as a survey, what value they place on an environmental aspect and the change or preservation of that resource. Due to the respondents' decisions being subjective, the two methods, contingent valuation method and CE will create a hypothetical market from the WTP. This value is described as being contingent on the natural aspect being investigated (Tietenberg, 2014). A discrete choice model will cause preference to be added to a variety of choices given to the respondents, thus determining the respondents WTP and their preference.

b. Revealed preference

The main types of revealed preferences used in environmental valuation are the travel cost method and the hedonic price method. The travel cost method is an economic valuation method of determining the value of environmental goods and services through the analysis of recreational activities of those resources. Such as determining how much an individual spent to get to a park, thus using this information to determine a demand curve from the individual's WTP. Becker (2005) used this method to determine how the increase in park fees would influence tourist activity. Yet, this method does not determine the economic benefit of these natural resources. This method is further used in studies such as, Nir Becker (2005), Iamtrakul

et al. (2005) and Fleming and Cook (2008), to determine the influence that increasing park fees would have on the parks' number of tourists and revenue changes. This is a common method used to determine financial strategies for nature reserves or parks and policies regarding park fees. For example, an application of this method was used where the main attraction to the park is European griffon vultures in a nature reserve in Israel (Nir Becker, 2005). This applies to the current study as it will also look at a specific natural attraction. Yet, the paper goes on to determine how the park should change its fees and how that would financially impact it.

Another view to look at the travel cost method is that it uses a cost-benefit analysis that is primarily based on three elements: (1) changes in access cost, (2) the creation or destruction of recreational sites and (3) changes in the environmental quality of the specific area. The method determines the WTP of the respondents by measuring the number of trips they would make to the site when one of those three factors changes (Zawacki et al., 2000). This is not ideal due to two assumptions that often fail for this method: (1) It is not always the case that tourists will respond to the changes in travel costs similarly to the changes in entrance fee costs of a park, and (2) a person does not always specifically travel for one reason if there are multiple destinations the value for the leading destination can be overstated (Saayman, 2013). Another vital weakness that should be taken into consideration is that the non-use value is not calculated in this process.

Another type of revealed preference method is the hedonic price method; there have been limited studies utilising this method to elicit the value of natural characteristics of a national park on property prices. An example of such a study is Garrod & Willis (1992) which identified countryside characteristics such as woodland or marshes on house prices, thus identifying the marginal cost of these characteristics. This method is described as a method that can determine the economic value of a non-marketed good such as an ecosystem or its equivalent services by looking at how it is directly affected by surrounding market prices. A typical example is looking at housing prices' circumstances, which reflect the surrounding local environmental attributes. The method is based on the premise that the price of a certain marketed good is directly related to its characteristics. An excellent theoretical example is valuing the price of two identical houses but with different environmental surroundings, such as a forest by the one and not the other. This difference in cost is the environmental characteristics implicit value. Studies such as Powe et al. (1995) and Mok et al. (1995) used this method in the real estate market to try and determine surrounding attributes on the price of the resulting properties.

What differentiates this method from the study at hand is not to determine the change in cost-benefit via park fees precisely but to be more accurate in determining the appreciative value of specific natural aspects of the park. Determining the value individuals place on these natural aspects or the WTP could help parks determine how to strategize their parks' rewilding and financial plans accordingly.

c. Stated Preference

Stated preference methods are survey techniques that elicit the WTP for marginal change, predominantly to determine the difference in the environment (Tietenberg, 2014). The contingent valuation method (CVM) has been described as a method used to determine the economic value of nonmarket environmental goods such as wildlife (van Tonder et al., 2013). Studies that have included CVM to determine an individual's WTP for wildlife or nature include the following Dumalisile et al. (2005), Abu Baka (2008), Baral, et al. (2008). According to Portney (1994), the two main advantages of CVM are that it is a method that reveals values that cannot be deduced from behavioural techniques or other economic methods (e.g., existence value). Secondly, this method relies on hypothetical scenarios. Thus, the surveys and questionnaires can include multiple cognitive processes that can help determine the value of environmental resources.

Some of the main problems with utilising the CV method is that the manner of payment is indirect and that it has to be deduced by utilising the willingness to pay from respondents. The willingness to pay that are determined has certain biases attached to them. According to Tietenberg (2014) four different biases have been identified in relation to contingent valuation methods. Namely; (1) strategic bias, where the respondent intentionally choose an answer to skew the results in their favour. (2) Information bias, this arises when the respondents have little information available about the topic and make uninformed decisions. (3) Starting-point bias, this bias occurs when the respondent is posed with a predefined range of options. This range chosen by the researcher can greatly influence the how respondents view the topic at hand and how they make their choices. Lastly, (4) hypothetical bias, occurs when the situation that is posited to the respondent is a hypothetical scenario that is not easily imaginable or applicable to the problem at hand. Therefore, respondents can envision an inaccurate willingness to pay from respondents (Tietenberg, 2014).

It was also identified that there are several apprehensions using the CVM technique. Some of the reasons identified were that the willingness to pay figures that were determined seemed to

be unproportionally high. The second concern was that it is difficult for researchers to determine if the respondents fully grasped the issues at hand in the study (Tietenberg, 2014).

2.9.4 Choice Modelling

Choice modelling is another type of stated preference method. It is a questionnaire-based technique that extracts individuals' preferences from choices made between different hypothetical scenarios. Discrete choice experiment (CE) also been described as just a choice experiment is the most used type of choice modelling method. This method uses different choice scenarios that respondents can choose from and allows analysis to depict better how these respondents value these goods. Examples include the determination of the value of landscape development and the protection area of Volcji Potok in Slovenia done by Verbic & Slabe-Erker (2009), the preservation of sharks in Costa Rica, by Berrios (2017), the valuation of a diving site in Indonesia done by Emang et al. (2020) and valuing different preferences for wildlife in a nature reserve Di Minin et al. (2013).

DCE presents respondents with a series of alternative options with different attributes and levels from which they choose their most preferred choice. A status quo option is preferably included, forcing individuals to choose an alternative to the current state or maintain the status quo. Not including the status quo can yield inaccurate estimates of consumer welfare (Oehlmann & Meyerhoff, 2017). DCE solves some of the problems from other stated preference methods such as CVM. Whilst a CVM presents a unique scenario to the respondent, so that the WTP for a specific scenario can be elicited. The DCE allows for the elicitation of preferences of attributes that describe the environment of the scenario being looked at, rather than a set scenario. By removing the focus on the willingness to pay in the CVM scenario, DCE allows for a reduction in strategic bias. It has also been concluded by Hanley et al. (1998) that DCE is better at determining marginal values of characteristics, whilst CVM is preferred for valuing total packages. Thus, for a study such as this being able to determine the individual characteristics that make up the park management policy is more important than looking at the whole area together. This offers an advantage because park managers would be able to look at individual attributes and the marginal value of changing these attributes. Secondly, these attribute values that are determined are easier to transfer to a different site if the supporting empirical research has been done there, whilst CVM would be the whole site based. DCE is

frequently used in health economics, determining environmental valuation, and ecosystem services.

Types of choice modelling that are based on the same principles as CE that can help in creating the most effective type of questionnaire are as follows:

The contingent ranking is a method that is very similar to CE that also shares the different alternative options. Yet, in contingent ranking, the main difference is that individuals rank all the alternative options with other attributes and levels. Ranking the data can provide more statistical information, thus resulting in smaller confidence intervals, yet it does have some limitations. It results in a sequential choice process where after an individual chooses their most preferred option, they will then choose the following option out of the remaining choice sets, Contingent rating is a different method in which the process is related to contingent ranking and CE. Respondents rank the options on a numerical scale when this method is used. Since this does not demand a direct comparison of alternative options, it can be derived that there is no direct theoretical link between the individual's choices and economic decisions.

Conjoint analysis is a survey-based technique predominantly used in market research, which also determines the value of different attributes regarding a specific product or service. Distinguishing between the conjoint analysis and that of DCE, Louviere et al. (2010) determined that conjoint analysis is mainly inconsistent with economic demand theory and representing numerous inconsistencies that make it unfavourable for applied economics. On the other hand, CE has been thoroughly tested on the theoretical bases of random utility theory.

Utilising the CE via questionnaires allows the researcher to identify numerous variables that can influence and/or play a role in the decision-making of WTP. This will enable researchers to determine the correlation between various variables ranging from socio-demographic factors of the respondents to the actual preference these respondents place on different characteristics.

2.10 Summary of Literature

The review of literature allows the conclusion that due to the decimation of natural wildlife around the world, rewilding can be a viable tool to help conserve biodiversity, boost the numbers of endangered species, and preserve land. This is also a tool and method that protected areas could use to market to tourists to increase the parks' visitation. Attracting visitors could assist nature reserves, especially those in Africa and other developing countries, to address

their struggles to become financially sustainable. This is crucial for parks in developing countries that overwhelmingly rely on governmental aid. Thus, finding a balance between increasing tourist numbers would provide financial relief without negatively impacting the natural environment.

It was determined that there are various motivating factors as well as socio-demographic variables that influence tourists to visit a protected park. In addition, numerous types of natural characteristics of parks influence the tourists' decision to go to that location. For example, the park's keystone and iconic wildlife species and ecosystem integrity serve this purpose. This displays that there is a need to determine the 'appreciative value' of these natural characteristics of a protected area, and in this study's case, it was applied to MNP.

Lastly, the total economic value was explained, and stated preference methods were reviewed. It was concluded that using the CE method, is a viable method to determine how tourists value these different characteristics and which they prefer the most, as the CE allows preferences and even heterogeneity in the sample population to be identified. It can be deduced that the CE method can be the best equipped to help determine the appreciative value of the different natural aspects of a protected area.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The research objective of the study is to determine MNP visitors' preferences for different attributes of the rewilding strategy. For this study, the economic value is understood as the marginal WTP of the MNP's visitors to see these changes. The changes considered are reintroducing carnivore species, reducing non-native species to protect the ecosystem, and introducing threatened species to boost current populations in the park. In order to calculate this WTP, an online survey was conducted that included a CE where respondents were allowed to choose among different configuration options MNP can apply when considering the changes. This chapter covers the research methodology, including the questionnaire development, research design, sampling, and data analysis method. However, the chapter starts with information on the study area, i.e. the MNP.

3.2 Study Area: Mokala National Park

The study focuses on the MNP in South Africa that has undergone and is still going through the rewilding process. MNP is located 89.6 km south of Kimberley in the Northern Cape Province and is one of the newest national park in South African (SANParks, 2020). Figure 3 shows the maps and the geographic location of the park

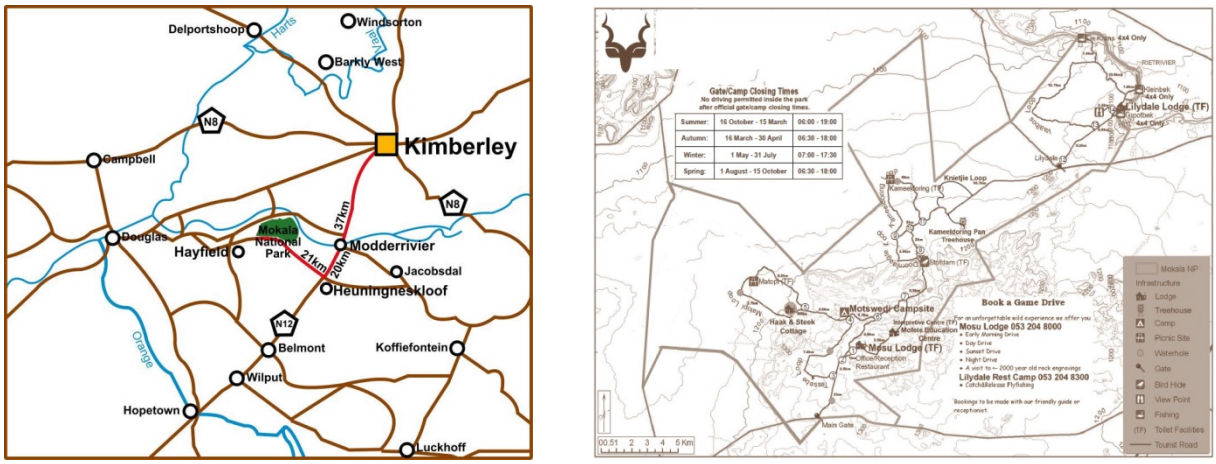

Figure 3: Map of Mokala National Park in relation to Kimberley and Map of Mokala National Park (SANParks, 2020)

Mokala National Park consists of 19,611ha of vegetation and hospitality facilities. Among these are fully functioning accommodation and camping sites aligned with SANParks regulations. The park started the process of rewilding by reintroducing numerous types of wildlife back into the park in 2007 and subsequently eradicating invasive species. It is currently prepared to enhance these rewilding efforts by bolstering current populations and increasing the number of species in the park (Spies, 2017).

3.3 Tourist motives in Mokala National Park

The designation “national park” in the name of a park is closely associated with nature-based tourism and has a more substantial effect on tourists than other protected area labels (Wall Reinius & Fredman, 2007). This results in the status as a national park influencing tourists to visit the area instead of other designated natural areas; this gives the name of the natural area a type of brand. The classification of the wild regions is important as labels are attached to the classification name. This applies to MNP as being proclaimed as a national park is already a motivation in itself for domestic tourists to visit the park. Tourism motivation in MNP also refers to what a tourist needs to participate in tourism activities. These are generally identified through either push or pull factors. Push factors influence the tourist's desire to travel, whilst the pull factors are regarding the attributes of the destination (Pesonen et al., 2011). These could include the following:
Pull factors of Mokala National Park could be that of:

- Mammal diversity,
- Bird diversity,
- To experience nature in its natural state

Push factors could be that of:

- Tourists to view and enjoy the scenery
- Break from the city
- Rest and relaxation

Based on these factors, the park offers an array of products aimed at attracting visitors and fulfilling its mandate as a national park. Among these products, the following can be highlighted:

3.3.1 Overnight accommodation

The park allows overnight accommodation and has numerous types of lodging with varying levels of quality. These range from standard self-catering units like the Mosu Lodge, the Lilydale rest camp, Mofele Environmental centre, and Motswedi Camp Site. More luxurious types of accommodation can also be found at the Haak and Steek Camp, Tree Top Cottage and even a Stofdam Bird Hide.

3.3.2 Activities

The park offers various activities to attract tourists and keep them occupied during their visit. Among these are safari-type drives, including morning, day, sunset, and night drives. These can be enhanced with a bush braai experience that combines a game drive with a bush dining experience. The park also offers guided rock art and other cultural heritage site tours. Further activities include picnic areas and fly-fishing at suitable sites in the park.

3.3.3 Vegetation of the park

Two types of biomes are present within the park, namely the Savannah and the Nama Karoo biomes. The former consists of two vegetation units: the Kimberly Thornveld and Rocky Shrubland. In the northern part of the park, the Nama Karoo Biome is present, consisting of vegetation of the Northern Upper Karoo biome. The park has integrated conservation objectives that try and conserve the two main types of biomes. It is stated in the MNP, Park Management document (Spies, 2017) that there are still areas that are fenced off that would need better rehabilitation. These fenced areas are designed to prevent herbivore species of the region from damaging vegetation in areas where fauna is under pressure as it inhibits vegetation rehabilitation.

3.3.4 Wildlife

The wildlife offering of MNP consists of avifauna and mammals that play a vital role as products.

a. Avifauna

The park has recorded up to 303 bird species, of which eleven are threatened. This is an abundant number of species for such a small park, mainly due to the different types of vegetation and biomes occurring within the park's boundaries.

b. Mammals

The park consists of a wide range of mammal species resident in the area. Twelve species were reintroduced to the park during the last decade after the proclamation of the park (Spies, 2017). The park has specifically focused on the reintroduction of herbivores and specifically rare species, which include Black Rhino, White Rhino, Disease-free Buffalo, Tsessebe, Roan Antelope, Mountain Reedbuck, Giraffe, Gemsbok, Eland, Zebra, Red Hartebeest, Blue Wildebeest, Black Wildebeest, Kudu, Ostrich, Steenbok, Duiker and Springbok. It is important to note that some of these mammal species are classified as vulnerable or endangered such as the roan antelope, sable antelope, black rhino and tsessebe by the South African National Biodiversity Institute and Endangered Wildlife Trust.

In conclusion, the MNP is a small but biodiverse park in the Northern Cape Province. The park strives to become a success story by rehabilitating used land into a natural landscape and systematically reintroducing regionally extinct species. There is a lack of predator species in the park, but the park is encouraged by its recently rewilded megafauna and the rehabilitation of the park's natural areas. Numerous activities are available to visitors and historically significant cultural heritage sites within the park.

3.4 Research design

3.4.1 Introduction

The study uses a DCE to determine participants' WTP for various natural attributes of MNP. In order to do this, a structured questionnaire was developed and completed by tourists who have visited the park. This allows the study to focus on explicitly differentiating the various clusters of natural attributes and choosing preferred wildlife that could be analysed within the species-specific cluster. This allows for determining the relative importance of different natural aspects in relation to each of the attractions, and an appreciative value between specific rare and iconic species could be determined and further analysed. The questionnaire was developed

through the following distinct stages, (1) an initial pilot study, (2) a refined pilot study, and (3) the development of a final questionnaire to be used in the DCE. Once data was collected, the DCE followed through a conditional logit model and an LCM, whereafter welfare estimations were completed. These processes are discussed in more detail below.

3.4.2 Discrete choice experiment

The theoretical foundation of the CE is based on random utility theory (RUT) and Lancaster's consumer theory (McFadden, 1974). Lancaster's theory is defined as follows: "A good is defined by its attributes and the subsequent different levels of these attributes.". This quote denotes that the good does not give the utility, but the attributes do. The theory developed by Kelvin Lancaster (1966) allows the ability to predict how preferences will change when the choice sets that are presented to consumers are changed. From this, a shadow price can be calculated for each characteristic, allowing the utility to be attributed to these characteristics or levels. Taking this a step further allows the utility maximisation to be calculated. This falls in line with Lancaster's idea that the total utility that is provided from a product or service is the resulted sum of all the individual utilities that the attributes of this good or service provides. Supporting this notion, is that utility theory follows the idea that individuals are profit-maximisers, and they are only self-interested. Therefore, this self–interest that they display maximises their effort and ability to save time and ultimately maximises utility (Stigler & Becker, 1977). This provides an excellent theoretical basis for developing a DCE based on the research purpose this study is analysing.

3.4.3 Survey Design

In order to execute a CE, in the current study, the questionnaire design consisted of pilot studies in order to determine the choice options. In this research study, these choice situations provided to respondents present three alternatives to choose from, namely the status quo (depicting the current park management situation) and two alternatives—a brief description of the park and how a choice experiment works were provided in the questionnaire. The various characteristics and their levels were explained before the choice sets were provided. To determine these characteristics and their levels, the CE was conducted in several phases:

- Selection of the relevant attributes, and for each attribute selection of the appropriate levels

- Development of choices that will be proposed to the respondents

a. Selection of attributes and levels

Key attributes and their levels had to be identified to develop a successful DCE. This was based on the literature review and kept consistent with similar studies for example, Sangkapitux (2017), Scarpa & Thiene (2005) and Chen (2019). These attributes and levels were refined and supplemented through consultation with various stakeholders such as park management and the SANParks' Arid Research team. Through this process, the following attributes were included due to their significance in the park and the potential value that they could have.

i. Reintroduction of carnivore species

Due to MNP being one of the newly established national parks in South Africa, they have already started the rewilding process by reintroducing species into the park. Yet, the park currently lacks mega carnivore species. This provided the need to determine which carnivore species tourists would prefer to be reintroduced back into the park first. Due to the park's limited carrying capacity, habitat suitability and population viability, it was decided only one carnivore species could initially be reintroduced (Spies, 2017). Given this limitation, a choice between lions and cheetahs was considered. This is because both species are native to the region, but more importantly, they have been successfully reintroduced to other SANParks, (e.g., Mountain Zebra National Park and Karoo National Park). Other carnivore species such as leopards and African wild dogs were excluded due to their free-roaming nature. In addition, spotted hyenas were not included, as studies indicate that major feline species are preferred and are regarded as more attractive than hyenas (Saayman, 2013). This attribute of the choice experiment (i.e., reintroducing carnivore species) consisted of three levels. The first option is the park's current status, whereby *no reintroduction* is the option. Secondly, the option of reintroducing a *pride of lions*, consisting of a male and a few female individuals. Lastly, the option of reintroducing some *cheetahs* into the park because their solitary behaviour allows for various yet a limited number of individuals that can be reintroduced.

ii. Restore the ecosystem by removing non-native species

The second characteristic that was identified in this process related to the various alien and invasive species that still exist within the park. Among this list was the iconic sable antelope, a species native to South Africa but not native to the MNP area. Non-native or non-indigenous

species are species that are not native or indigenous to a particular area and were introduced into these areas that are beyond their natural range by people (USGS, 2022). This provided an opportunity to identify respondents' preferences for non-indigenous species within a national park, by identifying if respondents would prefer non-indigenous species that are relatively scarce and iconic to either remain in the park or to be removed. This possible removal of species is particularly relevant, since the park is mandated to preserve the natural area and rehabilitate the environment to its old natural state without species that could upset the balance of the ecosystem. Ultimately, this provides a conundrum to park management because it could lead to the removal of species that might attract tourists.

Initially, it was decided to determine if tourists were willing to remove sable antelope or not. However, this was changed after the initial pilot phase and further consultation with park management because it became evident that three other antelope species were present within the park that are not native to the area but are native to South Africa, namely the impala, waterbuck and nyala. Thus, the attribute was changed to "determine respondents' preferences to protect the Mokala ecosystem." This was conceptualised as the choice that the park should be rewilded to its original biological levels by *removing* the non-native antelope species. Even though numerous invasive, alien and non-native species exist in the park, the four antelope species are easily identifiable and easy to group due to their low level of threat to the ecosystem of the park. These species only compete with other herbivores for water and food due to their relatively low numbers within the park. Based on the Endangered Wildlife Trust classifications, it is clear that only the sable antelope is threatened (Kruger et al., 2016). This allowed for another level to be added to this attribute. This attribute could further be divided to establish respondents' preferences for protecting the ecosystem, by removing the non-native or non-indigenous antelope species, irrespective of whether they are threatened (i.e. sable antelope) or not-threatened (i.e. impala, nyala and waterbuck).

Therefore, the three levels of this attribute could be defined (1) *do nothing,* i.e. to keep all the species within the park, (2) remove *threatened species not indigenous* to the Mokala area (e.g., sable antelope), or (3) to remove *non-threatened species not indigenous* to the Mokala area (e.g., impala, waterbuck and nyala). The antelopes would also be safely removed from the park in each of the last two cases.

iii. Protect Local Endangered Animals by Boosting Numbers

One of the aims to fully rewild the park would be to achieve a state where all-natural species within the region reach the park's ultimate carrying capacity. This will ensure their survival and safeguard population viability. Although the park has already initiated the process of introducing and reintroducing species that were lost to the area, many of these species have not recovered to their maximum population potential for the park. The park also boasts some unique and endangered species of mammals that are indigenous to the park and classified as endangered in South Africa by the Endangered Wildlife Trust and South African National Biodiversity Institute. Two threatened mammal species were initially identified, namely the roan antelope and a subspecies of the black rhino, i.e. the south-western black rhino. This allows to consider respondents' preferences on whether the park should increase the number of these species within the park by introducing more thereof by bolstering their current population.

After consultation with park management, it was decided to change the option "black rhino subspecies" to merely "black rhino.", this was to prevent confusion for the respondents. An additional threatened antelope species (i.e. the tsessebe) was also included as an endangered species. Therefore, it was determined that for this attribute, four levels were used: (1) *No introduction* of additional endangered species, (2) to introduce more *roan antelope*, (3) to introduce more *black rhino* and, finally, (4) to introduce more *tsessebe*. This attribute allows respondents to choose whether the park should maintain the current levels of the species numbers, let them increase naturally or introduce more of the endangered species to boost their population. Therefore, the respondents' preferences to boost specific endangered species could be determined.

iv. Price

The last attribute, but arguably the most important, is the price component, especially for its value to do further statistical analysis. The current park entrance fee is R50.00, and initially this was set as the price level indicating the status quo option of the CE. However, by investigating other national parks of similar size in South Africa, it was determined that the park entry fees at other parks increase to R59.00 when lions or other predators have been introduced to a park. The Karoo National Park and Mountain Zebra National Park are examples of this trend. Thus, initially, R60.00 was used as the minimum price level, and increments of

R15.00 were used to obtain further choices of R75.00 and R90.00. After the various levels of the design process and pilot stages, the entry-level park fee was altered to offer a wider range to influence respondents' choices. This led to the final levels being used to be R50.00 for status quo and R70.00; R100.00 and R130.00 for the alternative levels.

b. Summary of Attributes and respective Levels

The characteristics and their levels are shown in the simplified table below:

Table 2: Simplified table of all the attributes and their current and potential management alternatives

Simplified table of all the attributes and their current and potential management alternatives				
Attributes	**Description**	**Current Management**	**Potential Management Alternatives**	**The expected sign of the parameters in logit models**
1) Reintroduction of Carnivore Species	Introduce mega carnivore species into the park.	- No Introduction	-Reintroduce a few Cheetahs into the park - Reintroduce a pride of Lions into the park	Cheetah "+" Lion "+"
2) Restore the ecosystem: ***Removing species not indigenous to the Mokala region***	To either keep or remove species that are not originally from the area.	- Do not remove threatened and non-threatened species that live within the park that did not originally occur in the area	- Remove threatened species not indigenous to the Mokala area, such as the sable antelope - Remove non-threatened species not indigenous to the Mokala area,	Remove threatened species "+"

			such as the waterbuck, impala and nyala	Remove non-threatened species "+"
3) Protect Local Endangered Animals by Boosting Numbers	Introduce more of the endangered species that live in the park.	- No New Introduction	- Introduce more Black rhinos, to bolster their population - Introduce more Roan antelope, to bolster their population - Introduce more Tsessebe, to bolster their population	Black rhino "+" Roan antelope "+" Tsessebe "+"
4) Park Entry Fee	The fee that you would pay to enter the park.	- R50	- R70 - R100 - R130	Park fee "-"

c. Choice experiment design

A CE design aims to ensure that the estimated parameters will be statistically relevant. Once the preliminary key attributes and their subsequent levels were decided upon, different steps were conducted to determine that these attributes and levels are as accurate as possible and allow the induction of the monetary values. We first used an orthogonal design and interviewed 20 visitors (pre-pilot phase). Based on the data collected, we estimated a conditional logit model. The results of this conditional logit model were used as priors for creating a D-efficient design. After obtaining an additional set of 92 responses, we estimated a new conditional logit model and designed a new D-efficient model with these new priors. Finally, an additional 288 people completed the questionnaire using the final design, where 285 were used for the choice experiment analysis. Throughout this process, the attributes and their levels were altered to better suit the study's objectives and based on new evidence and information gathered from the park management and respondents.

i. Orthogonal design from the pre-pilot phase

The study had an initial pilot phase where twenty participants completed the questionnaire in person and some online. An initial, 18 choice set designs were created for the DCE based on an orthogonal fractional factorial design. These were split into two blocks that contained nine choice sets each, as they were presented to the respondents. The pre-pilot DCE results were analysed, and was shared with park management. A conditional logit model (CLM) was run and based on the results and further consultation, changes to the DCE could be made for the next phase of the design process. It was further determined that nine choice sets were too complex and tedious for the respondents, and the 18 choice sets were changed into three blocks of 6 choice sets each.

ii. D-efficient design after the initial start of the process.

The full factorial design produces 144 (= 3^2 x 4^2) possible combinations. It would be impossible to have respondents complete so many choice sets. Thus, after the initial pilot phase, a D-efficient factorial design was created on Ngene using the CLM results on the first 20 responses. The D-error was 0.203.

This allowed for further consultation after the attributes were changed to those used in the final stage. In this regard, it led to:

- Introducing the levels or boosting the numbers of tsessebe,
- Changing the attribute of restoring the ecosystem, and
- Introducing the level of removing non-indigenous and non-threatened species.

This first phase of the questionnaire was released on the MNP and SANParks Facebook pages with the collaboration of the SANParks media team. The questionnaire was attempted 176 times online, yet only 92 of those questionnaires were complete or usable. After sanitising the 92 respondents' data, it was determined that only 70 were usable for the DCE analysis. After estimating a new MNL model based on these 70 surveys, we developed a new D-efficient design using Ngene (D-error of 0.165). Three different choice set blocks were created with six choice sets each, and they were randomised through the Qualtrics system (Qualtrics, 2022). In addition, we increased the price range for the additional entry fee.

The final choice set consisted of eighteen choice sets separated into three blocks with six choice sets each. Once the questionnaire was updated on Qualtrics with the new and final

design, the questionnaire was emailed to the selected participants (see below). This email reached 1834 tourists with 430 respondents completing the questionnaire. From this, 288 were usable; after cleaning the data, they were used for further data analysis.

d. Example of a choice set used in the final round

An example of the choice set is provided below with the complete questionnaire and choice sets provided in Appendix C.

Table 3: Example of a choice set

Example of choice set			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **Reintroduce Cheetah**	 **No Carnivore reintroduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Roan antelope**	 **No Specific Introduction**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 1			

A graphical representation was used to facilitate use and to enable more straightforward consideration of the various options.

3.4.4 Additional components of the questionnaire

Although the CE was central to the questionnaire, introductory questions on environmental management preferences and Mokala National Park were also included. This was followed by a description of the CE and an explanation of the attributes was provided to assist respondents in understanding and facilitating the completion of the choice task. The section containing the DCE part was then followed by debriefing questions (to detect unconventional behaviours from the respondents and potential biases) and lastly questions to determine the respondents' socio-demographic characteristics.

The other three additional components that constitute the questionnaire are defined as follows:

a. Introductory questions on Mokala National Park and Environmental Management Preferences

The first section of the questionnaire (i.e. Part A) included questions about the lifestyle of the individuals and the respondents' understanding of the park and environmental resources. This consists of generic questions relating to conservation and environmental management areas, to determine how tourists, perceive these topics and their preferences. The section also included questions about how the respondents perceived the quality of the park and their park visitation preferences.

b. Debriefing Questions on the Choice Experiment

This section of the questionnaire consists of debriefing questions relating to the DCE. These include how respondents perceived the DCE but also how they chose between various options. From these questions, certain biases could be identified and during the pilot phases, clarification on the difficulty and clarity of the DCE could be addressed.

c. Socio-demographic Questions

The final part of the questionnaire consisted of questions to obtain socio-demographic information. Questions posed include information on income level, gender, travel companion, age, residing province, primary language, and education level.

3.4.5 Population and Sampling

The study used random sampling to focus on the target population, primarily domestic tourists who visit the MNP at the time of data collection. Although South Africa's nature reserves do attract the international market, domestic tourists are made up of more than 90% of the tourists in MNP. The park attracted 15,817 tourists during 2019/2020, a fraction of the total visitors to all SANParks parks. This number of visitors was significantly reduced during the covid period (SANParks, 2020, 2021).

The aim was to get as many respondents as possible in the timeframe of data gathering with a target minimum of 200 respondents and to align with similar studies (Van Tonder et al., 2013; Baral et al., 2008; Dumalisile et al., 2005). The questionnaire was emailed to all visitors that have stayed at the park between January 2019 and December 2021, and who have made their emails available to park management for potential research purposes. From this population, a sample group that correctly completed the questionnaire and did not represent any bias was chosen for further analysis.

3.4.6 Data Collection

The data collection took place using a web-based questionnaire on the program Qualtrics. Despite the low response rate of online web surveys, they provide accessibility to a larger sample population and can be spread effectively and widely as possible. This method also allowed for a more accessible visual presentation of the CE and offered the prospect of reducing data entry errors. The only in-person phase was during the initial pilot phase, August 2021. This allowed further consultation with the respondents and identified issues and difficulties with the pilot questionnaire. The subsequent pilot and final questionnaires were distributed online from December 2021 to March 2022. The questionnaire was distributed through the SANParks social media pages and email list of previous visitors. The questionnaire only used

individuals who had previously visited the park and disqualified those who had not visited the park before.

3.4.7 Data analysis

The analysis process started with a conditional logit model as a reference model. This was followed by an estimation of a LCM to capture possible heterogeneity of preferences in the population. We estimated the WTP for the different park's attributes based on these models' parameters.

a. Conditional logit Model

From the CE, the derived utility is split into a utility that can be attributed to identifiable attributes and a utility attributed to some random noise. This randomness is allowed because if a respondent is faced with the same choice twice, they may sometimes make a different choice. The lack of consistency and the probability of missing an attribute may influence their choices, but these factors are not observable. However, randomness is also an essential part of a discrete choice model. Therefore, the discrete choice model applying the RUT has two defining principles:

1. Deterministic component
2. Random element

The discrete choice model presents that the utility an individual *i* would receive from choosing an alternative *j* on a choice situation *h,* it can be stated as:

$$U_{ijh} = \beta V_{ijh} + \varepsilon_{ijh} \quad \textbf{(1)}$$

The deterministic component would equate to *V,* the different alternatives presented. This function consists of all the characteristics of the choice alternative *j* and of the individual *i,* in the choice set of *h*, such as reintroducing carnivore species, protecting the ecosystem, boosting endangered species and price. The stochastic unobservable error component or the unexplained/random proportion would equate to ε.

It can further be explained that if an individual chooses an alternative *j* the utility, they gained from choosing that alternative would be greater than the utility they would have gotten from the other alternatives. This is supported by the theory that when a respondent is provided with

a choice set with different alternatives, the respondent will choose the alternative that provides the highest level of utility (McFadden, 1974). This can show the probability of alternative *j* being chosen above alternative *g* from individual *i.*

$$P_{\{ijh\}} = P\{V_{ij} + \varepsilon_{ij} > V_{ig} + \varepsilon_{ig} \; \forall \; j \neq g\} \quad \textbf{(2)}$$

If it is assumed that the error term is assumed to be identically and independently distributed (IID) and that the scale parameter would be equal to one (Boxall & Adamowicz, 2002), then the probability of choosing alternative *j* from a set of *J* alternatives by individual *i,* by using a conditional logit model for discrete choices, the CLM can be stated as:

$$P_{ij} = \frac{\exp(x'_{ij}\beta')}{\sum_j^J \exp(x_{ih}\beta')} \quad \textbf{(3)}$$

The CLM assumes all the data is homogenous, in that the individuals analysed all have the same preference structures, therefore the CLM does not address heterogeneity.

Different methods and models can detect the potential heterogeneity of preferences, such as LCM, mixed logit models and conditional parameter models. We decided to use an LCM because it is generally recognised as one of the best models to be able to divide a homogenous population into different segments, especially identifying heterogeneity in the population (Boxall & Adamowicz, 2002; Di Minin et al., 2013).

b. Latent Class Model

An LCM addresses heterogeneity in the sample population by separating the homogenous respondent group into different classes to better reflect their differences in preferences. When socio-demographic variables are introduced, an LCM can also estimate the influence of these variables. Ultimately, the LCM helps identify groups of respondents with similar preferences. These preferences are heterogeneous across classes but assumed to be homogenous within each class (Boxall & Adamowicz, 2002; Greene & Hensher, 2003). Initially, during the data analysis part of the study, different models with a varying number of classes were constructed. Using different information criteria, the various LCM with varying classes and socio-demographics variables were compared and the most optimal model was selected.

The socio-demographic variables that are included are included in the form of a dummy variable. Categorical data such as gender, language, wild card holder, profession, marital status and others could be included in the model analyses (Trochim, 2020).

Ultimately, this research paper aims to identify heterogeneity in preferences between different groups of tourists that have previously visited MNP. Thus, differentiating the tourists from one homogenous group that is presented in the CLM. The LCM that is utilised effectively splits the population into a number of classes, each with different preference structures.

The LCM constitutes two sub-models. The first sub-model estimates the probability that the respondent *i* chooses alternative *j* from a choice-set *J* at choice situation *t* conditional on belonging to class *c*. This probability is:

$$P_{(ij|c)} = \frac{\exp(x_{ijt}\beta_c)}{\sum_{j=1}^{J} \exp\,(x_{ijt}\beta_c)} \qquad (4)$$

β_c would be a vector of estimated marginal utility parameters specific to class *c*. Again, it is assumed that the scale parameter which affects both the denominator and nominator is equalised to 1, which omits it.

The second sub model estimates the probability that a respondent belong to the different classes. The probability that member *i* is part of class *c* is given as follows:

$$P_{ic} = \frac{\exp\,(\theta_c Z_i)}{\sum_{c=1}^{C} \exp\,(\theta_c Z_i)} \qquad (5)$$

c= 1, 2 ..... , C, $\theta_C = 0$

The parameter Z_i could be split into two components: the parameter coefficient in class *c* and a set of individual characteristics affecting the probability of class memberships of individuals *i*. Further, the Z_i are covariates with latent class membership; these are the group membership characteristics related to the different class membership. θc is the class-specific parameter vector for class *c,* for the explanatory characteristics, basically the individual chosen attitudes. It must be noted that the C^{th} parameter is normalised to 0 for model identification (Greene & Hensher, 2003).

Finally, the combined expression of the preceding two sub-models (4) and (5) would provide the joint probability that individual *i* in class *c* would select choice set *j* (Boxall & Adamowicz, 2002). It is stated as follows:

$$P_{(ij|c)} = \sum_{c=1}^{C} P_{ic} . P_{(ijt|c)} \quad (6)$$

This model will not only consider the effects of observable attributes of choice in the choice set, but will also identify the heterogeneity of the individuals. Therefore, the socio-demographic membership characteristics of respondents and the control program of natural characteristics can be simultaneously determined to explain respondents' choice preferences.

c. Class selection criteria: AIC, BIC, and log-likelihood

To be identifiable, the model requires the number of classes to be chosen exogenously. However, no specific statistical test can choose the best number of classes. The most optimal class can be chosen by looking at the combination of the various criteria. To find out the optimal number of classes, several information criteria such as the Aike's information criteria (AIC) and Bayesian information criteria (BIC) can be utilised to identify the optimal number of classes. As well as inspecting the log-likelihood, parametric fit (adjusted-R^2) and qualitative criteria, such as the distribution patterns of the models, thereby eliminating the models with very small class probabilities. The log-likelihood function is the probability of observing data for a given parameter and is thus viewed as a function of the parameters (Train, 2002). It measures the goodness of fit of the statistical model for the sample population from the values of the unknown parameters. Maximum likelihood estimation is the method to create an objective function to be equal to the likelihood function, to estimate the parameters by maximising the likelihood function. For the information criterion, it has been shown that the class number that presents the smallest information criteria is usually chosen (Boxall & Adamowicz, 2002; Sangkapitux, 2017; Scarpa & Thiene, 2005). The formulas for AIC and BIC are provided.

$$AIC = -2\ln(LL + 2K) \quad \textbf{(8)}$$

$$BIC = -2\ln(LL + K\log(n)) \quad \textbf{(9)}$$

Where LL is the maximum log-likelihood of the model, n is the number of respondents and K is the number of parameters estimated for the model.

d. Welfare Estimation - Marginal Willingness to Pay

From the results of the logit models, the marginal WTP can be derived for each of the natural aspects of MNP. Marginal values can only be derived when there is movement from the status quo, by looking at the different choices the respondents made when the natural aspects levels changed. The WTP is effectively the marginal rate of substitution between the changes in monetary value and related changes in the natural characteristics of the park.

The following formula calculates marginal WTP:

$$Marginal\ WTP_i = -\frac{MU\alpha}{MUcost} = -\frac{\beta\alpha}{\beta cost} \quad \textbf{(9)}$$

Where $\beta\alpha$ is the marginal value coefficient of the aspects, and $\beta cost$ is the marginal value coefficient of the cost spent at the park.

3.5 Organising the data

The data from the questionnaires were collated on Qualtrics, where the electronic questionnaires were stored online. From the stored questionnaires, the data was converted onto a Microsoft Office Excel document. This is done manually and recorded in different tables and columns to reflect the different scenarios proposed by the questionnaires. Only close-ended questions were asked to allow for easy data transmission as 1's and 0's onto the excel file. All research isn't immune to the data not being perfect due to human errors and, therefore, missing data, and correcting errors in data was done to simplify the data. After the data was recorded in the Microsoft Office Excel file, it was converted into R studio for further analyses. Different R packages were used such as Tidyverse and Apollo, to identify the best econometric and statistical analyses. From the data, a standard conditional logit model and latent class models were created.

3.6 Limitations and bias

Although DCE is the most common method used, it is prone to the effect of biases such as strategic bias and information bias (Tietenberg, 2014). Information bias occurs when people have little to no experience of the subject and are forced to place value on the attributes of subjects, they are not familiar with. Strategic bias is when a respondent answers in a certain way to influence the study's outcome. Hausman (2012) also emphasizes hypothetical bias and

upward bias as further types of prejudice and indicates an observed discrepancy between WTP and willingness to accept. These hypothetical and strategic biases are most relevant to the current research and will be tested and addressed using appropriate techniques.

The respondents will be informed that they understand the type of scenario presented to them regarding the value that they will place on these natural aspects or clusters. Strategic bias could be an issue in the study due to respondents' bias toward certain natural aspects or types of fauna wanting to first influence the reintroduction of these species. These respondents would be removed through cleaning of the data before analysis.

Covid-19 is also a factor that played a significant role during the study's research. Limitations to access to parks and behavioural changes of tourists due to Covid could affect the validity and efficiency of the study regarding data collection. Therefore, electronic methods were garnered to overcome certain in-person limitations yet some could persist. For example, this can inhibit the research from identifying who answered the questionnaires and prevent the researcher from explaining the questions if there are queries and troubles.

3.7 Error, validity, and reliability in the data

3.7.1 Error

Conducting a self-administered online questionnaire can lead to errors that can influence the validity of the gathered results. Errors in data can occur in the manner that respondents answer and, in many cases, do not answer the questionnaire or make mistakes in answering, resulting in skewed results. Different methods can be conducted to reduce errors for online questionnaires. Techniques such as conducting pilot tests with a sample group in-person to identify if there are any concerns, difficulties and problems with the questionnaire. This allows these queries to be resolved before the online questionnaire is released, allowing the most simple and easy form to be released to potential participants. The online format allows respondents to respondents the ability to complete the online questionnaire in their own time, providing them with an opportunity to get back to the questionnaire if they do not have time in the moment to complete it.

3.7.2 Validity

Validity refers to the accuracy of the measurement, whether this is internal or external validity. External validity is dependent on whether the results from this study can be translated to another sample group and the general population as a whole (Streefkerk, 2019). This is ensured by choosing a representative sample of the sample population. In a trade-off with external validity, internal validity is related to whether the observed results represent the truth and is trustworthy, therefore not being influenced by methodological errors. This is ensured by determining the correct limitations of the study and the correct constructs of the research as a whole.

3.7.3 Reliability

The reliability of a study refers to the consistency of a measure, therefore ensuring a degree of trustworthiness and accountability to the research (Middleton, 2022). Pre-testing is an effective way to ensure the reliability of the research instrument used in a survey by allowing different tests on the questionnaire and the data that was accumulated to ensure that the results are reliable.

3.8 Research Ethics

The study was designed and followed all ethical guidelines and principles related to the research. Various clearances and authorisations had to be gained from different institutions to allow the research to be conducted. Ethical clearance was gained from the University of Pretoria to be able to conduct a questionnaire that was in line with the university's ethics requirements. A contract was signed between the research party and the institution involved i.e., the SANParks Arid research team. The contract stipulated the terms and agreements between both parties to allow research to be conducted within the parks and to allow the use of their database. The questions were reviewed and accepted not only by the university but by the SANParks Arid research team and park management, including the park manager. This was to ensure all potential ethical problems were addressed beforehand.

The questionnaire also informed respondents that their answers and data will be kept confidential and only be used for academic research purposes. They were all asked to provide their consent and could seize participation in the questionnaire at any time they wanted. They

were also never at any risk of any harm of any sort during the research. The research was also completely voluntary for any respective respondent.

It should, furthermore, be recognised that this study is not trying to place a simple monetary value on species and other natural aspects of MNP. Instead, it aims to utilise the knowledge of how tourists value certain natural characteristics and their preferences. If more tourists are attracted to the park due to the results of this study, further improvements and developments can occur within the park. These enhancements would increase the rewilding and rehabilitation of the park.

3.9 Summary

The research methodology chapter introduced the research problem and further expanded the study area by introducing the different activities and aspects of MNP. The chapter then went into detail about the development of the questionnaire and how the characteristics and their levels were chosen. It looked at the formulas for the CE and described the models that will be created during the data analysis. In summary, the study:

- Utilises a quantitative methodology whereby a research instrument was created and applied to a sample population.
- Created a questionnaire on Qualtrics and distributed it to tourists of Mokala National Park, either online or in-person. The main component of the questionnaire contained a stated preference method, namely the choice experiment.
- Uses statistical analyses (predominantly) from the CE but also including the other questions from the questionnaire,
- Draws results and conclusions such as the WTP of the different natural characteristics from the data through R studio, an open-source software for data science.

CHAPTER FOUR: RESULTS

4.1 Introduction

The questionnaire (Appendix C) is divided into four parts, namely:

A. Introduction questions on Mokala National Park and Environmental Management
B. Choice Experiment questions
C. Debriefing questions on the Choice Experiment
D. Socio-demographic questions

From these four parts, empirical results were obtained and will be presented in this chapter. The results that are provided will incorporate the objectives that were established in Chapter one. The results are quantitative by nature, utilising data sets, tables, figures, and formulas to facilitate ease of use and understanding. Firstly, a visitor profile of the chosen respondents is provided with a breakdown of key characteristics thereof. Following this, an analysis of the environmental management methods and respondents' views on MNP is presented. This is followed by the results of the CLM, a LCM and a WTP analysis using CE data. The chapter is concluded with the debriefing results of the CE.

4.2 Visitor Profile: Socio-demographic variables

Table 4 provides sample statistics of the socio-demographic characteristics of the respondents. Each of the demographic factors is discussed in the following sections.

Table 4: Socio-demographic characteristics of respondents

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Gender	286	Male	199	69.58
		Female	87	30.42
Age	287	18-24	3	1.05
		25-34	10	3.48
		35-49	45	15.68
		50-60	76	26.48
		61-64	53	18.47
		65 +	100	34.84
Home Language	288	Afrikaans	145	50.52
		English	127	44.25
		Other	16	5.23
Married	286	Yes	236	82.52
		No	50	17.48
Travel Partner	288	Alone	15	5.21
		As a couple	170	59.03
		Friends	18	6.25
		Family	72	25.00
		Organised Group	4	1.39
		Other	9	3.13
Wild card membership	288	Yes	258	89.58
		No	30	10.42
Highest level of education attained	287	Primary School	0	0.00
		Grade 12	29	10.10
		Diploma/ National Certificate	67	23.34
		Undergraduate Degree	56	19.51
		Postgraduate Degree	125	43.55
		Other	10	3.48
Profession		Employed full-time/ part-time	97	33.68
		Self-employed	47	16.32

	288	Unemployed/ Looking for work	1	0.35
		Retired	135	46.88
		Student	2	0.69
		Other	6	2.08
Monthly Personal Income	272	< R20000	28	10.29
		R20000 – R40000	95	34.93
		R40000 – R60000	64	23.53
		> R60000	85	31.25
Province, you reside in	288	Northern Cape	11	3.82
		Freestate	34	11.81
		Western Cape	87	30.21
		Eastern Cape	10	3.47
		Gauteng	95	32.99
		Mpumalanga	10	3.47
		Limpopo	2	0.69
		KwaZulu-Natal	20	6.94
		North West	7	2.43
		Other	12	4.17
Distance you live from the park	288	< 50km	1	0.35
		50 – 100 km	6	2.08
		100 – 250 km	34	11.81
		> 250km	247	85.76

Due to the lack of socio-demographic statistics of visitors at MNP and other South African national parks, comparison can be made from similar studies. It was subsequently identified that the average nature-based tourist is older, male and achieve higher levels of income and education than the general travellers and the general population (Meric & Hunt, 1998; Viljoen et al., 2017).

Supplemented by the research done by Viljoen et al. (2017), who did an extensive survey of the type of tourists visiting the Kruger National Park in South Africa, a comparison could be made between the kind of tourists visiting the Kruger National Park and those that responded to this studies questionnaire. The three main points identified in the paper's summary indicated that regarding gender, 58% of respondents visiting Kruger National Park at the time were male. Indicating a slight overrepresentation of males in this study. This was followed by 44% indicating their home language is Afrikaans and 40% indicating it is English; this is in line with

the current visitor profile. Lastly, the average age of the respondents was 42.5 years old, with 35% indicating they were between the ages of 45-59. These results clearly show that the age of this paper's respondents is older than the population of visitors to national parks that are being sampled. This needs to be discussed further. It was identified that 95.82% of the respondents are South Africans residing within the country. Clearly indicating a strong sample group of domestic tourists compared to the international market.

A crucial point to address is the high percentage of Wild card members i.e. 89.58% of respondents. This is important as it can result in bias being presented in the data analysis component of the study, due to the respondents not being seriously affected by the price component of the CE. The study's visitor profile fell in-line with the socio-demographic status of overall Wild card members. In that almost two-thirds of Wild card members are males (64.62%), comparable to the current visitor profile indicating 69.58% are males. It is also reported of the Wild card members that 57.19% of respondents were above 50 years old, compared to 79.79% of the sampled visitor profile. This will further be discussed and analysed as there is a higher proportion of older respondents in this sample population compared to the average Wild card member.

4.3 Environmental management questions

The study reported on tourists' preferences regarding environmental management with references regarding rewilding preferences and species preferences. It also obtained results regarding preferences for the High Ambition Coalition's 30x30 aims. The results are as follows:

a. Rewilding Preferences

Two questions were posed to respondents regarding rewilding preferences: introducing non-indigenous species to help rewild a park and reintroducing iconic Big 5 species into a park. These questions aimed to identify how respondents perceive types of species and their importance in rewilding efforts. The results are provided in Table 5.

Table 5: Rewilding preferences for non-indigenous species in a national park and prioritising the rewilding of the Big 5 into a national park

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Preference to introduce non-Indigenous species into a park	288	Yes	85	29.51
		No	203	70.49
Prioritise introducing the Big 5 into a park above other species	287	Yes	176	61.32
		No	111	38.68

Respondents indicated that 70,14% were unwilling to rewild national parks with non-indigenous species whilst 61% of the respondents believed that the Big 5 species should be prioritised for rewilding efforts in a national park.

b. Species Preference

Two questions were posed to the respondents regarding their preference for seeing certain species in national parks or other types of parks. The first question that was asked was about the Big 5 and the second relating to endangered species, for example, such as what the respondents' preferences are for visiting a national park with the Big 5 and what their preferences would be for visiting a national park with endangered species. The results were as follows and stated in Table 6.

Table 6: Respondents' preferences to visit a national park with the Big 5 and their preference to visit a park if endangered species are present

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Preference to visit a national park if Iconic Big 5 Species are present	288	Yes	141	48.96
		No	147	51.04
Preference to visit a national park if Endangered Wildlife are present	289	Yes	253	87.54
		No	36	12.46

The results of the two questions reveal that a slight majority (51%) of tourists stated they are not "more likely" to visit a park with the Big 5. This contrasts with the attraction of endangered species, where 87% of the respondents said they are more likely to go to parks with endangered species such as African wild dogs. These results show that endangered species have a higher attraction rate than the iconic Big 5 species amongst predominantly domestic South African tourists.

c. High Ambition Coalition

This question was asked to determine the current state of the formally protected area of South Africa and whether it should be increased. The question stated that the status of South Africa's formally protected areas is approximately 8% of its terrestrial land and 15% of its marine area is protected. This was followed by asking the respondents whether they believe the country should aim to increase this formal protection aligned with the Inter-governmental Group's, *High Ambition Coalition*'s 30x30 aim. This foresees a situation where 30% of the land and marine area of a country are formally protected.

Table 7: Preference to have High Ambition Coalition enacted

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
HAC - 30x30	289	Yes	258	89.27
		No	31	10.73

As is clear from table 7, 258 respondents agree with the High Ambition Coalition's 30x30 aim. However, 31 who completed the questionnaire prefer that the HAC 30x30 should not be implemented. The overwhelming response at 89,61% stated that they supported this initiative. This provides strong backing that previous visitors of MNP want to formally protect more land in South Africa.

4.3.2 Respondents' perception of Mokala National Park

This section reports on respondents' perception of the MNP and results regarding reasons for visiting the park; preference of season; the number of times visited; quality of the park; whether they were day visitors or overnight visitors; and finally, the degree of wilderness experience presented.

a. Reason for visiting the park

Six choices were presented to respondents to decide what their main reasons for visiting MNP are. They could choose as many presented options as they would like to relate to their reasons the most.

Table 8: Reasons for visiting MNP

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage of participants (%)
Reasons for Visit	289	Mammal diversity	179	61.62
		Bird Diversity	166	57.44
		View and enjoy the natural scenery	206	71.28
		Break from the city	65	22.49
		Rest and relaxation	127	43.94
		To experience nature in its natural state	232	80.28

The questionnaire allows for respondents to offer multiple reasons to indicate why they visit the MNP. This resulted in 289 respondents' identifying their main reasons for visiting MNP and also revealing combinations in which preferences are indicated. It was identified that the

main reason for visiting MNP was "*To experience nature in its natural state"* with 80.28% of respondents indicating this. This was closely followed by "*View and enjoy natural scenery"* with 71.28% choosing this option. Both options are to do with experiencing nature and enjoying it. These two are closely followed by "*Mammal diversity'* and *"Bird Diversity"* at 61.62% and 57.44%, respectively. This indicates that respondents want to experience nature and be part of it but also that they visit MNP due to its wide range of diversity of the parks biodiversity.

b. Seasonal preference

An important question to ask respondents is their preferred season to visit MNP. The results were as follows:

Table 9: Seasonal preference to visit Mokala National Park

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Best Season to Visit	289	Summer (Dec-Feb)	82	28.37
		Autumn (Mar-May)	183	63.32
		Winter (Jun - Aug)	98	33.91
		Spring (Sept - Nov)	161	55.71

It is clear from Table 9 that preferences according to the season are varied, with Autumn being the most preferred season, as indicated by 183 respondents. The next most responses were for Spring (161), while 98 prefer Winter and 82 have Summer as their preferred season.

When the results of seasonal preferences are presented as percentages, it is clear that the two intermediate seasons of Autumn and Spring are favoured above the peak seasons.

c. Number of visits

It is important to note how many times respondents have visited the park before. Since the park is relatively new, the question was not limited to a certain time frame for visitation. The questionnaire enabled information on the frequency of previous visits to MNP to be obtained. The results are presented in Table 10.

Table 10: Results for times visited

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Times Visited	289	1	102	35.29
		2	51	17.65
		3	47	16.26
		4	31	10.73
		5	14	4.84
		> 5	44	15.22

The largest share of respondents (35.29%) have only been to the park once. The rest of the respondents are repeat visitors to the park. This can influence their decisions due to their potential knowledge of the park. This must be considered and used in further analysis as the park would like to maintain its visitor base when MNP expands. If the infrequent visitors visit again, they will become more knowledgeable about the park and its characteristics with preferences not only be influenced by the immediate experience but also based on past experiences as well.

d. Park quality

A question was posed based on how the respondents viewed the quality of the park facilities to identify if respondents were satisfied with the park quality or not. The results were as follows:

Table 11: Opinions about the quality of the Mokala park

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Quality of Park Facilities	288	Poor	6	2.08
		Average	46	15.97
		Good	184	63.89
		Excellent	52	18.06

The respondents indicate overall satisfaction with the quality of the park when combining the "good" and "excellent" results (which constituted 81,95% of the respondents) and compare that against the 18,05% that stated it was experienced as average to poor a clear picture emerges of satisfaction levels. Yet, it must be noted that even though there was a generally positive view of the park quality, there were numerous comments from both positive and negative responders that stated the quality has been declining in recent years.

e. Day visit vs overnight stay

Two questions were presented to respondents regarding their preference when visiting a national park, and whether they prefer day visits or overnight visits. First off, 99.64% of the respondents identified they prefer overnight visits to day visits with 98.92% of respondents stating when they visited a national park, they stay stayed overnight. This shows that respondents not only prefer overnight stays to day visits but also actively pursue it when they visit a park. This could be due to the distance of national parks to urban areas but also that respondents actively look to extend their stays at national parks compared to short day visits.

f. Wilderness experience

The last question in Part A of the questionnaire was based on the idea to see if respondents could quantify their experience of nature by stating "wilderness feeling" of MNP. Question 13, was phrased as follows:

"Rank out of 10 on how you experience Mokala National Park's "Degree of Wilderness".

For example, when driving through the park did you feel you were away from civilisation and completely in the bush or were there too many people and facilities around that encroached on that "wilderness feeling".

The mean score out of ten was 7.239, proving that the average respondent believed the park provided an above-average degree of wilderness. This question was supplemented with another question that was asked to determine whether respondents believed the degree of wilderness would increase if the park's boundaries doubled in size.

Table 12: Park area doubled

Variable	Number of responses (n)	Grouping	Frequency (f)	Percentage (%)
Double the Area	287	Yes	255	88.85
		No	32	11.15

88.95% believed that the wilderness feeling would improve if the park doubled in size. These two questions indicated that the respondents had an overall perception that the park provided a feeling of wilderness.

4.3.3 Maximum Willingness to Pay

Three maximum WTP questions were asked and were structured to ask respondents to indicate what their maximum WTP (in South African Rand) for park entrance fees should they know in advance they would get a chance to see one of the following:

I. Major Feline Carnivores like a Lion or Cheetah
II. Endangered Species like the Roan antelope or Black Rhino
III. Iconic Species like the Sable antelope

The mean results were determined from the responses and are displayed in table 19.

Table 13: Willingness to Pay

	WTP Carnivore species	WTP Endangered species	WTP Iconic species
Mean	R 137.62	R 140.42	R 127.49
Std. dev.	70.339	72.124	71.126
Range (Min and Max)	R50 – R500	R50 – R500	R50 – R500

Table 13 shows the mean that respondents identified "Endangered species" such as roan antelope and black rhinos as the variable they would pay the most for at R140.42. This is closely followed by "Major feline carnivores" such as cheetah or lion at R137.62. Lastly, at a

slightly smaller amount is that of "Iconic species" such as sable antelope at R127.49. All three figures are more than the current park fees of R50.00.

4.4 Choice Experiment

4.4.1 Introduction

Model estimation for the CE was done using the Apollo package (Hess & Palma, 2019) on the R studio platform (RStudio Team, 2020). Different economic models were estimated, with the conditional logit model (CLM) used as a basis whilst formulating a Latent Class Model (LCM) for a more in-depth analysis of the respondents' answers.

4.4.2 Conditional logit model

Firstly, we estimated a CLM as a benchmark model. This model did not allow for any heterogeneity between respondents. The results are presented in Table 14.

Table 14: Conditional logit model estimates, respondents' utility function for each of the natural characteristics provided

Natural Characteristics that were valued	**Coefficient Estimate**	**Standard error**
Status Quo (no Change)	-1.076***	0.362
Reintroduce Lion	0.753***	0.165
Reintroduce Cheetah	1.473***	0.168
Remove Non-native, Threatened species (Sable antelope)	-0.668***	0.143
Remove Non-native, Non-threatened species (Impala, nyala and waterbuck)	-0.236**	0.141
Introduce more Roan antelope	0.429***	0.172
Introduce more Black rhino	0.752***	0.204
Introduce more Tsessebe	0.191	0.176
Park Fees	-0.0059***	0.002
Model statistics		
LL(final)	-1429	
Adj.Rho-square	0.108	
AIC	2876	
BIC	2925	

The figures denoted in between brackets represent the standard error. Statistical significance is denoted by "***", "**","*" at 1%, 5%, and 10% levels, respectively.

The first parameter i.e. the Status quo (representing the "no change" option in the park) was negative indicating that respondents wanted a scenario that would be different from the status quo. The parameters for introducing carnivore species were significant with either indicating positive or negative utility with both parameters, reintroducing lions and cheetahs, were

positive and significant. The reintroduction of cheetah had a bigger marginal utility than the lion's parameter, indicating respondents prefer the reintroduction of these species above the current situation of no carnivores, but prefer cheetahs over lions.

All three parameters for protecting endangered species by boosting their numbers were also positive. The three parameters representing the endangered species whose numbers are to be increased, the roan antelope, black rhino and tsessebe, all indicated positive utility. This represents that the respondents preferred that more of the endangered species be introduced, and their populations protected. It must be noted that the tsessebe parameter was not significant, whilst the black rhino and roan antelope parameters were significant. The black rhino parameter was the strongest of the three, followed by the roan antelope. Therefore, the respondents had a common interest in seeing these species' numbers boosted.

The results for the two parameters for protecting ecosystems by removing non-native species regardless of being threatened or not-threatened both displayed negative utilities. This means that the presence of these animals is perceived positively even if they prevent the restoration of the ecosystems to their native wild state. It must be noted that the non-native and not-threatened species parameter was only significant at a 10% level respectively. Lastly, the marginal utility of increasing park fees was negative and significant, as was expected.

4.4.3 Latent class model

In order to detect potential heterogeneity in the preferences of respondents and potentially amongst the respondents in their membership characteristics, an LCM was estimated.

To identify the correct LCM, the modeller has to determine the correct number of classes. In order to find out the optimal number of classes, a standard technique is to estimate models with different number of classes (shown below: 2 to 5 classes) and choose the model that best fit the data. Criteria used to choose the final model were the AIC and BIC. Some more qualitative criteria, such as the presence of classes with very small probabilities and loglikelihood supplemented the information criterion results.

A summary of the quantitative criteria for the models from two to five classes is presented in Table 15.

Table 15: Comparisons of global fitness of the models from two to five classes.

Latent Class Model and Classes Covariables: **Visit Frequency, Afrikaans Home Language and Age above 50 years**					
Class number and distribution	**Log-likelihood**	***R2 adj.***	**Parameters**	**AIC**	**BIC**
2 Classes Class 1 0.824 Class 2 0.176	-1340.64	0.1546	22	2725.28	2845.06
3 Classes Class 1 0.298 Class 2 0.167 Class 3 0.535	-1311.15	0.165	35	2692.29	2882.84
4 Classes Class 1 0.307 Class 2 0.413 Class 3 0.162 Class 4 0.118	-1277.04	0.1779	48	2650.07	2911.39
5 Classes Class 1 0.290 Class 2 0.041 Class 3 0.144 Class 4 0.244 Class 5 0.281	-1259	0.181	61	2639	2971

Table 15 provides the results of the various classes that were tested as well as the results for the criteria that can best describe the optimal number of classes, these include log-likelihood adjusted R^2, parameters, AIC, and BIC. Although there is no specific statistical test that can indicate the best number of classes, looking at the combination of results of the various criteria the most optimal class can be shown. Based on the results of table 15 the model with four classes was chosen and although the parametric fit increases as more classes are added, the difference became marginal after four classes. The probability of a respondent being classified into the 4^{th} and 5^{th} group was a fraction of the first three groups. Reinforcing this point was that the results of the AIC and BIC, both decreased and were low at that specific point. It can also be noted that the pseudo R^2 is improving from the CLM to the LCM.

Along the parameters that were included in the CE, different socio-demographic variables were included in the model to describe the respondents more accurately. These variables are

presented in Table 16. The variables personify the respondents on certain membership characteristics factors such as: whether they have visited the park three or more times or less than three times, if the members are above the age of 50 years or not and lastly, whether their home language is Afrikaans or if it is another language.

Characteristics and descriptions related to the respondents

Table 16: Description of the variables and their mean values

Variables	**Mean**	**Standard deviation**	**Definition**
Socio-demographic variables			
Afrikaans as their home language	0.503	0.501	0 = Respondents' home language is not Afrikaans 1 = Respondents' home language is Afrikaans
Experienced visits	0.469	0.500	0 = Less than 3 visits 1 = 3 or more visits
Age above 50 years old	0.792	0.405	0 = Respondents' age is below 50 years 1 = Respondents' age is above 50 years

The results of the selected model (with four classes) are presented in Table 17. The results of the four classes are shown in the table. It must be noted that for one of the latent classes, the coefficients of the descriptive characteristics will be normalised to zero. This allows the results of the other class coefficients to be compared and interpreted based on the normalised class's results. The statistical significance is also represented for each class.

To compare the results of the model with the CLM that was identified as the base, there is a clear increase in the LCM having a better explanatory effect than the CLM. The coefficients of the four classes in table 17 differ vastly from class to class, with only a few parameters having similar outcomes. The results of the CLM and LCM are presented below:

Table 17: Conditional logit model and Latent class model

Variables		**Latent Class Model Classes**			
Explanatory Attributes	**CLM**	**Class 1 – Pro Ecosystem diversity - Afrikaans speaking**	**Class 2 – Change adverse group - conservative**	**Class 3 – Pro Ecosystem diversity – Not so Afrikaans speaking**	**Class 4 – Price insensitive, true rewilders**
Status Quo (no Change)	-1.076***	-1.404*	-2.660***	-2.450*	0.007**
	(0.362)	(0.920)	(0.750)	(2.135)	(2.186)
Reintroduce Lion	0.753***	2.883***	-1.854***	2.950**	2.312
	(0.165)	(0.474)	(0.436)	(1.202)	(1.165)
Reintroduce Cheetah	1.473***	1.957***	0.617*	5.594***	2.226**
	(0.168)	(0.437)	(00.315)	(1.478)	(1.000)
Remove Non-native, Threatened species (Sable antelope)	-0.668***	-1.119***	-1.616***	-3.506***	1.787
	(0.142)	(0.387)	(0.334)	(1.072)	(0.997)
Remove Non-native, Non-threatened species (Impala, nyala and waterbuck)	-0.236**	-0.890**	-0.802**	-4.531***	3.053**
	(0.142)	(0.370)	(0.317)	(1.433)	(1.127)
Boost population of Roan antelope	0.429***	0.042	-0.072	1.036	1.321
	(0.172)	(0.472)	(0.372)	(1.012)	(1.005)
Boost population of Black Rhino	0.752***	1.160**	0.167	0.386*	2.205
	(0.204)	(0.533)	(0.384)	(1.219)	(1.259)
Boost population of Tsessebe	0.191	0.282	-0.388	-0.046	1.330

	(0.176)	(0.419)	(0.372)	(1.273)	(1.261)
Park Fees	-0.0059*** (0.002)	-0.014** (0.005)	-0.007** (0.003)	-0.019* (0.014)	0.006 (0.012)
Group Membership characteristic					
Visit (more than 3 times before)	-	0.000	0.954** (0.410)	1.660** (0.653)	0.176 (0.762)
Age (above 50 years old)	-	0.000	1.078** (0.442)	1.621* (0.910)	1.569 (0.762)
Afrikaans (main language)	-	0.000	-1.116*** (0.426)	-1.888*** (0.609)	-1.998*** (0.662)
Constant	-	0.000	-0.238** (0.505)	-1.769 (0.925)	-1.254 (1.16)
Distribution of classes	-	Class 1 0.307	Class 2 0.413	Class 3 0.162	Class 4 0.118
Model Characteristics					
Log-likelihood	-1429	-1277.04	-	-	-
Adjusted rho-squared, p	0.108	0.178	-	-	-
AIC		2650.07	-	-	-
BIC		2911.39	-	-	-

The figures denoted in between brackets represent the standard error. Statistical significance is denoted by "***", "**","*" at 1%, 5%, and 10% levels, respectively.

Class two to four all showed a high probability of the same membership characteristics compared to the base of class one, showing heterogeneity in membership characteristics. It was

also identified that there was heterogeneity between the different classes in preference for specific natural characteristics.

Based on the conditional probability of class membership it was estimated that for a given person, a respondent has a 30.7% chance of being in class one (pro-diversity), 41.3% chance of being in class two (conservative group), a 16.2% chance of being in class three (pro-diversity) and lastly a 11.8% of being in class four (true rewilders).

a. Class 1 -Pro-diversity in the park: Afrikaans speaking

Respondents had a 30.70% probability of being part of class one, the Afrikaans speaking pro-diversity group. This group had a strong and significant affinity for being pro-diversity of species in the park, even though this is, in contrast, to fully rewilding the park. This group does present a preference for specific rewilding tools to be initiated. They prioritised the reintroduction of carnivores into the park whilst having a more significant attraction for lions than cheetahs. The group did not want non-native species to be removed from the park, with both parameters providing significantly negative preferences. There was a stronger preference for the threatened, non-native species to be kept more than the non-threatened species, indicating a stronger preference for having more wildlife species within the park. Although the coefficients for boosting the endangered species numbers were positive, all were insignificant except the black rhino coefficient. The “no-change” option was also negative for this group, suggesting they prefer change within the park. The group had, as expected, a significant and negative park fees attribute. It can be concluded that this group wanted the most diversity of species within the park, even if this comes at the cost of protecting the park's ecosystem.

The group membership characteristics were most likely to be Afrikaans speaking, and ultimately prioritising diversity in the park than the native ecosystem.

b. Class 3 – Pro-diversity in the park: non-Afrikaans speaking, older, frequent visitor

Respondents had a 16.2% probability of being part of class three, the non-Afrikaans speaking, older and experienced pro-diversity group. Regarding the group’s parameter utility functions, it was very similar to class one (i.e., the other pro-diversity group), and displays a significant and strong attraction for reintroducing feline carnivores with a bigger draw for cheetahs than

lions. They also had the biggest attraction for cheetahs and lions from all the four classes, being the most pro-cheetah group and indicating a strong preference for rewilding carnivore species in the park. Additionally, this group had the largest negative coefficient for removing non-native species, larger than the first and second groups. The non-threatened species coefficient was larger than the threatened species, indicating they might prefer more diversity in the park. This group is the only group that did not want tsessebe numbers to increase, while indicators for roan antelope and black rhinos' numbers were positive, only the black rhino parameter's coefficient was statistically significant. This group shares a high preference for rewilding most of the park but still at the cost of certain parts of the natural ecosystem. This group also had the largest coefficient for reintroducing black rhinos compared to the other groups. Lastly, they had, as expected a significant and negative park fees attribute.

There is a strong probability that this group is significantly more likely not to be Afrikaans speaking as well as being above the age of 50 and a frequent visitor. All the membership characteristic coefficients were significant.

c. Class 2 - Conservative group: wants the least amount of change except cheetahs and black rhinos

Respondents had the largest probability of belonging in class two the conservative group at 41.3%. This group had the most conservative stance on change within the park and fully rewilding the ecosystem of the park. They were the only group showing a significant but negative coefficient for reintroducing lions into the park, this result was not expected. Still, they did have a positive and significant preference for reintroducing cheetahs—indicating this group would preferer rarer carnivore species to be reintroduced. The group has a strong tendency for non-native species not to be removed, with both parameters being significant. Again, indicating that they did not perceive all rewilding avenues to be necessary for the park. Group two was the only group with two negative parameters for boosting endangered species numbers, indicating preference for maintaining the status quo and not wanting the whole ecosystem to be rewilded. This conservative group had negative but insignificant coefficients for roan antelopes and tsessebe. Although, as expected, they had a positive preference for black rhinos, although it was statistically insignificant. Lastly, the group had a negative and significant preference for the park fees.

Their membership characteristics presented are similar to classes three and four in that they have a high probability of being older and have a bigger likelihood of not being Afrikaans speaking, although not as likely as class three but more than class one.

d. Class 4 - Price insensitive, True rewilding group

Lastly, respondents had the lowest probability of being in class four, the true rewilding group at an 11.80% chance. This class is referred to as the true rewilders as they are the only group that presents all the findings that were expected. The group had a larger preference for the reintroduction of cheetahs to lions with the cheetah parameter being significant. They were the only group that wanted the non-native species to be removed, regardless of their status of being threatened or not threatened. Although insignificant all three coefficients to boost endangered species were positive. This indicates that a small contingent of the sampled respondents truly prefer the ecosystem to be rewilded and animals to be reintroduced, introduced and removed. The marginal utility of money (the fee parameter) was not significantly different from zero. This will induce some difficulties in inferring the marginal WTP for the various attributes of this group and interpreting its overall preferences. As with the previous two classes, this group also consists of having a high probability of being non-Afrikaans speaking respondents.

e. Summary

The table provided shows that there is heterogeneity in the respondents' preferences regarding their choices in natural characteristics of MNP. It can be concluded that the results of the respondents' preferences are heterogeneous. The two pro-diversity groups had a probability of being 46.9% of the respondents, whilst the rest was split between 40.2% being the more conservative group and only a 11.8% chance being represented as the true rewilding group. All the classes preferred the reintroduction of cheetahs into MNP. All the classes also showed a positive preference for boosting the population of black rhinos in the park. Whilst a high probability of 58.70% respondents indicated a preference for reintroducing lions into the park, and only the conservative group did not show a preference for this characteristic. 88.20% of respondents did not want the non-native species that were presented, sable antelope, impala, waterbuck and nyala, whether they were threatened or not, to be removed. Only class four showed a preference that these species should be removed while the conservative group consisting of 40.30% of respondents showed a negative preference for boosting the two threatened antelope species numbers. Whilst all the other groups were in unison for boosting

the roan antelopes only groups one and four were supporting boosting tsessebe numbers. The results are summarised in Table 18 below.

Table 18: Summary of the four classes of their characteristics and preferences

Class	**Label**	**Utility increases by:**	**Utility decreases by:**	**Membership characteristics**
Class 1	**Pro Ecosystem diversity - Afrikaans speaking**	- Reintroducing carnivore species - Boosting black rhino numbers	- Removing non-native species	- More likely to be Afrikaans speaking,
Class 2	**Conservative - Change adverse group**	- Boosting black rhino numbers - Reintroducing cheetahs	- Reintroducing lions - Removing - Removing non-native species - Boosting roan antelope and tsessebe numbers	- Less likely to be Afrikaans speaking - More likely to be experienced visitors - More likely to be above the age of 50 years old
Class 3	**Pro Ecosystem diversity – Not so Afrikaans speaking**	- Reintroducing carnivore species - Boosting black rhino numbers	- Removing non-native species	- Less likely to be Afrikaans speaking - More likely to be experienced visitors - More likely to be above the age of 50 years old
Class 4	**Price insensitive, true rewilders**	- Boosting black rhino numbers roan antelope and tsessebe numbers - Removing non-native species - Reintroducing carnivore species		- Less likely to be Afrikaans speaking

4.5 Willingness to Pay

Based on equation (9) of the methodology chapter, we calculated the marginal WTP and the standard errors of each class for the different attributes (Table 19) by using the Delta method. The marginal WTP for the fourth class could not be calculated since the marginal utility for money was not significantly different from zero. Certain parameters were also insignificant which resulted in a N/A being presented.

Table 19: Class Marginal WTP for the different attributes

Marginal Willingness to Pay for Changes					
Variables	**CLM**	**LCM Class**			
Attributes		**Class 1 – Pro Ecosystem diversity - Afrikaans speaking**	**Class 2 – Change adverse group - conservative**	**Class 3 – Pro Ecosystem diversity – Not so Afrikaans speaking**	**Class 4 – Price insensitive true rewilders**
Status Quo (No Change)	-181.20*** (41.53)	-98.03** (47.71)	374.00*** (140.8)	-124.00* (76.99)	N/A
Reintroduce Lion	126.90*** (54.74)	201.40** (102.4)	-260.00** (129.8)	149.30* (96.66)	N/A
Reintroduce Cheetah	248.20*** (83.05)	136.70** (75.33)	N/A	283.10* (178.3)	N/A
Restore ecosystems: Remove Non-native, threatened species	-112.60*** (24.22)	-78.13*** (30.3)	-226.90** (111.6)	-177.40* (110.2)	N/A
Restore ecosystems: Remove Non-native, non-threatened species	-39.85** (21.99)	-62.13** (37.48)	-112.70** (65.7)	-229.30* (138.2)	N/A
Boost population of Roan antelope	72.27** (41.04)	N/A	N/A	N/A	N/A
Boost population of Black Rhino	126.7** (55.46)	81.00* (53.35)	N/A	N/A	N/A
Boost population of Tsessebe	N/A	N/A	N/A	N/A	N/A

The figures denoted in between brackets represent the standard error. Statistical significance is denoted by "***", "**","*" at 1%, 5%, and 10% levels, respectively. N/A represents figures that were insignificant. All figures are denoted in Rands.

It is crucial to keep in mind the current park fees entry value is R50.00 for MNP in light of the results presented. This should be considered since the various parameters presented a wide range of WTP figures. The CLM, class one and class two, all had significantly high marginal WTP for reintroducing lions. These figures ranged from R126.90 to R201.40, more than double and quadruple the current park entry fees rate. Class two, the more conservative class, was the only class that had a negative parameter for the reintroduction of lions stating a high figure of -R260.00 for lions not to be reintroduced. Regarding the cheetah parameter, there was a very strong and positive WTP from all classes to reintroduce cheetahs, with these figures being larger than the WTP for the lion parameter. The figures ranged from R248.20 for the CLM to R136.70 and R283.10 for class one and class two respectively. A range from double to more than five times the current price of the park entry fees rate.

Of the significant figures that were calculated for both, the "Restore ecosystems" parameters showed negative WTP figures. Ranging from -R39.85 for the CLM group for removing non-native, non-threatened species to -R78.13 for class one and -R177.40 for class two, i.e., the conservative group. The lowest figure was for class three the pro-diversity group, at -R229.30. The non-native and threatened groups all had negative WTP ranging from -R78.13 for class one, -R177.40 for class three for Class one and -R112.60 for the CLM. The conservative group of class two had the lowest figure as low as negative R226.90.

Lastly, the only significant figure for "Boosting endangered species numbers" for the four LCM classes was the introduction of more black rhinos into the park for class one, at R81.00. This figure was supported by the CLM group's figures of R72.27 for introducing more roan antelope and R126.70 for introducing more black rhino, more than double current park fees. Only the introduction of more tsessebe parameter presented insignificant results for all the classes and models.

4.6 Respondents' responses to the Choice Experiment

Although the CE forms the main element of the study it is important to analyse how the respondents responded to these CE questions. The function of this is to determine whether there is bias as well as to understand response patterns.

4.6.1 Choice Experiment

a. Clarity and difficulty

The first two debrief questions that were proposed to respondents reflected on the difficulty and clarity of the CE.

Results obtained indicates the majority of respondents found the instructions for the CE to be "clear" with 72% of respondents indicating such. A further 21% did not find it clear or not clear while only a limited amount of 7% found the instructions not clear. This is indicative that there can be improvements for future CE questionnaires but that overall, the instructions were satisfactory.

While the instructions were clear to the majority of respondents, the CE itself posed a greater challenge for the respondents. Only 21.45% of the respondents found the CE to be easy whilst this is overshadowed by 36.33% that found it to be difficult. A relative positive sign is that 42.21% found it neither hard nor easy. These results could be seen in a positive light as the CE is challenging and does ask the respondents to use a higher cognitive function to complete it.

b. Importance of characteristics

The next debrief question looked at the importance of each CE characteristic. Respondents had to rank their preference for each of the four characteristics ranging from their Most (1) to Least (4) important preference. Of the 288 respondents, only 234 responses fully completed this question. Results are indicated in the following table:

Table 22. Ranking of the CE Characteristics based on their perceived importance

Natural characteristic	1st Choice – Most Important	2nd Choice – Second most important	3rd Choice – Second least important	4th – Choice – Least Important
Carnivore Species	40%	20%	38%	2%
Protect Ecosystem	29%	29%	38%	5%
Endangered Species	25%	39%	22%	13%
Park Fee	6%	12%	2%	80%

The "Reintroduction of carnivore species" was regarded as the most important characteristic, 40% of respondents ranked it the most important. This is followed by "Protecting the

ecosystem" at 29% and "Boosting the population of endangered species" at 25%. "Park fees" were indicated by the fewest respondents, with only 6% indicating it as the most important.

The second most important characteristic followed a different path than the characteristic regarded as the most important (see above). Results indicating the second most important characteristic pointed out that "Park fees" were still the least chosen albeit double the number as in characteristic regarded as the most important characteristic at 12%. The most chosen characteristic is ″Boosting endangered species populations″, with 39% of respondents choosing this characteristic as their second most important characteristic, this is followed by ″Protecting the ecosystem″ at 29%, and fewer respondents indicated "Reintroduction of carnivore species" species into the park at 20%.

Whilst the characteristic "Reintroduction of carnivore species" is indicated as the most important characteristic, when combining the responses for the most and second most important characteristics, a different picture emerges. 60% of respondents choose it as the most or second most important. For the most and second most important characteristic of "Boosting endangered species", responses were first with 64%. This was closely followed by "Reintroduction of carnivore species" at 60% and close by "Protecting the ecosystem" at 58%.

The Second least important choice displays a different picture than the first two. Again, ″Park fees″ are the least important choice as only 2% of respondents who chose it. This time ″Protecting the ecosystem″ is equal to that of "Reintroduction of carnivore species". This is followed by ″Boosting the population of endangered species″ at 22%.

Lastly, the least important characteristic is that of ″Park Fee″, it is clearly shown as the least important preference out of the four characteristics by the respondents. One hundred eighty-five respondents chose ″Park fees″ as the least important characteristic. This is followed by a mere 29 choosing ″Endangered species″ as their least important characteristic and only 10 and 5 for the remaining two characteristics.

This indication of importance is vital for further analysis as the "Park fees" parameter was not regarded as of importance at all and may lead to potential bias and skewed results and should be considered in the analysis. The results also indicated regarding the other three categories there is a general importance for each three, with "Reintroduce carnivore species" initially the most important but then losing its importance further on.

4.6.2 The presence of animals identified in the choice experiment

Viewing an animal in the wild is not only down to considerable effort but is also dependent on significant luck. Although it might not be a clear indicator of the presence and status of the animals in the park, it is an indicator of how prevalent these animals are for viewers. The following graphic reveals whether respondents indicated that they spotted any of the following four species on their most recent visit: roan antelope, black rhino, tsessebe and the sable antelope. Results are presented in Figure 4.

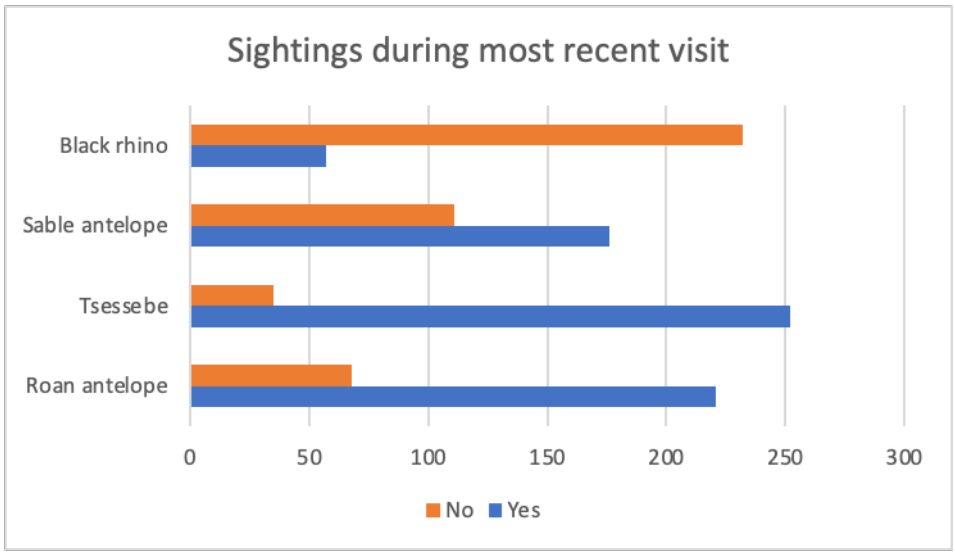

Figure 4: Sightings during most recent visit

As is clear from Figure 4, it can be shown that most respondents saw the ″Roan antelope″ and ″Tsessebe″ in the park on their most recent visit with 214 and 244 responses for each. The ″Sable antelope″ was the third most seen animal at 169 whilst the black rhino was the least spotted of the four threatened species. This could be due to the shy behaviour but also the limited number of animals within the park. 55 viewers saw the ″Black rhino″ on their previous visit, whilst 224 did not see any. Most respondents saw three of the four threatened mammal species antelope species on their most recent visits to the park. There is a direct link between the WTP for endangered species and the number of sightings during tourists' most recent visits. This link will be further discussed in the discussion chapter.

4.7 Summary

This chapter presents the results of the research paper. The empirical results were obtained from a questionnaire distributed to tourists who previously visited MNP and was presented in a tabulated and graphical manner. The presented findings covered general questions on environmental management regarding rewilding and species preferences as well as how respondents perceive MNP, such as its quality and their seasonal preferences. The chapter then applied a CE, and the results from the resulting latent class analysis were discussed, as well as the WTP of the different characteristics. Lastly, the Chapter covered the debrief questions based on the CE questions that were asked and the maximum WTP for certain types of species. This penultimate chapter is followed by the chapter on the research study's conclusions and discussions based on the results from this chapter as well as concluding with recommendations to park management and comment on future research.

CHAPTER FIVE: DISCUSSIONS OF RESULTS

5.1 Introduction

In the preceding chapter, the results were presented based on the objectives provided and were briefly described where necessary. This final chapter will provide a more in-depth interpretation, analysis, and synthesis of the results and will draw connections with relevant literature.

5.2 Discussion and interpretation of results

5.2.1 Visitor profile

In the sociodemographic section of the questionnaire, the visitor profile indicated a range of respondents with notable characteristics such as being of a higher age, male dominant gender distribution, Afrikaans as preferred their language, professional careers, and Wild card membership. This is consistent with research indicating that the types of tourists involved in nature-based activities tend to be older, with higher income and education levels than the general public (Meric & Hunt, 1998). For example, the age profile of the current study compares favourably with a previous study of other SANParks visitors (e.g., those visiting Kruger National Park) that also document that such visitors tend to be older than the average age with more than 70% of the respondents being older than 50 (Viljoen et al., 2017). Furthermore, 46.8% of visitor to MNP, who participated in the current research, who indicated their profession as being retired and is consistent with previous research findings that indicate the average nature-based tourist is generally older and could skew the results based on the current sample. Another characteristic of the visitor profile was the over-representation of male respondents with 68% of respondents indicating they were males. This is similar to other studies done at other South African national parks where there generally seems to be more male than female respondents (Shaw et al., 2012). This overrepresentation of males is also consistent with the general Wild card membership demographic.

Additionally, the majority of the respondents were Afrikaans-speaking and English-speaking individuals, which is a skewed representation of the demographics of South Africa in general. In a previous study, Saayman (2012) concluded that there is a serious lack of representation

from other languages in national park research and concluded that more ethnic groups should be included in future sample populations. The lack of diversity among questionnaire respondents could be an unintended result of distributing the questionnaire online via social media and the SANParks email list.

Furthermore, an overwhelming number of respondents were also Wild card members, which could be considered a limitation that skews how respondents addressed the CE. Since Wild card members do not pay park fees, the majority of the respondents may not have taken the CE scenarios' price parameters as seriously (compared to a visitor who must pay park fees upon entrance). This was also indicated by the fact that the respondents identified the "Park fees" as the least important of the four CE characteristics. However, the fact that a high percentage did respond to price is still encouraging, as the price parameter is significant in both the LCM and CLM. These results should be taken with extra precaution and future research should aim to increase the sample size to include more individuals *without* the Wild card membership or ultimately find another payment vehicle that could be used, such as providing an additional fee to the specific park in the name of rewilding efforts. Additionally, some respondents commented that the park entry fees are too high for those who are retired, which is coupled with the fact that a large proportion of respondents are retired.

In terms of monthly personal income, this was the most evenly distributed category across the visitor profiles ranging from less than R20000 per month to more than R60000 per month. Although the average monthly salary of a South African was R24000 per month in January 2022 (Statistics South Africa, 2021) with a national unemployment rate of 35%, more than half of the respondents indicated that their average monthly salary is greater than R40000. The higher-than-average monthly income of respondents suggests that the average visitor to MNP is generally more well off than the average South African and is most likely job secure; this aligns with the more nature-based tourist category as described by (Meric & Hunt, 1998). Even though a large portion of the respondents are retired, this demonstrates that the respondents have a more extensive price flexibility and can be more open to a marginal park entry fee change.

Lastly, the distribution of respondents was country-wide and limited the representation of day visitors to the park since nearly all respondents lived further than 250 km from the park and were residing in adjacent provinces. Although Northern Cape and Free State have smaller populations than the provinces of Gauteng, Western Cape, and KwaZulu-Natal, there was a

low presence of residents living in close proximity to the park participating in the research. In future research, conducting in-person questionnaires, such as the pilot questionnaire, can garner a greater day visitor profile (as opposed to visitors who attend the park for an extended stay). Unfortunately, the COVID-19 pandemic restrictions affected how research was conducted and how questionnaires were distributed. Future studies must consider the biases of online questionnaire distribution and how this can strongly influence the sample of respondents and overall representation.

5.2.2 Environmental Management

A few conclusions can be drawn from the environmental management questions on tourists' rewilding preferences. Firstly, respondents strongly opposed that areas to be rewilded with non-native species, which is expected since tourists would naturally prefer to visit a park that represents the natural biodiversity of that region for a genuine, authentic experience. Interestingly enough, there is nearly an even 50/50 split between respondents who believe iconic species such as the Big 5 should be prioritised in rewilding parks, which is linked to the fact that up to 61% of the respondents prefer to visit national parks with the Big 5 in them. Intriguingly both these figures are dwarfed by the number of respondents who prioritise visiting national parks with endangered species. This demonstrates that the eagerness toward iconic and big wildlife for the South African domestic tourist market is not necessarily the most important factor to consider when rewilding since more domestic tourists prefer to see more endangered species than iconic species. Even though the Big 5 and other iconic species continue to drive the interest of many domestic and (especially) international tourists, domestic tourists are not entirely drawn by the mere spectre of potentially seeing the Big 5. These results are supported by the findings of Lindsay et al. (2007), who determined that large flagship mammal species are responsible for attracting most tourists to protected areas; however, even more important to note is that these domestic tourists' viewing preferences are diverse, with international visitors preferring charismatic and megafauna. Further, domestic tourists had a wide range of interests, including rarer and less seen species, such as sable antelope and cheetahs, which is essential as it is in line with the results derived from the current CE.

Thus, it can be concluded that greater emphasis should be placed on rewilding parks with endangered species as this feature can be a potential pull factor for domestic tourists. The fact that respondents have a higher affinity to see endangered species within national parks could

be due to the experienced nature of the domestic tourists. These experienced visitors have already seen a high number of native fauna and are more interested in seeing rarer species (Lindsay et al., 2007). Therefore, parks should not only prioritise rewilding national parks where biologically possible but should do so with predominantly endangered and rarer species, followed by iconic species such as the Big 5 for the South African tourists. This will attract a large contingent of domestic tourists to the national parks and game areas.

Even though up to 85% of respondents believed the country should strive for the High Ambition Coalition, this figure should be taken with some caution since the sample population of tourists for this study have a strong bias toward protecting the natural environment. This might not be the true reflection of all South Africans. Yet, it is a clear indicator that a contingent of South Africans want the country to pursue such an ambitious initiative. Lastly, the experience of being in nature i.e. "feeling nature" is a preferred attraction and park management would be encouraged by the idea that respondents overwhelmingly believe the park provides such an experience. However, this should be regarded with some caution as many respondents may have some bias and a higher natural inclination for such wilderness feeling since they are more frequent visitors, and such support should be expected.

5.2.3 The respondent's perception of the park

Drawing from the results indicating respondents' favourite seasons to visit MNP, it is revealing that the highest-rated combinations (i.e., combining the two most preferred seasons) were the intermediate seasons of spring and autumn, rather than the peak cold and hot seasons. This finding is crucial as it could motivate park management to organise events or offer attractive park specials during those times since these dates attract the most tourists.

The results also indicate various reasons and push and pull factors encouraging tourists to travel to national parks and natural areas. What can be drawn from these results is that respondents had multiple reasons for visiting MNP. From the six options provided an image emerges that the main reason for domestic respondents visiting MNP is (1) "to experience nature in its natural state" or (2) "to enjoy the natural scenery". The preference for "wildlife diversity" closely followed these two options, with the "diversity of mammals" being slightly more preferred than "diversity of birds". This is a good indicator for park management as parks need to know whether a specific pull factor attracts tourists, and in this case, there is not. Instead, the natural setting and biodiversity are the main factors already attracting domestic tourists.

Coupled with the fact that the respondents perceive MNP as a "high" wilderness feeling, it can be easily said that the park is a natural attraction to nature lovers in the area and country. This is a crucial point to note—domestic tourists have a desire to be out in nature and experience it.

Regarding the quality of the park, there was an overall perception that the park was of a good standard. However, comments indicated a gradual decline in quality over the past couple of years. The frequency of visits was used as a group membership characteristic in the LCM as it identifies visitors with experience of the park and its characteristics with about 50% of respondents stating to have been to the park three or more times. This indicates respondents with a definite knowledge of the park and its surroundings. Lastly, the results show that respondents overwhelmingly prefer and choose to stay overnight at MNP (and other national parks) rather than attending for a day visit only. This could be a result of the questionnaire mostly reaching those who live from more than 250 km from MNP, meaning they do not have the luxury of being in close proximity to make a day visit. Although day visitors were the minority of those sampled, these results are particularly important for this study since the majority of visitors were repeat visitors with multiple experiences at the same park allowing for a comparison between current and previous visits.

5.3 Choice Experiment – Latent class model

The results of this part of the study presented that a meaningful portion of domestic tourists showed a clear preference for improving certain natural characteristics in MNP through rewilding efforts. Yet, rewilding as a whole was not favoured by the majority of the respondents. The results from the LCM have proved that there is a degree of heterogeneity amongst the tourists that visit MNP and thus have a greater variety of preferences amongst themselves. The economic value tourists place on certain ecosystem services was also calculated. Lastly, the results also provide information that certain characteristics had broader support amongst the four classes, whilst other parameters were more specific to a particular class.

5.3.1 Membership Characteristics

The CE method helped elicit the different preferences that tourists have and the potential value they infer from these characteristics. These natural characteristics provide a key influence on potential priorities for rewilding a national park; the specific characteristics of "reintroducing

potential carnivore species", "protecting the current ecosystem", and "boosting threatened species numbers" could all be regulated by park management. From these results, it was identified that there was heterogeneity regarding the preferences of the tourists across the sampled population regarding these potential rewilding priorities.

Class one and three, (i.e., the pro-species diversity groups), presented the same preferences with different significance and multitude. Yet, they are distinguished by class one being the most likely Afrikaans-speaking and class three having a higher probability of not being Afrikaans-speaking but being a more experienced, older visitor. Both these groups have a strong preference for reintroducing cheetahs and a lesser extent, the reintroduction of lions. Still, they are against removing non-native species from the park, resulting in a desire for more diversity in the park.

Class four is the only group that is the true rewilding group in that they want to protect the ecosystem by removing all the non-native species regardless of their threatened status. This indicates that there is a portion of tourists who want to protect the ecosystem at all costs. This group also has a higher probability of being older, more experienced and not Afrikaans-speaking.

Class two, is considered the most conservative and adverse to overall change. It can be concluded a large proportion of older respondents do not want significant change within the park across the broad parameters that were presented. They are the only group that does not want to reintroduce lions and are against the boosting of endangered animals (with the exception of the black rhino). This shows there is a sizeable contingent who prefer maintaining the status quo and limit change within the park. Yet, this group strongly prefers to reintroduce cheetahs and boost the black rhino numbers.

The frequency of the visits of tourists should be highlighted as being influenced by the needs and preferences of the tourists. Visitors with a higher frequency of park visits ultimately better understand the park and its natural system. The less frequently visited tourists could have a higher tendency to be influenced by their direct experience of the park, and a lack of sightings and skewed perception compared to bigger parks could dictate their stated preferences. For example, by not seeing any of the park's threatened species, they could prefer their populations to be boosted. Yet, as is indicated that when these tourists visit the park more often, their set of preferences solidify and could explain the preference of the reintroduction of cheetahs ahead of that of lions.

It can be noted that the groups are generally split into the more likely to be Afrikaans-speaking to non-Afrikaans-speaking. However, there is a consensus with most of the classes regarding the natural characteristics and their preferences. Despite there being differences amongst the population group, there is still a high likelihood that big groups of respondents have similar preferences— preferences to reintroduce cheetahs and a lesser extent lions, not remove any non-native species, and to boost black rhino numbers. This shows a greater preference amongst respondents for higher species diversity within the park. SANParks should try and actively pursue a wider variety of tourists, from more experienced and Wild card members to less experienced who are not within the SANParks fold.

Reintroducing species that will attract future generations are important as well since there is a general indication of the need for more species diversity. It is further emphasised by the importance of supporting conservation initiatives to improve the biodiversity of the park.

5.3.2 Carnivore species

It was determined that there is a distinction in the preferences of tourists for reintroducing carnivore species back into MNP. Reintroducing major predators into the park can result in greater marketing opportunity for the park, as well as introducing different types of park activities such as the guided cheetah walks that are currently present in the Mountain Zebra National Park. This is supported by (Lindsey et al., 2007) who presented the findings that the top three most attractive animal species for visitors to the Addo Elephant National Park were lion, leopard, and cheetah. This is supplemented by Hayward & Somers (2009), who presented their findings that identified the general public is more attracted to carnivore and iconic species. The results stipulate that there is a great preference for reintroducing cheetahs back into MNP across all classes of the LCM and CLM. As noted before, domestic tourists prefer the rarity of the species and more endangered species, while having a lesser affinity for the Big 5—this is ultimately shown in the LCM results.

Reintroducing carnivores also provides a different perspective to a park and add heightened levels of excitement to visitors. Although the need to fence the park due to the added species would be an additional and long-term cost, their presence would greatly benefit the park. The results from this study point out that parks should consider reintroducing cheetahs prior to reintroducing a pride of lions and when considered respondents' preference for rewilding and

prioritising endangered species over the iconic Big 5 species, it provides a compelling argument for the reintroduction of cheetahs. This is clearly shown with all the respondents showing significant preference for the reintroduction of cheetahs—a threatened *and* rarer species. Whilst the smaller coefficient indicates preference for lions by three classes, a single class (i.e. class two (the more conservative class)) did not prefer the reintroduction of lions. It can still be noted that lions provide a viable tourist attraction to a national park. SANParks has a history of reintroducing carnivore species back into national parks, such is the case in Karoo National Park, Mountain Zebra National Park and others, so this provides a good foundation on how to effectively and efficiently provide the measures to implement these rewilding initiatives.

5.3.3 Protecting Ecosystems

The results of the study reveal that the majority of respondents did not show a preference for the removal of species from MNP that are not native to the area. Only one class, the true rewilders group (representing a small percentage of the respondents) had a significantly higher preference to remove the non-native species that are already present within the park, whether these species were threatened or non-threatened. This could denote that although respondents believe the integrity of the park's natural biodiversity should be kept intact from alien species (such as the four antelope species mentioned that are already present), respondents have a higher inclination for keeping them in the park if they present a low threat to the native ecosystem. This shows that respondents have a higher preference for animal diversity in MNP. It can also indicate that if a park had to rewild itself further, respondents would prefer that non-native species not be removed but if they are already present and provide a low threat and greater biodiversity, then domestic tourists would potentially prefer more animal diversity.

Furthermore, this result contradicts with responses obtained from the environmental preference questions that were asked before the CE. These results indicated that the majority of the same respondents did not want non-native species to be rewilded into national parks. This shows that there can be selfish behaviour and bias from the respondents and domestic tourists. Even though they acknowledge the threat of non-native species in a national park, when challenged with a particular case study, such as the CE, they would prefer the non-native species to remain for the added diversity within the park.

Interestingly, it can be concluded that respondents would prioritise higher mammal diversity within the park, albeit at the cost of protecting the ecosystem to its previous natural level or allowing the park to be fully rewilded. This is supported by the findings of Arbieu et al. (2018) who determined that the demand for wildlife tourism in South African protected areas is directly related to a high diversity of species within these protected areas. Due to humanity's ever-changing impact on the planet and its natural areas, it can be seen that even though these species did not naturally occur in the region, their low-impact presence can be a boon for conversation and attract more tourists to the park. It is reinforced by Leader-Williams (2015), that tourist preferences can change park priorities and management policies. Thus, even though tourists want these species to be maintained the park still has their mandate and biodiversity plans. This topic should be carefully addressed and species such as antelopes that do not have a high level of threat to the natural biomes and biodiversity, such as competing for food in the area, do not necessarily have to be removed from the park. Overall, it is recommended for MNP management to retain the low-threat antelope species currently in the park since this can provide a bigger benefit than removing them.

5.3.4 Boosting of threatened species

The third parameter pertained to boosting the threatened species numbers by increasing their current herd size and ultimately enable the park to achieve its natural carrying capacity sooner. Remarkably, there was a lower affinity for the roan antelope and tsessebe herds to be increased, which could be linked to the fact that most respondents previously saw roan antelope and tsessebe on their most recent visits to MNP. This has been pointed out by Bandara & Tisdell (2014) that WTP for tourists decreased with an increase in endangered species numbers, thus already seeing the species the tourists have a lower affinity to pay more. This could indicate that tourists are less likely to support rewilding initiatives for endangered species if the tourists' perception of these species is altered because of the greater ability to see these species in the park.

As 70% and 80% of respondents saw both of those species on their most recent visits, it could explain why they would not yield greater preference to boost their numbers in the park. Linking the sightings of the threatened species with the preference to increase their numbers could be vital in identifying why the numbers are not as significant for most classes.

It is important to note that tourists' perception of an endangered or threatened species might become altered if they have a higher chance of seeing this species in a park. This can create a false perception that the species must be doing well and/or their numbers must be abundant due to them being prevalent and, therefore, sighted often. Further research and educating the tourists on the realities surrounding the status of these species should be prioritised to prevent tourists from not supporting these endangered species.

Most respondents did not see any black rhinos on their recent trips, indicating a greater need to boost their numbers and support this species through rewilding initiatives. This indicates that there is a direct relationship between the most recent sightings of black rhinos, which were at a meagre 20%, with the fact that all four classes prefer the species numbers to be boosted. This could be important as it links with research that tourists want to see rare and iconic species (Bandara & Tisdell, 2004). Thus, there is a limited preference to boost all the endangered species numbers across the four classes, but preferably that of the black rhino. The increasing pressure of the poaching epidemic, which has dramatically reduced their numbers over the past couple of decades (Africa Geographic, 2022), could be another factor influencing this preference. So, there could be a more significant push for boosting black rhino numbers due to the recent awareness and marketing that has targeted this species.

So, while it is evident that there is a link in the WTP and preference to introduce more endangered species based on the respondents' historical sightings, there is also the indication that the rarer species is, the more valuable the species is, meaning that a low supply creates a higher demand. Thus, tourists will place a higher preference and value on endangered species when they have less chance of seeing them while visiting the park. Park management should take heed of these findings and the preferences of the four classes for seeing the boosting of black rhino numbers. Park management should also consider providing sighting maps at park camps and entrances, as a higher sighting probability would satisfy the tourists accordingly. Rewilding initiatives could be supported if tourists are satisfied with their sightings of threatened and rarer species resulting in a greater pull factor for respondents.

Lastly, it is important to ensure that certain parks (such as MNP) have viable populations of threatened species. This could not only provide the survival of those species but also help distribute them to other parks and areas or sell them to private game reserves for revenue. This could potentially be the role of a smaller park such as MNP. It is suggested that SANParks

further consider this type of park management model. It can therefore be concluded that there tourists have preferences for boosting the numbers of endangered species back into MNP.

5.3.5 Rewilding

This study has provided evidence that rewilding can be used as a tool to attract tourists and adjust park fees to generate more revenue by reintroducing, introducing or removing certain species. Yet, the results have indicated that the respondents had limits to what should be rewilded i.e. respondents being against a complete rewilding of the park and maintaining its natural ecosystem equilibrium. From the LCM, it was determined that only a small component of respondents do not want the non-native species present within the park. It also shows only 11% of the respondents truly cared about rewilding the whole ecosystem, whilst the other respondents had a greater preference for animal diversity above ecosystem integrity. Better education programmes and initiatives could be created to teach respondents, park visitors and the general population about the dangers and threats of non-native and alien species and in a park.

Rewilding species that have been previously removed, protecting the ecosystem, and boosting current endangered species populations are all approaches that can be implemented to ensure the survival of species and promote biodiversity of an area. There is a greater need to ensure the survival of species and the various rewilding aspects of national parks should be promoted, and park management should strive towards it. Rewilding is not the ultimate tool for ecosystem protection but with the proper education and strategies, it can be a viable tool in the future.

Even if large portions of the country's land are set aside for protected areas, more effort should be made to achieve the standard of natural biodiversity of an area. Protecting species and biodiversity is essential to promote a more sustainable world as promoted by the SDGs, especially Goal 15, which aims to protect "life on land." Protecting species and rewilding areas provide value beyond the inferred values in the preceding research paper and discussions provided, where there are direct and indirect use values displayed by protecting an area and rewilding it. Furthermore, these natural areas provide non-use values and benefits such as a functioning ecosystem, protection of endangered species and reduction of greenhouse gases through the variety of ecosystem services. It is strongly encouraged that these indirect and non-use values be incorporated into the general discussion of the management of certain natural characteristics and natural resources of a national park. Rewilding initiatives also provide a

good educational background for the local communities. Showcasing the need for reintroducing these animals to school children and other educational programmes can boost overall conservation efforts. In addition, it can showcase the ability to successfully have these species and in what order for private and public game reserves in the area, struggling with the same problems.

5.3.6 Willingness to Pay

MNP management needs to ensure they comprehend the economic values and benefits gained from tourists by maintaining the prospect of these tourists returning to MNP. The natural characteristics analysed in the current study indicated a tourist's WTP is greater than the current park fees for certain parameters although these fees exclude accommodation, travel and other costs. Due to the park's dependence on tourists and government budgets, eliciting a higher park entry fee based on certain natural characteristics improvements can help sustain a greater revenue base. Although somewhat concerning, it must be noted the results indicated that respondents did not prioritise park fees regarding the CE. This combined with the fact that almost all respondents were Wild card members lead to caution as the WTP results should be looked at regarding the potential bias and limitations. It has also been determined that high-budget guests were more interested in Big 5 mammals and carnivores (Lindsay et al., 2007). This is supported by the WTP analysis indicating higher amounts respondents are willing to pay for carnivore species. In this regard figures ranged between R200.00 and R283.00 for the reintroduction of lions or cheetahs.

A further revelation of the WTP analysis indicates Class two (the portion of the respondents that were more likely to be conservative to change) showed that they did not want to change all the parameters. Those who are more conservative to change did not necessarily want to change most of the parameters, but did show significant WTP/WTA preferences for some species and parameters. This could be due to these respondents being satisfied with the way the park is currently managed, as most changes would be expensive and result in a decrease in the quality of the park. These respondents may have the perception that bigger parks should cater for carnivore species and so forth, and that smaller parks such as MNP are fine as is and by providing other attractions. This is an important point for park management to note as it represents a visitor base that the park does not want to lose. Coupled with the fact that the less frequent visitors and other frequent visitors classes are not only willing to pay more than double

or triple for lions in the park, but they are all more willing to pay more for the reintroduction of cheetahs. The park could use this as a research-based view to argue for reintroducing cheetahs and if a further land expansion of the park emerges, then further species reintroduction should be considered, such as lions.

There is also a link with class one, (the pro-diversity group) that reported that they were willing to pay the most for increasing the numbers of black rhinos within the park, although it should be noted that respondents already have a low chance of seeing a black rhino. This is consistent with the findings of Estifanos et al. (2019) who determined that tourists WTP for an increase in endangered Ethiopian wolves from 200 to 250. They, furthermore, found that WTP reached a limit once an upper limit has been reached and became negative- indicating that the rarity of a species plays a part in WTP. It can also be concluded that where tourists do not see the species their WTP would increase as is to be expected of those wanting to see roan antelope and tsessebe.

Overall, results indicate that the tourists to the park are willing to pay more than the usual park entry fee for certain natural characteristics improvements. An increase in prices can help with community projects and educational programmes, and further support additional rewilding initiatives and park infrastructure projects. Thus, helping build a higher quality park that can compete against bigger and more well-known parks across the country.

CHAPTER SIX: CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1 Conclusion

The main aim of the study was to determine visitors', preferences for different characteristics of MNP's rewilding strategy, through determining their preferences and WTP of rewilding initiatives. This research paper is one of the limited studies that utilised a CE method to investigate a South African national park's natural characteristics to help enable rewilding. The findings would contribute to better biodiversity management and a sustainable inflow of capital via a sustainable increase in tourist numbers. The CE method was applied to explore the protentional welfare impacts of tourists from a rewilding perspective to either increase or decrease the biodiversity of MNP from its natural biological state, introducing, reintroducing or removing species. But more importantly, the paper sought to identify if there was heterogeneity in the population regarding their preferences for natural characteristics. The research questions were addressed, and the study achieved its overall aim of determining the relative importance of tourists' preferences for certain natural characteristics.

Based on the LCM it was identified that due to certain membership characteristics of the respondents, such as frequency of visits, age and home language, there is heterogeneity in the population regarding their preferences. Two pro-diversity groups were identified, one being more Afrikaans speaking than the other. A large conservative contingent was identified and a small group of the sample population being true rewilders, both groups being more likely to be non-Afrikaans speaking, older and being experienced travellers. The paper identified that all respondents preferred the reintroduction of cheetahs, whilst the conservative group was the only group that did not want lions to be reintroduced. All but the true rewilding group, did not want the non-native species to be removed and preferred more diversity of species within the park. The only endangered species that was unanimously preferred to be introduced by the four classes was that of the black rhino.

It shows the main groups of respondents would be willing to pay more for the park entry fee through reintroducing carnivore species preferably cheetahs' and boosting currently threatened species numbers, especially the rarer types such as the black rhino. Yet, more importantly, they would be against the prospect of removing the current batch of species that are not native to

the area within the park boundary—indicating less attraction to the complete rewilding of the ecosystem of the park.

In the future, the limitations around the accessibility to national park study questionnaires, should be more thoroughly considered, to ensure that the collected data accurately represents all visitors to national parks within South Africa. Due to a large proportion of the country's population being urban and poor, greater attention should be directed towards achieving a broader respondent base for environmental and conservation research. This has resulted in a park visitor profile that does not truly reflect the general national park visitor in South Africa, especially not that of the broader population of South Africa.

This study adds to the existing literature on environmental economics by utilising a choice experiment and latent class analysis for natural characteristics to understand how rewilding certain natural characteristics for MNP can better enable future management policies. Consequently, this will help to ensure that nature-based tourism is implemented and used appropriately to serve as the best possible financial opportunity to support and supplement conservation whilst providing sustainable, high-quality tourism. Ultimately, rewilding is a tool that can and should be used to boost biodiversity, protect ecosystems and attract tourists.

6.2 Recommendations to park management

Certain recommendations can be made to park management regarding the rewilding preferences of natural characteristics of MNP. Firstly, the park should prioritise the reintroduction of cheetahs above that of lions. There has been a great attraction from all respondents for that of cheetahs but apprehension by some for lions. Thus if there is a budget for reintroducing a carnivore species it should be cheetahs.

The park should increase the numbers of black rhinos within the carrying capacity of the park. Subsequently, the increase of roan antelope would be preferred. The introduction of more tsessebe should not be prioritised by park management. Park management should also consider providing sighting maps at park camps and entrances, as a higher sighting probability would satisfy the tourists accordingly. Showcasing the need for reintroducing these animals to local communities and through educational programmes can boost overall conservation efforts. In addition, it can showcase the ability to successfully have these species and in what order for private and public game reserves in the area, struggling with the same problems.

Based on the preferences of the tourists, the park should not remove the species that are not native to the Mokala area, such as the sable antelope, impala, nyala and waterbuck. Tourists prefer a wider range of biodiversity within the park even at the cost of the integrity of the parks ecosystem. If these species numbers are controlled and they do not provide any danger to the ecosystem as a whole, they can provide an additional attraction for tourists. Yet, the biodiversity and ecosystem of the park should be prioritised and if these species present any serious danger to the parks ecosystem they should be removed.

Overall, results indicate that the tourists to the park are willing to pay more than the usual park entry fee for seeing certain natural characteristics improvements. If carnivore species are introduced the park can consider increasing its prices in range with parks of similar status and potentially even more. An increase in prices can help fund further infrastructure projects and potentially additional rewilding initiatives. Thus, helping build a higher quality park that can compete against bigger and more well-known parks across the country.

6.3 Limitations

Various limitations were identified during the research study's progression and analysis of the collected data. These limitations should be addressed in future environmental economics research, especially in the field of rewilding and utilising choice experiments. Some of these are:

- The study's findings were primarily based on the context of the South African domestic tourist market to national parks and should be contextualised to that sample space.
- Limitations in the broader sample base of respondents were evident and should be noted. The findings presented in the research paper should not be specifically generalised to the broader population of South Africa and tourists of other national parks. Natural preference bias should be noted, due to the type of respondents that made themselves available and were willing to fill in the questionnaire, all belonging to a particular set of the country’s population that are more environmentally inclined and are frequent national park visitors.
- An overabundance of Wild card members potentially reduced the accurateness of the results. As Wild card members pay a one-time fee and get free access to parks, thus they might be less influenced by price during CE experiments.

- The high rate of incomplete questionnaires demonstrates the tediousness of completing a lengthy questionnaire but could also be attributed to the difficulty and lack of clarity in the CE.
- During the data analysis stage of the research paper, it was clear that certain gaps emerged with the findings. The questions presented should have been supplemented with additional and more fine-tuned questions. This would have resulted in a wider set of results being gathered and a better understanding of environmental problems and preferences from respondents.
- Another limitation that emerged from the data analysis was the high number of insignificant results produced in the various tested models. A higher participation group could have made the results more accurate and significant. Different types of results analysis should be looked at and utilised.

6.4 Recommendations for future research

The study has identified that there is scope for research in this field, that could contribute significantly to conservation and rewilding efforts. Future research can be directed into different streams to help and contribute to rewilding and conservation and to help park management solve certain problems. More research should be directed in the space of rewilding and the potential it can have on biodiversity across the globe. As well as determining how the value of certain species can attract more tourists and help parks alleviate certain financial difficulties. Some of the future considerations to be looked at could include:

- The key aim of the study was to determine the visitors' preferences for natural aspects of the Mokala National Park. A better knowledge of these preferences can help in orienting rewilding efforts towards the "demand-side", which would enable a greater attraction to the park for their efforts to ultimately bring the land back to its natural and preferred biological state. However, for this to happen, it was important to check whether tourists are interested in restoring ecosystems in their initial states, including removing non-native species. On the one side, the results suggest that only a small proportion of the visitors value the complete removal of non-native species, indicating a preference for viewing a large diversity of wildlife irrespective of the fact they are changing and/or degrading the native ecosystems. This also suggests a lack of knowledge about the challenges these non-native species pose to the ecosystems. On

the other side, the results also suggest that visitors are keen to protect endangered species. Providing additional information about the impact of each species in the ecosystems could progressively change visitor preferences.

- The outcome of the research could be improved by introducing a broader range of respondents from a domestic and international audience. A more diverse sample population should be gathered in future research. This can allow more knowledge to be inferred from the results, better determining what demographic perceives and prefer which type of rewilding characteristics.
- The study proved gaps that respondents would not want non-native antelope species, whether threatened or not, to be removed from the park regardless if they posed a low threat level to the park and its ecosystem. Further research on this topic should be examined regarding these views, to identify how widespread such views are, and point out to identify reasons for these preferences and what the potential implications on the biological states of national parks and tourist attraction towards certain parks would be.
- Further research should be done on the potential that certain species and other natural characteristics of a park could have in the process of rewilding parks. This research has provided evidence that there is potential to provide direct financial support for parks by reintroducing, increasing, or decreasing certain species. This could be expanded further to see whether there is a preference for species on different levels such as endangered, iconic, carnivore, mage fauna etc. Therefore, additional species should be looked at in this manner to identify the WTP from a touristic perspective to identify the appropriate park fees and the additional value certain species provide for the park.
- There is a link in the WTP to see species numbers increase based on the respondents' historical sightings. Further research should be conducted to better understand tourists' perception and preference for endangered species numbers compared to their actual sightings, and whether tourists are primarily interested in being able to see species regardless of their endangered status. Therefore, the question is posed: Is there a higher preference from tourists to see parks with higher diversity of animal species even if that infringes on the park's ecosystem?

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Appendix 1: University of Pretoria Ethical Clearance

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
Ethics Committee
E-mail: ethics.nas@up.ac.za

25 May 2021

ETHICS SUBMISSION: LETTER OF APPROVAL

Mr CJ Kriek
Department of Agricultural Economics Extension and Rural Development
Faculty of Natural and Agricultural Science
University of Pretoria

Reference number: NAS058/2021
Project title: The economic value of natural characteristics of a rewilded park in South Africa: The case of the Mokala National Park

Dear Mr CJ Kriek,

We are pleased to inform you that your submission conforms to the requirements of the Faculty of Natural and Agricultural Sciences Research Ethics Committee.

Please note the following about your ethics approval:

- Please use your reference number (NAS058/2021) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.
- Please note that ethical approval is granted for the duration of the research (e.g. Honours studies: 1 year, Masters studies: two years, and PhD studies: three years) and should be extended when the approval period lapses.
- The digital archiving of data is a requirement of the University of Pretoria. The data should be accessible in the event of an enquiry or further analysis of the data.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.
- **Applications using GM permits:** If the GM permit expires before the end of the study, please make an amendment to the application with the new GM permit before the old one expires
- **Applications using Animals:** NAS ethics recommendation does not imply that Animal Ethics Committee (AEC) approval is granted. The application has been pre-screened and recommended for review by the AEC. Research may not proceed until AEC approval is granted.

Post approval submissions including application for ethics extension and amendments to the approved application should be submitted online via the Ethics work centre.

We wish you the best with your research.

Yours sincerely,

Prof VJ Maharaj
Chairperson: NAS Ethics Committee

Appendix 2: SANParks Tourism research agreement cover letter

South African
NATIONAL PARKS

RESEARCH AGREEMENT

BETWEEN

SOUTH AFRICAN NATIONAL PARKS
herein represented by **Mr Kevin Moore**
in his capacity as **General Manager: Visitor Services**
(hereinafter referred to as "SANParks")

AND

Mr JC Kriek

ID/ Passport no. 9707295032081
(hereinafter referred to as "the Researcher")

WHEREAS the Researcher submitted a research application to SANParks to conduct a research on **"The economic value of natural characteristics of a rewilded park in South Africa: The case of the Mokala National Park"** ("Research") and to collect information ("Data") from SANParks and/or SANParks' visitors;

AND WHEREAS SANParks accepted the Researcher's application to conduct Research and collect data from SANParks and/or SANParks' visitors subject to the terms and conditions as stipulated hereunder:

Appendix 3: Data collection instrument and consent form

PARTICIPANT INFORMATION

Title of Study: Estimating the values of natural characteristics of a National Park: The case of Mokala National Park.

Dear Respondent
You are kindly invited to volunteer to take part in an academic study by completing the following questionnaire conducted by Carel Johannes Kriek, MSc Agricultural Economics student from the University of Pretoria.

This study is a registered research project at SANParks. Although SANParks did not commission it, the study objectives and questionnaire have been reviewed and approved by SANParks.

This study has received written approval from Research Ethics Committees of the Faculty of Natural and Agricultural Sciences, tel 012 420 4356.

Please be informed of the following:
This questionnaire is run only for academic research and the data obtained from it will only be used for that purpose. Your participation in this study is entirely voluntary. You may choose not to answer questions. You can refuse to participate or stop at any time during the questionnaire. All information that you give will be kept strictly confidential. Research reports, presentations and articles in scientific journals will not include any information that may identify you.

There are no major risks involved with this study as it is just a simple questionnaire that you would need to fill out.

The questionnaire will take approximately 15-20 minutes of your time.

Contact details
If you have any questions or comments about the study please contact:
Carel Johannes Kriek - hannokriek@gmail.com or 0716806237

Supervisors
Dr. Selma Karuaihe - Selma.karuaihe@up.ac.za
Dr. Damien Jourdain - damien.jourdain@cirad.fr

CONSENT TO PARTICIPATE IN THIS STUDY

I confirm that the person asking my consent to take part in this study has told me about the nature and risks of the study. I understand that my personal details will be kept confidential, and the findings will

be used for the purpose of the study in line with the university ethics requirements. I understand that there is no penalty should I wish to discontinue with the questionnaire.

- ○ Yes, I give my consent to participate
- ○ No, I do not give my consent to participate

Background: Mokala National Park

Mokala National Park is a small but biodiverse national park. The park has started the process of rehabilitating the land back to its natural state by reintroducing certain megafauna, yet there is still a long way to go for the park to be back to its old natural state.
The Park Management is considering expanding and reintroduce more animals over the years to come. This questionnaire will help with those decisions. The purpose of this questionnaire is to determine tourists' preferences for certain natural aspects of Mokala National Park. Therefore, the park could focus their operation and rewilding strategies accordingly to attract more tourists, improve tourist satisfaction and generate sustainable revenue.

The Questionnaire is structured into four parts:
A) Introduction questions on Mokala National Park and Environmental Management
B) Choice Experiment Questions
C) Debriefing Questions on the Choice Experiment
D) Socio-demographic Questions

Key words defined:

Carnivore species: Species whose food and energy requirements are completely derived from eating other animals
Endangered: A species which is seriously at risk of extinction
Threatened: Cause something to be vulnerable or at risk; endanger
Iconic Species: Species that are unique and rare that are chosen to raise support for biodiversity in a given place and context, they could be seen as flagship species.
Indigenous: Originating or occurring naturally in a particular place.
Non-indigenous Species: A species that does not occur in the region naturally, the species was introduced into the area by humans for commercial or non-commercial use.
Rewild: The process of returning nature to an area where it has previously been removed by humans. Therefore, returning the natural area back to its natural biological way before human activity.

Section A: Introduction questions on Mokala National Park and Environmental Management

1. Do you think that National Parks should introduce species that are not indigenous to that area to help rewild the park? Rewild: restore an area of land back to its natural uncultivated state

- Yes
- No

2. Do you think National Parks should prioritise reintroducing Iconic species like the Big 5 (Lion, Leopard, Buffalo, Elephant and Rhino) back into parks in an effort to rewild the parks?

- Yes
- No

3. Are you more likely to visit a park with the "Big 5" in (lion, leopard, rhino, buffalo and elephant)?

- Yes
- No

4. Are you more likely to visit a park with Endangered wildlife (Rhinos, African wild dogs etc.) in it?

- Yes
- No

5. South Africa formally protects approximately 8% of its terrestrial land and 15% of its marine area.
- Do you believe the country should aim for the High Ambition Coalition (an Intergovernmental Group), where 30% of its land and 30% of its maritime area should be set aside for Formal Protected Areas and Nature Reserves?

- Yes
- No

7. What are the main reason for visiting Mokala National Park? Please check all that apply.

- To view the Mammal diversity
- To view the Bird diversity
- To view and enjoy the Natural Scenery
- Break from the city
- For Rest and Relaxation
- To Experience Nature in its Natural State

8. How many times have you visited Mokala National Park?

- 1
- 2
- 3
- 4
- 5
- >5

9. What was the overall quality of the park facilities during your most recent visit?

- Poor
- Average
- Good
- Excellent

10. Which season do you prefer to go to Mokala National Park? Please, check all that. apply.

- Summer (Dec-Feb)
- Autumn (Mar-May)
- Winter (June–Aug)
- Spring (Sept-Nov)

11. When visiting a National Park do you prefer day visits or staying overnight?

- Day visit
- Overnight Stay

12. When visiting a National Park do you usually stay overnight or is it just a day visit?

- Day visit
- Overnight stay

13. Rank out of 10 how you experience Mokala National Park's "Degree of Wilderness".
For example, when driving through the park did you feel you were away from civilisation and completely in the bush or were there too many people and facilities around that encroached on that "wilderness feeling".

0	1	2	3	4	5	6	7	8	9	10

Q14. If the park doubled in size, do you believe this "Degree of Wilderness" as mentioned in the previous question would improve?

- Yes
- No

Section B: Choice Experiment Questions

In this section you will be presented with 6 Choice Set Questions.

Each choice set will consist of three options named Option A, Option B and Option C (Status Quo). The Status Quo corresponds to the current management scenario and is the same across all choice sets.

We want to find out which of the three Options (A, B or C) you prefer the most for each Choice Set. These options are just Hypothetical scenarios, each option will be different for each choice set and wewant to find out what you prefer the most. For each Option there will be 4 different attributes with different management alternatives these alternatives will change for each option.

Attributes Description Current Management Potential Management Alternatives

1) **Reintroduction of Carnivore Species: Introduce mega carnivore species into the park.**

i. No Introduction-
ii. Reintroduce Cheetahs
iii. Reintroduce Lions

2) Restore Ecosystem: Removing species not indigenous to the Mokala region

To either keep or remove species that are not originally from the area.

i. Do not remove threatened and non-threatened species that live within the park that does not originally occur from the area
ii. Remove threatened species not indigenous to the Mokala area
iii. Remove non-threatened species not indigenous to the Mokala area

3) Protect Local Endangered Animals by Boosting Numbers

Introduce more of the endangered species that live in the park.

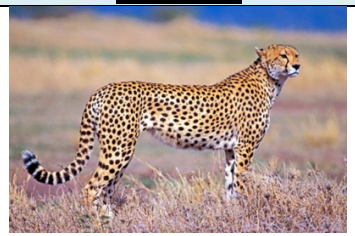
i. No New Introduction - Introduce more Black rhino
ii. Introduce more Roan antelope
iii. Introduce more Tsessebe

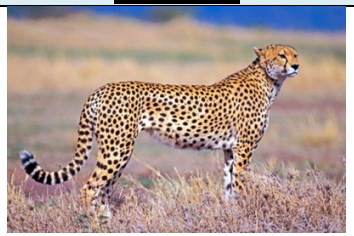
4) Park Entry Fee

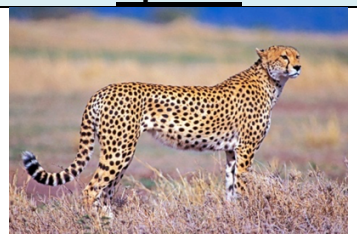
The fee that you would pay to enter the park.

i. R50
ii. R70
iii. R100
iv. R130

Simplified table of all the attributes and their current and potential management alternatives			
Attributes	**Description**	**Current Management**	**Potential Management Alternatives**
1) Reintroduction of Carnivore Species	Reintroduce mega carnivore species into the park.	- No Introduction	-Reintroduce a few Cheetahs into the park - Reintroduce a pride of Lions into the park
2) Restore the ecosystem: ***Removing species not indigenous to the Mokala region***	To either keep or remove species that are not originally from the area. The impact of antelope species not indigenous to the Mokala area is categorised as low on the list of invasive species.	- Do not remove threatened and non-threatened species that live within the park that did not originally occur in the area	- Remove threatened species not indigenous to the Mokala area, such as the sable antelope - Remove non-threatened species not indigenous to the Mokala area, such as the waterbuck, impala and nyala
3) Protect Local Endangered Animals by Boosting Numbers	Introduce more of the endangered species that live in the park. To ensure their survival of the species based on the park's carrying capacity.	- No New Introduction	- Introduce more Black rhinos, to bolster their population - Introduce more Roan antelope, to bolster their population - Introduce more Tsessebe, to bolster their population
4) Park Entry Fee	The fee that you would pay to enter the park.	- R50	- R70 - R100 - R130

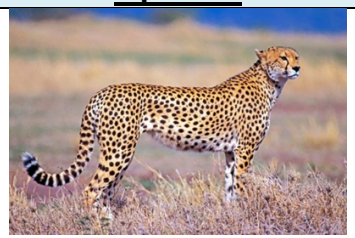
Choice Experiment: 1			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **Reintroduce Cheetah**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Black Rhino**	 **No Specific Introduction**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 1			

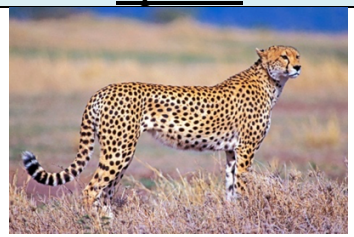
Choice Experiment: 2			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **No Carnivore introduction**	 **Reintroduce Cheetah**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Black Rhino**	 **Introduce more Roan antelope**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 2			

Choice Experiment: 3			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **Reintroduce Cheetah**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce More Tsessebe**	 **Introduce more Black Rhino**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 3			

Choice Experiment: 4			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **No Carnivore introduction**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **No Specific Introduction**	 **Introduce more Black Rhino**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 4			

Choice Experiment: 5			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **No Carnivore introduction**	 **No Carnivore introduction**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove threatened** species like: **Sable antelope**	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Roan antelope**	 **Introduce More Tsessebe**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 5			

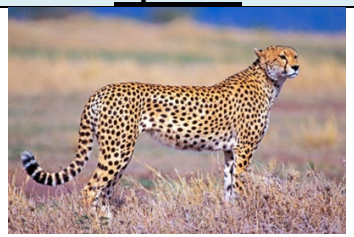
Choice Experiment: 6			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Cheetah**	 **Reintroduce Lion**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce More Tsessebe**	 **No Specific Introduction**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: A - 6			

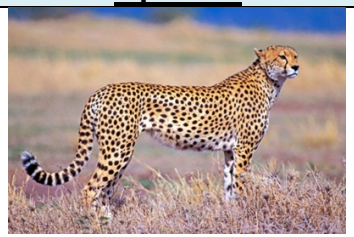
Choice Experiment: 1			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Cheetah**	 **Reintroduce Lion**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce More Tsessebe**	 **Introduce more Roan antelope**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: B - 1			

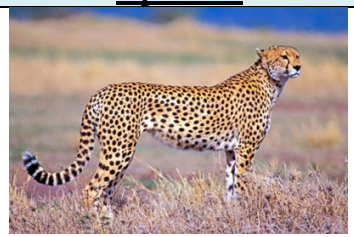
Choice Experiment: 2			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **No Carnivore introduction**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove threatened** species like: **Sable antelope**	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **No Specific Introduction**	 **Introduce More Tsessebe**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: B - 2			

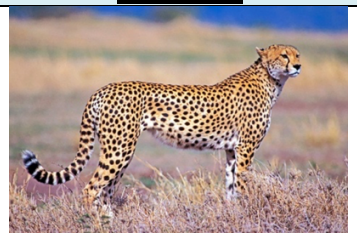
Choice Experiment: 3			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **No Carnivore introduction**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Roan antelope**	 **Introduce more Black Rhino**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: B - 3			

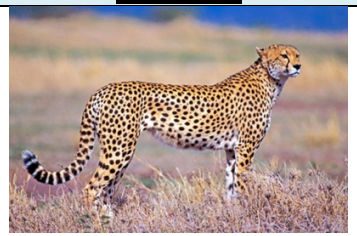
Choice Experiment: 4			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **No Carnivore introduction**	 **No Carnivore introduction**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **No Specific Introduction**	 **Introduce more Roan antelope**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: B - 4			

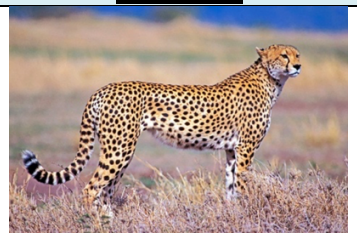
Choice Experiment: 5			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Cheetah**	 **Reintroduce Lion**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **No Specific Introduction**	 **Introduce more Black Rhino**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: B - 5			

Choice Experiment: 6			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Cheetah**	 **Reintroduce Lion**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce More Tsessebe**	 **Introduce more Black Rhino**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: B - 6			

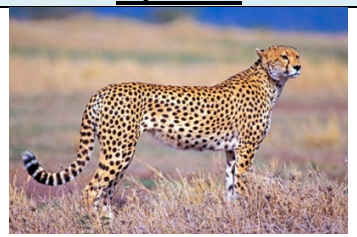
Choice Experiment: 1			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Cheetah**	 **No Carnivore introduction**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Black Rhino**	 **Introduce more Roan antelope**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: C - 1			

Choice Experiment: 2			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **No Carnivore introduction**	 **Reintroduce Cheetah**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Roan antelope**	 **No Specific Introduction**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: C - 2			

Choice Experiment: 3			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **No Carnivore introduction**	 **Reintroduce Cheetah**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove threatened** species like: **Sable antelope**	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Black Rhino**	 **No Specific Introduction**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: C - 3			

Choice Experiment: 4			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Cheetah**	 **Reintroduce Lion**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Remove threatened** species like: **Sable antelope**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Roan antelope**	 **Introduce More Tsessebe**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: C - 4			

Choice Experiment: 5			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **No Carnivore introduction**	 **Reintroduce Lion**	 **No Carnivore introduction**
Restore Ecosystem: ***Removing species not indigenous to the Mokala region***	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Black Rhino**	 **Introduce More Tsessebe**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R100** ***2 Individuals = R200*** ***4 Individuals = R400***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: C - 5			

Choice Experiment: 6			
Attribute	**Option A**	**Option B**	**Option C (Status Quo)**
Reintroduce Carnivore Species	 **Reintroduce Lion**	 **Reintroduce Cheetah**	 **No Carnivore introduction**
Restore Ecosystem: *Removing species not indigenous to the Mokala region*	**Do not Remove Species** that are not indigenous to the Mokala region	**Remove Non-threatened** species like: **Impala, Waterbuck and Nyala**	**Do not Remove Species** that are not indigenous to the Mokala region
Protect Local Endangered Animals by Boosting Numbers	 **Introduce more Black Rhino**	 **Introduce more Roan antelope**	 **No Specific Introduction**
Park Entry Fee	**1 Individual = R130** ***2 Individuals = R260*** ***4 Individuals = R520***	**1 Individual = R70** ***2 Individuals = R140*** ***4 Individuals = R280***	**1 Individual = R50** ***2 Individuals = R100*** ***4 Individuals = R200***
Q: C - 6			

Section C: Debriefing Questions

21. In general, how clear were the instructions provided for you to start the Choice Experiment questions?

- Not Clear
- Neither Clear or Not Clear
- Clear

22. Please indicate how hard it was for you to make a choice from the choice set?

- Hard
- Neither Hard or Easy
- Easy

23. When answering the Choice Experiment questions did you always choose the status quo option (Option C)?

- Yes
- No

24. If you indicated Yes in the previous question, can you explain why you did not choose an option for change within the park?

_____

25. Which one of the following statements best describes how you made your choices within each scenario? Please select one answer and comment in the box where necessary:

- I considered all the choices carefully and chose the one that was most favourable for me
- I chose randomly without regards to the choices
- When choosing between options, there were some attribute(s) that I never looked at. (if you tick this option, please mention which attribute)

  _____
- I chose the option with a specific attribute level which was the most favourable for me and ignoring the other options. If so what was that attribute or level?

  _____
- Other (Please comment) _____

26. Please indicate your preferences for the attributes by ranking them from Most (1) to Least (5) important.

_____ Reintroduce Carnivore species (1)
_____ Restore Ecosystem by removing species not indigenous to the Mokala area (2)
_____ Protect Local Endangered Animals by Boosting Numbers (3)
_____ Park Fees (4)

27. During your most recent visit did you see any Roan Antelope?

- Yes
- No

28. During your most recent visit did you see any Black Rhino?

- Yes
- No

29. During your most recent visit did you see any Tsessebe?

- Yes
- No

30. During your most recent visit did you see any Sable Antelope?

- Yes
- No

Maximum Willingness to pay questions These questions are open ended and you can write down any amount that you feel is accurate.

31. In Rands what is the **Maximum You are Willing to Pay** for **Park Entrance** knowing that you will get a chance to see a **Major Feline Carnivore** like a **Lion or Cheetah**?

_____

32. In Rands what is the **Maximum You are Willing to Pay** for **Park Entrance** knowing that you will get a chance to see an **Endangered species** like the **Roan or Black Rhino**?

_____

33. In Rands what is the **Maximum You are Willing to Pay** for **Park Entrance** knowing that you will get a chance to see an **Iconic species** like the **Sable Antelope**?

_____

Section D: Socio-demographic questions

34 Choose the correct answer that represents your age:

- 18-24
- 25-34
- 35-49
- 50-60
- 61-64
- 65 or older

35. Please indicate your gender:

- Male
- Female
- Other

36. Are you married?

- Yes
- No

37. With whom do you usually travel with when you visit National Parks like Mokala National Park?

- Alone
- As a couple
- Friends
- Family
- Organised group
- Other: (Please specify) (6) _____

38. Are you a Wildcard Member?

- Yes
- No

39. What is your home language?

- Afrikaans
- English
- IsiXhosa
- IsiZulu
- Sepedi
- Setswana
- Sesotho
- Other: (Please specify)

40. Please indicate the highest level of education that you have obtained?

- Primary School
- Grade 12
- Diploma/ National Certificate
- Undergraduate Degree
- Postgraduate Degree

- Other: _____

41. Please specify your monthly personal income:

- Less than R20000
- R20000 - R40000
- R40000 - R60000
- More than R60000

42. Please indicate your profession:

- Employed full time/ part time
- Self-employed
- Unemployed/ looking for work
- Retired
- Student
- Other: (Please specify) _____

43. Which province do you reside in?

- Northern Cape
- Freestate
- Western Cape
- Eastern Cape
- Gauteng
- Mpumalanga
- Limpopo
- KwaZulu-Natal
- North West
- Other:

44. How far do you live from the park?

- Between 50-100km (Kimberley is 89.6km away)
- Between 100-250km (Bloemfontein is 227km away)
- >250km