South African
NATIONAL PARKS

Karoo National Park

Park Management Plan

For the period 2017 - 2027

Acknowledgement

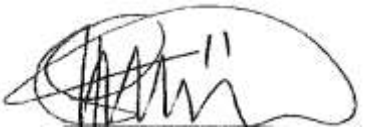
This plan was prepared by André Spies, with significant input and help from André Riley, Dr Angela Gaylard, Arlene du Toit, Brian v.d. Westhuizen, Chrispen Chauke, Esna van Zyl, Dr Dirk Roux, Dr Danny Govender, Dr David Zimmermann, Dewald Duimpies, Dries Engelbrecht, Elizabeth Mhlongo, Ernest Daemane, Hendrik Sithole, Dr Hugo Bezuidenhout, Dr Ian Russell, Dr Izak Smit, Jayshree Govender, Karen Waterston, Lauren Nel, Dr Mike Knight, Nicholas Cole, Nico van der Walt, Nolubabalo Tantsi, Riaan Nel, Dr Sam Ferreira, Temba Simon Mangcaka, Tercia Strydom and various stakeholders.

Section 1: Authorisation

This management plan is hereby internally accepted and authorised as required for managing the KRNP in terms of Sections 39 and 41 of the National Environmental Management: Protected Areas Act No 57 of 2003 (NEM: PAA).

Mr. N. v.d. Walt
Park Manager: Karoo National Park — Date: 10 February 2017

Mr. A.H. Engelbrecht
General Manager: Frontier Region — Date: 10 February 2017



Mr. P.S. Mokoena
Managing Executive: Parks — Date: 10 February 2017

Mr. F.G. Mketeni
Chief Executive: SANParks — Date: 18 August 2017

Ms. J. Yawitch — Date: 21 August 2017
Chair: SANParks Board

Approved by the Minister of Environmental Affairs

Dr. B.E.E. Molewa, MP — Date: 30 September 2017
Minister of Environmental Affairs

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Glossary

Aircraft	Means an airborne craft of any type whatsoever, whether self-propelled or not, and includes hovercraft and drones.
Db land type	Refers to a soil pattern where duplex soils, such as Swartland and Valsrivier forms, are dominant. Without exposed rocks, stones or boulders, more than half of the remaining land must consist of duplex soils. Non-red, prismatic and / or pedocutanic B horizons characteristically dominate this land type.
Desired state	The park desired state is based on a collectively developed vision and set of objectives of the desired future conditions (that are necessarily varying, across the full V-STEEP range) that stakeholders desire.
Dynamic pricing	Dynamic pricing, also called "real-time" pricing, is a pricing strategy in which businesses set highly flexible prices for products or services based on current market demands. The goal of dynamic pricing is to allow a company that sells goods or services over the Internet to adjust "prices" on the fly "in response to market demands".
Extra-limital	Those species occurring outside their historical distribution.
Fc land type	The F unit indicates land where the dominant soil-forming processes have been rock weathering, typically giving rise to lithocutanic horizons. The Fc Land Type indicate land where lime occurs regularly (it does not need to be present in every soil) in upland and valley bottom soils.
Forbland	Land cover is significantly altered / disturbed by introduced annual and biennial forbs. Natural vegetation types are no longer recognisable.
Ib land type	Refers to exposed rocks, which cover 60 to 80% of the area. The rocky portions of Ib land type may be underlain by soil that would qualify the unit for inclusion in another broad soil pattern had it not been for the surface rockiness.
Interpretation	Interpretation is the communication of information about, or the explanation of, the nature, origin, and purpose of historical, natural, or cultural resources, objects, sites and phenomena using personal or non-personal methods.
Land type	Land Type denotes an area that can be shown at 1:250 000 scale and that displays a marked degree of uniformity with respect to terrain form, soil pattern and climate.
Metapopulation	A "metapopulation" consists of a group of spatially separated populations of the same species which interact at some level.
MICE	Meetings, Incentives, Conferences and Events. Used to refer to all function types available.
Mission	An articulation of the Vision that describes why the park exists and its overall philosophy on how to achieve its Vision.
MODIS satellite imagery	The moderate-resolution imaging spectroradiometer (MODIS) is a payload scientific instrument. The instrument capture data in 36 spectral bands ranging in wavelength from 0.4 µm to 14.4 µm and at varying spatial resolutions (2 bands at 250 m, 5 bands at 500 m and 29 bands at 1 km).
Objectives hierarchy	The objectives for a park, with the most important, high-level objectives at the top, cascading down to objectives at finer levels of detail, and eventually to operational actions at the lowest level.

Responsible tourism	Tourism that maximises benefits to local communities, minimises negative social or environmental impacts, and helps local people conserve fragile cultures, habitats and species. Or, it is a tourism or leisure activity implementing a practice that is respectful of natural and cultural environment and which contributes, in an ethical manner, to local economic development.
Servitude	A "servitude" shows a registered right that an entity / person has over the immovable property of another. It allows the holder of the servitude to do something with the other person's property, which may infringe upon the rights of the owner of that property.
Shale gas mining	Shale gas mining is a process that applies the technique of high-volume, horizontal, slick-water fracturing ('fracking' or 'hydraulic fracturing'). It involves pumping water, sand and chemicals into horizontally drilled wells under hydraulic pressure, to fracture the underground shale layers and release gas.
Stakeholder	A person, an organ of state or a community contemplated in section 82(1)(a); or an indigenous community contemplated in section 82(1)(b) of National Environmental Management: Biodiversity Act No 10 of 2004 (NEM: BA).
SPOT5 imagery	**SPOT** (French: *Satellite Pour l'Observation de la Terre*) is a commercial high-resolution optical imaging Earth observation satellite system operating from space.
Universal access	Refers to the design of products, devices, services, or environments to cater for people with disabilities.
Vision	A word 'picture' of the future, or what the stakeholders see as the future for the park.
Vital attributes	Unique or special characteristics of the park, the determinants of which management should strive to protect, and the threats towards which management should strive to minimise.
V-STEEP	The values (social, technological, economic, ecological and political), used to understand, with stakeholders, the social, economic and ecological context of the system to be managed, and the principles / values that guide management. These are used to develop a broadly acceptable vision for the future.

Acronyms and abbreviations

1	AMSL	Above Mean Sea Level
2	IAS	Invasive and Alien Species
3	APO	Annual Plan of Operations
4	BSP	Biodiversity Social Projects
5	BWLM	Beaufort West Local Municipality
6	BWTO	Beaufort West Tourism Organisation
7	CARA	Conservation of Agricultural Resources Act (Act No 43 of 1983)
8	CBD	Convention on Biological Diversity
9	CDF	Conservation Development Framework
10	CKDM	Central Karoo District Municipality
11	CPF	Coordinated Policy Framework
13	CRMF	Corporate Risk Management Framework
14	CSD	Conservation Services Division
15	CSIR	Council for Scientific and Industrial Research
16	CSM	Supply Chain Management
17	DEA	Department of Environmental Affairs
18	DEAT	Department of Environment Affairs and Tourism
19	DEADP	Western Cape Department of Environmental Affairs and Development Planning
20	DEDEAT	Eastern Cape Department of Economic Development, Environmental Affairs and Tourism
21	EDRRP	Early Detection and Rapid Repose Programme
22	EIA	Environmental Impact Assessment
23	EMP	Environmental Management Plan
24	EPWP	Expanded Public Works Programme
25	FEPA	Freshwater Ecosystem Priority Area
26	GG	Government Gazette
27	GN	Government Notice
28	HIL	High Intensity Leisure
29	HRAFO	Human Resource and Administration and Financial Officer
30	IDP	Integrated Development Plan
31	IUCN	International Union for Conservation of Nature
32	KRNP	Karoo National Park
33	l	Litre
34	LIL	Low Intensity Leisure
35	LLP	Lower Level Plan
36	m	Metre
37	mm	Millimetre
38	NEMA	National Environmental Management Act (Act no 107 of 1998)
39	NEM: BA	National Environmental Management: Biodiversity Act (Act no 10 of 2004)
40	NEM: PAA	National Environmental Management: Protected Areas Act (Act no 57 of 2003)
41	NHRA	National Heritage Resources Act (Act no 25 of 1999)
42	NPAES	National Protected Areas Expansion Strategy
46	NPTSA	National Parks Trust of South Africa
47	OHS	Occupational Health and Safety
48	OPEX	Operational Expenditure
49	PDI	Previously Disadvantaged Individuals
50	PM	Park Management
51	RBA	Risk Benefit Analyses
52	SAHRA	South African Heritage Resources Agency
53	SAM	Strategic Adaptive Management
54	SANBI	South African National Biodiversity Institute
55	SANParks	South African National Parks
56	SAPS	South African Police Service
57	SDF	Spatial Development Framework

58	SHEQ	Safety, Health, Environment and Quality
59	SHRs	SANParks Honorary Rangers
60	SMF	Science Management Forum
61	SMO	Special Management Overlay
62	SMME	Small, Medium and Micro Enterprise
63	SPOT5	Satellite Pour l'Observation de la Terre
64	SSC	Species of Special Concern
65	TPC	Threshold of Potential Concern
66	UA	Universal access
67	UNISA	University of South Africa
68	V-STEEP	Values - Social, Technological, Environmental, Economic and Political
69	WfW	Working for Water
70	WoL	Working on Land

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Executive summary

In compliance with the NEM: PAA, SANParks is required to develop a management plan for each of its protected areas. In developing the management plan for this park, SANParks has reviewed the biodiversity conservation, Responsible Tourism and constituency building components that make up its core business, whilst ensuring continual learning and compliance.

The park is situated in the Western Cape, on the southern slopes of the Nuweveld Mountain range in the Great Karoo. It was proclaimed in 1979 after members of the public petitioned the National Parks Trust to establish a national park in the Beaufort West area. The steep topographical gradients and different altitudes in the park produce a structurally complex environment which provides many niches for animal and plant species. Vegetation types are closely linked to soil type, soil depth, rockiness, slope and aspect. It is situated in the semi-arid Nama-Karoo and falls within two biomes namely Nama-Karoo and Grassland. The park has a wide variety of endemic wildlife, with 58 mammal species, more than 200 bird species and a rich reptilian fauna including 18 snake species and five tortoise species. All of the above are largely determined by the steep gradients, the geology and soil, climate and rainfall typical of the Great Karoo. The development of conflicting land uses present the biggest threat to the park's vital attributes.

An important objective for SANParks is to promote responsible opportunities for visitors to appreciate and value national parks. The priority for the conservation of biodiversity should also recognise that the park could act as a nature-based tourism destination of choice, thereby constituting an economically and culturally valuable asset to the region in which it occurs.

The desired state of the park is based on a vision, mission, vital attributes and objectives. It encompasses the characteristic Karoo biodiversity components, including ecological patterns and processes and associated Karoo cultural, historical and scenic resources while facilitating benefits to the neighbouring communities by creating job opportunities and other forms of income generation, while remaining informed and constrained by its biodiversity values. Programmes to achieve the desired state fall within four categories, *i.e.* biodiversity, Responsible Tourism, constituency building and benefit sharing, and effective park management.

The first management plan for the park was submitted to, and approved in part, by the Department of Environment Affairs and Tourism (DEAT) in 2008. This first review builds on the foundation of the first plan and addresses its inadequacies. The layout of the plan follows the format provided in the guideline drawn up by the Department of Environmental Affairs (DEA) (Cowan and Mpongoma 2010) while also incorporating the adaptive planning process adopted by SANParks. Local and district municipalities and other organs of state, as well as other stakeholders were consulted as required (Appendix 2).

Introduction

The plan serves as a reference to the management and development of the park in its current and envisaged future form with information on the background, biophysical context, desired state, programmes at strategic and operational levels and costing.

This management plan will come into effect following the approval by the Minister in terms of sections 39 and 41 of NEM: PAA. It is intended for a timeframe of 10 years after commencement unless it is replaced earlier by a newly approved plan. SANParks will review this plan no later than ten years after the commencement date.

The plan contains the following sections**:**

- **Section 1** - provides for the required authorisation;
- **Section 2** - provides a record of the legal status of the park, descriptions of its context as well as relevant local, regional, national and international agreements;
- **Section 3** - sets out the framework of legislation, national policies, SANParks structures, policies, guidelines, practices regarding management;
- **Section 4** - describes the consultation process followed in the preparation of this plan;
- **Section 5** - presents the vision, purpose, values, principles and attributes considered in developing a desired state for the park and provides the high-level objectives as basis for the management programmes contained in Section 10 of the plan;
- **Section 6** - outlines the zoning plan;
- **Section 7** - describes access and facilities;
- **Section 8** - summarises the expansion and consolidation strategy;
- **Section 9** - sets out the concept development plan;
- **Section 10** - provides a strategic plan with programmes, objectives and activities with cost estimates. Monitoring and evaluation are integrated into the actions;
- **Section 11** - contains detailed costing of the programmes; and
- **Appendices** to this plan contain further details such as declarations, stakeholder participation report, park development framework, internal rules and maps.

Section 2: Legal status

2.1 Name of the area

Karoo National Park was initially proclaimed in 1979 (Government Gazette No 6648 dated 07 September 1979). A full list of the declarations appears in Appendix 1.

2.2 Location

The park is situated against the Nuweveld Mountain range, 3 km northwest of Beaufort West, in the Western Cape Province (Appendix 5, Map 1). It forms part of the Great Karoo, South Africa's largest ecosystem, covering 35% of South Africa's land area. The park thus falls within the Central Karoo District of the semi-arid Nama-Karoo environment.

2.3 History of establishment

During the late 1950s a local farmer and bird enthusiast Mr William Quinton campaigned for a conservation area in the Beaufort West vicinity. However, it was only in the 1970s that the then National Parks Board proposed the establishment of a national park that would be representative of the Nama-Karoo Biome after a campaign launched by the South African Nature Foundation. This campaign was funded through the commission and sale of special art stamps depicting the flora and fauna of the Great Karoo. After considering a number of possible suitable areas it was decided to establish this new park in the vicinity of Beaufort West. In a gesture of support, the Town Council of Beaufort West donated 7,209 ha of communal land north-west of the town to the National Parks Board. This area then formed the nucleus of the KRNP, proclaimed in 1979. The South African Nature Foundation purchased additional land to be incorporated into the park, and in 1989 a rest camp was opened. The Great Karoo is an area of unrivalled importance for understanding the evolution of the oldest known complex ecosystems on land. The park forms part of one of the Karoo's classic study and collecting areas for the wealth of ancient petrified fossils of the long-gone Karoo animals.

2.4 Contractual agreements

Contractual agreements remain one of the options available for private landowners to become part of the park and improve the ecological representation of the park. In this regard the National Parks Trust of South Africa (NPTSA), has made land acquired by the trust, available for inclusion into the park. As per the notarial agreements, these land parcels are fully managed by SANParks. Table 1 below provides a summary of the privately owned land that was contractually included into the park.

Table 1. Private land included, by declaration, into the park.

Title deed	Farm name	Portion No	Extent (Ha)	Owner	GG	Proclamation date	Period
T78548/1997	Morceaux 207	1	2,653	NPTSA	25562	2003-10-17	99 Years
T3907/1999	Afsaal 301	1	1,207		26615	2004-07-30	
T3907/1999	Brand Kraal 209	3	468		26615	2004-07-30	
T24174/2000	Blaauwkrans 216	5	1,747		26615	2004-07-30	
T24174/2000	Brandewyns Ghat 214	12	1,147		26615	2004-07-30	
T36913/2000	Klipplaats Fontein 210	1	2,027		26615	2004-07-30	
T36913/2000	Klipplaats Fontein 212	0	989		26615	2004-07-30	

Title deed	Farm name	Portion No	Extent (Ha)	Owner	GG	Proclamation date	Period
T37905/2000	Berg-En-Dal 391	0	1,466		26615	2004-07-30	99 Years
T37905/2000	Brandewyns Ghat 214	14	424		26615	2004-07-30	
T37905/2000	Brandewyns Ghat 214	6	422		26615	2004-07-30	
T37905/2000	De Kruis 458	3	355		26615	2004-07-30	
T37905/2000	De Kruis 458	2	240		26615	2004-07-30	
T52481/1999	Farm 180	3	576		26615	2004-07-30	
T7529/2000	Bushmans Kop 427	1	2,664		26615	2004-07-30	
T17703/2005	Afsaal 301	2	250		36951	2013-10-25	-
T17703/2005	Brand Kraal 209	0	383		36951	2013-10-25	-
T17703/2005	Brandewyns Ghat 214	10	879		36951	2013-10-25	-
T17703/2005	Brandewyns Ghat 214	10	1,050		36951	2013-10-25	-
T17703/2005	Hendriks Kraal 298	5	407		36951	2013-10-25	-
T17703/2005	Klipplaats Fontein 210	0	3,209		36951	2013-10-25	-
T17703/2005	Klipplaats Fontein 210	6	649		36951	2013-10-25	-
T17703/2005	Klipplaats Fontein 210	5	1,655		36951	2013-10-25	-
T98716/2005	Alwynsgat 187	2	411		36951	2013-10-25	-
T46520/2007	Grootfontein 180	4	1,413		36951	2013-10-25	-
T72330/2008	Farm 202	0	211		36951	2013-10-25	-
T51882/2009	Danster Fontein 219	0	379			Not declared	-
T51883/2009	Danster Fontein 219	4	59			Not declared	-

2.5 Co-management agreements

There are currently no co-management agreements effective.

2.6 Total area

The park is currently 90,535 ha in size of which 83,123 ha are declared while 7,412 ha are in the process of being declared (Appendix 5, Map 3).

2.7 Highest point

The highest point in the park is the Nuweveld Mountain at 1,908 m (6,258 feet) above mean sea level (AMSL). The latter is of note as this determines the park's restricted airspace (2,500 feet above the highest point, thus 8,758 feet AMSL) above the park (Appendix 5, Map 2).

2.8 Municipalities within which the park falls

The park is situated within the following local and district authority boundaries:

- Beaufort West Local Municipality (BWLM); and
- Central Karoo District Municipality (CKDM).

2.9 Land claims

There is currently (2017) no land claim registered against any portion of land within the park. However, the land claims process has been re-opened until 30 June 2019.

2.10 International, national and provincial listings

There are no relevant international, national or provincial listings.

2.11 Environmental authorisations

No environmental authorisation has been issued when this document was approved.

2.12 Biophysical description

2.12.1 Climate

2.12.1.1 Historic

Mean annual rainfall ranges from 175 mm - 406 mm in different parts of the park, with 60 % – 75 % falling in summer. Rainfall reliability, as expressed by the coefficient of variation in annual rainfall, diminishes from west to east. The park experiences cold winters (mean minimum winter temperature is 3.5 °C) and hot summers (mean maximum summer temperature is >32 °C). The mountains of the Great Escarpment experience a cool steppe climate, with the steep elevation and precipitation gradient rapidly changing to a warm steppe climate in the eastern, southern and western lowland areas of the park. Mild to heavy frost occurs with periodic snow on top of the Nuweveld Mountains. The vegetation growth season lasts seven to eight months. Westerly and north westerly winds dominate and have a scorching effect on the soil and vegetation.

2.12.1.2 Future

By 2050, average temperatures in the park are expected to increase by between 1.5 ^{o}C and 2.5 ^{o}C (DEA, 2013; Driver *et al.,* 2012; Holness & Bradshaw, pers. comm.). Though these changes might sound small, they significantly increase the chance of extreme temperatures (*e.g.* if maximum temperatures increased by 1.5 ^{o}C to 2.5 ^{o}C, there would be ~16 – 31 more days in the year where the Beaufort West temperature would exceed 35 ^{o}C). Hot extremes have negative impacts on plants and animals, as well as tourists, especially where hot spells stretch for a number of days. Under the intermediate and driest scenarios, rainfall is predicted to decrease annually by between 20 mm and 80 mm (DEA, 2013; Driver *et al.,* 2012; Holness & Bradshaw, pers. comm.). The latter decrease would effectively halve the rainfall of the region. The wettest scenario would see an increase in rainfall of 54 mm per year. Despite uncertainty in predictions, parks should prepare for a variety of futures, different from current conditions and have plans in place to deal with the consequences of either set of extremes. Encouragingly, under all of the possible 2050 scenarios, climatic conditions would still be within the range experienced across the Nama Karoo currently, making the park an important area for Nama Karoo conservation.

Some parks have explicit or dramatic climate changes predicted, while for others, like Karoo, the level of future change may be less certain or dramatic. The park should however contribute to climate change mitigation measures to ensure a more sustainable future. The changing climate presents SANParks with an opportunity to educate the public and showcase methods for sustainable living.

2.12.2 Topography

The park can be divided into five physiographic units: the Southern and Central plains <1,000 m AMSL, the South Eastern plains < 1,000 m AMSL, the Middle plateau 1,100 – 1,200 m AMSL,

the Northern Upper plateau 1,600 – 1,900 m AMSL, and the flat topped Korannasfontein Mountain in the west 1,400 – 1,550 m AMSL. The dominant topographic feature of the park is its location on the Great Escarpment, with the higher old African surface to the north and more recently exposed lower lying plains areas to the south, which are dotted with characteristic Karoo koppies. Consequently, the park's almost entirely non-perennial rivers mostly drain to the south, often through deep cut ravines in the mountainous areas. The park's steepest profile (1, 100 m) is in the east, between the high-lying area above the steep south facing Nuweveld escarpment; and the plains to the south.

2.12.3 Geology and soils

In KRNP there is a clearly visible link between the geological horizons of the plains of Beaufort West, progressing through time, layer by layer, to those at the top of the Nuweveld escarpment. The Karoo Supergroup of Permian age consists of the Dwyka Formation, Ecca Group and Beaufort Group. The Beaufort Group overlies the Ecca Group and consists of alternating mudstone (red in places) and sandstone. It sub-divides into the lower Abrahamskraal Formation (1,500 m – 2,000 m thick) and an upper Teekloof Formation (±1,400 m thick) with the boundary arbitrarily at the base of the so-called "Poortjie Sandstone". This formation consists of mudstone (red in places), sandstone and thin greenish cherty beds. The sandstones represent river channel deposits and the mudstones, floodplain deposits. The cherty beds were originally ash fall tuffs, although the presence micro-cross-lamination suggests subsequent transportation by water onto the floodplains. Jurassic-age dolerite extensively intrudes the Beaufort Group as dykes and sheets. Inclined sheets form crescent-shaped or concentric intrusions that are clearly visible on the Middle- and Upper Plateau. The sills range from a few metres to over 100 m in thickness. The dolerite causes a metamorphosis effect on the adjacent host rocks. Mudstone altered to hornfells and the sandstones develop a quartzitic appearance. Deposits of Quaternary age include river terrace gravel, calcrete, alluvium and debris. Terrace gravel consists of fairly well-rounded cobbles and boulders composed largely of dolerite. The terrace gravel shows clearly along the banks of the Gamka River where sharp profiles occur. These gravels are partly calcrete cemented and occur on terrace remnants that now lie from a few metres to a maximum of 30 m above the general land surface. Calcrete occurs directly on bedrock and has also formed extensive deposits within some larger areas of alluvium, attaining a maximum thickness of a few metres. The alluvium embraces both alluvial slopes (sheet wash) and alluvial valley (channel-related) deposits, with the former predominating in the Lammertjiesleegte and the latter dominating in the Stolshoek areas of the park (Rubin & Palmer 1996).

This geology and geomorphology processes is the main reason why many paleontological surveys have been done in and around the park. The Fossil trail was setup to share this wonderful findings with visitors. An example is that around the current rest camp a scatter of Middle Stone Age stone tools- mainly scrapers and flakes made of a variety of materials and probably of two different time periods between 60,000 to 100,000 years old have been founded. The abundant fossil evidence of past life forms that flourished here many millions of years ago indicate the significance of conserving our paleontological and archaeological heritage in the park.

The dominant soil-forming process is rock weathering, the formation of orthic topsoil horizons and, commonly, clay alleviation, giving rise typically to lithucutanic horizons. The Ib land types are mainly associated with the Nuweveld Mountain, upper steep midslopes and also the middle plateau areas. Apart from the dominant rocky outcrops the other soil forms (Glenrosa and Mispah) are typical of these terrain forms. The dominant soil forms, depth is between 0.05 m – 0.3 m, while the clay content of the B-horizons vary between 15 % – 35 %. The north eastern corner of the upper plateau of the Nuweveld Mountain in the park is closely associated with the Db land type. The dominant soil forms are Valsrivier and Oakleaf, with depth of between 0.1 m - 0.3 m and high clay content of 20 % - 55 %. Non-red B horizon, duplex soil cover more than half of this terrain form. The central and southern areas of the Park is being dominated by lower lying undulating terraces (plateau and midslopes) and valley bottomlands which are closely associated with the Fc land types. The dominant soil forms are Glenrosa and Mispah with the depth between 0.05 m - 0.3 m and the clay content between 15 % - 35 % (Land Type Survey Staff 1987, Soil Classification Work Group 1991).

2.12.4 Freshwater ecosystem

The Nuweveld Mountain range forms a watershed between the Upper Karoo and the Central Karoo. However, most of the park is situated to the south of the mountain range where water drains via a large number of drainage lines. Consequently, a number of important rivers have their source in the park, namely the Sak, Leeu and Gamka Rivers. In KRNP, the Sand (from its source to its confluence with the Doringhoek River), Doringhoek and Stols Rivers are Freshwater Ecosystem Priority Areas (FEPA). These rivers provide critically important ecological functions and ecosystem services at the local scale and should be managed accordingly. The Leeu River enters the park from the Northern Cape at Brandewynsgat and flows

through the park towards the west, and is joined by the Paalhuis River, Klipplaatsfontein River, Boesmanskop River, Doringhoek River and Sand River, all of which have their catchment within the park. In the north east, the Gamka River has part of its source partly in the park and then flows through the park towards the south. The Stolshoek River originates in the park and joins the Gamka River further downstream. Also in the north east the Puttersvlei area drains from a gentle slope towards the north and forms the source of the Sak River. All of these streams and rivers are seasonal and dependent on rainfall and snow in the winter to flow. However, some of these such as the Klipplaatsfontein and Doringhoek Rivers, can retain water in pools for long periods after rain.

There are a number of small springs in the park. The spring at Kookfontein is the largest and best-known, and was used for irrigation in earlier times. Ground water is abundant, but not properly quantified for the whole area. Some boreholes in the Stolshoek and Doringhoek areas yield in excess of 40,000 l per hour, and more that 60 boreholes exist which were at some stage equipped with windmills. Some wetlands occur, mostly small and associated with larger rivers and springs. The northern upper plateau and mountain slopes are generally more moisture rich than the southern plains.

2.12.5 Terrestrial flora

The park forms part of the Great Karoo, South Africa's largest ecosystem, covering 35 % of its land area. It is situated in the semi-arid Nama-Karoo against the Nuweveld Mountain range. The vegetation of the park falls within two Biomes namely Nama-Karoo, which covers the largest section of the park and a relatively small section of the Grassland Biome. The Upper- and Lower Karoo Bioregion units representing the Western Upper Karoo, Upper Karoo Hardeveld and the Gamka Karoo vegetation types. The Grassland Biome is being represented by the Karoo Escarpment Grassland vegetation type, which form part of the Dry Highveld Grassland Bioregion. The physical appearance of the vegetation comprises of Montane Karoo grassy shrublands, Karoo grassy dwarf shrublands, Karoo succulent dwarf shrublands and riparian vegetation.

In a phytosociological study by Rubin & Palmer (1996), they described fifteen dominant plant communities in the original 33,000 ha park. Steep elevation and precipitation gradients within the park have a direct impact on the variety of habitat-cum-vegetation units. The relative high elevation and rainfall of the montane grassland inhabited plant communities are dominated by *Merxmuellera disticha*, *Cymbopogon pospischilii* and *Themeda triandra.* Grass species and Fynbos associated tall forbs such as *Elytropappus rhinocerotis*, *Euryops annae* and *Passerina montane* and sparse woody plant species such as the tree Sterboom *Cliffortia arborea* and dwarf shrub *Diospyros austro-africana* are common. The increasing aridity away from the escarpment edge in a south western direction is steep, and the Montane Karoo dwarf shrublands replace these mesic plant communities with plant species such as *Eriocephalus ericoides*, *Rosenia oppositifolia* and *Pteronia tricephala* dominating this unit. In the valley bottomlands and plains the rainfall is erratic and very low. The many drainage lines support the only woodland plant community in the park, with the tree *Vachellia karroo*, dwarf shrub *Lycium cinereum*, grass species *Stipagrostis namaquensis* and *Cenchrus ciliaris* the most prominent / conspicuous plant species. Adjacent to the drainage lines dry forbland plant communities are encountered, this is being dominated by the grass species *Stipagrostis obtusa*, *Stipagrostis ciliata* and the forbs *Pentzia incana*, *Hermannia* species, *Aptosimum* species and *Eriocephalus* species. A total of 864 plant species, representing 355 genera and 93 families have been recorded in the park (Rubin *et. al*., 2001). Thirty percent of the recognised endemic plant species of the Nama-Karoo Biome are conserved within the park.

The classification, description and mapping of plant communities and their associated abiotic features are vital first steps in building a framework for understanding, protecting, conserving and managing our natural resources. Bezuidenhout (2016) has synthesised the classification,

distribution and description of three major ecosystems with 15 landscape units for the park (Appendix 5, Map 8). Table 2 below describes the identified landscape units.

Table 2: Landscape units and plant communities of the park.

Major ecosystems and landscape units	Description
Nuweveld Mountain plateau and ridges	
Montane Grassland	This relatively high elevated landscape unit is closely associated with the Nuweveld mountain plateau representing a grassland with sparsely scattered shrubs. Historically, fire has been an important component of this landscape unit, with pyrophilic grass species predominating. A similar plant community was described by Rubin & Palmer (1996) as the *Merxmuellera disticha-Lightfootia nodosa* Montane Grassland.
Leegtes / wetlands	This landscape unit is closely associated with the Bushman Vloere (AZi5) and Eastern Upper Karoo (Nku 4) (Mucina & Rutherford 2006). Also associated with the *Euryops annae-Elytropappus rhinocerotis* Montane Shrubland described by Rubin & Palmer (1996).
Shrub thicket	This landscape unit is closely associated with the Upper Karoo Hardeveld (Nku 2) (Mucina & Rutherford 2006). A similar plant community has been described by Rubin & Palmer (1996) as the *Euryops annae-Elytropappus rhinocerotis* Montane Shrubland. It has fairly dense perennial shrub patches in localised depressions and shallow valleys in the high altitude Montane Grassland. The Montane Shrubland appears to replace the Montane Grassland where disturbance occurred in the past, while often more mesic nature of these habitats probably also protects them from natural lightning fires that sporadically occur on these mountain. Past cultivation practices are clearly visible in some larger valleys (Rubin & Palmer 1996).
Mountain Shrubland	This landscape unit is also closely associated with the Upper Karoo Hardeveld (Nku 2) (Mucina & Rutherford 2006). A similar plant community was described by Rubin & Palmer (1996) as the *Euryops annae-Nemesia fruticans* semi-woody Shrubland. It occurs on the steep higher midslopes directly below the escarpment. It consists of rocky sandstone screes interspersed with less rocky areas, and drier areas interspersed with wetter areas where the sun is absent in winter and in the afternoons. It has a high canopy cover and high plant species diversity (Rubin & Palmer 1996).
Short Shrubland	This landscape unit is closely associated with the Upper Karoo Hardeveld (Nku 2) (Mucina & Rutherford 2006). A similar plant community was described by Rubin & Palmer (1996) as the *Eriocephalus ericoides-Pteronia tricephala* Montane Dwarf Shrubland, which occurs on open and flat terrain. It is the only Dwarf Shrubland on the upper plateau within the park.
Terraces of the Nuweveld Mountain midslopes and mid-plateau	
Grewia robusta Shrubland	This shrubland occurs on steep, unstable to stable mudstone / sandstone midslopes, with the occasional influence of dolerite. A similar plant community was described by Rubin & Palmer (1996) as the *Rhigozum obovatum-Garuleum bipinnatum* Dwarf Shrubland.
Grassland	This is a new landscape unit which requires more fieldwork and research before it could be comprehensive describe.
Karroid Grassland	This grassland landscape unit occurs in repetitive patterns on the flat sandstone pediments present in varying degrees on the mountain midslopes and foothills. A similar plant community was described by Rubin & Palmer (1996) as the *Eriocephalus ericoides-Trichodiadema setuliferum* Dwarf Shrubland.
Searsia sparse Shrubland	This shrubland occurs on the flat middle escarpment. The high shrub and grass component suggests a mesic site, probably due to the precipitation deposited by the south westerly fronts (Rubin & Palmer 1996). A similar plant community was described by Rubin & Palmer (1996) as the *Aristida diffusa-Rhus burchellii* Grassy Shrubland.
Valley bottomland and associated drainage lines	
Bossieveld	This Bossieveld landscape unit occurs on the foothills. Typically found around the main camp site, around Stolshoek and on the first section of the circular drive of Lammertjiesleegte. A similar plant community was described by Rubin & Palmer (1996) as the *Rhigozum obovatum-Enneapogon desvauxii* Dwarf Shrubland.
Sparse Bossieveld	This landscape unit occurs in the lower more arid and degraded rocky foot slopes and plains of Lammertjiesleegte, Sandrivier and Doornhoek. A similar plant community was described by Rubin & Palmer (1996) as the *Stipagrostis obtusa-Rhigozum obovatum* Dwarf Shrubland.

Major ecosystems and landscape units	Plant communities
Valley bottomland and associated drainage lines	
Salsola veld	This landscape unit occurs in flat, low-elevation floodplain areas. Leaching of salts and salinisation of the soil is an integral part of the patterns and processes in these areas. Symptoms of erosion are conspicuous in localised areas, with brackish bare patches or deep gullies visible in some floodplains (Rubin & Palmer 1996). A similar plant community was described by Rubin & Palmer (1996) as the *Lycium cinereum-Salsola aphylla* Shrubland.
Leegtes / Depressions / wetlands	This landscape unit is closely associated with the Southern Karoo rivers (AZi6) (Mucina & Rutherford 2006). Further fieldwork is required for more detailed description.
Thornveld	Further fieldwork and data collection are required for description.
Woodland	This landscape unit is closely associated with the major drainage lines or rivers. This landscape unit is often the only densely vegetated area, and provides refuge and palatable browse for black rhinoceros, kudu and eland (Rubin & Palmer 1996). A similar plant community was described by Rubin & Palmer (1996) as the *Acacia karroo-Stipagrostis namaquensis* Riparian Woodland.

2.12.6 Terrestrial fauna

The park has a wide variety of endemic wildlife, particularly small reptiles. It is unlikely that the great herds of migrating springbok *Antidorcas marsupialis*, black wildebeest *Connochaetes gnou*, ostrich *Struthio camelus* and the ill-fated quagga *Equus quagga quagga* documented in the 1800's will ever be seen again. However, the park still hosts an impressive array of fauna, with 58 mammal species, over 200 bird species and a rich reptilian fauna, including 18 snake species and five tortoise species – the highest density of tortoise species in the world. Mammal species include plains game typical of the Karoo landscape, such as gemsbok *Oryx gazella*, red hartebeest *Alcelaphus buselaphus caama*, eland *Taurotragus oryx* and springbok. The park is also considered to be one of the best birding spots in the Greater Karoo, with typical Karoo species including various warblers, chats, korhaans, larks and bustards. Many species such as lion *Panthera leo*, brown hyaena *Hyaena brunnea*, black rhino *Diceros bicornis bicornis* and Cape mountain zebra *Equus zebra zebra* have been relocated to the park in order to re-establish species that were historically present in the region. In addition to their inherent species value, the reintroduction of lion and brown hyaena has re-established their predation and scavenging roles in the ecosystem (Ferreira *et al.,* 2011). The endangered Cape mountain zebra is thriving in the park, which now represents the second largest population of this species in the country. However, a decision was taken in 2013 to discontinue the Quagga Project, which aimed to rebreed the extinct quagga species (Harley *et al.,* 2009), since selective breeding is not feasible or desirable in a park whose objective is to restore natural processes. The project continues on private properties. In addition, Plain's zebra *Equus quagga* were removed from the park during 2015 after evidence of hybridisation with Cape mountain zebra was found in Mountain Zebra National Park. The park also contributes towards the national targets set for the conservation of the south-western subspecies of south-western black rhino *Diceros bicornis bicornis* (Ferreira *et al.,* 2016). Over 20 breeding pairs of Verreaux's Eagle *Aquila verreauxii* find sanctuary within the park. The park also has a rich reptile diversity. The invertebrate fauna are little known. However, the park lies within an area where outbreaks of the brown locust *Pardalina locustana* and Karoo caterpillar *Loxostege frustalis* occur periodically. Harvester termites and harvester ants also occur.

2.13 Archaeology and cultural heritage

The cultural heritage of the park is diverse and includes remains of structures that were left by farmers in the historical period. One such structure is Afsaal – an overnight hut**,** which used to be a shepherd's cottage about a 100 years ago. The hut was repaired and is currently used for overnight accommodation. The other historic buildings are Grantham house and Stolzhoek Ou Schuur. The later is a shed and typical of the period was built using Karoo stones and has a thatch roof. The shed was used to house wagons, household goods as well as store food and house equipment.

There are also Corbelled house remains, left by the 19th century sheep farmers. These farmers also left behind baking ovens that were made from raw bricks and plastered with clay. One such baking oven has been rebuilt at the interpretation centre. There are also a couple of "Wolwehokke' / traps that the farmers used to catch and kill hyenas, jackals, leopards and other predators. The traps were so successful that they ultimately contributed to the extinction of the brown hyena in Karoo.

There are also a number of graves and graveyards from the same period, with the earliest date from one of the headstones showing 1875 as the date of death. The graves are an important testimony of the occupation of the park during historical periods. Old graves from the archaeological period have not been identified, although it is a fact that they should be there as the area has evidence of occupation by the San and latter Khoi cattle herders.

Within the park are also the remains of lime burning kilns. Limestone was broken into lumps with heavy hammers, then mixed with coal and fed into the top of the kiln, which acted like a furnace. The lime was then collected from the bottom of the kiln. The lime was used for plastering among other things. Previous narrations do show that there are rock art sites within the park, but these are yet to be found. All the different cultural heritage sites are identified, documented and described. Some of these sites are situated along the 4x4 tourism route and are marked with sign boards.

2.14 Socio-economic context

The park is situated in the Western Cape within the CKDM which includes the Local Municipalities of Beaufort West, Laingsburg and Prince Albert (Central Karoo, 2016/17). The BWLM incorporates the towns of Beaufort West, Merweville, Murraysburg and Nelspoort. The CKDM was declared a presidential poverty node due to the high unemployment and poverty levels in the region. Although the district is the largest (spatially) municipal district in the Western Cape, it has the smallest population. The Western Cape Province had the fourth highest number of inhabitants in 2011, with a total of 5,822,734 persons, which constituted only 28.7 % of the South African total population (Stats SA, 2011).

In 2016 it was estimated that about 88% or 49,586 of the people living in the CKDM — with a total population of 56,323 — resides within the BWLM area. Beaufort West has an extremely high unemployment rate of around 32%, and an estimated 48% of the population of the district receiving social grants, and thus being a major challenge for the local municipality. The CKDM had the highest percentage of people aged 20 years and older with no education (Stats SA, 2011). The above facts poses a challenge for all living in the CKDM, both the authorities and the inhabitants. In addition, the geographical separation of its inhabitants contributes to the difficulty experienced by local government in delivering to all of its constituents. Both the local and district municipalities have Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) that incorporate the park.

Beaufort West is strategically positioned on the N1 national road, which links Cape Town with the interior and northern parts of South Africa. This transport related infrastructure contributes somewhat to the area's economic growth due to the high volume and diversity of road users. The Central Karoo has limited resources (such as water) and this is demonstrated by the agrarian economy, with agricultural and construction activity, some light industry and the associated support services dominating production activities (Beaufort West, 2016 / 17). The park itself is mainly surrounded by private livestock (mainly sheep) farms that focusses on meat production. The majority of the farms around the park have no electricity and rely on generators, solar and wind power to generate energy. The area is believed to have significant uranium and shale gas deposits, which have attracted applications for mining in the area. Although mining has the potential for considerable job opportunities, it could conflict with the park's conservation objectives due to the proximity of the prospecting areas.

Although the tourism sector in the BWLM has the natural resources to play a significant role in order to contribute to the economy of the area, the sector is still not fully developed to its ultimate potential. The park consequently plays a significant role as an economic contributor in the region.

2.15 Tourism

The park is a transit park, as it is a convenient stopover on the N1 route between Cape Town and the interior of the country. The park entrance is situated less than 12 km from the town of Beaufort West but is not easily accessible by air, as the closest commercial airport is situated in George, approximately 300 km from the park.

The park has one rest camp, which is situated at Stolzhoek approximately 6 km from the N1, and includes accommodation and camping facilities. There are a total of 37 Cape Dutch style units available in the park. All units are self-catering and three of the units have been adapted for persons with limited mobility. All accommodation includes breakfast and laundry facilities are available. The 24 award-winning camping and caravan sites cater for a maximum of six people and one vehicle per site, and are set amidst a veritable green oasis in the rugged Karoo environment, with communal ablutions and kitchen facilities. Additional accommodation is available at the Grantham facility, which is mainly used for environmental education *e.g.* Kids in Parks, and can sleep up to 50 people. There are also two remote overnight facilities available, one on the Embizweni 4x4 route, sleeping six people and Afsaal, a rustic shepherd's cottage, which sleeps two adults with option of two additional kids on stretchers.

The Ou Schuur Interpretive Centre adds to the guest experience, as it provides an overview of the ecological and cultural history of the Great Karoo dating back millions of years. Additional facilities include a swimming pool for overnight visitors, restaurant, shop and small conference facility. There is also a day visitor facility with braai areas, a swimming pool and ablutions. The popular Doornhoek picnic site provides ablution and braai facilities, and is located on the Potlekkertjie loop and is available to all visitors. Activities available within the park include scenic guided day and night game viewing drives, nature trails (Bossie-, rest camp- and Pointer trails and upgraded fossil trail) and a bird hide. The Pointer trail is a guided paid activity, available since November 2015. The park's road network is not very extensive and includes 30 km tar, 143 km gravel roads and 6 km 4x4 trails.

The park generally experiences very high unit occupancy between 72 % - 75 %, whilst bed occupancy range between 50 % – 60 %, and camping occupancy range between 60 % - 70 %, year round. During 2015 / 16 an estimated 40,548 visitors visited the park, of which only a small percentage are from the local community.

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Section 3: Policy framework

3.1 Introduction

SANParks, like all protected area management authorities, is subject to the constitution, international agreements, legislation, national policies and government priorities. Section 41 of the NEMA: PAA requires that management plans be nested within the context of a coordinated policy framework (CPF). The CPF can be downloaded from the SANParks website using the following link http://www.sanparks.org/conservation/park_man/.

The CPF provide the organisational guidance required by the DEA guideline for management plans (Cowan and Mpongoma 2010). This document will summarise the institutional, ecological, economic and social environment for park management and includes:

- An introduction to the management plan requirements of the NEM: PAA, what it means for stakeholders, and the corporate provisions SANParks has made to comply with NEM: PAA;
- SANParks as an organisation: including its organisational structure, vision, mission, biodiversity values and performance management system (by means of the balanced scorecard), and its approach to strategic adaptive management; and
- Policies and guiding principles:
    - Finances and commercialisation;
    - Tourism;
    - Zoning system in parks;
    - Stakeholder relationships;
    - Management to maintain biodiversity and ecosystem processes;
    - Risk management;
    - Safety and security;
    - Cultural heritage resources;
    - Resource use; and
    - Research.

SANParks policies are guided by its vision and mission statements. As a public entity, SANParks is committed to act in pursuit of transformation of South Africa's society in support of entrenching South Africa's democracy. And as such, this policy framework is available to stakeholders.

The relationship between the park-specific adaptive management planning cycles and the SANParks CPF is outlined in Figure 1, where the planning cycle for management plans in SANParks is 10 years. The programmes and costing could be revised at shorter time intervals, as required.

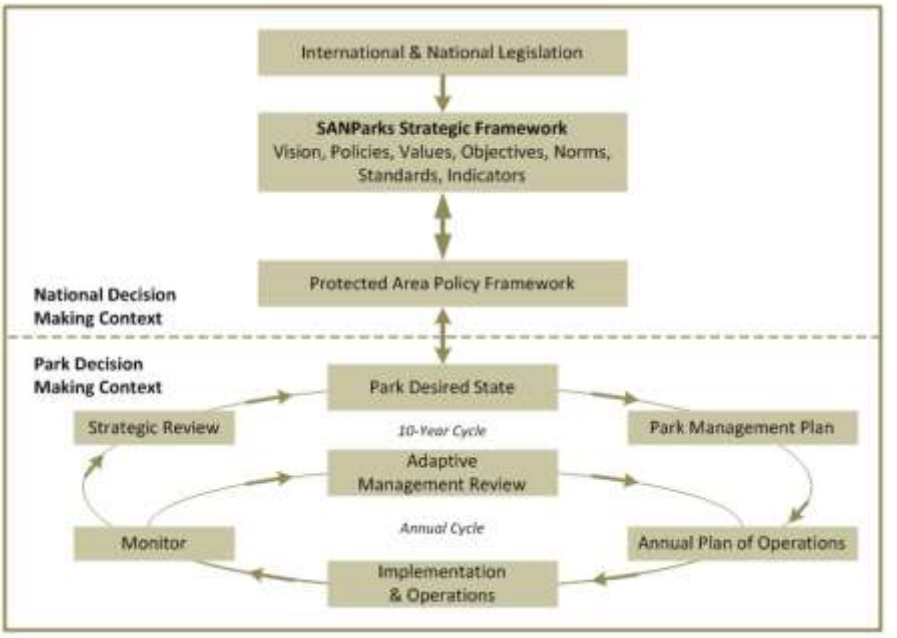

Figure 1. SANParks protected area planning framework.

3.2 Strategic adaptive management

Protected areas are increasingly viewed as complex social-ecological systems. The social-ecological coupling acknowledges multiple interactions that take place between people and natural landscapes – even fenced-off protected areas are influenced by external social issues. These systems are regarded as complex because the results of interactions between the social and ecological components, as well as between components within each of these sub-systems, are often unpredictable. A further complication in the management of protected areas is that the suite of stakeholders may have widely varying or even conflicting expectations, based on different world views and values. Under these conditions of divergent stakeholder interests and limited predictability, it might be impossible to agree on an optimal solution and similarly unrealistic to expect certainty in terms of management outcomes. Strategic Adaptive Management (SAM) has emerged as the SANParks approach of choice to deal with the complexity and multi-stakeholder tensions that characterise park management decisions (Figure 2). SAM is designed to be strategic (facilitate action with foresight and purpose), adaptive (facilitate learning whilst we are doing) and participatory (facilitate engagement and co-learning with stakeholders) (Grant *et al*., 2008).

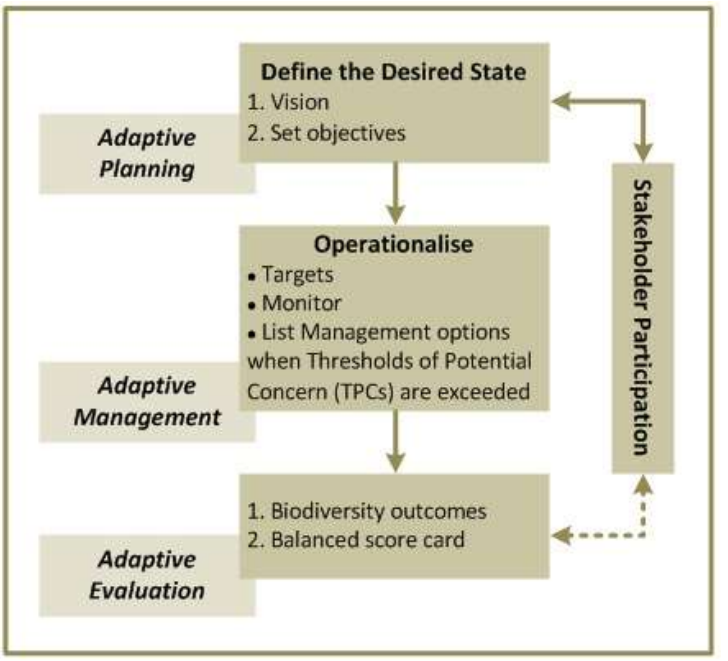

Figure 2. Steps in the adaptive management cycle as used by SANParks.

SAM begins with determining the desired future state of a particular social-ecological system (Figure 3). The aim of this step is to build a sense of common purpose among all relevant stakeholders and to develop a collective roadmap for moving from a current reality to a more desirable social-ecological system. This desired state or vision needs to be described within the context of associated stakeholders and their respective values, as well as social, technological, environmental, economic and political (V-STEEP) influences. Description of the future state is further enriched by deliberating the distinctive and special features (called vital attributes) of the park.

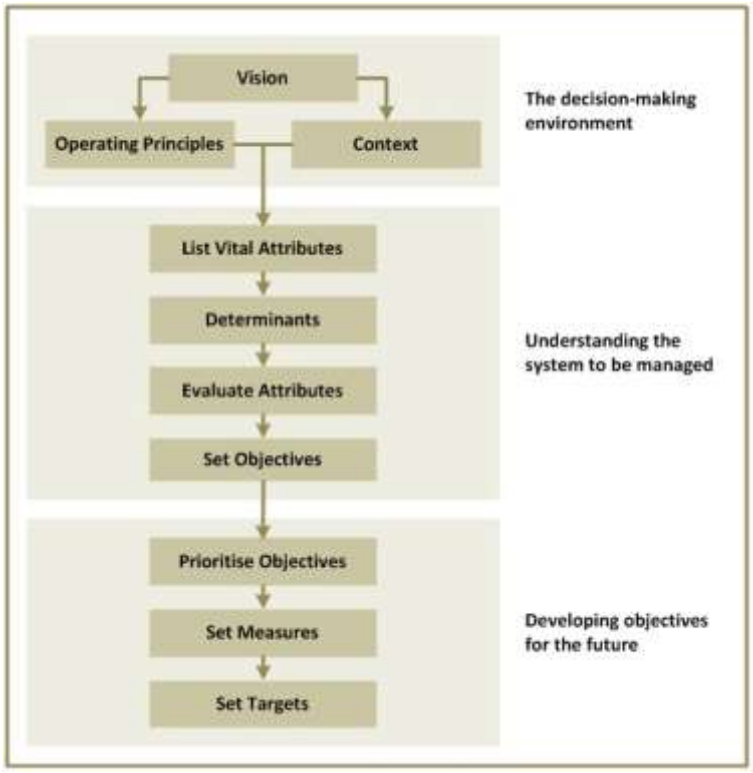

Figure 3. The adaptive planning process as used by SANParks.

The mission, together with the vital attributes of the system to be managed, informs the setting of objectives. A nested hierarchy of objectives starts with high-level objectives that are deconstructed into a series of lower-level objectives and, ultimately, management options for achieving those objectives. Alternative management options are considered by looking at resources, constraints, potential threats and risks associated with a particular management option, while anticipating likely results. From these options the most appropriate is selected, followed by a planning stage and implementation.

A critical component of SAM is to monitor and evaluate the consequences of management decisions. Constant scrutiny of emerging results and evaluation against objectives are essential to allow strategy and methodology to be adjusted as new understanding and knowledge emerges (see section 10.7). Of critical importance is the participation and engagement of all relevant stakeholders.

3.3 Park-specific framework

All park managers (except for Kruger National Park) report to the Managing Executive: Parks through a Regional General Manager. In the case of KRNP, reporting is via the Regional

General Manager for the Frontier cluster. The park's summarised organogram (Figure 4) sets out the reporting structure in the park.

3.4 Park regulations and internal rules

In addition to the regulations for the proper administration of special nature reserves, national parks and world heritage sites, as gazetted on 28 October 2005 in GG 28181, the park has also drafted applicable internal rules in terms of Section 52 of the NEM: PAA, (Appendix 4).

3.5 Support to the park

Park management is primarily supported by head office, providing human resource, financial, marketing, review and auditing services. The regional operations office assists the park with line management support. The park also receives support from functions such as park planning and development, veterinary wildlife service, scientific services *etc.*

Figure 4. Karoo National Park organogram.

Section 4: Consultation

SANParks recognises that parks must serve societal values and that they need to be part of and interrelate with the broader landscape and socio-economic context within which they are situated. The goal of the park within the public participation process is to work directly with stakeholders to ensure that the stakeholder concerns and aspirations are consistently understood and considered (Spies & Symonds 2011). Therefore stakeholders, both interested and affected, were included in the revision process of the park management plan by notifying them of participation processes through mechanisms suitable for the different stakeholder groups. These processes provided the opportunity for input from all stakeholders within reasonable timeframes, with the emphasis on sharing of information and joint learning. Processes also aim to recognise all knowledge, indigenous, ordinary and expert, as well as the diversity of values and opinions that exist between stakeholders. The commitment to the incorporation of public opinion into this plan is rooted in the park's management activities and is therefore geared towards promoting conservation values (and society's connection with those values, as also outlined in the NEM: PAA) and promoting this goal in part, by engaging the broader context in which the park is situated. The adaptive planning process that was followed was designed to (i) help stakeholders express opinions and values in a structured way, (ii) to use the opinions and expressed values to formulate a vision for the park, (iii) to translate the vision into management objectives that reflect the values as expressed by stakeholders and (iv) comment on the draft park management plan.

The objectives of the stakeholder participation process are to:

- Create a channel for the accurate and timely dissemination of information to interested and affected stakeholders;
- Create the opportunity for communication between SANParks and the public;
- Promote opportunities for the building of understanding between parties;
- Provide the opportunity for stakeholders to give meaningful input into the decision-making processes that drive the development of the park management plan.

The approach to the stakeholder participation process is based on the principles embodied in the following legal framework, namely:

- The Constitution of the Republic of South Africa Act No. 108 of 1996;
- The National Environmental Management Act No. 107 of 1998 (NEMA); and
- The National Environmental Management: Protected Areas Act No. 57 of 2003 as amended by the National Environmental Management: Protected Areas Act No. 21 of 2014.

In addition to the above legal framework, the stakeholder process was developed with the guiding principles for SANParks stakeholder participation in mind. SANParks thus undertakes to:

- Seek to notify stakeholders of participation processes through appropriate mechanisms;
- Ensure that the process provides the opportunity for input from all stakeholders within reasonable timeframes, emphasising the sharing of information, joint-learning and capacity building;
- Promote participation by stakeholders through timeous and full disclosure of all relevant and appropriate information;
- Provide feedback on the outcome of the process to stakeholders and demonstrate how their inputs have been considered in the decision making process;
- Ensure that methodologies accommodate the context of the issue at hand and the availability of resources (people, time, money) and do not conflict with these guiding principles; and
- Give particular attention to ensuring participation by marginalised communities, communities with specific concerns, or communities that have contractual rights in the national park.

The stakeholder participation process followed during the revision process of this management plan is depicted in Figure 5 below.

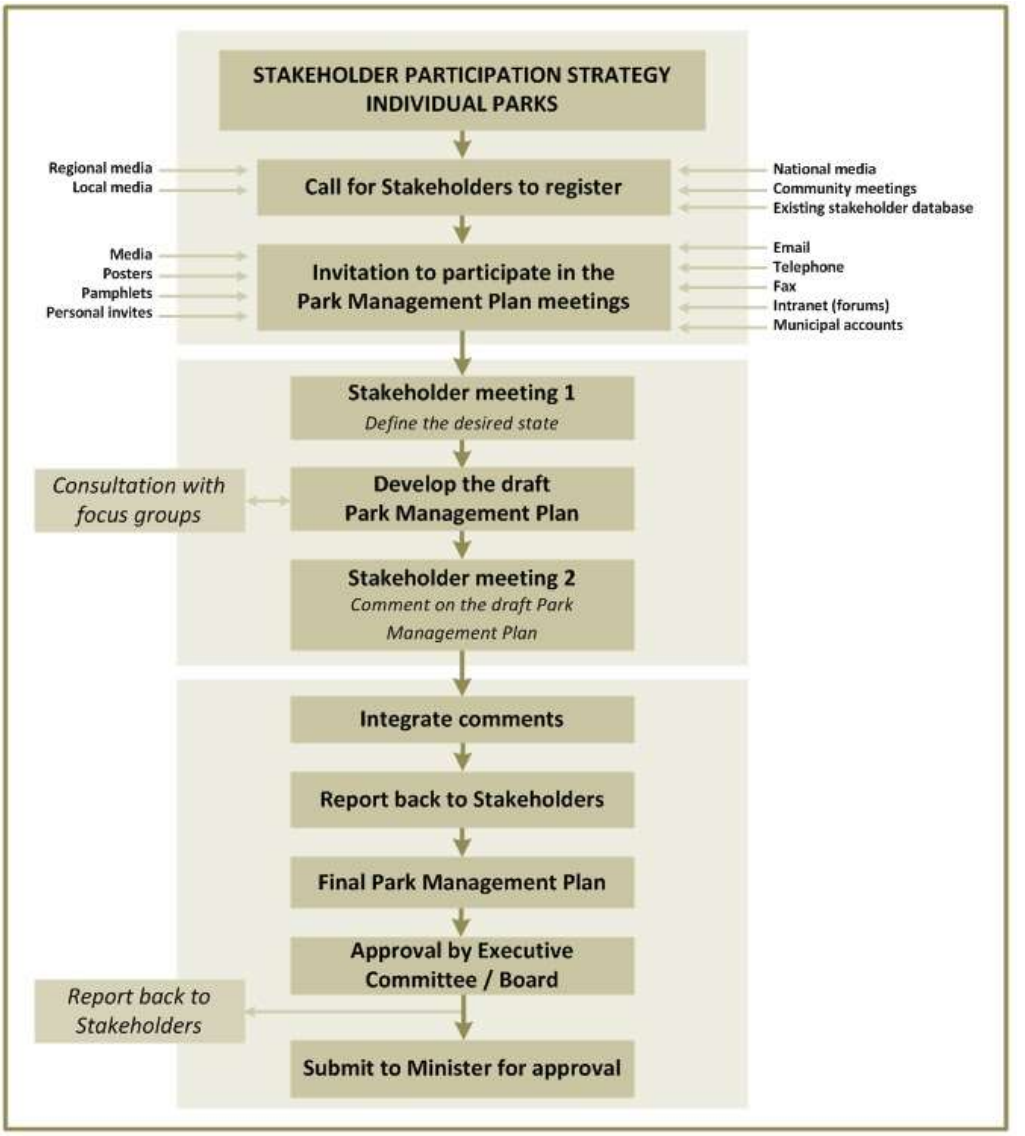

Figure 5. SANParks stakeholder participation process.

Details regarding the stakeholder process that was followed are outlined in Appendix 2.

Section 5: Purpose and vision

5.1 Purpose of the park

The NEM: PAA requires that the park be managed in accordance with the purpose for which it was declared. The original purpose of the park was not officially specified, neither in the first gazetted declaration nor any subsequent addition. However the initially motivation for establishing a park in the Beaufort West area could be attributed to the requirement to preserve a representative sample of the Nama Karoo and the efforts of members of the public. SANParks will manage the park firstly in accordance with its organisational vision and secondly in accordance with the mission and objectives hierarchy that were derived through consultation with stakeholders, as set out in this section.

5.2 Desired state for the park

In order for the current and future extent of the park to be protected and managed effectively, a desired state for the park has been developed through an adaptive planning process to guide park management in its daily operations. To formulate this desired state, focus was placed on the mission, park context, operating principles and, vital attributes that make this park unique, or at least very special in its class. Each attribute was discussed along with important factors determining / strengthening or threatening / eroding these attributes. Using this information helped focus the exact formulation of the park objectives, which must strengthen positive determinants and weaken or remove negative ones so that objectives are appropriate to the uniqueness and special nature of this park. In this way the management plan is customised according to its local context, without detracting from some of its more generic functions along with certain other parks. This framework forms a bridge between the CPF and its vision for the park, and the medium term (10 years) priorities to attain the vision and mission in co-operation with its stakeholders.

5.2.1 Vision and mission

The vision is an inspirational statement designed to provide a picture of the envisaged future for the park. It answers the question of 'where do we want to go?'. SANParks' corporate vision, which holds for all national parks including KRNP, is as follows:

VISION

"A sustainable national park system connecting society"

The mission defines the fundamental purpose of the park, succinctly describing why it exists and what it does to achieve its vision. The following mission was developed after consultation with stakeholders at a workshop on 19 April 2016:

MISSION

"To ensure KRNP is a key driver of sustainability in the region, by restoring and conserving processes that maintain representative cultural, landscape and biodiversity assets, which facilitate equitable opportunities for the well-being of society and deliver high quality nature-based tourism derived from the Nama-Karoo's sense of place".

5.2.2 SANParks corporate vision of the desired state

Examined from the perspective of the entire system of national parks, SANParks has identified a broad vision and strategic direction for each individual park. This corporate strategic direction is intended to complement the role of other parks in adding overall value to South Africa's national park system in terms of biodiversity conservation, recreational opportunities and regional socio-economic contribution.

Thus the following strategic direction for the park has also informed the programmes of implementation (Section 10) of this management plan:

The park's most outstanding feature is its scenic value, overall biodiversity and heritage values are moderate. The diversity of tourism products and potential for income generation are average in relation to other parks. Job creation will contribute to the socio-economic impact of the park. Wildlife sales will help to generate income. It will be possible to achieve surplus income generation. Fencing is the only form of supporting infrastructure that will be required. The biodiversity value is predicted to remain stable over the next 20 years, and there are no major biodiversity risks.

5.2.3 Operating principles or values

SANParks has adopted eleven corporate values which serve as guiding principles around which all employee behaviour and actions are governed and shaped. Stakeholders recognised and endorsed the SANParks corporate and conservation values as outlined in the CPF. These principles or values are:

Corporate values:

1. Show **leadership** in all we do.
2. Be guided by **environmental ethics** in all we do.
3. Promote **transformation** within, and outside of the organisation.
4. Strive for **scientific** and **service excellence** at all times.
5. Act with **professionalism** at all times.
6. Adopt, and encourage **initiative** and innovation by all.
7. Treat all our stakeholders with equity and **justice**
8. Exercise **discipline** at all times.
9. Show **respect** to all.
10. Act with **honesty** and **integrity.**
11. Strive for **transparency** and open **communication** at all times.

In addition to the above, SANParks has also adopted Biodiversity values as set out below:

1. We adopt a **complex systems view** of the world while striving to ensure the **natural functioning** and **long term persistence** of the **ecosystems** under our care.
2. We aim at persistent achievement of **biodiversity representivity** and **complementarity** to promote **resilience** and ensure **ecosystem integrity**.
3. We can **intervene in ecosystems responsibly and sustainably**, but we focus management on **complementing natural processes** under a **"minimum interference"** philosophy.
4. We accept with humility the **mandate of custodianship** of biodiversity **for future generations** while recognising that both natural and social systems change over time.

At the workshop that took place on 19 April 2016, the participants suggested adding additional values. SANParks agreed to adopt the following:

1. **Transparency** when dealing with the surrounding community;
2. Guests that are **treated as individuals**;
3. Respect for **cultural diversity**;
4. Strive to **maintain a good staff team**; and
5. Open to **learning and adapting**.

5.2.4 Park context

The context refers to the current circumstances and the conditions that determine these circumstances. The context is therefore important as a set of agreed-upon realities that will influence the setting of management objectives. The context is summarised under sections 2.1 to 2.15.

5.2.5 Vital attributes

The vital attributes of the park are the important characteristics and / or properties of the park that concisely describe the key features of the park. The park identified 13 attributes that are vital to the approach by which it is managed. The key attributes are:

1. The unique Nama-Karoo vistas (land, night and soundscapes);
2. The nature experience, tranquillity and ambiance provides a sense of place and opportunity for reflection;
3. Tourist facilities ideally placed to enhance visitor experience of the setting;

4. The convenient location of the park along the N1 highway between Cape Town and Gauteng;
5. Opportunities to experience charismatic species (*e.g.* Cape mountain zebra, lion, black rhino) in a Nama-Karoo setting;
6. Fossil trail with access for people with mobility impairment;
7. A landscape of cultural heritage which include archaeology, indigenous language, arts and culture;
8. The park's biodiversity including the ecological gradients, geology, soil and climate that produce the particular drainage lines, catchments and vegetation typical of the Nama-Karoo;
9. The park protects 30% of the known plant species of the Nama-Karoo Biome, as well as the under-protected Karoo Escarpment Grassland vegetation type;
10. The park is a key contributor to the persistence of species of special concern (SSC) (*i.e.* Cape Mountain Zebra, black rhino, Sterboom);
11. Park initiatives have potential to have significant positive cascading effects due to low density of neighbours;
12. Large proportion of conservation-compatible adjacent land uses; and
13. Existing good relationships with a wide range of stakeholders.

5.2.6 Determinants and risks to the vital attributes

A major component of management's responsibility is to ensure the maintenance of the determinants or strengths of the vital attributes and to limit the influence of threats to the system.

The boxes below reflect the vital attributes, determinants and threats.

1. The unique Nama-Karoo vistas (land, night and soundscapes).	
Determinants: Topography, geology, vegetation, lack of development, climate**.**	
Threats	
• Pollution (uranium mining and fracking) • Climate change • Town encroachment • Inappropriate development in the park	• Litter • Illegal extraction of resources (fire wood) • Noise pollution (mining) • Solar and wind farm developments in the buffer zone

2. The nature experience, tranquillity and ambiance provides a sense of place and opportunity for reflection.	
Determinants: Quietness, market demographics, sense of remoteness.	
Threats	
• Sound and light pollution due to town encroachment and industrial activities	• Traffic on the Fraserburg road • Changes in market demographics

3. The convenient location of the park along the N1 highway between Cape Town and Gauteng.	
Determinants: Main route (tourist and business), preferred safe accommodation for travellers, long distance between Gauteng and Cape Town, quick access from the N1 to experience the Karoo sense of place.	
Threats	
• Change in transport mode	• Competing destinations / accommodation options

4. Tourist facilities ideally placed to enhance visitor experience of the setting.	
Determinants: Facilities placement, reuse of well-placed facilities.	
Threats	
• Lack of maintenance funding • Limited road network for sedan vehicles	• Limited facilities and points of interest

5. Opportunities to experience charismatic species (*e.g.* Cape mountain zebra, lion, black rhino) in a Nama-Karoo setting.	
Determinants: Rich habitat diversity, vegetation type enabling good game viewing, predator proof fencing.	
Threats	
• Climate change • Poaching • Alien species • Limited road network	• Challenging fence maintenance • Unfulfilled expectations • Limited road network for sedan vehicles

6. Palaeological fossil trail with access for people with mobility impairment.	
Determinants: Fossil assets, easy access to trail, setting of trail, good knowledge base of fossils, guided tours, other potential fossil sites to be opened for tourism.	
Threats	
• Lack of cultural heritage management plan and site management plans • Vandalism and theft	• Lack of fossil inventory • Weathering • Poor maintenance

7. A landscape of cultural heritage which include archaeology, indigenous language, arts and culture.	
Determinants: Well documented history of sites, protection of sites, !Xam language is recorded and documented at University of Cape Town, guided tours to cultural sites, promotion of heritage.	
Threats	
• Lack of cultural heritage and site management plans • Limited budget to restore / manage sites	• Lack of expert knowledge to restore / maintain the sites • Climate change / weathering

8. The park protects 30% of the known plant species of the Nama-Karoo Biome, as well as the under-protected Karoo Escarpment Grassland vegetation type.	
Determinants: Size of the park, park expansion strategy, range of habitats, rainfall, temperature, ecological processes.	
Threats	
• Fragmentation • Inappropriate utilisation by herbivores • Climate change • Alien plants	• Illegal resource use • No fire management plan • Limited information / knowledge

9. Park initiatives have potential to have significant positive cascading effects due to low density of neighbours.	
Determinants: Small urban community with concentrated settlement close to park, large land allows critical mass of biological and social resources, close proximity to maximise value chain.	
Threats	
• Development of new informal settlements or expansion thereof • Social injustice persistent	• Change in local Government priorities (IDP) • Unusual population growth associated with perception of short term gains

10. KRNP's biodiversity including the ecological gradients, geology, soil and climate that produce the particular drainage lines, catchments and vegetation typical of the Nama-Karoo.	
Determinants: Ecological gradients, geomorphology, vegetation, soil, climate, natural disturbances, other ecological processes, surface water availability.	
Threats	
• Climate change • Mining (fracking, uranium) • Erosion • Degradation • Inappropriate water provision • Conflicting objectives • Poor engagement with authorities	• Inappropriate development • Incompatible surrounding landuse • Limited animal movement in the landscape due to fencing • Management practises that reduce variability • Poor planning at local and district municipal level

11. The park is a key contributor to the persistence of species of special concern (*i.e.* Cape mountain zebra, black rhino, Sterboom).	
Determinants: Suitable habitat, climate, adequate security, participation in national biodiversity management plans.	
Threats	
• Illegal resource extraction • Disease • Small population effects • Predation • Competitive interactions	• Inappropriate infrastructure development • Climate change • Social constraints based on park size • Hybridisation

12. Large proportion of conservation-compatible adjacent land uses.	
Determinants: Switch from traditional to game farming, large tracks of land relatively intact, private conservation initiatives.	
Threats	
• Breakdown in relationships • Inappropriate conservation-unfriendly practises / developments • Local government ineffectiveness	• Claiming activity under misleading banner • Human wildlife conflict • Poor planning at local and district municipal level

13. Existing good relationships with a wide range of stakeholders.	
Determinants: Common goal of achieving sustainability, relatively small stakeholder group, park forum, interaction in various other forums, SANParks Honorary Rangers (SHRs).	
Threats	
• Changes in key role players • Loss of reputation / integrity • BWLM government ineffectiveness	• Lobbying tactics reduce cohesion amongst stakeholder groups • Poor planning at local and district municipal level

5.2.7 High-level objectives

While the Mission sets out the "Where do we want to go", high-level objectives act as the roadmap to achieve the Mission, these high-level objectives tend to flow naturally from the vital attributes. The desired state is achieved by means of a hierarchy of objectives (Figure 6), starting with an overall objective aligned with SANParks' organisational structure and the park's Vision and Mission statements, then broad, high-level objectives (this Section) and then to more detailed levels, ending with specific operational or management actions (Section 10). Discussions at the stakeholder meeting gave rise to an initial set of high-level objectives. These were refined to reflect the following:

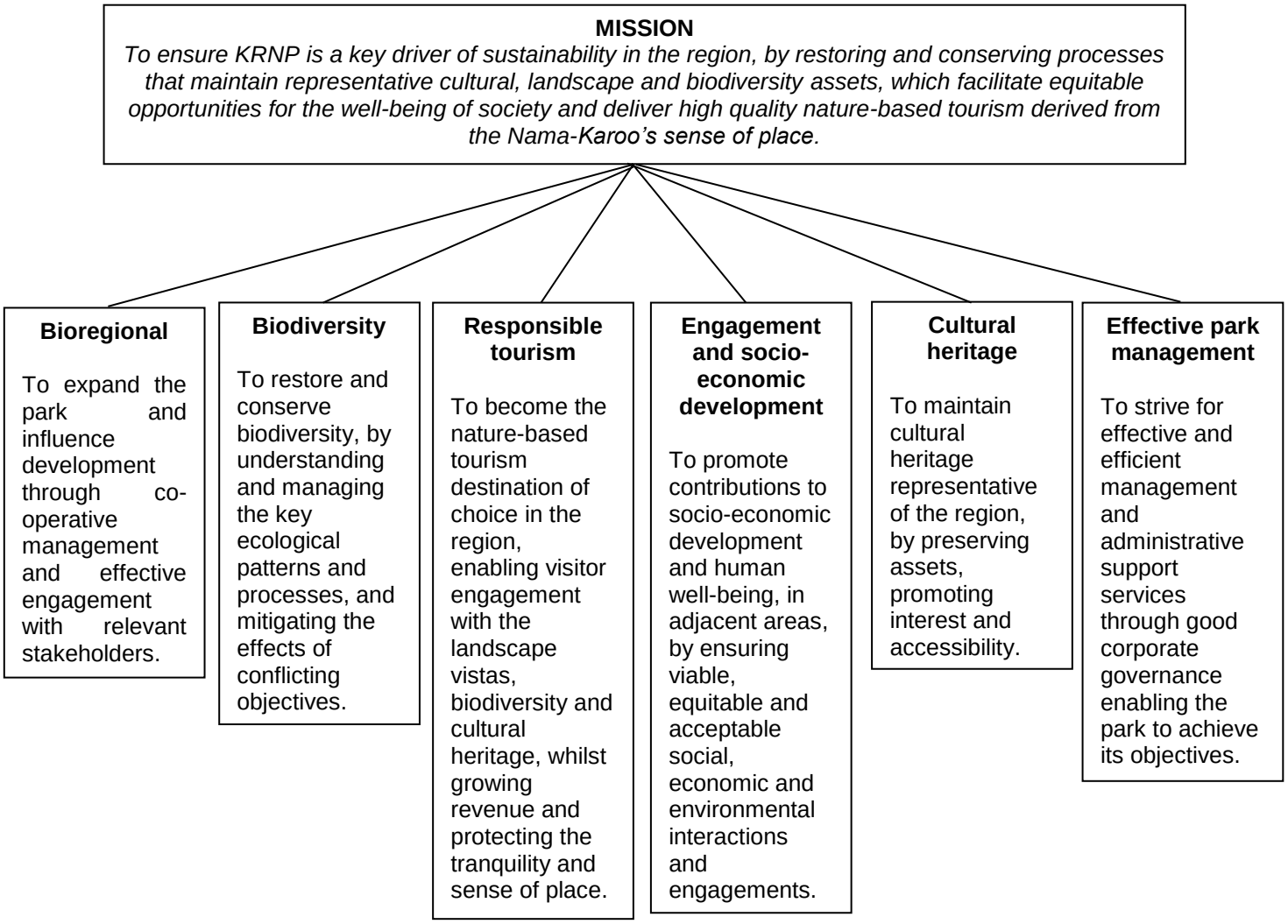

Figure 6. Park high-level objectives.

5.2.8 Unpacking the high-level objectives

The high-level objectives listed above is now progressively being disaggregated through a series of "objectives" of increasing focus. These are set out in Figures 7 – 12 below.

1. Bioregional high-level objective: To expand the park and influence development through co-operative management and effective engagement with relevant stakeholders.

- **1.1 Mainstreaming biodiversity objective:** To minimise the potential conflicts that arise from different land uses in the park buffer zone, through responsible engagements with regional conservation initiatives, land owners and local authorities, and promoting mitigating options.
- **1.2 Park consolidation objective:** To incorporate the spectrum of biodiversity patterns representative of the area, which support the long term ecological processes through conservation focused partnerships and strategic land acquisitions.

Figure 7. Bioregional high-level objective and supporting objectives.

2. Biodiversity high-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.

- **2.1 Habitat and vegetation objective:** To conserve vegetation patterns representative of the Nama Karoo, through appropriate management of herbivory, fire, ecological gradients, Species of Special Concern and water.
- **2.2 Degradation and rehabilitation objective:** To restore the integrity of degraded systems, by understanding and mitigating the drivers of degradation.
- **2.3 Fresh water objective:** To strive for “natural” patterns and processes of water in the landscape, by appropriate ground and surface water utilisation and management.
- **2.4 Species of special concern objective:** To contribute to the persistence of SSC, through targeted species management and participation in broader conservation initiatives.
- **2.5 Carnivore objective:** To restore or mimic predator-prey dynamics, through the management of carnivore social dynamics and game offtakes.
- **2.6 Herbivory objective:** To ensure appropriate patterns of herbivory, by mimicking spatio-temporal variability in landscape utilisation.
- **2.7 Fire objective:** To restore natural fire regimes, by appropriate veld management and handling of fires.
- **2.8 Disease objective:** To prevent negative impacts of disease on biodiversity, through vigilance and timeous addressing of disease issues.
- **2.9 Reintroduction objective:** To restore ecological patterns and processes by reintroducing and/or supplementing species that historically occurred in the region.

Figure 8. Biodiversity high-level objective and supporting objectives.

3. Responsible tourism high-level objective: To become the nature-based tourism destination of choice in the Region, enabling visitor engagement with the landscape vistas, biodiversity and cultural heritage, whilst growing revenue and protecting the tranquility and sense of place.

- **3.1 Responsible Tourism performance objective:** To establish, maintain and continuously improve the Park's Responsible Tourism performance, by implementing SANS1162.
- **3.2 Visitor experiences objective:** To continually enhance the visitor experience within the park, by effective visitor engagement, management, interpretation and quality of facilities offered.
- **3.3 Service excellence objective:** To enable appropriate customer- focused service excellence, by understanding and responding appropriately to market preferences.
- **3.4 Grow tourism revenue objective:** To grow income through tourism by providing visitors with an appropriate and a diverse range of products and services, whilst protecting the tranquillity and sense of place.
- **3.5 Operational effectiveness objective:** To enable cost savings within tourism operations, by ensuring operational effectiveness and controls.
- **3.6 Promotion objective:** To promote the park with its species rich, unique landscapes and cultural experiences, by developing and implementing a variety of sales, marketing and communication strategies.
- **3.7 Equitable access objective:** To enable equitable access to the park and facilitate SMME opportunities, by supporting local stakeholder interests and needs.

Figure 9. Responsible tourism high-level objective and supporting objectives.

4. Engagement and socio-economic development high-level objective: To promote park based contributions to socio-economic development and human well-being, in adjacent areas, by ensuring viable, equitable and acceptable social, economic and environmental interactions and engagements.

- **4.1 Stakeholder participation objective:** To create and enhance cooperative relationships in the area of influence, by purposefully enabling and facilitating informal and formal engagements.
- **4.2 Local socio economic development objective:** To improve human well-being in the area of influence, by identifying and facilitating feasible socio economic development initiatives.
- **4.3 Awareness and responsibility objective:** To enhance mutual understanding, trust and support from our stakeholders by implementing appropriate learning and awareness initiatives, that foster shared environmental responsibility.

Figure 10. Social high-level objective and supporting objectives.

5. Cultural heritage high-level objective: To maintain the cultural heritage representative of the Region, by preserving assets and promoting interest.

- **5.1 Preserving objective:** To preserve cultural heritage representative of the region, by engaging with relevant expertise to understand and manage assets.
- **5.2 Promoting objective:** To promote interest in the region's cultural heritage, by providing high quality interpretation and opportunities for cultural practices.

Figure 11. Cultural heritage high-level objective and supporting objectives.

6. Effective park management high-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.

- **6.1 Environmental management objective:** To strive for best practise and ensure compliance with environmental legislation through improved governance and environmental risk management.
- **6.2 Risk management objective:** To establish and maintain effective, efficient and transparent risk management systems by creating an enabling environment for the management of risk.
- **6.3 Financial management and administration objective:** To ensure sound financial management and administration through proficient budget management, effective internal controls and compliance to corporate governance prescripts.
- **6.4 Human capital development objective:** To ensure sufficient and effective staff capacity to achieve management objectives by adhering to legislation, corporate human resource policies and guidelines.
- **6.5 Information management objective:** To achieve best practice in the field of information and records management by complying to the Records Management Legislative framework and policies and thereby ensuring care of all vital records in SANParks.
- **6.6 Infrastructure objective:** To maintain, upgrade and develop new park infrastructure through proper planning and efficient management.
- **6.7 Safety and security objective:** To provide a safe and secure environment for both visitors and SANParks employees and to ensure the protection and integrity of natural, cultural and physical assets and resources, by implementing a Park Safety and Security Plan.
- **6.8 Occupational health and safety objective:** To continuously reduce the disabling injury frequency rate through the implementation of an efficient and effective Occupational Health and Safety management system.

Figure 12. Effective park management high-level objective and supporting objectives.

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Section 6: Zoning

6.1 Introduction

The primary objective of a park zonation plan is to establish a coherent spatial framework in and around a park to guide and co-ordinate conservation, tourism and visitor experience initiatives, and minimise conflict between these sometimes, differing activities. A zoning plan is also a legislated requirement of the National Environmental Management: Protected Areas Act No 57 of 2003 (NEM: PAA), which stipulates that the management plan, which is to be approved by the Minister, must contain "a zoning of the area indicating what activities may take place in different sections of the park and the conservation objectives of those sections".

The zoning of the park was based on an analysis and mapping of the sensitivity and value of the park's biophysical, heritage and scenic resources (SANParks, 2005a); an assessment of the regional context; and an assessment of the park's current and planned infrastructure and tourist routes / products – all interpreted in the context of the park objectives. This was undertaken in an iterative and consultative process. This section – which is guided by the Conservation Development Framework (CDF) planning manual (SANParks, 2005b) – sets out the rationale for use zones, describes the zones, and provides management guidelines for each of the zones. The use zoning of the park is shown in Appendix 5, Map 4, and summarised in Table 1 below.

6.2 Synopsis of updates to the 2008 zonation

Changes included the updating of place names, roads, incorporation of new infrastructure. The quiet zone was removed due to presence of dangerous game, and tourists are not allowed to walk around in the park other that in designated areas. Catering to the park needs, new tourism routes were opened. These included the Leeuriverspoort and Klipplaatsfontein, both (4x4) routes, located on the western side of the park. The opening of both the Leeuriverspoort and Klipplaatsfontein routes, resulted in a zonation change from "remote" to "primitive". De Hoek (4x4) road was also opened as a tourism route that resulted in no change to zonation. Doornhoek (twee spoor) and Mountain View roads, situated in the eastern section of the park were additional routes opened to tourism. Both the Doornhoek and Mountain View roads resulted in a zonation change from "primitive" to "low intensity leisure (LIL)". A total of four look out points were added at Nuweveld (1), Mountain View (2) and Klipsringer's Pass (1). A new high intensity leisure (HIL) zone was added opposed the Oudtshoorn turn-off and the entrance gate was rezoned to HIL. The area between these two HIL zones were rezoned to low intensity leisure (LIL) to accommodation tourist infrastructure and needs.

6.3 Guiding principles underpinning the zonation

The principles underpinning park zonation, as listed below, were informed by the SANParks CDF planning manual, the Guidelines for Strategic Environmental Assessment in South Africa, Integrated Environmental Management and the National Environmental Management Act (NEMA). Accordingly the zonation:

- Is the foundation of all planning and development within a park, with the aim of ensuring its long term sustainability;
- Accommodates strategic, flexible and iterative planning procedures;
- Is a "framework for planning" not a "plan for implementation" (*i.e.* implementation is dealt with through lower level plans and programmes);
- Is risk-averse and promotes a cautious approach, which takes into account the limits of current knowledge about the consequences of decisions and actions;
- Recognises that the mandate of SANParks is to conserve biodiversity and heritage resources of national and international significance, in terms of both the NEM: PAA and the National Heritage Resources Act;
- Ensures the integrity of the park's scenic quality by limiting human intrusions into the landscape;

- Accommodates a wide range of unique opportunities for experiences of solitude and nature based recreation which do not conflict with the desired social and environmental states;
- Confines development within the park to areas that are robust enough to tolerate transformation and without detracting from the "sense of place";
- Rationalises and channels access into the park and internal movement through it;
- Sets the limits of acceptable change; to minimise the loss of biodiversity and to reduce conflict between different park uses;
- Recognises that park boundaries are not static in time and that there are factors beyond the current or future boundaries that can positively or negatively influence the park; and
- Recognises that the park cannot exist in isolation and that planning needs to ensure that the park is integrated with the surrounding landscapes as well as the economic and social structures at local and regional scales.

6.4 Rationale for use zones

The primary function of a protected area is to conserve biodiversity. Other functions such as the need to ensure that visitors have access to the park, and that adjoining communities and local economies derive benefits from the park, could potentially conflict with and compromise this primary function. Use zoning is the primary tool to ensure that visitors could have a wide range of quality experiences without comprising the integrity of the environment.

Furthermore, the expectations and recreational objectives of individuals that visit the park may differ. Some individuals visit the park purely to see the wildlife and natural landscapes. Other individuals wish to experience the intangible attributes such as and not limited to solitude, remoteness, wildness and serenity (which can be grouped as wilderness qualities), whilst some visit to engage in a range of nature-based recreational activities, or to socialise in a rest camp. Different people have different accommodation requirements ranging from extreme "roughing it up" to luxury catered accommodation. There is often conflict between the requirements of different users and different activities. Appropriate use zoning serves to minimise conflicts between different users of a park by separating potentially conflicting activities – such as game viewing and day-visitor picnic areas – whilst ensuring that activities which do not negatively impact on the park's vital attributes and objectives (especially the conservation of the protected area's natural systems and its biodiversity) can continue in appropriate areas. Use zones serve to ensure that high intensity facilities and activities are placed in areas that are robust enough to tolerate intensive use, as well as to protect more sensitive areas of the park from over-utilisation.

6.5 The zoning system

SANParks has adopted a multiple zoning system for its parks. The system comprises of:

- Visitor use zones covering the entire park;
- Special management overlays; and
- A buffer zone surrounding the park.

6.5.1 The zoning process and its linkage to the underlying environmental analysis

The zoning for the park was underpinned by an analysis and mapping of the sensitivity and value of a park's biophysical, heritage and scenic resources. This analysis examined the parks' biophysical characteristics including: habitat value (in particular the contribution to national conservation objectives) and vegetation vulnerability to physical disturbance; special habitat value (the value of the area based on rare and endangered species); hydrological sensitivity (areas vulnerable to disruption of hydrological processes such as floodplains and wetlands); topographic sensitivity (steep slopes) and soil sensitivity (soils that are vulnerable to erosion). In addition, the heritage value and sensitivity of the sites were examined (mostly archaeological and cultural aspects). The visual sensitivity of the landscape was also surveyed in order to identify sites where infrastructure development could have a strong aesthetic impact. This analysis was used to inform users of the appropriate use of the different areas of the park as well as assisted in defining the boundaries between zones. The zoning was also informed by the park's current infrastructure and tourism products as well as the regional context (especially linkages to neighbouring areas and impacts from activities outside the park). Planned infrastructure and tourism products were also accommodated where these were compatible with the environmental informants. These were all interpreted in the context of the park's objectives and undertaken in an iterative and consultative process.

Table 3. Use zones and use zone characteristics for the park.

Zone	General characteristics	Experiential qualities	Interaction between users	Type of access	Type of activities	Type of facilities	Limits of acceptable change: biophysical	Limits of acceptable change: aesthetics and recreational	Guide infrastructure
REMOTE*	Retains an intrinsically wild appearance and character (essentially no infrastructure), or capable of being restored to such.	Solitude and awe inspiring natural characteristics.	None to very low	Controlled access and non-motorised.	Guided hiking in small groups.	Established footpaths where erosion may be a problem. Essentially undeveloped and roadless.	Deviation from a natural/pristine state should be minimised and existing impacts should be reduced.	Activities which impact on the intrinsically wild appearance and character of the area will not be tolerated.	Ideally there should be no management infrastructure but temporary infrastructure may be present only to limit biodiversity loss.
PRIMITIVE	Generally retains wilderness qualities, but with basic self-catering facilities. Access is controlled, or limited to 4x4 vehicles. Provides access to the remote zone and can serve as a buffer.	Experience wilderness qualities.	Low	Controlled access. Accompanied or unaccompanied. Foot and 4x4 vehicles.	Hiking; 4x4 drives and game viewing.	Small, basic, self-catering, distributed to avoid contact between users; or limited concessions with limited numbers; 4x4 trails and hiking trails.	Deviation from a natural/pristine state should be small and limited to restricted impact footprints. Existing impacts should be reduced.	Activities which impact on the intrinsically wild appearance and character of the area should be restricted; and impacts limited to the site of the facility.	Small, isolated permanent but low spec (usually dirt road) infrastructure may be present. This may be to help manage biodiversity, or service tourist facilities.
LOW INTENSITY LEISURE	The underlying characteristic of this zone is motorised self-drive access with basic self-catering facilities. The numbers of visitors are higher than in the remote and primitive zones. Camps are without large commercial facilities such as shops and restaurants.	Comfortable facilities in a relatively natural environment.	Moderate to high	Motorised self-drive access.	Motorised self-drive game viewing; picnicking; guided walking or hiking.	Facilities limited to basic self-catering picnic sites; ablution facilities; information/education centres and parking areas. Small self-catering (incl. camping) rest camps with ablution facilities. May contain small or seasonal convenience stores or tea gardens. Low spec access roads to provide a more wild experience.	Deviation from a natural/pristine state should be minimised and limited to restricted impact footprints as far as possible. However, it is accepted that some damage to the biophysical environment associated with tourist activities and facilities will be inevitable.	Although it is inevitable that activities and facilities will impact on the wild appearance and reduce the wilderness characteristics of the area; these should be managed and limited to ensure that the area still provides a relatively natural outdoor experience.	Where this is the highest usage zone anticipated in a park, management infrastructure should be concentrated here as far as is feasible; allowing management to efficiently make use of existing high volume infrastructure. To limit impacts, management infrastructure should be placed close to the park boundary.
HIGH INTENSITY LEISURE	The main characteristic is that of a high density tourist development node, with commercial amenities, where more concentrated human activities are allowed.	Comfortable and sophisticated facilities while retaining a natural ambiance.	High	Accessible by motorised transport (car/bus) on high volume transport routes, including delivery vehicles.	As stated above. Additional sophisticated infrastructure. Larger, organised adventure activities. Dining at restaurants.	High density tourist camps with commercial amenities. Footpaths; transport systems; accommodation; restaurants; curio and refreshment stalls; and information/education centres. High volume roads.	The greatest level of deviation from a natural/pristine state is allowed in this zone and it is accepted that damage to the biophysical environment associated with tourist activities and facilities will be inevitable.	Although it is inevitable that the high visitor numbers, activities and facilities will impact on the wild appearance and reduce the wilderness characteristics of the area, these should be managed and limited to ensure that the area generally still provides a relatively natural outdoor experience appropriate for a national park.	Where this is the highest usage zone in a park, management infrastructure should be concentrated here as far as is feasible; allowing management to efficiently make use of existing high volume infrastructure. To limit impacts, management infrastructure should be placed close to the park boundary.

The sensitivity map (Appendix 5, Map 5) shows the relationship between the use zoning and the summary of the biodiversity and landscape sensitivity-value analysis. This indicates that in general it was possible to include most of the environmentally sensitive and valuable areas into zones that are strongly orientated towards conservation rather than tourist use. Also, in numerous cases the boundaries between zones are based on changes in environmental sensitivity. Table 2 summarises the percentage area of the park covered by each zone, as well as the percentage of the highly environmentally sensitive and valuable areas (defined as areas with values in the top quartile of the sensitivity-value analysis) that are within each zone. This indicates that nearly 87.3 % of the park is covered by zones that are strongly conservation orientated in terms of their objectives (*i.e.* remote and primitive). The table demonstrates a good correlation between the spatial distribution of environmentally sensitive areas and conservation orientated zones, with 82.2 % of highly sensitive areas in the conservation orientated zones. More so, the most conservation orientated remote zone only covers about 50.1 % of the park yet it contains 41.6 % of the highly valuable and sensitive areas. Conversely, the tourist orientated zones covers 12.6 % of the park yet contains approximately 17.8 % of sensitive areas.

Table 2. Park percentage area summary covered by each zone, as well as the percentages of the highly environmentally sensitive and valuable areas (defined as areas with values in the top quartile of the sensitivity value-analysis) that are within each zone.

Zone emphasis	Use zone	Zone as a % of park area	% of highly sensitive areas that are in a zone
Conservation orientated	Remote	50.1	41.6
	Primitive	37.2	40.6
Tourism orientated	Low intensity leisure	12.5	17.5
	High intensity leisure	0.1	0.3

6.5.2 Remote zone

Objective

The objective of this conservation-orientated zone is to protect sensitive environments from almost all development impacts and tourism pressures.

Characteristics

This is an area retaining an intrinsically wild appearance and character, or capable of being restored to such and which is essentially undeveloped and road less. There are no permanent improvements or any form of human habitation. Remote zone provides outstanding opportunities for solitude with awe inspiring natural characteristics. Sight and sound of human habitation and activities are barely discernible and at a far distance.

Visitor activities and experience

Activities: Access is strictly controlled and non-motorised. Groups must be small, and can either be accompanied by a guide or unaccompanied, depending on the presence of dangerous animals. Several groups may be in an area at the same time, but if necessary densities and routes must be defined so that groups are unaware of each other. The principle of “Pack it in Pack it out” must be applied. Specially arranged once-off events such as an adventure race may involve higher visitor numbers for a brief limited period, but these events are not the norm.

Interaction with other users: There is no interaction between groups. The number of groups within the area will be determined by the ability to ensure that there is no interaction between groups.

Limits of acceptable change

Biophysical environment: Deviation from a natural / pristine state should be avoided, else minimised and where unavoidable, existing impacts must be reduced.

Aesthetics and recreational environment: Activities which impact on the intrinsically wild appearance and character of the area, or which impact on the wilderness characteristics of the area (solitude, remoteness, wildness, serenity, peace, *etc.*) is not allowed.

Facilities

Type and size: No facilities are provided. Should overnight facilities be required to serve this zone, these must be placed in the adjoining zones.

Sophistication of facilities: Except for self-carried portable tents, no other facilities are permitted. Guidelines for washing, ablution and cooking must be defined according to the "Pack it in Pack it out" principles. Camping is allowed only at designated sites.

Audible equipment and communication structures: None.

Access and roads: Public access is non-motorised. Vehicular access and parking is provided in the adjoining zones. Established footpaths may be provided where erosion risks occur. Limited low specification management tracks (*i.e.* not built up roads) are acceptable within this zone, though these tracks should be rationalised, and eventually removed.

Location in park

Remote areas were designated in the plains, mid-altitude plateau and mountainous areas to include most landscapes with high environmental sensitivity and value.

Guidelines on management infrastructure and utilisation

Ideally there should be no management infrastructure, and natural processes must be allowed to function without management intervention. However, in reality, most parks are too small to allow ecological processes (fire, fecundity – particularly of large predators) to continue without management intervention, which would eventually impact biodiversity negatively. Furthermore, in young or expanding parks, farm management infrastructure might still be apparent. For this reason, concessions are made on management infrastructure in this zone, principally to prevent loss of biodiversity or restoration. Infrastructure might include footpaths where erosion might be a problem, or identified (barely) traversable management 4x4 routes for fire management or ensuring area integrity. Temporary management infrastructure, as might be used for game capture or anti-poaching activities, such as temporary bomas or helicopter landing sites would be permissible, as would vehicular access by staff for specific management interventions, although this must be exercised circumspectly.

6.5.3 Primitive zone

Objective

The objective of this conservation-orientated zone is to protect sensitive environments from development impacts by limiting the size, number and sophistication of infrastructure, and by reducing tourism pressure through controlled access and visitor numbers.

Characteristics

The primary characteristic of this zone is the experience of wilderness qualities with the emphasis on controlled access. Access is controlled in terms of numbers, frequency and group sizes. The zone shares the wilderness qualities of wilderness areas and the remote zone, but with the provision of small basic self-catering facilities with controlled access. It also provides

access to areas zoned as remote or wilderness. Views of human activities and development outside of the park may be visible from this zone.

This zone serves to protect sensitive environments from high levels of development, and acts as a buffer between conservation-orientated and tourist-orientated zones, *e.g.* remote (or wilderness areas) and low intensity leisure respectively. The primitive zone may contain concession sites and other facilities where impacts are managed through strict control of the movement and numbers of tourists, for example if all tourists are in concession safari vehicles.

Visitor activities and experience

Activities: Access is controlled in terms of the number, frequency and group sizes. Activities include hiking, 4x4 drives and game viewing. In the park, access control is mostly passive, with 4x4 trails marked as restricted to 4x4 vehicles only, thus limiting visitor numbers on these routes. Access may also be controlled either through only allowing access to those with bookings for specific facilities, or alternatively through a specific booking or permit for a particular hiking trail or 4x4 route in more sensitive areas. Several groups may be in the area at the same time, but access should be managed to minimise interaction between groups if necessary.

Interaction with other users: Interaction between groups of users is low, and care must be taken in determining the number and nature of facilities located in the area in order to minimise these interactions.

Limits of acceptable change

Biophysical environment: Deviation from a natural / pristine state must be small and limited to restricted impact footprints. Existing impacts must be reduced. Any facilities constructed in these areas, and activities undertaken here, should be done in a way that limits environmental impacts. Road and infrastructure specifications must be designed to limit impacts.

Aesthetics and recreational environment: Activities which impact on the intrinsically wild appearance and character of the area, or which impact on the wilderness characteristics of the area (solitude, remoteness, wildness, serenity, peace, *etc.*) must be restricted and impacts limited to the site of the facility. Ideally visitors must only be aware of the facility or infrastructure that they are utilising, and this infrastructure / facility must be designed to fit in with the environment within which it is located in order to avoid aesthetic impacts.

Facilities

Type and size: Facilities are small, often basic and are distributed to avoid contact between users. To achieve this, camp development must be limited to 15 beds, alternatively facilities can be designed for high levels of luxury, but with limited visitor numbers (*e.g.* controlled access camps or concession sites).

Sophistication of facilities: Generally facilities are small, basic and self-catering, though concession facilities may be significantly more sophisticated.

Audible equipment and communication structures: None.

Access and roads: Vehicular accesses to facilities are mostly limited to low-spec roads, often 4x4 only. Tourist and game viewing roads are usually 4x4. Established footpaths are provided to avoid erosion and braiding.

Location in park

Primitive areas were designated to buffer remote areas and to protect most of the remaining sensitive areas from high levels of tourist activity. Primitive areas were also designated to allow access to remote areas, as well as to accommodate the existing 4x4 pass north of the rest camp, the Klipplaatsfontein 4x4 extension and new Leeurivierpoort 4x4 route. In areas where remote zones border on the park boundary, a 100m wide primitive zone was designated to allow park management access to fences.

Guidelines on management infrastructure and utilisation

Permanent management infrastructure is permissible in this zone, but these should be relatively small and isolated. Park operations staff may need to service tourist facilities in this zone. Examples may include “twee spoor” management tracks, permanent bomas for wildlife, ranger camps and outposts, and possibly

even permanent helipads. The responsibility is on park management to coordinate the tourist road network usage in such a way that tourists do not encounter management infrastructure in this zone, such as by using of no entry signs. Low volume access gates or entrances to access 4x4 routes could be accommodated in this zone.

6.5.4 Low intensity leisure zone

Objective

The objective of the tourist-orientated zone is to provide infrastructure for day and overnight visitors in a natural environment. While game viewing areas may be zoned low intensity leisure (LIL) to allow for flexibility of the game viewing road network, in reality, development footprints must be localised, with some areas having more of a primitive or even remote zone "feel." Impacts must be mitigated by using infrastructure to direct and manage the movement of park visitors away from the more sensitive areas that may occur within this zone.

Characteristics

The underlying characteristic of this zone is motorised self-drive access, with basic self-catering facilities. Small or seasonal commercial or catered facilities can be accommodated; however, these facilities must be small and aligned to the general ambiance of the zone. Numbers of visitors are higher in the low intensity leisure zone as compared to the remote and primitive zones. Relatively comfortable facilities are positioned in the landscape retaining an inherent natural and visual quality, which enhances the visitor experience of a more natural and mostly self-providing experience. Access roads are low key, preferably gravel roads and / or tracks to provide a more natural experience, however higher volume roads may be tarred. Facilities along roads are generally limited to basic self-catering picnic sites with toilet facilities. Large busses and open safari vehicles may be permitted subject to certain conditions.

Visitor activities and experience

Activities: Self-drive motorised game viewing, guided game drives, picnicking, walking, cycling, rock climbing, hiking and adventure activities.

Interaction with other users: Moderate to high.

Limits of acceptable change

Biophysical environment: Deviation from a natural / pristine state must be minimised and limited to restricted impact footprints as far as possible. However, it is accepted that some damage to the biophysical environment associated with tourist activities and facilities will be inevitable.

Aesthetics and recreational environment: Although it is inevitable that the activities and facilities will impact on wild appearance and reduce wilderness characteristics of the area (solitude, remoteness, wildness, *etc.*), these activities and facilities must be managed and limited to ensure that the area still provides a relatively natural outdoor experience.

Facilities

Type and size: Picnic sites, view sites, information centres, ablution facilities, parking areas, education centres, *etc.* Small self-catering camps (including camping and caravanning) of low to medium density (up to 50 beds). Additional facilities can include swimming pools. Trails for 4x4 vehicles can also be provided. Small or seasonal (facilities are only open as required or during peak season) commercial facilities can be provided; such as kiosks, small tourist convenience stores, or tea gardens. However, these facilities must still fall within the general ambiance of the zone– and as such may make use of converted or restored farm houses. Larger commercial

facilities and larger concessional operators (*e.g.* Cattle Barons and Mug & Bean), must be placed in the high intensity leisure (HIL) zone. Day visitor sites are not placed within the camps, and must be compliant with the general self-catering or smaller-scale catered characteristics of the zone.

Sophistication of facilities: Mostly self-contained self-catering accommodation units with bathroom facilities. Camp sites mostly include ablution and kitchen facilities. Tourist facilities may include modern commercial facilities such as shops, kiosks, tea gardens and small tourist convenience stores, as long as these are small.

Audible equipment and communication structures: Cell phone coverage in vicinity of camps. Code of use for cell phones and radios required to retain relative level of solitude.

Access and roads: Motorised self-drive access (traditional game viewing) on designated routes, which are preferably gravel roads. Large busses and open safari vehicles are restricted to high volume roads designed to accommodate them, and indicated as such. Roads may be tarred, secondary gravel tourist roads, or minor game viewing roads.

Location in park

Low intensity leisure areas were designated in the current game viewing areas, along planned access routes and in the high altitude plateau, where these areas did not conflict with the underlying landscape sensitivity and value analysis.

Guidelines on management infrastructure and utilisation

The placement of permanent management infrastructure is encouraged in this zone, particularly when it is the highest level use zone within the park. Where HIL already exists, attempts must be made to concentrate the development of park management and operational infrastructure in the highest usage zone of the park, where feasible, and especially when this is situated close to the boundary of the park. Where it may be preferable to include non-industrial components of management infrastructure on the periphery of the park, these can be accommodated in LIL. Examples may include moderate to high volume access or main entrance gates, park reception, or park management / administration offices (which may wish to be close to park reception facilities). This will allow management and operations to make use of high volume access routes, which will be built to accommodate high traffic volume, and if positioned close to the boundary of the park, will involve shorter commuting distances, limiting disturbance to both wildlife and tourists, and limiting wear and tear to roads.

6.5.5 High intensity leisure zone

Objective

The main objective of this tourist-orientated zone is the concentration and containment of commercial, tourism, managerial, operational and industrial park activities within a restricted and designated area, which is robust enough to tolerate development, and where these diverse activities can share multi-use infrastructure (roads, plumbing, power), thus reducing their overall footprint. As impacts and particularly cumulative impacts are higher, where possible the HIL zone must be placed in areas that have low sensitivity values and are sufficiently robust to tolerate development, and idyllically be close to the periphery of the park. Staff not directly associated with tourism facilities must be accommodated outside of the park if and where possible. When inside a park, all industrial type facilities such as laundries, abattoirs, maintenance depots and workshops, must be ideally located nearby to the park boundary or, if and where possible, outside of the park but within municipally suitably zoned adjoining urban or rural areas.

Characteristics

The main characteristic is that of a high density tourist development node with modern commercial amenities such as restaurants and shops. This is the zone where more concentrated human activities are allowed. High intensity leisure is accessible by motorised transport (car / bus) on high volume transport routes. More concentrated and commercialised (concessional) activities occur here than in than LIL areas.

Visitor activities and experience

Activities: Traditional game viewing routes with associated more sophisticated infrastructure, sightseeing at tourist destinations, picnicking, walking, cycling, rock climbing, hiking and activities associated with amenities such as dining in larger or concessional restaurants.

Interaction with other users: High

Limits of acceptable change

Biophysical environment: The greatest level of deviation from a natural / pristine state is allowed in this zone, and it is accepted that damage to the biophysical environment associated with tourist activities and facilities will be inevitable. However, care must be taken to ensure that the zone still retains a level of ecological integrity consistent with a protected area.

Aesthetics and recreational environment: Although it is inevitable that high visitor numbers, activities and facilities will impact on wild appearance and reduce wilderness characteristics of the area (solitude, remoteness, wildness, *etc*.), these must be managed and limited to ensure that the area generally still provides a relatively natural outdoor experience.

Facilities

Type and size: High density camps providing tourist accommodation with diverse modern amenities. Restaurants, shops, education / information centres, view sights, ablution facilities, parking areas and botanical gardens. Day visitor sites are provided outside of rest camps. Day visitor sites or picnic sites may provide catered facilities and kiosks. Where it may be necessary to provide high density recreational sites with a wide range of intensive activities, an attempt must be made to concentrate these sites close to the periphery of the park. Staff villages and administrative centres must be restricted to core staff. Non-essential staff housing, administration and industrial infrastructure must be positioned outside of or close to the periphery of the park were possible.

Sophistication of facilities: Moderate to high density facilities. Self-catering and catered. Camps often have diverse modern facilities such as shops and restaurants, which may be concessional.

Audible equipment and communication structures: Cell phone coverage in vicinity of camps. Code of use for cell phones and radios required to retain relative level of solitude.

Access and roads: The zone is highly motorised, including busses and delivery vehicles on designated routes, which are often tarred. Care must be taken to distinguish between roads that serve as high access delivery routes to camps, link roads between camps, and game viewing roads, to minimise conflict between users.

Location in park

High intensity leisure areas were restricted to the current rest camp, interpretive centre, opposite the Oudtshoorn turn-off, entrance gate and management areas.

Guidelines on management infrastructure and utilisation

Management guidelines that apply to LIL apply to HIL zone as well. Generally, the presence of HIL in a park indicates higher or more intense utilisation or development, with a higher diversity and concentration of facilities, and thus may require additional management or operational facilities. As HIL is by definition a high use area, and must be located in an area of low sensitivity, the development of management and operations infrastructure in this zone must be

favoured. In the park, most operations and administration infrastructure are situated in existing and well established HIL tourist node at the rest camp.

6.6 The park buffer zone

The buffer zone shows areas outside the park within which land use changes can affect the park. The buffer zone, in combination with guidelines, will serve as a basis for: (i) identifying focus areas in which park management and scientists must respond to Environmental Impacts Assessment's (EIAs), (ii) helping to identify types of impacts that will be important at a particular site, and most importantly (iii) integrating long term protection of the park into the Spatial Development Frameworks (SDFs) of municipalities and other local authorities. The park will interact with all spheres of government, whether local, provincial, or national, as required, to achieve a positive conservation outcome in the buffer zone. In terms of EIA responses, the buffer zone serves largely to raise red-flags and does not remove the need for carefully considering the exact impact of a proposed development. In particular, it does not address activities with broad regional aesthetic or biodiversity impacts *e.g.* renewable energy development projects.

In KRNP's case, there are three categories within the park buffer zone, the priority natural area, catchment protection and the view shed protection area (Appendix 5, Map 6).

6.6.1 Priority natural areas

This zone aims to ensure the long term persistence of biodiversity, within and around the park, by identifying the key areas on which the long term survival of the park depends. This includes areas important to both biodiversity pattern (especially reasonably intact high priority natural habitats) and processes (ecological linkages, catchments, intact hydrological systems, *etc*.). This does not imply any loss of existing rights (*e.g.* current agricultural activities or legal extractive biodiversity use such as fishing), but rather aims to ensure the pars survival in a living landscape.

Priority natural areas include areas identified for future park expansion as well as reasonably natural areas of high biodiversity value, which are critical for the long-term persistence of biodiversity within the park. These include adjacent natural areas (especially high priority habitats), which function as an ecologically integrated unit with the park, as well as areas critical for maintaining ecological links and connectivity with the broader landscape.

Development guidelines: Inappropriate developments and negative land use changes (such as additional ploughing permits for natural veld, development beyond existing transformation footprints, urban expansion, intensification of land use through golf estates, *etc.*) must be opposed within this area. Developments with site specific impacts (*e.g.* a lodge on a game farm) must be favourably viewed if they contribute to ensuring conservation friendly land use within a broader area. Guidelines applicable for the Catchment Protection Section will also apply to these areas.

6.6.2 Catchment protection

These are areas important for maintaining key hydrological processes (surface and groundwater) within the park.

Development guidelines: Within these areas inappropriate development such as dam construction, loss of riparian vegetation and excessive aquifer exploitation must be opposed. In addition, the control of alien vegetation, control of soil erosion, and appropriate land care (*e.g.* appropriate stocking rates) must be promoted.

6.6.3 View shed protection

These are areas where developments can impact on the aesthetic quality of a visitors experience in a park. This zone is particularly concerned with visual impacts (both day and night), but can also include sound pollution.

Development guidelines: Within these areas any development proposals must be carefully screened to ensure that they do not impact excessively on the aesthetics of the park. The areas identified are only broadly indicative of sensitive areas, as at a fine scale many areas within this zone will be perfectly suited for development. Further, invasive developments outside this zone will also have to be considered.

6.7 Future improvements

No future improvements are envisaged at this stage.

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Section 7: Access and facilities

7.1 Public access and control

The park can be accessed from all major hubs, with the nearest significant town being Beaufort West which is 12 km away. Approximate travel times by road to the park are as follows:

- 4.5 hours from Cape Town (N1);
- 12 hours from Johannesburg (N1); and
- 5 hours from Bloemfontein (N1)

The park has one entrance gate, which is located on the N1 highway, 12 km outside of Beaufort West towards Cape Town. The park includes approximately 179 km of tourist roads and 310 km of management roads.

7.2 Areas with restricted access

The park has only one tourist access gate which is manned by SANParks officials during park operating hours. The main gate opening hours are from 05h00 till 22h00 (late arrivals and early departures need to be arranged in advance).

The tourist routes gates times are as follows:

- 01 October to 31 March: 06:00 - 19:00; and
- 01 April to 30 September: 07:00 - 18:00

The rest camp and caravan park is surrounded by an electric fence and controlled by 3 motorised gates. The two picnic areas (Bulkraal and Doornhoek) are fenced and is not electrified. Bulkraal is controlled by an automatic gate and Doornhoek with a manual gate. Access from the outside is restricted by a 177 km predator-proof boundary fence. During operating hours, the main gate is manned by a gate official and thereafter a private security officer is on duty. All vehicles entering or leaving the park are subjected to routine inspections. Three other access gates (Bulkraal, Mountain View and Noordeinde) are in existence but does not offer access to the general public.

7.3 Airfields and flight corridors

There are no airfields in the park. If required, for operational purposes, existing roads can be used as a temporary landing strip. No need has been identified to establish flight corridors through the park's airspace as allowed for in section 47 of NEM: PAA. There is a helipad located in the main rest camp near the administration offices (S 32° 20' 02.80'', E 22° 29' 24.20''). The helipad is exclusively for operational use, and not available to tourists. There is an active airport, available to private aircraft owners, located outside Beaufort West.

7.4 Administration and other facilities

The facilities listed below in Table 5 are utilised for operational purposes enabling the park in fulfilling its' legal mandate. Map 7 in Appendix 5 shows all the infrastructure in the park.

Table 5. Current administrative infrastructure in the park.

Infrastructure	Current status	Zone	Proposed role by 2027
Conservation workshop and abattoir	Operational	LIL	Same as at present
Conservation offices	Operational	LIL	Same as at present

Infrastructure	Current status	Zone	Proposed role by 2027
Main gate	Operational	LIL	Same as at present
People and conservation office	Operational	LIL	Same as at present
Staff housing	Operational	LIL	Same as at present
Technical workshop	Operational	LIL	Same as at present
Administration complex	Operational	HIL	Same as at present

7.5 Visitor facilities

Visitor facilities including all non-commercial facilities and points of interest available to visitors, these are set out in Table 6 below.

Table 6. Visitor facilities and points of interest in the park.

Infrastructure / visitor sites	Current status	Zone	Proposed role by 2027
177 km 2.4 m Electrified game fence	Operational	LIL	Same as at present
142.5 km Gravel roads	Operational	LIL	Same as at present
6.2 km Pienaars Pass 4x4 route	Operational	LIL	Same as at present
30.2km Tar roads	Operational	LIL	Same as at present
Bird hide in main camp	Operational	HIL	Same as at present
Bulkraal picnic site, swimming pool and ablutions	Operational	HIL	Same as at present
Doornhoek picnic site and ablutions	Operational	HIL	Same as at present
Main camp swimming pool and ablutions	Operational	HIL	Same as at present
P&C interpretive centre	Operational	HIL	Same as at present
950 m Bossie trail	Operational	HIL	Same as at present
1.5 km Bulkraal fence	Operational	HIL	Same as at present
400 m Fossil trail	Operational	HIL	Same as at present
4.6 km Pointer hiking trail	Operational	HIL	Same as at present
3.6 km Rest camp fence	Operational	HIL	Same as at present
1.1 km Rest camp trail	Operational	HIL	Same as at present

7.6 Commercial activities

For the purposes of this management plan, commercial activities include all income-generating facilities, products and services offered, and are divided into those operated by the park and those operated by third parties, for example concession lodges.

7.6.1 Accommodation

Accommodation facilities in the park are currently limited, with much potential for expansion. Existing facilities include those listed in Table 7, below.

Table 7. Accommodation facilities available in the park.

Infrastructure	No of units	Current status	Zone	Proposed role by 2027
Afsaal overnight cottage	1	Self-catering - serviced - economy accommodation - historic shepherds hut	LIL	Same as at present

Infrastructure	No of units	Current status	Zone	Proposed role by 2027
Embizweni overnight hut	1	Self-catering - serviced - economy with gas and solar power	Primitive	Same as at present
Caravan sites (including communal kitchen, ablutions and laundry facilities)	25	Camping - budget accommodation - power	HIL	Same as at present
Campsites (including communal kitchen, ablutions and laundry facilities)	6	Camping - budget accommodation - power	HIL	Same as at present
Chalets	20	Self-catering - serviced - economy accommodation.	HIL	Same as at present
Cottages	10	Self-catering – serviced (premium). Semi-lux accommodation	HIL	Same as at present
Family cottages	8	Self-catering – serviced - economy accommodation.	HIL	Same as at present

7.6.2 Concessions

Jobojali CC trading as Salt & Pepper Restaurant and Curio Shop, has been awarded the concession in December 2013 to manage the restaurant and curio shop. This contract expires in 2023 and must thus be advertised again.

7.6.3 Retail and other facilities

The current retail facilities comprise of a restaurant and curio shop, located in the administration complex.

7.6.4 Activities

There are a number of income generating activities available in the park, and these are listed below:

- Guided game drives (morning and night);
- Guided morning walks;
- Pienaars Pass 4x4 self-drive (6.2 km);

There are also a number of annual events, arranged by and generating income for the SHRs, which indirectly benefit the park through investment in park projects. These include:

- Annual golf day;
- Annual birding weekend;
- Annual bowling day;
- Annual tennis tournament; and
- SHRs family day.

The annual Beaufort West marathon is run in conjunction with the Beaufort West local municipality and is considered a community development activity and is supported by the Park and the SHRs.

7.7 Cultural heritage sites

A number of sites, as listed in Table 8 below, are accessible to visitors.

Table 8. Cultural heritage sites available in the park with tourism potential.

Sites	Current status	Zone	Proposed role by 2027
Corbelled house	Undeveloped	Remote	Change to tourism facility
Lime burning kiln	Undeveloped	Remote	Access to be provided in future
Old mill	Undeveloped	Remote	Change to tourism facility
Stone corals	Unchanged, access provided to certain points along tourist roads	Remote	Same as at present
Grantham house	Hosts camps and Kids and Parks programme	Primitive	Same as at present
Stolzhoek Ou Schuur	Interpretive centre	HIL	Same as at present
Graves and gravesites	Access are provided on request	Various	Same as at present
Hyena traps	Some are available to tourist	Various	Access to be provided to additional sites along tourist roads

7.8 Community use

Communities are given access to grave sites or cultural sites for ritual purposes by appointment. They will be accompanied by a ranger for safety reasons. There are currently no community resource use projects active in the park, however, future applications will be evaluated according to the SANParks resource use policy.

7.9 Mining

Other than gravel pits used for maintenance purposes, there is currently no commercial mining taking place in the park. No mining rights / permits have been issued on park property.

7.10 Servitudes

There is an Eskom servitude, to accommodate of two overhead powerlines, traversing the north-eastern section of the park. In addition, the park have contractual agreements with the Department of Public Works and Vodacom, granting them access to the site where the Sentech tower is situated. Access is also granted to other companies *i.e.* MTN and Telkom.

Section 8: Consolidation and expansion

The expansion and consolidation of the park remains a national priority for SANParks given its recognised biodiversity, its landscape interface and its regional social-economic importance. The expansion programme is informed by SANParks policy regarding land inclusion (SANParks 2015; Knight *et al.,* 2009), and the National Protected Areas Expansion Strategy (NPAES) (DEAT 2008), as well as the 3-year rolling land acquisition plan. It is important to note that this 3-year plan can change due to the availability of funds, willing-buyer-willing-seller concept and the negotiation process. The expansion of the park also addresses national objective SO1.1 of the National Biodiversity Strategy and Action Plan (NBSAP) (DEA 2015).

The park expansion programme aims to contribute to NPAES that recommends expansion towards 12 % of the terrestrial area and 25 % of the marine inshore. Effectively engaging with relevant stakeholders through collaborative interventions would contribute towards achieving co-operative management within the park's buffer zone. Expansion of the park can be achieved through direct acquisition by means of own (SANParks) funding, government funding or donation from a private or Non-Governmental Organisation donor. In the case of SANParks or state funding the acquired land becomes state land and is declared as national park (Clause 20 (2) of the NEM: PAA and its Amendment No 31 of 2004). In some cases a private entity may acquire the land for national park purposes, but retains ownership (such as World Wide Fund for Nature; National Parks Trust of South Africa) with the land declared Clause 20 (3) of the NEM: PAA. Land can also be included via contractual park agreements which refer to cases where private or communal land is incorporated into the park (and declared under the same Clause 20 (3) of NEM: PAA under agreement between the parties but they retain ownership.

In order to conserve the biodiversity and landscapes, the park has systematically focused on consolidating the Leeu-Gamka catchment system from the Nuweveld Mountains escarpment to the low lying plains towards an ecologically viable park size and shape (Castley & Knight 2000). The expanded park will provide the largest formally protected area within the great Karoo region.

To meet the conservation expansion objectives over the next 10 years, a single upland expansion footprint has been identified (Appendix 5, Map 3). This will increase the areas conserved to: Karoo Escarpment Grasslands (9,045 ha); Eastern Upper Karoo (11,815 ha); Western Upper Karoo (32,501 ha); and Upper Karoo Hardeveld (65,663 ha). Additional targets for Bushman land Vloere (1,062 ha) and Gamka Karoo (46,789 ha) vegetation types will bring the collective total to 166,877 ha. Furthermore, the KRNP remains important in the conservation of the Gamka Karoo and Upper Karoo Hardeveld as the park conserves 13 % and 21 % of the national target of these ecosystem (DEAT 2008). The current park only contributes to meeting 4 % for the national conservation targets for these ecosystems. Expanding the park to its desired state would increase this contribution to a larger 7.6 % of the national target. Importantly the park will conserve 14 % of the Gamka Karoo and 27 % of the Upper Karoo Hardeveld vegetation types. The other ecosystems would conserve between 1 % and 9 % of the national targets.

The approach that SANParks will follow can be found in section 10.2.2 on page 64.

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Section 9: Concept development plan

9.1 Long term development plan

Development is not considered lightly and is only embarked on in order to fulfil a real operational need or tourism opportunity. The park is not yet fully sustainable, however it has growth potential and runs at good occupancies.

The current development planning focuses on ways to attract increased numbers of visitors, and to increase their length of stay. Product development and diversification, as well as the development of a marketing plan and budget is high on the tourism agenda. Desired development in the park, should funding become available, will include the addition of 4 - 6 serviced caravan / campsites, an additional unit similar to Afsaal, a bush camp sleeping 8 persons and or an overnight hut. The Honorary Rangers are investigating the possibility of implementing a mountain-biking trail within the main rest camp.

In addition to development planning within the park, the Beaufort West Tourism Organisation (BWTO) is planning a conservancy next to the park, in order to drive socio-economic development in the region. The planned conservancy will be located within the vicinity of Walkers Dam and BWTO has requested the park's support for this endeavour. This development if successful, will primarily benefit the community but may also be of benefit to the park, due to its location on the park periphery.

Caution should be exercised when considering any tourism development. The zonation of the park will dictate the placement of any development and the implementation of identified projects is dependent on the availability of funds.

9.2 Development nodes

The primary development node remains the rest camp, with limited expansion in a number of other areas.

9.3 Communication routes

Communication needs to be improved in the park, including telephone, data network, free and metered Wi-Fi and cellular access.

9.4 Service supply routes

Should the proposed 4 - 6 serviced caravan / campsites be developed, then the existing bulk services must be upgraded (including water, sewer and power supply) to cater for the expansion.

9.5 Infrastructure development proposals

All infrastructure development proposals, including activity development, are presented in Tables 9 - 13 below. /

9.5.1 Administration and other facilities

The facilities set out in Table 9 below will be utilised for operational purposes.

Table 9. Proposed administrative infrastructure development in the park.

Infrastructure	Current status	Zone	Proposed role by 2027	Probability
Administration complex	In use	HIL	High priority for re-thatching of roof.	High

Infrastructure	Current status	Zone	Proposed role by 2027	Probability
Environmental education facility	Non existent	HIL	Environmental education facility	Medium
Staff houses	In use	HIL	Upgrade existing staff housing.	Medium

9.5.2 Visitor facilities

Visitor facilities include all non-commercial facilities and points of interest available to visitors are set out in Table 10 below.

Table 10. Proposed visitor facility development in the park

Infrastructure / visitor sites	Current status	Zone	Proposed role by 2027	Probability
Additional picnic ablutions - Middleveld	Non existent	LIL	New development	Medium
Upgrade identified 4x4 roads to be accessible to sedan vehicles	In use	LIL	30 Kilometres of existing roads need to be upgraded	High
Upgrade camping ablutions and kitchen complex	In use	HIL	To be re-painted, tiled and upgraded	High

9.5.3 Commercial facilities and activities

There are a limited number of commercial activities and or products that could be developed in the park, or those currently in operation to be expanded / upgraded, in order to improve the tourism experience. All proposed opportunities will be individually investigated and the priority determined based on feasibility and income potential. Following these studies, identified opportunities may be excluded from potential development. There may be opportunities for development that are excluded as they are considered unlikely to be developed within the term of this plan. However, should the market change or a third party present an opportunity, products may be considered based on the agreed terms and locations, as per the park product development framework (Appendix 4).

9.5.3.1 Accommodation

The new accommodation infrastructure that is envisaged for the park is set out in Table 11 below.

Table 11. Proposed accommodation development in the park.

Infrastructure / visitor sites	Current status	Zone	Proposed role by 2027	Probability
Renovating of the Mountain View Rondawels	Not currently in use	LIL	Current road to be upgraded to be accessible by sedan vehicles	Medium
Upgrade Mountain View hiking hut	Not currently in use	Primitive	Upgrade current road and facility	Low
Develop Leeu River 4x4 route informal bush camp	Non existent	Primitive	Add an informal bush camp (5 sites) along the Leeu River 4x4 Route	High
Develop Leeu River 4x4 route informal overnight hut	Non existent	Primitive	Add an overnight hut sleeping up to 10 people	High
Additional Afsaal type facility	Non existent	LIL	2 Bedroom house with ablutions & central kitchen / living area and stoep	High

Infrastructure / visitor sites	Current status	Zone	Proposed role by 2027	Probability
Upgrade all chalets in main rest camp	In use	HIL	General upgrades ongoing, including re-thatching	High
Upgrade caravan sites	In Use	HIL	Paving of caravan sites	High
4 - 6 new serviced caravan / camping sites	Non existent	HIL	If add services, include 2 units back to back	Medium

9.5.3.2 Concessions

The current concession, which include the restaurant and shop, is coming up for review in 2023. No concession development is planned at this time.

9.5.3.3 Retail and other facilities

SANParks has identified a possible development node close to the N1.

9.5.3.4 Activities

Leisure activities provide a mechanism for income generation, with the potential for community development and without the high capital investment required for accommodation. Key challenges regarding provision of leisure activities in future will be diversity of offering, customer demand and increasing the 'adventure' element of activities in order to engage the younger markets and markets with a high disposable income. Activity development will need to take the visual impact of each activity into account, in order to ensure the unique selling proposition of remoteness of the park is maintained. Certain activities will also need to cater for different product grades and visitor experience levels.

Table 12. Proposed activity development in the park.

Activities	Current status	Zone	Proposed role by 2027	Probability
Star gazing	Non existent	Various	Paid star-gazing activity	High
Mountain-biking	Non existent	HIL	Develop a trail in the main camp for overnight visitors	High

9.5.4 Cultural heritage sites

There is a need to enhance the interpretation of the cultural heritage sites in the park. Additional sites have been identified (Table 13) for possible interpretation.

Table 13. Proposed cultural heritage product development in the park.

Sites	Current status	Zone	Proposed role by 2027	Probability
Corbelled house	Not currently in use	Remote	Interpretation potential	Medium
Old mill	Not currently in use	Remote	interpretation potential	Medium

Intentional left blank

Section 10: Strategic plan

10.1 Introduction

Sections 3, 4 and 5 of this plan outlined the policy framework, the consultation process and vision, mission and high-level objectives for the park. In this section the higher level objectives of the park are developed into lower level objectives and sub-objectives and finally into operational actions. In this way decision-making, even at the operational level, can be traced all the way back to the core values and inputs from stakeholders on which they have been based. This approach conforms to the requirements of the NEM: PAA and the NEM: BA, SANParks policy and ratified international conventions.

Programmes of implementation, developed as outlined above, form the strategic plan for this planning cycle, are arranged under the following headings:

- Bioregional;
- Biodiversity;
- Tourism;
- Constituency building and benefit sharing; and
- Effective park management.

Each programme is presented as follows:

- **Programme name:** A name describing the programme.
- **Background:** Overview of intent**,** guiding principles, description, outcome, research and monitoring and risk (all where applicable);
- **Tables:** Outline of objectives, initiatives and management actions within the scope of the objective with an indication if the programme is once-off, continuing or conditional on the availability of resources. These tables have the following headings:
    - **Objectives** The various objectives derived from the hierarchy of higher level objectives, which make up each programme;
    - **Actions**: The actions necessary to achieve the objective;
    - **Responsibility**: The SANParks person, section, department, division or unit responsible for implementing the action;
    - **Indicator**: A measure whereby the achievement of the objective can be evaluated;
    - **Timeframe**: An indication of when the action is likely to be completed (indicated by year in the planning cycle); and
    - **References**: References to relevant programmes, lower level plans (LLPs) or other documents.

The commitments outlined in the various programmes under section 10 are aligned with the performance management system of the operational staff. This is revised annually to ensure all the actions will be implemented.

10.2 Bioregional

The purpose of the bioregional objective is to conserve systems and processes within and around the park to ensure a positive conservation outcome in the park and buffer zone, by influencing developmental processes in the buffer zone and by adding key parcels of land to the protected area. The park recognises that partnerships could be developed with other likeminded organisations to maintain the faunal and floral assemblages and ecological processes representative of the area for the long-term beneficiation of the region and country. It aims to collaborate with relevant international, national, provincial and local government structures; non-governmental organisations and land owner groups. The park is an important driver of the regional economy, through tourism, and by direct and indirect employment opportunities.

10.2.1 Mainstreaming biodiversity programme

The purpose of this programme is to engage and interact with local and district municipalities, non-governmental organisations, neighbours, surrounding communities *etc.* bordering the park to ensure that biodiversity considerations are taken into account, as far as possible and as appropriate, into all developmental decisions.

Agriculture forms the backbone of the economy in the Beaufort West municipal area and this sector has the most employment opportunities. The park has a number of land uses occurring on its borders, but traditional farming is based mainly on sheep farming and meat production. Other activities include private game farms, guest houses, construction industry and industrialisation close to the town of Beaufort West. The Central Karoo District municipal area is an agrarian and services economy which makes a small contribution to the Western Cape economy. The economy is relatively closed with it being mainly dependent on the demand conditions in the rest of the country. While the agricultural sector is in decline due to climatic and other factors, with knock-on effects to other sectors, it remains a cornerstone of the local economic outlook.

Currently, there are no renewable energy developments in the immediate vicinity of the park; however the BWLM Integrated Development Plan (2016 / 2017 Review) recognises local climatic conditions are conducive to renewable energy generation. The SDF proposes the establishment of a wind power generation farm to the North West of Beaufort West. Although this proposal is beyond the park buffer zone, this area should be monitored for further renewable energy developments. Of more immediate concern is the potential for shale gas mining or fracking. In September 2012, the moratorium on fracking in South Africa was lifted and various companies published their intent to prospect for shale gas in the Karoo, including the areas adjacent to the park. Of particular concern is the amount of water required for fracking, in an already water stressed environment, as well as the potential contamination of ground and surface water from mining activities. This would not only impact negatively on the park, but also on the largely agricultural landscape. In light of these potential threats, SANParks is proposing to use KRNP as a natural laboratory, to conduct baseline studies of water availability and water quality. An application for mining exploration for uranium is also a concern for the park as the exploration blocks include areas to the north and south-west of the park.

All of these activities can negatively affect the natural systems in the park and its future to conserve biodiversity, if left unchecked and uninformed. The park aims to oppose or minimise the negative impacts of poor conservation strategies and development along its borders, through the proactive engagement with surrounding land owners, regional planners and scientists. The primary mechanism to address these concerns is through the park's buffer zone (Appendix 5, Map 6), in accordance with the gazetted DEA Strategy on Buffer Zones. The buffer zone serves as a guide to indicate areas within which landuse changes could affect the park, and where park management and scientists should assess, and where required, respond to EIAs as an interested and affected party. SANParks may also respond to developments with broader regional impacts, even if these occur outside the buffer zone, but are deemed to have an impact on the park. Ultimately, the park and its buffer zone should be integrated into the IDPs and SDFs of local and district municipalities.

The achievement of the park's aspirations depends on understanding the relationships and inter-dependencies between various strategic planning processes and partnerships in the region. The park will co-operate with the relevant national, provincial and local government structures insofar as these affect the park, and keep track of issues affecting the park and region to ensure functional ecosystem are protected. Through education about the importance of biodiversity, the park intends to raise awareness of people and communities, in the buffer zone, to the plight of conservation in the region. By building positive relationships with land owners and providing a central point for conservation ideas and examples, KRNP can achieve the objective of this programme.

Of the protected areas in the BWLM, KRNP makes up 96 % and the remaining 4 % is privately owned nature reserves (Beaufort West Local Municipality, 2016).

This programme links with high level objective 1 and objective 1.1 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

MAINSTREAMING BIODIVERSITY PROGRAMME					
High-level objective: To expand the park and influence development through co-operative management and effective engagement with relevant stakeholders.					
Objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To minimise potential conflicts that arise from the differing objectives of non-aligned land-uses in the park buffer zone through responsible engagement with land owners and local authorities and development of conservation options.	Identify land use and transformation trends in the park buffer zone, and how these may affect the park.	PM, CSD	Report	Year 2, ongoing	
	Update land use planning databases for landuse assessment, sector plans, CBA data, SPOT5 imagery *etc.*	CSD	Data bases	Year 2, ongoing	
	Identify possible external threats from development.	CSD, PM	List of threats	Ongoing	
	Establish institutional collaboration to use the park to establish water quality baselines.	CSD, PM	Research contracts	As required	
	Participate in IDP and SDF processes to influence decisions.	PM	Minutes of meetings	Annually	
	Respond to EIAs, scoping reports *etc.*	PM, CSD	Scoping, EIA reports	As required	
	Engage with identified landowners to achieve common conservation goals.	PM, CSD	Minutes of meetings	Ongoing	

10.2.2 Park consolidation programme

The purpose of this programme is to achieve the SANParks goal of conserving ecological patterns and processes typical of the region by acquiring conservation-worthy land through purchase or by other means in line with SANParks land acquisition framework. The rational for this programme can be found in section 8 on page 56.

The immediate expansion priorities are to focus on rectifying the park's rather inefficient shape and lack of a link to the major road network. Over the next 10 years the emphasis would be on addressing the jagged boundary in the northern section of the park thus improving managerial efficiency in term of fencing, and wildlife tension points. This expansion would add more of the limited Northern Upper Karoo vegetation.

These priority expansions are in line with recommendations of the NPAES. These planned expansions entail a total of about 24,900 ha. In order to meet this expanded footprint a total of 13,600 ha has specifically been identified for acquisition, with a further 60,000 ha identified for either acquisition or contractual inclusion and 45,000 ha for contract only. The general small stock and game farming land use activities in the surrounding mosaic make for relatively easy assimilation of acquired land into the park. The prioritised acquisition would cost about R15 - R30 million at current prices. There are however several possibilities to include large land holdings on long-term contracts. This could potentially reduce the estimated acquisition bill by up to 50 %, but is largely dependent upon reaching consensus on park – contractual objectives with private land owners.

This programme links with high-level objective 1 and objective 1.2 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

PARK CONSOLIDATION PROGRAMME					
High-level objective: To expand the park and influence development through co-operative management and effective engagement with relevant stakeholders.					
Objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To incorporate the spectrum of biodiversity patterns representative of the area, which support the long term ecological processes through conservation focused partnerships and strategic land acquisitions.	Update the conservation expansion plan as per section 8 of this document.	CSD, PM	Plan	Ongoing	
	Motivate and prioritise acquisitions.	CSD, PM	Priority list	Year 1	
	Obtain and allocate required funding.	CSD	SANParks expansion plan	Annually	
	Target the acquisition of ~25, 000 ha over 10 years.	CSD, PM	Purchase agreements	Year 10	
	Review conservation expansion plan.	CSD, PM	Annual report	Year 3, ongoing	

10.3 Biodiversity

As such, a number of biodiversity management programmes have been developed to effectively manage the diversity, patterns and processes of the characteristic elements of a typical Karoo landscape. The key management strategies listed below cover the next planning cycle (or longer), in order to advance the biodiversity component of the park's desired state, and represent the sub-objectives of the park's Biodiversity Programme:

- To ensure appropriate patterns of herbivory, by mimicking spatio-temporal variability in landscape utilisation;
- To restore or mimic predator-prey dynamics, through the management of carnivore social dynamics and game offtakes;
- To restore the integrity of degraded systems, by understanding and mitigating the drivers of degradation;
- To restore natural fire regimes, by appropriate veld management and handling of fires;
- To prevent negative impacts of disease on biodiversity, through vigilance and timeous addressing of disease issues;
- To conserve vegetation patterns representative of the Nama Karoo, through appropriate management of herbivory, fire, ecological gradients, species of special concern and water availability;
- To strive for natural patterns and processes of water in the landscape, by appropriate ground and surface water utilisation and management; and
- To contribute to the persistence of species of special concern, through targeted species management and participation in broader conservation initiatives.

10.3.1 Habitat and vegetation programme

The purpose of this programme is to determine potential change of key habitats and plant communities and its consequences for fauna and associated processes, as well as for their aesthetic value that may affect the park's potential as a tourist attraction.

Since protected areas are under increasing threat from a range of external and internal factors, and a primary SANParks mandate being the conservation of biodiversity, monitoring is an essential component of measuring the performance of protected areas. Moreover, the requirement for biodiversity monitoring in national parks is specified in national legislation (National Environmental Management Biodiversity Act No. 10 of 2004) and international policy (Convention on Biological Diversity), as well as by SANParks' own adaptive management approach.

The physical appearance of the vegetation comprises Montane Karoo grassy shrub lands, Karoo grassy dwarf shrub lands, Karoo succulent dwarf shrub lands and riparian vegetation. The park therefore represents a unique reference site to monitor the changes in these dynamic vegetation types. The vegetation is subjected to continuous climatic pressure because of the influence of a semi-arid climate from

the west and a moderate climate from the east. There is a close relationship between seasonal rainfall and its effect on the growth of grasses and Karoo dwarf shrubs in the area. Prior to the establishment of the nucleus Karoo in 1979, the area was used for small-stock ranching (Rubin & Palmer, 1996). Vegetation monitoring was initiated four years after the declaration of the park. Canopy cover was recorded from 1984 to 1986 and in 1992 in eight plots at Lammertjiesleegte (Kraaij & Milton 2006). Regular monitoring associated with exclosures started in 1995 and was subsequently done every year at the end of the growing season (April / May) until 2004. Kraaij & Milton (2006) found that although degradation in semi-arid Karoo rangelands has been ascribed to over-utilisation by livestock and variations in rainfall regime, understanding vegetation dynamics in confined plant–herbivore systems is hampered by the difficulty in uncoupling biotic and abiotic determinants of vegetation change, as well as a paucity of long-term studies.

The requirement for biodiversity monitoring is specified by SANParks' own adaptive management philosophy and the SANParks' Framework for Biodiversity Monitoring guides the structure and development of the Biodiversity Monitoring System (BMS) for SANParks (McGeoch *et al*., 2011). Past research has focused on inventorisation (vegetation / habitat map and plant species list) and the monitoring of veld condition. SANParks will continue with the existing monitoring initiated by SANParks and UNISA or in collaboration with external researchers of different tertiary organisations and government organisations. This programme is very closely linked to the Herbivory Management and Species of Special Concern Programmes, which aims to maintain patchy herbivore impacts across the park. Vegetation monitoring, together with analysis of vegetation greenness and cover from satellite images, will form the basis of the monitoring for these two linked programmes. The results and recommendations of the monitoring should be used to adapt management policies when necessary.

This programme links with high-level objective 2 and objective 2.1 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

HABITAT AND VEGETATION PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To conserve vegetation patterns representative of the Nama Karoo, through appropriate management of herbivory, fire, ecological gradients, species of special concern and water.	Collate all old and current vegetation research.	CSD	Documents and GIS information	Year 1	Programmes for degradation and restoration, fire, fresh water, species of special concern
	Implement monitoring projects to assess the vegetation.	CSD, PM	Research projects (in-house and external), monitoring reports	Annually or biennially	Programmes for degradation and restoration, fire, fresh water, species of special concern
	Implement monitoring projects to assess alternative methods for assessing the veld condition such as the MODIS satellite imagery.	CSD, PM	Research projects (in-house and external), monitoring reports	Annually or biennially	Programmes for degradation and restoration, fire, fresh water, species of special concern

10.3.2 Degradation and rehabilitation programme

The purpose of this programme is to assess the habitat degradation status and implement mitigation measures needed to facilitate the improvement of ecological processes and enhancement of ecosystem functioning in affected areas.

The national policy on the conservation and sustainable use of South Africa's biodiversity, produced by DEA calls for the identification of key sites for rehabilitation based upon biological and socio-economic criteria, and the development and implementation of rehabilitation plans for identified sites. Similarly, the Convention on Biological Diversity lists rehabilitation as an important tool for promoting the conservation of biodiversity. Human threats are still actively affecting biodiversity due to past disturbances such as indigenous tree clearing for farming purposes or the aftermath of long periods of intensive grazing (Daemane *et. al.,* 2011). Environmental disturbances that hinder ecosystem stability and function, threaten the various benefits derived from national parks as they result in decreased species diversity and subsequent decline in ecological function and resilience (Tilman *et. al.,* 1997; Evans *et. al.,* 2001). Therefore, these anthropogenic disturbances should be mitigated and ecological processes restored to reduce undesirable impact on the biological integrity of ecosystems.

SANParks consider degradation as the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems and the extinction of wildlife – the generated change or disturbance to the environment is percieved to be deleterious or undesriable. During this process in some cases, the disturbed or damaged ecosystem cannot re-establish on their own without human facilitation (SER 2004; Forsythe 2013). This is because the environment has been exposed to frequent or intense disturbances that hinder or delay ecosystem repair (Pullin 2002). These disturbances can be man-made or natural and still need human interventions to recover even in natural ecosystems such as national parks (Daemane *et al*., 2013). Most degradation types in the park are human-induced such as; past agricultural practices, invasive alien species (although relatively small scale), past and present herbivory, old infrastructure, erosion and soil degradation and presence of extra-limital species. Invasive alien plants have allelopathic effects that completely exclude and hinder native vegetation presence (Sean *et. al.,* 2008; Gerber *et. al.,* 2008) by modifying nutrient formation and hydrology (Higgins *et. al.,* 1999; Zachariades & Goodall 2002). This restructures resource availability and modifies ecosystem processes. In general, degrading agents in the system lead to species loss (Oldeman *et. al.,* 1991; Nachtergaele *et. al.,* 2010). However, not all disturbances and associated change is toxic for ecosystems. The impact differs with the type of disturbance and its intensity. For example, moderate grazing benefits biodiversity as it removes senescent vegetation (Read & Andersen 2000; Littlewood 2008). Generally highest diversity and conservation value result at intermediate levels of disturbance (Barnosky *et. al*., 2012; Chesson and Huntly 1997; Roxburgh *et. al.,* 2004). Apart from human-induced activities, degradation can be caused by natural disturbances (*i.e.* floods, droughts) that are too frequent or severe to allow natural ecosystem recovery in a reasonable period of time. Degradation resulting from various factors, including climate perturbations and extreme events, inappropriate fire or herbivory regimes, alien species invasion, as well as human activities, generally reduces flows of ecosystem goods and services. Although some of these are natural processes, intervention may be required to aid recovery in protected areas where natural recovery processes are retarded or prohibited as a result of fragmented habitat surrounded by alternative land use. Except for some chaotic or gradual natural events leading to land degradation, the phenomenon is mainly due to the interaction of the users with the land. Water runoff is also accelerated by road infrastructure in areas of high tourism intensities. Degradation therefore affects the capacity of the habitat to support life, thereby contributing to an unsustainable ecological system.

The sensitive nature of soils in the park permits easy erosion during rainfall seasons and floods. Infestation by alien invasive plants also occur causing vegetation community degradation as species richness, composition and diversity declines. Past agricultural cropped land is another challenge hindering biodiversity increase in some parts of the park. The removal of indigenous vegetation during cropping times negatively affect indigenous species and ecosystems as soil erosion is enhanced and foraging places and food resources for species are decreased. Therefore, these anthropogenic disturbances should be mitigated and ecological processes restored to reduce undesirable impact on the biological integrity of ecosystems. Often degradation is accompanied by loss of ecosystem functioning such that the extent of transformation or change in some areas cannot undergo passive rehabilitation without mitigation measures to facilitate recovery. In areas affected by past or current herbivore management practices, removal of basal vegetation cover and associated soil capping are evident, leading to soil degradation such as sheet, rill and gully erosion.

The Landscape Function Analysis technique (Tongway and Hindley 2004) is undertaken at selected sites to assess soil stability, infiltration / runoff and nutrient cycling as indicators to measure soil degradation. Rehabilitation in areas affected by soil degradation includes gully control methods such as resloping, silt fencing, brush packing and gabions construction (Coetzee 2005). For bigger interventions such as gullies, fixed photos are taken before and after intervention. Where sheet erosion was identified as a major degradation concern, a combination of soil ponding and brush packing is undertaken to break capped soils and facilitate sediment and seeds capture. Vegetation is then monitored in selected sites to assess the success of intervention measures in areas affected by sheet erosion.

If rehabilitation does not receive attention, the park runs the risk of allowing further degradation which consequently has negative impacts on biodiversity. The risks involved include erosion, loss of biodiversity and reduced forage to support herbivores. To this regard the Biodiversity Social Projects (BSP) unit has in the three years since 2013 / 14 rehabilitated 337 ha at a cost of R 8,306,362.

Detailed degradation and alien plant distribution maps have been compiled and are used for prioritisation of restoration. Invasive alien clearing will be addressed in programme 10.3.1.2 below. This programme links with high-level objective 2 and objective 2.2 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

DEGRADATION AND REHABILITATION PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective: To restore the integrity of degraded systems, by understanding and mitigating the drivers of degradation					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To restore the soil functioning and associated vegetation patterns of land degraded by erosion	Identify, map and prioritise sites requiring rehabilitation.	BSP	Ha rehabilitated	Ongoing	BSP' Annual Plan of Operation
	Rehabilitation of areas affected by soil erosion.	BSP	Ha of land rehabilitated	Ongoing	
	Monitoring recovery in areas undergoing rehabilitation.	BSP, CSD	Number of monitoring sites established	Ongoing	

10.3.3 Invasive and alien species programme

The purpose of this programme is to protect the biodiversity and infrastructural assets and tourism experiences within the park through supressing and where possible eradicating and preventing the re-infestation of invasive and alien species (IAS) within the park as well as the protected area buffer of the park and to protect the park from new and emergent species.

Many international conventions call for the management of invasive alien species among others the Convention on Biodiversity. In South Africa, the management of IAS is mandatory under the NEM: BA. There are sixteen national acts, provincial ordinances and municipal by-laws that govern the management of IAS. Of these, the most immediately relevant are the NEM: BA and the Conservation of Agricultural Resources Act (No. 43 of 1983) [CARA] and regulations made under these acts. The CARA provides additional guidance for the management of IAS plants. The IAS management framework for SANParks (Hendricks and Symonds 2009) provides the context within which all management of IAS is implemented. A small number of alien or extralimital animal species are found in the park, or occasionally enter the park from neighbouring properties. It is SANParks's policy that no species that were not historically present in the area are allowed to persist in a park. Consequently, all extra-limital or alien animal species must be removed from the park as soon as is practically possible. CARA requires the management of listed alien invasive plants. There are three categories of plants, each with its own management and control regulations. NEM: BA provides for the protection of South Africa's biodiversity within the framework of the National Environmental Management Act (Act No. 107 of 1998) [NEMA]. This act puts in place a framework for the management of IAS, regulations governing the management of IAS was published in July 2013 (Government Gazette No. R. 506).

Climate change, invasive alien species, pollution and mining are amongst some of the key threats to protected areas (Alers *et al*., 2007). Invasive and alien species are accepted to be one

of the largest, and fastest growing threats to biodiversity and the ecosystem services they support. These species can transform the structure and species composition of ecosystems by replacing indigenous species, either directly by out-competing them for resources or by changing the way nutrients are cycled through the ecosystem. They also increase biomass which in turn changes fire regimes and fire intensity (McNeely *et.al.,* 2001). Foxcroft *et.al.* (2013) identified biological invasions as one of the greatest threats to protected areas. The development of robust decision-making tools that are based on both invasive species traits as well as ecological principles, along with effective implementation, is key to the success of invasive species management programmes. The likelihood of protecting the park from the threats of IAS is dependent on sound management strategies, adequate resources and effective engagement with key stakeholders, effective legislation and policing of legislation. The likelihood of eradication or maintenance control varies considerably with species and terrain invaded. Rapid response is required to remove species before being allowed to build up large populations.

List of invasive species occurring in the park

Twenty nine alien plant and animal species have been recorded for the park. In addition to the above, one extra-limital bird species have been recorded, and are listed in Table 14 below.

Table 14. List of alien and invasive plant and animal species recorded in the park.

Taxonomic classification	Scientific name	Common name	NEM: BA category	Current perceived level of threat
Birds	*Bostrychia hagedash*	Hadeda ibis		Low
	Columba livia	Feral pigeon	3	Low
	Passer domesticus	House sparrow	3	Low
	Sturnus vulgaris	European starling	3	Low
Mammals	*Antilope cervicapra*	Indian black buck		Low
	Dama dama	Fallow deer	2	Low
	Equus caballus	Horse		Low
Plants	*Agave sisalana*	Sisal	2	Low
	Argemone Mexicana	Yellow-flowered Mexican poppy	1b	High
	Arundo donax	Giant reed	1b	High
	Atriplex lindleyi	Lindley's saltbush		Low
	Atriplex nummularia	Old man saltbush	2	Low
	Austrocylindropuntia cylindrical	Cane cactus	1a	High
	Cereus jamacaru	Queen of the night	1b	High
	Cirsium vulgare	Scotch thistle	1b	High
	Cuscuta campestris	Golden dodder	1b	High
	Cylindropuntia imbricata	Cane cholla	1b	High
	Eucalyptus globulus	Blue gum		Low
	Nicotiana glauca	Brazilian tree tobacco	1b	High
	Opuntia ficus-indica	Sweet prickly pear	1b	High
	Pennisetum purpureum	Elephant grass	2	Medium
	Pennisetum setaceum	Fountain grass	1b	High
	Prosopis glandulosa	Honey mesquite	1b	High
	Salsola kali	Russian thistle	1b	High
	Schinus molle	Peruvian pepper		High
	Xanthium spinosum	Spiny cocklebur	1b	High

Description of the land infested and assessment of the extent of infestation

The park is infested by various IAS plants which occur at different densities of infestation (detail below). Mitigation measures will be implemented to facilitate the improvement of ecological patterns and processes by the enhancement of ecosystem functioning in affected areas through passive control and aggressive irradiation of IAS. Two management areas have been identified by the BSP programme, these are (i) the

park itself and (ii) the park buffer zone. Within these management areas, various units have been identified. These are:

- Park.
  There are four main groups of IAS found across the parks landscape; (i) annuals, (ii) cacti, (iii) grasses and (iv) woody species. The woody and cacti IAS are recorded at relatively low densities; the annual IAS however, as tends to be the norm, are recorded at higher densities. The dynamics of annuals across suitable habitats are expected to flux seasonally between wet and dry cycles. Four units have been identified as potential habitat that could be threatened by IAS infestation, namely; (i) the upper plateau, (ii) the mid to bottom slope, (iii) the plains / vlaktes and (iv) the drainage lines. On the upper plateau were seeps and wet areas are common, *Cirsium vulgare* are a threat. These areas also need to be monitored for infestation by IAS from outside of the park. The plains/vlaktes and drainage lines units are both potential habitats for the cacti and woody IAS, and need to be systematically monitored. Invasion by IAS such as *E. globulus*, *N. glauca*, *P. glandulosa* and *S. molle* along the drainage lines, particularly in association with human habitation also needs to be monitored. Most of the IAS originated on the farms, prior to the parks establishment and consolidation, from where they were dispersed by wind, animals and other means of movement. *Atriplex* spp. are also associated with the old and degraded farm lands in the lower lying areas, however this species, though alien, has been identified as serving an ecological function through soil retention in areas prone to erosion. For this reason *Atriplex* spp. in these areas are not being removed but placed under a monitoring program.

- Buffer zone.
  A full assessment of the park buffer zone needs to be undertaken to identify potential threat of invasion or infestation by IAS from private property specifically in the upper catchments of the Leeu river as well as Klipplaatsfontein and Gamka Rivers that all arise in the highlands north of the park. Post this process, prioritisation for treatment will be undertaken. Initial indications are that approximately 5,000 ha is associated with this unit and is located within the southern area of the park buffer zone. These adjacent municipal properties of the town of Beaufort West, acts as the springboard for the spread of IAS into the park. The main IAS are *Opuntia* spp. that occur within the lower lying areas and *P. setaceum* in the rivers and on the embankments.

Status report on the efficacy of past control measures

The Working for Water programme has been active in the park between 2003 and 2011. For this period, R 1,108,348 has been invested into the control and eradication of IAS. The programme has utilised 7,615 person days and cleared an estimated 1,674 initial ha and further 8,116 follow-up ha. During this period, initial clearing primarily involved the mechanical and chemical control of the following genera: *Agave, Atriplex, Argemone, Cereus, Opuntia, Pennisetum, Populus* and *Prosopis*.

Woody invaders such as *P. glandulosa*, Brazilian peppers and eucalyptus associated with human habitation have largely been effectively managed through the WfW program. The management of *C. imbricata* across the broader landscape was also effective in the early days of the WfW programme. While chemical treatment and manual removal of IAS have been very effective and required little follow-up work, *C. imbricata* has provided a challenge and requires extensive follow-up treatment, with densities of this species remaining relatively constant despite continued treatment over the years. Due to the widespread dispersal of this species and the ease with which it propagates, more regular follow-up treatments will have to be conducted. The two grasses *P. purpureum* and *P. setaceum* also require monitoring and management. The treatment of *O. ficus-indica* has not been successful. The species is isolated to a few of the

'kloofs' within the park, these areas need to be assessed and managed accordingly. The use of bio-control seems not to be effective in areas that experience cold and wet winters and therefore chemical control is recommended, especially in areas demarcated for asset protection. Due to no or very little control measures within the buffer zone regarding IAS, the spread of certain cacti species remains a concern, resulting in continual follow-up to be conducted to avoid dispersal.

Current measures to monitor, control and eradicate invasive and alien species

The SANParks invasive and alien species framework provides an integrated approach to alien and invasive species management, with the primary objective of meeting the biodiversity objectives of the park's management plan. The framework includes five vital components:

- Assessment and risk analysis;
- Priority setting;
- Early detection and rapid response;
- Control; and
- Restoration.

The spread of IAS into the park from the broader alien plant footprint and cadastral areas are a high risk. These areas will be monitored, assessed for risk of pathway movement into the park, prioritised in terms of eradication and treated accordingly. A full assessment and risk analysis of IAS in the park will enable priority setting. Prioritisation will then allow for available resources to be directed into ecologically sensitive and economically feasible areas. A generic set of criteria has been developed to prioritise areas and species. Once species and associated areas have been prioritised for treatment, this will be feed into an annual plan of operation (APO), which will form the basis of the motivation for funding annually. The APO will set out clearing schedules for each site, personnel requirements and costing. A long term strategy will be developed for the areas within the park and adjacent buffers, which will assist in compiling an inventory, priority listing and allocation of resources over a five to ten year time frame. This long term strategy will inform funding motivation and operations on an annual basis. Working with the South African National Biodiversity Institute (SANBI) Early Detection and Rapid Repose Programme (EDRRP) the park will aim to identify pathways into the park, so that new IAS introductions may be prevented and to enable a rapid response to eradicate or contain infestation. Even though a new invasion may seem insignificant, it must be evaluated for risk and potentially prioritised for treatment to ensure the threat does not spread, which could potentially require exponentially more effort and resources to clear at a later stage.

Control methods, or an integrated combination thereof are designed to suit the target species and environment in which they occur. The following methods could be used within the park, cadastral and broad alien plant footprint boundaries:

1. Initial treatment (mechanical, chemical and biological).

    - Chainsaw – fell, debranch and stack;
    - Foliar spray – application of herbicide; and
    - Biocontrol release - collection of clean cladodes, propagation of biocontrol and deployment of agent.

2. Follow up treatment (manual, chemical and biological).

    - Loppers and hand saws;
    - Foliar spray – application of herbicide; and
    - Biocontrol release - collection of clean cladodes, propagation of biocontrol and deployment of agent.

3. Integrated combination of methods.

The following species have been identified as a priority for control:

- *Schinus molle*;
- *Atriplex spp*;
- *Nicotiana glauca*;
- *Eucalyptus spp*; and
- *Pennisetum spp.*

Indicators of progress and success, indications of when the programme is to be completed

The success of the control programme will be determined by the results gathered from the monitoring programme. These results will highlight status of IAS infestation, densities and rate of spread. These in turn, will direct operational investment and the longevity of the programme in the park.

Of the seven species that have been placed under management since the inception of WfW funding in 2003 only the Opuntia spp, specifically *O. ficus-indica* has not shown any reduction in distribution and density. In addition, the *Agave*, *Popular* and *Cereus* spp have shown to be brought under management, however these species must remain on a monitoring programme to ensure that there is no infestation of these species. Both *Pennisetum* and *Prosopis* spp have shown significant reduction in population dynamic across the park, though, as stated above management of both species is still required. *Atriplex* spp have been demarcated under a monitoring programme due to the species having an ecological function, soil retention, within areas of the park.

With reference to the buffer zone, utilising the landscape characteristics as well as legislation the development of a core protective buffer along the park's boundary can be delineated. This will allow management to focus on key strategic areas outside the park for management of IAS thereby awarding protection to the park. In turn the key strategic areas outside of the park reflect key strategic area within the park. It has been found that IAS de-creases significantly particularly where natural vegetation remains intact. It is therefore important that management focuses effort on the areas of highest risk based on the intensity of landscape characteristics outside of the park.

It is unlikely that IAS control will ever be completed within the two management areas identified and associated with the park, due to the extreme complexity of natural systems and the dispersive agents present in the environment. Therefore continuous effort consisting of monitoring, risk assessment and control will have to be undertaken into the foreseeable future. A detailed lower level plan outlining the rationale and operational approach is available.

This programme links with high-level objective 2 and objective 2.2 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

INVASIVE AND ALIEN SPECIES PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective: To restore the structure and function of degraded land by addressing the threats posed by soil erosion and alien and invasive vegetation.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To systematically survey and list alien species in and around the park.	Survey the park and cadastral area, in order to determine alien species (fauna and flora) abundance and distribution, and maintain updated species lists.	PM, BSP, CSD	Survey report, annual reports	Annually for park, Year 2 for cadastral area	
	Secure resources to evaluate the broader alien plant footprint to determine alien species (flora) abundance and distribution.	BSP	Funding allocated	Year 3	

INVASIVE AND ALIEN SPECIES PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective: To restore the structure and function of degraded land by addressing the threats posed by soil erosion and alien and invasive vegetation.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To prevent, where possible, the introduction of alien species.	Prohibit and where present remove alien species (fauna and flora) from staff quarters and tourism accommodation.	PM	Monthly report	Ongoing	
	Monitor, and / or where necessary, manage previously degraded areas within the park and adjacent to the park in order to reduce the risk of invasion or post clearing reinvasion.	PM, BSP	Monitoring results	Ongoing	
To ensure the effective and timely development and implementation of integrated control strategies, in such a manner that rapid response and long-term maintenance goals are met.	Maintain control of species and areas according to the current management programmes' APO.	BSP, PM	APO	Annually	
	Introduce biological control agents and / or other appropriate and novel methods (subject to risk-benefit evaluation) where appropriate and necessary.	BSP, PM	APO	Annually	
	Eradicate, where possible, all new incursions of alien species (fauna and flora) and monitor the efficiency of the eradication programme.	PM	Monthly report	Ongoing	
	Monitor the efficacy of the clearing programmes.	PM, BSP, CSD	Monthly reports	Ongoing	

10.3.4 Freshwater ecosystem programme

The purpose of the freshwater ecosystem programme is to strive for "natural" patterns and processes of water in the landscape, by appropriate conservation and utilisation of ground and surface water as well as associated ecosystems.

South Africa is a signatory to the Convention on Biological Diversity (CBD). Therefore, SANParks' strategic plan, management plans and conservation policies are informed by the CBD's Programme of Action on Protected Areas. In 2010, CBD member nations agreed to 20 Aichi Targets to stop loss of biodiversity by 2020. Target 11 states that, "by 2020, at least 17% of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape". South Africa was pro-active in adopting a freshwater conservation target. This target emerged from a series of participative workshops involving several government departments and national agencies [SANParks, Council for Scientific and Industrial Research (CSIR) and SANBI], and stated that at least 20% of each inland water ecosystem type should be conserved (Roux *et al.,* 2006). The endorsement of a quantitative target was followed by a national planning exercise to identify strategic spatial priority areas for satisfying the 20% target. The resulting conservation priorities, known as Freshwater Ecosystem Priority Areas (FEPAs), comprise 22% of South Africa's river length and 38% of wetland area (Nel *et al*., 2011). In the park, the Sand (from its source to its confluence with the Doringhoek River), Doringhoek and Stols Rivers are FEPA rivers. The Steyns River, of which the source is in the south-east of the park, has a Phase 2 FEPA status. However, whether FEPA status or not, rivers provide critically important ecological functions and ecosystem services both at the local scale and beyond park boundaries, and should be managed accordingly. Interestingly, during a 2016 field visit, the occurrence of populations of the fish Chubby head barb *Barbus anoplus* was confirmed in both the upper Leeu River and the upper Sak River.

An important step is to acknowledge freshwater ecosystems as biodiversity features in their own right that are central to a protected area's conservation mandate. Even in protected areas such as national parks, freshwater ecosystems are often appreciated only for their functional utility such as game watering or providing attractive locations for tourist lodges, rest camps, lookout points and game drives. In the park, biodiversity associated with riverine habitats is driven by three main factors: (i) the climate and nature of the landscapes (*e.g.* temperature and underlying geology) that rivers drain; (ii) the flow characteristics of rivers

(*e.g.* perennial, intermittent or ephemeral flows); and the geomorphological zone or slope of a river (*e.g.* mountain headwater stream, foothills or lowland river). Accordingly, conservation of rivers also depends on the conservation of their surrounding terrestrial landscapes, their natural hydrological regimes (including the magnitude, frequency, duration, timing, and rate of change in water flow) and their longitudinal connectivity between different zones.

In arid and semi-arid landscapes there is an intricate relationship between water, soil, vegetation and productivity. The capacity of these landscape to regulate water is a major determinant of their functionality, of which grazing and rainfall are key drivers. In intact landscapes, nutrients and water will result in vegetated patches which in turn will impede runoff (protecting against erosion), increase water infiltration and maintain soil biota and fertility. Increased grazing intensity will reduce vegetation cover which leads to increased runoff and decreased water infiltration. At local scales, freshwater ecosystems are highly connected systems. Hydrological connectivity mediates the transfer of matter, energy and organisms via water within and between elements of the water cycle. Connectivity can be viewed along three gradients: longitudinal, lateral and vertical. Longitudinal connectivity refers to the pathway across the entire length of a stream or river. Lateral connectivity refers to the links between a water body and the adjacent land. Vertical connectivity refers to the connections between surface and groundwater.

A number of freshwater systems in the park has been delineated as FEPA wetlands (Nel *et al.*, 2011). However, ground-truthing will be required to validate the national-scale FEPA data for wetlands. In fact, the mapping and broad classification (*e.g.* manmade dam, natural wetland, artificial water point) of all aquatic ecosystems would be an important step towards better understanding the influence of surface water availability on other biodiversity patterns and ecological processes in the park.

Although the freshwater ecosystems programme deals primarily with surface water, it cannot be seen in isolation of groundwater resources. Groundwater feeds many wetlands as well as rivers and is particularly important in arid systems and for seasonal or ephemeral rivers. In the park, groundwater is also the main source of drinking water and as such it relates to the objective of effective park management. The park has inherited modified freshwater ecosystems, for example artefacts such as wells, weirs and drainage canals. Furthermore, groundwater abstraction from the park is a source of potable water for the neighbouring town of Beaufort West. Moreover, even in national parks freshwater ecosystems are often seen for their utility, such as game watering or providing attractive viewpoints or locations for tourist lodges, rather than their biodiversity value.

The park should strive to maintain, and restore where necessary, the natural connectivity associated with freshwater ecosystems. In particular, it should allow the natural and free flow (timing and magnitude) of water and sediment down river courses, protect riparian zones against development and guard against overuse of groundwater resources.

A detailed lower level plan outlining the rationale and operational approach is available. This programme links with high-level objective 2 and objective 2.3 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

FRESHWATER ECOSYSTEM PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives**.**					
Objective: To ensure the functionality and associated ecosystem services of the freshwater systems by maintaining and restoring the hydrological connectivity and variety of aquatic habitats.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To maintain or restore hydrological connectivity by understanding the longitudinal connectivity of the main rivers in the park and developing guidelines for restoration.	Hold a targeted SMF to unpack drivers of river connectivity.	CSD, PM	Mechanism diagram	Year 1	
	Solicit research on the main rivers of the park.	CSD	Registered research projects	Year 1	
To maintain or restore the variety of aquatic habitats in the park by identifying these habitats, understanding the threats to these systems and developing an integrated aquatic management plan.	Institute monitoring for rivers, wetlands and groundwater.	CSD, PM	Freshwater monitoring protocol	Year 1, ongoing	
	Develop an inventory of wetlands including classification and spatial mapping.	CSD, PM, BSP	Wetland map	Year 2	
	Assess the ecological condition and functionality of wetlands as well as rehabilitation potential and priorities.	CSD	State of freshwater ecosystems report	Year 3	

10.3.5 Species of special concern programme

The purpose of this programme is to ensure the persistence and viability of key species by contributing to national and international initiatives and implementing species-specific management interventions.

SANParks' biodiversity values stipulate that, except in crucial instances for the survival of globally critically endangered species, management for system integrity and biodiversity must take precedence over species management. However, SANParks will strive to prevent extinction, within national parks, of species on the International Union for the Conservation of Nature (IUCN) global critically endangered or endangered lists, and will work with other conservation initiatives to secure and strengthen the future of such species over their historic distribution ranges. Within this context, there are four species currently found in the park that are regionally threatened (Table 15 below).

The Nama Karoo Biome, the Noorsveld, Great Karoo (represented in the KRNP) and Steytlerville areas have the greatest density of threatened taxa (Hilton-Taylor & le Roux 1989). Hilton-Taylor & Le Roux (1989) indicate that a total of 95 species are threatened within the Nama Karoo with the majority of these falling into the 'rare', 'uncertain', 'indeterminate' or 'vulnerable' IUCN classes. Of these, one endangered, 10 vulnerable, 10 rare, five indeterminate and 86 endemic vertebrate species occur in the park. The park may be particularly important for the conservation of the critically endangered riverine rabbit *Bunolagus monticularis*, although no recent sightings have been confirmed, as well as securing additional breeding habitat for the vulnerable Cape vulture *Gyps coprotheres*.

Within this context, there are currently two mammal species that require additional management considerations namely Cape mountain zebra and black rhinoceros. The park is currently home to the second largest population of Cape mountain zebras. Conservation measures for Cape mountain zebra are formulated in collaboration with relevant provincial conservation authorities (Novellie *et al.,* 2002). As such it has the potential to play a key role in the recently formulated Biodiversity Management Plan for the species, through metapopulation management. However, the former quagga breeding programme has been terminated due to the fact that animal husbandry is not feasible in the park where natural processes are being restored. Moreover, all Plain's zebra have recently been removed due to a demonstrated hybridization risk with Cape mountain zebra. All Cape mountain zebra must be tested for genetic purity prior to offtakes or sales.

SANParks is custodian of approximately half of the white rhinos and roughly 40% of the black rhinos in South Africa (Knight *et al*., 2013), with the park being one of four national parks where the south-western black rhino currently occurs. The black rhinoceros is represented by a small population in the park, but is managed as part of a larger metapopulation across other national parks. Continentally, rhinos are facing several threats, with the onslaught of poaching in recent years, being the most serious, particularly in South Africa (Thomas 2010). The management of rhinos within KRNP aligns with the National Biodiversity Management plans for black and white rhinos (Knight *et al*., 2013; Knight *et al*., 2015). As such, it is

critically important to maintain an up-to-date database of individual sightings, births and deaths, as well as to track the lineages of any new calves. This necessitates individual recognition through ear-notch patterns, and therefore the maintenance of, and funding for, an ongoing ear notching programme.

Daemane (2008) describe special habitats and special species of concern in KRNP. Four plant species were described as well as their special habitats and their localities. The vulnerable *Aloe longistyla* is found in the valley bottomland plains. This plant species use rocks and other plant species as nursery habitats to establish and defend themselves. The rare *Pellaea rufa* is found on rocky soil of shale origin, in the river banks and hill midslopes**.** Although *Pleiospilos compactus* (Volstruistoon) is not a red data plant species, the known population in the park is small and threatened by animal trampling. It occurs on the ridges in the lower plains between large rocks. Another scarce plant species are the erect, perennial succulent *Crassula pyramidalis* (Rygbossie) which only grows in one locality in the park. Its habitat is bare ground with scattered rocks. There are a number of plant species of special concern that occur in the park that will require dedicated inventorisation, prioritisation and monitoring amongst these are *Adromischus cooperi*, *Faucaria* species, *Crassula barbata* and *Crassula columnaris*.

Table 15. List of species of special concern that occur in the park.

Taxonomic classification	Scientific name	Common name	IUCN category - regional	IUCN category - global
Birds	*Gyps coprotheres*	Cape vulture	Endangered	Vulnerable
Mammals	*Bunolagus monticularis*	Riverine rabbit	Critically endangered	Critically endangered
	Equus zebra zebra	Cape mountain zebra	Least concern	Vulnerable
	Diceros bicornis bicornis	Black rhinoceros	Endangered	Vulnerable

This programme links with high-level objective 2 and objective 2.4 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

SPECIES OF SPECIAL CONCERN PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective: To contribute to the persistence of SSC, through targeted species management and participation in broader conservation initiatives.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To manage the population performance of key species of special concern, including black rhino and Cape mountain zebra as well as plant species.	Undertake annual aerial surveys to evaluate trends in population performance.	CSD	Records	Annually	
	Monitor black rhino births and deaths, as well as adult body condition.	CSD, PM	Records	Ongoing	
	Implement metapopulation management actions (including swapping and moving black rhino).	CSD, PM	Monthly reports	When required	
	Inventorise / map plant species of special concern, with bi-annual follow-up monitoring	CSD	Records	Year 2	
To participate in broader conservation initiatives for key species of special concern.	Participate in the implementation of the Cape mountain zebra Biodiversity Management Plan.	CSD	Monthly reports, initiatives	Ongoing	

10.3.6 Carnivore management programme

The purpose of this programme is to establish and maintain large mammal predator-prey relationships and associated processes. The restoration and maintenance of predation is a key objective for SANParks in achieving ecosystem objectives. The management of carnivores in the park is guided by park-specific objectives primarily aimed at the conservation and promotion of the unique landscapes. For the purpose of this plan, carnivores refer primarily to meso (*e.g.* black-backed jackal *Canis mesomelas* and caracal *Caracal caracal*) and large mammalian predators and scavengers (lion and brown hyena).

In this instance, SANParks wishes to restore / maintain the ecological role of large carnivores as apex predators in the terrestrial ecosystem. The park requires restoration of large carnivore social units and subsequent management of these that carries specific challenges. Fences limit dispersal and movement opportunities that often lead to inflated abundances of predators that pose risks to local persistence of prey species (Hayward and Kerley 2009). Such spatial constraints reduce the likelihood that dynamic predator-prey relationships will be established and increase the likelihood that siblings can breed with each other.

In addition, the larger mammalian herbivores influence plant community structure and function in ecosystems (Gordon *et al.,* 2004). The park also seek to restore these disturbance regimes through herbivory, trampling and nutrient cycling at various spatio-temporal scales across landscapes. This implies top-down regulation of plant community structure and function. However, it is likely that both top-down, through predation, and bottom-up, through nutrient quality of vegetation, may regulate herbivore dynamics. The absence of large predators may thus pose some constraints on conservationists wishing to restore key ecological processes associated with herbivory and how predation influences herbivory. The challenges of maintaining ecological processes that involve large carnivores are further complicated by expectations and attitudes of stakeholders (Kerley *et al.,* 2003). These range from positive such as a general assumption that the presence of large carnivores enhances a tourism experience, to negative (Treves and Karanth 2003) such as those brought about by livestock losses as a result of carnivores spilling over into landscapes neighbouring the park.

Four adult lions (two males and two females) and four juveniles originating from Addo Elephant National Park were introduced into KRNP in September 2010 as an initial phase in restoring the missing guild of large predators in the park. Further lions were subsequently introduced to bolster the genetic diversity of the population, but it remains largely of Kalahari origin. The reintroduction of cheetah will be revisited once the springbok population has recovered from a recent (2006 – 2008) substantial reduction in numbers.

Black-backed jackal and caracal can reach high densities, resulting in high levels of predation on the smaller prey species in the park. SANParks' approach to managing these meso-predators is to restore or mimic the factors that regulate meso-predator-prey dynamics. Management interventions depend on the suite of factors that exist in the particular section of the park, such as predator-proof fencing (that prevents meso-predator dispersal) and other large carnivores (that provide carrion). Culling is only carried out if there is evidence from prey demographic profiles and meso-predator surveys that there is a risk of meso-predator prey dynamics collapsing. Brown hyenas currently provide the main scavenging role in the park, but these animals can also behave as predators. Therefore their role in predation must be incorporated into predation management in the park. There is evidence to suggest that the recent springbok population crash in the park was triggered by a management intervention (large scale removal), and that the population thereafter was unable to sustain itself due to reduced breeding opportunities and potentially being caught in a "predator trap". The implications of this for future introductions of large carnivores to the park were recognised by supplementing the population by introducing first 600 (mid-2009) and then 2,500 (mid-2010) springbok. A large number of jackal were also killed prior to the springbok reintroduction in 2010.

Management of large carnivores in the park therefore focuses on managing social relations, which is one of the key mechanisms of carnivore population regulation, rather than on a population approach with fixed "carrying capacity" as was historically the case. It also incorporates the minimisation of conflicts with neighbours and addresses the ways in which predators influence the park's ability to generate revenue.

A detailed lower level plan outlining the rationale and operational approach is available. This programme links with high-level objective 2 and objective 2.5 on page 36.

CARNIVORE MANAGEMENT PROGRAMME					
Objective: To ensure the persistence of spatial heterogeneity resulting from linkages between diverse topography, soil and vegetation types by maintaining, restoring and mimicking key ecological processes.					
Carnivore management objective: To sustain viable populations of both predator and prey species by mimicking the natural regulating mechanisms of predator populations.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To maintain sustainable predator-prey relations.	Mimic changes in carnivore survival associated with social stress and prey biomass limitations.	CSD, PM	Carnivore plan	Ongoing	
	Mimic changes in carnivore fecundity by increasing the age of first reproduction and / or interval between births.	CSD, PM	Carnivore plan	Ongoing	
	Incorporate meso-predators and scavengers into the Frontier carnivore management plan	CSD, PM	Carnivore plan	Year 1	
To maintain genetic integrity by inducing social limitations.	Identify and extract life-history characteristics of carnivore species.	CSD	Science report	Year 2	
	Mimic male and female dispersals and male dominance changes.	PM, VWS	Annual report	Ongoing	
To manage carnivore impact on stakeholders.	Identify the profile of potential human-carnivore conflict.	CSD, PM	Reports	Year 1	
	Engage stakeholders on the development of problem animal management strategies and plans.	CSD , PM	Meeting minutes	Ongoing	
	Maintain perimeter fence to a standard adequate to secure both the safety of the large carnivores, adjacent local communities and park visitors.	CSD, PM	Report	Ongoing	
	Ensure that existing co-management agreements are aligned with the carnivore management programme and implement these.	CSD, PM	Agreements	Ongoing	
	Update carnivore LLP according to knowledge gained through feedback.	CSD, PM	Plan	Year 5	
To conduct collaborative research and monitoring to inform carnivore management.	Develop an integrated research and monitoring programme which addresses carnivore demography, impact on prey species, conflict and consequences for stakeholders.	CSD, PM	Science report	Year 3	
	Implement an integrated research and monitoring programme.	CSD, PM	Science report	Year 4, ongoing	
	Update carnivore plan according to knowledge gained through feedback.	PM, CSD	Carnivore LLP	5-yearly	

10.3.7 Herbivory management programme

The purpose of this plan is to ensure that monitoring of rainfall, herbivores (densities and distribution) and vegetation (cover, composition and condition) is conducted and subsequently integrated to inform herbivore management responses.

One of the key philosophies underpinning appropriate herbivore management in the park revolves around the notion that herbivory in the Nama Karoo used to be highly variable in space and time due to erratic and often localised or regional rainfall patterns, linked to massive migrations and nomadic behaviour of herbivores. As such a key aim of the herbivory programme is to ensure that management actions do not homogenise herbivory in space or in time, as the Karoo is adapted, and probably dependent, on "boom-and-bust" and variable conditions for maintaining, and where appropriate restoring, healthy veld.

The vegetation in KRNP is influenced by the steep ecological gradients in the park ranging from 1,800 AMSL (~400 mm / annum) to 800 AMSL (175 mm / annum). These gradients also result in high species diversity in the park, comprising over 850 plant taxa, including 30 % of the recognised endemics of the Nama-Karoo biome (Rubin *et al.,* 2001). Herbivores are both a driver (Kraaij & Milton 2006) and responder (Gaylard 2016) to these gradients and associated vegetation patterns (in combination with rainfall and soils). Although inappropriate utilisation can have negative impacts on the plant communities (Esler *et al.*, 2010), herbivory is a natural process in these systems and has been so for many years. Large herds of especially migratory springbok trekked through the Karoo (Skinner 1993), giving rise to considerable impact on the vegetation in the short term, as well as prolonged periods of rest or lower utilization levels (Roche 2008). Therefore, although inappropriate herbivory can have negative effects and lead to vegetation and soil degradation (Esler *et al.*, 2010), herbivory is also a natural process that has positive effects, *e.g.* increasing plant species diversity (Rutherford *et al*., 2012) and maintaining soil properties (Beukes & Cowling 2003).

The historic movement patterns of massive herds of migratory springbok (Skinner 1993), is an indication that the vegetation dynamics and herbivore utilization patterns in the Nama Karoo used to be highly variable in space and time. Due to current constraints *i.e.* fencing, tourism expectations, logistical constraints of mimicking Karoo boom-and-bust cycles, surrounding land-uses (*e.g.* spraying of locusts), it will not be possible to fully restore these processes historically associated with highly variable herbivory levels. It is argued that the replacement of historic eruption and nomadic processes, which is typical of the fluctuations and unpredictability of the Karoo, by a statistic and artificially manipulated system seeking to "override" the Karoo ecological cycles and variability, resulted in a continual degradation of the Karoo vegetation (Roche 2008). Interestingly, brown locust outbreaks may be a similar (and still somewhat more intact) "eruption of herbivory" occurrence that has been noted in the Karoo since at least 1795 (Samways 2000), and that is considered an important process within this system (Henschel 2015).

Artificial waterholes make areas available for water dependent species and increase time spent by these herbivores in these areas that would otherwise be inaccessible or less utilised – as such, waterholes make certain areas available for water dependent species, resulting in more intense and persistent utilisation patterns than would not have been the case without waterholes. Wide-scale provision of artificial water sources reduce "water remote" areas, which has been shown to be important in arid systems (Fensham & Fairfax 2008). Therefore, even though waterholes can be attractive tourism viewpoints, they can often be detrimental in arid systems where they limit the development of natural grazing gradients, favouring specific species above others (Todd 2006). Thus careful planning of the placement of waterholes or providing tourists with access to natural water sources can often mitigate the negative ecological effects, whilst still delivering on tourism expectations.

Management actions should as far as possible mimic these (*e.g.* through park expansion across ecological gradients; herbivore offtakes / introductions that mimic dispersal to create variable herbivore densities over time; predator management which impacts on localised density and distribution of herbivores through creating a landscape of fear) or at least minimise actions that actively oppose these (*e.g*. wide-scale water provision; fixed stocking rates; spraying of brown locust outbreaks within the park). In order to better understand if, and how, herbivores respond to the existing gradients in the park, research is needed to ascertain how herbivore distribution patterns in the park differ and change over space and time in response to the spatio-temporal availability and variability of resources.

The herbivory management programme will be considered successful if vegetation utilisation by herbivores in the park is patchily distributed rather than homogenous. The influence of predation on the proportional representation of herbivore species in different feeding guilds should be closely monitored, and therefore represents a cross-link with the predation management programme above. In particular, the population growth rates of large herbivores in the park must be monitored, by means of annual aerial surveys and ideally supplemented with demographic surveys.

Decision-making for the management of herbivory is based on mimicking lost dispersal processes, as well as incomplete predation processes due to the unfeasibility of having large numbers of predators in the park. The number of herbivores to be removed or introduced is based on a joint decision-making process between scientists, veterinarians and park management, which involves an evaluation of several herbivore population models (against trends in annual aerial survey results), satellite imagery that provides a spatial

and temporal indication of vegetation quality (measured as “greenness”), vegetation surveys that incorporate the compositional and structural components of vegetation condition, and climate forecasts provided by the South African Weather Service.

A detailed lower level plan outlining the rationale and operational approach is available. This programme links with high-level objective 2 and objective 2.6 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

HERBIVORY MANAGEMENT PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective: To ensure appropriate patterns of herbivory, by mimicking spatio-temporal variability in landscape utilisation.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To ensure herbivore management decisions and actions are informed by an integration of long-term herbivore and vegetation data.	Compile rainfall time series for the park (to contextualise prevailing rainfall conditions).	PM, CSD	Records	Year 1	
	Monitor monthly rainfall (across gradients if possible).	PM, CSD	Records	Monthly	
	Compile park-wide herbivore population.	CSD, PM	Records	Year 1	
	Undertake annual aerial surveys to update herbivore population trends.	CSD, PM	Report	Annually	
	Compile satellite derived vegetation greenness / cover trends for park and update trends in vegetation greenness and cover over space and time.	CSD	Results, records	Year 1, annually	
	Set out veld condition sites to represent the four main physiognomies of the park, as well as additional sites in areas of interest / concern / sensitivity.	CSD, PM	Records, map	Year 2	
	Undertake vegetation surveys of veld condition.	PM, CSD	Results, records	Annually	
	Integrate and evaluate all data sources to recommend herbivore offtakes / introductions.	CSD, PM	Internal report	Annually	
To minimise the homogenising effect of extensive surface water provision.	Create surface water database for each water source.	PM	Records	Year 2	
	Based on above, create surface water map.	CSD	Map	Year 2	
	Consider surface water map to evaluate artificial water provision implementation, ensuring that water remote areas are maintained and tourism objectives achieved.	PM, CSD	Report, minutes of meeting	Year 3	
To better understand herbivore spatio-temporal responses, in order to ensure management actions enable or at least do not actively obstruct variability in herbivore utilisation patterns.	Solicit and support research to explore spatio-temporal herbivore landscape usage of different herbivore species.	CSD	Registered research project(s)	Ongoing	

10.3.8 Fire management programme

The purpose of this programme is to determine potential impact of fire on major landscape units and its consequences for the faunal component and aesthetic values that may affect the park as a potential tourist destination. According to the National Veld and Forest Fire Act, No 101 of 1998, SANParks is obliged to be a member of the local fire protection association (FPA) to gain full legal benefit thereof and stakeholder support.

Fire is a rare but quite natural phenomenon in the semi-arid Nama-Karoo Biome and south-western Grassland Biome, occurring predominantly in above average rainfall years after sufficient fuel loads have accumulated. The estimated rate of occurrence is approximately every eight to 10 years. Natural fires occur during the summer months due to lightning strikes associated with electric storms. Outside of this period they are normally started by humans. Thus, permitting anthropogenic fires to enter into the park that could lead to an excessive frequency of burning, hence some active fire management might be necessary. The impact of fires on the vegetation of the top plateau landscape units, these units are closely associated with the relative high elevation and rainfall of the montane grassland inhabit plant communities dominated by *Merxmuellera disticha*, *Cymbopogon pospischilii* and *Themeda triandra* grass species and Fynbos associated tall forbs such as *Elytropappus rhinocerotis*, *Euryops annae* and *Passerina montane* with sparse woody plant species such as the tree *Cliffortia arborea* and dwarf shrub *Diospyros austro-africana* (Rubin & Palmer 1996). These plant communities have a natural association with fire. No research has been conducted on fire management in this area and a priority should be to encourage further research on the role of fire in the area. The results and recommendations of the fire research should be used to adapt management policies when necessary. The biodiversity will benefit as this programme will improve our knowledge of the fire dynamics and fire impact on the ecosystem.

On the basis of current evidence, it appears desirable for management to promote as far as possible the natural occurrence of fire. To achieve this, it is recommended that all fires that occur out of the rainy season, and which are not associated with electric storms, should be controlled as far as possible and ultimately suppressed. This needs to be reconciled with the issue of fire security.

This programme links with high-level objective 2 and objective 2.7 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

FIRE MANAGEMENT PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To restore natural fire regimes, by appropriate veld management and handling of fires.	To implement research projects to understand fire ecology.	CSD, PM	Registered research projects, reports	Annually or biennially	
	Fire monitoring and mapping.	CSD, PM	MODIS fire scar	As required	
	Encourage the establishment of a local Fire Protection Association and participate as required.	PM	Minutes of meetings	Year 3, ongoing	

10.3.9 Disease management programme

The purpose of the disease management plan is to acknowledge indigenous diseases as a component of biodiversity within the park, while limiting the introduction or impact of alien diseases, and minimising the spread of disease from the park.

SANParks acknowledges its legal responsibilities with regard to managing diseases, especially controlled diseases, in the light of the requirements as set out in the Animal Diseases Act No 35 of 1984. Whilst disease management options are limited in free-ranging wildlife, emphasis is on prevention of disease introduction (in particular alien diseases like bovine tuberculosis and canine distemper) and to reduce the risk and impact of indigenous wildlife diseases to neighbouring communities and their livestock. Due to the dynamic nature of disease and the continuous improvement of diagnostic tests, disease management depends on making the best decisions with the data available at the time.

There have not been any recorded disease outbreaks / incidents in the park. The area is naturally dry and the extremes in temperature of very warm summers and cold winters mean that it is a relatively disease and vector-limited environment. However, several diseases occur in the Western Cape that are controlled by the Department of Agriculture, Forestry and Fisheries (DAFF). Several of these diseases are of little consequence to their endemic wild hosts, but do pose threats to domestic animals, and therefore free movement of wildlife is restricted. These diseases also affect management options for species through movement restrictions of wildlife and are therefore important to keep in mind. An example of such a disease is African Horse sickness. The park falls within an infected zone and movement of Cape mountain zebra into the controlled zone is restricted and needs to be accompanied by an extensive quarantine period in an approved facility. The Western Cape has also experienced several Avian Influenza outbreaks in commercial ostrich flocks, resulting in movement restrictions on wild ostriches as well. The park is within the endemic area for bat-eared fox associated rabies, and therefore the necessary precautions to minimise risk to tourists and staff is required. Knowledge of disease and an appropriate passive monitoring surveillance system is therefore necessary in order to mitigate risk to the park and fulfil legal and civil responsibilities.

This programme links with high-level objective 2 and objective 2.8 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

DISEASE MANAGEMENT PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives.					
Objective: To prevent negative impacts of disease on biodiversity, through vigilance and timeous addressing of disease issues.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To set up an adequate surveillance system for dead, dying and culled animals as well as introductions and translocation.	Conduct a training course to equip and train park conservation staff to conduct basic post mortem investigation, and collect and store appropriate samples.	CSD, local state vet	Training register	Years 1 - 5	
	Develop park-specific Cybertracker sequence for disease syndromes likely to be encountered.	CSD	Park-specific disease sequence in use.	Year 1	
	Develop a reporting structure for disease incidence that allows for close interaction between local state vet, park staff, biotechnician and Scientific Services.	CSD, PM, local state vet	Local state vet and SANParks reports.	Year 1	
	Develop a quantitative risk assessment and associated disease mitigation actions for all animal introductions or translocations.	CSD, PM	Completed risk assessment	Year 5	
	Ensure blood, tissues and associated materials are banked whenever an animal is handled / captured / culled for translocation and veterinary or research purposes.	CSD	Biological samples	As required	

10.3.10 Reintroduction programme

The purpose of the reintroduction programme is to re-establish viable populations of faunal or plant species that occurred in the park historically. This includes not only species that no longer occur in the park, but also those whose populations need to be supplemented in order to prevent local extinction or to enhance genetic diversity. In addition, the programme focuses on species

that previously played a key role in important ecological processes, including predation. In this context, for example, the reintroduction programme will aim to restore the full suite of predators historically occurring in the park, thereby filling the vacant niches between the current predators in the park (lion, jackals). It is envisaged that restoring this predation suite will contribute to stable predator-prey and predator-predator dynamics in the park.

Reintroduction should only take place if there is good evidence that the species occurred in the area in historical times and consideration should be given to whether the original causes of local extinction have been removed. However, it should be noted that reintroductions cannot be based on the historical distribution of the species alone. Additional factors such as current habitat suitability, as well as population viability are central to the success of reintroductions and are addressed in the SANParks Policy Framework. All reintroductions need to be carefully considered against the objectives set out for KRNP, including consideration of stakeholder interests. These trade-offs are best addressed by undertaking risk benefit analyses (RBA), which should be conducted to way up the risks and benefits of reintroductions.

It is not anticipated that KRNP will reintroduce any new faunal species within the next 5-year period, although cheetah may be reconsidered once the springbok population has stabilised. Supplementation of the springbok population is planned once environmental conditions are conducive to improved vegetation conditions after the recent drought (2015 / 2016).

This programme links with high-level objective 2 and objective 2.9 on page 36. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

REINTRODUCTION PROGRAMME					
High-level objective: To restore and conserve biodiversity, by understanding and managing the key ecological patterns and processes, and mitigating the effects of conflicting objectives					
Objective: To restore ecological patterns and processes by reintroducing and / or supplementing species that historically occurred in the region.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To determine the need to reintroduce species that historically occurred in the area	Identify species for reintroductions, conduct RBA to determine feasibility of reintroduction.	PM, CSD	Reports	Ongoing	Herbivore, disease and habitat and vegetation LLPs
	Secure funding and partnerships to monitor and implement monitoring.	PM, CSD	Reports	Ongoing	
To supplement currently small populations of particular species	Establish a monitoring protocol for detecting and establishing population sizes for smaller species (*e.g.* small herbivores).	CSD, PM	Monitoring protocol	Year 5, 10	
	Submit proposals to WMC to source required species.	CSD, PM	Proposals	As required	
	Supplement populations as per WMC recommendation.	PM, CSD	Reports	As required	

10.4 Responsible tourism programme

The purpose of the responsible tourism programme is to act as an enabler for conservation through enhancement of the financial sustainability of the park with optimal benefit to the local communities.

SANParks' has adopted the national Responsible Tourism Standard, SANS1162:2011. The Responsible Tourism programme thus looks at all aspects of the current and potential tourism product and service offering in order to ensure that the park meets the required standards for environmental and financial sustainability, local community beneficiation and customer service excellence, and this starts by establishing the parks responsible tourism baseline. This baseline will need to be established in order to identify a clear point of departure from which to work. A measure for customer service excellence is measuring the customer feedback, tourism quality standards, universal access (UA) standards, and then evaluating the visitor management aspects relating to the park, for example gate efficiency. Implementation of Responsible Tourism enables operational efficiency and thus creates the environment for new product development, packaging and dynamic pricing in order to maximise yield, though dependencies such as the availability of advanced technologies do exist.

The park is considered to have a high scenic value with medium biodiversity value. Whilst the park is not a key driver of tourism income generation for SANParks, it has revenue generating potential and shows steady growth. The park is not yet breaking even, but is seen to be a park that could play a significant role as a socio-economic catalyst in the region. Currently, the majority of tourism income is generated by accommodation offered within the park and the conservation fees charged for park access, while income from activities contribute far less. A greater contribution can be achieved with extensive and effective tourism planning, and reviewing and adapting to the constantly changing environment.

A detailed lower level plan supports this programme. This programme links with high-level objective 3 and objectives 3.1 – 3.7 on page 37.

RESPONSIBLE TOURISM PROGRAMME					
High-level objective: To become the nature-based tourism destination of choice in the region, enabling visitor engagement with the landscape vistas, biodiversity and cultural heritage, whilst growing revenue and protecting the tranquility and sense of place.					
Responsible Tourism performance objective: To establish, maintain and continuously improve the park's Responsible Tourism performance, by implementing SANS1162.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To communicate 2022 Responsible Tourism Strategy to all park stakeholders.	Educate and motivate staff in the responsible tourism principles and enhance tourism capacity and skills base within staff complement.	Tourism standards	Training records	Year 3	Responsible Tourism policy 2012-2022, Responsible Tourism strategy
	Inform the park stakeholders of the SANParks 2022 Responsible Tourism Strategy and potential impact on the park	PM	Park Forum minutes	Ongoing	2012-2022 Responsible Tourism strategy
To enable continuous improvement of Responsible Tourism performance.	Establish a baseline (gap analysis) to identify current performance iro the Responsible Tourism Standard, SANS1162:2011.	Tourism standards	Responsible Tourism standards manual	Year 3	SANS1162, Responsible Tourism strategy
	Engage in Responsible Tourism assessment, in order to measure performance improvement in relation to Responsible Tourism baseline targets.	Tourism standards	Responsible Tourism assessment / audit report	Every third year	SANS1162 Responsible Tourism baseline targets
	Engage in Tourism Quality Assurance assessments and grading, as appropriate.	Tourism standards	Tourism quality assessment report, tourism grading assessment report	Every third year	Responsible Tourism strategy
	Engage in UA assessments.	Tourism standards	UA assessment report	Every third year	UA strategy UA protocol

RESPONSIBLE TOURISM PROGRAMME					
High-level objective: To become the nature-based tourism destination of choice in the region, enabling visitor engagement with the landscape vistas, biodiversity and cultural heritage, whilst growing revenue and protecting the tranquility and sense of place.					
Visitor experiences objective: To continually enhance the visitor experience within the park, by effective visitor engagement, management, interpretation and quality of facilities offered.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
Establish and / or monitor, where relevant, Responsible Tourism requirements for commercial and Public Private Partnership (PPP) partners.	Engage with commercial and PPP operators regarding SANParks' commitment to Responsible Tourism principles and agree to targets and assessment with operators.	BDU	Updated agreements, assessment reports	Every third year	SANS1162, Individual PPP agreements
To ensure effective visitor management in the park.	Create a park visitor management plan, including priorities for implementation.	GM: Visitor Management	Visitor management plan	Year 3	Visitor management protocol
	Implement the visitor management plan actions according to the prioritised list.	PM	Visitor management plan	Year 3, ongoing	
	Maintain the visitor management plan taking changes in the environment into account.	GM: Visitor Management	Visitor management plan	Every third year	
To enable a quality visitor experience through dynamic interpretation of biodiversity, cultural and heritage value of the park.	Create a park interpretation plan, taking existing interpretation into account, and including priorities for implementation.	GM: Visitor Management	Interpretation plan	Year 3	Interpretation Protocol
	Implement the interpretation plan actions according to the prioritised list.	PM	Interpretation plan	Year 3, ongoing	
	Maintain the interpretation plan taking changes in the environment into account.	GM: Visitor Management	Interpretation plan	Every third year	
	Identify mechanisms for improving the parks UA facilities and services, with reference to existing facilities for persons with mobility impairments and access for the aged.	Tourism standards	Business targets	Year 3	UA protocol
	Implement improvements to accessibility for persons with mobility impairments.	PM	Key performance indicators	Every third year	UA Plan
	Identify and implement opportunities for engaging visitors with sensory impairments, *e.g.* hearing and sight.	PM	Key performance indicators	Ongoing	UA Plan
	Engage in regular UA training of customer facing staff, to enable an empathetic and appropriate response.	PM	Key performance indicators	Every third year	UA Protocol
To ensure adequate, effective and accurate visitor communication within and on approach to the park.	Update and maintain the signage manual.	PM, GM: Interpretation	Signage manual	Year 3	Branding guideline
	Complete the implementation of and maintain signage requirements.	PM, GM: Interpretation	Updated signage manual	Every third year	Signage manual

RESPONSIBLE TOURISM PROGRAMME					
High-level objective: To become the nature-based tourism destination of choice in the region, enabling visitor engagement with the landscape vistas, biodiversity and cultural heritage, whilst growing revenue and protecting the tranquility and sense of place.					
Visitor experiences objective: To continually enhance the visitor experience within the park, by effective visitor engagement, management, interpretation and quality of facilities offered.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To ensure adequate, effective and accurate visitor communication within and on approach to the park.	Tourism guide to be completed and maintained.	Regional Marketing Manager	Document	Year 2	Interpretation plan, sales and marketing strategy
	Ensure clear and accurate communication of park rules, rates and facilities on all platforms, including within the park, on correspondence, and on the website.	Regional Communication Manager, PM	Park rules, park information on website, reservation attachments, interpretive signage	Ongoing	Visitor management policy and protocols, SOPs
	Ensure all staff are adequately trained (including conservation and support staff), to communicate key park, tourism and biodiversity information to visitors, and where appropriate to access information, if unknown.	PM	All tourism staff and non-tourism staff informed	Ongoing	Park rules, visitor information
Service excellence objective: To enable appropriate customer- focused service excellence, by understanding and responding appropriately to market preferences.					
To continually enhance customer service standards applicable to all visitors and other travellers.	Manage and resolve feedback received from the public timeously (all sources) visiting or having visited the park.	PM	Closure of customer feedback issues, KPAs	Ongoing	Guest feedback
	Review and Assess customer feedback received and action taken to address customer service recommendations and targets, reporting on these in the Tourism Quality Assurance Assessment Report.	PM	Customer service assessment	Annually	Guest feedback
	Regularly assess facilities to ensure standards are maintained and operational procedures are optimised.	PM	Tourism quality assurance assessment results	Every third year	Tourism grading standards

RESPONSIBLE TOURISM PROGRAMME					
High-level objective: To be a leading role-player in driving the tourism economy of the region, through service excellence, hospitality, product diversity and implementation of Responsible Tourism.					
Grow tourism revenue objective: To grow income through tourism by providing visitors with an appropriate and a diverse range of products and services, whilst protecting the tranquillity and sense of place.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To ensure optimal development and maintenance priorities to enable revenue optimisation	Identify events, activities and facilities that may be considered for development within the park.	PM	Product development framework	Year 10	Park management plan
	Identify specific sites (including cultural heritage sites) with tourism development potential.	PM	Product development matrix	As required	
	Review of development plan in order to ensure optimal tourism development priorities without eroding conservation values.	PM	Infrastructure development plan updated	Every third year	
	Conduct a feasibility study of priority opportunities in order of perceived value added and income generated.	Product Development Steering Committee	Site specific feasibility study	As required	Product development guideline
	Review of maintenance and replacement / refurbishment priorities.	PM	Maintenance plan	Every third year	Tourism maintenance protocol
	Implement identified development projects.	PM	Tourism development plan	Year 10	Park management plan
Operational efficiency objective: To enable cost savings within tourism operations, by ensuring operational effectiveness and controls.					
To ensure optimal returns from commercial operations.	Support retail outlet(s) and restaurant(s) promotion in order to maximise concession income generating potential.	PM	Increase / sustained concession income	Ongoing	Concession income
	Review tourism operational procedures and processes for possible leakage, and put processes in place to limit these.	PM	Tourism income	Ongoing	Tourism plan, Responsible Tourism standards
	Review staffing practices and where possible improve management of staff complement through peaks and troughs.	PM	Resource management plan	Every third year	Resource management plan
	Provide regular staff training in operational procedures and customer service.	PM	Training records	Annually	Training plan and policies

RESPONSIBLE TOURISM PROGRAMME					
High-level objective: To be a leading role-player in driving the tourism economy of the region, through service excellence, hospitality, product diversity and implementation of Responsible Tourism.					
Promotion objective: To promote the park with its species rich, unique landscapes and cultural experiences, by developing and implementing a variety of sales, marketing and communication strategies.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To market the park to SANParks' broader markets and park specific target markets.	Identify park specific markets, and devise strategies for expanding on these markets, where not included in the strategic and focus markets for SANParks.	Regional Marketing Manager	Sales and marketing plan	Every second year	Sales and marketing strategy
	Create opportunities to market the park to Black Middle Class and Previously Disadvantaged Individuals (PDI) markets, with specific focus on local communities.	Regional Marketing Manager	Sales and marketing plan	Every second year	Sales and marketing strategy
	Expand the reader group for the park. Create awareness for people who have never visited the park.	Regional Marketing Manager	Sales and marketing plan	Every second year	Sales and marketing strategy
	Find opportunities for media coverage and enhance existing - editorials, magazines, social media ensuring to maintain high media visibility.	Regional Marketing Manager	Sales and marketing plan	Every second year	Sales and marketing strategy
	Maintain marketing collateral for the park.	Regional Marketing Manager	Sales and marketing plan	Every second year	Sales and marketing strategy
	Sponsor journalists and build relationships with journalists that will promote the park to key source and as yet untapped markets.	Regional Marketing Manager, Regional Communications Manager, GM: Sales and Marketing	Sales and marketing plan	Ongoing	Sales and marketing strategy
	Explore opportunities for promoting Park attractions in conjunction with tourism partners *e.g.* Beaufort West Tourism Organisation.	PM	Minutes of meetings	Ongoing	
	To enhance the research and collection of data relating to untapped tourism markets.	Research Manager	Research outputs, sales and marketing plan	Every third year	Research
	Where appropriate, promote park events, internally, to the customer base and / or target markets.	Regional Sales and Marketing / Manager	Sales and marketing plan	Ongoing	Sales and marketing strategy
Equitable access objective: To enable equitable access to the park and facilitate Small, Medium and Micro Enterprise (SMME) opportunities, by supporting local stakeholder interests and needs.					
To engage with stakeholders in order to enable access to the park by a variety of transport mechanisms.	Engage with local and regional government, commercial business operators and the local community to identify opportunities for improving local community (especially PDI) access to the park.	PM	Park Forum minutes	Quarterly	Park Forum

RESPONSIBLE TOURISM PROGRAMME					
High-level objective: To become the nature-based tourism destination of choice in the region, enabling visitor engagement with the landscape vistas, biodiversity and cultural heritage, whilst growing revenue and protecting the tranquility and sense of place.					
Equitable access objective: To enable equitable access to the park and facilitate SMME opportunities, by supporting local stakeholder interests and needs.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To understand the desired community interaction with the park in order to encourage community visitation and interaction with the park.	Attending farmers' union meetings to communicate with neighbouring farms to keep communications open.	PM	Minutes of stakeholder meetings	Quarterly	Stakeholder workshops
	Identify unexplored opportunities for encouraging visitation by communities surrounding the parks. Using the park forum create opportunities for enhancing the community interaction with the park.	PM	Minutes of community meetings	Annually	Community engagement

10.5 Constituency building and benefit sharing

The People and Conservation (P&C) department in SANParks was established to build constituencies among people in support of the conservation of the natural and cultural heritage assets within national parks. This is achieved through strengthening relationships with neighbouring communities, contributing to local socio-economic development through job creation and skills development, cultural resource and indigenous knowledge management, environmental education programmes, awareness and interpretation programmes, social science research, and youth outreach. Stakeholders are engaged on different levels and in diverse ways according to their needs. It is of vital importance to the existence, development and expansion of the park to maintain good relations with these stakeholders.

10.5.1 Stakeholder relationship programme

The purpose of this programme is to establish and maintain meaningful and beneficial relationships with a wide range of stakeholders supporting SANParks core business of biodiversity conservation and tourism. The stakeholder programme is a key strategy to achieve the overall desired state of the park.

The park aims to enhance biodiversity conservation through the promotion of a conservation ethic and developing healthy community custodianship for the park. Co-operative, collaborative and mutually beneficial relationships are essential to reach park objectives and ultimately to ensure the sustainability of the park. Both formal and informal partnerships are initiated, maintained and nurtured with Government, conservation entities, business partners, communities, various non-governmental organisations (NGOs), community based organisations (CBOs), the media, customers and employees. The park / SANParks will use the media (printed media, radio, television and online media) as a key communication tool to keep stakeholders informed and to promote a positive image of SANParks. Media relations are managed by the Regional Communication Manager and Park Manager and is subject to SANParks' communication protocols.

Karoo National Park works with various community organisations and structures to promote mutually-beneficial community relations. The park work closely with various local communities situated in or close to the towns of Beaufort West, Leeu-Gamka, Nelspoort, Merweville, Murraysburg, Prince Albert, Klaarstroom and Rietbron through supporting specific community projects / initiatives. These include amongst others:

- Working with the various community development workers to collaborate on community events, outreach programmes and job creation;
- Attending the quarterly Koup and Nuveld farmers' association meetings and collaborates on matters such as security and wildlife management; and
- Participating in the SAPS Forum, Disaster Management Forum, Wildlife Operations Group – Wildlife Foundation, Rhino Management Group and the Beaufort West Tourism Organisation.

The Park Forum has been constituted and is functioning as an advisory body. It is a means of providing a legitimate platform to communicate park / SANParks matters to ensure participation by all stakeholders on matters of mutual relevance affecting the park. It is expected that the Park Forum will facilitate constructive interaction between the Park and surrounding communities / stakeholders and to build constituencies in support of natural and cultural heritage conservation goals of the park.

The park has a close working relationship with the SHRs. They contribute both in cash and in kind to park programmes. Their vast expertise is used by the park to fulfil its vision and mission. They contribute in the following ways, to name but a few:

- Support and assist in environmental education and community outreach programmes;
- Fundraising;
- Participate in park operations during weekends when requested; and
- Participate and assist with holiday programmes.

A detailed lower level plan outlining the rationale and operational approach is available. This programme links with high-level objective 4 and objective 4.1 on page 37.

STAKEHOLDER RELATIONSHIP PROGRAMME					
High-level objective: To promote contributions to socio-economic development and human well-being, in adjacent areas, by ensuring viable, equitable and acceptable social, economic and environmental interactions and engagements.					
Objective: To create and enhance cooperative relationships in the area of influence, by purposefully enabling and facilitating informal and formal engagements.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To improve co-operation and build sound stakeholder relationships.	Coordinate and support quarterly Park Forum meetings.	PM	Minutes	Year 1 and quarterly	
	Engage with government structures on issues of mutual interest.	PM	Minutes of meetings	As required	
	Collaborate and engage with conservation entities (*e.g.* EWT, IUCN rhino and Cape Mountain zebra working groups and various universities).	PM	Research reports, Minutes of meetings and workshops	As required	
	Meet regularly with restaurant operator to discuss operational issues and identify new business opportunities as they arise.	PM	Meeting minutes, Product Development Strategy	Ongoing	
	Engage in mutually-beneficial projects with local community representatives or organisers.	PM	Minutes of stakeholder meetings, joint events	Monthly or quarterly	SANParks Guidelines for Stakeholder Participation
	Maintain good visitor relations through providing a quality customer feedback service.	PM	Visitor book analysis, Customer care logs, customer care performance	Ongoing	
	Maintain good media relations through media releases as well as active participation on social media sites.	Corporate and Regional Communication, PM	Media release, social media posts	As required	SANParks Communications Protocol and Media Policy and Procedures
	Maintain liaison with SHRs, including identification of park requirements and needs.	PM	Minutes of Honorary Ranger meetings, Annual Wish List	Quarterly	

10.5.2 Socio-economic development programme

The purpose of this programme is to play a significant, targeted and effective role in contributing to local economic development, economic empowerment and social development in communities and neighbouring areas. This will be achieved by partnering with national and local government through participating in government programmes such as the Expanded Public Works Programme (EPWP), contributing to the municipal Integrated Development Plans (IDPs), and beneficiation and local and regional procurement.

The SANParks socio-economic development programme is aligned to Government's National Development Plan and the DEA objectives to enhance fair and equitable sharing of benefits from biological resources and to improve the socio-economic benefit flow from biodiversity conservation. A number of programmes are being implemented throughout SANParks to contribute to the development of local communities, including, waste management, social legacy, Expanded Public Works Programme, and Environmental Protection, Infrastructure Development, the wildlife economy and blue economy. The Green and Blue economy programmes contribute to the development and growth of green sector industries in local communities through provision of access to and use of wildlife and marine resources in national parks. Wildlife economy initiatives include game breeding, sustainable hunting, eco-tourism and bio-prospecting whilst marine economy include fishing and related aquaculture activities. The decision to implemented green or blue economy initiatives will depend on the outcome of feasibility studies. The establishment of viable ecotourism enterprises for the economic benefit of the local communities is another key area for the programme. The sourcing of goods and services from the local communities is also promoted through the identification and ring fencing of opportunities for the benefit of the local enterprises.

The EPWP remains a significant focus area of the organisation to effectively contribute to local socio-economic development while achieving biodiversity outcomes. The park currently manages various programmes namely Working for Water (WfW), Working on Land (WoL), WfEcosystem and environmental monitors. These programmes focus on poverty alleviation and are labour intensive projects that create temporary jobs in the short term while simultaneously achieving biodiversity objectives. Since inception in 2002 / 03 until 2016 / 17, 465 temporary jobs were created and R 10, 700, 096 has been spent on operations and the management of these programmes. Skills development and capacity building is regarded as a cornerstone to enable economic activity. Great emphasis is placed on skills development in the above programmes. The park will continue to facilitate and encourage skills development through learnership and internship programmes in a broad range of fields (*i.e.* reception, field guiding experiential training for students). The park continues to support and develop local initiatives or small businesses that provide services that are required during specific events or functions. Where possible, local small, medium and micro-sized enterprises, especially previously disadvantage individuals are favoured when sourcing contractors, provided that all procurement conditions as stated in SANParks procurement policy are adhered to.

Local social development initiatives are supported through collaborating with the Western Cape Departments of Education, Social Development, Health, Agriculture, Labour, National Departments of Environmental Affairs, Correctional Services and the Beaufort West Local Municipality. Examples of these initiatives include community clean-up programmes, HIV/Aids and cancer awareness campaigns, crime prevention campaigns, drug abuse awareness, amongst others. The park continues to promote environmental education in the community, and enhance economic upliftment and conservation awareness of all stakeholders. The annual recruitment of female students for the South African Tourism College in Graaff-Reinet, in partnership with the park, also supports job creation in the communities.

A detailed lower level plan outlining the rationale and operational approach is available. This programme links with high-level objective 4 and objective 4.2 on page 37.

SOCIO-ECONOMIC DEVELOPMENT PROGRAMME					
High-level objective: To promote contributions to socio-economic development and human well-being, in adjacent areas, by ensuring viable, equitable and acceptable social, economic and environmental interactions and engagements.					
Objective: To improve human well-being in the area of influence, by identifying and facilitating feasible socio-economic development initiatives.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To maintain and strengthen relationships with local government.	Ensure projects and plans are incorporated into the local and district municipal IDPs.	PM	BWLM and CKDM municipal IDPs	Annually	

SOCIO-ECONOMIC DEVELOPMENT PROGRAMME					
High-level objective: To promote contributions to socio-economic development and human well-being, in adjacent areas, by ensuring viable, equitable and acceptable social, economic and environmental interactions and engagements.					
Objective: To improve human well-being in the area of influence, by identifying and facilitating feasible socio-economic development initiatives.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To maintain and strengthen relationships with local government.	Collaborate with local government departments on socio-economic programmes.	PM	Events, minutes of meetings	As required	
To provide socio upliftment, employment, skills development and business opportunities for local residents, entrepreneurs and business.	Identify additional opportunities for implementation of the EPWP programmes.	BSP, PM	Feasibility study and business plan	Annually	
	Identify opportunities to contribute to local economic benefit through projects or contributions such as the wildlife economy.	PM	Report	Ongoing	
	Provide employment and skills development through the implementation of the EPWP programmes.	BSP, PM	Monthly report	Annually	
	Employ permanent and temporary staff for park operations and recruit staff locally if possible when vacancies arise.	PM	Establishment table	As required	SANParks Recruitment Policy
	Provide skills development opportunities for permanent and temporary staff.	PM, BSP	Annual Training plan, Individual Development Plans	Annually	SANParks Learning and Development Strategy
	Procure goods and services locally, providing preference to local BBBEE-accredited suppliers.	PM	BBBEE Procurement Report	As required	SANParks Commercialisation Strategy, SANParks Supply Chain Policy
To demonstrate the impact of the park on local socio-economic upliftment.	Commission research on the socio-economic benefit of the park.	CSD, PM	Research contract	Year 2	

10.5.3 Environmental education and interpretation programme

The purpose of this programme is to build constituencies amongst people in support of the park's conservation endeavours by playing a significant, targeted and effective role in promoting a variety of educational opportunities and initiatives.

An integrated approach to environmental education and interpretation has been adopted in SANParks. A broad stakeholder base is targeted and relevant programmes addressing a variety of issues are presented. The current beneficiaries of this programme are mainly school and youth groups and special interest groups. The approach takes the form of organised, high quality and interactive activities which are categorised into:

- Formal programmes:
  These programmes target the formal education sector and are directed at school groups and communities adjacent to the park. This is achieved through facilitating visits to the park and outreach programmes. The programmes are aligned with the school curriculum assessment policy statement (CAPS). Examples of these formal programmes are the Kids in Parks programme, experiential training programme, the planned junior ranger programme and calendar - and special day commemorations.

- Informal programmes:
  The informal programmes are aimed at park visitors and community-oriented initiatives targeting specific stakeholders such as the broader community and especially women, youth and people living with disabilities. The content of the programmes is conservation issue-specific. Examples of these informal programmes are information sharing (guided game drives and walks), SANParks Week, interpretive leaflets and signage and holiday programmes.

Interpretation is provided to visitors in the form of information leaflets such as species lists and visitor maps. Interpretative signage is currently limited and there is a need to develop appropriate informative signage. The park has an interpretation centre that house interpretative displays and posters depicting information about the parks' history, geology, fauna, flora *etc.* and are utilised by both the visitors and school / community groups. Educational programmes can be provided in this centre according to specific needs. The park further presents two school holiday programmes per year, namely in June and December. Various programmes / activities are offered including guided walks and drives, environmental learning game, talks, PowerPoint presentations and watching DVDs.

A detailed lower level plan outlining the rationale and operational approach is available. This programme links with high-level objective 4 and objective 4.3 on page 37. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

ENVIRONMENTAL EDUCATION AND INTERPRETATION PROGRAMME					
High-level objective: To promote contributions to socio-economic development and human well-being, in adjacent areas, by ensuring viable, equitable and acceptable social, economic and environmental interactions and engagements.					
Objective: To enhance mutual understanding, trust and support from our stakeholders by implementing appropriate learning and awareness initiatives that foster shared environmental responsibility.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To plan, develop and present formal education programmes for organised school and other youth groups.	Develop an environmental education plan and update annually.	PM	Plan	Year 1 and ongoing	CAPS
	Organise and conduct environmental education programmes for schools including the Kids in Parks, Junior Rangers and calendar days.	PM	Programme reports, monthly reports	Ongoing	EE Plan
	Organise and conduct applicable youth development programmes that will benefit the community of Beaufort West.	PM	Programme reports, monthly reports	Ongoing	
	Organise and conduct outreach programmes in the identified communities.	PM	Programme reports, monthly reports	Ongoing	
	Offer holiday programmes to visitors.	PM	Programme reports, monthly reports	Biannually	

ENVIRONMENTAL EDUCATION AND INTERPRETATION PROGRAMME					
High-level objective: To promote contributions to socio-economic development and human well-being, in adjacent areas, by ensuring viable, equitable and acceptable social, economic and environmental interactions and engagements.					
Objective: To enhance mutual understanding, trust and support from our stakeholders by implementing appropriate learning and awareness initiatives that foster shared environmental responsibility.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To plan, develop and present informal education programmes for the broader stakeholder group of the park.	Develop new and update existing programme information.	PM	Documents (worksheets, presentations, *etc.*)	Annually	CAPS
	Arrange and facilitate community awareness programme initiatives targeting specific stakeholders on conservation issues.	PM	Programme reports, monthly reports	Year 1, ongoing	EE Plan
	Facilitate presentations and talks for special interest groups.	PM	Programme reports, monthly reports	As required	
	Review and update current materials (programmes and activities).	PM	Programmes	As required	EE Plan
To plan, develop and present informal education programmes to the broader stakeholder groupings.	Arrange and or facilitate community awareness programme initiatives targeting specific stakeholders on conservation issues.	PM	Monthly reports	Ongoing	EE Plan
	Facilitate presentations and talks for special interest groups.	PM	Monthly reports	As required	
	Review and update current materials (programmes and activities).	PM	Programmes	As required.	EE Plan

10.5.4 Cultural heritage programme

The purpose of this programme is to consolidate, sustain, manage and present the significance, authenticity and integrity of tangible and intangible cultural heritage resources.

The management of the cultural heritage resources is guided by national legislation, policies and procedures within SANParks. The National Heritage Resources Act (NHRA) No 25 of 1999 provides the framework for the maintenance and conservation of heritage resources in accordance with the standards and procedures set out by the South African Heritage Resources Agency (SAHRA). SANParks policies such as the Cultural Heritage Policy (2011), the Heritage Objects Collections Management Policy (2011), and Guidelines for Burials and Scattering of Ashes (2010) and the Development and Maintenance of Heritage Sites (2011) provides further guidance.

The park safeguards various cultural heritage sites. Whilst some sites are not well known, others are threatened by possible inappropriate development and impact from tourists and animals. All the known sites need to be managed and protected. It is therefore required to survey the park to identify new sites and assess the condition thereof. The results of this work should be entered into a database to facilitate monitoring and management. The cultural heritage programme also include oral history and the documentation of indigenous knowledge. The oral history collection project aims to build a relationship between the park and communities by recovering and interpreting information relating to cultural heritage, specifically related to the areas incorporated

within the park. The process of identification of cultural heritage sites (cultural mapping) and development of site management plans will be conducted in conjunction with local community members and the organisations representing community interests, as well as relevant academic institutions and researchers.

Access by visitors and local communities, interpretation, risk mitigation and monitoring of the sites are important components for the management of these sites. In order to fully comply with all management requirements for cultural heritage resources in the park, a number of initiatives have been planned and are being implemented.

This programme links with high-level objective 5 and objectives 5.1 - 5.2 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

CULTURAL HERITAGE PROGRAMME					
High-level objective: To maintain cultural heritage representative of the region, by preserving assets, promoting interest and accessibility.					
Objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To preserve cultural heritage representative of the region, by engaging with relevant expertise to understand and manage assets.	Carry out a full survey of the park to identify sites.	CSD	Report	Year 3	
	Create and update a full inventory of cultural resources.	CSD	Database	Year 3	NHRA
	Record the oral history of the park.	PM, CSD	Database	Ongoing	
	Develop a cultural heritage management plan.	CSD	Document	Year 5	
	Support ongoing cultural heritage research.	PM	Registered research projects	Ongoing	
	Develop an inspection schedule, and monitor and report on resources accordingly.	CSD	Schedule, reports	Year 1, as required	
	Develop and review site specific plans for selected sites.	CSD	Documents	Years 4, 9	
	Implement the cultural heritage resources management plan.	PM	Monthly reports	Year 5, ongoing	
To promote interest in the region's cultural heritage, by providing high quality interpretation and opportunities for cultural practices.	Identify and develop sites that are suitable for tourism.	PM	Developed sites	Year 2, 5, 8	
	Develop an interpretation plan as part of each site management plan.	CSD, PM	Document	Year 4	
To create an awareness of, and appreciation for, park and regional cultural heritage, by developing a variety of mechanisms for interpreting and communicating the history with different audiences.	Incorporate cultural heritage component into environmental education and interpretation programmes.	PM, CSD	Brochures, posters, presentations	Ongoing	
	Provide visitor access to selected sites as a guided activity.	PM	Monthly reports	Ongoing	

10.6 Effective park management

Effective park management programmes (including daily, weekly, monthly quarterly and annual actions, reports and reviews) are geared to ensuring that the values and objectives of the park are maintained. These programmes put in place the systems and processes that enable proactive management of the park's objectives. This section outlines the management programmes, objective and actions that assist in effective park management such as environmental management, financial management (*e.g.* procurement, reporting), budgeting, maintenance planning, and monitoring compliance.

10.6.1 Environmental management programme

The purpose of this programme is to minimise negative operational impacts on the park and set clear guidelines for the management of environmental impacts.

The Minister of the Department Environmental Affairs has, in terms of section 24(2) of the National Environmental Management Act, 107 of 1998 (NEMA), identified activities that may not commence without authorisation from the competent authority. NEMA is of general application throughout South Africa and relevant provisions therefore apply to the park.

Given the national importance of the park, it is vital to manage this park to required standards. Proper management of new developments and operational activities within the park can only be achieved through appropriate planning and effective controls. A number of management tools are being used to develop and manage the park in a manner consistent with the relevant legislation and SANParks policy framework. These key tools and controls used by the park form the basis of an environmental management framework.

Further to the provisions of NEMA, the park will implement best practice to guide all operational activities that may have an impact on the environment. These activities will cover any new infrastructure development that is not listed under NEMA; as well as general maintenance. The development of best practice operating procedures will be guided by the precautionary principal. The precautionary principal states that if an action might cause harm to the environment, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action.

This programme links with high-level objective 6 and objective 6.1 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

ENVIRONMENTAL MANAGEMENT PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To ensure compliance with environmental legislation and best practise principles for all management activities.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To manage and reduce the impacts of park activities on the vital attributes.	Make all environmental legislation available to relevant staff.	PM	Electronic / hard copy of applicable legislation	Ongoing	
	Ensure that EIAs and heritage impact assessments are completed for listed activities.	PM	Documents / reports	As required	
	Make all environmental legislation available to relevant staff.	PM	Documents / E-versions	Ongoing	
	Ensure that EIAs and heritage impact assessments are completed for listed activities.	SGM:SP, PM	Documents	As required	
	Conduct internal scoping for all activities / developments that may potentially impact on the environment.	SGM:SP, PM	Documents	As required	

ENVIRONMENTAL MANAGEMENT PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To ensure compliance with environmental legislation and best practise principles for all management activities.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To manage and reduce the impacts of park activities on the vital attributes.	Provide an environmental management plan (EMP) to contractors / service providers when operating in the park.	SGM:SP, PM	Document	As required	
	Enforce the requirements as set out in the EMP.	PM	Inspection checklist / report	As required	
	Develop and implement a set of best practice procedures for the identified activities.	PM	Standard operating procedures	Year 2	
	Develop and implement emergency response plan/s for identified activities.	PM	Plans	Year 2	
	Determine the scope of the water and electricity savings programme.	PM	Report	Year 3	
	Implement the water and electricity savings programme.	PM	Green energy devices	Year 7	
	Co-ordinate and implement effective waste management (solid and fluids).	PM	Schedules	Ongoing	Waste Management Policies

10.6.2 Risk management programme

The purpose of the programme is to update and maintain the park's risk profile and to manage risks accordingly. The management of business risks is regarded by SANParks as an integral part of management across all operations.

In line with corporate governance best practices and as per PFMA requirements, the Board of SANParks has formalised the risk management processes by adopting a Corporate Risk Management Framework (CRMF). As its foundation, the risk management framework follows an enterprise-wide risk identification and assessment process, based on thorough understanding of the environment in which the organisation operates and the strategic corporate objectives it intends to deliver on.

The main aim of the CRMF is to instil a culture of corporate risk management awareness and risk ownership being practised as the responsibility of all. This will provide SANParks with a comprehensive understanding of all identified risks and their potential impact on the achievement of objectives, thereby creating a good basis for the effective management of all risks to remain within the risk appetite of the organisation.

Acknowledging that all activities occurring at different levels within the organisation are exposed to the various types of risks, the focus of this framework is to shift the attention of this organisation towards a philosophy of optimising the balance between potential risks and the potential rewards that may emanate from both pro-active and conscious risk oriented actions. As such, SANParks maintains a corporate profile of the identified key strategic challenges the organisation faces. This profile is communicated to the Board and is reviewed on an on-going basis. The risk profile reflects among others the risks identified as well as how each is addressed and or monitored.

At individual park level, the park manager is responsible for risk management. Being the link between the operational activities and its environment on the one hand, and the corporate support and management structure on the other, the Park Manager is in many instances, responsible for implementation of corporate initiatives, programmes, management plans and others that form part of the SANParks strategy to address or mitigate issues of risk. Examples are the implementation and roll-out of a safety and security plan, implementing and maintaining ecological monitoring systems to identify and assess the impact of

environmental change, and complying with financial and cash-flow directives especially in economic depressed times. The park may also experience extreme environmental / weather conditions from time to time (*i.e.* droughts, floods, runaway fires) as part of the normal cycle. An appropriate response to each of these events will be drafted as and when required.

Similarly, the Park Manager needs to ensure that emerging issues of risk, that can jeopardise achievement of park (and SANParks corporate) objectives, are timely identified and assessed in terms of possible severity. In consultation with the corporate support structure such issues are either assessed to be within the management capacity of the park and its existing resources, or the matter is elevated to a corporate level, where a specific risk management strategy is agreed upon, resources allocated where applicable, and a risk management or monitoring plan is implemented.

This programme links with high-level objective 6 and objective 6.2 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

RISK MANAGEMENT PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To establish and maintain effective, efficient and transparent systems of risk management.	To identify and assess risks for all operations in the park.	PM	Risk register	Quarterly	CRMF
	To develop responses to address and prevent or mitigate issues of risk.	PM	Risk response plan	Annually	PFMA, OHS Act, NEM: PAA,
	To monitor effectiveness in terms of the risk response plan and improve as needed.	PM	Report	Quarterly	Park risk profile

10.6.3 Financial management and administration programme

The purpose of the programme is to ensure sound financial management and administration. As a public entity, SANParks manages the public funds entrusted to the organisation in accordance with the Public Finance Management Act, Act 1 of 1999 (as amended by Act 29 of 1999), and it is listed as a Schedule 3 Part A: 25 public entity. Financial management and administration encompasses the following, debtors, reconciliations, creditors, financial administration and supply chain management (SCM). Support is also provided by the regional financial and administration manager, regional reconciliation officer and the regional supply chain management practitioner that's based in Addo Elephant National Park. Without incisive financial management of the park, there can be no realistic conservation effort.

All revenue received, which includes monthly billing of concessionaires and BSP and confirmation of payments received, is managed by Karoo Administration. The reconciliation unit will verify and ensure that all transactions captured in the financial system correspond with the income received and expenditure incurred. Creditor management ensures payment of all suppliers and service providers and the follow up of outstanding invoices and queries received from suppliers. The Park Manager and Human Resource and Administration and Financial Officer (HRAFO) are responsible to supervise, guide and provide the necessary assistance with the budget process, asset management and related administration.

SANParks budget policy dictates a zero-based approach, which implies that every category must be critically assessed, evaluated and supported by an approved business plan. Annual budgets are compiled in accordance with budget guidelines and instructions issued by the Corporate

Finance Division. The Park Manager, in collaboration with middle management will ensure sound and proper budget management. Middle management is responsible for procuring goods and services, as well as ensuring compliance and managing contracts with the assistance of the HRAFO and the regional supply chain management practitioner. Middle management, with the support of the HRAFO are responsible for asset control and manage a wide range of assets in support of the park.

The park will ensure that all park operations and park projects are cost-effective and financially sound. In addition, particular attention will be given to developing a diverse income base and proactive financial networking to maintain and improve the financial sustainability of the park.

This programme links with high-level objective 6 and objective 6.3 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

FINANCIAL MANAGEMENT AND ADMINISTRATION PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To ensure sound financial management and administration.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To attain effective financial management.	Ensure less than 1% variance on cost of operations.	PM	Statements with <1% variance	Ongoing	
	Ensure sound financial management of special projects - BSP	BSP	Budget targets achieved	Ongoing	
	Participate in the independent audit of financial records.	PM	Audit report	As required	
	Address audit findings.	PM	Audit findings report	As required	
To grow revenue (Including alternative sources of revenue).	Identify new and align existing business opportunities within the commercialisation programme of SANParks.	PM	Opportunities identified in line with policy.	Ongoing	
	Identify possible external funding to supplement current income streams.	PM	Funding proposals submitted	Ongoing	
To improve the management of financial resources.	Prepare accurate and realistic annual budgets in consultation with management team that are in line with the sound management plan objectives.	PM	Annual budgets prepared	Annually	
	Provide monthly financial reports timeously by cost centre.	PM	Financial reports	Monthly	
	Review the insurance schedule and submit to corporate.	PM	Documents submitted	Annually	
	Submit insurance claims as and when required	PM	Claims	As required	
To ensure proper asset and SCM.	Verify and manage assets registers.	PM	Asset register	Bi-annually	
	Assist with the procurement of goods and services.	PM	Monthly reports	Ongoing	
	Manage and maintain existing contracts for the supply of goods and services.	PM	Contract register	Ongoing	
	Ensure sound management of vehicle fleet (*i.e.* logbooks, services, licencing, fuel management).	PM	Logbooks, service records, fuel card statements	Monthly	

10.6.4 Human capital development programme

The purpose of the human capital development programme is to ensure that the park has an adequate human resources function to render effective conservation, visitor and supporting services. SANParks has developed corporate human resources policies, guidelines and procedures to guide the park and its workforce in an effectively organised structure while delivering the outputs of this management plan.

By adhering to these policies, guidelines and procedures the park will ensure that competent staff is appointed, and that current staff will be managed in an effective manner to keep them positive, proactive and committed to their tasks and responsibilities. This will also ensure that human resource management will comply with the relevant national legislation. Park human resource capacity is not only defined by development of current staff, but requires the holistic management of the appropriate human capital. This includes the creation of a learning environment, developing leadership skills, sharing of knowledge and experiences as well as making a staff wellness programme available to employees and their families. This will assist staff in dealing with the negative effects of lifestyle diseases and other lifestyle challenges (*i.e.* financial planning). The HRAFO must report on new appointments, resignations, attendance registers, overtime claims, leave *etc.* A salary instruction is prepared from this for processing and preparation of monthly salaries.

The park reviews training needs on an annual basis and submits the training need analysis and requirements for approval to corporate. Compilation of training needs starts off with reviewing the Individual Development Plans for each staff member and is then followed by training, skills development and performance appraisals. Park management encourages all staff to improve their skills levels and qualifications in their relevant field of expertise through study bursaries and training on an on-going basis.

The park currently (2016) has 46 permanent positions, seven temporary positions, five students / interns and 78 contract positions (BSP workers). Additional management functions and infrastructure, especially in tourism, conservation and administration departments as outlined in this plan, will make it necessary to grow the staff establishment.

This programme links with high-level objective 6 and objective 6.4 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

HUMAN CAPITAL DEVELOPMENT PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To ensure sufficient and effective staff capacity to achieve management objectives by adhering to corporate human resource policies and guidelines.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To ensure the park attracts and retains the most suitable human capital	Preparation and processing of monthly salaries and employee benefits and leave management.	PM	Salary instructions	Ongoing	
	Ensure implementation of the prescribed disciplinary code and procedures.	PM	Reports	As required	
	Conduct regular employment equity and skills development forum meetings.	PM	Minutes of meeting	Quarterly	EE report submitted
	Fill vacancies as per employment equity targets.	PM	EE statistics	Ongoing	

HUMAN CAPITAL DEVELOPMENT PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To ensure sufficient and effective staff capacity to achieve management objectives by adhering to corporate human resource policies and guidelines.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To implement plans and skills development strategies to meet the strategic goals of the organisation.	Identify training needs and conduct training interventions within budget allocation.	PM	Training plan in place, % of employees trained, and % of budget spent on training	Annually	
	Assist employees with applications with regard to study bursaries, staff accommodation bookings, changes in medical status, banking changes and assist with queries to medical aid regarding unpaid medical accounts.	PM	Documents	Ongoing	
	Participate in the internal and independent audit of human capital documentation.	PM	Audit report	As required	
	Address audit findings.	PM	Audit findings report	When required	
To ensure the park attracts and retains the most suitable human capital.	Develop human capital in the fields of tourism, conservation and administration through the internship programme.	PM	Payroll	Annually	
	Develop human capital in the field of people and conservation and ecotourism by introducing tourism and conservation experiences to learners and community groups.	PM	Learner and community groups addressed	Annually	
To implement workplace wellness programmes.	Conduct wellness awareness workshops.	PM	Workshops	Annually	Wellness policy
	Provide private facilities within the park to enable employee's access to the wellness programme.	PM	Facility	Ongoing	Wellness policy
	Identify and refer employees that require assistance through the employee wellness programme.	PM	Number of referrals	As required	Wellness policy
	Invite professionals to the park to promote awareness on OHS and health issues.	PM	Attendance registers	Ongoing	OHS Act
	Commemorate events related to wellness (*e.g.* AIDS day, world blood donor day, days of activism on non-violence against women).	PM	Attendance registers	Annually	Wellness policy

10.6.5 Information management programme

The purpose of the programme is to establish and maintain a database of park information.

Management of the park requires that appropriate data and information is collected, maintained and made readily accessible to staff responsible for all aspects of management. Data is not only essential for formulating effective long-term management objectives, plans, programs and systems, but also for educating and informing residents, associations, user groups, local authorities, provincial and national decision and policy makers, international organisations and aid / donor agencies.

This programme links with high-level objective 6 and objective 6.5 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

INFORMATION MANAGEMENT PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To implement best practices in the field of records and information management.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To develop and implement a records management and file plan for the park in accordance with SANParks policies and procedures.	Review the existing records management and file plan of the park, and implement a single file plan.	PM	File plan	Year 2	National Archives and Records Services of SA Act
	Implement the records management and file plan.	PM	Records and documents filed	Ongoing	Corporate file plan and policy
	Ensure appropriate access to park files and records in accordance to corporate records management policy and guidelines.	PM	Access procedures recorded and implemented	Ongoing	Corporate file plan and records management policy

10.6.6 Infrastructure programme

The purpose of this programme is to provide guidance for the upgrading and maintenance (day-to-day and scheduled) of infrastructure. This is primarily to ensure that the park's infrastructure (buildings, roads, fences *etc.*) and services infrastructure (provision of water, electricity and waste management) is well maintained and its capacity is periodically improved in order to provide safe, reliable and affordable products to its staff and visitors. The technical department's key responsibility is the delivery and implementation of departmental programmes and to ensure the realisation of set goals regarding the above.

Infrastructure in the park consists of facilities in support of conservation (such as management roads and tracks, office facilities, staff housing, fences, bomas, water points, communication infrastructure, bulk services, workshops and stores) and tourism (such as tourist roads and tracks, walking trails, office facilities, staff housing, bulk services, public viewing points, bird hide, picnic sites, entrance gate, environmental centre, interpretative centre, tourist accommodation and swimming pools). These facilities enable staff to execute their respective duties towards achieving the park's objectives and providing a tourism product at the best possible standard.

Management policies and procedures ensure that infrastructure is maintained, renovated, upgraded and replaced at the required intervals and specifies design norms and standards, including national construction regulations, "green building" and "touch the earth lightly" principles and water and electricity saving measures and minimising waste. The five-year rolling maintenance plan addresses issues related to securing funding for upgrading, renovation / maintenance and replacement. The technical department continues to periodically review and assess performance in an attempt to align activities and allocate resources.

This programme links with high-level objective 6 and objective 6.6 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

INFRASTRUCTURE PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To upgrade and maintain existing infrastructure and develop new infrastructure in support of conservation and tourism in compliance with the zonation.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To ensure that infrastructure in the park is maintained to a desired state.	Compile an inventory of all infrastructure in the park, assess construction types and update as required.	PM	Inventory	Year 1, as required	
	Document the scope of maintenance needs in accordance with relevant specifications.	GM:ISP, PM	Reports	Year 1	Building and Electrical regulations
	Document the scope of maintenance needs in accordance with relevant specifications to guide contractors.	PM, Parks technical office	Specification guideline	As required	Building and electrical regulations, civil engineering guideline / specifications
	Prioritise maintenance needs and develop a five-year rolling maintenance plan for the park.	PM	Maintenance plan	Annually	
	Implement the five-year rolling maintenance plan according to the annual maintenance schedules.	PM	Monthly reports	Ongoing	
	Identify possible development of infrastructure that can enhance visitor experience	PM	Reports	Ongoing	Reports / visitor feedback
	Assess progress, revise annual maintenance plan and evaluate standard of work.	PM	Monthly report	As required	Building / civil / electrical specifications
	Appoint contractors as needed to provide maintenance support.	PM	Purchasing order	As required	
	Ensure that all tourism infrastructure comply with tourism grading standards.	PM	Annual tourism grading report	As required	Tourism grading specifications

INFRASTRUCTURE PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To upgrade and maintain existing infrastructure and develop new infrastructure in support of conservation and tourism in compliance with the zonation.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To ensure that all mechanical and electrical equipment is maintained to a desirable state.	Compile an inventory of all mechanical and electrical equipment in the park and update as required.	PM	Inventory	Year 1, as required	
	Develop and implement annual maintenance schedule for all equipment.	PM	Maintenance plan	Annually	OHS Act, electrical regulations, fire equipment, pressure vessels and lifting gear
To assist with planning and provide support to developmental infrastructure projects.	Provide input / support to the parks technical section during the planning and development phases of new infrastructure projects.	PM	Minutes of meeting, monthly reports	As required	

10.6.7 Safety and security programme

The purpose of this programme is to provide a safe and secure environment for both visitors and SANParks employees and to ensure area integrity.

South African National Parks implement and enforce the requirements contained in legislation and organisational policies. The primary legislation and organisational policies include, amongst other:

- NEMA;
- NEM: PAA and regulations;
- SANParks Code of Conduct;
- Rhino protection plan; and
- Park rules.

The safety and security plan comprehensively addresses both the strategic and operational aspects of visitor and staff safety as well as area integrity. A SWOT analysis of issues affecting safety and security in the park has been developed and the resulting strengths, weaknesses, opportunities and threats have been converted into achievable objectives and actions. Proactive consideration is given to issues such as working hours, law and order, high risk areas, personnel, infrastructure, resources, equipment, staff training, reporting, data capture, record keeping, monitoring, information and intelligence. The park has a good working relationship with the local SAPS and other law enforcement agencies. In addition to this a number of reactive measures have been developed, including immediate action drills, emergency procedures and evacuation plans. Information regarding these emergency procedures are available in the various tourism accommodation facilities. All staff must be familiar with the above procedures and will receive regular relevant training.

The overall perceived poaching risk is relatively low, even though the park is situated along the N1 National road, R381 and MR584 provincial roads and borders onto the town of Beaufort

West. However, the security of the park's rhinos is at risk due to the nationwide rhino poaching epidemic. A rhino protection plan has been developed and implemented, which addresses the specific security needs and risks in order to safeguard the park's rhino population. Certain plant species known for their medicinal qualities could also be at risk, while the harvesting of fire wood in the winter by the nearby community poses a threat to the integrity of the park. Any compromise with regards to safety and area integrity would negatively impact on tourism, biodiversity conservation and SANParks reputation.

A detailed lower level plan supports this programme. This programme links with high-level objective 6 and objective 6.7 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

SAFETY AND SECURITY PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To provide a safe and secure environment for both visitors and SANParks employees and to ensure that the integrity of the natural and cultural resources and assets is secured.					
Sub-objectives	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To provide a high level of safety and security for visitors, SANParks employees, natural and cultural resources and assets.	Review the safety and security plan and relevant emergency action drills.	PM	Updated SS plan and action drills	Annually	Safety and security plan
	Conduct regular interventions *i.e.* patrols to ensure that area integrity is maintained.	PM	Monthly reports	Ongoing	
	Implement the rhino protection plan.	PM	Monthly reports	Ongoing	Rhino protection plan
	Train staff in area integrity management, conservation guardianship and readiness to react to emergency situations.	PM	Training schedule, monthly report	Ongoing	SoAIM
	Assess readiness of staff and functionality of equipment.	PM	SoAIM audits	Annually	
	Equip staff to effectively carry out their safety and security functions.	PM	New equipment purchased	As required	
	Align safety and security activities to accommodate collaborative operations with external partners, *e.g.* SAPS, DEDEAT, DEADP, Cape Nature, neighbouring landowners.	PM	Safety and security plan	Annually	
	To participate in external safety and security forums and joint operations.	PM	Monthly reports	Quarterly	

10.6.8 Safety, health, environment and quality programme

The purpose of the current occupational health and safety (OHS) programme is to prevent, minimise and manage occupational accidents and occupational illnesses and diseases. This programme is required by the Occupational Health and Safety Act No 85 of 1993, to ensure that workplace hazards are managed and controlled in order to ensure a safe working environment at all times, including contractor activities on site. The OHS programme is guided by the SANParks SHEQ (Safety, Health, Environment and Quality) policy and framework and includes the elements required by the occupational health and safety legislation as a minimum, and is also based on the ISO 45001 Occupational Health and Safety management system standard.

SANParks has made the decision to move away from the generic OHS management model to an internationally recognised and best practice system called the ISO 45001 standard. Under this standard, the park is expected to align with and implement best practice processes and norms. The environment and quality components of the SHEQ programme will be developed over the next five to eight years.

The ISO 45001 standard consists of six elements namely:

- Identifying hazards and risks;
- Identifying legal and other requirements;
- Establishing objectives and programmes;
- Operational control;
- Emergency preparedness and response; and
- Internal audit.

The implementation of the ISO 45001 system will be done in a phased manner. The first phase (2016/17 – 2020/21) will focus on the first three bullets as listed above. Phase two (2021/22 – 2025/26), will focus on the last three bullets as listed above.

This programme links with high-level objective 6 and objective 6.8 on page 38. To achieve the purpose of this programme, the actions listed in the table below will be implemented.

OCCUPATIONAL HEALTH AND SAFETY PROGRAMME					
High-level objective: To strive for effective and efficient management and administrative support services through good corporate governance enabling the park to achieve its objectives.					
Objective: To continuously reduce the disabling injury frequency rate through the implementation of an efficient and effective Occupational Health and Safety management programme.					
Sub-objective	**Actions**	**Responsibility**	**Indicators**	**Timeframe**	**Reference**
To implement the ISO 45001 standard.	Identify hazards and risks.	OHS Manager, PM	Risk register	Year 2 and ongoing	
	Identify legal and other requirements.	OHS Manager, PM	Legal register	Year 2 and ongoing	
	Establish, implement and maintain programmes to mitigate identified hazards and risks.	PM, OHS manager	Training register and other records	Year 2 and ongoing	
	Develop and implement standard operating procedures to manage identified hazards and risks.	PM, OHS Manager	Training register, checklists, SOPs	Year 6 and ongoing	
	Develop and implement emergency preparedness and response plans.	PM, OHS Manager	Emergency plans, corrective action plans	Year 6 and ongoing	
	Conduct regular self-audits.	PM	Internal audit plan, audit reports	Year 6 and thereafter annually	
	Support internal audits.	OHS Manager, PM	Internal audit plan, audit reports	Year 6 and thereafter annually	
	Support external audits.	OHS Manager, PM	Internal audit plan, audit reports	Year 7 and thereafter bi-annually	

10.7 Evaluation and learning

10.7.1 Introduction

Section 5 has dealt with the jointly-agreed desired state, and section 10 with all the specific programmes which are necessary to achieve this. However, the desired state cannot be effectively maintained without explicit attention being given to prioritisation, integration, operationalisation, and above all, reflection and adaptation according to the principles in the SANParks biodiversity custodianship framework (Rogers 2003).

The need for reflection and adaptation (*i.e.* adaptive learning) comes from acknowledging that the world of conservation is complex and that the existing knowledge base is imperfect. Complexity implies that feedbacks between components of the conservation system are likely to change in unpredictable ways and the only way to stay abreast of such changes is through ongoing learning and adaptation. Lack of effective feedback and reflection is the commonest underlying cause of failure of strategic adaptive management, and hence of reaching the desired outcomes of the park. Evaluation should furthermore test the appropriateness of an intervention and monitoring, the predictive capacity, societal acceptability and accomplishment of broad goals (Kingsford & Biggs 2012; Figure 12).

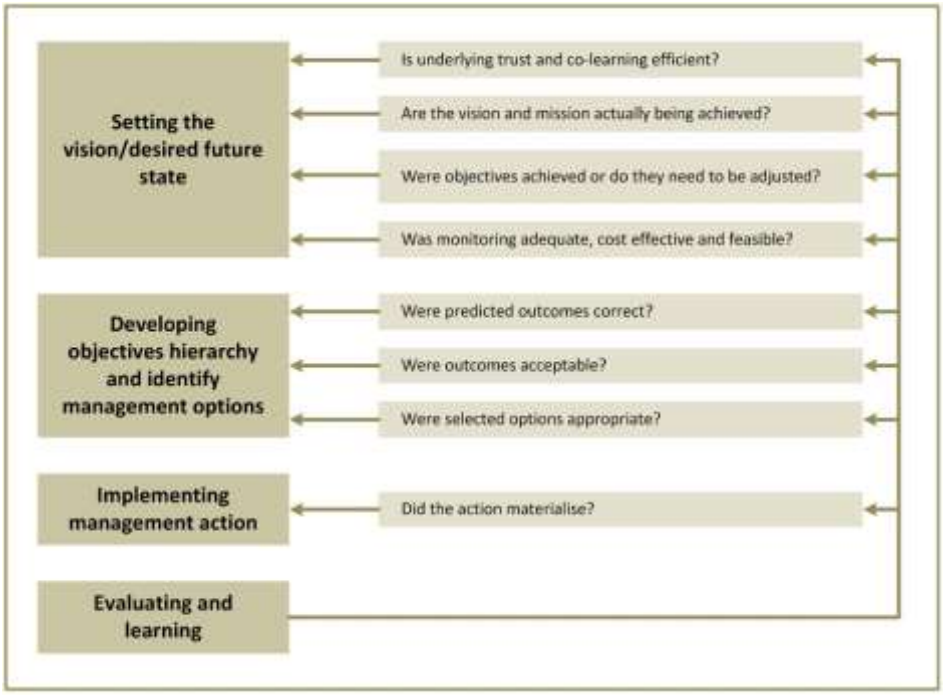

Figure 12. Feedback questions essential for adaptive learning (from Kingsford and Biggs, 2012).

10.7.2 Operationalisation

Given the desired state, and the programmes outlined in Section 10, specific action and operational plans need to inform the Key Performance Areas (KPAs) of staff members (applicable personnel working in the Parks, CSD and Tourism Divisions) to ensure that the outcomes are achieved. In addition, explicit reflection and co-learning opportunities need to be maintained and honoured to facilitate an adaptable, learning approach that can cope with unexpected events or surprises. An example are those opportunities provided by the science-management forum engagements at park or regional level.

A critical component of strategic adaptive management is to monitor and evaluate the consequences of management decisions and actions. This involves assessment of the outcome of management interventions, but also frequent evaluation of early warning signals (referred to in SANParks as Thresholds of Potential Concern, or TPCs) of whether the intervention is on an appropriate trajectory for achieving the particular objective. Ongoing evaluation of emerging results against objectives is essential to allow strategy and methodology to be adjusted as new understanding and knowledge emerges. Continuous evaluation and learning is facilitated by making time for reflecting on the following questions (Roux and Foxcroft, 2011):

- Has the intended plan of operation materialised?
- Were the selected options appropriate?
- Were the predicted consequences correct and, if not, why?

- Is the monitoring adequate, cost effective and feasible?
- Were the consequences actually acceptable?
- Even if the predicted consequences were correct and are acceptable, are the objectives and vision being met?

Science-Management Forum discussions are aimed at ensuring that feedbacks take place, best available knowledge and understanding is incorporated into decision-making and Thresholds of Potential Concern are timeously flagged and considered. In addition, annual reflection workshops involving managers and scientists will evaluate what has been learnt in each programme, and what should be adjusted.

If this process is effectively honoured, it is believed that the park will be practicing strategic adaptive management, and in accordance with our overarching values around complex systems, will have the best chance of achieving the desired state in a sustainable way.

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Section 11: Costing

11.1 Introduction

In line with the legal requirement, the programmes of implementation to achieve the desired state have been costed below.

The park will adhere to the guiding principles listed below:

- Responsibly manage the allocation of budget, revenue raising activities and expenditure;
- Ensure that solid financial management supports the achievement of the objectives in this plan;
- Compliance to the Public Finance Management Act as well as SANParks financial policy and procedures.

Using the zero-based budgeting approach a funding estimate was derived based upon the activities in this management plan. When estimating the costing the following items were considered:

- Those costs and associated resources which could be allocated to specific activities and which were of a recurring nature;
- Those costs and associated resources which could be allocated to specific activities but which were of a once-off nature;
- Unallocated fixed costs (water, electricity, phones, bank fees *etc*.);
- Maintenance of infrastructure;
- Provision for replacement of minor assets, (furniture, electronic equipment, vehicles, *etc.*).

11.2 Income

SANParks manages a number of national parks as part of the national park system, currently twenty in total. Not all of these parks are financially viable, currently only five national parks *i.e.* Addo Elephant National Park, Augrabies Falls National Park, Kalahari Gemsbok National Park, Kruger National Park and Table Mountain National Park make a surplus. SANParks receives an annual grant from the DEA to carry out its mandate, but this is not sufficient to cover the management costs. The organisation utilises its own revenue derived from commercial activities to subsidise the shortfall. The surplus generated by the aforementioned parks is used to fund management costs across all national parks. An organisation of this magnitude also has overhead costs relating to support services such as human resources, tourism and marketing, finance, conservation support *etc.* which is not allocated to individual parks and must also be funded by the revenue generated in financially viable parks.

The income is categorised as follows; accommodation, conservation fees, concession fees, activities, other tourism income and wildlife sales. Total income for 2017 / 2018 is budgeted at -R 15, 939, 872 increasing to an estimated -R 20, 123, 721 in 2021 / 2022. A summary is presented in Table 15.

Table 15. A summary of the total estimated income budgeted for the park management plan over the next five years.

	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022
Total income	-R 15,939,872	-R 16,896,264	-R 17,910,040	-R 18,984,643	-R 20,123,721

11.3 Expenditure

11.3.1 Recurring costs

The annual directly allocated cost (includes staff, travel and supplies and tools) is estimated at R 20,692,340 for 2017 / 2018. These ongoing costs are split according to the programmes listed in Table 16.

Table 16. The estimated annual operational costs for the park for 2017 / 2018.

Programme	Amount	Percentage of total
Responsible Tourism	R 5,464,219	26.4%
Degradation and rehabilitation	R 3,869,771	18.7%
Infrastructure	R 2,942,864	14.2%
Safety and security	R 2,717,558	13.1%
Species of special concern	R 925,974	4.5%
Invasive and alien species	R 900,656	4.4%
Carnivore management	R 762,887	3.7%
Herbivory management	R 524,986	2.5%
Finance and Administration	R 434,849	2.1%
Environmental education and interpretation	R 430,484	2.1%
Human capital development	R 343,279	1.7%
Stakeholder relationship	R 270,853	1.3%
Habitat and vegetation	R 157,558	0.8%
Cultural heritage	R 154,430	0.7%
Fire management	R 152,007	0.7%
Socio-economic development	R 137,745	0.7%
Safety, health, environment and quality	R 132,838	0.6%
Environmental management	R 83,520	0.4%
Information management	R 62,146	0.3%
Freshwater ecosystem	R 59,102	0.3%
Mainstreaming biodiversity	R 58,219	0.3%
Disease management	R 56,140	0.3%
Park consolidation	R 29,256	0.1%
Risk management	R 21,001	0.1%
Total	**R 20,692,340**	**100%**

11.3.2 Once-off costs

In addition to the above there is a further once-off cost estimated at R 37,565,000 over the period 2017 / 2018 – 2021 / 2022 as can be seen in Table 17 below.

Table 17. The estimated once-off cost of the various programmes.

Programme	Estimated budget
Park expansion	R 30,000,000
Infrastructure	R 7,135,000
Cultural heritage	R 430,000
Total	**R 37,565,000**

11.3.3 Unallocated fixed costs

The unallocated fixed costs applicable but not allocated in Table 16 above for 2017 / 2018 amounts to R 2,510,781.

11.3.4 Maintenance

A breakdown of the infrastructure, both existing and new with their replacement value and an estimate of the ongoing annual maintenance for 2017 / 2018 is provided in Table 18. The projected maintenance for existing infrastructure is estimated at R 3,595,940 in 2017 / 2018. If the new planned infrastructure is developed it will add a further R 106,920 (at 2017 / 2018 rates) onto this annual maintenance budget, increasing it to R 3,702,860. The maintenance requirement was calculated as a percentage of the replacement value.

Table 18. The estimated replacement value of the existing infrastructure and any new infrastructure required with the estimated annual maintenance budget for the existing and new infrastructure in the park.

	Estimated replacement value			Estimated maintenance		
	Existing (R)	**New (R)**	**Total (R)**	**Existing (R)**	**New (R)**	**Total (R)**
Buildings	71,230,150	4,200,000	75,430,150	1,025,714	60,480	1,086,194
Roads and tracks	116,770,000	900,000	117,670,000	1,665,488	18,000	1,683,488
Trails	422,050	0	422,050	607,752	0	607,752
Fencing	17,861,500	960,000	18,821,500	257,206	13,824	271,030
Water system	1,735,000	600,000	2,335,000	28,224	8,640	36,864
Electricity	2,665,000	385,000	3,050,000	1,080	5,112	6,192
Sewerage	667,500	90,000	757,500	9,612	864	10,476
Other	60,000	0	60,000	864	0	864
Total	**211, 411, 200**	**7,135,000**	**218, 546, 200**	**3,595,940**	**106,920**	**3,702,860**

11.3.5 Replacement of minor assets

With many of the vehicles being leased along with the computers, this will significantly reduce this requirement as these items are expensive and require frequent replacement. To calculate the replacement provision, the cost price of the assets was divided by the estimated useful life. SANParks applies certain standards in this regard. The estimated asset value for various categories based on their original purchase price and the estimated budget required annually to make provision for their replacement. Management should make provision for about R 843,929 in 2017 / 2018, this figure is presented in Table 19.

Table 19. The total value various categories of minor assets and replacement thereof (based on the original purchase price).

Asset type	Asset value	Provision for replacement
Air conditioners	R 197,920	R 29,971
Computer equipment	R 315,519	R 111,484
Firearms	R 16,174	R 1,714
Furniture	R 638,879	R 96,745
Mechanical equipment	R 1,861,880	R 281,942
Office equipment	R 220,857	R 33,444
Vehicles and trailers	R 1,256,272	R 190,236
White goods (*e.g.* stove, fridge, microwave)	R 649,771	R 98,394
Total	**R 5,157,274**	**R 843,929**

11.4 Summary

It is estimated that the park will require an annual operating budget of R 27,858,746 for 2017 / 2018, increasing to R 35,171,025 in 2021 / 2022. In addition to this amount the park will also require **R 37,565,000** over the next five-year period for once-off costs. A summary is presented in Table 20.

Table 20. A summary of the annual and once-off costs that is required to fully implement the activities in the management plan over the next five years.

	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022
Annual operational costs	R 27,858,746	R 29,530,271	R 31,302,087	R 33,180,212	R 35,171,025
Once-off costs over five years	R 37,565,000				
SANParks budget for KRNP	R 22,373,794	R 23,716,222	R 25,139,195	R 26,647,547	R 28,246,400
Shortfall	R 5,484,952				

The shortfall can be broken down as follows:

- An additional amount of R 2,418,932 is required to cover the current maintenance shortfall;
- An additional amount of R 2,201,942 is required for additional administration, technical and tourism staff;
- An additional amount of R 523,930 is required for the replacement of assets; and
- An additional amount R 267,120 is required for an additional vehicle for the tourism department.
- An additional amount of R 73,028 is required for tourism OPEX to service the additional units that will be added;

11.5 Implications

Should the park be unsuccessful in securing the shortfall amount of R 5,484,952 then the following programmes will be affected;

- Infrastructure programme: The park will be unable to maintain the current infrastructure to a high standard;
- Responsible tourism programme: The park will be unable to develop new products and inability to maintain the tourism infrastructure to the required standard, resulting in a possible decline in business volumes;
- Assets: The park will be unable to replace assets that have reached the end of their life span, operations could be adversely affected and thereby increasing the risk profile.
- Finance and administration programme: The financial controls and governance could be compromised.

There are various ways in which the shortfall could be covered, options include:

- To request additional funding from Head Office;
- To approach donors; or
- To except the shortfall.

Depending on the priority and urgency of the various requirements, management will make a decision regarding the most appropriate action to take.

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Appendix 1: Declarations

1. Land declared

Government Notice 201 / Government Gazette 6648 of 07 September 1979 declared the following land as the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Erf 3545, in extent of 6,696.8138 ha, situated in the district of Beaufort West;
2. Erf 1943, a portion of Erf 1, in extent of 2.4644 ha, situated in the district of Beaufort West;
3. Erf 1707, a portion of Erf 1361, in extent of 6.7638 ha, situated in the district of Beaufort West;
4. The farm Groothoek 194, in extent of 162.2357 ha, situated in the district of Beaufort West;
5. The farm Stolshoek 184, in extent of 6,391.7559 ha, situated in the district of Beaufort West;
6. Remainder of portion 2 of the farm Stolshoek 182, in extent of 10.1872 ha, situated in the district of Beaufort West;
7. Portion 1 of the farm Wolvehokskloof 195, in extent of 690.9073 ha, situated in the division of Beaufort West;
8. Portion 6 of the farm Alwins Gate 186, in extent of 253.1687 ha, situated in the division of Beaufort West;
9. Portion 7, a portion of portion 2, of the farm Alwins Gate 186, in extent of 122.6132 ha, situated in the division of Beaufort West; and
10. Remainder of the farm Puttersvlei 190, in extent of 3,368.8549 ha, situated in the district of Beaufort West.

Government Notice 132 / Government Gazette 8885 of 16 September 1983 declared the following land as part of the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Portion 5 of the farm Alwins Gate 186, in extent of 1.7770 ha, situated in the division of Beaufort West;
2. Erf 1442, in extent of 10.1337 ha, situated in the district of Beaufort West;
3. Portion 5, a portion of portion 2, of the farm Stolshoek 182, in extent of 2,310.2809 ha, situated in the division of Beaufort West;
4. The farm Klein Plaat 183, in extent of 843.0559 ha, situated in the district of Beaufort West;
5. Portion 8, a portion of portion 2, of the farm Stolshoek 182, in extent of 6.9435 ha, situated in the division of Beaufort West;
6. Portion 9, a portion of portion 7, of the farm Stolshoek 182, in extent of 545.6109 ha, situated in the division of Beaufort West;
7. Remainder of the farm Doornhoek 197, in extent of 4,413.5851 ha, situated in the district of Beaufort West; and
8. Certain portion of portion 2, of the farm Stols River 171, in extent of 316.3 ha, situated in the division of Beaufort West.

Government Notice 1047 / Government Gazette 11325 of 03 June 1988 declared the following land as part of the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Portion 1 of the farm Doornhoek 197, in extent of 2,633.8722 ha, situated in the district of Beaufort West; and
2. Portion 2 of the farm Doornhoek 197, in extent of 3,147.2233 ha, situated in the district of Beaufort West.

Government Notice 177 / Government Gazette 16180 of 23 December 1994 declared the following land as part of the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Erf 5289, in extent of 765.5802 ha, situated in the division of Beaufort West.

Government Notice 35 / Government Gazette 18600 of 30 December 1997 declared the following land as part of the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Farm 393, in extent of 5,033.9783 ha, situated in the division of Beaufort West.

Government Notice 1496 / Government Gazette 25562 of 17 October 2003 declared the following land as part of the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Remainder of the farm Morceaux 207, in extent of 3,068.1913 ha, situated in the division of Beaufort West, held under Title Deed No T77007/1993;
2. Portion 3 of the farm Klipplaats Fontein 210, in extent of 9.8506 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
3. Portion 3 of the farm Afsaal 301, in extent of 325.8232 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
4. Portion 8 of the farm Hendriks Kraal 298, in extent of 1,028.7389 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
5. Remainder of the farm Hendriks Kraal 298, in extent of 2,036.0047 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
6. Remainder of the farm Afsaal 301, in extent of 389.0086 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
7. Portion 4 of the farm Hendriks Kraal 298, in extent of 1,725.4842 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
8. Portion 2 of the farm Klipplaats Fontein 210, in extent of 630.1734 ha, situated in the district of Beaufort West, held under Title Deed No T9790/1994;
9. Remainder of Farm 211, in extent of 1,212.1270 ha, situated in the division of Beaufort West, held under Title Deed No T30286/1994;
10. Portion 1 of Farm 211, in extent of 132.3913 ha, situated in the division of Beaufort West, held under Title Deed No T30286/1994;
11. Portion 1 of the farm adjoining Klipplaats Fontein 211, in extent of 240.9567 ha, situated in the division of Beaufort West, held under Title Deed No T31286/1994;
12. Portion 1 of the farm Alwynsgat 187, in extent of 2.8109 ha, situated in the division of Beaufort West, held under Title Deed No T92428/1997;
13. The farm Paalhuis 392, in extent of 4,980.7315 ha, situated in the division of Beaufort West, held under Title Deed No T33632/1999;
14. Portion 1 of the farm De Hoek 204, in extent of 869.9788 ha, situated in the division of Beaufort West, held under Title Deed No T84798/2000;
15. Portion 3 of the farm Drooge Hoek 92, in extent of 55.6028 ha, situated in the division of Beaufort West, held under Title Deed No T84798/2000;
16. Remainder of the farm De Hoek 204, in extent of 993.8120 ha, situated in the division of Beaufort West, held under Title Deed No T84798/2000;
17. Remainder of the farm Drooge Hoek 92, in extent of 208.9406 ha, situated in the division of Beaufort West, held under Title Deed No T84798/2000;
18. Remainder of the farm Rietfontein 205, in extent of 4,114.0303 ha, situated in the division of Beaufort West, held under Title Deed No T84798/2000;
19. Remainder of the farm Slagt Kloof 203, in extent of 434.8913 ha, situated in the division of Beaufort West, held under Title Deed No T84798/2000; and
20. Portion 1 of the farm Morceaux 207, in extent of 2,669.3378 ha, situated in the division of Beaufort West, held under Title Deed No T77007/1993.

Government Notice 905 / Government Gazette 26615 of 30 July 2004 declared the following land as part of the Karoo National Park in terms of the National Parks Act (Act No. 57 of 1976)

1. Portion 1 of Farm 427, in extent of 2, 640.1482 ha, situated in the division of Beaufort West, held under Title Deed No T7529/2000;
2. Portion 12, a portion of portion 10, of the farm Brandewyns Ghat 214, in extent of 1,103.2217 ha, situated in the division of Beaufort West, held under Title Deed No T24174/2000;
3. Portion 5, a portion of portion 1, of the farm Blaauwkrans 216, in extent of 1,647.1115 ha, situated in the division of Beaufort West, held under Title Deed No T24174/2000;

4. Portion 3, a portion of portion 2, of the farm Danster Fontein 219, in extent of 66.0108 ha, situated in the division of Beaufort West, held under Title Deed No T24174/2000;
5. Remainder of portion 1 of the farm Klipplaats Fontein 210, in extent of 2,227.7541 ha, situated in the division of Beaufort West, held under Title Deed No T36913/2000;
6. Remainder of the adjoining farm Klipplaats Fontein 212, in extent of 987.6171 ha, situated in the division of Beaufort West, held under Title Deed No T36913/2000;
7. Portion 6, a portion of portion 3, of the farm Brandewyns Ghat 214, in extent of 838.6604 ha, situated in the division of Beaufort West, held under Title Deed No T37905/2000;
8. Portion 2 of the farm De Kruis 458, in extent of 223.0894 ha, situated in the division of Beaufort West, held under Title Deed No T37905/2000;
9. Portion 3 of the farm De Kruis 458, in extent of 337.6192 ha, situated in the division of Beaufort West, held under Title Deed No T37905/2000;
10. Remainder of the farm Berg en Dal 391, in extent of 2,162.5604 ha, situated in the division of Beaufort West, held under Title Deed No T37905/2000;
11. Portion 3, a portion of portion 1, of the farm Grootfontein 180, in extent of 576.6013 ha, situated in the division of Beaufort West, held under Title Deed No T52481/1999;
12. Portion 1 of the farm Afsaal 301, in extent of 1,189.7343 ha, situated in the division of Beaufort West, held under Title Deed No T3907/1999;
13. Portion 3 of the farm Brand Kraal 209, in extent of 467.8092 ha, situated in the division of Beaufort West, held under Title Deed No T3907/1999; and
14. Portion 3 of the farm La-De-Da 178, in extent of 2,938.0263 ha, situated in the division of Beaufort West, held under Title Deed No T88793/2001.

Government Notice 810 / Government Gazette 36951 of 25 October 2013 declared the following land as part of the Karoo National Park in terms of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

1. Portion 5, a portion of portion 3, of the farm Klipplaats Fontein 210, in extent of 1,717.9305 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
2. Portion 5 of the farm Hendriks Kraal 298, in extent of 403.1691 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
3. Portion 6, a portion of portion 3, of the farm Klipplaats Fontein 210, in extent of 655.1503 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
4. Portion 2 of the farm Afsaal 301, in extent of 250.4055 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
5. Remainder of the farm Brand Kraal 209, in extent of 398.7409 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
6. Remainder of the farm Klipplaats Fontein 210, in extent of 3,549.4686 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
7. Portion 10 of the farm Brandewyns Ghat 214, in extent of 1,910.7881 ha, situated in the division of Beaufort West, held under Title Deed No T17703/2005;
8. Portion 2 of the farm Aalwynsgat 187, in extent of 411.0147 ha, situated in the division of Beaufort West, held under Title Deed No T98716/2005;
9. Portion 4, a portion of portion 2, of the farm Grootfontein 180, in extent of 1,419.8561 ha, situated in the division of Beaufort West, held under Title Deed No T46520/2007;
10. Farm 202, in extent of 200.7911 ha, situated in the division of Beaufort West, held under Title Deed No T72330/2008.

2. Land excluded

Government Notice 208 / Government Gazette 28582 of 03 March 2006 excluded the following land from the Karoo National Park in terms of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

1. Portion 3, a portion of portion 1, of the farm Grootfontein 180, in extent of 576.6013 ha, situated in the division of Beaufort West, held under Title Deed No T52481/1999;
2. Portion 3 of the farm La-De-Da 178, in extent of 2,938.0263 ha, situated in the division of Beaufort West, held under Title Deed No T88793/2001.

Appendix 2: Stakeholder participation report

STAKEHOLDER EVENTS AND ACTIVITIES

Stakeholder consultation

This table reflects the various organisations that were identified to participate in the park management plan process. The government departments are at national, provincial and local level. The intention is to show that, in terms of the spirit of co-operative governance SANParks has approached these parties.

Local government	Beaufort Wes local municipality, Central Karoo district municipality
Provincial government	WC Department Agriculture, WC Department Environmental Affairs, WC Department of Basic Education, WC Department of Labour, WC Depart Social Development, WC Depart of Health, Provincial Traffic
National Government	SAPS
Park Forum	Yes
Media	Die Courier, Radio Gamkaland
Conservation organisations	CapeNature
Community organisations	BADISA
Tourism organisations	Beaufort West tourism association
Organised associations	KOUP4 Farmers Association, Nuweveld Farmers Association
Tour operators	Karoo Birding, Africa Kombi Tours
SHR's	Karoo Honorary Rangers

Desired state workshop

A range of key stakeholders and SANParks specialists participated in the development of the desired state which entails developing a vision for the park supported by higher level objectives which forms the basis of the management plan.

Activities	Description
Invitations	Park management, certain SANParks specialists and key stakeholders were invited.
Desired state workshop	The workshop took place on 19 April 2016 at the Gamka East Dutch Reformed Church in Beaufort West.
Attendance:	27 Participants (14 stakeholders and 13 SANParks staff members) partook, representing the following constituencies: • Private tourism enterprise; • Farmers; • SHR's; • Media; • Beaufort West Tourism; • IPACEDSA; • Western Cape Department of Health; • CapeNature; • South African Police Service; and • SANParks.

Media platforms used to invite stakeholders to register and participate

A variety of media platforms were used to engage stakeholders in an effort to inform them of the revision of the park management plan and invite stakeholders to participate.

Mechanism to register	Description
Media advertisements	Advertisements to inform interested and affected parties of the public days and request to register to participate was placed in the following national newspapers on 19 February 2017: • Sunday Times; • Rapport. An advertisement to inform interested and affected parties of the public days and request to register to participate was placed in Die Courier local newspaper on 10 February 2017.
Government Gazette	Government Notice 136 / Government Gazette 40637 of 24 February 2017
Registration at meetings	Participants were also able to register at the following meetings: • Desired state workshop on 21 April 2015 in Beaufort West; and • Public meetings on 22 February 2017 in Beaufort West.
Internet	Stakeholders were ask to register via the SANParks website from 19 February 2017.
Radio	During a 1 hour session on Radio Gamkaland on 17 February 2017, listeners were informed of the revision process and invited to attend the public meetings.
Public information boards	Official notices were place at 6 public venues in Beaufort West, namely: • Checkers; • Mimosa public library; • Shoprite; • Beaufort West local municipality office; • Georgies Multisave; and • Thusong community centre.

Public days to allow comment on the draft management plan

Two public day meetings were held.

Venue	Date	Number of stakeholders that attended
Mimosa public library	22 February 2017	0
Gamka East Dutch Reformed Church	22 February 2017	0

Dissemination of documentation and feedback to stakeholders

Item	Action	Date
Draft park management plan for comment placed in public venues.	Beaufort West local municipality office and Mimiso public library.	22 February 2017
Draft park management plan for comment placed on SANParks website.	https://www.sanparks.org/conservation/park_man/	20 February 2017
Dissemination of comment and response document	The document will be available on the SANParks website, or emailed, mailed, faxed or delivered by hand where no contact details were supplied.	N/A
Dissemination of approved park management plan	The plan will be available on the SANParks website once approved by the Minister.	N/A

Appendix 3: Tourism product development framework

The product development framework provides park management with a guideline in order to inform the development potential of the park. Identified opportunities remain subject to comprehensive feasibility study prior to implementation, thus listing an activity does not automatically result in development.

Similarly, whilst specific products or activities may be developed within the park, they will be restricted to specific areas within the park or on the periphery (buffer zone), and may be further restricted to guided activities or events only. The park is zoned into various visitor use zones, based on its environmental sensitivity, as described in the legend below, and products are applicable to the various use zones accordingly.

LEGEND

No.	Visitor use zones	Description
1	**Wilderness / remote**	Pristine natural environment, essentially undeveloped and roadless. Controlled non-motorised access - usually on foot visitors. Could have paths where erosion is a problem or for safety
2	**Primitive**	Almost completely natural state to be maintained. Development footprints absolute minimum. Controlled access - 4x4s, horse-riding. Small basic overnight facilities.
3	**Quiet**	General natural state to be maintained. Only non-motorised access. Access not specifically controlled. Ablution facilities can be allowed.
4	**Low intensity leisure**	Motorised self-drive with basic facilities. Small - medium sized camps. Infrastructure should be minimised in order to maintain natural state.
5	**High intensity leisure**	High density tourism development node with concentrated human activities. High volume roads, high density camps with modern amenities.
6	**Buffer / adjoining**	Land in the buffer zone or adjacent to national parks. Products indicated are those with which SANParks is comfortable to be associated with.

For the purposes of this management plan, the focus of the framework listed in Table 22 is to indicate which products already exist, which new products may be allowed, and in which visitor use zones these may occur.

Table 22: Tourism product development framework for the park.

PRODUCT CATEGORY		PRODUCT OR SERVICE	Is Product currently AVAILABLE or under develop-ment?		Is Product APPROPRIATE for the applicable National Park?		ZONING FOR WHICH PRODUCT IS APPROPRIATE					
							Within boundaries of national- / contractual park					Buffer / adjoining
			YES	NO	YES	NO	1	2	3	4	5	6
Over-nigh facilities	Self-catering - limited service (serviced prior to arrival and after departure only)	Accommodation (budget)	√		√			√		√	√	√
		Accommodation (economy)		√	√			√		√	√	√
		Accommodation (premium) / guest house		√	√					√	√	√
		Accommodation backpacking / youth hostels		√	√					√	√	√
		Dormitories / school groups / educational facilities	√		√					√	√	√
		Game / bird hide		√	√					√	√	√
		Military bunker / fort / gun sites		√		√						√
		Tree houses / platforms		√	√			√		√	√	√
		Fly camp / platform / sleep out		√	√			√		√	√	√
	Self-catering - serviced (serviced daily)	Accommodation (budget)	√		√					√	√	√
		Accommodation (economy)	√		√					√	√	√
		Accommodation (premium) / guest house		√	√					√	√	√
		Accommodation backpacking / youth hostels		√	√						√	√
		Dormitories / school groups / educational facilities	√		√					√	√	√
		Houseboat (economy)		√		√						√
		Houseboat (premium)		√		√						√
	Camping	Camping (budget facilities) (power / no power)	√		√					√	√	√
		Camping (premium facilities) (power / no power)		√	√					√	√	√
		Camping bush rustic (protected) (budget facilities)		√	√			√		√		√
		Camping bush rustic (protected) (premium facilities / self-sufficient)		√	√			√		√		√

PRODUCT CATEGORY		PRODUCT OR SERVICE	Is Product currently AVAILABLE or under develop-ment?		Is Product APPROPRIATE for the applicable National Park?		ZONING FOR WHICH PRODUCT IS APPROPRIATE					
							Within boundaries of national-/ contractual park					Buffer / adjoining
			YES	NO	YES	NO	1	2	3	4	5	6
Over-nigh facilities	Camping	Camping bush rustic (unprotected) (self-sufficient)		√	√			√		√	√	√
	Full service (generally some/all meals and activities included)	Game / bush / safari / boutique lodge - under 20 beds		√		√						√
		Game / bush / safari / boutique lodge - 20 beds plus		√		√						√
		Conference lodge / hotel - 21 - 50 beds		√		√						√
		Conference lodge / hotel - 50 beds plus		√		√						√
		Houseboat		√		√						√
		Luxury tented safaris		√	√			√		√	√	√
		Remote camp / fly camp / platform / sleep Out		√	√			√		√	√	√
		Overnight train rides		√		√						√
	Additional services	Cook and guide provided		√	√			√	√	√	√	√
		Cook, guide and OSV provided		√	√			√	√	√	√	√
		Meal packages *e.g.* breakfast, half board or full board	√		√			√	√	√	√	√
Leisure / recreational		4x4 Eco-trails (multi-day, self-drive, basic facilities)		√	√			√		√	√	√
		4x4 Eco-trails (multi-day, self-drive, no facilities)		√	√			√		√	√	√
		4x4 trails (full-day / half-day / guided or unguided)	√		√			√		√	√	√
		Abseiling / rappelling		√	√			√		√	√	√
		Animal interaction activities (limited)		√		√						√
		Animal tracking activities		√		√						√
		Archery		√	√					√	√	√
		Base jumping		√		√						√
		Bird watching	√		√			√		√	√	√
		Boat cruises		√		√						√
		Boat cruise - birding		√		√						√
		Boat cruises - sunset		√		√						√
		Botanical sightseeing	√		√			√		√	√	√
		Bouldering		√		√						√
		Bungee / bungee jumping		√		√						√
		Cableway		√		√						√
		Canoe trails (Varying facilities)		√		√						√
		Canoeing		√		√						√
		Canopy tour (acrobranch)		√		√						√
		Canopy tour (boardwalk)		√		√						√
		Canopy tour / flying fox (tree top / cliff to cliff)		√		√						√
		Caving / spelunking/ potholing		√		√						√
		Clay-pigeon / clay target shooting		√		√						√
		Coasteering		√		√						√
		Cruise - birding		√		√						√
		Cycling		√	√						√	√
		Cycling (downhill cycling)		√		√						√
		Cycling (BMX track area)		√		√						√
		Diving (scuba)		√		√						√
		Dog walking		√		√						√
		Elephant backed rides / safaris		√		√						√
		Fishing (catch and release)		√		√						√
		Funicular		√		√						√

PRODUCT CATEGORY	PRODUCT OR SERVICE	Is Product currently AVAILABLE or under develop-ment?		Is Product APPROPRIATE for the applicable National Park?		ZONING FOR WHICH PRODUCT IS APPROPRIATE					
						Within boundaries of national-/ contractual park					Buffer / adjoining
		YES	NO	YES	NO	1	2	3	4	5	6
Leisure / recreational	Game drives - night drive	√		√			√		√	√	√
	Game drives - night drive (Night Vision aided)		√	√			√		√	√	√
	Game drives - premium		√	√			√		√	√	√
	Game drives - standard	√		√			√		√	√	√
	Game drives - UA		√	√			√		√	√	√
	Games facilities (*e.g.* table tennis, pool, *etc.*)	√		√					√	√	√
	Geocaching		√	√					√	√	√
	Golf		√		√						√
	Golf club membership		√		√						√
	Green hunting / darting safaris		√	√							√
	Hang gliding		√		√						√
	Hiking	√			√						√
	Hiking trails - Wilderness (full service)		√		√						√
	Hiking trails - Wilderness (no facilities) (backpack)		√		√						√
	Hiking trails (budget)	√			√						√
	Hiking trails (premium)		√		√						√
	Horse riding		√		√						√
	Horse riding trails (varying facilities)		√		√						√
	Jet skiing		√		√						√
	Jogging / running		√	√					√	√	√
	Kayaking / paddling		√		√						√
	Kayaking / paddling trails		√		√						√
	Kitesurfing / kiteboarding / fly surfing		√		√						√
	Kloofing (guided)		√		√						√
	Mini golf / putt-putt		√		√						√
	Model aircraft flying		√		√						√
	Motorcycle trails (varying facilities)		√		√						√
	Motorcycling		√		√						√
	Motorcycling - off-road		√		√						√
	Motorised boating		√		√						√
	Mountain bike trails (varying facilities)		√	√					√	√	√
	Mountain biking		√	√			√	√	√	√	√
	Mountain biking - unicycling		√		√						√
	Mountaineering		√		√						√
	Paddle boards		√		√						√
	Paddle boats		√		√						√
	Paddle skiing		√		√						√
	Paragliding		√		√						√
	Parasailing		√		√						√
	Park and ride		√	√			√		√	√	√
	Photography	√		√		√	√	√	√	√	√
	Picnicking (basic facilities)		√	√					√	√	√
	Picnicking (full facilities)	√		√					√	√	√
	Picnicking (no facilities)	√		√					√	√	√
	Quad biking		√		√						√

PRODUCT CATEGORY	PRODUCT OR SERVICE	Is Product currently AVAILABLE or under develop-ment?		Is Product APPROPRIATE for the applicable National Park?		ZONING FOR WHICH PRODUCT IS APPROPRIATE					
						Within boundaries of national-/ contractual park					Buffer / adjoining
		YES	NO	YES	NO	1	2	3	4	5	6
Leisure / recreational	Railway		√		√						√
	Rap jumping (deepelling)		√		√	√	√	√	√	√	√
	River rafting		√		√						√
	Rock climbing		√	√		√	√	√	√	√	√
	Sailing		√		√						√
	Sandboarding		√		√						√
	Self-drive night drives		√		√						√
	Skate boarding / roller blading		√	√					√	√	√
	Skate boarding / roller blading (downhill)		√		√						√
	Skydiving		√		√						√
	Snorkelling		√		√						√
	Spear fishing		√		√						√
	Speed gliding		√		√						√
	Sports facilities (*e.g.* tennis, squash, bowls, *etc.*)		√		√						√
	Stairway (via ferrata / ironway)		√		√						√
	Stargazing	√		√					√	√	√
	Surf Skiing		√		√						√
	Surfing		√		√						√
	Swimming	√		√					√	√	√
	Trail running		√	√							√
	Trail running (night time)		√		√						√
	Tubing		√		√						√
	Vessels (cruise boats, yachts, river/paddle boats)		√		√						√
	Walking		√	√					√	√	√
	Walks - day	√		√			√		√	√	√
	Walks - night		√	√					√	√	√
	Wildlife / game viewing	√		√			√		√	√	√
	Wingsuit flying / wingsuiting		√		√						√
Airborne (Implications of CAA)	Drones over national parks		√		√	√	√	√	√	√	√
	Flights over national parks		√	√		√	√	√	√	√	√
	Helicopter flips		√	√		√	√	√	√	√	√
	Hot-air ballooning		√		√						√
	Microlight flying / ultra-light aviation		√	√		√	√	√	√	√	√
Interpretive	Archaeology		√	√					√	√	√
	Endangered species breeding centre		√		√						√
	Films - amphitheatre		√	√					√	√	√
	Films - auditorium		√	√					√	√	√
	Interpretive centres	√		√						√	√
	Palaeontology		√	√		√	√	√	√	√	√
	Theatre		√	√					√	√	√
	Tours - astronomy		√	√				√	√	√	√
	Tours - birding		√	√				√	√	√	√
	Tours - botanical		√	√				√	√	√	√
	Tours - specialist (fauna and flora)		√	√				√	√	√	√
	Tours - tree (dendrology)		√	√				√	√	√	√

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						Within boundaries of national-/ contractual park					Buffer / adjoining
						1	2	3	4	5	6
		YES	NO	YES	NO						
Interpretive	Trail - mobility impaired		√	√					√	√	√
	Trails - brail		√	√					√	√	√
	Trails - sensory		√	√					√	√	√
Cultural / historical	Cleansing ceremonies (including baptism)		√	√				√	√	√	√
	Cultural dances		√	√					√	√	√
	Cultural points of interest		√	√				√	√	√	√
	Cultural village		√		√						√
	Gold panning (recreational)		√		√						√
	Historical points of interest	√		√					√	√	√
	Mountain worship		√	√					√	√	√
	Museums		√	√					√	√	√
	Religious facilities (prayer or otherwise)		√	√					√	√	√
	Storytelling		√	√					√	√	√
	Tours - battlefield / military		√		√						√
	Tours - cultural		√	√					√	√	√
	Tours - historical		√	√					√	√	√
	Tours - medicinal plants		√	√					√	√	√
	Tours - rock art	√		√					√	√	√
	Tours - South African struggle		√		√						√
Medical / health	Health spa		√	√					√	√	√
	Gymnasium		√	√					√	√	√
	Wellness centres		√		√						√
Developmental	Astronomy training		√	√					√	√	√
	Birding course	√		√					√	√	√
	Botany course		√	√					√	√	√
	Bush homeopathy		√	√					√	√	√
	Bush skills		√	√					√	√	√
	Field guide training	√		√					√	√	√
	Firearm skills		√	√							√
	First aid		√	√					√	√	√
	Game capture training		√	√					√	√	√
	Nature / wildlife photography course		√	√					√	√	√
	Nature based hospitality training		√	√					√	√	√
	Off-road driving skills training		√		√						√
	Orienteering		√	√					√	√	√
	Rope skills course		√	√					√	√	√
	Scuba diving Skills		√		√						√
	Specialised training / courses		√	√					√	√	√
	Survey and mapping skills		√	√					√	√	√
	Survival skills		√	√					√	√	√
	Tracking skills		√	√					√	√	√
	Training - ranger	√		√					√	√	√
	Volunteering		√	√					√	√	√
	Wilderness search and rescue		√	√					√	√	√
Children / youth	Babysitting		√	√					√	√	√

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						Within boundaries of national-/ contractual park					Buffer / adjoining
		YES	NO	YES	NO	1	2	3	4	5	6
Children / youth	Child care centres in camps		√	√					√	√	√
	Children activity centres (jungle gym)		√	√					√	√	√
	Children encounter zone		√		√						√
	Children game drives	√		√					√	√	√
	Children holiday programmes in camps	√		√					√	√	√
	Children trails	√		√					√	√	√
	Learner programmes	√		√					√	√	√
	Paint ball		√		√						√
	Youth camps (KampKwena, "summer" camps)		√	√					√	√	√
Business tourism and events	Events - any		√	√					√	√	√
	Events - adventure		√	√					√	√	√
	Festivals		√	√					√	√	√
	Fundraising events *e.g.* WWF Swim for Nature		√	√					√	√	√
	Lapas / bomas (to rent)		√	√					√	√	√
	MICE (Meetings, Incentives, Conventions and Exhibitions)	√		√					√	√	√
	Musical concerts		√	√					√	√	√
	Photographic shoots and filming		√	√					√	√	√
	Product launches		√	√					√	√	√
	Races / competitions - marathons / trail running		√	√					√	√	√
	Races / competitions - mountain-biking		√	√					√	√	√
	Races / competitions - other		√	√					√	√	√
	Races / competitions - adventure / expedition racing		√	√					√	√	√
	Scientific conferences		√	√					√	√	√
	Team building		√	√					√	√	√
	Weddings	√		√					√	√	√
Retail / services	Apparel outlets		√		√						√
	Airport / aerodrome / airstrip		√		√						√
	Banking - Bank or ATM		√	√						√	√
	Rental - bicycle		√		√						√
	Camping equipment rental		√		√						√
	Rental - car		√		√						√
	Car wash		√	√					√	√	√
	Casinos		√		√						√
	Clinics / Doctor/ first aid		√		√						√
	Outlets - community curios		√	√					√	√	√
	Outlets - curios	√		√					√	√	√
	Essential commodities in camps (ice, wood, *etc.*)	√		√					√	√	√
	Fast moving consumer goods (FMCG) outlets		√	√					√	√	√
	Fuel stations		√	√					√	√	√
	Gas equipment hire		√	√					√	√	√
	Hop-on guides		√	√					√	√	√
	Internet café / Wi-Fi hotspot		√	√					√	√	√
	Laundromats and laundry service	√		√					√	√	√
	Pharmacies		√		√						√
	Photo booth		√		√						√

PRODUCT CATEGORY	PRODUCT OR SERVICE	Is Product currently AVAILABLE or under develop-ment?		Is Product APPROPRIATE for the applicable National Park?		ZONING FOR WHICH PRODUCT IS APPROPRIATE					
						Within boundaries of national-/ contractual park					Buffer / adjoining
		YES	NO	YES	NO	1	2	3	4	5	6
	Pop-up retail		√		√						√
	Postal services	√		√					√	√	√
	Proshop		√		√						√
	Road emergency services		√		√						√
	Shuttle services		√	√						√	√
	Vending machines		√	√					√	√	√
	Vendors		√		√						√
	Wi-Fi facilities (free service)		√	√					√	√	√
Food and beverage	Bars	√		√					√	√	√
	Boma / lapa meals		√	√					√	√	√
	Bush meals		√	√					√	√	√
	Coffee shops / tea rooms		√	√					√	√	√
	Fast-food outlets		√	√					√	√	√
	Game drives picnic baskets		√	√					√	√	√
	Local cuisine	√		√					√	√	√
	MICE catering	√		√					√	√	√
	Picnic baskets	√		√					√	√	√
	Pop-up food, retail		√		√						√
	Restaurants	√		√					√	√	√
	Room service	√		√					√	√	√
	Sports bar		√		√						√
Non tourism related activities											
Mining/ Exploratory	Prospecting		√		√						√
	Mining		√		√						√
Consumptive / Subsistence	Fishing (non-release)		√		√						√
	Hunting (lethal)		√		√						√
	Sustainable harvesting of resources		√	√		√	√	√	√	√	√

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Appendix 4: Internal rules

The following internal rules are applicable to all visitors in terms of Section 52 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003).

General

- Declare firearms at the gate. Unsealed firearms are prohibited in the park;
- Visitors may only enter or exit the park through the main entrance gate;
- Remain in your vehicle at all times, unless in designated areas or lookout points. Exiting your vehicle at designated areas and lookout points is done so at your own risk;
- Remain on designated visitor roads. Do not enter a road that has a No Entry sign;
- The speed limit is 40 km/h.;
- The use of drones inside (and over) the park is strictly prohibited;
- No animals, domestic or otherwise, and plant material (other than firewood), may be brought into the park;
- Do not disturb, feed, remove, pick, destroy, deface or cause damage to any animal, plant or object in the park. No firewood or kindling may be collected from any area within the park.
- Be aware of wild animals on the boardwalk when visiting the interpretive centre;
- Take caution when utilising the rest camp trails for snakes and scorpions.
- Do not litter in the park;
- Fires are only permitted in designated places;
- Camping is only permitted in the designated area of the park;
- No music or noise is allowed in the park, rest camp, picnic sites and at the swimming pools;
- Do not drive or park in such a manner that it is a nuisance, disturbance or an inconvenience to any other person or animal;
- Only designated accommodation areas may be used. You may not overnight in the park without the knowledge of the Park Management;
- Travel in the park may only occur during stipulated times during the following months: 1 April to 30 September from 7 am – 6 pm and 1 October to 31 March from 6 am – 7 pm.
- The main entrance gate opens at 7 am throughout the year. The main entrance gate closes at 7 pm from 01 October to 31 March and closes at 6 pm from 01 April to 30 September. The rest camp gate opens at 6 am and closes at 7 pm from 01 October to 31 March and opens at 7 am and closes at 6 pm from 01 April to 30 September. Visitors must ensure that they have exited or entered the gates before gate closing times;
- Overnight visitors may exit the main gate at 05h00 if all payments have been made;
- An exit permit is required to exit the park. Exit permits are obtainable from reception. Late exits are subject to a R 500 penalty;
- All visitors to the park are required to fill in their Identity Numbers or Passport Numbers on the SANParks indemnity forms when entering the park;
- All conservation levies and other payments to be made to reception prior to leaving the park; proof of payment must be shown to the gate guard at the exit point;
- Only valid Drivers' Licence holders may drive in the park;
- Only 4x4 vehicles may be used on the designated 4x4 Loop roads;
- Only visitors with high clearance vehicles with diff-lock can access the Afsaal and Embizweni cottages;
- Terms and conditions apply to guided activities;

- No alcohol permitted in the swimming pool area;
- Entrance to the swimming pool at own risk;
- No person shall fail to comply with lawful instructions issued by park officials;

Activities: Terms and conditions

- Visitors taking part in guided activities must sign an indemnity form before undertaking the activity.
- Children younger than 6 years old may not take part in guided game drives.
- Children younger than 12 years old may not take part in guided walks.
- Adults older than 65 years may not take part in guided walks without a doctor's certificate stating the person is medically fit to undertake such a hike in rugged terrain.
- Visitors undertaking the following guided activities: Guided walks must have a reasonable level of fitness and must inform the guide of any medical conditions before taking part in the activity. The guide has the right to refuse to include any person on a guided activity if there is a doubt as to whether the person is physically able to complete the activity.

Non adherence to these rules and regulations constitutes an offence, and offenders will be liable to a fine or prosecution.

Appendix 5: Maps

Map 1: Regional context

Map 2: Physical features

Map 3: Land tenure and park expansion

Map 4: Zoning

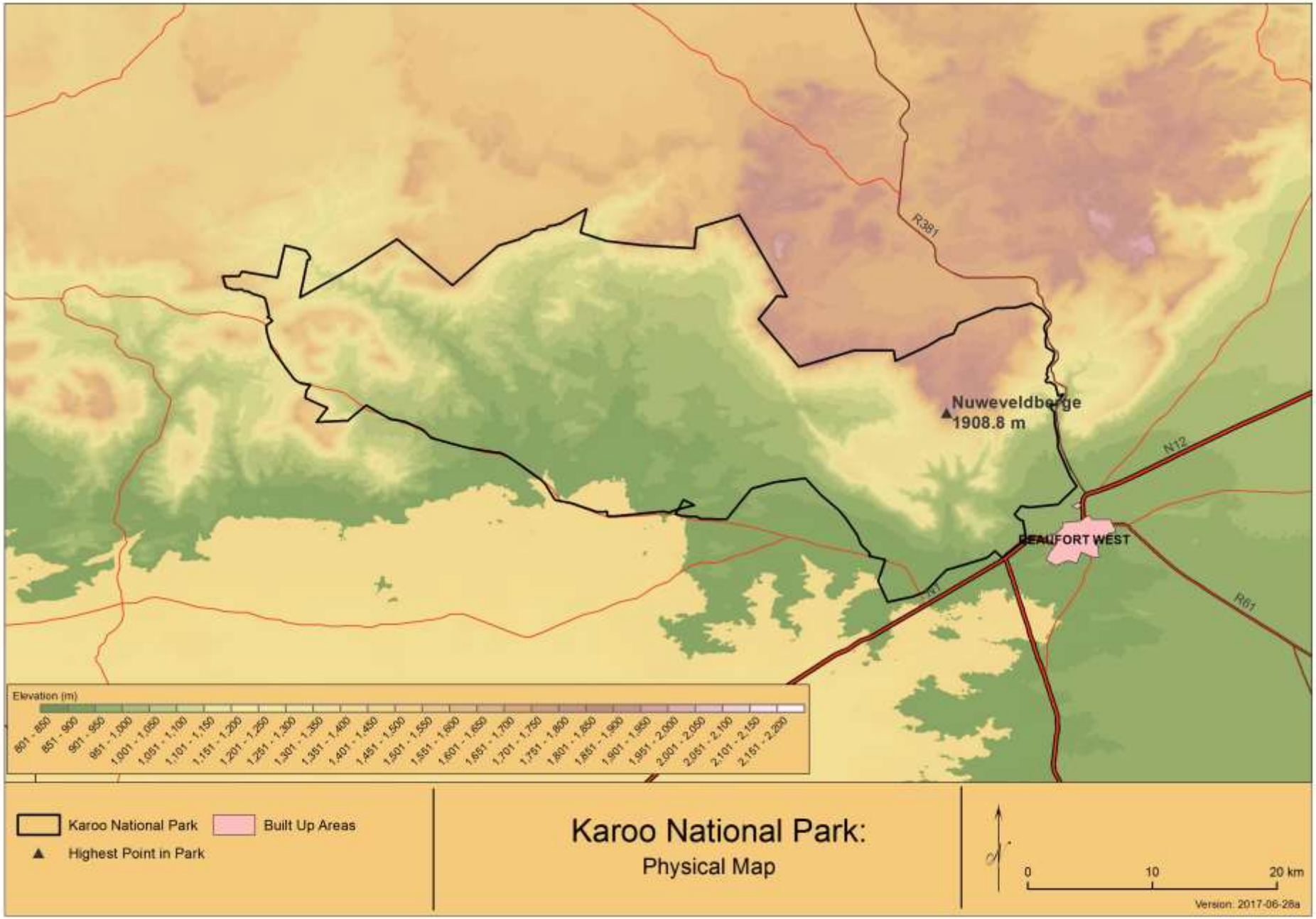
Map 5: Zoning with sensitivity value

Map 6: Buffer areas

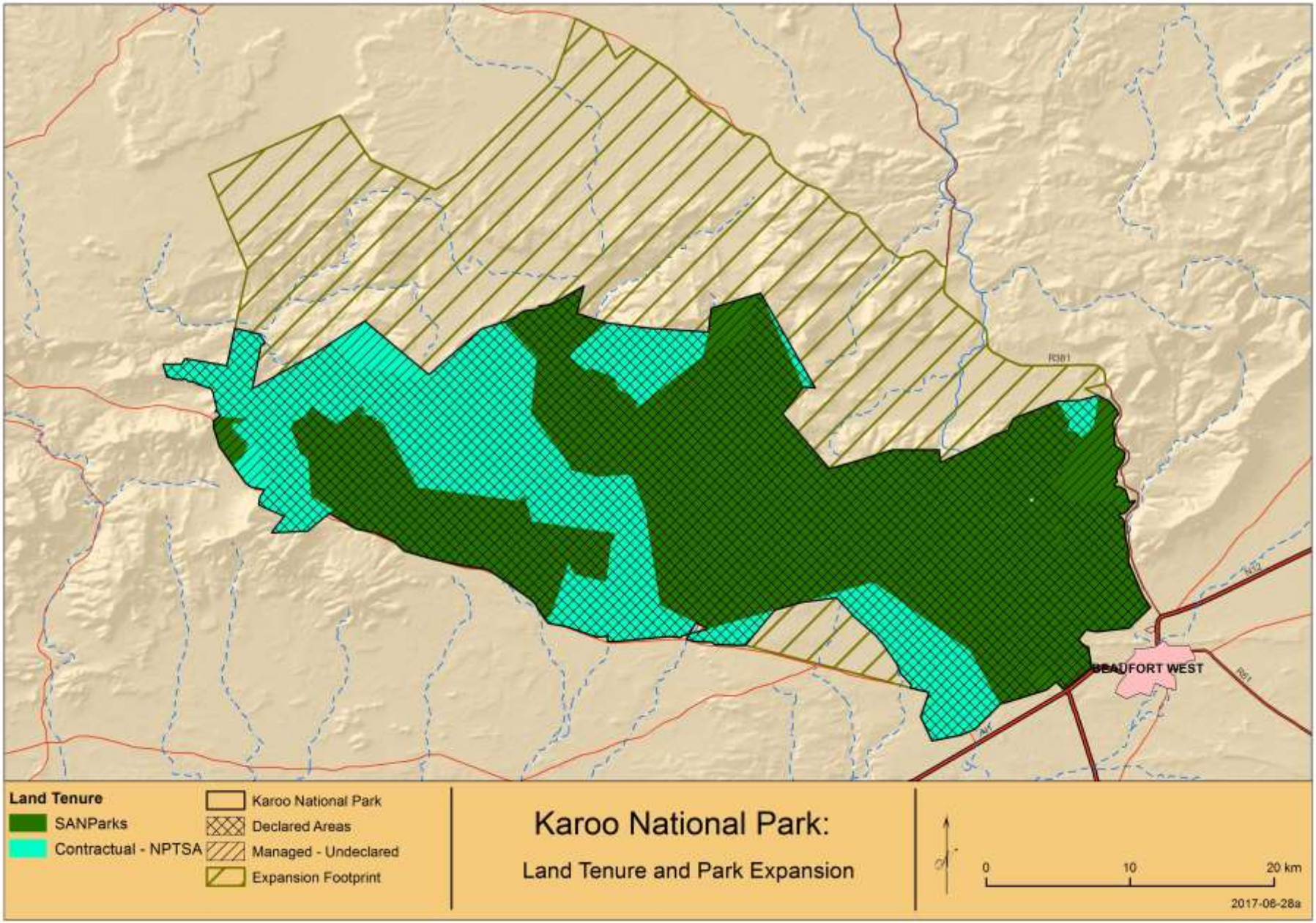
Map 7: Infrastructure and development

Map 8: Vegetation

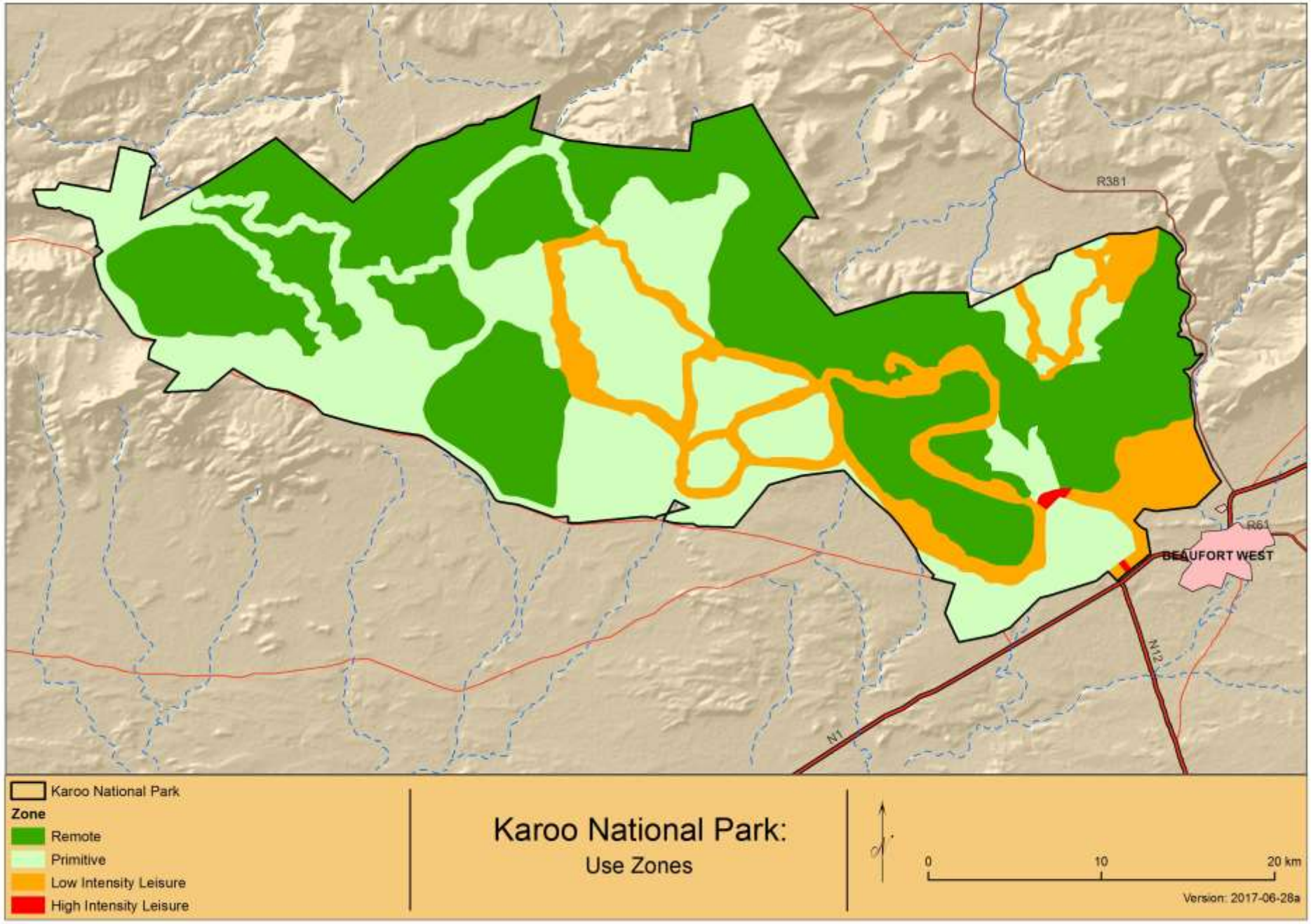
Map 1: Regional context



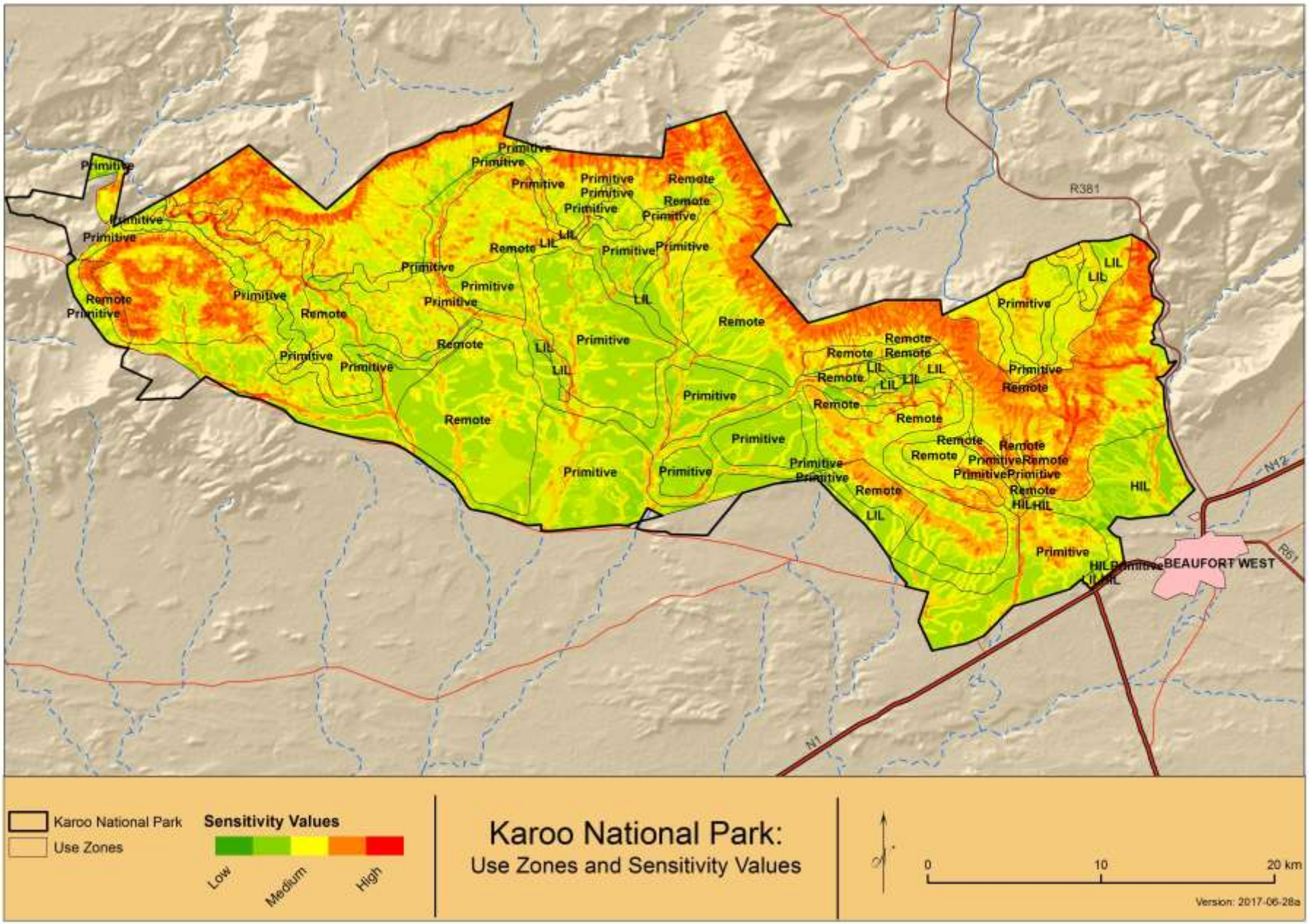
Map 2: Physical features



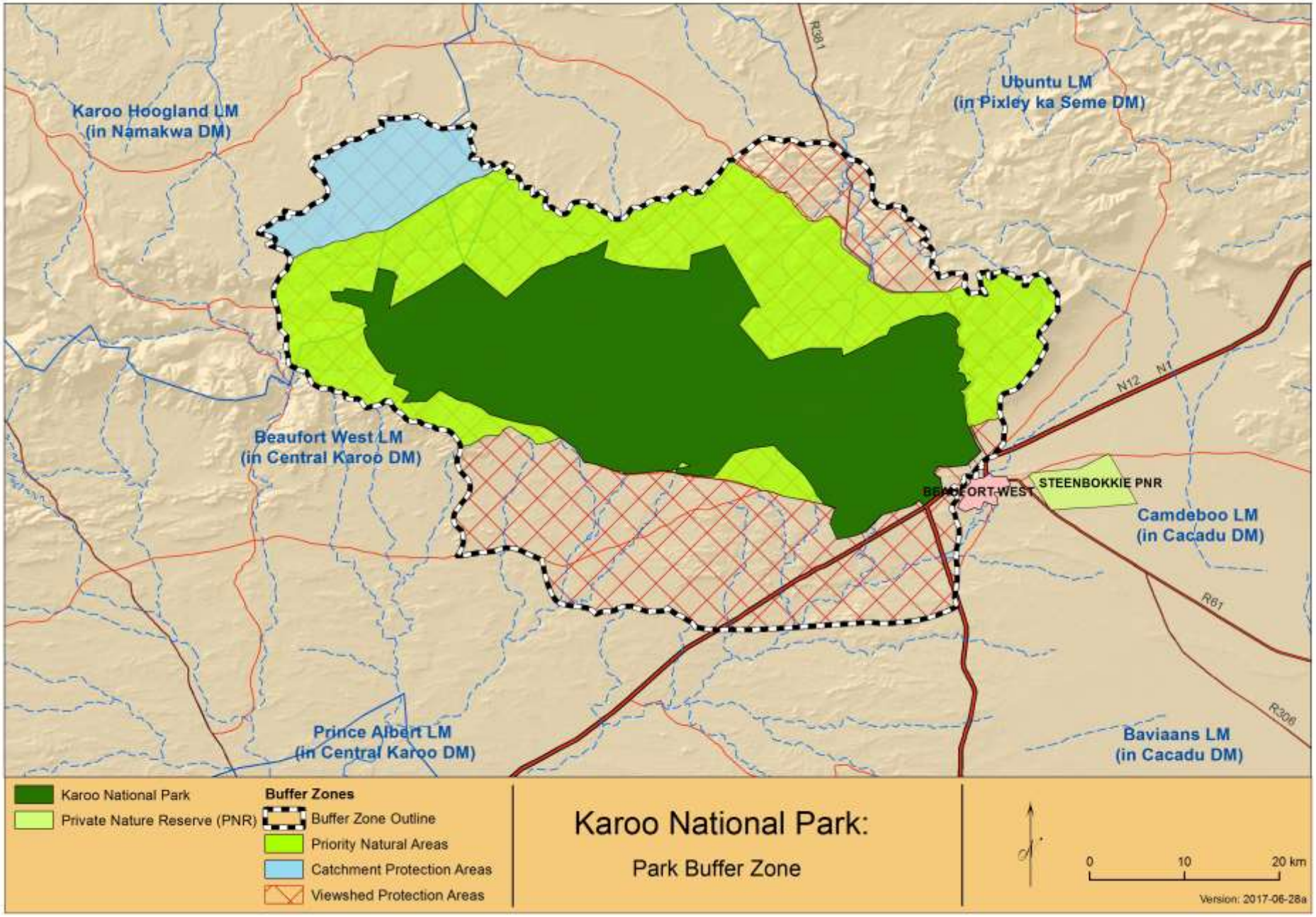
Map 3: Land tenure and potential expansion


R381
R61
BEAUFORT WEST
N12
N1
Karoo National Park
Zone
Remote
Primitive
Low Intensity Leisure
High Intensity Leisure
Karoo National Park:
Use Zones
0
10
20 km
Version: 2017-06-28a

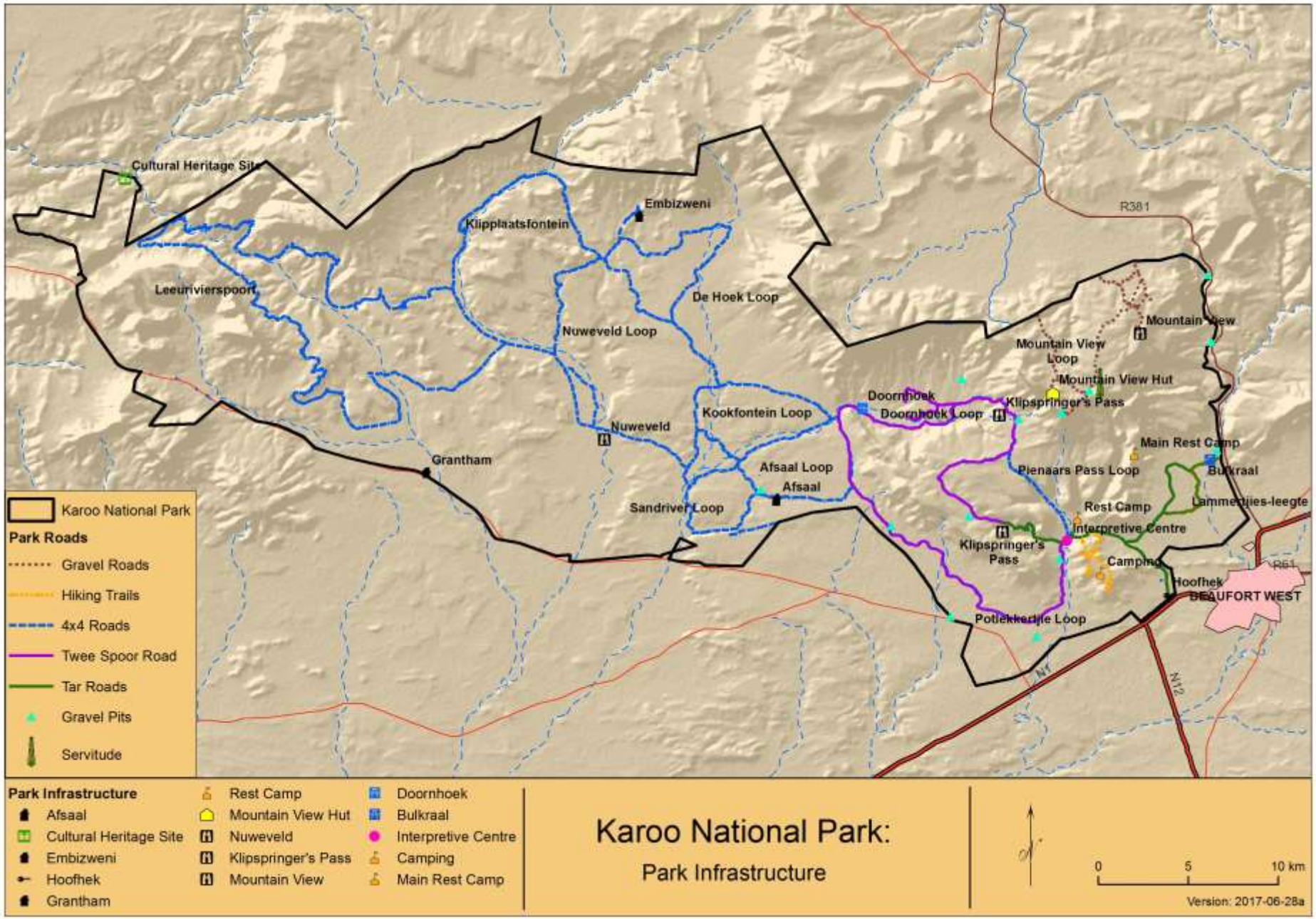
Map 4: Zoning



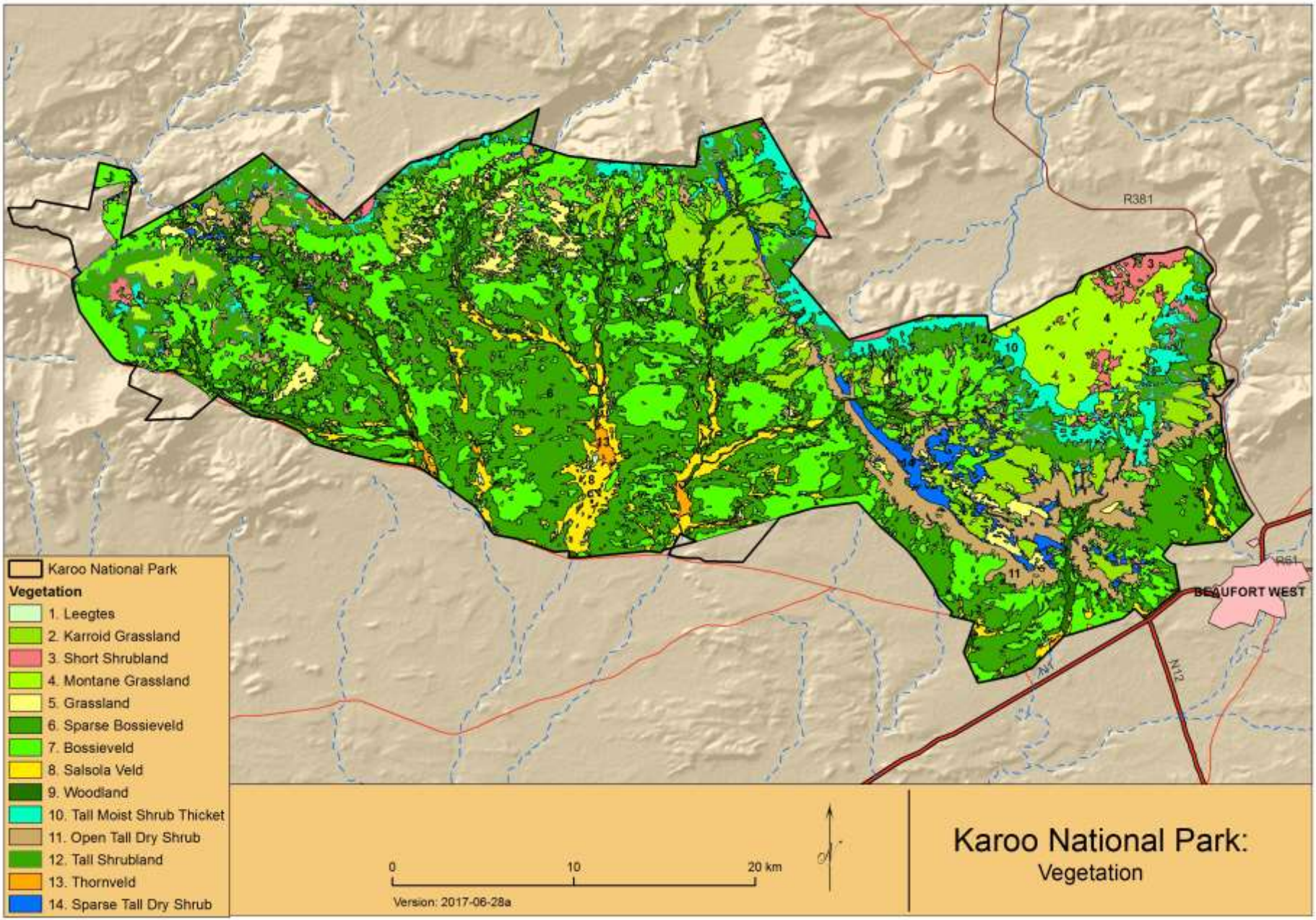
Map 5: Zoning and sensitivity



Map 6: Buffer zone



Map 7: Park infrastructure



Map 8: Vegetation