Doornkloof Nature Reserve

Northern Cape Province,
South Africa

Integrated Management Plan

Five-year cycle: 2019 to 2024

AUTHORIZATION

This Integrated Management Plan (IMP) for the Doornkloof Nature Reserve (DKNR) was drafted by the Reserve Planning Team (RPT), a multi-disciplinary team in consultation with all stakeholders, for approval in terms of sections 39 and 41 of the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003).

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Contents

Index of Tables

Index of Figures

List of Annexures

FOREWORD

The Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL) is the provincial conservation authority tasked wit the mandate of ensuring biodiversity conservation in the Northern Cape. Part of this mandate is the establishment and management of a system of protected areas which is representative of the province's ecosystems and ecological processes.

The protected areas portfolio under the direct management of DAERL consists of eight provincial nature reserve which cover an array of ecosystems and landscapes of high biodiversity conservation value. These provincial nature reserve have numerous benefits to both humans and natural ecosystems. They contribute directly to local, regional and national economies through tourism, employment and expenditure on reserve management. Nature reserves also facilitate complementary private sector investments, such as infrastructure and commercial services, which includes enabled industries such as the hospitality industry. Important social benefits to the public include the provision of an educational resource; indigenous and heritage values; and in the increased quality of life, health and wellbeing.

Nature Reserves are established in the Northern Cape Province as a strategy to conserve and protect the natural environment for the benefit, enjoyment and welfare of present and future generations from a healthy environment. In 2004, the 7th Conference of Parties decided that all member states of the Convention on Biological Diversity should develop and apply methodologies and criteria that would enable them to measure the effectiveness of Nature Reserve (protected area) management in the conservation and protection of biodiversity. South Africa has endorsed the Worldwide Fund for Nature (WWF) Management Effectiveness Tracking Tool (METT-SA) in this regard, which is being used in Northern Cape Province to measure management effectiveness in Nature reserves. Management effectiveness evaluations of Nature Reserves are vital for the measurement and improvement of the performance of each Provincial Nature Reserve against set management objectives.

The management plans that have been developed for Northern Cape Province include:

- Conservation and tourism objectives for the effective management of the Nature reserves that fall under the jurisdiction of Northern Cape Province;
- Visitor marketing and the facilitation of investment opportunities;
- Capacity building and tourism transformation;
- METT indicators to ensure the continuous improvement of the management of these Nature Reserves; and
- Provision of mechanisms for collaboration with communities and neighbours for harmonious co-existence and beneficiation to the province and the country.

By developing these management plans, the Department has ensured:

- That Northern Cape Province meets its obligatory implementation of international agreements; the Convention on Biological Biodiversity; the provisions of the Constitution of the Republic of South Africa, 1998 (Act No. 108 of 1998) and the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) through which natural resources are managed;
- The provision of ecosystem services for everyone in order to facilitate employment, exports, economic growth and a good quality of life.
- That the sourcing of funds for the management of nature reserves beyond the scope of formal Treasury allocations is enhanced

GM Manopole
Member of Executive Council
Agriculture, Environmental Affairs, Rural Development and Land Reform

ABBREVIATIONS AND PLANNING TERMS

ABBREVIATIONS:

APO	Annual Plan of Operations
ARC	Agricultural Research Council
BCEA	Basic Conditions of Employment Act, 1997 (Act No. 75 of 1997)
CAPEX	Capital Expenditures
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
DEFF	Department of Environment, Forestry & Fisheries.
DAELR	Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform.
DETEA	Free State Department of Economic Development, Tourism and Environmental Affairs
DFFE	Department of Forestry, Fisheries and Environment
DKNR	Doornkloof Nature Reserve
DMR	Department Mineral Resources
DRPW	Department of Roads and Public Works
DWAS	Department of Water and Sanitation
EEA	Employment Equity Act, 1998 (Act No. 55 of 1998)
EMF	Environmental Management Framework (Local Authority CBA's)
EPWP	Extended Public Works Programme
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
FPA	Fire Protection Association [in terms of the National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)]
HDI	Historically Disadvantaged Individual
HO	Head Office
HOD	Head of Department
HR	Human Resources
HRD	Human Resources Development
IBA	Important Bird Area
IDP	Integrated Development Plan (municipal)
IT	Information Technology
IUCN	International Union for the Conservation of Nature
KPA	Key Performance Area
LRA	Labour Relations Act, 1995 (Act No. 66 of 1995)
MEC	Member of the Executive Council
METT-SA	Management Effectiveness Tracking Tool for South Africa
MET	Ministry of Environment and Tourism
NWA	National Water Act 1998 (Act 36 of 1998)
NBSAP	National Biodiversity Strategy and Action Plan (2015-2025**)**
NBRBSA	National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 58 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NGO	Non-Government Organization
NPAES	National Protected Area Expansion Strategy
NVFFA	National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
OPEX	Operating Expenditures

PAAC	Protected Area Advisory Committee
PAM	Protected Area Management
PFMA	Public Finance Management Act, 1999 (Act No. 1 of 1999)
PPP	Public Private Partnership
PSA	Public Service Act, 1994 (Act No. 103 of 1994)
Ramsar	Name of a town in Iran where the Convention of Wetlands of International Importance was adopted in 1971.
RMP	Reserve Management Plan
RNR	Rolfontein Nature Reserve
RPT	Reserve Planning Team
SAQA	South African Qualifications Authority
SANS	South African National Standards
SDA	Skills Development Act, 1998 (Act No. 97 of 1998)
SEMP	Strategic Environmental Management Plan (Local Authority)
SEA	Strategic Environmental Assessment
SIS	Security and Investigation Services
SKDR	State of Knowledge Data Repository
SONR	State-owned Nature Reserves
SP	Strategic Plan
TOR	Terms of Reference
TFCA	Trans Frontier Conservation Area
TFP	Trans Frontier Park
THETA	Tourism and hospitality Education and Training Authority
UNESCO	United Nations Educational, Scientific and Cultural Organization
UZM	Use Zone Map
VCA	Veld Condition Assessment
WfW	Working for Water
WfWet	Working for Wetland
WftC	Working for the Coast
WOF	Working on Fire
WSA	Water Services Act, 1997 (Act No. 108 of 1997)

DEFINITION OF KEY PLANNING TERMS:

Activities	Activities are management tasks required to collectively realize the objectives.
Domain (Planning domain)	Planning domain include areas not declared in terms of NEMPAA where DAELR is appointed as management authority as a result of ownership or co-management agreements with planned protected area expansion for next 5-year planning period.
Estate	Estate is the area declared in terms of NEMPAA and where DAERL is appointed as management authority as a result of ownership or co-management agreements.
Guiding principles	Guiding principles provide overall direction to the implementation of activities
Monitoring	Monitoring is the collection of data and information in a consistent manner over time for the purpose of evaluation.
Objectives	Objectives are derived from the vision. They represent key areas in which achievements must be obtained in total, or in some combination, to give direction to the management aspiration (the vision).
Outcomes	Ideally outcomes are benefits produced from objectives and activities.
Outputs	Outputs are tangible results produced by activities.

Performance	Performance assessment is a measurement of accomplishment assessment against a set of pre-determined criteria (e.g. efficiency or effectiveness).
Performance indicator	A performance indicator is a measurement used to evaluate the success in achieving targets and realizing objectives.
Resources	Resources include the people, materials, technologies, money, etc. required to implement the activities.
Target	Targets are set for particular aspects of performance – financial returns, efficiency, and quality of services, etc. – against which performance is monitored and measured.
Conservation Development Framework (CDF)	A CDF is a spatial framework that includes a use zone map (zoning) that guides and co- ordinates conservation and development activities in a protected area.
Value	A value is a specific attribute or feature (cultural, ecological or recreational) within a reserve that may require additional/special consideration during the planning process and subsequent management.
Vision	Vision indicates the direction of management aspiration.
Zone of Influence	Shows the areas within which surrounding land-use changes could affect the reserve. Reserve boundaries are not static and there are factors beyond the current or future boundaries that can influence the Reserve.

EXECUTIVE SUMMARY

The following Executive Summary provides an overview of the 5-Year Integrated Management Plan (IMP) of the Doornkloof Nature Reserve.

i. Purpose of the plan

The IMP sets out the ambitions for the Doornkloof Nature Reserve (DKNR), as articulated through the vision and objectives for the Nature Reserve for the next 5-year planning cycle. The plan sets out how these ambitions will be achieved and delivered through a range of management guidelines and actions.
The integrated Plan strives to:

- Identify the defining qualities and characteristics of the DKNR (*i.e.* what makes it special and unique) and why it was declared;
- Describe the DKNR's management requirement and challenges;
- Set out medium- and long-term ambitions for the desired state of the DKNR;
- Provide a five-year operational management framework for delivering this desired state;
- Describe the specific activities to be implemented on an annual basis;
- Identify the measures required to evaluate if the management actions are collectively contributing to achieve the desired state; and
  Describe the institutional, human resource and budget requirements for implementing the management plan.

ii. Reserve context

Protected areas have been set aside for the protection of natural resources and to perpetuate the natural conditions (Visser *et al.* 1996) that are necessary for the continued existence of these systems. Management, in this context, is the practice by which that purpose is realized (Pyle 1980).

The DKNR was proclaimed on the 12th of September 1981 under the previous Cape Nature Conservation and Museums Provincial Authority (*i.e.* proclamation 276 of 1981 under section 6(1) of the Nature and Environmental Conservation Ordinance 19 of 1974) with the purpose to conserve its biodiversity and ecological processes (Badenhorst 1997). The Reserve has thus been in existence for 41 years. The DKNR covers area of 13 749,7747ha with proclamation number 276/1981 and is therefore legally defined as a Provincial Nature Reserve in terms of Section 12 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA).

The DKNR is located 45km north-west of the town of Colesberg in the Pixley ka Seme and Umsobomvu District and Local Municipalities respectively. The protected area is situated along the western shore of the Orange River (which forms part of the Vanderkloof Dam) approximately 47km south of the dam wall and 60km north of the Gariep Dam. The Vanderkloof Dam (*i.e* second largest dam in South Africa) and Orange River form the eastern boundary of the Reserve which too is the provincial boundary of the Northern Cape and Free State Provinces. An important feature of the DKNR is the Seekoei River (*i.e* early colonist translation of its original Hottentot name, *Koekaup)* which is an important tributary of the Orange River. This river originates on the northern slopes of the Campassberg, the highest free-standing

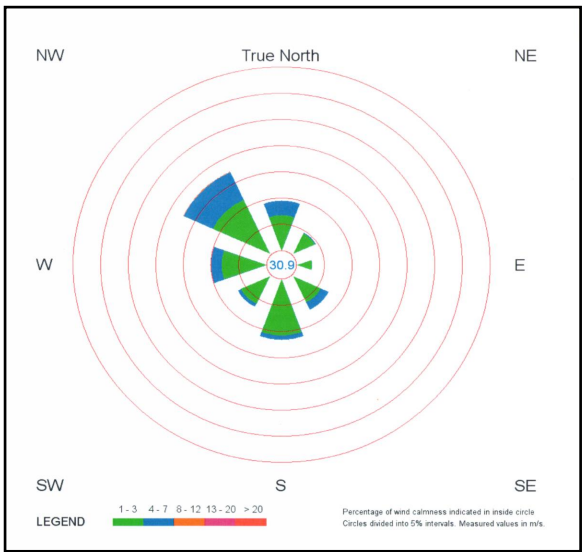
peak in the Cape at 2052 m.a.s.l. (meters above sea level) It starts with three tributaries in the New Bethesda, Richmond and Noupoort districts and meanders for 300km in a northerly direction until it confluences with the Orange River within the DKNR. Land adjacent to the Vanderkloof Dam (*i.e.* both the Northern Cape and Free State is dominated by private game farms and to a lesser extent by cattle and sheep farms.

Seekoei River, Doornkloof Nature: H.P. Cronje

The DKNR forms the northern most part of the proposed Seekoei River Valley Nature Reserve initiative which has the objective of formally protecting the entire length of the Seekoei River. The area is unique with regard to the topography and vegetation which is not found in any other place in the Northern Cape or Free State. The DKNR and all land adjacent to the Vanderkloof Dam is situated in an ecotone or transitional area between the grasslands of the Free State and Karoo vegetation characteristic of the south-eastern part of the Northern Cape. The area has wilderness attributes with Doornkloof being the centre from which the Reserve can be expanded through land acquisition or stewardship agreements with adjacent landowners.

The staff component at the DKNR consists of 23 positions of which only 6 (26%) are currently filled. Critical vacancies that need to be filled are the general foreman, general assistants, field rangers and gate guards. The existing staff component of the maintenance team is approaching retirement age and thus it is of the utmost importance that young staff are employed to avoid the loss of skills and facilitate skills transfer to the younger generation. Reserve management will only be effective once all vacancies have been filled with goal-oriented staff.

DKNR's summer and winter months are characterized by extreme temperature fluctuations. Summer can be extremely hot and winter very cold with icy nights, frost and occasional light snowfalls. Temperatures range from –8 ºC in July to 41 ºC from November to February. The mean annual precipitation varies between 300 mm to 400 mm, which occurs predominantly as thunderstorms during summer. The long-term mean precipitation of the reserve over a period of 41 years (1981 to 2021) is 357mm. Dry summer storms are common (October to December) before the onset of the wet season which often result in lightning fires. Wind direction is predominately in a north-



Mean wind rose for DKNR 2009 -2021.ARC.

westerly direction. Windy conditions occur mostly from September to February with relatively calm windy conditions from March to August. Weather condition data supplied from a weather station stationed at DKNR that was erected by the ARC in September 2009. This weather station forms part of a network of weather stations used by the ARC for climatic monitoring in South Africa.

The topography of the DKNR is dominated by mountainous terrain with several kloofs and drainage lines. The northern parts of the Reserve consist of undulating plains with no true flats. The topography of the Reserve is a product of the historical geological process. The geomorphology of the DKNR is largely defined by the resistant Karoo dolerites and Beaufort sandstones and by its proximity to the Orange River. The geology of the Reserve forms part of the late Carboniferous to Jurassic age Karoo Super-group. At the time of the supercontinent, Gondwana, the area was part of an inland sea. This is clearly noticeable in the horizontal layers of white sandstone outcrops which characterize the hillocks on the Reserve. The area at and below the white sandstone approximately indicates the level of the Jurassic inland sea (*i.e.* the Karoo Basin). Several of the hillocks at DKNR and in the greater Karoo landscape have flat apexes. This is as a result of the flat-lying dolerite sills and sandstone that have formed resistant cappings giving the hillocks this feature. Occasionally near vertical dolerite sills are observed which crop out as resistant linear ridges. These are observed at Diepkloof, Middelwaterkloof and particularly along the Orange River south of Doornkloof Bay. An attractive geological formation within the DKNR is the tufa, a waterfall that builds itself up in contrast to waterfalls that erode.

White feldspathic sandstone outcrop, DKNR, I. Cronje

Isolated outcrops of tufa occur in the DKNR. These spectacular chemical sedimentary rocks are largely composed of calcium carbonate which form by evaporation as thin, soft, spongy surficial incrustations around the opening of calcareous springs, or along streams carrying calcium carbonate in solution. The dolerite intrusives are calcium rich rocks and represent the source of the calcium for the formation of the tufa. The most impressive tufa at Doornkloof is the one located along the Orange River at Twyfelberg Kloof.

Tufa, Twyfelberg, DKNR, H.P. Cronje

Plant fossil impressions and trace fossils of *Nerietes ichnofacies* have been found in at DKNR in the areas, Middelwater and Rietvalley.

Vertical dolerite sills, Diepkloof, DKNR, H.P. Cronje

Vertical dolerite sill Twyfelberg, DNKR, H.P. Cronje

The first inhabitants of the area were the San (*Hottentot or Khoikhoi*) who hunted game for food and undertook small scale farming. San artefacts can be seen on farms neighbouring the Reserve. In 1830, Mr. A Steedman, a naturalist and explorer, travelled the length of the Seekoei (previously called the Seacow) River to its confluence with the Orange River and documented in particular the regular occurrences of lion and hyaenas. The last Cape Lion was shot in 1836 in close proximity to the town of Colesberg. In 1836 land, on which Doornkloof Nature Reserve is presently established, was allocated for stock farming. The lifestyle of these early pioneer farmers are evident in the remnants, which are scattered throughout the Reserve. These structures include old stone kraals and dipping kraals, old draw-wells and the foundations of the old farm dwellings. During the Anglo-Boer War (1899-1902) intensive battles took place in the area. Remains of a fort and two watch towers that were used in the Anglo-Boer war can still be seen on the DKNR in the Kattegat area.

Watch tower used in Anglo Boer War, Kattegat, DKNR, H.P. Cronje

Vegetation on the plateaus associated with deep red soils, DKNR, H.P. Cronje

Doornkloof Nature Reserve is located in the Dry Highveld Grassland and Upper Karoo Bioregions and the Grassland and Nama-Karoo Biomes. The vegetation types found in the DKNR are the Besemkaree Koppies Shrubland and Eastern Upper Karoo vegetation types. Vegetation is closely related to their associated topographic units (plateaus, slopes, foot-slopes and drainage lines),

geology and soil characteristics (i.e a sandy, loam and clay content). Species broadly characteristic of the topographic units are listed. Karoo Kuni-bush (*Searsia burchellii*) that was once used by the San to make bows, and Red Grass (*Themeda triandra*) dominate the slopes. The plateaus are more open with Sour Karee (*Searsia ciliata*) and Love Grass (*Eragrostis* sp.). The abundant kloofs are densely grown with Sweet Thorn (*Vachellia karoo*), Wild Olive (*Olea europaea* subsp. *africana*) and Buffalo-thorn (*Ziziphus mucronata*). The Seekoei River has a dense fringe of Sweet Thorn (*Vachellia karoo*) along its banks with reedbeds (*Phragmites australis*) in the shallower parts of the river. Some of the Wild Olive trees in the Reserve are over a hundred years old. The most characteristic features of this tree species are the silver green leaves and the rounded crown, especially in the older trees. A comprehensive vegetation map was produced in 2014 which classified the vegetation of the DKNR into six broad plant communities namely: *Eragrostis chloromelas-Chloris virgata* Grassland; *Melianthus comosus-Vachellia karoo* River thicket; *Hyparrhenia hirta-Olea europaea* subsp. *Africana.* Drainage lines; *Olea europaea* subsp. *africana-Searsia burchellii* Shrubland; *Pentzia globosa-Eragrostis lehmanniana* Grasslands; *Themeda triandra-Searsia burchellii* Randjie veld. Management units were delineated according to the practical management of each of the broad plant communities. The plant species list for the DKNR totals three hundred and ninety-two (392) species.

Buffalo Bull, Rietvally, DKNR, Z Gumbo

Sixty-four (64) mammal species have been documented to occur in the Reserve of which the most prominent are buffalo (*Syncerus caffer*), eland (*Taurotragus oryx*), gemsbok (*Oryx gazelle*), kudu (*Tragelaphus strepsiceros*), red hartebeest (*Alcelaphus buselaphus*) and warthog (*Phacochoerus africanus*). Smaller antelope species inhabiting the DKNR are steenbuck (*Rhapicerus campestris*), grey duiker (*Sylvicapra grimmia*) and mountain reedbuck (*Redunca fulvorufula)*. The buffalo have the highest economical value of all the other species because they are free from *Bovine Tuberculosis.* Alien species include: waterbuck (*Kobus ellipsiprymnus*) and impala (*Aepyceros melampus melampus*). The avian species list for the DKNR currently stands at one hundred and seventy-two (172) species. Several aquatic birds and

Martial Eagle, M. Anderson

raptors occur in the DKNR. These include but not limited to South African Shellduck (*Tadorana cana*), Egyptian geese (*Alopochen aeyptiacus*), yellow-billed duck (*Anus undulata*), White-breasted cormorant (*Phalacrocorax carbo*), African spoonbill (*Platalea alba*) and the iconic African Fish eagle (*Haliaeetus vocifer*). Verreaux (*Ictinaetus malaiensis*) and Martial (*Polemaetus bellicosus*) eagles inhabit the mountain cliffs. Predators that inhabit the DKNR are caracal (*Felis caracal*), black-backed jackal (*Canis mesomelas*), brown hyena (*Hyaena brunnea*) and leopard (*Panthera pardus*). The reptile species list of the DKNR is currently at thirty (30) species with the amphibian species at eight (8).

Cape cobra, J, Maris

The DKNR falls within the Umsobomvu Local municipality which according to Statistic SA (2011) in the second smallest municipality within the Pixley ka Seme District municipality and has a surface are of 6 819km^2 which is 6.60% of the district municipality. The closest additional local municipality to the DKNR is the Renosterberg and Local Emthanjeni municipalities. Towns within these three local municipalities include Colesberg, Noupoort, Norvalspont Phillipstown, Petrusville, Van Der Kloof, De Aar, Hanover and Britstown. The population sizes for the three indicated local municipalities (Umsobomvu. Renosterberg and Emthanjeni) are 28 376, 10 978 and 42 356 respectively (Statistics SA 2011). Sixty-three percent (63%) of the population in the Umsobomvu municipality are of working age. The population size of the Pixley ka Seme district totals 186 351 people. Although Pixley ka Seme has an unemployment rate of only 28.3% (2011 census), household income levels are low, 64% of households have an income of R1 000 or less per month compared to the Northern Cape average of 54%. The Umsobomvu local municipality has an unemployment rate of 39.16%. It is thus of the utmost importance that Reserve related development projects focus on employment of local labour. During the recent revitalization project at Doornkloof which amounted to R48 466 584.00, the number of project beneficiaries from Colesberg, Noupoort, and Norvalspont totaled 511. The Reserve is in urgent need of an operational budget and skilled staff to maintain the Reserve's infrastructure. This has been non-existent for several year now. The DNKR is mentioned in the IDP Document of the Pixley ka Seme district municipality with specific reference to improving its tourism potential. Land degradation through overgrazing is listed as a key threat in the district's integrated environmental management programme. Evidence of degradation in the district is clearly visible, mainly as a result of environmental (low and erratic rainfall) and anthropogenic factors (poor management practices).

Wild olive tree, DKNR, H.P. Cronje

The administrative hub of the DKNR is situated at the main entrance to the Reserve. DKNR's workshop complex is situated 200m to the right of the administrative building and entrance gate. Adjacent to the workshop complex area is Doornkloof's staff village. The Reserve Manager's house is located approximately one kilometre from the entrance gate but along the main tourist road. Eskom electricity supply is limited to the administrative building, workshop complex, staff village, Manager's house and Doornkloof's guest house. All the tourist facilities make use of solar power for the provision of electricity and water. Gas appliances are used for heating purposes. Communication to the Reserve is currently limited to VSAT (Telkom) communication. Cellular network reception across all networks is limited. Management communication is facilitated through radio communication through a repeater. The repeater allows for communication within the Reserve and up to 50km radius of the repeater. Communication can be facilitated between the DKNR and RNR through the radio infrastructure at the DKNR.

The road network within the DKNR is of an acceptable condition. The road network is limited in the sense that roads lead to specific areas. The visitor must travel on the same road to exit the Reserve. No circular game viewing road is available at the DKNR primarily due to the topography and conservation design of the Reserve. The main access road (*i.e.* the AP3076 off the R369) to the DKNR is in moderate condition but deteriorates to a poorer state during periods of high rainfall. Generally, the DKNR is more suitable for the off-road vehicles than lower sedan vehicles.

Chalets at Roodewal recreational area, DKNR I. Cronje

The tourism facilities include a guesthouse, six (6) chalets, eight (8) camping sites and day a visitor relaxation area along the Seekoei River. Three hiking trails are available for the wilderness enthusiast ranging from 1-5km day trail to a 32km 2 to 3-day trail. The activity for which DKNR is most renowned is angling at the Roodewal and Broederstroom recreational areas. Mountain biking is also enjoyed by several visitors to the Reserve. Kayaking is a developing recreational activity. Dedicated budget availability is crucial for the maintenance of the facilities at DKNR.


Mountain biking DKNR, HP Cronje.

Picnic facility, Roodewal recreational area, DKNR, I. Cronje

Kayaking, DKNR, PC Ferreira

The DKNR is within close proximity to the Senqu Caledon (#33) focus area of NPAES although this focus area is not documented in detail in the NPAES. However, neither of the vegetation types encompassed within the DKNR or surrounding area are adequately protected. This can be remedied by acquiring the land immediately adjacent to DKNR and progressing in a northerly direction to Rolfontein Nature Reserve (RNR) through land acquisition (most preferred) or stewardship agreements with co-management systems in place. The most limiting factors with regard to the expansion of the Reserve though the stewardship approach is the management divergences of government and the private sector.

The conservation significance of the DKNR can be improved through the introduction of black desert rhino (*Diceros bicornis bicornis*) and Cape mountain zebra (*Equus zebra zebra*). Conservation is defined as the sustainable utilization of natural resources. Through zoning of the DKNR into contrasting land use areas different activities can be allowed. One such possible activity is to allow hunting in the DKNR during the winter period when, due to climatic conditions, visitor numbers drop. Through the implementation of rare game breeding programs, and participating in game auctions, economic benefits will be realized with re-investments made in the DKNR to maintain a high degree of service delivery with regard to reserve and infrastructure management. The DKNR requires a genetic management policy and implementation plan which has been absent since game species were initially introduced in 1991. Eland (*Taurotragus oryx*) was introduced in 1991 followed by buffalo (*Syncerus caffer*) during 2000 and then gemsbok (*Oryx gazella*) and red hartebeest (*Alcelaphus buselaphus*) in 2001.

Desert black rhinoceros, F. Solomon

iii. Reserve values

The following section outlines the key values that have been identified during the situational assessment and refined through a series of stakeholder workshops.

Institutional

- The Reserve potential to demonstrate the efficacy and benefits of functional partnerships between DAERL, Local communities, NGO's, Private landowners and other State Departments across provincial boundaries in the collaborative administration and management of DKNR;
- The Reserve is committed to management in accordance with best practice and rationally driven by current knowledge;
- The Reserve is committed to good administration and the efficient use and good maintenance of resources;
- The Reserve is committed to being a good employer and socially affirmative neighbour in the Umsobomvu local community.

Ecological

- The Reserve has exceptional scenic and wilderness qualities. Its diverse topography includes sheer cliffs, deep valleys and mountain slopes interspersed with undulating plains, wetlands and river courses;
- The Reserve has suitable habitat to actively implement a natural breeding programme of rare or endangered game species historic to the area *e.g*. the Desert Black Rhinoceros (*Diceros bicornis bicornis*) and Cape Mountain Zebra (*Equus zebra zebra*);
- The Reserve has an active genetic management policy and manages game populations accordingly;
- The Reserve is an important water catchment area;
- The Reserve is dissected by the Seekoei River which is a major tributary of the Orange River. It is also the only river that flows from south to north;
- The Seekoei River, smaller river tributaries and bay areas are breeding areas for Large (*Barbus kimberleyensis*) and Small Mouth Yellow Fish (*Barbus aeneus*), Moggel (*Labeo umbratus*), Orange River Mudfish (*Labeo capensis*) and Sharptooth catfish (*Clarias gariepinus*). The catch, weigh, photograph and release principle is promoted within the DKNR for all indigenous fish species.

Socio-Economic

- The Reserve is regarded as playing an important social support role in local and surrounding communities;
- The Reserve is easily accessible by tourists and offers a self-drive option for normal sedan vehicles although the road network is limited and thus hiking and mountain biking, and canoeing is promoted;
- The Vanderkloof Dam, Seekoei and Orange River (central portion) are regarded as one of the best angling areas in the Northern Cape. These waters are home to large specimens of the indigenous Small (*Barbus aeneus*) and Large Mouth Yellowfish (*Barbus kimberleyensis)*, Sharptooth catfish, Moggel (*Labeo umbratus*) and Orange River mudfish (*Labeo capensis)*;
- Good quality accommodation is available in the reserve ranging from a luxury guest house to rustic chalets;

- The PA offers some of the best bird watching opportunities in the Northern Cape and hosts the breeding grounds of a variety of aquatic birds and raptors;
- The Reserve is regarded as having a high-income generating potential through the sustainable utilization of several species and the breeding of TB free buffalo (*Syncerus caffer*);
- The Reserve has the potential to play an important socio-economic support role in local communities.

iv. Management issues and challenges

The following section outlines the key management issues and challenges facing the Reserve that have been identified during the situational assessment and refined through a series of stakeholder workshops to inform implementation and planning.

Institutional

- There are insufficient resources and capacity to coordinate and implement effective management of the Reserve;
- Centralized budget, and de-capacitated reserve management;
- Lack of supported budget to operate the Reserve properly;
- Lack of reserve staff's capacity to ensure law enforcement;
- Severely understaffed, resulting in reduced management effectiveness;
- Difficulty in access to training (technical and administrative) to improve staff skills;
- Compensation of staff problematic with regards to overtime worked and the provision of a danger allowance;
- No young staff to assimilate knowledge of senior staff before aging staff retire;
- Staff members do not have sufficient protective clothing and have limited resources to conduct day to day work;
- Limited staff accommodation is available at the Reserve and surrounding area. The full staff contingent cannot be accommodated in the Reserve.
- Accessibility of roads (only gravel roads) in and around the Reserve is limited as a result of: (i) the poor condition of the roads (especially during the wet season); and (ii) the mountainous topography;
- There is a potential for management objectives to be undermined if not clearly communicated to and supported by institutions responsible for management of the reserve interface.

Ecological

- The boundary of the PA is inconsistent, does not adequately incorporate important habitat features and is poorly aligned with existing ecological boundaries;
- The Reserve is not registered with a Fire Protection Association (FPA). This is currently part of the local farmers union and to be part of the FPA, the PA must pay annual membership fees. Fire management is currently a partnership between the PA and adjacent private landowners;
- Lightning during dry storms is the main course of fire in the PA although fire due to visitor negligence is also a possibility;
- There are limited conservation management procedures in place;
- Research and monitoring is required to improve baseline data and assess changes in the ecosystems responses to management activities;

- There is a need to promote scientific research and disseminate results to better understand the functioning of the ecosystem process in the PA**;**
- There is a need to harmonize bag and size limits and improve control of angling activities to prevent over-exploitation of angling species;
- Alien game species (impala (*Aepyceros melampus melampus*), waterbuck (*Kobus ellipsiprymnus*) need to be eradicated from the PA.

Socio-Economic

- Poor condition of the access road to the PA is restricting visitor access*;*
- A focused tourism development plan is required to grow tourism activities associated with the PA;
- Marketing strategies need to be implemented to encourage tourists to visit the area;
- There is an opportunity to promote educational activities at PA;
- There is a need to review and refine the draft zonation plan to manage conflicting activities within the PA according to area specification and season;
- Local communities (poor) don't enjoy benefits from the PA except through access to angling sites *e.g.* culling activities benefit established venison companies. Culling should be a management activity with venison provided to local communities at a highly reduced cost.

v. Desired condition of the Reserve

The vision of the Reserve describes the overall long-term goal for the operation, protection and development of the DKNR. The following vision was developed by the RPT:

VISION

A protected area representative of the of the biodiversity and ecosystem services of the region, conserved and managed for future generations in collaboration with adjacent private landowners, local communities and organs of state for the people of South Africa and the environment.

From this collaboration, it is envisaged that the following will be secured:

- ***Conservation of indigenous biodiversity of the DKNR and the area it represents;***
- ***Conservation of the ecological services with particular reference to the Seekoei River which is the main tributary of the Orange River below the Gariep Dam;***
- ***Ensure scientific genetic management of all game species;***
- ***Introduction of rare game species to improve the conservation importance of the DKNR;***
- ***Implementation of integrated environmental management strategy;***
- ***Preservation of cultural and historical heritage attributes of Reserve;***
- ***The integrity of the natural environment is maintained to ensure the remote and scenic qualities of the Reserve to serve a basis for tourism;***
- ***Quality of life of rural communities are improved by developing opportunities for tourism;***
- ***Equitable access to, and responsible use of, the Reserve and its natural resources for the benefit of present and future generations through strategic partnerships***

vi. Key management activities and targets

Twenty-four (24) objectives, anticipated to contribute to realizing the vision of the DKNR, were identified by the RPT and can be grouped according to the following six key performance areas: Biodiversity and heritage conservation; sustainable use; enforcement, security and access control; infrastructure and equipment (operations); stakeholder involvement; and administration and planning. These objectives are:

KPA 1: Biodiversity and Heritage Conservation

Objective 1.1: Obtain Biodiversity knowledge;
Objective 1.2: Restoration and mitigation of degradation;
Objective 1.3: Maintenance of ecological processes;
Objective 1.4: Maintenance of critical ecosystem services;
Objective 1.5: Land use planning and management outside of the protected area;
Objective 1.6: Water use planning and management operations influencing the protected area;
Objective 1.7: Audit achievement of biodiversity targets;
Objective 1.8: Manage and mitigate the environmental impacts of conservation management, tourism, recreation and natural resource use;
Objective 1.9: Obtain Cultural Heritage knowledge.

KPA 2: Recreation, Marketing, Education, Awareness and Interpretation

Objective 2.1: Develop, deliver and maintain a diverse range of tourism and recreational services for visitors in accordance with CDF;
Objective 2.2: Develop and implement a focused and cost-effective marketing program;
Objective 2.3: Develop and implement a focused and cost-effective awareness-raising and educational program.

KPA 3: Enforcement, Security and Access Control

Objective 3.1: Secure the management authority and its tenure;
Objective 3.2: Secure the boundaries of, and maintain controlled access; and
Objective 3.3: Sustain an effective law enforcement and compliance capacity.

KPA 4: Infrastructure and Equipment

Objective 4.1: Acquire and maintain operational equipment and vehicles;
Objective 4.2: Construct, maintain and upgrade the administration infrastructure and bulk services infrastructure;
Objective 4.3: Construct, upgrade and maintain day and overnight visitor buildings and infrastructure.

KPA 5: Stakeholder Involvement

Objective 5.1: Interaction with stakeholders and communities in the planning, development and management;
Objective 5.2: Actively participate in local and regional conservation and socio-economic development initiatives that may affect or benefit the protected area;
Objective 5.3: Develop, implement and maintain effective mechanisms for ongoing communications with co-management partners.

KPA 6: Administration and Planning

Objective 6.1: Institute and maintain an effective management planning capability in the DKNR;

Objective 6.2: Maintain an adequately equipped, resourced and trained staff complement for the DKNR;

Objective 6.3: Institute and maintain an effective financial and administration and planning capability of the DKNR.

vii. Institutional arrangements and budget requirements

The following recommendations regarding the minimum staffing complement and funding required for the successful implementation of the Reserve Management Plan (*i.e.* the IMP and APO) was made by the RPT making use of the RB Martin formula. Martin has developed formulae which give a crude estimate of the number of field staff, the required operating costs and the necessary capital expenditure for a protected area of any given size.

The RB Martin formula has been used to estimate minimum conservation costs for protected areas and compare these with disclosed budgets, which suggests a 30% aggregate underfunding of conservation. Conservation functions in provinces appear seriously underfunded, largely because they must vie for provincial allocations along with other critical social functions such as health, education and social welfare. Regardless of the final figure, there appears to be ample evidence from a number of sources that conservation is seriously underfunded in aggregate, and that a comprehensive review of the funding requirements for conservation is required (DEA, 2012).

It is proposed that a total of 23 staff members, (consisting of a reserve manager, an assistant reserve manager, field rangers (including a senior field ranger), 6 logistical supporters (including a general foreman), 1 administrative officer, 1 Handyman/driver, 1 facility manager, 3 gate guards and 3 cleaners) would be required for the successful implementation of this IMP.

The following capital and operational budgets are proposed for the successful implementation of this IMP:

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONNEL	R4 635 579,22	R5 371 341,25	R6 167 780,46	R7 082 745,49	R7 630 473,59
GOODS AND SERVICES	R1 936 811,64	R3 514 319,52	R2 192 394,06	R1 945 095,88	R2 012 095,88
CAPITAL ASSETS >R5000	R74 000,00	R2 362 000,00	R1 833 000,00	R425 000,00	R1 172 000,00
TOTAL:	R6 646 390,86	R11 247 660,77	R10 193 174,52	R9 452 841,37	R10 814 569,47

The key responsibilities of the Reserve Planning Team, as well as the DKNR Protected Area Advisory Committee (DKNR PAAC) are defined and recorded and are regarded as crucial in the development, implementation, monitoring and review of the IMP.

1. INTRODUCTION

1.1 Integrated Environmental Management System

The Integrated Environmental Management System (IEMS) assists DAERL in managing its ecological, social (including human resources) and financial resources to meet the Nature Reserve's management objectives. It is a system that meets the requirements of relevant ISO standards but also enables the Department and its Nature Reserves to plan for and meet strategic (five-year) objectives as well as assist with the implementation of annual planning objectives within a coherent system of continual improvement. Linking the strategic planning cycle and the annual planning cycle enables the Department to ensure that operations are focused to meet Departmental and Nature Reserve strategic objectives. At a Nature Reserve level, the strategic objectives and annual planning objectives will be guided by the Departments objectives within these two cycles of planning.

Figure 1 is an overview of an ideal Integrated Environmental Management System developed to meet the ISO 14001 EMS requirements but also compatible with reserve management planning objectives.

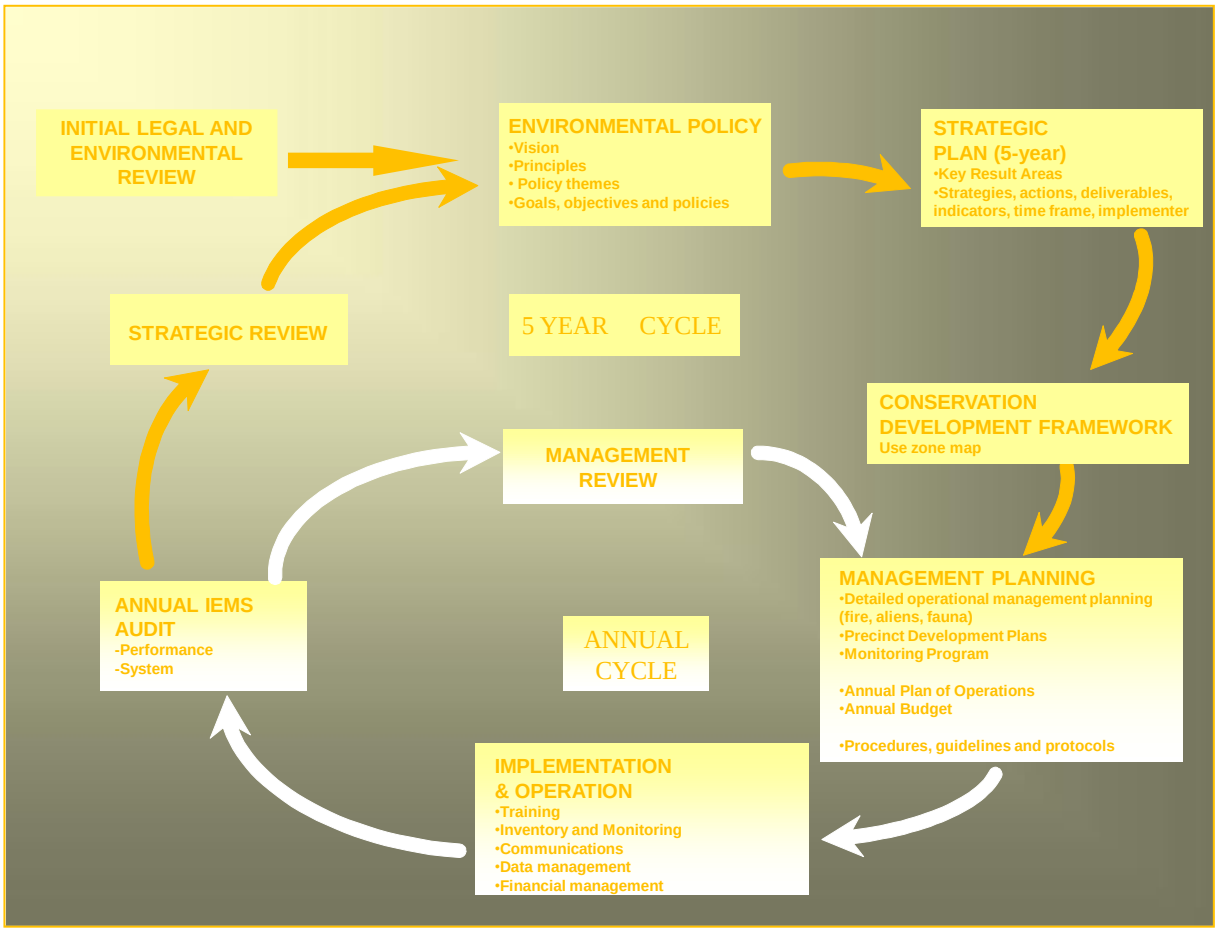


Figure 1: IEMS for NC Provincial Nature Reserve Network.

1.2 Strategic Management Planning

The Integrated Management Plan (IMP) is compiled every five years with the involvement of representative stakeholders. The IMP forms a bridge between the long-term policy and vision for the Reserve, and the medium-term (five year) priorities to attain that vision. Rather than detailing all operational and potential reactive courses of action in the next five years, the IMP focuses on strategic priorities. These priorities are considered strategic because they will shape the future development of the Nature Reserve, as well as ensuring responsible operational management on a day-to-day basis. In compiling the IMP, significant efforts are directed towards integrating the vision with operational reality.

To ensure its survival as an action plan, the IMP is presented as a series of Key Performance Areas, each of which contains objectives that the Reserve staff will need to address. For each one of the aforementioned objectives, a number of guiding management principles (*i.e.* norms and standards by which operational decisions with regard to the Reserve will be made); management actions (*i.e.* key strategic activities to be implemented in order to achieve the reserve's objectives); and management targets were set by the RPT.

Each management action was defined and prioritized as being of a high, medium or low priority for the five-year horizon covered by this Integrated Management Plan. Time frames, targets, key performance indicators and responsibilities were also allocated to each management action, or to a group of linked management actions.
The aforementioned principles, actions and targets will be used to inform the annual operational framework (OMF) that include the annual plans of operation (APO) of the Reserve, as well as the resources required to implement it. To provide a spatial context to the strategic Reserve objectives, a Conservation Development Framework (CDF) is formulated to demarcate the Reserve into functional areas with a specification of management guidelines for each use zone and to provide a spatial framework for visitor facility provision and access with a specification of management guidelines for the range of visitor sites, facilities and access.

1.2.1 *The DKNR Management Plan*

The Reserve Management Plan (RMP) is the overarching management planning document for the Doornkloof Nature Reserve (DKNR).
The DKNR Management Plan comprises two complementary documents[1]:

- A Integrated Management Plan (IMP) covering a period of five years (this document); and
- An Operational Management Framework (OMF) including an Annual Plan of Operation (APO) covering the current financial year.

All the information necessary to guide the management of the Nature Reserve is included in these two documents. The structure of the DKNR IMP (Table 1) is the same for all DAERL Nature Reserves. No major decisions potentially affecting the future of the Reserve will be taken without reference to the IMP.

[1] These two planning documents will be supported by a **State of Knowledge Data Repository (SKDR)** and program-specific, more detailed **Subsidiary Plans**.

Table 1: Structure of the IMP for Doornkloof Nature Reserve

SECTION 1	**INTRODUCTION**
This section briefly describes the: (i) planning context for the IMP; (ii) purpose of the IMP; (iii) structure of the IMP; and (iv) approach to developing the IMP.	
SECTION 2	**CONTEXTUAL FRAMEWORK**
This section provides a succinct summary of contextual information about the Reserve. Context identify the defining qualities and characteristics of the Reserve. What makes it special and unique and also describes the Reserve's management issues and challenges.	
SECTION 3	**STRATEGIC PLANNING FRAMEWORK**
This section defines the ambitions for the Reserve, through the formulation of a vision and a set of objectives. This section also spatially represents the desired state of the reserve in the form of a use zone map for the Reserve. Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy. Set out medium- and long-term ambitions for the desired state of the Reserve	
SECTION 4	**OPERATIONAL MANAGEMENT FRAMEWORK**
This section defines how the vision and the objectives will be delivered. It details the key management guidelines and management actions for six thematic areas (Key Performance Areas). Operations management is a dynamic, iterative and complex process, which is comprised of a series of decisions and activities by managers and employees – affected by a number of interrelated internal and external factors – to turn strategic plans into reality in order to achieve strategic objectives. Operational Management Framework- - Translates the strategic planning framework for each set of objectives into management actions; and management targets to accomplishing objectives and the resources required to implement it, including specific activities to be implemented on an annual basis; - Identify the measures required to evaluate if the management actions are collectively contributing to achieve the desired state - Describe control mechanisms (legislation, policies, norms and standards) for guiding implementation and decision-making. - Provide procedures on how to implement operations (standard operating procedures)	
SECTION 5	**RESOURCING AND GOVERNANCE FRAMEWORK**

1.2.2 *Purpose of the DKNR IMP*

The National Environment Management: Protected Areas Act No. 57 of 2003 requires that DAERL produces management plans for all of its Nature Reserves in consultation with relevant stakeholders.

The overall aim of the Management Plan as per the Protected Areas Act (PAA) is to:

- Ensure the protected area is managed according to the reason it was declared;
- Be a tool to guide management of a protected area at all levels, from the basic operations to the level of the Minister of Forestry, Fisheries and Environment (DFFE);
- Be a tool which enables the evaluation of progress against set objectives;
- Be a document which can be used to set up key performance indicators for Reserve staff;
- Set the intent of the Reserve and provide explicit evidence for the financial support required for the Reserve, and
- Provide for the scoping process required as part of the Environmental Impact Assessment (EIA) process for development in the Reserve.

The purpose of the IMP for the DKNR is in line with the aim of the NEMPAA and is to:

- Identify the defining qualities and characteristics of the Reserve (*i.e.* what makes it special and unique);
- Describe the Reserve's management issues and challenges;
- Set out medium- and long-term ambitions for the desired state of the Reserve;
- Provide a five-year implementation framework for delivering this desired state;
- Describe the specific activities to be implemented on an annual basis;
- Identify the measures required to evaluate if the management actions are collectively contributing to achieve the desired state; and
- Describe the institutional, human resource and budget requirements for implementing the management plan.

The overall purpose of the IMP for the DKNR is to set out the medium-term ambitions for the Reserve. These ambitions are expressed through the **Vision** and **Objectives**. The IMP then describes how these ambitions will be delivered through a range **of management guidelines** and **management actions**. The eight stages followed during the development of the IMP is outlined in Table 2.

Table 2: The eight basic steps taken in preparing the IMP of the DKNR

Step	Purpose of step
STEP 1: Data collection, background research and site visit.	To collect, collate and review the contextual Reserve information that informs the reserve management planning process.
STEP 2: Establishment of a DKNR Planning Team (RPT).	To establish an inter-disciplinary team to guide and advise on the preparation, and ongoing review and evaluation, of the IMP.
STEP 3: Identification of the DKNR values.	To describe why the Reserve was designated, and its associated values and benefits.
STEP 4: Deciding on the desired state for the DKNR.	To develop and articulate a desired condition, state or appearance of the Reserve (vision, objectives and use zone plan).
STEP 5: Development of an action plan for the DKNR.	To identify and develop the key management actions needed to achieve the desired state for the Reserve.
STEP 6: Preparation of the first draft of the IMP for the Reserve.	To integrate all the information from Step 1 and Steps 3 to 5 into a first draft of the IMP.
STEP 7: Stakeholder consultation.	To create an opportunity for the RPT, and later the general public and other stakeholders/interested parties, to review and comment on iterative drafts of the IMP.
STEP 8: Revision of the IMP to include comments and recommendations from the RPT and other stakeholders.	To revise the draft IMP, taking into account the comments received from the RPT and other stakeholders/interested parties and the public. Complete a final IMP for approval.

1.3 IEMS audit

An audit of the Integrated Environmental Management System (IEMS) is undertaken on an annual basis. An audit is designed to obtain objective information that provides an evaluation of the PA's conformance to the criteria it has set itself. These criteria may include legal compliance, conformance with PA procedures, achievement in Key Performance Areas, and compliance with any other standard the Department may have adopted. The annual management review below and progress against Key Performance Areas forms the basis of the annual IEMS Audit.

The results of this process were communicated to management, staff and other stakeholders through the management effectiveness improvement strategy (MEIS).

1.4 Management review

A review of the IEMS is undertaken on an annual basis to prevent it from constraining new initiatives and innovative approaches to challenges that may arise. The review takes account of the changing circumstances that comprise the Reserve environment. In undertaking such a review or assessment, the Protected Area Manager considers the results of the METT-SA, relevant recommendations by Stakeholders, and any other information considered relevant to the review. The Management review provides the framework within which Protected Areas will develop their Operational Management Framework (OMF) for the following year.

1.5 Operational Management Framework

The PA is required to develop and maintain an Operational Management Framework (OMF) or Annual Plan of Operations (APO). This Framework translates the expectations of the Strategic Management Plan into workable objectives or project areas in a manner that serves the management style of the respective operational sections within the PA. The Operational Management Framework provides an indication of required human and financial resources for each of the objectives or project areas. The development of Operational Management Framework therefore serves as an important interface between the project-planning and budgeting exercises.

1.6 Strategic review

A Strategic Review of the IMP is held every five years and seeks to evaluate the effectiveness, suitability and adequacy of the Integrated Environmental Management System, within the context of a changing PA environment. The Strategic Review differs from the Management Review in that it includes the participation of relevant stakeholders. The Strategic Review may recommend changes to Policy and Procedures. Participants may also decide to commission further Environmental Reviews (including a Legal Review) to provide information necessary for the assessment. The results of the Strategic Review provide the framework for the development of a five-year Integrated Management Plan for the following 5-year planning cycle of the PA.

1.7 Implementation

Implementation and maintenance of the IMP is the responsibility of all Reserve staff. Specific procedures are developed and followed to ensure there is continuity in the implementation.

1.8 Responsibilities

General responsibilities for Reserve operations are set out in the Performance Agreements and Work Plans of the Reserve staff. An assessment of personal performance in respect of allocated tasks and applicable Key Performance Areas is undertaken on an annual basis for all Reserve staff. This is described in the Northern Cape Provincial Administration's Performance Management and Development Policy.

1.9 Training

As part of the Performance Management and Development Policy training needs in relation to Work Plans is described in the Personal Development Plan of staff members. This system aims to ensure that Reserve staff is competent to carry out allotted tasks in a manner that supports the goals of the Environmental Policy.

1.10 Communications

Communication within the Reserve is regarded as a two-way dialogue, and all Reserve staff are encouraged to raise issues and concerns they have regarding the operation. Effective communication is seen as imperative in creating a Reserve community.

1.11 Documentation and Records

Documentation is maintained to provide management, staff, visitors and other stakeholders with an understanding of the management priorities and systems that operate within the Reserve. Wherever possible, documentation is available electronically to facilitate access and avoid unnecessary paper waste. A document control system is employed to ensure documents remain relevant, up-to-date and accessible. All documentation and records form part of the SKDR of the Reserve.

1.12 Monitoring

According to McGeoch *et al.* (2011) the measurement and monitoring of biodiversity in protected areas is generally aimed at:

- Assessing and improving the efficiency and effectiveness of conservation action,
- Informing management action and policy at both local and national levels,
- Providing evidence of conservation success and
- Strengthening the case for conservation among policy makers, funding agencies and landowners.

In addition, biodiversity monitoring systems in protected areas are intended to provide early recognition of unforeseen changes that impact on biodiversity, and to contribute to understanding potential impacts of current and new activities on biodiversity. These data will also feed into national and international assessments of the state of biodiversity. Monitoring systems are thus necessary to both identify where policy or management intervention may be required, and to inform and evaluate the effectiveness of any interventions.

DAERL has developed a Biodiversity Monitoring Framework that maps the way forward for biodiversity monitoring in its Nature Reserves. The monitoring framework provides the principle motivation for the development and implementation of a Monitoring systems (BMS) for DAERL that addresses and prioritises the full range of key biodiversity concerns, conservation, and reporting commitments and obligations across reserves, taxa and environments. As such, it is intended to play a significant role in guiding investment in research, monitoring, and resulting policy and management action in Nature Reserves for the foreseeable future.

Two main approaches were used to guide the design and development of the DAERL BMS and to identify Biodiversity Monitoring Programmes (BMPs) (Figure 2).

BIODIVERSITY MONITORING FRAMEWORK *Guides & Contextualises the Biodiversity Monitoring System*	
BIODIVERSITY MONITORING PROGRAMMES	
BMP 1	**BMP 2**
Biodiversity Mechanisms BMP 1,1: *Environ. Observations* BMP 1,2: *Fauna Monitoring* BMP 1,3: *Flora Monitoring*	**Species of Special Concern** BMP 2,1: *Species Inventories* BMP 2,2: *Designation & Distribution of SSC*
BMP 3	**BMP 4**
Wetands BMP 3,1: *Freshwater systems* BMP 3,2: *Esturaine systems*	**Invasive Alien Species** BMP 4,1: *IAS Control and Eradication Plan* BMP 4,2: *IAS Management Success*
BMP 5	**BMP 6**
Resource Use, Recreation & Tourism BMP 5,1: *Resource Use* BMP 5,2: *Responsible Tourism*	**Habitat Respresntaion & Persisitance** BMP 6,1: *Habitat Description* BMP 6,2: *PA Respresntation*
BMP 7	**BMP 8**
Habitat Degradations and Rehabilitation BMP 7: *Habitat Degradation Status*	**Cultural Heritage Resources** BMP 8,1: *Heritage Survey & Listing on SAHRIS* BMP 8,2: *Archeological Data Colecction*
BMP 9	**BMP 10**
Climate & Climate Change BMP 9,1: *Recording Climatic factors* BMP 9,2: *Monitoring Climate Change*	**Organizational Reporting**

Figure 2: DAERL Biodiversity Monitoring System (BMS) composed of a several of Monitoring Programs (BMPs)[2]

The approaches that will be used to track and evaluate progress in the development and adoption of DAERL's BMS will be based on the evaluation and monitoring principles set for the PA's IMP. These approaches adopt a logical series of steps to measure progress with the implementation of the BMS. It ensures ongoing assessment of the effectiveness of the framework and its implementation, and ultimately the organisation's mandate to enable informed and accountable decision-making through monitoring and analysis. As part of this process, the BMS should be regularly reviewed and evaluated, as is the case with management plans.

[2] The 10 Biodiversity Monitoring Programs shown here are those that have been identified for development and adoption.

2. CONTEXTUAL FRAMEWORK

2.1 Location and interface

The DKNR is approximately 45km northwest of the town of Colesberg in the Pixley ka Seme and Umsobomvu District and Local Municipalities. Phillipstown and De Aar are 60km and 120km west of the Reserve respectively. The Orange River and Vanderkloof Dam form part of the eastern boundary of the Reserve. The DKNR is 47km south of the Rolfontein Nature Reserve (along water surface) and 98,2km along the AP3076, R369 and R48 roads just outside the town of Vanderkloof. Properties adjacent to the DKNR are the Hunters Moon Game Ranch/Desert Star (effectively surrounding the Reserve to the south, west and north) with the Lahou Valley Reserve Northern Cape situated adjacent to the south-eastern boundary of the Reserve. The DKNR is situated along lower portion the Seekoei River which flows for 17.37km through the Reserve in a northerly direction and confluences with the Orange River within the central north-eastern part of the Reserve. In managing a protected area of this nature, it is important that the protected area's boundary is clearly established with notices along the aquatic eastern boundary and all terrestrial access points. The interface of the DKNR is depicted in Figures 3. The surface area of the DKNR expands over an area of 13 749,7745 ha and consists of portions of the properties as indicated in Table 3 and shown in Figure 4[3].

Table 3: Properties included in DKNR

FARM	SIZE HA	TILE DEED	LANDOWNER	DECLARATION NO
Elands Kloof 124	1475,7024	T25048/1971	Republic of SA	55/1991
Rietvalley 125/5/6	784,13	T10882/1973 T17147/1988	Republic of SA	55/1991
Holvarth 1	1758,1116	T25048/1971	Republic of SA	276/1981
Kattegat 2/2	180,744	T25048/1971	Republic of SA	276/1981
Driehoek 3	28,2656	T29781/1970	Republic of SA	276/1981
Broederstrom 4/1/2/3	1098,074	T29781/1970	Republic of SA	276/1981
Doorn Kloof 5 /1&2	2196,38	T16694/1945 T1498/1963	Republic of SA	276/1981
Overschot 6	1740,170362	T12333/1948	Republic of SA	276/1981
Roodewal 7 &7/1	2423,0034	T17926/1969	Republic of SA	276/1981
Doornhoek 14	1872,4361	T5188/1951	Republic of SA	276/1981
Farm 206	168,8351	T5525/1985	Republic of SA	276/1981

[3] Current actual size of the Reserve.

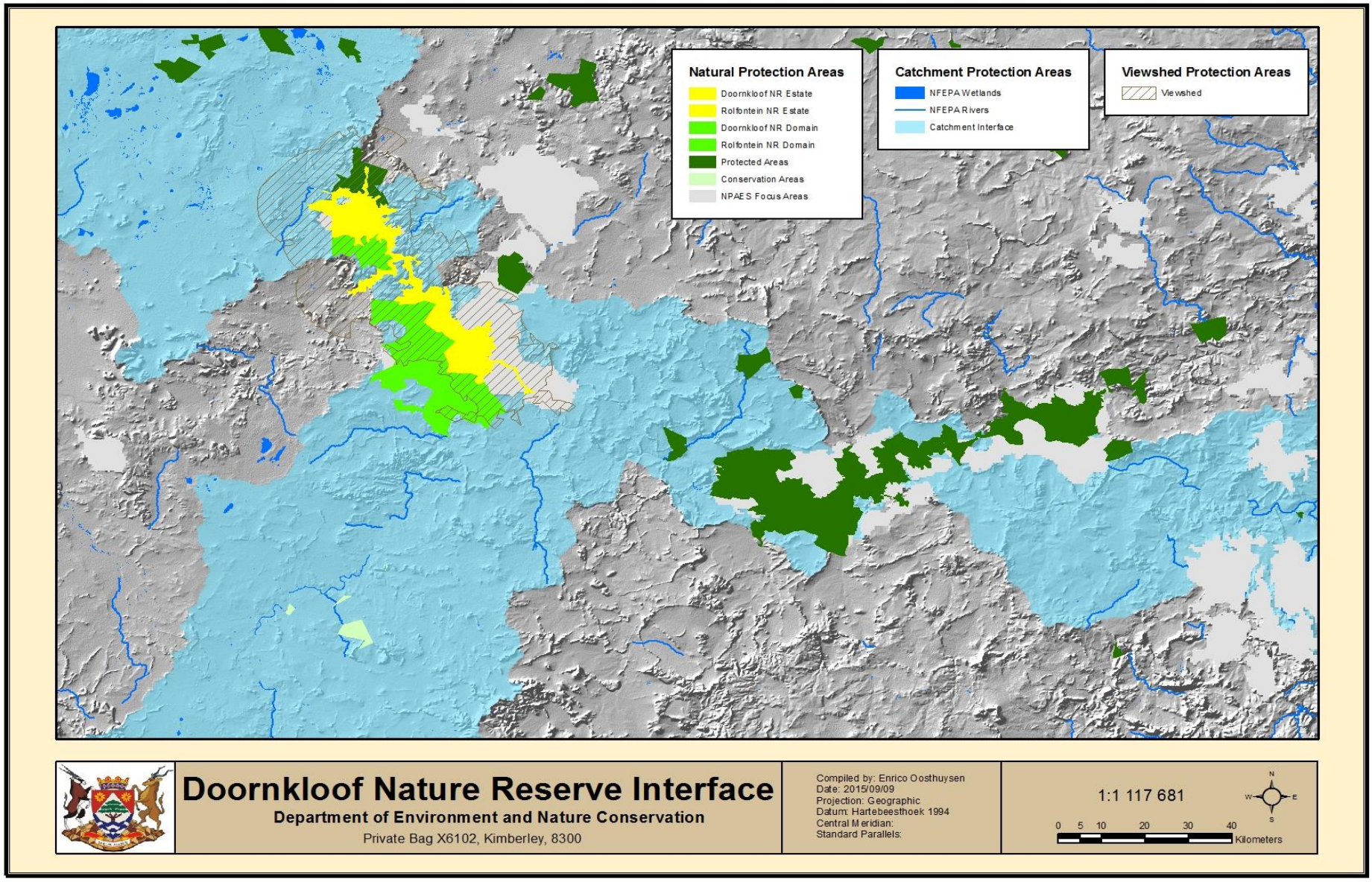


Figure 3: Interface Map of the DKNR.

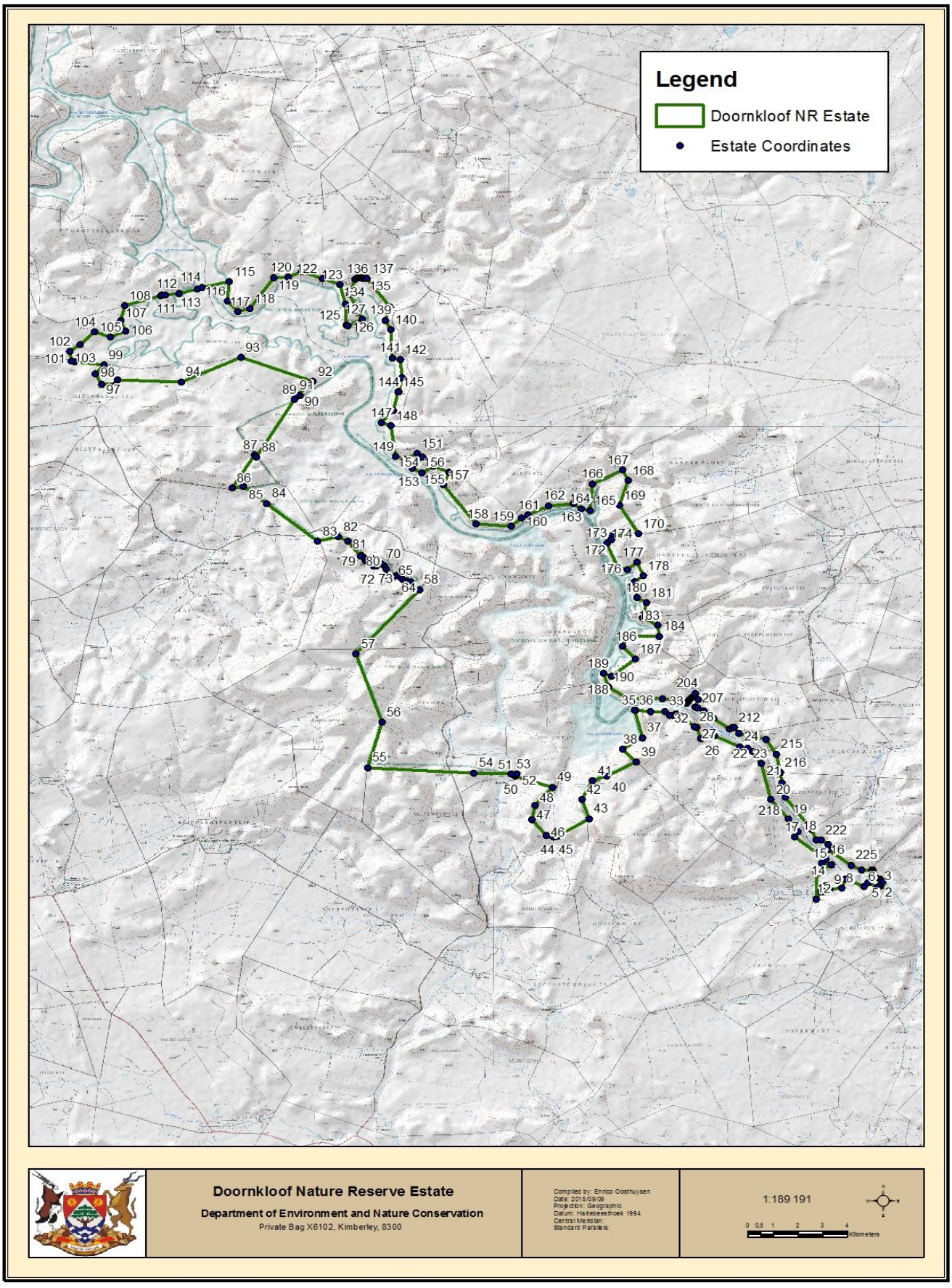


Figure 4: The estate of the DKNR.

2.2 Legal status

The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (''the Act'') has as one of its aims the protection of conservation and ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes and makes provision for the declaration of various types of protected areas. Section 9(a) provides for special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments and Section 9(c) provides for Marine protected Areas.

The DKNR (Table 3) covers an area of 13 749,7745 ha and was declared as a Nature Reserve in 1994 in terms of Section 6(1) of the Nature and Environmental Conservation Ordinance (Ordinance 19 of 1974) proclamation number 37/1994 and is therefore legally defined as a Provincial Nature Reserve in terms of Section 12 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA).

The Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL) is currently the Management Authority of the DKNR.

In addition to the Protected Areas Act, a Reserve Management Plan must comply with other related national legislation such as the National Environmental Management: Biodiversity Act (NEMA:BA), national policy and international conventions that have been signed and ratified by the South African Government. The key national, provincial and local legislation that has a direct influence on management activities are provided for in the SKDR.

2.3 Institutional arrangements

2.3.1 *General*

In implementing the IMP, it is essential that Reserve Management understand the mandates of various role-players and the institutional framework in which decision making; implementation and monitoring will be carried out. In light of this, a brief outline of the mandates and responsibilities of the Management Authority and key supporting government departments is provided below.

The mission of the DAERL, the current designated management authority of the DKNR, is to conserve and protect the natural environment for the benefit, enjoyment and welfare of present and future generations by integrating sustainable utilization with socio-economic development. The Department's strategic goals are to conserve, value, sustainably use, protect and continually enhance environmental assets; enhance socio-economic benefits and employment creation for present and future generations from a healthy environment; and provide a department that is fully capacitated to deliver its services efficiently and effectively.

The current Strategic and Annual Performance Plans of DAERL aim at achieving 6 strategic goals for the current cycle that is reviewed in line with the Medium Strategic Framework and the Environmental Sector Strategic Plan.

The Strategic goals with goal statements of DAERL include the following:

Goal 1	***Environmental Quality and Biodiversity Management***
Statement	Environmental assets conserved, valued, sustainably used, protected and continually enhanced.
Goal 2	***Socio-economic benefits and Employment creation***
Statement	Enhanced socio-economic benefits and employment creation for the present and future generations from a healthy environment.
Goal 3	***Cooperative Governance and Administration***
Statement	A department that is fully capacitated to deliver its services efficiently and effectively
Goal 4	***Environmental Education***
Statement	Environmental education to stimulate critical thinking and influence decision making
Goal 5	***Research and Development Support***
Statement	Sound decision making based scientific research and monitoring
Goal 6	***Compliance and Enforcement***
Statement	To promote and enforce compliance with environmental legislation

To achieve these strategic goals the Department is divided in 8 programs with their sub-programs (Annexure 1). Protected Area management resorts under sub-program 8.3.2 Conservation Agencies and Services. The strategic objective of this sub-subprogram is that “The protected area network is secured, expanded and managed to ensure that a representative sample of biodiversity and key ecological processes are conserved”. The purpose of the sub-program is implementing mechanisms for management of ecologically viable areas, conserving biodiversity, protecting species and ecosystems of specific land areas, and related conservation activities. Also, to build a sound scientific base for the effective management of natural resources and biodiversity conservation decision making. Conservation agencies (either external statutory bodies or provincial departments) are primarily engaged in nature conservation as well as the tourism and hospitality industry, the management of provincial nature reserves, enforcement and monitoring within their areas and as well as research, education and visitor services.

This sub-program currently directly manages 8 nature reserves covering a total area of 75 261.5843 ha or 3.29% of the total Northern Cape protected area estate. This total area does not include areas managed in terms of management or co-management agreements. The Nature Reserves are divided into a western and eastern region and the current staff complement of the western region including DKNR is detailed in Table 4. ***Doornkloof Nature Reserve is currently critically understaffed.***

In addition, a range of other core government departments have important roles to play in ensuring that the DKNR is appropriately conserved and managed as set out in the sections below.

2.3.1.1 *Department of forestry, fisheries and Environment*

The Department of Forestry and Fisheries and Environmental (DFFE) is responsible for the overall co-ordination of environmental activities in South Africa and is also the custodian of all protected areas in terms of NEMPAA. It also co-ordinates environmental research, undertakes environmental education and ensures the implementation of environmental impact assessments, amongst other duties.

South Africa's Department of Forestry and Fisheries and Environmental (DFFE) is also tackling the critical challenge of natural resource management, environmental protection and infrastructure development and maintenance under the management of Environmental Programs (EP) through two divisions, namely Natural Resource Management (NRM) Programs and the Environmental Protection and Infrastructure (EPI) Programs.

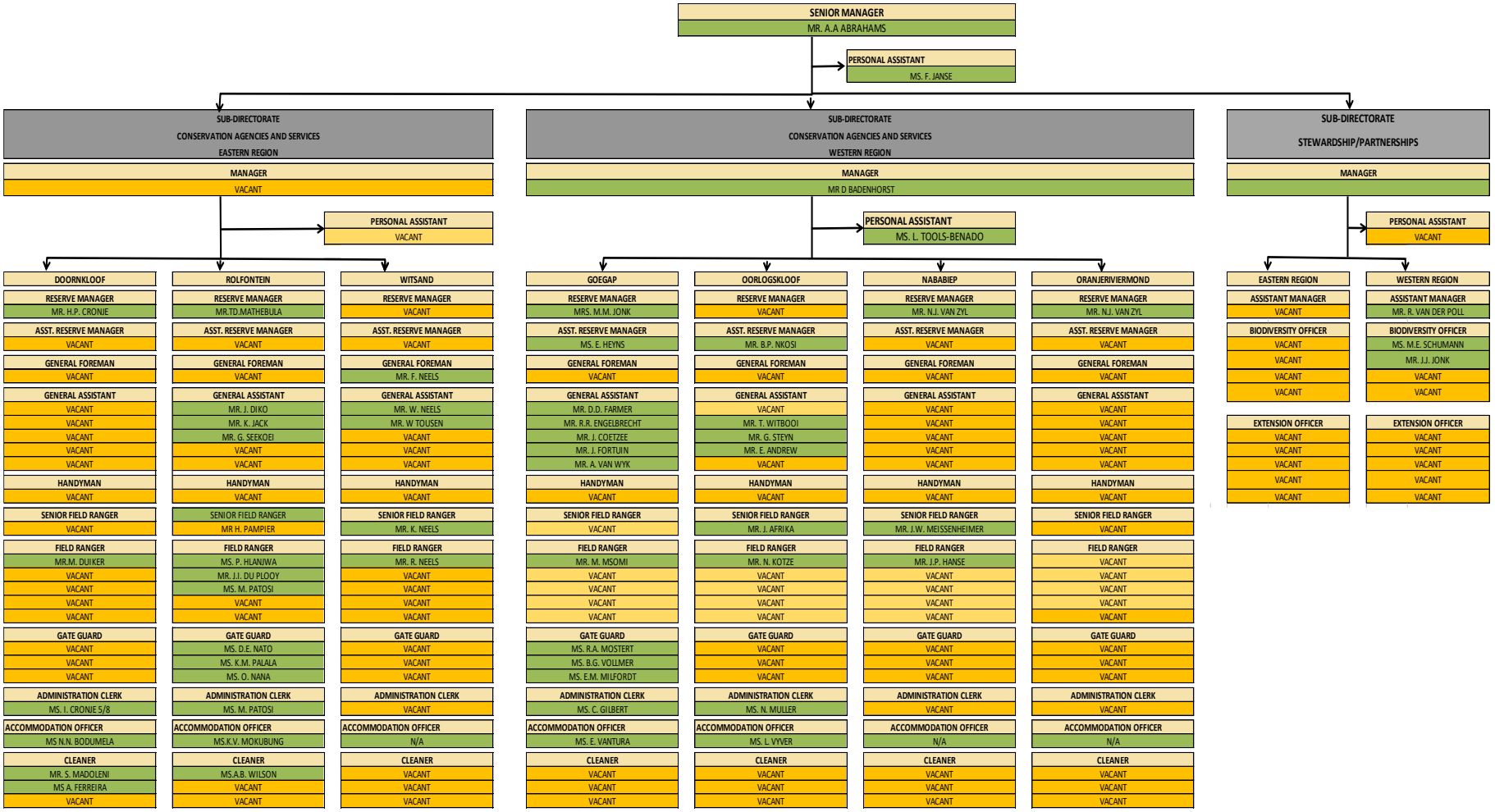
Natural Resources Management (NRM) Programs address threats to the productive use of land and water, and the functioning of natural systems. These range from invasive alien species clearing programs to wildfires and land degradation. NRM programs include the following:

- Working for Water
- Working for Wetlands
- Working on Fire
- Working on Land
- Working for Forests
- Working for Energy

Environmental Protection and Infrastructure (EPI) Programs manage the identification, planning and implementation of focal areas such as:

- Working on Waste
- Working for the Coast
- People & Parks
- Eco-Furniture Factories, a component of Working for Land,
- Greening and Open Space Management.

Table 4: Organizational structure of sub-program 8.3.2: Conservation Agencies and Services



2.3.1.2 *Department of Water and Sanitation*

The DWAS has the responsibility of developing tools and legislation related to water resource management; establishing appropriate institutional arrangements (CMA, other forums & advisory committees); and creating awareness and building capacity. Water resource planning, both quantity and quality, at catchment level, as well as the issuing of water use licenses and the enforcement and compliance of the provisions of the NWA also fall within the responsibilities of DWAS. Given the importance of catchment management in maintaining the integrity of the DKNR, the DWAS also has a very important role to play in ensuring the long-term protection and maintenance of the Reserve.
It is also the responsibility of the DWAS to develop legislation and policies related to water resource management, namely:

- Developing approaches, systems, tools, standards, objectives and strategies that support and promote the sustainable utilization of water resources;
- Facilitating the implementation of catchment management and other related strategies;
- Monitoring resource quality (this includes hydrological, water quality and bio monitoring);
- Auditing the state of South Africa's water resources against set objectives;
- Constructing & maintaining water-related infrastructure; and
- Setting water quality standards for the specific Water Management Area

2.3.1.3 *Department Roads and Public Works*

The provincial Northern Cape Department of Roads and Public Works (DRPW), in accordance with the Constitution, is responsible for Public Works functions, which relate to provincial functions and provincial state property (including State-owned Nature Reserves). The Department's mission is to provide and maintain all provincial land, buildings and road infrastructure in an integrated, sustainable manner.
The core functions of the provincial DRPW include:

- The provision and management of immovable properties that serve as a platform for the efficient delivery of various government services;
- Rendering an expert-built environment function that involves technical planning, design and construction management;
- Co-ordination of the expanded Public Works Programme.

2.3.1.4 *Department Sports, Arts and Culture*

Only the Western Cape, Eastern Cape and Kwa-Zulu Natal have Provincial Heritage Authorities, and consequently the national heritage authority, SAHRA administers heritage in the remaining provinces particularly where archaeology and palaeontology are the dominant concerns. Archaeology, including rock art, graves of victims of conflict and other graves not in formal cemeteries are administered by the South African National Heritage Authority, SAHRA. World Heritage Sites are administered by DFFE. Heritage Northern Cape (Ngwao Boswa Kapa Bokoni) a public entity established in terms of the National Heritage Resources Act is responsible for the protection, conservation, management and interpretation of the heritage resources of the Northern Cape. Amongst other things the latter administers:

- World Heritage Sites;
- Provincial Heritage Sites (except those defined as archaeological and paleontological sites, which are administered by SAHRA);
- Heritage Areas;
- Register Sites;
- Structures older than 60 years, but younger than 100 years or structures older than 100 years and still in use; and
- Public monuments & memorials.

2.3.1.5 *Department: Cooperative Governance, Human Settlements and Traditional Affairs (CoGHSTA)*

The mission of the Northern Cape Department of CoGHSTA is to facilitate and manage:

- integrated sustainable human settlements and infrastructure development for effective service delivery;
- facilitate, monitor and support the consolidation and sustainability phases at municipalities for integrated, sustainable service delivery;
- promote and support inter-sphere engagement for integrated planning and coordination;
- facilitate, develop and support systems and structures to enhance traditional leadership; and
- ensure the efficient, effective and economic utilization of departmental resources to maximize service.

2.3.1.6 *Department of Rural Development and Land Reform*

The Spatial Planning and Land Use Management Branch of the department are to:

- Develop policy and standards, provide support and monitor implementation of SPLUM legislation and capacitate planning institutions;
- Provide spatial planning information and environmental planning services;
- Provide integrated spatial planning support;
- Manage projects at Branch level;
- Provide programme management support; and
- Provide service delivery coordination services.

This branch through the local municipality will be responsible for the implementation of the Northern Cape Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013). This act provides for the spatial planning, land use management and development of land in the Northern Cape Province in a sustainable manner, by means of the coordination and alignment of land use, land development policies, plans and systems of all spheres of government through the development of a single spatial structuring system, which ensures that sustainable development is developmental, consistent, uniform, transparent and inclusive in nature.

The function of the Land Redistribution and Development Branch of the department is to:

- Provide land acquisition and strategic institutional partnerships;
- Provide PLAS trading account's financial management services;

- Develop and provide strategic support to farmers and cooperatives;
- Provide land reform programme support and service delivery coordination; and
- Provide land acquisition and recapitalisation & development services at regional and district level.

2.3.1.7 *Department of Transport, Safety and Liaison*

The mission of the Northern Cape Department of Transport, Safety and Liaison is to enable a safe and secure environment and mobility for the community of the Northern Cape through:

- good corporate governance, management, administration and support;
- establishing and supporting community safety partnerships;
- monitoring and oversight of the police;
- facilitating and coordinating social crime prevention and road safety programmes;
- educating, enforcing and administering road traffic legislation;
- liaison with all relevant stakeholders, role-players and clients pertaining to policing, safety and security; and
- provision of an integrated transport system and operation for goods and people.

2.3.2 *Institutional Arrangements Specifically Relevant to DKNR*

2.3.2.1 *Local Community, NGO's and Private Landowners*

All of the properties included in the DKNR are state-owned and no community or private land is included in the Reserve. The Reserve is managed by DAERL. Stakeholder consultation and support is an important aspect of effective protected area management. It is also a requirement in terms of Sections 39(3) and 41(2)(e) of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003). Accordingly, the development of this 5-year IMP has been undertaken through a collaborative process involving local communities and other key stakeholders. Stakeholder engagement has furthermore also been set as a Key Performance Area in this 5-Year IMP: Strategic Implementation Framework: KPA 5 namely:

- Stakeholder Involvement.

To give effect to the objectives of the NEMPAA section 2(f) to promote participation of local communities in the management of protected areas, where appropriate, and Section 41(2)(e) that states a management plan must contain procedures for public participation, including participation by the landowner, any local community or other interested party DKNR has to establish a protected area advisory committee (PAAC). A PAAC provides a means for a legitimate platform through which to communicate Nature Reserve and Protected Environment issues to ensure participation of all stakeholders on matters of mutual relevance affecting the Reserve. It is expected that the PAAC will facilitate a constructive interaction between the Reserve and the surrounding communities / stakeholders. PAACs are established to encourage the building of constituencies in support of the natural and cultural heritage conservation goals of the Northern Cape. PAAC's are not decision-

making institutions but are crucial for adherence to Batho Pele Principles. The Batho Pele Principles adopted by the DKNR relative to service delivery and accountability embraces ***the process of consultation; high service standards; access to services; embracing an attitude of courtesy; provision of accurate and reliable information; embracing an open and transparent work ethic; providing a platform to redress unsatisfactory performance; managing for value for money (i.e. seek to do the best with the resources that are available); encourage innovation and reward service excellence; facilitate positive customer impact and pursue leadership and proactive planning.***

2.3.2.2 *Linkages with the Gariep Dam Nature Reserve, Karoo Seekoei River Nature Reserve and immediately adjacent landowners*

The Gariep Nature Reserve is located 62km south-east (upstream) of DKNR along the northern shore of the Gariep Dam (formerly known as the Hendrik Verwoerd Dam) along the Orange River in the Free State between the towns of Gariep Dam and Bethulie. The Oviston Nature Reserve is located on the Free State/Eastern Cape Boundary along the southern shore with the Tussen- die- Riviere Nature Reserve located along the eastern shore of the Gariep Dam. The Gariep and Tussen-die-Riviere Nature Reserves are both managed by DETEA. The Oviston Nature Reserve is managed by the Eastern Cape Parks & Tourism Agency. The indicated protected areas including DKNR and the RNR protected area are therefore linked together through the common aquatic system namely the Orange River and the ecological services provided by it (*e.*g. providing important habitat for indigenous aquatic fish and bird species). Adverse occurrences (e.g. drought, excessive flooding, chemical spillage) in the Gariep Dam, Orange River and surrounding areas could potentially negatively affect the ecological integrity of the DKNR.

The expansion of the Gariep Dam Nature Reserve resulted in the establishment of the Lake !Gariep Initiative with the purpose of establishing a tri-provincial (cross boundary), prosperous and sustainable development entity with a primary focus on conservation and tourism development. The provinces involved are the Free State, Eastern Cape and the Northern Cape. The envisaged impact areas of the Lake !Gariep Initiative include the DKNR and RNR (Figure 5). An optimistic and long-term conservation initiative would be the creation of a protected area linking DKNR with the Lake !Gariep and the Karoo Seekeoi River Nature Reserve. Developments in this regard are however tedious and requires support from both government and the private sector.

The Karoo Seekoei River Nature Reserve (KSRNR) is an initiative by the private sector to amalgamate all the properties adjacent to the Seekoei River (though partnerships with adjacent landowners) and thus establish as Nature Reserves encompassing the entire length of the Seekoei River (*i.e* 300km) (Figure 6). This river originates on the northern slopes of the Campassberg (on provincial border between the Northern and Eastern Cape), the highest free-standing peak in the Cape at 2052 *m.a.s.l.* It starts with three tributaries in the New Bethesda, Richmond and Noupoort districts. The Seekoei River one of the largest tributaries of the Orange River of which only 17.37km of 300km (*i.e.* 5.7%) is formally protected. The vision of the KSRNR is to have all fifty-seven (57) farms through which the Seekoei River traverses formally proclaimed as a protected area which will expand over an area 450 000ha (Figure 6).

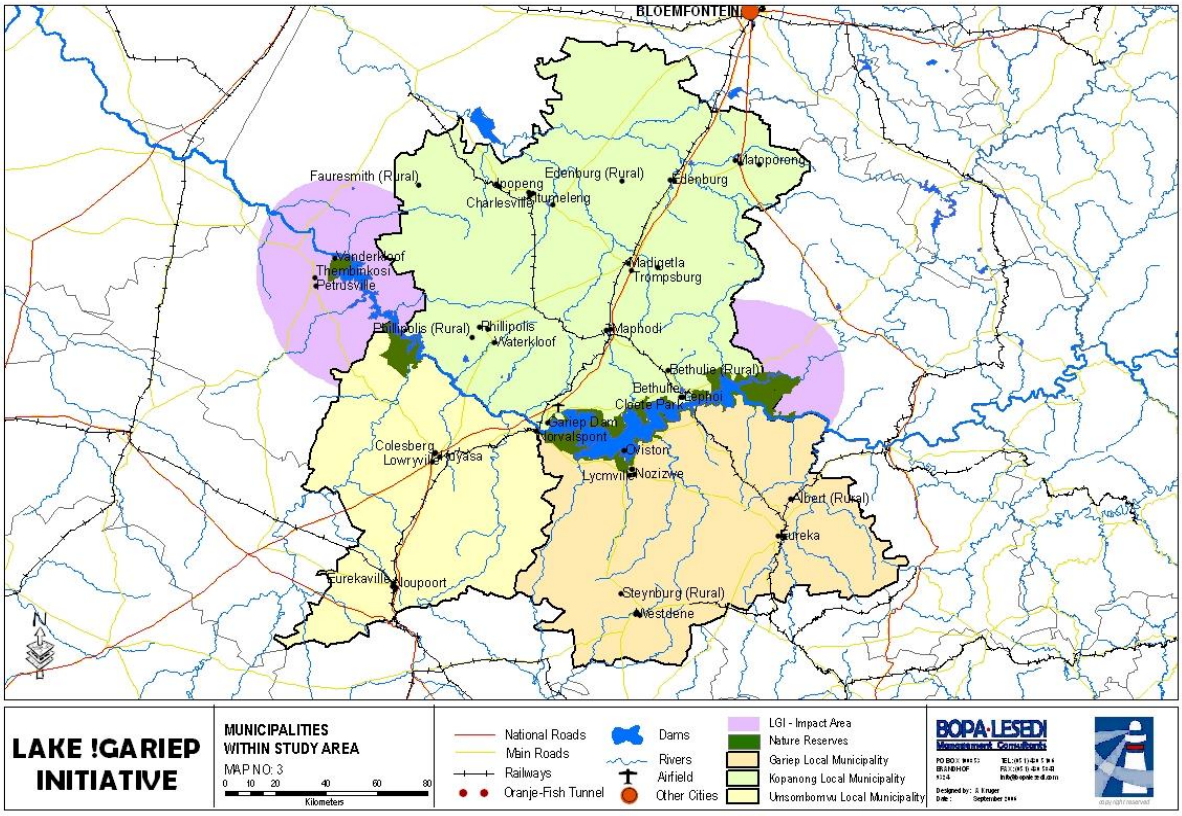


Figure 5: Impact area of the Lake !Gariep Initiative.

Currently four (4) farmers have signed a land incorporation agreement covering a surface area of 30 000ha. This initiative is of paramount conservation importance and will contribute to the province's conservation targets. In support of this initiative the DAERL could assist in provision of game species. It is thus of conservation importance that maintain a pro-active partnership with the KSRNR. Management practices along the entire length of the Seekoei River need to incorporate conservation best practice. Environmental problems upstream have the potential to negatively affect the conservation integrity of the DKNR and possibly the Vanderkloof Dam. It is thus of paramount importance that a platform be put in place that will communicate best conservation practices to all the landowners along the length of the Seekoei River at least bi-annually. The formal establishment of the KSRNR will ensure best conservation practice and benefit the conservation of the Seekoei River.

The DKNR is surrounded to the south, west and north by two private landowners. These properties are Lahou Valley Northern Cape (15 000ha), Hunters Moon Game Ranch (30 000ha) and Desert Star (10 000ha). Good neighbour relations exist between the DKNR and the landowners which enables conservation management and prompt emergency response. All the landowners support the conservation of the DKNR and the adjacent properties. The expansion of the DKNR is dependent on the functional relationship between DKNR and the adjacent landowners.

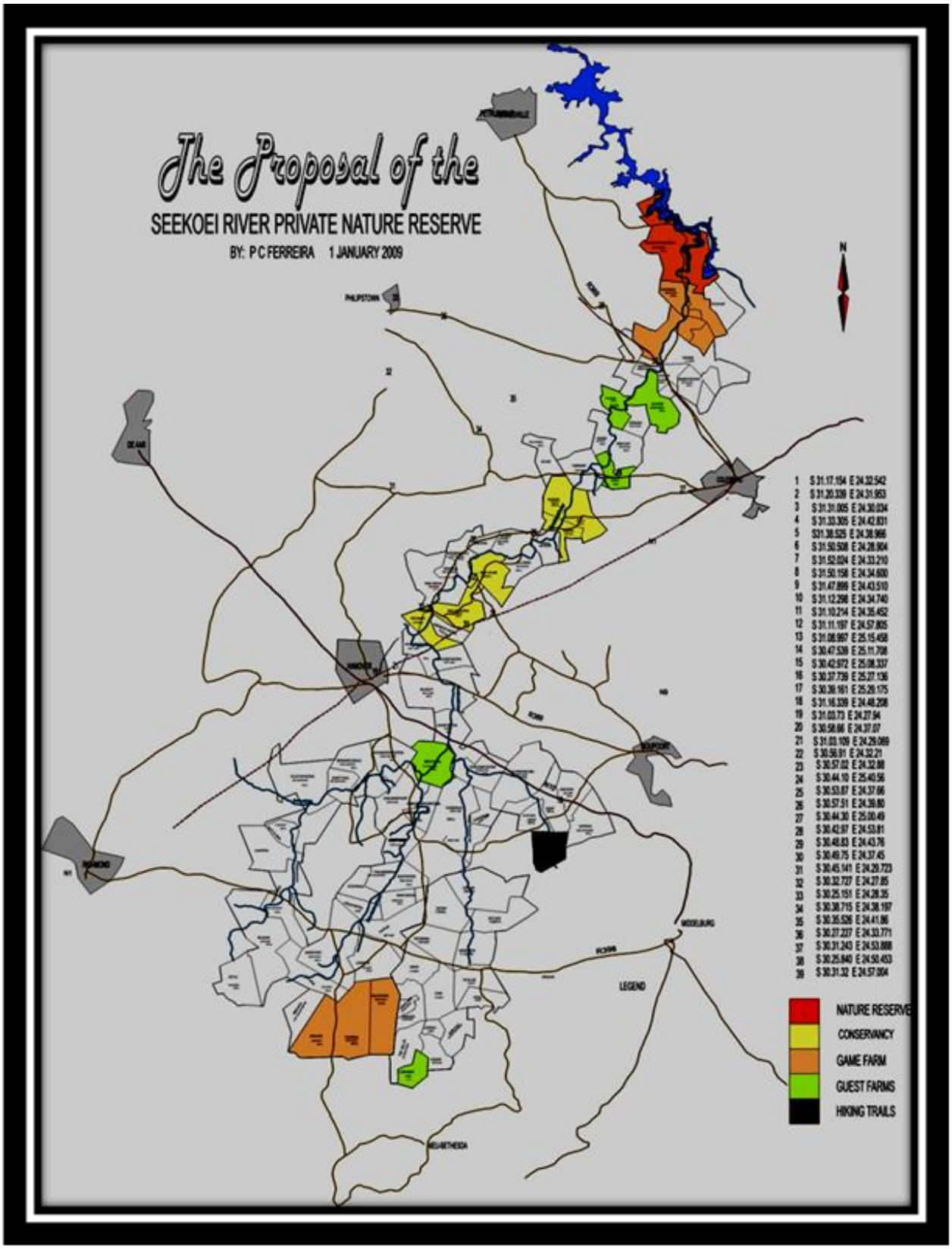


Figure 6: The KSRNR relation to the DKNR (1 January 2009).

In the absence of available budgets to purchase land the expansion of the DKNR will be subject to operational and co-management management agreements. This was negotiated previously, however equitable benefit sharing between government and the private landowners and how this would be practically defined and implemented, was problematic. This could be overcome through the establishment of a trading entity. The private landowners are still interested in forming a partnership, but this now relies on DAERL to put forward attractive proposals.

2.3.2.3 *Linkages with Important Bird Areas*

The DKNR falls within the immediate vicinity of *(i.e.* it currently touches the DKNR's northern boundary) the Platberg-Karoo[4] Conservancy IBA (Number: SA037, Global IBA A1, A3, A4i & ii) and covers the entire districts of De Aar, Philipstown and Hanover, including suburban towns (Figure 7). The Platberg-Karoo Conservancy was established on 31st July 1990 and covers an area of 1 246 330 ha. The Platberg-Karoo Conservancy is recognized as an Important Bird Area because of the significant occurrence of two globally threatened species eg the Lesser Kestrel, (*Falco naumanni)* and Blue crane (*Anthropoides paradiseus*), four nationally threatened species, including Kori Bustard (*Ardeotis kori)* and Ludwig's Bustard (*Neo ludwigii)* and several globally and nationally near-threatened species including Blue Korhaan (*Eupoditis caerulescens)*, Black stork (*Ciconia nigra)* and Secretary bird *(Sagittarius serpentarius*) (Barnes & Anderson 1998). Biome (*i.e. Eastern mixed Nama-Karoo*) restricted species include Karoo Lark (*Calendulauda albescens)*, Karoo Long-billed Lark (*Certhilauda subcoronata)*, Karoo Chat (*Cercomela schlegelii)*, Tractrac Chat (*Cercomela tractrac)*, Sickle-winged Chat (*Cercomela sinuate)*, Namaqua Warbler (*Phragmacia substriata)*, Layard's Tit-Babbler (*Sylvia layardi)*, Pale-winged Starling (*Onychognathus nabouroup*) and Black-headed Canary (*Serinus alario)*. Congregatory species include Lesser Kestrel *(Falco naumanni)*, and Amur Falcon (*Falco amurensis*). Within the timeframe of this document the DKNR will formally be included with the Platberg-Karoo IBA.

The Upper Orange River[5] IBA (Number SA051; Global IBA A1, A3, A4i & ii) is located 67 km southeast of the DKNR. The Upper Orange River IBA (formerly known as Gariep Oviston Tussen-Die-Riviere IBA) consists of a set of Reserves that surround the Gariep Dam on the Orange (Gariep) River. The Gariep Dam Nature Reserve covers most of the dam in its northern the northern section; the Tussen-Die-Riviere Nature Reserve lies in the east and wedged between the Caledon and Orange rivers; and Oviston Nature Reserve is in the centre. The smaller

[4]http://www.birdlife.org.za/conservation/important-bird-areas/iba-directory/item/178-sa037-platberg-karoo-conservancy

[5] http://www.birdlife.org.za/conservation/important-bird-areas/iba-directory/item/192-sa051-upper-orange-river

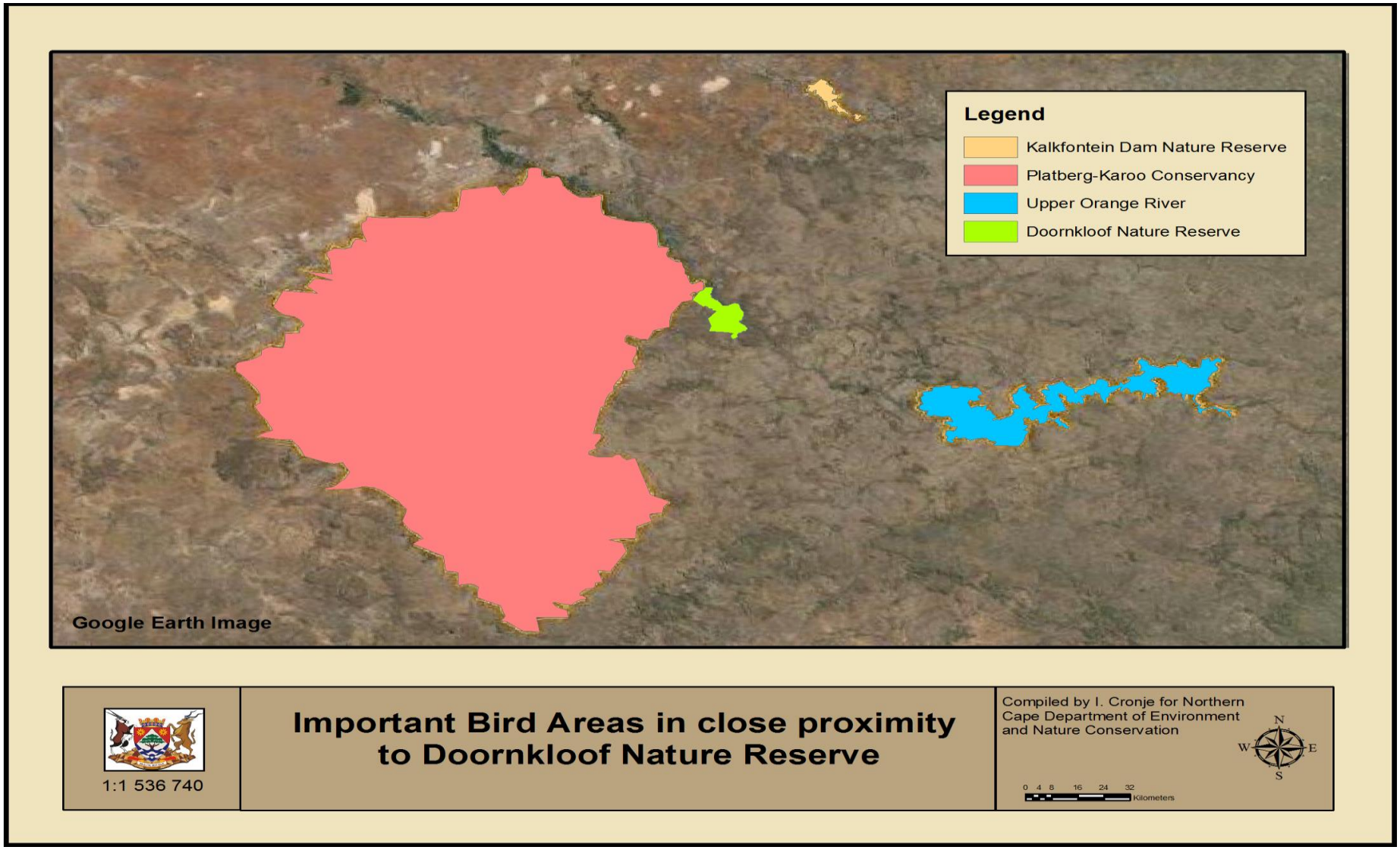


Figure 7: The location of the Platberg Karoo, Upper Orange River and Kalkfontein Dam IBA's in relation to the DKNR.

ephemeral rivers running into the dam are the Bossiesspruit, Brakspruit, Broekspruit, Oudagspruit, Palmietspruit and Slykspruit. Globally threatened species are Blue Crane (*Anthropoides paradiseus*) (100–300; B Colahan CWAC data), Blue Korhaan (*Eupodotis caerulescens*), Melodious Lark (*Mirafra cheniana)*, Ludwig's Bustard (*Neotis ludwigii*) and Secretary bird (*Sagittarius serpentarius*). Regionally threatened species (450 birds; B Colahan CWAC data) are breeding Caspian Tern (*Hydroprogne caspia*), Karoo Korhaan (*Eupodotis vigorsii*), Greater Flamingo (*Phoenicopterus roseus*) and Verreauxs' Eagle (*Aquila verreauxii*). Karoo Chat (*Cercomela schlegelii*), Sickle-winged Chat (*Cercomela sinuata*), Layard's Tit-Babbler (*Sylvia layard*), Namaqua Warbler (*Phragmacia substriata*), Black-headed Canary (*Serinus alario*) and Pale-winged Starling (*Onychognathus nabouroup)* are biome-restricted species. Congregatory species include Egyptian Goose (*Alopochen aegyptiaca*), Yellow-billed Duck (*Anas undulata*) and South African Shelduck (*Tadorna cana*).

The Kalkfontein Dam IBA (Number SA 050; Sub-regional IBA C4i, ii) is located 90km northeast of the DKNR in the southwestern part of the Free state. The IBA is fully protected and managed by DETEA. Globally threatened birds are Lesser Flamingo (*Phoeniconaias minor*) and Black-winged Pratincole (*Glareola nordmanni)*. Regionally threatened species are Caspian Tern (*Hydroprogne caspia*) and Greater Flamingo (*Phoenicopterus roseus)*. Caspian Tern have been recorded breeding on islands in the dam. Congregatory waterbirds include Great Crested Grebe (*Podiceps cristatus*), African Spoonbill (*Platalea alba)*, South African Shelduck (*Tadorna cana)*, Red-knobbed Coot (*Fulica cristata)*, Little Grebe (*Tachybaptus ruficollis)*, Egyptian Goose (*Alopochen aegyptiaca)*, Cape Shoveler (*Anas smithii*) and White-winged Tern (*Chlidonias leucopterus*).

The indicated IBA's are similar in the conservation role they play in providing habitat for several bird species. However, of the three, the Platberg Karoo IBA is not fully protected because it is not limited to the confines of a formally protected area. The Platberg Karoo IBA has the largest surface area with several landowners. The conservation success of this IBA will be a function of the conservation commitment of all its stakeholders.

Small isolated reserves cannot fulfill the conservation requirements of large, wide-ranging, non-passerine birds. The only feasible long-term approach to conserving these species is to manage the agricultural landscape in which they occur. The land forming the Platberg Karoo IBA is used primarily for grazing and agriculture. Commercial livestock farming is mostly extensive wool and mutton production, with some cattle and game farming. Less than 5% of this IBA is cultivated under dry-land or irrigated conditions and includes lucerne and prickly pear *Opuntia ficus-indica* orchards. The Platberg-Karoo Conservancy is an example of how conservation can be achieved without sacrificing the farming potential of the land. The focus of the conservancy has included seeking selective and environmentally acceptable methods to control problem mammalian carnivores (such as the Black-backed Jackal, *Canis mesomelas*) and the Brown Locust (*Locustana pardalina*). In summer, close to 10% of the global population of Lesser Kestrels, *Falco naumanni* roost in this IBA. Amur Falcons, *F. amurensis* are also abundant and forage and roost with Lesser Kestrels. This IBA is seasonally important for White Stork (*Ciconia ciconia)*, and CARs (*i.e*. coordinated avifaunal road counts) indicate

high numbers of this species during outbreaks of brown locusts (*Locustana pardalina*) and armoured ground crickets (*Acanthoplus discoidalis)*.

Protected areas within the IBA include the DKNR (*i.e.* northern buffer zone) and Rolfontein Nature Reserves. The Seekoei River Valley Nature Reserve is private conservation initiative that aims to formally establish a protective area including the entire length of the Seekoei River through the DAERL's stewardship programme. Several game farms exit in the IBA which also contribute to the conservation initiatives of IBA. The Platberg Karoo Conservancy initiative is currently inactive and primarily only exists on paper (R. Visagie, EWT, *pers. comm*). The IBA will need to be re-assessed originating from the DNKR and RNR with the inclusion of landowners that are willing to commit to the re-vitalization of the Platberg Karoo Conservancy and the continued stakeholder protection of this IBA. The current involvement of the DKNR in the conservation objective of the IBA is the participation in seasonal (*i.e*. summer and winter) Coordinated Waterbird Counts (CWAC) and Karoo Large Terrestrial Bird Surveys (KLTBS). The data collected is sent to the Animal Demographic Unit of the University of Cape Town. The Animal Demography Unit (ADU) launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part South Africa's commitment to international waterbird conservation. It is one of the largest and most successful citizen science programmes in Africa, providing much needed data for water bird conservation around the world. Currently the project regularly monitors over 400 wetlands around the country, and furthermore curates water bird data for over 600 sites. DKNR will investigate the revitalization of the Platberg Karoo Conservancy and possible re-alignment of the Platberg Karoo IBA within the validity of this IMP.

2.4 Reserve description

2.4.1 *History*

The first inhabitants of the area were Bushmen who hunted game for food and undertook small scale farming (Sampson & Sampson 1994; Badenhorst 1997). In 1836 land on which the DKNR is now established was allocated for stock farming (Badenhorst 1997). These were further subdivided as families and occupants of the land increased. At one stage there were three farm schools operating in the area but were terminated as the town of Colesberg grew. Grave sites of previous landowners and their labourers are scattered throughout the DKNR. During the Anglo-Boer War (1899-1902) intensive battles took place in the area. Remains of a British Fort and two watch towers that were used by General De Wet can still be seen on the DKNR today. Mr. A Steedman, a naturalist and explorer travelled the length of the Seekoei (previously called the Seacow) River in 1830 to its confluence with the Orange River and documented in particular the regular occurrences of lion and hyaenas (Sampson & Sampson 1994), thus indicating their historical occurrence to the current DKNR and surrounds. The last Cape Lion is stated to have been shot by Capt. Copland Crawford in 1836 in close proximity to the town of Colesberg[6]. A photograph of the only relic of the Cape Lion preserved in the world today is on display in the Kemper Museum situated in the town of Colesberg in the Northern Cape Province.

[6] Information provided by the Kemper Museum, Murray str., Colesberg, 9795.

With the construction of the Vanderkloof Dam (previously known as the P.K. Le Roux Dam) during 1971 several properties were purchased by the Department of Water Affairs and Sanitation along the Orange River which would fall within the flooding zone of the dam. These properties were then transferred to the Cape Provincial Administration in 1974 who rented the properties until proclamation was finalised on the 12th of September 1981 as the Doornkloof Nature Reserve.

2.4.2 *Climate*

The climate of a location is affected by its latitude, terrain and altitude, as well as nearby water bodies and their currents. Climates can be classified according to the mean of typical ranges of different variables, most commonly temperature and precipitation. The areas' summer and winter months are characterized by extreme temperature fluctuations. Summer can be extremely hot and winter very cold with icy nights, frost and occasional light snowfalls. Temperatures range from -8 ºC in July to 41 ºC from November to February. DKNR falls within the summer rainfall region of South Africa. The mean annual rainfall varies between 300 mm to 400 mm, which occurs mainly as thunderstorms during summer. The long-term mean precipitation of the Reserve over a period of 41 years is 357mm. The highest rainfall record for the DKNR was 770mm in 1991. Of ecological importance is the use of the seasonal (*i.e.* July to June) precipitation in contrast to annual (*i.e.* January to December) precipitation. This allows precipitation data to be linked with rangeland monitoring data in interpreting the relationship between the two. The rangeland condition data collected in April of each year is the product of the rainfall received from July of the preceding year until April and thus not only the rainfall received from January to April as an example. Dry summer storms are common (October to December), before the onset of the wet season, which often result in lightning fires. Wind direction is predominately in a north-westerly direction. Windy conditions occur mostly from September to February with relatively calm conditions from March to August. Weather condition data is supplied from a weather station stationed at DKNR that was erected by the ARC in September 2011.

Doornkloof ARC automated weather station, HP Cronje

The mean rainfall for the DKNR is the mean taken from four rain gauges located at Soutplaat, Doornhoek, Ou Doornkloof and PV gate. The reason for this is that precipitation is not evenly distributed. The site-specific climate data for DKNR over 11 years (2010 to 2021) is provided in Figures 8 and 9.

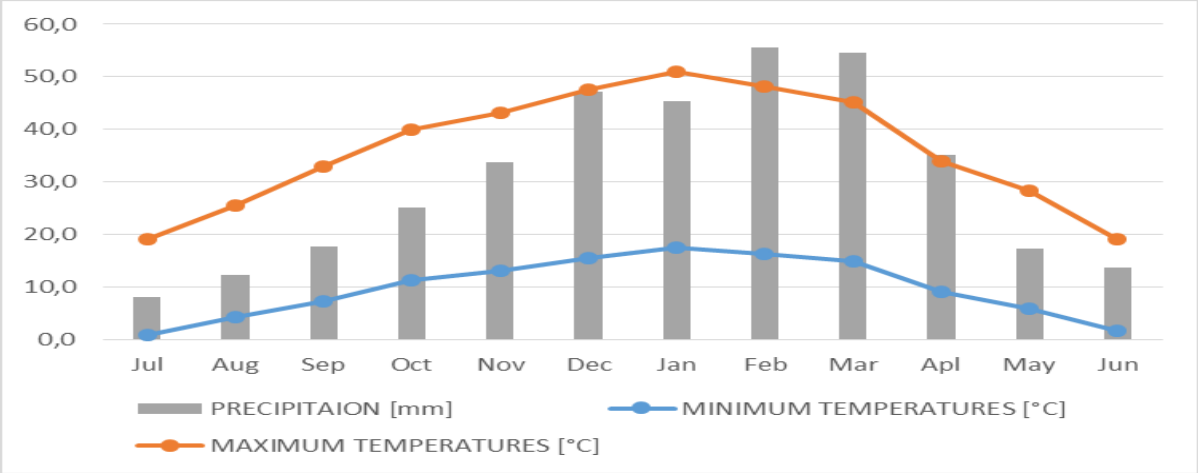


Figure 8: Average monthly rainfall and maximum and minimum temperatures[7] over a period of 11 years (2010 to 2021).

This weather station forms part of a network of weather stations used by the ARC for climatic monitoring in South Africa. The CSIR created a detailed revised Köppen-Geiger map to quantify the current climatic conditions as accurately as possible in South Africa (Schulze 1994; Kruger 2004; Kottek *et al* 2006). This classification uses a concatenation of a maximum of three alphabetic characters that describe the main climatic category, amount of precipitation and temperature characteristics. DKNR is located in BSk (Arid, Steppe, Cold arid) climatic region (Figure 10).

The effect of rainfall on the vegetation is well known and is more profound in drier regions. Most of the precipitation occurs in the late summer with the maximum average rainfall being in March and the minimum in July (Werger 1980; Esler *et al.* 2006). In the dry Karoo region, the amount of precipitation has a great impact on the vegetation. During wet years Karoo rangeland have high production levels of annual and short-lived perennials (O'Conner & Roux 1995). Esler *et al*. (2006) also state that the level of grassiness in the Karoo varies from year to year depending on the timing and quantity of precipitation. These rapid changes in vegetation are due to the ability of annual plants to grow rapidly after precipitation and thus quickly covering bare ground (Esler *et al*., 2006).

The predominant wind direction at the DKNR is in northwesterly direction (Figure 10) followed by southerly and then westerly wind directions. Conditions are calm 30.9% of the time.

[7] Reserve Weather Station: Latitude: 24.98069°; longitude: 30.38077° (decimal degrees; Altitude: 1199 m above sea level.

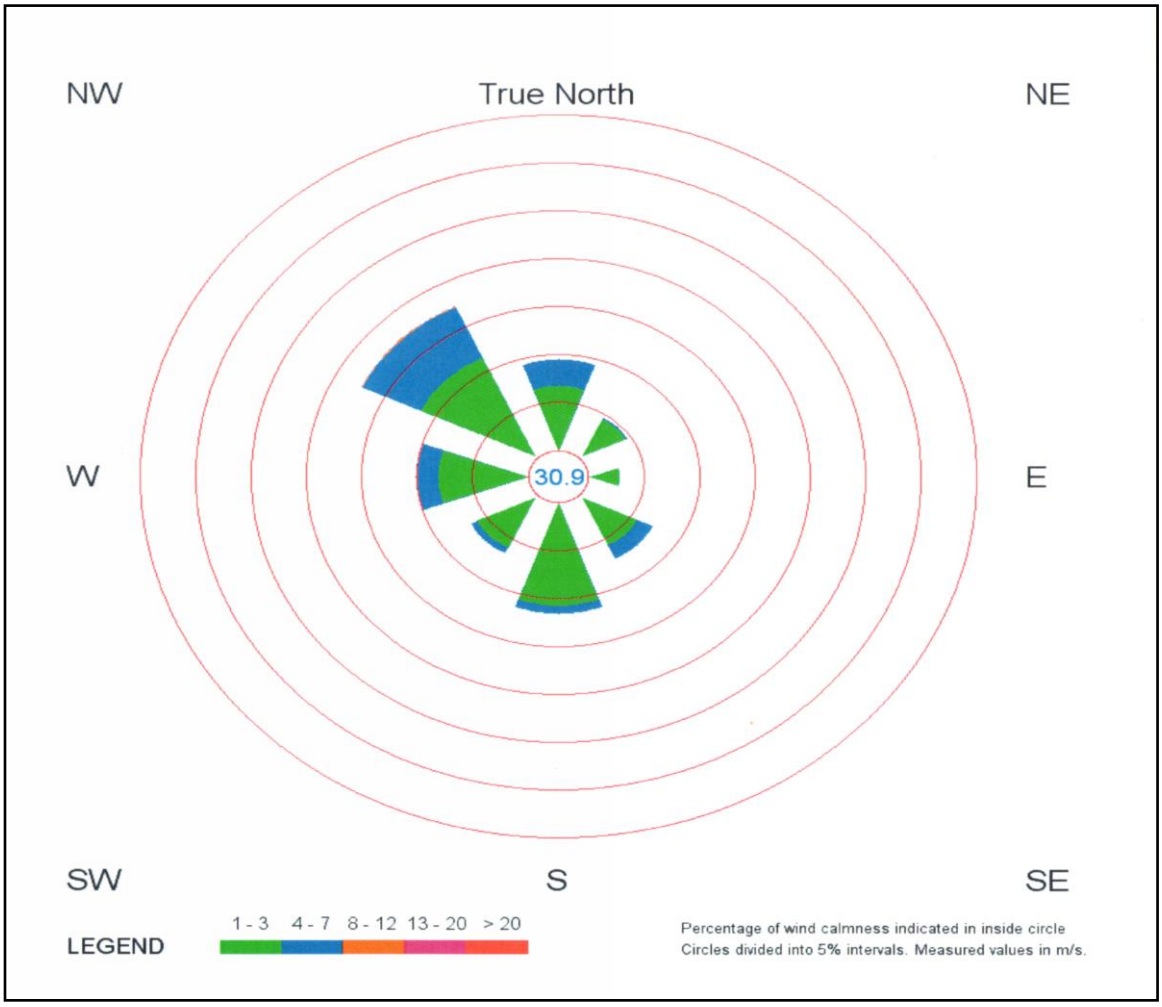


Figure 9: Mean windrose for the DKNR over 11 years (2010 to 2021).

2.4.2.1 *Climate change*

Climate change can be described as the increased frequency with which anomalies occur, *i.e.* positive or negative weather conditions to which people have not as yet adjusted. It is predicted that the Karoo could experience more drought periods, coupled with increased evaporation and temperatures and this will negatively impact already restricted water supply and rangelands. Regional predictions suggest a drying trend from west to east, a shift to more irregular precipitation of possibly greater intensity, and rising temperatures everywhere. It is likely that the greatest impacts will be on water supply (Midgley *et al*. 2005).

This highlights the importance of protecting water resources from over-abstraction, degradation and the spread of invasive alien plants (which use more water than indigenous plants). Management of mountain catchment areas is critical in this regard, as they are the primary source of our water supply. The increase in temperatures anticipated with climate change may result in increased fire frequencies. Invasive alien plants are often highly flammable and with their large volumes, are likely to fuel more frequent fires. The combination of more frequent and intense fires will have a devastating impact on the region. One of the most effective ways to mitigate against the impacts of climate change, at the local level, is to

safeguard the biodiversity of the area. The conservation integrity of ecosystems is thus of paramount importance and management actions should not have a negative impact on them. The DKNR falls within an ecotone between the broad Grassland and Karoo vegetation types. Climate change with regard to a negative change in precipitation will favour the predominance of the Karoo vegetation and result in the degradation of the current biodiversity assemblage.

Climate change will exacerbate these challenges, especially if species are likely to shift geographically as their optimum climate zones shift, shrink or even disappear. Coping with fire and alien invasive species may become even more difficult. Therefore, a good understanding of the basic principles of ecosystem functioning will be essential in sustainable management approaches (Freeth R., *et al.* 2007).

Bomhard and Midgley (2005) summarize the potential climate change impacts on biodiversity as follows:

- ***Species distributions***
  - Individualistic species responses in latitudinal and altitudinal directions;
  - Individualistic species responses to warmer/cooler and drier/moister conditions;
  - Geographic variation in the magnitude of species responses to the changing conditions;
  - Species range shifts/losses due to range expansions, contractions and eliminations;
  - Species range shifts relative to reserve boundaries: net loss/gain of species in reserves;
  - Local, regional and global extinctions of species due to the changing conditions;
  - Spread of invasive alien species and/or pathogens and parasites.

- ***Community composition and configuration***
  - Changes in presence/absence and relative/absolute abundance (evenness/richness);
  - Formation of non-analogue communities (new species assemblages).

- ***Ecosystem functioning, services and states***
  - Changes in phenology (the timing of events such as flowering);
  - Changes in nutrient cycling and natural resource supply (e.g. water);
  - Changes in predator-prey, parasite-host, plant- pollinator and plant-disperser relationships pollination and soil stabilization;
  - Ecosystem switches following changes in ecosystem functioning and disturbance regimes.

- ***Disturbance regimes***
  - Changes in the intensity, frequency and seasonality of periodic and extreme events such as fires, floods, droughts and other extreme weather events;
  - Changes in human land use pressures (global change synergies).

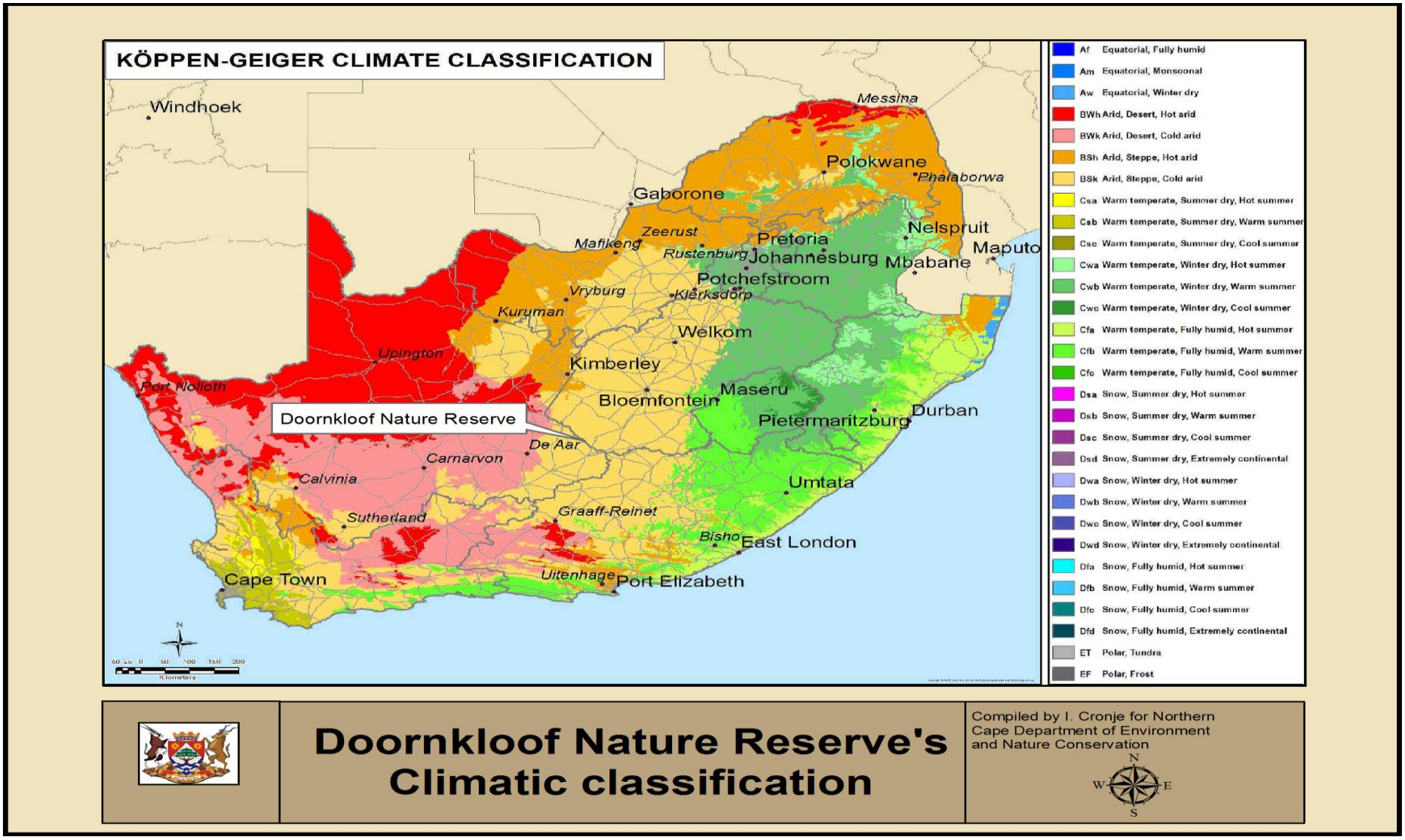


Figure 10: Climate regions of South Africa.

The initiation of additional biodiversity component monitoring programmes and the enhancement of the current programmes (*i.e.* sensitive to change) will aid in decision support in managing the DKNR to mitigate the effects of climate change.

Protected areas are an essential part of the global response to climate change….Without them, the challenges would be even greater, and their strengthening will yield one of the most powerful natural solutions to the climate crisis."[8] The Nama-karoo biome is a poorly conserved biome and the size and design of the current protected areas in this biome (*i.e.* small and of poor conservation design) will only be beneficial if cumulative ecological services at large scales are incorporated into the DKNR. This can be achieved through the adoption of the expansion strategy of the DKNR while also assimilating the KSRNR and Lake !Gariep initiatives and the possible formation of a trans-provincial collaborative conservation initiative between the private sector and the Northern Cape and Free State governments specifically targeting property adjacent to the Vanderkloof dam.

The application of best practice conservation management of the collective area will yield improved responses to climate change due to its larger conservation contribution to ecological services in in contrast to smaller inconclusive conservation areas. The establishment of corridors (natural) linking distant conservation area is also a tool to allow species migration relative climate change events.

2.4.3 *Topography*

The topography of any area is defined by the physical features of the land represented by relief and contour characteristics. Doornkloof is characterised by a mountainous terrain with no true plains. This characteristic has led to the formation of several relief lineages predominantly draining in an easterly direction into the Seekoei River and Vanderkloof Dam. The elevation attributes of the Reserve ranges between 1084 – 1764 metres above sea level (*m.a.s.l.*). Doornkloof incorporates 17.37km of the Seekoei semi-perennial river, with its confluence with the Orange River being at the central northern-eastern boundary of the Reserve at the co-ordinates 30.2988889˚ S and 25.0116694˚ E (d.dddddd). The highest peak in the DKNR is 1764 metres above sea level. Two trigonometry beacons are located in the DKNR namely as Holvarth with the name Vaalkop (30.266981˚S; 24.9311˚E) in the far North and Doornhoek (30.37795˚S; 25.05225˚E) in the south-eastern part of the reserve (Figure 11). From the digital terrain model map (Figure 11) it is evident the conservation design of the DKNR is incorrect. The majority of the western boundary traverses the edge of the mountain range west of DKNR. Inclusion of the mountainous areas of Grasberg and Hartzenberg will improve the conservation design of the DKNR. Too little of the mountain ranges currently in DKNR are effectively conserved. The inclusion of Twyfelberg into the DKNR also makes better conservation sense as the south-eastern boundary also traverses the edge of the mountain (Twyfelberg). The south-eastern boundary of the Reserve (Twyfelberg) as indicated in Figure 4 needs to be amended. The boundary as

8 http://www.iucn.org/about/union/commissions/wcpa/?4345/Natural-Solutions---Protected-Areas-Helping-people-cope-with-climate-change

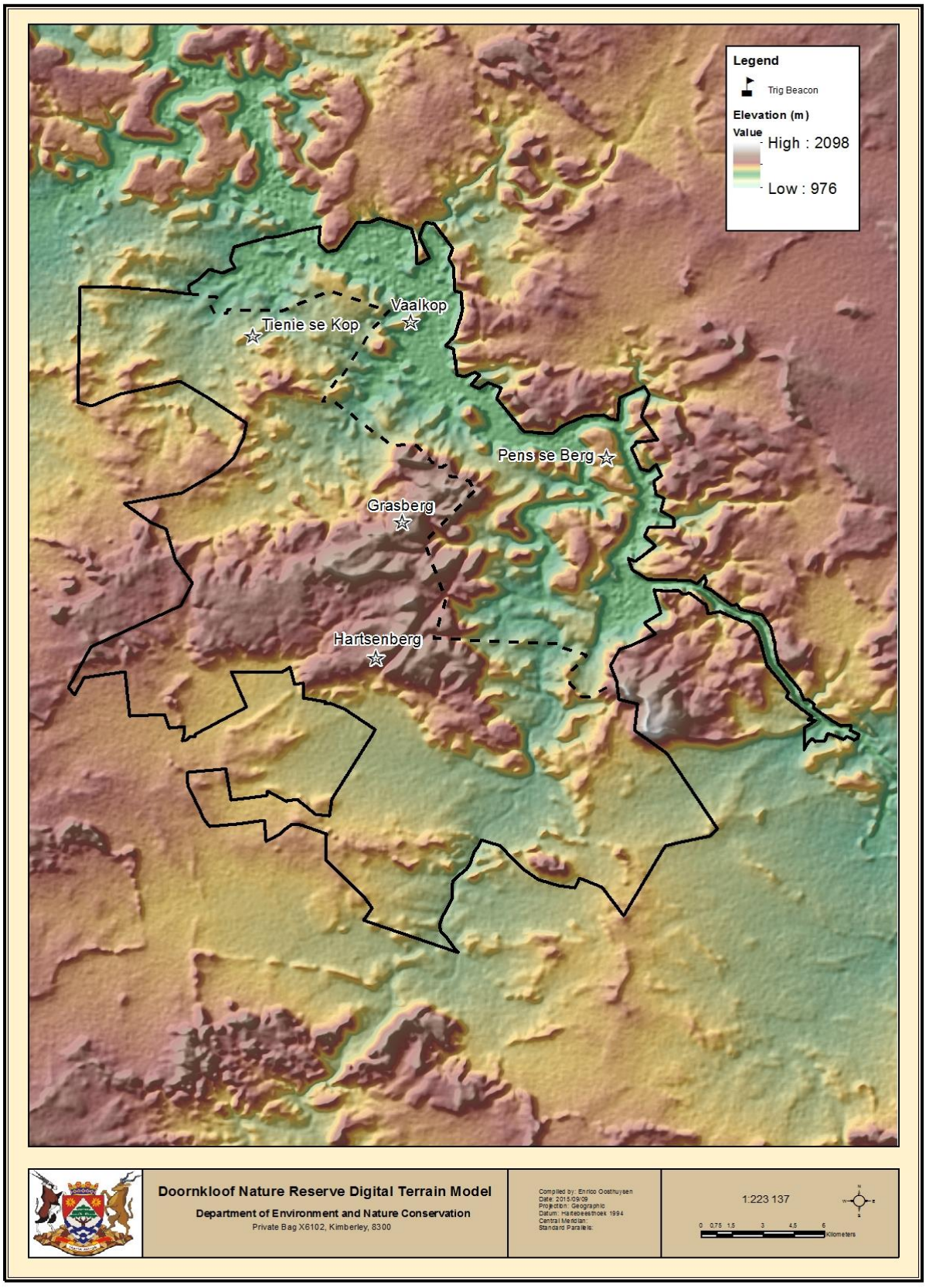


Figure 11: Digital Terrain Model Map of the DKNR**.**

indicated is the proclaimed boundary of the Reserve, but in reality, differs because of the difficulty in changing the boundary historically, and was left as is and technically is now part of the DKNR. Processes to officially include this area into the reserve proclamation must be finalized during the validity of this IMP.

2.4.4 *Geology and Soils*

2.4.4.1 *Geology*

All the rocks which outcrop in the DKNR form part of the late Carboniferous to Jurassic age Karoo Supergroup (Macey & McDonald, 2002). A vertical schematic representation of the geology of the DKNR is illustrated in Figure 12. The geology of the DKNR was originally mapped by Le Roux (1983) (Figure 13) and refined with additional information by Macey & McDonald (2002). This Supergroup is further subdivided into the Drakensberg, Beaufort and Ecca groups. A subgroup is delineated in the Beaufort group called the Adelaide Subgroup. Additional to these geological groups is the occurrence of unconsolidated alluvial sands and gravels. The Drakensberg group formations consist of dolerite sills and dykes. The subgroup Adelaide of the Beaufort group is equi-granular, moderately well sorted, fine-grained pale-yellow weathering rock massive and structureless. The Ecca group consist of the Tierberg formation collectively but subdivided into the upper (Pt_u) and lower (Pt_l) Tierberg formations based on their colour variations. The upper Tierberg formation is green-grey in colour while the lower Tierberg formation is blue-grey in colour. The Tierberg formation is comprised of shales, mudstones and siltstones. The geomorphology of the region is largely defined by the resistant Karoo dolerites and Beaufort sandstones and by the proximity of the area to the Orange River. The flat-lying dolerite sills and Beaufort Group sandstones form resistant cappings which are responsible for the flat-topped hills observed throughout the Karoo. Alternating sandstone (resistant) and mudstone (non-resistant) layers give the relief a stepped terraced appearance.

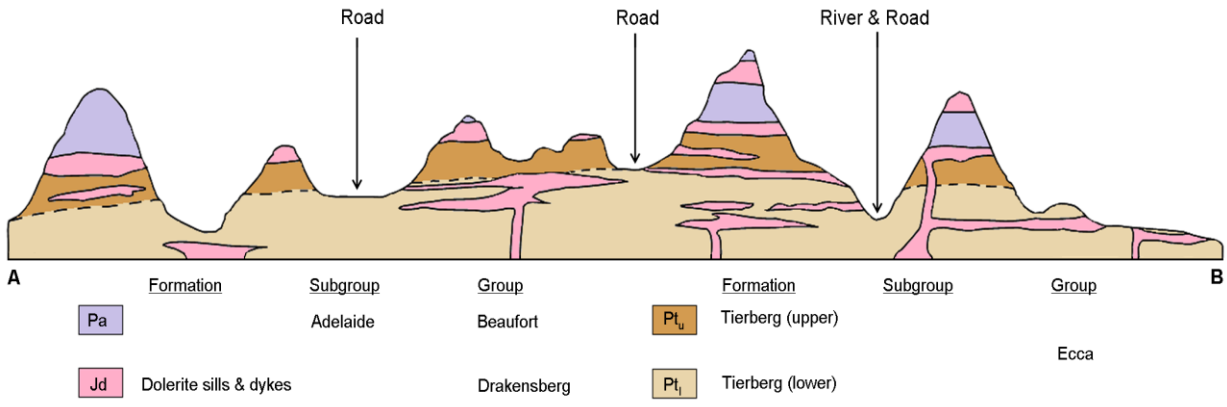


Figure 12: A vertical schematic representation of the geology of the DKNR (Macey & McDonald 2002).

Land type surveys involve dividing an area into a number of unique mapping units or land types each with a unique combination of soil pattern, macroclimate and terrain form. When one or more of these features change a boundary is drawn to separate the land types from each other. The land types delineated and mapped for the DKNR comprise of the following land types: Da25 DA43; Ib199; Fb74, Fb78, Fb79, Fb82; Fb78, Fb86, Ib200, Ib206 (Figure 14) and are broadly described are follow:

- Da 24, 25 & 43 land types consist of shale, mudstone and sandstone of the Beaufort Group, Karoo Sequence. Dolerite intrusions are common;
- Ib 199 land type consist of Shale, mudstone and sandstone of the Ecca Group, Karoo Sequence. Dolerite intrusions are common. Land types 200 & 206 Shale, mudstone and sandstone of the Beaufort Group, Karoo Sequence. Abundant dolerite intrusions;
- Land type Fb 74 consists of Dolerite intrusions are common in shale and mudstone of the Ecca and Beaufort Group, Karoo Sequence. Land type Fb 79 have Crests usually of dolerite. Midslopes and footslopes usually shales. Land type Fb 78 & 86 Shale, mudstone and sandstone of the Beaufort Group, Karoo Sequence. Dolerite intrusions are common. Land type Fb 82 comprises of shale, mudstone and sandstone of the Beaufort Group, Karoo Sequence.

2.4.4.2 *Soils*

The land types described in the previous section (2.4.4.1) have broad soil associations but were omitted because a finer scale soil survey of the DKNR was conducted by Schloms and Ellis (1994) and has greater relevance. A map of the soils of the DKNR is provided in Figure 15. Eight soil map units were delineated and are described as follows:

- **Map Unit A:** Shallow lithosols and red structured soils on shales and dolerite on steep slopes with a slope percentage greater than 25%;
- **Map Unit AD**: Shallow red structured soils with abundant stones and boulders on the surface and in soil profile on dolerite. Mid-slopes with a slope percentage greater than 25%;
- **Map Unit B**: Shallow to moderately deep red structured soils on near level terrain on high lying dolerite plateaus with a slope of less than 5%;
- **Map Unit CD:** Shallow, stony, red structured soils on an undulating terrain with a slope percentage of 5 to 25%;
- **Map Unit CS:** shallow stony lithosols on shale on an undulating terrain with slope between 5 and 25%;
- **Map Unit E**: Deep well drained alluvial soils on river terraces with a slope percentage less than 5%.
- **Map Unit DD:** Moderate deep calcareous red structured soils on dolerite along foot-slopes with a slope percentage of less than 5%;

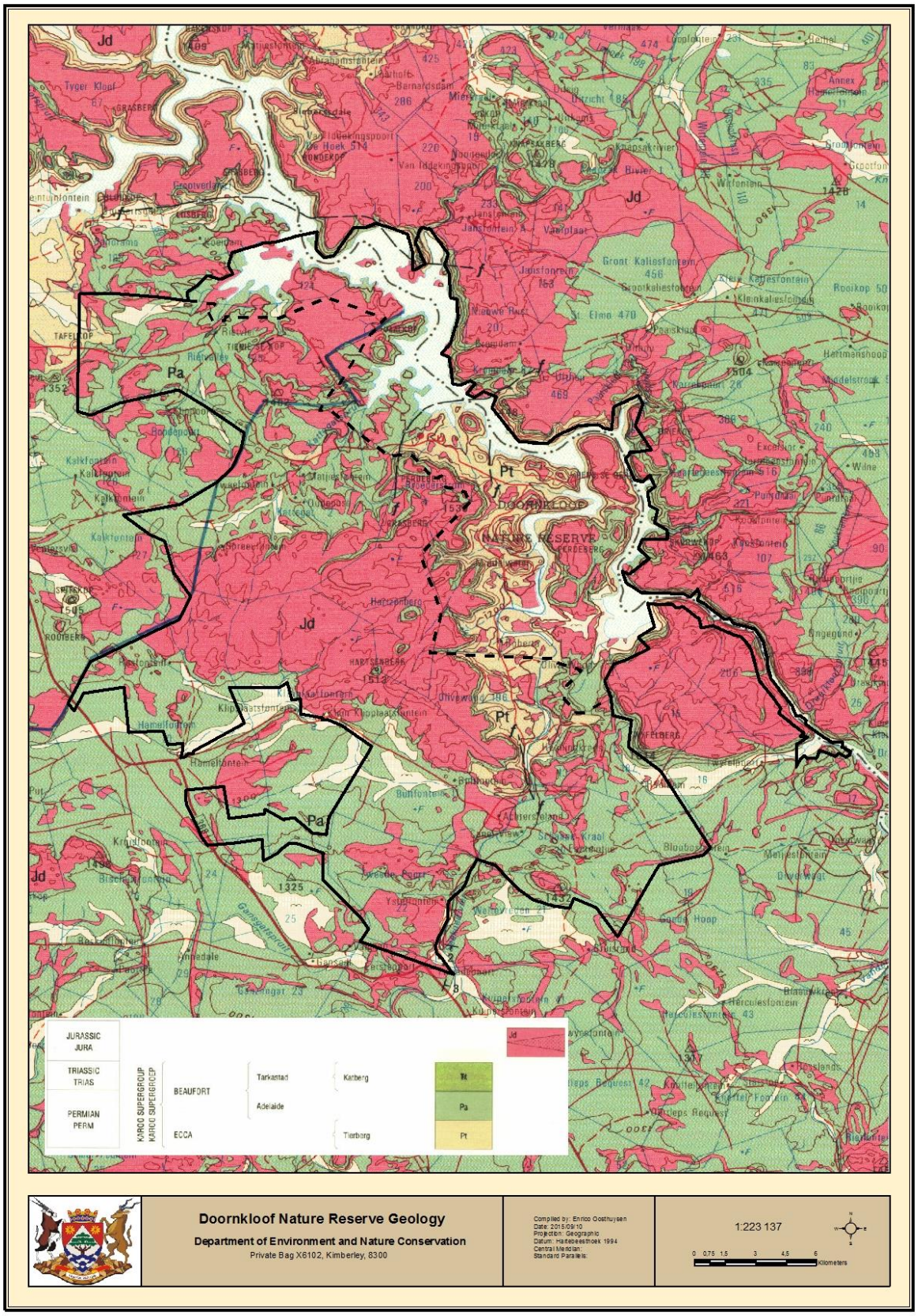


Figure 13: Geological Map of the DKNR.

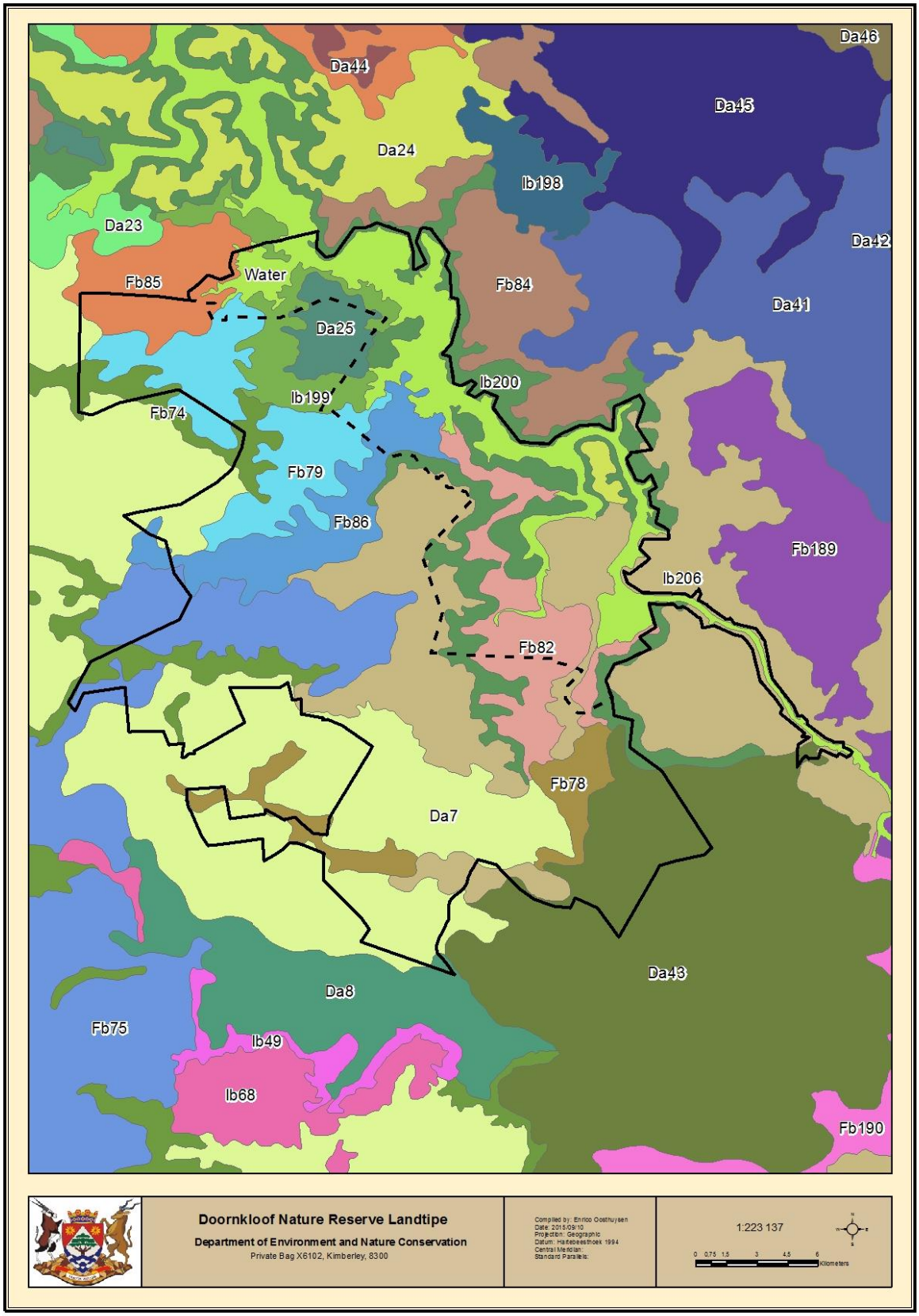


Figure 14: Land Type Map of the DKNR.

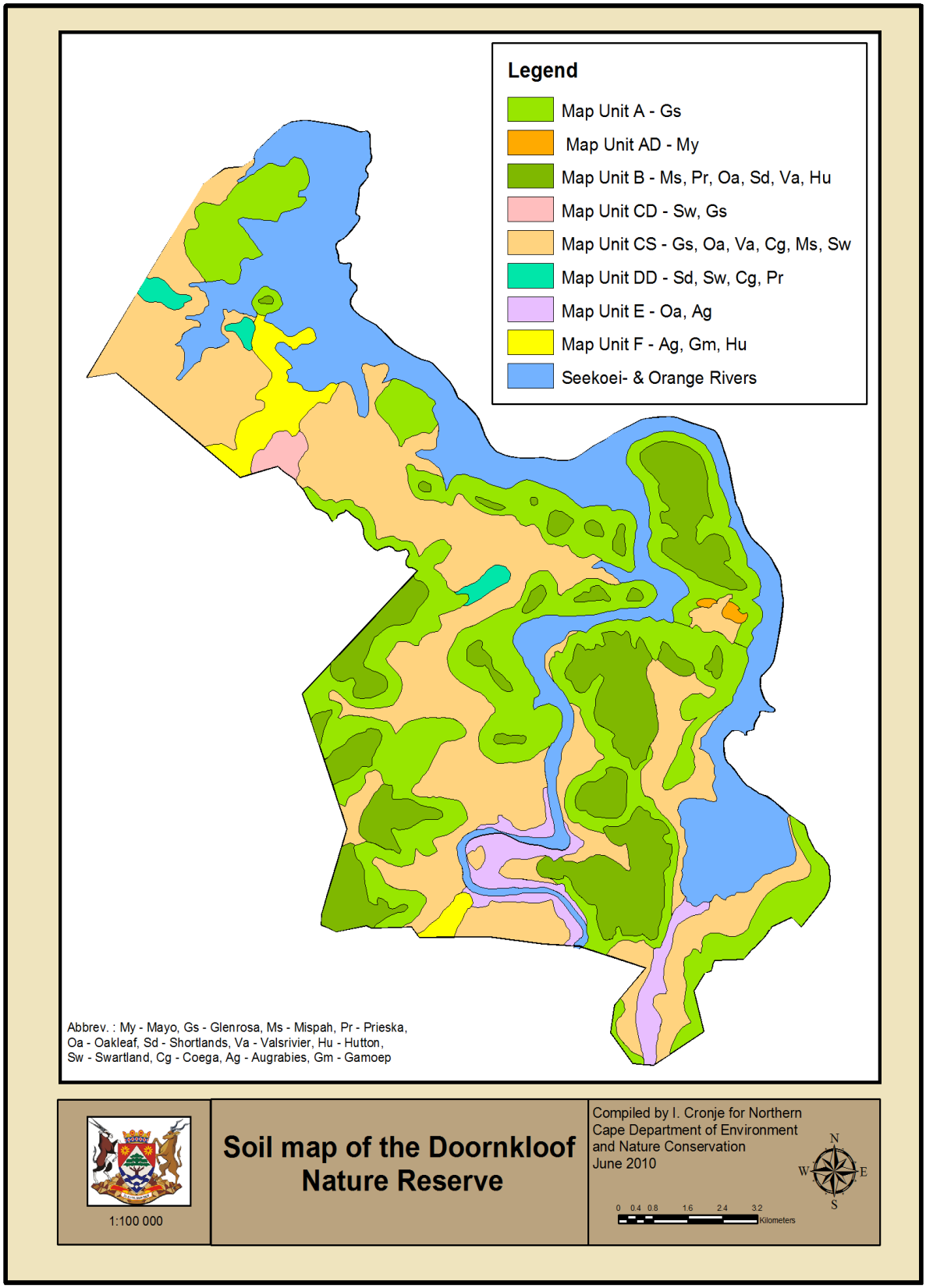


Figure 15: Soil Map of the DKNR.

- **Map Unit F:** Moderately deep red neocutanic soils on lower lying dolerite on foot-slopes with a slope percentage of 10%.

2.4.4.3 *Soil Erosion*

Due to the mountainous and undulating terrain of the DKNR erosion during periods of heavy precipitation results in sheet, splatter and gully erosion which is compounded by vegetative cover reduction through the grazing habit *(e.g.* trampling) of game in certain areas of the Reserve. Erosion is combated though positioning of gabions, rocks or through brush packing. Game numbers must be kept at numbers at which their grazing impacts are not noticeable. Selective feeders (particularly warthog) should be kept at a minimum as well.

2.4.5 *Wetlands and other Aquatic Ecosystems*

Wetlands are limited to seasonal pools and springs in drainage lines. Seasonal artificial dams are also found in the DKNR. Historic boreholes that fed these dams or drinking troughs have been closed. The dam walls of the catchment dams at Ou Doornkloof were broken several years ago. Water provision is not a management task due to sufficient water being available for game from the Seekoei River, Orange River and the Vanderkloof dam (Figure 16). The provision of water for game is only contemplated during excessive drought periods when water in the Seekoei River, Orange River and Vanderkloof dam is negligible. All land immediately in the dam but not flooded or totally submerged (islands) and the land surrounding the dam up to the 100-year flood-line is managed *(i.e.* law enforcement) by DAERL. The surface area of the Vanderkloof Dam is also patrolled by DAERL law enforcement staff (*i.e* field rangers of the DKNR and RNR). Water quality and quantity is a function of DWS. The extent of the Vanderkloof dam in relation to the location DKNR and RNR is presented Figure 17. The distance along the dam between the DKNR and RNR is 46km.

2.4.5.1 *Rivers*

The DKNR is situated in the Upper Orange River Management Area with the Vanderkloof Dam being one of the main dams in the Orange Vaal drainage basin. The Orange River (*Gariep River, Groote River or Senqu River*) is the longest river in South Africa. It originates in the Drakensberg mountain in Lesotho Maloti Mountains (at an elevation of 3350m.a.s.l) flowing westwards for 2200km through South Africa and embouges into the Atlantic Ocean at Alexander Bay. The Seekoei River is the largest tributary of the Orange River. Currently only the lower regions of the Seekoei River are protected. A total of 17.37km of the Seekoei River falls within the boundary of the DKNR. Limited information is currently available on the general health of the Seekoei River. The only recent study done on the Seekoei River was that done by Avenant (2010) which looked at using fish communities in the Seekoei River to establish the ecological integrity of the river. Efforts are progressing to establish the Karoo Seekoei River Nature Reserve which has the long-term objective of formally protecting the entire length of the Seekoei River. The Orange River forms the western boundary of the Reserve.

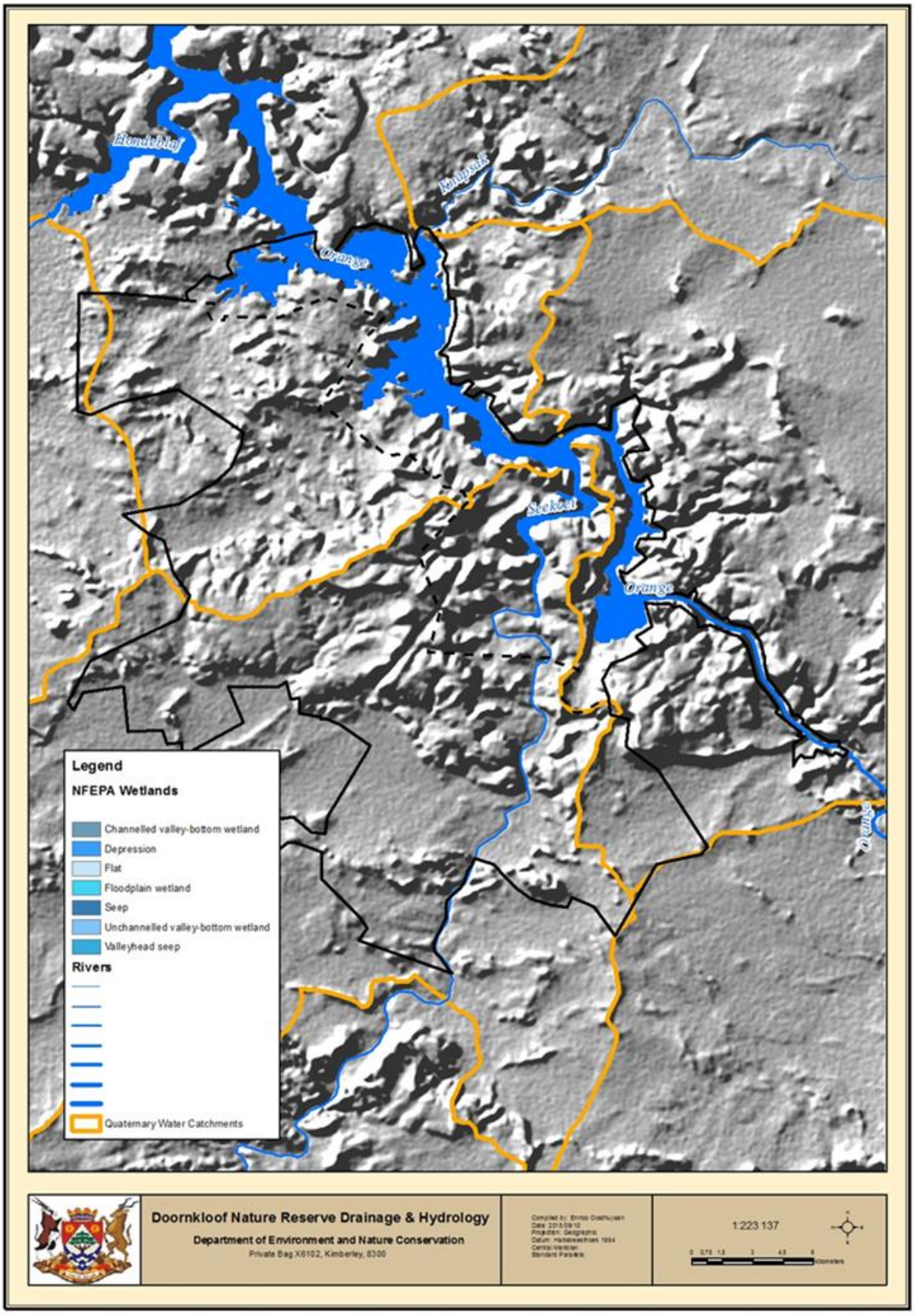


Figure 16: Drainage and Hydrology Map of the DKNR.

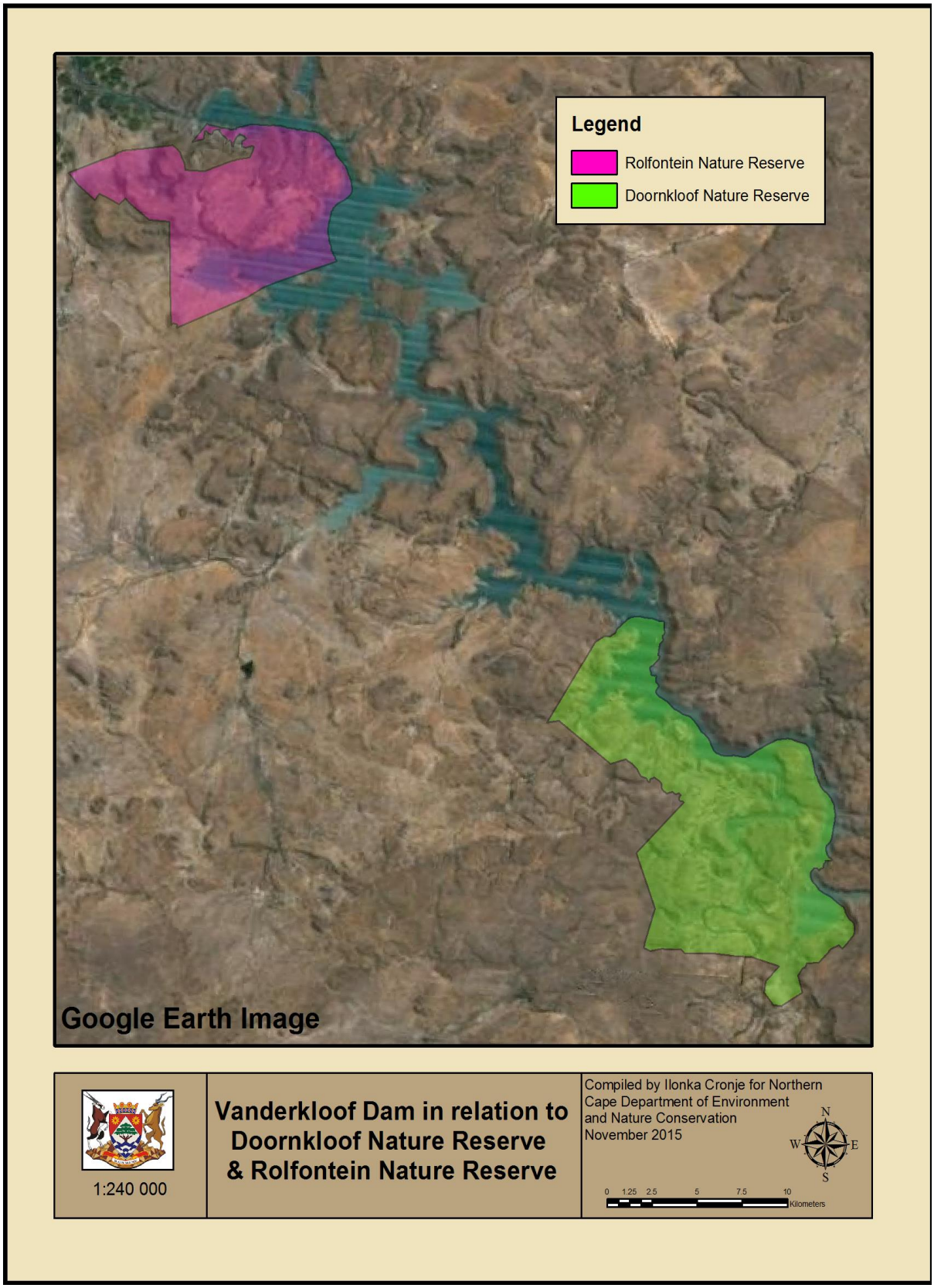


Figure 17: Vanderkloof Dam in relation to the DKNR and RNR.

River health assessments are currently required for the rivers within the eastern part of the Northern Cape Province. Alien vegetation that enters the DKNR by flooding water from the Seekoei River include Large Cocklebur (*Xanthium strumarium*), Spiny Cocklebur (*Xanthium spinosum*) and Spear thistle (*Circium vulgare*). The former two proliferate when dam and river levels subside for extended periods. Management of these species is continual within the boundary of the Reserve. Silver-leaf nightshade (*Solanum alaegnifolium*) has been recorded along the length of the Seekoei River where agricultural activities occur. Landowners upstream need to be encouraged in the control of these species. The importance of the Seekoei River to conservation should assist in obtaining assistance from *Working for Water* (DFFE) in relation to obtaining chemicals that can be used to treat stands of these aquatic alien plants

2.4.6 *Vegetation*

The DKNR is located within in the Dry Highveld Grassland Bioregion. Limited portions of the Upper Karoo Bioregion are within the boundary of the DKNR, but greater parts are however found within the Domain. Biomes included in the DKNR and the Domain are the Grassland and Nama-Karoo Biomes (Figure 18).

According to the biome boundaries as redefined by Mucina & Rutherford (2006), the DKNR falls within the ecotone of the Nama-Karoo Biome and the Grassland Biome. In previous classifications the DKNR fell within the boundaries of the Nama Karoo Biome that stretched into the southern Free State Province (Acocks, 1988; Low & Rebelo, 1996).

The Veld Type of DKNR is described as the Besem Karee Koppies Shrubland (Mucina & Rutherford, 2006). According to older classifications, this Veld Type was described as the Eastern Mixed Nama Karoo Veld Type by Low & Rebelo (1996) and as the False Upper Karoo Veld by Acocks (1988). The vegetation within the Besem Karee Koppies shrubland Veld Type is characterized by slopes and koppies (hillocks) that are covered by a structurally two-layer karroid shrubland. The lower layer is dominated by dwarf karoo shrubs with a high abundance of grasses, while the second layer is dominated by higher shrubs such as *Searsia erosa, Searsia burchellii* and *Olea europaea* subsp. *europaea*. (Mucina & Rutherford, 2006).

According to Acocks (1988) the region surrounding the Zeekoei (Seekoei) River was originally grass veld but has been transformed to Karoo veld. This was mainly caused by the introduction merino sheep into the Colesberg division in the middle of the last century and the consequent overgrazing of the veld which enabled the establishment of karoo pioneer species (Acocks, 1988).

DKNR, being situated in the transitional zone between the Nama-Karoo and the Grassland Biome, vegetation displays characteristics of both biomes (Smit 2014). The slopes and plateaus of the DKNR display characteristics of the Grassland Biome with perennial grasses such as *Themeda triandra, Heteropogon contortus* and *Cenchrus ciliaris,* and shrubs such as *Searsia burchellii* and *Searsia ciliata* being dominant. This is consistent with the description by Acocks (1988) of the False Upper Karoo Veld that the hills are still essentially a grass veld type. The flats show more characteristics of the Nama Karoo Biome where a wide variety of Karoo dwarf shrubs, such as *Pentzia spp*., *Eriocephalus ericoides* and *Selago spp.* occur.

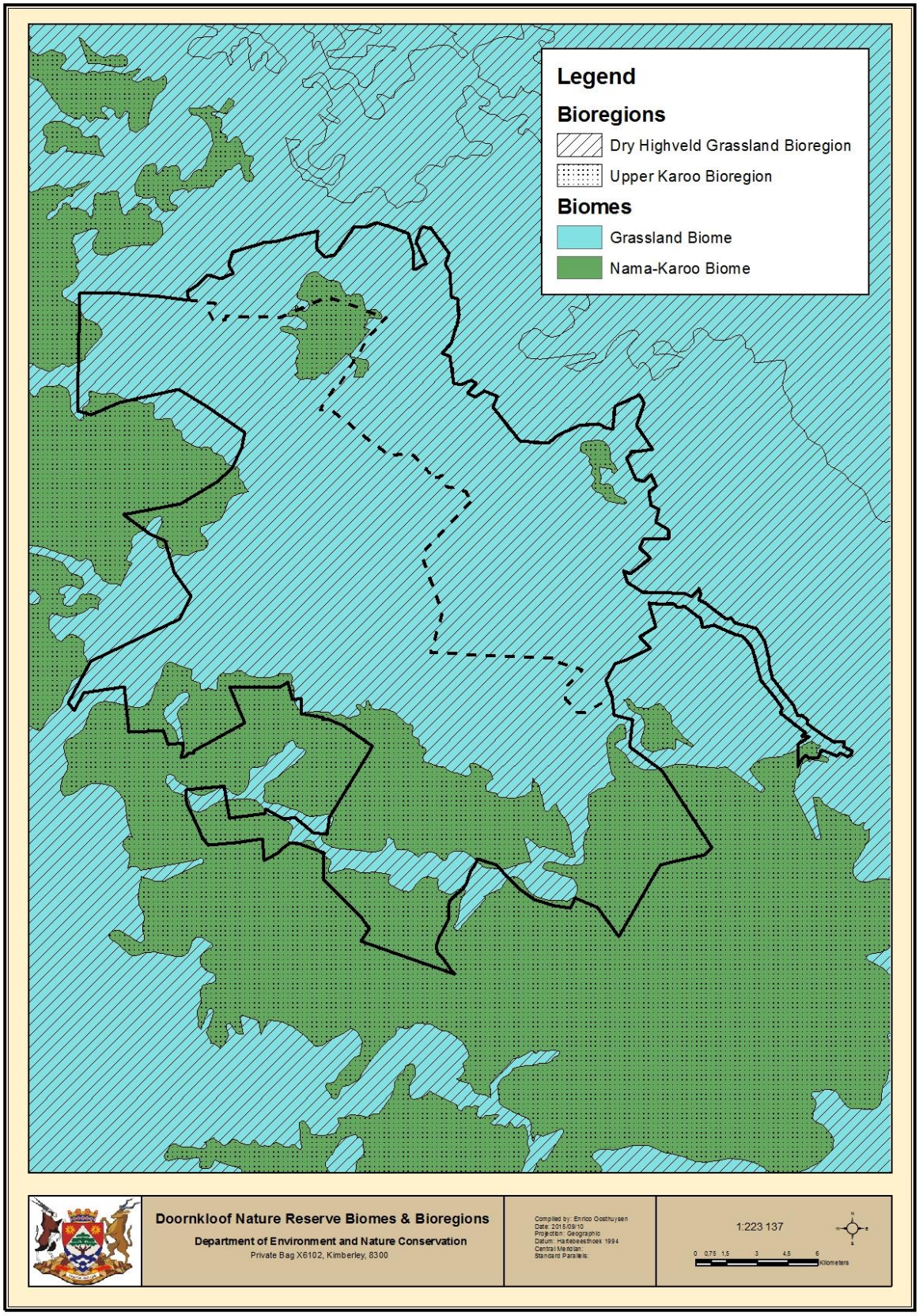


Figure 18: Bioregions and Biomes of the DKNR.

The kloofs and parts of the Seekoei Riverbank are characterised by a high tree density with dominance of species such as *Vachellia karoo, Searsia lancea*, *Olea europaea* subsp. *europaea* and *Diospyros lycioides* (Smit 2014).

A fine-scale vegetation classification of the vegetation of the DKNR (Figure 19) was completed by Smit (2014) who delineated six main plant communities with associated sub-plant communities as described below:

2.4.6.1 *Eragrostis chloromelas-Chloris virgata Grassland*

The *Eragrostis chloromelas-Chloris virgata* Grassland is a small plant community that is located in isolated patches on low lying plateaus and flat ridges. These plateaus and ridges lie predominantly between the Seekoei and Orange Rivers but also include areas in the far northern section of the reserve. This is the smallest plant community on the reserve that covers a total area of only 135 ha. The terrain is characterized by very flat plains that consist of deep, darkish clay soils with few rocks covering the surface. Grazing and animal trampling vary from low to very high in parts of this community. Very little indication of any soil erosion is visible.

Diagnostic species, with also a high fidelity, are the species *Aristida adscensionis*, *Eragrostis chloromelas* and *Chloris virgata*. These grasses are the dominant species, while the karroid shrub *Pentzia incana* is also dominant. The geophyte *Moraea pallida* and the forb *Oxalis depressa* occur frequently within this community. The herbaceous layer is well developed with a high canopy cover. Sub-plant communities within this main plant community are the *Eragrostis chloromelas-Chloris virgata-Felicia muricata* Grassland and *Eragrostis chloromelas-Chloris virgata-Searsia burchellii* Shrubby grassland.

2.4.6.2 *Melianthus comosus- Vachellia karoo River thicket*

The distribution of the *Melianthus comosus-Vachellia karoo* River thicket community is mainly restricted to the lower of the Seekoei River and along larger drainage lines. This small riparian plant community covers a total area of 144 ha. The very deep soils that have mainly been formed by sedimentary deposits are sandy and light of colour. The soil often remains moist for long periods after rainstorms, mainly due to the relatively cool and shaded conditions created by the dense shrub layer. Almost no rocks occur on the ground. Incidence of overgrazing and trampling are very high within large areas of this community.

The vegetation is structurally dominated by a woody layer of which a tree and shrub stratum is very prominent. In many areas the height of the tree canopy is over 10m. The diagnostic species are the grass *Cynodon hirsutus* and the shrubs *Melianthus comosus, Lycium cinereum, Urtica dioica*, *Hibiscus pusillus,* and *Salvia disermas*. The dominant woody species are tree species that include *Vachellia karoo*, *Searsia lancea, Diospyros lycioides* subsp. *lycioides* a lesser extent *Ziziphus mucronata.* The herbaceous layer is dominated by the creeping grass species *Cynodon hirsutus*. Due to the mat-forming growth form of *Cynodon hirsutus*, it is the main contributor to the relative high canopy cover of the herbaceous layer.

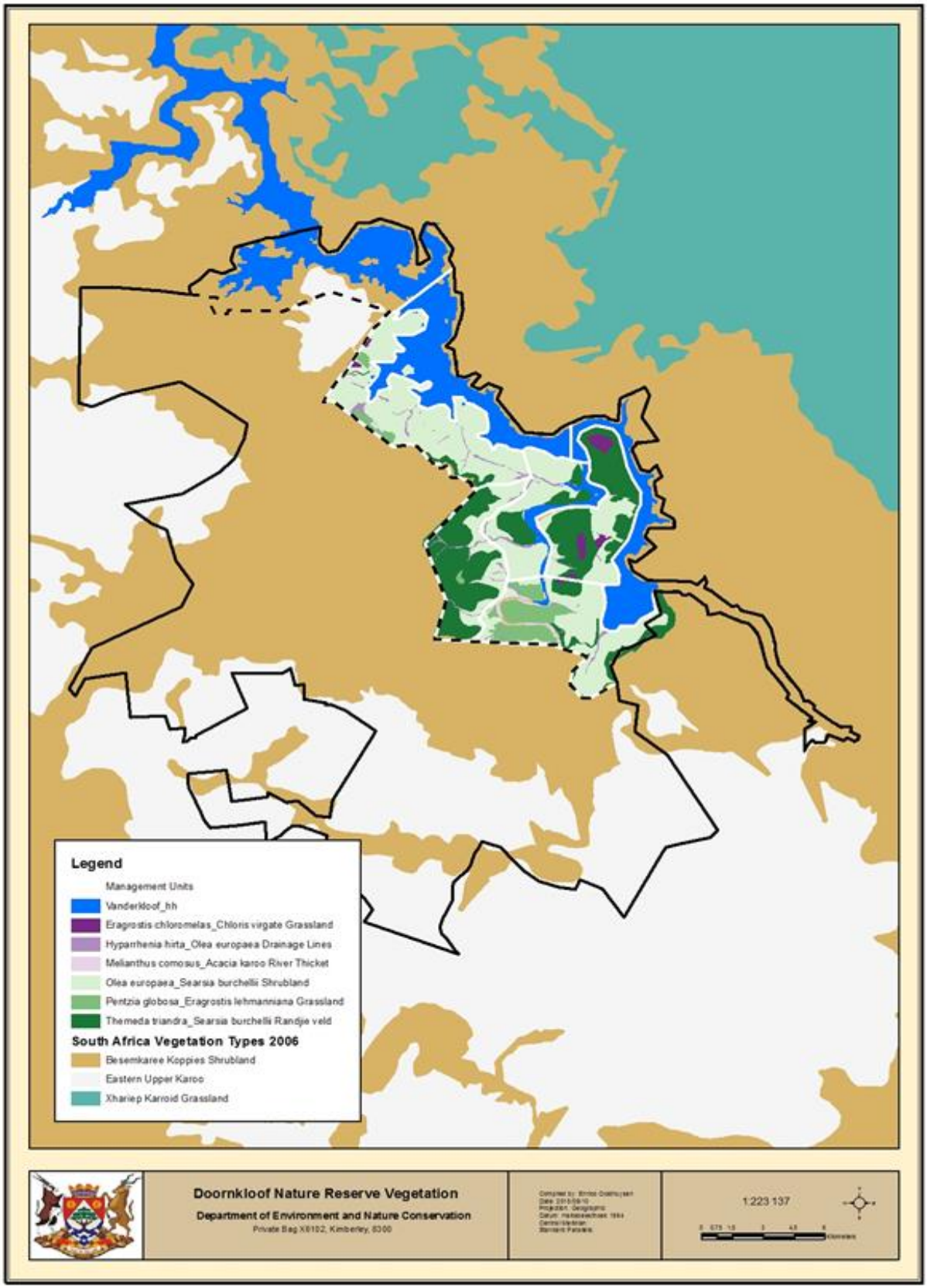


Figure 19: Veld Types and the main plant communities (management units) of the DKNR.

Werger (1980) classified the river communities of the upper Orange River as the *Diospyrios lyciodes* alliance with four distinct riverine communities (associations and sub-associations) grouped under this alliance. The Thicket community of DNR falls under the *Zizipho- Acacia* association described by Werger (1980), but also shows definite characteristics of the *Rhoo- Diospyretum acacietosum* karoo sub-association. Characteristic species of the *Rhoo-Diospyretum acacietosum* karoo sub-association that are also prominent in the *Melianthus comosus- Vachellia karoo* River thicket community is the grass species *Melica decumbens* and the shrubs *Asparagus suaveolens* and *Melianthus comosus*. This is probably due to the fact that DKNR is located on the western boundary of the *Rhoo- Diospyretum acacietosum* karoo sub-association where the riverine community changes to the *Zizipho-Acacietum karoo* association (Werger 1980).

The entire *Diospyros lyciodes* alliance falls within the *Vachellia karoo* Riparian Thicket phytosociological class that was described for the Free State Province by Du Preez & Bredenkamp (1991). Malan *et al*. (2001) also described many of the drainage lines found throughout the southwestern Free State, which also forms part of the *Vachellia karoo* Riparian Thicket. The results of Malan *et al*. (2001) closely resemble the species composition found for this Thicket community. The similarity between these two communities is mainly due to the close proximity of DKNR to that of the study area of Malan *et al*. (2001).

The *Setaria verticillata-Vachellia karoo* sub-community described in the Kareefontein Private Game Reserve by Botha (2003) is also very similar to the *Melianthus comosus- Vachellia karoo* River Thicket community. The *Setaria sphacelata-Vachellia karoo* and to a lesser degree the *Diospyros lyciodes-Rhus pyroides* communities from the central Free State are also comparable to this Thicket (Muller 2002). Other similar communities are the *Searsia pyroides-Acacia karoo* Shrub sub-community and *Ziziphus mucronata-Asparagus africanus* Shrub sub-communities found along the Vet River, Free State Province (Van Aardt 2010). This community forms part of the inland Azonal vegetation described by Rutherford & Mucina (2006), where species composition is determined and characterized by the presence of permanent bodies of water such as rivers, drainage lines and dams.

2.4.6.3 *Hyparrhenia hirta-Olea europaea subsp. africana Drainage lines*

This community is associated with the numerous drainage lines and tributaries found across the Reserve and in total covers an area of 222 ha. The soils are deep and sandy with soil depths between 30-50cm. The surface has little rock cover that varies from 0-25% (average 9.3%). Many locations have moist soil conditions because water infiltration from the drainage lines containing water. The ground cover is also semi shaded by a generally thick and often high tree canopy cover, similarly to that found in the *Melianthus comosus- Vachellia karoo* River thicket community. Large areas are overgrazed mainly by buffalo. Some drainage lines have very high soil erosion, while others have none and are mainly influenced by the amount of herbaceous cover and amount of water discharge.

The vegetation is dominated by the woody layer, which mainly consists of a medium high to high tree stratum that varies from 3 to 6 m or more in height. The diagnostic species for this community are the perennial grasses *Hyparrhenia hirta* and *Panicum*

coloratum var. *coloratum.* The distribution of the highly palatable grass *Panicum coloratum* var. *coloratum* was mainly restricted to areas where it is protected from grazing. The grass *Hyparrhenia hirta,* although an indicator of previous disturbances, plays an important role in stabilizing and protecting bare soil against erosion (Van Oudtshoorn 2004; 2012) and is also present in many of the drainage lines of the Reserve. As expected, the most dominant species are predominantly tree species which include the small to medium sized evergreen *Olea europaea* subsp. *africana*, *Searsia lancea* and deciduous *Vachellia karoo* which are far more abundant in the lower reaches than upper reaches of the drainage lines. All three these species are known to occur along watercourses throughout their distribution (Palgrave 2002; Van Wyk *et al.* 2008). Other dominant species of the herbaceous layer are the grass *Hyparrhenia hirta* and shrub *Salvia namaensis*. Other prominent species include the shrub *Searsia burchellii*, the small trees *Ziziphus mucronata* subsp. *mucronata*, *Diospyros lycioides* subsp. *lycioides,* and the shrub *Diospyros austro-africanum* var. *microphylla.*

The *Vachellia Karoo-Diospyros lycioides* sub-community described by Muller (2002) found throughout the central Free State Province shows a close similarity to the *Hyparrhenia hirta-Olea europaea* subsp. *africana* Drainage line community. The woody layer in particular displays a very close resemblance, while the herbaceous layer is less similar to each other. The *Vachellia karoo-Diospyros lycioides* sub-community is also typically found along drainage lines, ravines and foot slopes of the hills. The canopy cover of the woody layer is between 80-100% with an average cover of 89.3%. The cover of the herbaceous layer is between 40-70% with an average of 47.9%.

2.4.6.4 *Olea europaea subsp. africana-Searsia burchellii Shrubland*

This shrubland community is the second largest of all the plant communities, covering a total land area of 3 239 ha. The landscape varies from flat to undulating plains with numerous scattered ridges and small hills. The largest part of this community is covered by very rocky terrain with very shallow soils. Soils from lower regions are generally sandy and often also gravely while soils from higher areas tend to have a higher loam content. Rock cover varies from 0-60% (average 27.3) and soil depth from 3-40 cm. Large areas within this community, particularly lower and flat areas, are heavily overgrazed and trampled. In large areas sheet erosion has removed most of the topsoil.

The characteristic species for this community are the woody species of small to medium high trees *Olea europaea* subsp. *africana* and *Ziziphus mucronata* subsp. *mucronata* as well as the perennial grass *Heteropogon contortus.* The tree *Olea europaea* subsp. *africana* usually occurs near water such as riverine fringes but also grows in mountain ravines and on rocky terrain (Palgrave 2002; Van Wyk *et al.* 2008). The woody layer is well defined and is made up by a shrub and low to medium high tree layer. The plant cover of the herbaceous layer is in many instances sparse and patchy with large areas of bare soil.

This community can be grouped into four different sub-communities, namely the *Olea europaea* subsp. *africana - Searsia burchellii-Tarchonanthus camphoratus* Shrubland, the *Olea europaea* subsp. *africana - Searsia burchellii-Melinis repens* Shrubland, the *Olea europaea* subsp. *africana - Searsia burchellii-Enneapogon*

scoparious Shrubland, and the *Olea europaea* subsp. *africana* - *Searsia burchellii-Stipagrostis ciliata* Shrubland.

2.4.6.5 *Pentzia globosa-Eragrostis lehmanniana Grasslands*

This community is characterized by the occurrence of less abundant karroid shrub species. These karroid shrub species are *Pentzia globosa*, *Aptosimum marlothii*, *Gnidia polycephala*, *Phymaspermum parvifolium*, *Helichrysum zeyheri* and *Pteronia glauca. Gnidia polycephala* is a plains species that prefers sandy and limestone-rich soil (Le Roux *et al*. 1994). The dominant species are the grasses *Eragrostis lehmanniana* var. *lehmanniana* and *Aristida diffusa* subsp. *burkei* and the karroid shrubs *Pentzia incana* and *Pentzia globosa*. The high abundance of the grass *Eragrostis lehmanniana* var. *lehmanniana* is an indication of overgrazing as it is documented that this species, which prefers sandy soils, increases where disturbances have occurred in the past (Van Oudtshoorn 2004;2012). Many of the common species in this community are also abundant in the *Olea europaea* community and are almost entirely associated with overgrazing.

This community is the closest representation of true plains on DKNR and covers areas in the south and north of the Reserve. These plains consist of alluvial flats that surround the Seekoei River as well as flat low hills. In total this grassland encompasses an area of 1 421 ha. Rock cover varies from 0-30% (average 9%). Soil depth is between 11-30 cm and of sedimentary and sandy soil type. Lower lying regions of this community, most notably areas *Eragrostis lehmanniana* Grassland is the *Aristida diffusa* - *Aristida congesta* community of the Central Free State province (Muller 2002).

Three different sub-communities can be differentiated, namely the *Pentzia globosa-Eragrostis lehmanniana-Aristida adscensionis* Grasslands, the *Pentzia globosa-Eragrostis lehmanniana-Aristida diffusa* Grasslands and the *Pentzia globosa-Eragrostis lehmanniana-Eriocephalus spinescens* Grassland.

2.4.6.6 *Themeda triandra-Searsia burchellii Randjie veld*

All the higher and larger hills of the Reserve form part of this community and it covers an area of 3 880 ha, making it the largest plant community. The bedrock of these hills consists largely of dolerite sills and dykes. The terrain varies from very steep slopes (25° and higher) to flat plateaus that are characterized by very deep brown loamy soils. The soil is both covered and embedded by large rocks and boulders. Except for a few localities on steep slopes, no indication of soil erosion is evident. There are no evidence indicating grazing and trampling on the mountain slopes in general, while low levels of grazing and trampling are evident in various areas on the mountain plateaus, with a few isolated grazing-lawns occurring within the community.

Diagnostic species of this community are the perennial grasses *Themeda triandra* and *Digitaria eriantha*, the tall shrub *Euclea crispa* subsp. *ovata*, and the dwarf shrub *Stachys linearis* and ferns *Cheilanthes hirta* and *Pellaea calomelanos* var. *calomelanos*. The large shrub *Euclea crispa* subsp. *ovata* typically occur in mountainous terrain throughout its distribution in the Karoo region (Van Wyk *et al*.

2008). The vegetation is characterized by a dense herbaceous layer that is dominated by perennial grasses with a definite woody layer also distinguishable.

The woody layer varies from low to medium canopy cover density and consists of large shrub and small trees stratum usually under 2 m high. The herbaceous layer is particularly dominated by the diagnostic perennial grass *Themeda triandra* that in some instances constitutes almost 100% of the herbaceous layer cover. *Themeda triandra* occurs in all veld types over its distribution range but is especially common in undisturbed climax grassland on loamy soils at altitudes between 1300-3000 m (Van Oudtshoorn 2004; Snyman *et al*. 2013). The abundance of both perennial grasses *Themeda triandra* and *Digitaria eriantha* is an indication that the veld is in very good condition.

This community can be divided into three sub-communities, namely the *Themeda triandra- Searsia burchellii-Boophane disticha* Randjie veld, the *Themeda triandra-Searsia burchellii-Sporobolus fimbriatus* Slope vegetation and the *Themeda triandra-Searsia burchellii-Melolobium microphyllum* Randjie veld.

Rangeland conditions forms the basis on which game recommendations are derived at the DKNR. Prior to the vegetation map provided by Smits (2014) rangeland condition was assessed relative to twenty rangeland monitoring quadrats that were selected from an initial 471 sampling sites to represent the major topography units of the DKNR namely plateaus, mid-slopes and foot-slopes (Badenhorst 1994; Lloyd & Badenhorst 1996;1997). The rangeland monitoring technique applied since 1985 is described by Lloyd and Badenhorst (1997), Smit (2014) and Cronje (2015). Rangeland at the DKNR takes place twice annually namely in April (end of summer) and October (end of winter) each year. The data is collected from 29 monitoring plots and is calculated into an ecological index value followed by an ecological grazing value expressed as a LSU/ha [large stock unit of 450kg mass per unit area (hectare)]. The holistic stocking rate of the area, is an area of land in the system of management which the operator has allocated to each animal unit in the system, and is expressed per length of grazeable and/ or browsable period of the year- ha/LSI or LSU/ha.

The data of each year provides the estimated ecological carrying capacity which for the past several years was based on the broad topographic units of the DKNR. Best practice for stocking rate determination is to make use of the mean ecological carrying capacity computed for the area and extrapolate this for the entire area. This will ensure that the best ecological areas of the Reserve are not negatively impacted on. This is alternatively known as the conservative ecological carrying capacity. Precipitation and current stocking rates have a direct influence on the overall ecological carrying capacity - for example high game numbers during period of low annual seasonal precipitation will have a negative effect on rangeland condition. The ecological carrying capacity of the DKNR is generally maintained at 60% of the conservation recommended carrying capacity of the DKNR. In September 2014 additional monitoring quadrats were identified to accommodate the vegetation plant communities identified by Smit (2014). Data collection from the additional quadrats commenced in April 2016. The total plant species list for the DKNR totals 383 species distributed across 75 plant families. The plant species list for the DKNR forms part of the DKNR state of knowledge repository. The long-term agricultural grazing capacity for DKNR is 20LSU/ha (Esler *et al*. 2006) with the long-term mean

computed from Reserve rangeland condition data being 20,5LSU/ha (Cronje 2019). This is conservative relative to the recommendation of 16-18LSU/ha by Voster (1986) and Tainton (1999).

2.4.6.7 *Alien Plants*

Alien invasive plant species that have been documented to occur within the DKNR total 56 species of which *Argemone ochroleuca* subsp. *ochroleuca* (white-flowered Mexican poppy), Cirsium *vulgare,* (Spear thistle), *Opuntia ficus- indicata* (barbary fig), *Opuntia ficus-imbricata* (Imbricate cactus)*, Xanthium spinosum* (spiny cocklebur), *Xanthium strumarium* (large cocklebur) are common. The most prolific alien invasive species at the DKNR is the *Xanthium spinosum* and *Xanthium strumarium* which are found near water (alluvial areas of the Seekoei River, Orange River and Vanderkloof Dam). *Solanum elaeagnifolium (Satansbos)* has recently been recorded in the upper regions of the Seekoei at its entrance to the Hunters Moon Game Ranch. Although plant eradication (*i.e.* mechanical and chemical treatment) is done in the DKNR, seed from upstream areas infest the area during flooding, and rooting when the water level of the indicated water sources subside.

2.4.6.8 *Bush Encroachment*

Bush encroachment is not perceived to be a problem at the DKNR. Bush thickening of *Vachellia karoo* does however occur along the Seekoei River and in scattered areas within close proximity to water on the DKNR. Isolated thickening of *Rhyzogium trichotomum* occurs in previously disturbed areas in the DKNR.

2.4.7 *Fauna*

Game within the area described by Skead (1987) as the Western Upper Midlands from the Sneeuberge to the Orange River was historically abundant. In the autobiography of Andries Stockenstrom he had the following to say with regard to Seekoei River Valley '***When we descended onto the great plains bordering on the Sea Cow River, the endless droves of wildebeest, quaggas, hartebeests, gemsbok, blesbok and springbok were indeed astonishing' (Stockenstrom 1887).*** Mr. A Steedman a naturalist and explorer travelled the length of the Seekoei (previously called the Seacow) River in 1830 to its confluence with the Orange River and documented in particular the regular occurrences of lion and hyaenas (Sampson & Sampson 1994) thus indicating their historical occurrence to the current DKNR and surrounds.

2.4.7.1 *Mammals*

The historical occurrence of mammal species in the area has been documented by Skead (1987). Only species that historically occurred in the area will be accommodated in the DKNR. A total of sixty-four (64) mammal species have been recorded in the DKNR. These species include Egyptian slit-faced Bat (*Nycteris thebaica*), Straw-coloured Fruit Bat (*Eidolon helvum*), Geoffroy's Horseshoe Bat (*Rhinolophus clivosus*), Cape Serotine Bat (*Neoromicia capensis*), Egyptian Free-tailed Bat (*Tadarida aegyptiaca*), Natal Long-fingered Bat (*Miniopterus natalensis*), Rock Elephant-shrew (*Elephantulus myurus*), Reddish-grey musk Shrew (*Crocidura cyanea*), South African Hedgehog (*Atelerix frontalis*), Common Mole-rat (*Cryptomys hottentotus*), Porcupine (*Hysterix africaeaustralis*), Vlei Rat (*Otomys irroratus*), House

Rat (*Rattus rattus*), Four-striped Grass Mouse (*Rhabdomys pumilio*), House Mouse (*Mus domesticus*), Pygmy Mouse (*Mus minutoides*), Multimammate Mouse (*Mastomys coucha*), White-tailed Mouse (*Mystromys albicaudatus*), Pouched Mouse (*Saccostomus campestris*), Large-eared Mouse (*Malacothrix typical*), Grey Climbing Mouse (*Dendromus melanotis*), Namaqua Rock Mouse (*Aethomys namaquensis*), Hairy-footed Gerbil (*Gerbillurus paeba*), Cape Short-tailed Gerbil (*Desmodillus auricularis*), Bushveld Gerbil (*Tatera leucogaster*), Highveld Gerbil (*Tatera brantsii*), Ground Squirrel (*Xerus inauris*), Springhare (*Pedetes capensis*), Cape Hare (*Lepus capensis*), Scrub Hare (*Lepus saxatilis*), Smith's Red Rock Rabbit (*Pronolagus rupestris*), Rock Dassie (*Procavia capensis*), Warthog (*Phacochoerus aethiopicus*), Red Hartebeest (*Alcelaphus buselaphus*), Common Duiker (*Sylvicapra grimmia*), Steenbok (*Raphicerus campestris*), Gemsbok (*Oryx gazelle*), Buffalo (*Syncerus caffer*), Kudu (*Tragelaphus strepsiceros*), Eland (*Taurotragus oryx*), Mountain Reedbuck (*Redunca fulvorufula*), Aardwolf (*Proteles cristatus*), Brown Hyaena (*Hyaena brunnea*), Leopard (*Panthera pardus*), Caracal (*Felis caracal*), Southern African Wild Wildcat (*Felis silvestris cafra*), Black-footed Cat (*Felis nigripes*), Bat-eared Fox (*Octocyon megalotis*), Cape Fox (*Vulpes chama*), Black-backed Jackal (*Canis mesomelas*), Cape Clawless Otter (*Aonyx capensis*), Honey Badger (*Mellivora capensis*), African Striped Weasel (*Poecilogale albinucha*), Striped Polecat (*Ictonyx striatus*), Small-spotted Genet (*Genetta genetta*), Suricate (*Suricata suricata*), Yellow Mongoose (*Cynictis penicillata*), Small Grey Mongoose (*Galerella pulverulenta*), White-tailed Mongoose (*Ichneumia albicauda*), Water Mongoose (*Atilax paludinosus*), Chacma Baboon (*Papio ursinus*), Vervet Monkey (*Cercopithecus aethiops*), Aardvark (*Orycteropus afer*). Mammal species of particular conservation concern are listed in Table 5.

Table 5: Mammal species of particular conservation concern

SCIENTIFIC NAME	COMMON NAME	TOPS 2015 STATUS	IUCN STATUS
Eidolon helvum	Straw-coloured Fruit Bat		NT
Hyaena brunnea	Brown Hyaena	PR	NT
Felis nigripes	Black-footed Cat	PR	VU
Orycteropus afer	Aardvark	PR	
Otocyon megalotis	Bat-eared Fox	PR	
Panthera pardus	Leopard	PR	NT
Vulpes chama	Cape Fox	PR	

Mammal species that can be introduced into the DKNR that will improve the conservation status of the Reserve are black desert rhinoceros (*Diceros bicornis bicornis*) and cape mountain zebra (*Equus zebra zebra*).

Alien species that are in the DKNR are Impala (*Aepyceros melampus*), waterbuck (*Kobus ellipsiprymnus*) and Hartmann's Mountain Zebra (*Equus zebra hartmannae*). These species originated from the adjacent property during periods of intense flooding of the Seekoei River and the large drainage lines which damaged the fence-line traversing through them. These species did not historically occur in the area and thus should be removed from the DKNR. This can be done though culling and live game capture operations.

Registers detailing game introductions and removals are maintained in DKNR's state of knowledge repository.

2.4.7.2 *Avifauna*

One hundred and seventy-two (172) bird species have been documented in the DKNR, which include 20 birds of prey species. Of particular note are the African Fish Eagle (*Haliaeetus vocifer*), Martial Eagle (*Polemaetus bellicosus*), Verreaux's Eagle (*Aquila verreauxii*) and Black-chested Snake-Eagle (*Circaetus gallicus*). The Reserve is also a refuge and breeding area for a great variety of wading and other water birds, of which the Caspian Tern (*Sterna caspia*) is listed as near threatened in the South African Red Data Book. Aquatic avian species include white-breasted cormorant (*Phalacrocorax carbo*), Reed Cormorant (*Phalacrocorax africanus*), Darter (*Anhinga melanogaster*), Grey Heron (*Ardea cinerea*), African Spoonbill (*Platalea alba*), Egyptian Goose (*Alopochen aegyptiacus*), South African Shelduck (*Tadorna cana*), Yellowbilled Duck (*Anas undulata*), Spur-winged goose (*Plectropterus gambensis*), Cape Shoveller (*Anas smithii*), Giant Kingfisher (*Ceryle maxima), Malachite Kingfisher (Alcedo cristata) and Pied Kingfisher (Ceryle rudis).* The Bokmakierie (*Telophorus zeylonus*), one of southern Africa's most vocally conspicuous birds also in the DKNR. Terrestrial bird species include Ludwig's Bustard (*Neotis ludwigii*), Karoo Korhaan (*Eupodotis vigorsii*), Black Korhaan (*Eupodotis afra*), Blue Crane (*Anthropoides paradisea*), Secretary Bird (*Sagittarius serpentarius)*. An avian species list is maintained in DKNR's state of knowledge repository. Bird species of particular conservation concern are detailed in Table 6.

Table 6: Avifauna species of particular conservation concern

SCIENTIFIC NAME	COMMON NAME	TOPS 2015 STATUS	IUCN STATUS
Anthropoides paradiseus	Blue Crane	PR	VU
Neotis ludwigii	Ludwig's Bustard	EN	EN
Polemaetus bellicosus	Martial Eagle	EN	VU
Sagittarius serpentarius	Secretary Bird		VU

2.4.7.3 *Reptiles*

The reptile species diversity of the DKNR is low (i.e. at total of 34 species) with the following reptiles species occurring: Leopard tortoise (*Geochelone pardalis*), Puff adder (*Bitis arietans*), Cape cobra (*Naja nivea*), Water monitor (*Varanus niloticus*), Rock Monitor (Varanus albigularis), Cape Terrapin (*Pelomedusa subrufa*), Greater Padloper (*Homopus femoralis*), Serrated Tent Tortoise (*Psammobates oculiferus*), Bibron's Tubercled Gecko (*Chondrodactylus bibronii*), Marico Gecko (*Pachydactylus mariquensis*), Golden Spotted Gecko (*Pachydactylus oculatus*), Cape Gecko (*Pachydactylus capensis*), Ground Agama (*Agama aculeata aculeata*), Southern Rock Agama (*Agama atra atra*), Western Rock Skink (*Mabuya sulcata*), Cape Skink (*Mabuya capensis*), Western Three-striped Skink (*Mabuya occidentalis*), Variegated Skink (*Mabuya variegata variegata*), Namaqua sand Lizard (*Pedioplanis namaquensis*), Spotted Sand Lizard (*Pedioplanis lineoocellata*), Karoo Girdled Lizard (*Cordylus polyzonus*), Cape Spade-snouted Worm Lizard (*Monopeltis capensis capensis*), Karoo Whip Snake (*Psammophis notostictus*), Spotted Skaapsteker (*Psammophylax rhombeatus*), Striped Skaapsteker (*Psammophylax tritaeniatus*)

Common Egg-eater (*Dasypeltis scabra*), Brown House Snake (*Lamprophis capensis*), Delalande's Beaked Blind Snake (*Rhinotyphlops lalandei*), Herald Snake (*Crotaphopeltis hotamboeia*), Common Wolf Snake (*Lycophidion capense*), Mole Snake (*Pseudaspis cana*), Sundevall's Shovel-snout (*Prosymna sundevallii sundevallii*), Kalahari Sand Snake (*Psammophis trinasalis*), Namib Tiger snake (*Telescopus beetzii*).

2.4.7.4 *Fish*

Indigenous fish species occurring in the Seekoei River and bays in the DKNR that are part of the Orange River and Vanderkloof Dam are small mouth yellow fish (*Barbus aeneus*), largemouth yellowfish (*Barbus kimberleyensis*), moggel (*Labeo umbratus*), Orange River mudfish (*Labeo capensis*), Sharptooth Catfish (*Clarias gariepinus*). Species most sort after by anglers is the carp (*Cyprinus carpio*) and catfish with the former being an alien species. A pilot study on the feasibility for the establishment a small-scale fishery on the Vanderkloof Dam is being explored by DALRRD. The study is being undertaken by the Rural Fisheries Programme of the Department of Ichthyology and Fisheries Science, Rhodes University (van der Vyver *et al.* 2015). The largemouth yellow fish is of particular conservation concern (Table 7).

Table 7: Fish species of particular conservation concern

SCIENTIFIC NAME	COMMON NAME	TOPS 2015 STATUS	IUCN STATUS
Barbus kimberleyensis	Largemouth yellowfish	PR	NT

2.4.7.5 *Amphibian, Mollusc and Crustaceans*

Eight amphibian species have been documented for the DKNR namely Karoo Toad (*Bufo gariepensis*), Southern Pygmy Toad (*Poyntonophrynus vertebralis*), Cape River frog (*Afrana fuscigula*), African Clawed Toad (*Xenopus laevis*), Common Caco (*Cacosternum boettgeri*), Bubbling Kassina (*Kassina senegalensis*) and Tremolo Sand frog (*Tomopterna cryptotus*). The freshwater mussel has been documented to occur along the Seekoei and Orange Rivers.

2.4.7.6 *Invertebrates*

Information on invertebrates is limited and thus research in this area is required and should be initiated within the currency of this IMP.

2.4.8 *Cultural/Heritage Resources*

Only the Western Cape and Kwa-Zulu Natal have functioning Provincial Heritage Authorities, and consequently SAHRA administers heritage in the remaining provinces particularly where archaeology and paleontology are the dominant concerns. Heritage Northern Cape (Ngwao Boswa Kapa Bokoni) deals largely with built environment issues at this stage. Amongst other things the latter administers:

- World Heritage Sites
- Provincial Heritage Sites

- Heritage Areas
- Register Sites
- 60-year-old structures
- Public monuments & memorials

Archaeology, including rock art, graves of victims of conflict and other graves not in formal cemeteries are administered by the national heritage authority, SAHRA.

No formal registered heritage sites are present within the Reserve, however 60-year-old structures could potentially be classified as heritage resources in terms of Section 34 of the NHRA, are present within the DKNR. The heritage value of these structures has, however, not been confirmed to date. The archaeology, including rock art, graves of victims of conflict and other graves not in formal cemeteries of the reserve are however of interest and should be investigated as information on the pre-colonial archaeology of the reserve is limited (Figure 20).

The first inhabitants of the area were Bushmen who hunted game for food and undertook small scale farming (Sampson & Sampson 1994; Badenhorst 1994). In 1836 land on which the Doornkloof Nature Reserve is now established was allocated for stock farming (Badenhorst 1994). During the Anglo-Boer War (1899-1902) intensive battles took place in the area. Remains of a British Fort and two watch towers are located along the Kattegatspruit in the northern part of the reserve. Another British lookout post is found on Vaalkop (Figure 11). Ground-truthing and the provision of verified information of place names in historical accounts of the Anglo-Boer War in the DKNR and surrounds will provide clarity on the occurrence of the war. A complete archaeological site assessment of the DKNR and surrounding property is a research priority that should entertained during the validity of this IMP.

2.4.9 *Reserve Infrastructure*

The administrative hub and staff housing of the DKNR (Figure 21) is located in close proximity to the main entrance to the reserve. Eskom electricity supply is limited to Soutplaat. Telecommunications and internet connectively are currently problematic at the administrative building. Internet connectivity is poor. This will be rectified within the validity of this document. Reserve management communication is facilitated through radio communication through a repeater that is centrally located. The repeater enables communication within a 50km radius of the reserve. Communication with the RNR is also possible. Management personnel are issued with handheld radios to facilitate Reserve related communication within the DKNR. Cell phone network reception is limited throughout the DKNR.

The Reserve road network (69.2km), including the main access road (18km) to the Reserve (*i.e.* AP3076), is in a poor to moderate condition which can deteriorate during periods of heavy precipitation. The condition of the roads is a major reason why visitors with sedan vehicles would rather not visit the Reserve. Upgrading of the main access road to the Reserve and main tourist roads in the DKNR will be initiated through engagement with the Northern Cape Department of Roads and Public Works.

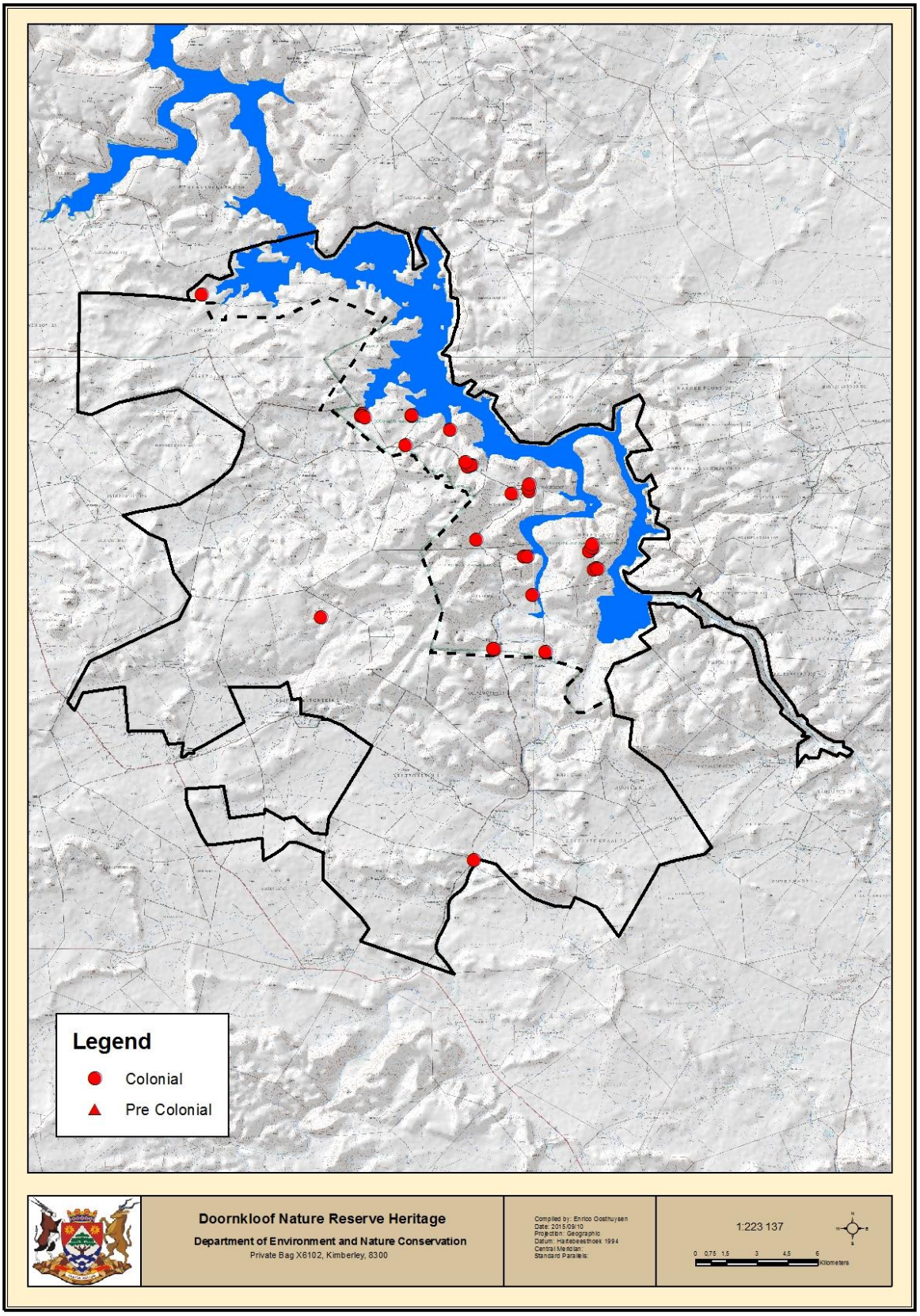


Figure 20: Heritage Resources of the DKNR.

The solar house (5kw) that supplies electricity to the overnight facilities at the Roodewal recreational areas needs to be upgraded (10kw) to handle additional water filtering systems and additional electrical appliance in the chalets. All accommodation facilities have closed sewage systems which are drained with the use of a honey sucker and purified through a package plant. The provision of water is through solar and ESKOM facilitated borehole pumps. The water provision storage capacity at the Roodewal recreational area and the main administrative hub is 20 000 and 30 000 litres. Three ESKOM electrical power supply points are at the administrative hub with current supply of 50KVA (administrative building), 50KVA (workshop, group camp and staff village), and 25KVA (managers house, inspection quarters and guesthouse). DKNR's terrestrial game fence (2.4m) traverses 44.5km of difficult mountainous terrain and is in need of maintenance during the validity of this document. Three energizers (two solar (16 Joule) and one electrical (36 Joule), power two electrical strands on the boundary fence.

2.4.1 *Reserve Tourism*

Tourism facilities include a day visitor picnic area and angling area with two ablution facilities. Overnight facilities at the Roodewal recreational area includes eight camping sites (accommodating a maximum of eight persons per site) with communal braai area and ablution facilities (toilets and showers). Each camping site also has its own private braai. Six chalets are located at the Roodewal recreational area. Five of these chalets accommodate four persons with one designed to accommodate physically disabled persons and a large family unit that accommodates eight persons. All facilities at Roodewal are solar powered for lighting and fridges. Gas appliances include gas stoves and gas geysers. A guest house is available for those requiring luxury and comfort. This guest house accommodates four persons. Eskom electricity powers electrical appliances which includes TV (with Openview), fridge and four inverter air conditioners. The guest house has two bedrooms each with an en-suite bathroom. The attraction to the DKNR is fundamentally the scenic and wilderness attributes of the reserve. For the angler the Seekoei River offers one of the best angling destinations in the Northern Cape Province. Ninety percent (90%) of the visitors to the DKNR are anglers. This is both a strength and a weakness. Angling in the DKNR is dependent on the water capacity of the Vanderkloof Dam. During periods at which the Vanderkloof Dam's water capacity is at 60% or lower, angling in the DKNR can no longer be accommodated. During these periods visitor numbers have shown a steep decline and this negatively effects revenue and tourism targets. Extensive marketing products will have to be designed to promote the DKNR during periods when angling is not available. The Bokmakierie and Kudu hiking trails are to be extensively marketed as these are under-utilized activities at DKNR. Possible Wilderness camps with the use of the islands in the Vanderkloof Dam originating and ending at DKNR need to be investigated but will require a guide to be employed for this purpose. This could be outsourced to facilitate job creation. The aquatic wilderness can currently not be accessed by visitors to the Reserve. The Reserve has ten touring kayaks that can be rented out to groups wanting to the experience the aquatic wilderness attributes of the Reserve. The establishment of this visitor activity as an additional revenue source will be initiated during the validity of this document.

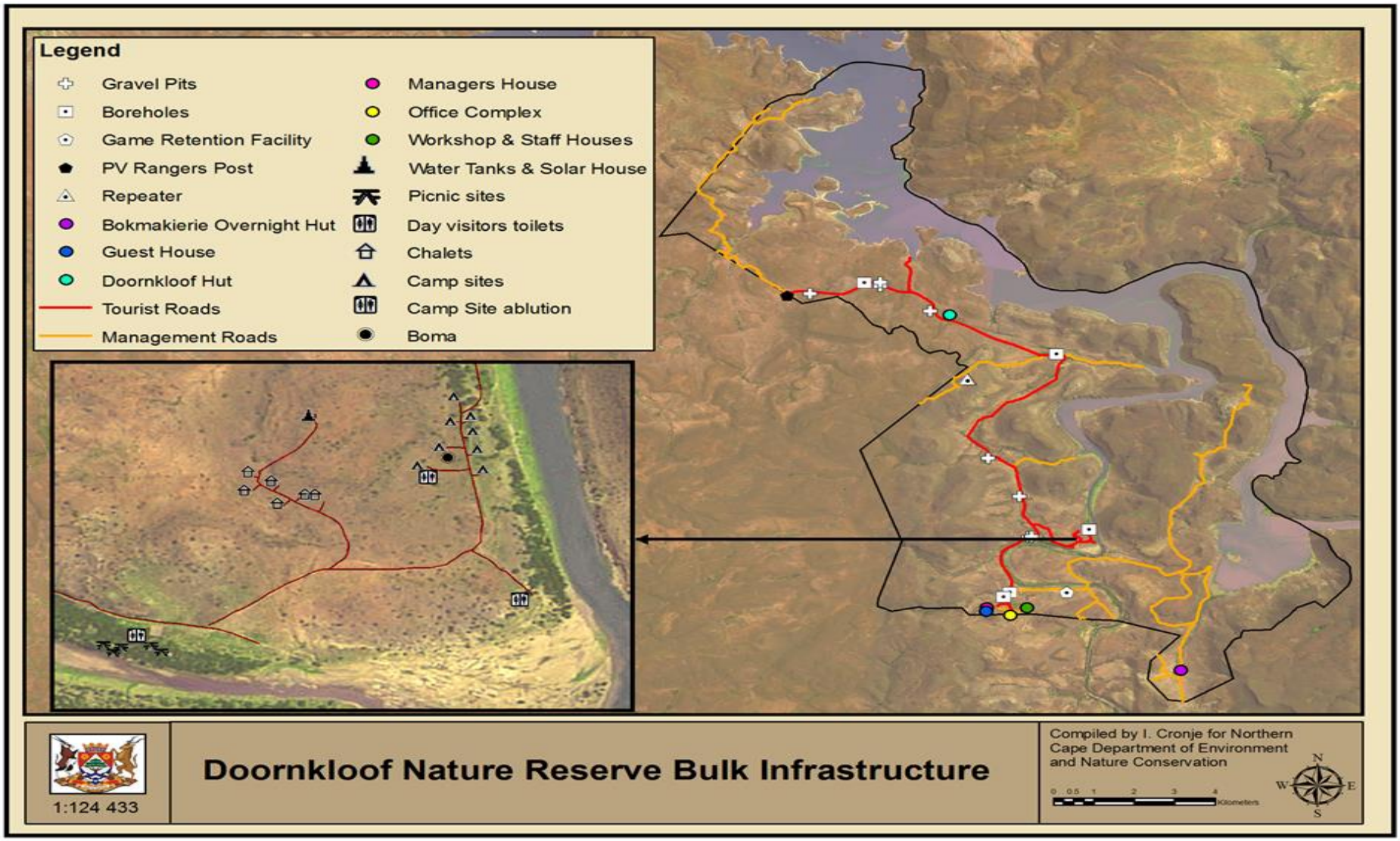


Figure 21: Infrastructure and Bulk Services Map of the DKNR.

Touring Kayaks available for hire at Doornkloof Nature Reserve, HP Cronje

The South African War (*i.e.* the Anglo Boer War 1899 - 1902) was the only military conflict in the history of this country which galvanised and affected virtually all communities and regions of this country. The suffering, deprivation and heroism of many people are currently giving rise to a flood of books and articles, and the War is becoming an important tourism theme. Even though it was originally regarded as a "White Man's War", there has been ample evidence of the multiple roles played by black people in the conflict, and the suffering inflicted on black communities. Consequently, the Minister of Arts and Culture (30 November 2015) stated, in a recent speech at the South African War Museum in Bloemfontein: "Without us being able to grasp history and its facts and figures at our fingertips, we cannot fully grasp ourselves and understand the present in its totality. Because the past is never only the past. We can only overcome and transform that which we know and not that which we do not know or that which is hidden from view. This is why it is important that the full truths of our history are told"[9]. Karoo Dynamics NPC[10] has put together a proposal and business plan for the establishment of the Karoo Battlefield Heritage Route which includes the DKNR with the aim of improving visitors through the provision of experience routes of the South African War by following the route of General De Wet during the invasion of the Cape Colony on horseback. This together with other educational information and experiences will incite interest in the War that will be put in complete South African context. Several benefits to the DKNR will be realised through tourism initiative.

Any additional tourism activities will however be according to the Reserve CDF to establish a coherent spatial framework in and around the Reserve to guide and co-ordinate conservation, tourism and visitor experience initiatives. The CDF will play an important role in minimizing conflicts between different users of the Reserve by separating potentially conflicting activities such as hiking and day-visitor picnic areas whilst ensuring that activities which do not conflict with the reserve values and objectives (especially the wilderness value) can continue in appropriate areas.

2.4.2 *Social Context*

The Pixley ka Seme District lies in the south-east of the Northern Cape Province and shares its borders with three other provinces namely, the Free State to the east, the

[9] http://www.gov.za/speeches/minister-nathi-mthethwa-launch-reconciliation-month-30-nov-2015-0000

[10] Prof Doreen Atkinson,7 Colin Fraser Street, Philippolis 9970, E-mail karoo@intekom.co.za

Eastern Cape to the south-east and the Western Cape to the south-west. It is one of the five district municipalities in the province and is the second largest covering a surface area of 103 410 km². The Pixley ka Seme District Municipality is made up of eight (8) municipalities namely the Emthanjeni, Kareeberg, Renosterberg, Siyancuma, Siyathemba, Thembelihle, Ubuntu and Umsobomvu municipalities. The DKNR is located within the Umsobomvu municipality and includes the towns of Colesberg, Noupoort and Norvalspont. The Umsobomvu municipality covers a surface area of 6 819 km² which is 6.6% of the surface area of the district municipality with a population size of 28 376. The Umsobomvu municipality has the highest population density of four persons per square kilometre in contrast to the mean of the district of two persons per square kilometre. Census 2011 indicated that Umsobomvu municipality has the highest rate of unemployment (33.0% in the district), which is attributed to the decline in the railway industry. Economic development and job creation through attracting investors to the district and developing and supporting local entrepreneurs, are crucial developmental issues in the Pixley ka Seme District Municipality.

2.5 Local and Regional Planning

The DKNR is located within the Umsobomvu Local Municipality, which forms part of the Pixley ka Seme District Municipality of Northern Cape. The Umsobomvu Local Municipality falls with the IDP of the district municipality. An Integrated Environmental Management Programme (IEMP) was developed to provide a high-level plan for sustainable development in the Pixley ka Seme District Municipality of the Northern Cape Province that also includes the Umsobomvu Local Municipality.

Protection of the environment and promotion of economic development are not separate challenges. Development cannot subsist on a deteriorating environmental resource and the environment cannot be protected when projects or development plans consistently fail to consider the cost of environmental destruction. The IEMP provides an evaluation of the state of the environment, sets out an environmental vision and details the constraints, opportunities, management measures, monitoring indicators and desired state of the environment for the various environmental elements. The management measures in the IEMP acknowledge the need for social and economic development and provide strategic issues which should be addressed to take advantage of the environmental goods and services in the district. On the other hand, the strategic issues in the IEMP provide strategic actions that should be taken to protect and conserve environmental resources including the protected areas within the Pixley ka Seme District Municipality. The IEMP recognizes the DKNR as a high sensitivity area in which limited development should take place (Figure 22)

The area around and including the DKNR is documented in the IEMP as an area

- suitable for conservation as it not suitable for arable agriculture;
- with low moderate occurrences of alien vegetation;
- an area with high tourism potential;

A conservation biodiversity assessment and protected area expansion strategy for the Pixley ka Seme District still needs to be compiled.

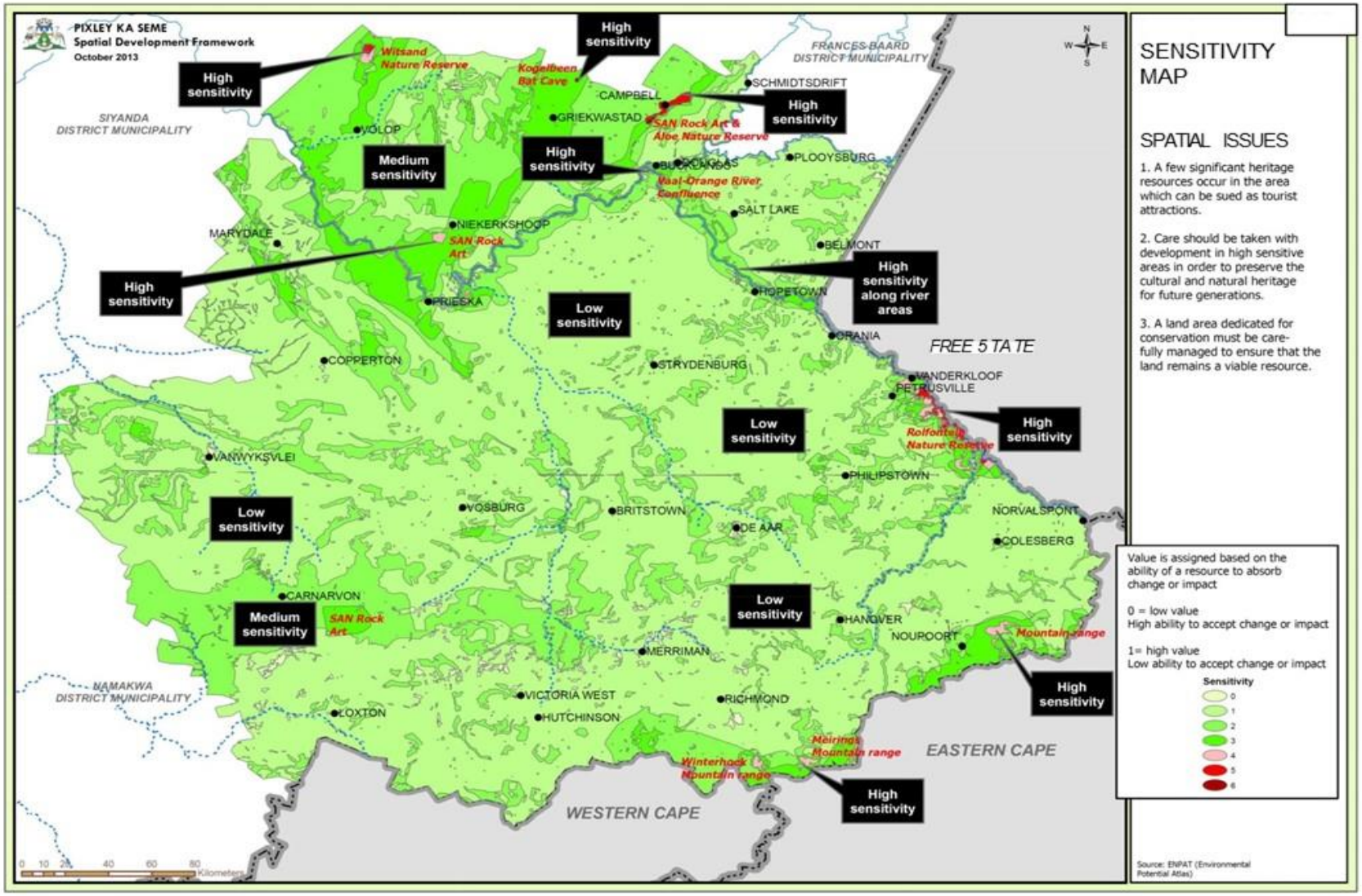


Figure 22: Sensitivity Map of the Pixley ka Seme District Municipality (2013).

2.6 Reserve Expansion

A National Protected Area Expansion Strategy (NPAES) was compiled for South Africa in 2008. The aim of the NPAES is to achieve cost-effective protected area expansion that will ensure a) ecological sustainability and b) increased resilience to climate change. The NPAES sets five- and twenty-year protected area expansion targets; identifies focus areas for protected area expansion; and makes recommendations on potential mechanisms through which protected area expansion could be achieved.

The DKNR is within close proximity to one of the focus areas identified for protected area expansion by the NPAES, namely the **Senqu Caledon** focus areas which lie to the northwest and southeast of the Reserve. Conservation action in this area should be aimed at reducing further habitat loss and ecosystem functioning as well as identifying approaches to increase protection of vegetation types in this focus area. The Nama-Karoo biome covers an area of 24 820 000 ha of which only on 1% is formally protected. The twenty-year target of the NPAES is have 11% of the Nama-Karoo Biome formally protected by 2028. This equates to an additional 2 600 000ha that will require formal protection.

The establishment of a large conservation area and linking the DKNR and RNR through conservation, community involvement and tourism benefit was documented by Venter and Malatjie (2002). A larger conservation area has many advantages over two smaller reserves. A larger area will be able to provide habitat for more species and would thus increase biodiversity and ecosystem services. This will additionally improve the conservation design of the DKNR. Linking the DKNR to the RNR would incorporate an additional 38 000ha with a cumulative conservation potential expanding over an area of 87 000ha. The private sector is willing to participate in conservation initiatives to assist in achieving the conservation targets of the NPAES. Partnerships are valuable in the expansion of protected areas however the most limiting factor is marrying the operations of government agencies and the private sector.

The protected area expansion strategy is provided as a subsidiary plan to this IMP.

2.7 Strengths, Weaknesses, Opportunities and Threats

Table 8 lists the key strengths, weaknesses, opportunities and threats that were identified for the DKNR.

Table 8: SWOT analysis for the DKNR

KEY STRENGTHS
• There is sufficient accommodation in the Reserve; • Forms part of larger Biodiversity Conservation initiative; • Reserve has wilderness attributes; • Good relationship with local communities; • Favoured by anglers as a good angling area.

Table 8 *Cont*. SWOT analysis for the DKNR

KEY WEAKNESSES (ISSUES & CHALLENGES)
• There are insufficient resources and capacity to coordinate and implement effective management of the PA site; • The Reserve is poorly staffed and has undergone a major skills drain; • Lack of effective communication devices: limited cell phone network reception; • Limited road network not conducive to self-drive game viewing by visitors; • Quality of access roads to the DKNR limits wider spectrum of visitors to the Reserve; • Centralized budget, and de-capacitated reserve management; • Appropriate institutional arrangements are required to facilitate active involvement of local stakeholders in decision making; • No signage along aquatic boundary of the Reserve; • Limited fuel holding capacity; • The Reserve is not registered with a Fire Protection Association (FPA); • The Reserve does not have a Strategic Development Framework (SDF) in pace.
OPPORTUNITIES
• Potential for greater collaboration with other conservation initiatives to support management objectives; • Potential for research and monitoring by tertiary institutions; • Potential for job creation; • Potential for tourism-related benefits accrued to local target communities.
THREATS
• Potential poaching from aquatic boundary of the Reserve; • Overgrazing due to non-adherence to ecological management recommendations; • Loss of skills due to retirement age of existing staff; • Uncontrolled fires entering the Reserve from neighbouring areas;

3. STRATEGIC PLANNING FRAMEWORK

3.1 Purpose

The DKNR was initially proclaimed to conserve biodiversity in all its natural facets and fluxes (*i.e*. changes) and to provide human benefits in such a manner that detracts as little as possible from the natural qualities (*i.e*. the ***wilderness milieu***) of the Reserve.

In present times, four of the most important contributions of protected areas are:

- biodiversity conservation and ecological sustainability,
- adaptation to climate change,
- land reform and rural livelihoods, and
- socio-economic development, including ecosystem services.

Some of them were only partially realized through the initial goals of the DKNR that included the following:

- To conserve the biodiversity and life-support mechanisms of DKNR and the surrounding area;
- To implement an integrated environmental management strategy (CDF);
- To preserve and promote the cultural and historical heritage as well as the aesthetic and spiritual value of DKNR and the surrounding area;
- To ensure local community involvement by securing access to and sharing benefits from natural and cultural resources.

3.2 Reserve Values

The following key values (Table 9) of the DKNR were identified by the RPT:

Table 9: Key values associated with the DKNR

KEY RESERVE VALUES
• The Reserve potential to demonstrate the efficacy and benefits of functional partnerships between DAERL, NGO's, Private landowners and other State Departments across provincial boundaries in the collaborative administration and management of DKNR;
• The Reserve is committed to management in accordance with best practice and rationally driven by current knowledge;
• The Reserve is committed to good administration and the efficient use and good maintenance of resources;
• The Reserve is committed to being a good employer and socially affirmative neighbour in the Umsobomvu local community;
• The Reserve has suitable habitat to actively implement natural breeding programmes of rare and economic endangered game species historic to the area *e.*g. the Desert black rhinoceros (*Diceros bicornis bicornis*), Cape mountain zebra (*Equus zebra zebra*) and Cape buffalo (*Syncerus caffer);*
• The Reserve has an active genetic management policy and manages game populations accordingly;
• The Reserve is accessible by tourists and provides great inland water angling experiences;

- The Reserve is regarded as playing an important social support role in local and surrounding communities;
- The Reserve is accessible by tourists and offers a self-drive option for normal sedan vehicles although the road network is limited and thus hiking, mountain biking, and kayaking is promoted;
- The lower portions of the Seekoei River is regarded as one of best inland water angling destinations in the Northern Cape. These waters are home to large specimens of the indigenous small and large mouth yellowfish, catfish, moggel and mudfish. ***Catch, Photograph and Release is promoted***;
- Good quality accommodation is available in the Reserve ranging from a luxury guest house, basic chalets and camping facilities;
- The Reserve offers some of the best bird watching opportunities in the Northern Cape and hosts the breeding grounds of a variety of aquatic birds and raptors;
- Protection of cultural heritage areas with the Reserve and domain.

3.3 The Reserve Vision

The DKNR is a protected area representative of the biodiversity and ecosystem services of the region, conserved and managed for future generations in partnership with adjacent private landowners, local communities and organs of state for the people of South Africa and the environment.

From this partnership, it is envisaged that the following will be secured:

- Conservation of the indigenous biodiversity of the DKNR;
- Conservation of ecological services with specific reference to the Seekoei River which is the main tributary of the Orange River;
- Expansion of the protected area to improve conservation design and inclusion of additional catchment areas;
- Ensure the scientifically genetic management of all games species;
- Introduction of rare game species to improve the conservation importance of the DKNR;
- Implementation of an integrated environmental management strategy;
- Preservation of the cultural and historical heritage attributes of the Reserve;
- The integrity of the natural environment is maintained to ensure the remote and scenic qualities of the reserve to serve as a basis for tourism;
- Equitable access to, and responsible use of, the Reserve and its natural resources for the benefit of present and future generations through strategic partnerships.

3.4 Key Performance Areas and Objectives

The RPT identified 24 Objectives for the DKNR (Table 12). Collectively these objectives are anticipated to contribute to realizing the Vision for the Reserve. These objectives have, in turn, been grouped into six Key Performance Areas (KPAs), as follows:

Table 10: Key performance areas and objectives of the DKNR

KEY PERFORMANCE AREAS (KPA)	OBJECTIVES
KPA 1: Biodiversity and Heritage Conservation	1.1 Obtain **Biodiversity knowledge** about the DKNR; 1.2 Restoration of degraded areas; 1.3 Maintenance of **ecological processes** in the DKNR; 1.4 Maintenance of critical **ecosystem services**; 1.5 Land use planning and management outside of the protected area; 1.6 Water use planning and management operations influencing the protected area; 1.7 Audit achievement of biodiversity targets; 1.8 Manage and **mitigate** the **environmental impacts** of conservation management, tourism, recreation and natural resource use in the DKNR; 1.9 Protect the **heritage resources** of the DKNR.
KPA 2: Recreation, Marketing, Education, Awareness and Interpretation	2.1 Develop, deliver and maintain a diverse range of **tourism and recreational** services for visitors to the DKNR in accordance with CDF; 2.2 Develop and implement a focused and cost-effective **marketing program** for the DKNR; 2.3 Develop and implement a focused and cost-effective **awareness-raising and educational program** for the DKNR.
KPA 3: Enforcement, Security and Access Control	3.1 Secure the **legal tenure** of, and **management authority** for, the DKNR; 3.2 Secure boundaries of, and maintain controlled access to, the DKNR; 3.3 Sustain an effective law enforcement and compliance capacity in the DKNR.
KPA 4: Infrastructure and Equipment	4.1 Acquire and maintain **operational equipment and vehicles** for the DKNR; 4.2 Construct, maintain and upgrade the **administration infrastructure and bulk services** infrastructure in the DKNR; 4.3 Construct, upgrade and maintain day and overnight visitor **buildings and infrastructure** in the DKNR.
KPA 5: Stakeholder Involvement	5.1 Interaction with **stakeholders and communities** in the planning, development and management of the DKNR; 5.2 Actively participate in **local and regional conservation** and **socio-economic development** initiatives that may affect or benefit the DKNR; 5.3 Develop, implement and maintain effective mechanisms for ongoing communications with co-management partners
KPA 6: Administration and Planning	6.1 Institute and maintain an effective **management planning** capability in the DKNR; 6.2 Maintain an adequately equipped, resourced and trained **staff complement** for the DKNR; 6.3 Institute and maintain an effective **financial, administration** and **planning** capability in the DKNR.

3.5 Conservation Development Framework (CDF)

The CDF is a strategic spatial plan for the Reserve and its surrounds that indicates a range of visitor use zones (Figure 23), areas requiring special management intervention, the placement of visitor facilities, the nature and size of these facilities, entry points and movement routes through the reserve. It also provides guidelines for potential future development, rehabilitation and the management of land-use along the reserve borders. The CDF is underpinned by a thorough analysis of the biodiversity, cultural-heritage and landscape limits to development, as well as the tourism opportunities. Sensitivity-value analysis is a decision support tool for spatial planning that is designed to integrate best available biodiversity information into a format that allows for defensible and transparent decisions to be made. The CDF for the Reserve is not yet fully developed as the Reserve is in a transition between having a zonation plan and a fully developed CDF (which will include the Use Zone Map). One of the elements underlying the CDF not yet fully developed is a full tourism market analysis and detailed analysis of all development nodes. Other element of the CDF still to be considered further in future are resource use potential and better interfacing with municipal Integrated Development Plans and Environmental Management Frameworks. The development of the initial CDF for the Reserve followed the generic planning process and basic planning principles for all reserves as described in Annexure 2.

3.5.1 *Use Zone map and development sites*

3.5.2 *Determine use zones*

- This step of the CDF process is a requirement for all Reserves in terms of the PAA. A draft was exposed to all stakeholders and amended as required by the PAA that is now submitted to the Executive Management for ratification and approval by the MEC as part of this IMP;
- This process was informed largely by the sensitivity map and Reserve policies and planning principles;
- The generic set of visitor use zones for all Reserves was used as a guideline.

3.5.3 *Determine locations for future development of specific facilities*

- Informed by the use zones, regional influences, visitor requirements, market needs and other informants, sites for potential visitor facilities and alternates were identified;
- At the same time potential transport routes and alternates are identified and the standards for all roads, footpaths and cycle routes will be set;
- Using the principles of SEA, the alternate sites will be critically examined and the most suitable location decided on;
- The scale of development and the numbers of visitors need to be informed by an assessment of cumulative impacts for the whole reserve.

Based on available information, and in consultation with the RPT, the Conservation Development Framework (CDF) (Annexure 2) is presented as a strategic spatial planning framework for the DKNR and its surrounds. Annexure 2 describes the objectives, characteristics, uses, management guidelines and broad conservation

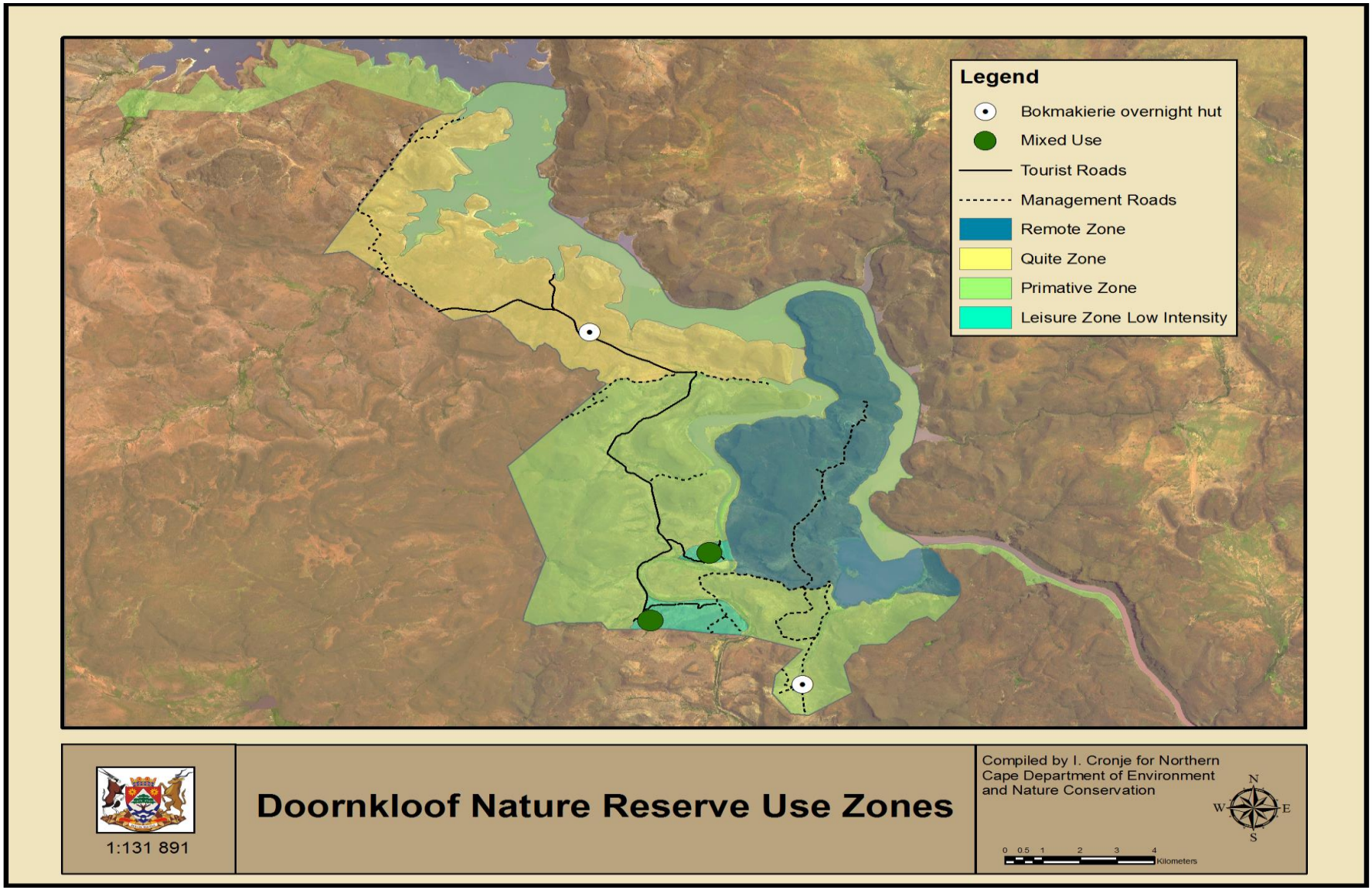


Figure 23: Use Zone Map for the DKNR.

and tourism infrastructural requirements designated for each of the use zones shown in Figure 23. Each of these zones has criteria for the type of activities, inter-action with other users the type and size of facilities, the sophistication of facilities and the standard of roads.

4. OPERATIONAL MANAGEMENT FRAMEWORK

The Operational Management Framework (OMF) translates each KPA and its set of related objectives into:

- Guiding management principles to guide decision-making and operations including:
  - International Conventions, Commissions and Treaties;
  - National Acts and Regulations;
  - Provincial legislation and municipal by-laws;
  - Policies to guide decision-making and operations and strategies relating to implementation
  - Standard Operating Procedures (SOP's) on how to implement policy and strategy including:
    - Frameworks;
    - Norms and Standards; and
    - Protocols
- Management actions and targets that should be implemented to achieve the PA objectives and the resources required to implement it.

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Guiding management principles are provided for in the Annual OMF with copies of the relevant documents as part of the SKDR. Management actions according to priority, management targets and performance indicators are also provided for in the Annual OMF together with Time Frames, Responsibilities and Cost estimate provided as subsidiary plan to this document.

The management action priorities are categorized according to the tabulated divisions below:

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

4.1 KPA 1: Biodiversity and heritage Conservation

4.1.1 *Objective 1.1: Obtain Biodiversity knowledge about the PA*

4.1.1.1 *Norms and standards*[11]

- ❖ Ensure proper planning in the establishment or expansion of the protected area
  - ➢ A biodiversity resource inventory for the protected area is maintained and monitored:
    - Priority species, habitats or ecosystems have been identified;
    - information on these species, habitats and ecosystems is sufficient to support planning and decision making and little additional information is required to manage the protected area's biodiversity;
    - A monitoring programme for these species habitats and ecosystems is in place.
  - ➢ A cultural heritage resource inventory for the protected area is maintained:
    - There is a comprehensive inventory of cultural heritage resources.
- ❖ Ensure that each protected area has an approved programme identifying research needs and a monitoring plan according to the management plan of a protected area.
  - ➢ A research programme for the protected area is being implemented:
    - Research provides for management application (where possible and allowed for by budget);
    - Scientific decision support is available and or facilitated;
    - Management orientated research projects form a substantial part of the programme;
    - Results of research projects are fed back to protected area management;
    - The results are used to adapt management of the protected area where relevant;
    - There is an approved research plan with all research requirements;
    - There is a number of approved projects in place;
    - There is a platform in place to give feedback of research results;
    - There are research records in place;
    - Distinction between research for management purposes and that done by outsiders which may not have direct applications and managing the external researchers;
    - Researchers comply with ethical research procedures.
  - ➢ A monitoring programme for the protected area is being implemented:
    - The protected area has developed an applicable monitoring programme supporting management objectives, and provide for review of the programme;
    - Indicators for monitoring have been established;
    - The results of the programme are used to adapt management of the protected area where relevant.

[11] The norms, standards and indicators is according to the "Norms and standards for the management of protected areas in South Africa" published in terms of NEM:PAA Act (57/2003) under General Notice 528.

4.1.1.2 *Principles*[12]

- The Research and Monitoring Program (RMP) should be developed, where relevant, to align with and complement national and international monitoring systems (Teder *et al*. 2007);
- The RMP recognizes that monitoring is required at multiple levels and scales and that monitoring objectives are often hierarchical. In this way, standard approaches facilitate aggregation of information across ecosystems and into organizational, national and global measures (Teder *et al*. 2007);
- Clear, rigorous and relevant sets of objectives, hypotheses and methods must be established for each monitoring programme (Nichols & Williams 2006), with feedbacks between scoping, design, testing and implementation phases (Reyers & McGeoch 2007);
- Monitoring programmes are designed using best scientific practice and current understanding, and supported by integrated, long-term and question- driven research (Pringle & Collins 2004; The Royal Society 2003; Nielsen *et al.* 2009);
- Where possible and appropriately designed monitoring programmes are implemented using well-established, widely applied techniques and methods, that capitalize on technological developments (Margules *et al*. 2003; Soberon & Peterson 2009);
- Minimum monitoring requirements should initially be established independently of current capacity and resource constraints, whereafter cost-effectiveness assessments, prioritization and staged implementation options should be evaluated (Gardner *et al*. 2008).
- Few, well-implemented monitoring programmes (including the indicators and thresholds of concern that underpin them) are preferable to many under-developed programmes, or programmes that cannot be sustained because of capacity limitations (Biggs & Rogers 2003; Timko & Innes 2009);
- Planning for analysis, reporting, data management, archiving and programme integration must be incorporated as essential elements during the design of the RMP (Spellerberg 2005; Field *et al.* 2007; Flenry *et al.* 2008). This includes planning for the translation of results and outcomes into actions and advice relevant to management and/or policy development, that is, to complete the adaptive management cycle;
- Monitoring programme proposals should be peer-reviewed prior to implementation, and thereafter should have regular review cycles;
- The BMP will not necessarily exclude other monitoring activities (current or future), and additional monitoring with highly localized and perhaps shorter-term objectives may be necessary. Where such activities and projects exist or are implemented, they will add value to and are likely to complement the RMP and should be integrated into the RMP.

[12] The policy (principles) guiding the development of Biodiversity Monitoring System (BMS) and the Biodiversity Monitoring Programmes (BMPs) in this section were developed by SANParks.

4.1.2 *Objective 1.2: Restoration and mitigation of degradation*

4.1.2.1 *Norms and standards*

- ❖ Ensure that the protected area has visitor facilities that contribute positively to the experience without negatively affecting the environment and biodiversity.
  - ➢ Visitor facilities are established in line with the protected area objectives, and in response to tourism market demands, and contribute positively to the visitor experience:
    - There are active programmes for restoration of degraded areas in the protected area and/or associated buffer zone, resulted (resulting) from visitor use;
    - Areas in the protected area suffering from degradation or damage as a result of visitor use are subject to a rehabilitation plan.
- ❖ Ensure biodiversity resources are managed to meet the protected area objectives as set out in the management plan.
  - ➢ The protected area is implementing an effective invasive species control and eradication (programme) strategy, as required in terms section 76 of the National Environmental Management: Biodiversity Act, 2004:

4.1.2.2 *Principles* [13]

- PA management shall strive to remove all alien species where possible, control, maintain and where necessary, restore previously invaded or planted areas, in order that these sites resemble or form part of the functioning landscape and ecosystem;
- DAERL recognizes that invasive alien species are one of the greatest threats to the biodiversity of the Reserve estate;
- Under the guiding international conventions, national legislation, and by means of its own objectives, invasive alien species impact on and harm the core conservation business of Provincial Nature Reserves;
- DAERL as the leading conservation organization in the Northern Cape, has a responsibility to lead by example, provide awareness and educate the broader community about invasive alien species in the interests of the province ecological and economic environment;
- Implement rules applicable to use and control of ornamental plants within Nature Reserves including rules under which camps and personnel villages will be surveyed and cleared, as well as rules for replacement and use of plants for landscaping and ornamentation. These principles must also be captured in the Code of Conduct which guides staff residing in the reserve, as well as plants used for ornamental purposes at tourism facilities;
- Identify associated research and monitoring needs; and
- Highlight potential risks or threats:
  - o Map the parcels of land under the control of the Protected Area Management Authority, in management unit compartments;
  - o Compiling the list of invasive species for each management unit compartment;
  - o Describing the prioritization of the land parcels in the management unit compartments;

[13] The guidelines in this section were developed by DEA as part of the Guidelines for species listed as invasive in terms of Sec 70 of NEM:BA, 2004 (Act No. 10 of 2004) and as required by Sec 76 of this Act.

- Assessing the extent of infestations;
- Reporting on the efficacy of previous control or eradication measures;
- The current measures to monitor, control or eradicate listed invasive species;
- The measurable indicators of progress and success, and indications of when the Control Plan is to be completed.

- Identify redundant structures and impacted sites within the PA which require removal and/or rehabilitation in order to restore wilderness qualities and 'sense of place' and also to improve ecosystem functioning;
- Prioritize rehabilitation goals with highest priority given to wilderness zones and areas bordering on those zones;
- Determine the rehabilitation needs for the next five years with associated time-frames and projected funding requirements.

4.1.3 *Objective 1.3: Maintenance of ecological process in the PA*

4.1.3.1 *Norms and standards*

- Ensure proper planning in the establishment or expansion of the protected area
  - The management of the protected area contributes to the maintenance of ecological processes:
    - The management of the protected area includes the operational management framework to ensure monitoring of ecological processes;
    - The management of the protected area effectively maintains the environment for ecological processes critical for the achievement of biodiversity targets;
    - Ecological processes are being effectively maintained with the result that ecological integrity and biodiversity are not being compromised;
    - The management of the protected area has a monitoring system in place;
    - The management of the protected area has a system to mitigate ecosystem threats in place.
- Ensure the approved management plan is implemented accordingly to meet the objectives set in the management plan.
  - Biodiversity resources are managed to meet the protected area objectives as set out in the management plan:
    - An effective fire management programme for the protected area is implemented;
    - The protected area is adequately managed for sustainable use of resources;
    - The protected area has management guidelines for the sustainable use of biological resources;
    - The biodiversity assets and values are being managed consistent to objectives;
    - The impact of legal and illegal extractive use of biological resources is being monitored;
    - Species management plans as required in terms of NEM: Biodiversity Act, 2004 (Act No. 10 of 2004) are approved.
- Existing DAERL strategies relating to management of ecological processes:

- Wildlife management strategy for Provincial Nature Reserves in Northern Cape:
  - Game census on Provincial Nature Reserves;
  - National norms and standards on hunting on PA's;
  - procedures for game registers on provincial nature reserves;
  - Procedures for the introduction of mammals into Provincial Nature Reserves including provincial and national translocation policy;
  - Procedures on the donation of game;
  - Provincial directive on the control and management of damage-causing wild animals in Northern Cape Province; and
  - Removal of game from Provincial Nature Reserves;
- Vegetation monitoring strategy for Provincial Nature Reserves in Northern Cape.

❖ The Reserve shall conform to the legal requirements of the NVFFA.
- Unplanned wildfires that occur in areas where it could have undesirable ecological effects, threaten Reserve infrastructure or threaten neighbouring properties shall be suppressed or controlled wherever possible;
- Unplanned wildfires that occur in Reserve areas where it will do no ecological harm and/or threaten properties may be allowed to burn, provided that safety concerns are not compromised;
- Fire protection measures and resources (equipment, trained personnel, firebreaks, etc.) must be maintained and effective in the Reserve at all times;
- Reserve management shall, wherever possible, establish partnerships with neighbours and other role-players through agreements and membership of FPAs;
- Controlled block burns can only be implemented after an ecological assessment of the dry matter/fuel load has been completed.

4.1.3.2 *Principles* [14]
- Respect the complexity, as well as the richness and diversity of the socio-ecological systems making up the PA and the wider landscape and context;
- Respect the inter-dependency of the fundamental drivers of landscape diversity, the associated biotic and landscape diversity, and the aesthetic, cultural, educational and spiritual attributes;
- Strive to maintain natural processes in ecosystems, along with the uniqueness, authenticity and worth of cultural heritage, so that these systems and their elements can be resilient and hence persist;
- Manage with humility the systems under our custodianship, recognizing and influencing the wider socio-ecological context in which we are embedded;
- Strive to maintain a healthy flow of ecosystem and cultural goods and services (specifically preserving cultural artefacts), and to make these available, also through access to reserves, thereby promoting enjoyment, appreciation and other benefits for people;

[14] The principles in this section were developed by SANParks's as part of fulfilling their mandate for biodiversity custodianship.

- When necessary, intervene in a responsible and sustainable manner, complementing natural processes as far as possible, using only the level of interference needed to achieve our mandate;
- Do all the above in such a way as to preserve all options for future generations, while also recognizing that systems change over time;
- Acknowledge that conversion of some natural and cultural capital has to take place for the purpose of sustaining our mandate, but that this should never erode the core values above;
- Biodiversity forms an important basis of the ecosystem services that sustain the benefits that humans derive from conservation;
- People are seen as part of ecosystems, though the ways in which they interact with ecosystems may vary widely in different PA's and circumstances;
- We measure our performance in all that we are mandated to do;
- We are responsive to the impact of other value systems on biodiversity such as cultural and tourism values;
- We are concerned, and responsible, for the implications of our conservation management decisions/actions;
- Co-operative governance is seen as a central guiding principle, and collaborative methodologies are thus seen as fundamental;
- We treat all biodiversity elements (all species, ecosystems, processes, structural components, etc.) with equity;
- We strive to maintain a balance between the management of biodiversity and cultural heritage;
- Wildlife management in the Reserve is focused primarily on protecting the ecological functioning of the Reserve;
- Wildlife stocking densities should be maintained within the ecological capacity of the supporting habitats of the Reserve;
- A regular programme for monitoring rangeland condition, animal numbers and the physical condition of animals must be in place to ensure that the ecological capacity of the Reserve is not exceeded;
- Population management of wildlife species is required to ensure that such species are not causing the ecological degradation of the Reserve;
- Wherever feasible, non-lethal and environmentally friendly measures should be implemented to limit, or mitigate, the impacts of any indigenous damage causing animal in, or escaping from, the Reserve.

4.1.4 *Objective 1.4: Maintenance of critical ecosystem services*

4.1.4.1 *Norms and standards*

- ❖ Ensure proper planning in the establishment or expansion of the protected area.
  - ➢ A protected area contributes to the socio-economic benefits of the surrounding communities:
    - The protected area management has identified the ecosystem services that the protected area and neighbouring land-users are reliant upon;
    - The ecosystem services are being effectively maintained with the result that the protected area and neighbouring land users are deriving most benefit from these services.

4.1.4.2 *Principles*[15]

- Precautionary approach - The "precautionary approach" must apply. This is interpreted as:
  - leaving an appropriate "margin of error" where information is inadequate;
  - prohibiting or preventing use of resources in instances where the consequences of erring could be severely negative for species, heritage resources, cultural landscapes and/or ecosystems;
  - Terminating resource use activities if doubt arises as to the sustainability or impacts on the PA.
- Maintenance of system integrity - The ecological, aesthetic, socio-cultural, archaeological and spiritual integrity of the protected area must not be jeopardized in the long-term in order to satisfy short-term needs/demands;
- Cost-benefit analysis - The benefit-cost ratio to DAERL must be positive;
- Determination and evaluation of potential influence of resources;
- The thresholds of potential concern for use on affected species, heritage resources, cultural landscapes and ecosystems must be determined and evaluated using methodology that is appropriate for this purpose. This must take into account the effects of resource use on population dynamics, ecosystem functioning and social and cultural values. This must be achieved in an integrated manner, incorporating all relevant scientific, formal and informal information and knowledge (including traditional knowledge);
- Cost recovery - Costs must be recoverable from resource users who are able to pay, and it should be possible to leverage "contributions in kind" from users who are unable to pay. Cost recovery also includes the costs of monitoring programmes that are required to manage resources in a sound manner;
- Adequate capacity - Appropriate human and financial resources must be available to manage, monitor and regulate resource use;
- Adaptive management - Resource use must be managed adaptively, accompanied by constant learning based on monitoring, information gathering and research;
- Incentives - Incentives for sustainable resource use and disincentives for unsustainable or wasteful use must be put in place;
- Ethics - Accepted ethical norms and standards must be adhered to;
- Redress - Past inequalities must be addressed through benefiting the poor, but without undermining the diversity of people's livelihood strategies;
- Respect for rights - Intellectual property rights and historical claims to resources must be respected;
- Co-management – Decision-making must be consultative and transparent. All stakeholders involved in resource use should accept responsibility for sustainable use;

[15] The principles in this section were developed by SANParks's as part of fulfilling their mandate for biodiversity custodianship.

- Enforcement - Illegal resource use must be prevented through law enforcement;
- Rights and responsibilities: While DAERL acknowledges the responsibilities outlined above, it also has the right to choose which resources it will make available and how much, as well as the right to withdraw if necessary (*i.e.* the use of a resource does not automatically constitute the source as being permanent).
- The Reserve regards any action that utilizes or impacts on the scenery, sense of place, soil, water, air and nutrient cycles, habitats, heritage resources, flora and fauna, and the interrelatedness between these, as a resource use;
- The Reserve recognizes that it has a responsibility to ensure that natural and cultural resources which are not harvested from within the PA boundaries, but are used in the PA, are collected and harvested in an ethical way that conforms to DAERL policies;
- Strive to maintain a healthy flow of ecosystem and cultural goods and services (specifically preserving cultural artefacts), and to make these available, also through access to reserves, thereby promoting enjoyment, appreciation and other benefits for people;
- Biodiversity forms an important basis of the ecosystem services that sustain the benefits that humans derive from conservation;
- Our understanding and management must reflect the social imperatives (*e.g.* transformation, equity, efficiency, empowerment, growth) of an emerging African democracy;
- Whenever feasible and justifiable, we strive to implement the option which best serves local community needs.

4.1.5 *Objective 1.5: Land use planning and management outside of the protected area*

4.1.5.1 *Norms and standards*

- Promote and or ensure the positive involvement of the protected area management in planning outside the protected area which may affect its integrity.
  - An appropriate buffer zone for the protected area has been established.
    - The protected area has identified a buffer zone in its management plan;
    - The protected area has mechanisms to facilitate the implementation of the buffer zone;
    - The protected area management has proactively sought to encourage neighbours to introduce conservation-friendly land uses to enhance buffering of the protected area;
    - A policy for controlling activities in the buffer zone has been developed and is implemented.
  - The protected area is integrated into land-use planning outside of the protected area:
    - Management authorities play an active role in land use planning affecting the protected area;
    - The land-use planning takes cognizance of the protected area and the achievement of protected area management objectives.
  - Promote compliance with NEMA, 1998 (Act No 107 of 1998) Environmental Impact Assessment Regulations, 2014 Listing Notice 3 of 2014 under sections 24(2), 24(5), 24D and 44, read with section 47A (1)

(b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), in Gazette No. 38282 dated 04 December 2014 – Northern Cape Province.

- ❖ Contribute to a good relationship between the protected area staff and neighbouring communities.
  - ➢ Neighbour relations contribute positively to the success of the protected area:
    - A zone of influence has been identified;
    - A programme to encourage the development and maintenance of good relations with neighbours in the zone of influence is in place;
    - There is a formalized programme of regular interaction between protected area management and neighbouring land users;
  - ➢ The protected area staff regularly collaborate with partners, local communities and other organizations;

4.1.5.2 *Principles*[16]

- Develop and introduce appropriate strategies, mechanisms and incentives to integrate the Reserve within the broader ecological and social landscape, and encourage conservation in adjacent private and communal areas;
- Support and promote activities adjacent to protected areas that are compatible with and which complement the objectives of the protected area;
- Discourage development in areas in which biodiversity and ecological function would be adversely affected;
- Conserve and make sustainable use of biological resources in the buffer zone and avoid o minimize adverse impacts on the biodiversity of such areas;
- Support the development of community-based biodiversity management initiatives as part of a broader set of approaches to land-use planning and developing local sustainable development strategies;
- Promote the development of partnerships between the management authority, other conservation authorities, community, non-governmental organization (NGOs), and private entrepreneurs for purposes of planning and managing the use of resources within the PA zone of influence, and optimizing benefits for local people;
- Enhance the capacity of communities residing in or adjacent to protected areas to participate in protected area management through providing appropriate training and education, and through local expertise and traditional institutions;
- Take steps to avoid or minimize damage caused to people and property by wildlife;
- Improve benefit flows to people in and around protected areas.

4.1.6 *Objective 1.6: Water use planning and management influencing the protected area*

4.1.6.1 *Norms and standards*

[16] The principles in this section were modified from the goals of the Biodiversity Policy and Strategy for South Africa: Strategy on buffer zones for National Parks Government Gazette No 35020. 2012.

- ❖ Promote and or ensure the positive involvement of the protected area management in water use planning and management operations influencing the PA.
  - ➢ Water-use planning outside takes into account the objectives of the protected area:
    - Management authorities play an active role in water use planning affecting the protected area;
    - The water-use planning takes cognizance of the protected area and the achievement of protected area management objectives.

4.1.6.2 *Principles:*

- Reserve management is a key stakeholder and role player in the management of water resources in all the catchments within which it is situated (water quantity and quality issues are very important from both biodiversity management and tourism perspectives);
- The National Water Act details the involvement of stakeholders in the management of water resources and the Reserve has taken an active role in the initiation and management of Catchment forums;
- Increased interaction with neighbouring and upstream land-use planning and catchment management activities as the interdependence of these systems is more fully appreciated.

4.1.7 *Objective 1.7: Audit achievement of biodiversity targets*

4.1.7.1 *Norms and standards*

- ❖ Verify the importance of the protected area to the South African system of protected areas.
  - ➢ The protected area contributes to the achievement of national biodiversity targets:
    - The protected area is an ecological viable area;
    - It protects a representative sample of South African biodiversity;
    - It protects a representative sample or iconic feature of South Africa's land/seascapes.
  - ➢ The protected area is important for the conservation of biodiversity:
    - Contribution to protection of endemic, threatened, or endangered species;
    - Contribution to conservation of threatened ecosystems;
    - Contribution to biodiversity conservation targets;
    - Protection of a representative range of plant and animal diversity for the eco-region (in terms of biodiversity targets);
    - Viability and extinction risk of populations of key species;
    - Contribution to the representative examples of biomes, vegetation types and ecosystems;
    - Extent to which natural and disturbance processes necessary for ecosystem functioning are maintained;
    - The state of landscape linkages and connectivity that allow the protected area to function as part of larger surrounding ecosystems;
    - Provision of ecosystem services that the protected area and neighboring land-users are reliant upon;
    - The protected area provides a critical landscape function;

- The protected area includes ecosystems whose historic range has been greatly diminished.

4.1.7.2 *Principles:*

- Criteria must be scientifically credible, practical and simple;
- Different thresholds may be required for different environments;
- The most appropriate scale for mapping ecosystems depends on a range of factors including the nature of the ecosystems and the available data.
- The approach must be explicit and repeatable;
- The approach must be target-driven and systematic, especially for threatened ecosystems;
- The approach must follow the same logic as the IUCN approach to listing threatened species, whereby a number of criteria are developed and an ecosystem is listed based on its highest ranking criterion;
- The identification of ecosystems to be listed must be based on scientifically credible, practical and simple criteria, which must translate into spatially explicit identification of ecosystems.

4.1.8 *Objective 1.8: Manage and mitigate the environmental impacts of conservation management, tourism, recreation and natural resource use in the PA*

4.1.8.1 *Norms and standards*

❖ Ensure the approved management plan is implemented accordingly to meet the objectives set in the management plan.

➢ All development projects that require environmental scoping are assessed through either internal or external EIA processes and are authorized at the relevant level.

- There are records of decisions/authorizations in place;
- There is a process to monitor and effect compliance with conditions of records of decisions.

4.1.8.2 *Principles*

- The Reserve shall strive to continually improve its environmental management systems, through reducing or mitigating the environmental impacts of *inter alia*: administrative and visitor infrastructure and activities; solid waste disposal; water supply and distribution systems; energy supply and distribution networks; sewage systems; and herbicide and fuel supplies;
- The Reserve shall strive to continually improve its environmental management systems, through restoration and/or rehabilitation efforts.

4.1.9 *Objective 1.9: Protect the heritage resources of the PA*

4.1.9.1 *Norms and standards*

❖ Proper planning in the establishment or expansion of the protected area.

➢ A cultural heritage resource inventory for the protected area is maintained:

- Cultural heritage values have been identified;
- Information on these resources and values is sufficient to support planning and decision making and little additional information is required to manage the cultural heritage of the protected area;
- There is a comprehensive inventory of cultural heritage resources.

- ❖ Ensure the approved management plan is implemented accordingly to meet the objectives set in the management plan.
  - ➢ Cultural heritage resources are managed to meet the protected area objectives as per the management plan and in terms of the South African Heritage Resources Agency requirements:
    - The heritage resources are managed;
    - The heritage monuments are managed and maintained;
    - The cultural sites are adequately managed;
    - Cultural heritage resources adequately managed;
    - Heritage assets and values managed consistently to objectives;
    - The management of heritage assets and values (are being managed) is consistent (to) with protected area objectives;
    - Critical cultural heritage assets are predominantly intact according to the objectives of the protected area.

4.1.9.2 *Principles:*

- The Reserve shall conform to the legal requirements of the NHRA.

4.1.10 *Management actions and targets relating to Biodiversity and Heritage Conservation KPA 1*

#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
KPA 1: Biodiversity and Heritage Conservation											**R 5 168 090,12**	**R 1 942 450,29**	**R 2 340 445,76**	**R 1 130 349,72**	**R 1 930 250,70**
Objective 1.1 Obtain Biodiversity and Cultural Heritage knowledge about the DKNR											R 73 753,95	R 226 327,54	R 164 278,17	R 130 379,93	R 114 471,29
1	Identify and analyse internal and external risks/influences wrt. Biodiversity & Heritage Conservation with potential actions to be taken to manage these.		A full risk assessment, covering *inter alia* biodiversity, financial management, human resources, tourism, pressures & threats has been undertaken for the PA that informs management planning.	1.6 Risk assessment	Management Authority (Biodiversity Unit); Reserve Manager						R 0,00	R 10 068,67	R 0,00	R 11 100,71	R 0,00
2	Identify, and prioritise the biodiversity management requirements of the PA for baseline information, research and monitoring.		Research needs have been identified and projects relevant to all management needs are being undertaken, enabling the monitoring of results of management actions against set objectives.	3.1 Management Research Programme							R 0,00	R 12 585,84	R 0,00	R 0,00	R 0,00
a	*Inclusion of Doornkloof into the Platberg-Karoo IBA*														
3	Develop and maintain a targeted research and monitoring program relevant to management needs to guide biodiversity management		There is an established Monitoring & Evaluation program which is fully implemented with PA management participation and is used to guide adaptive management.	3.1.1 Monitoring and Evaluation Programme							R 34 318,78	R 28 878,41	R 11 422,33	R 29 993,44	R 12 593,12
4	Facilitate access for external research institutions to implement the priority research and monitoring requirements of the reserve.		There is an established working relationship with researchers and regular liaison leads to research results feeding into management decisions.	3.1.2 Relationship with researchers							R 0,00	R 23 878,41	R 32 915,58	R 15 000,00	R 7 702,62
a	*In collaboration with academic institutions implement a a genetic intregity study of game species in the reserve to guide best management practices.This includes the provision of a genetic database of all species with documented introductions;*														
b	*Initiate in collaboration with academic institutions a small predator (i.e. black-backed jackal and carcal) prey research study to investigate the decline of mountain reedbuck in the reserve.*														
5	Collect and update key baseline information concerning key species, habitats, ecosystems and invasive species in the reserve:		Information and the understanding thereof concerning key species, habitats, ecosystems and invasive species of the PA as compiled by scientific services supports the achievement of all biodiversity objectives.	1.4. Biodiversity knowledge and understanding	Ecological Manager & Field Rangers						R 28 485,23	R 66 703,19	R 103 627,38	R 61 558,75	R 76 190,61
a	*01 BMP 1 Biodiversity mechanisms*														
b	*02 BMP 2 SSC*														
c	*03 BMP 3 Freshwater and Wetlands (Ground water - Boreholes)*														
d	*04 BMP 4 IAS*														
e	*05 BMP 5 Resource Use Tourism*														
f	*07 BMP 7 Degradation Rehabilitation*														
g	*08 BMP 8 Cultural Heritage*														
h	*09 BMP 9 Climate and Climate Change*														
6	Maintain the baseline biodiversity data sourced from field ranger cybertracker reports and export to GIS for data interpreation,presentation and preservation.		Reserve database of management-oriented biodiversity information readily accessible and in an understandable format to facilitate decision making.	1.5.1 Format of data							R 10 949,93	R 84 213,03	R 16 312,88	R 12 727,03	R 17 984,95

Management actions and target relating to Biodiversity and Heritage Conservation KPA 1 cont.

Objective 1.2: Restoration and mitigation of degraded areas in the DKNR							R 4 613 163,05	R 170 839,88	R 289 745,74	R 300 767,21	R 327 961,69
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Collect and update key baseline information concerning degradation:		There is a plan for addressing degraded areas within the PA. Visitor impacts which could result from current and anticipated levels of visitation are fully mitigated by the design of the tourism infrastructure	5.1 Tourism Infrastructure (mitigating impacts) 2.6 Restoration of degraded areas	Reserve Manager; Ecological Manager						
a	*Map and monitor visitor impact (trampling, waste, graffiti, fire rings and other negative impacts) per hotspot wrt. special natural features (caves, waterfalls etc.)*						R 10 949,93	R 9 026,62	R 9 477,95	R 9 951,85	R 10 449,44
2	Compile an invasive species control and eradication plan in terms sec. 76 of the NEM: Biodiversity Act, 2004:		There is a plan for addressing control and eradication of invasive species within the PA.								
a	*Locate, document and map invasive species within the reserve estate, domain and interface with particular reference to aquatic invasive speces that enter the reserve via the Seekoei and Orange Rivers.*						R 0,00	R 12 585,84	R 0,00	R 0,00	R 8 741,81
3	Develop partnerships with funding and implementing agencies (e.g. WfW) to improve the capacity of the reserve to sustain its invasive alien plant control program.						R 4 775,35	R 0,00	R 5 286,05	R 0,00	R 5 827,87
4	Implement an invasive species control and eradication plan		No spread or densification of excotic encroachment. Extent, by density, of invasive alien plants known.	2.6 Restoration of degraded areas	Reserve Manager, Field Ranger,Maintenance Team						
a	*Routine follow up and clearing along Seekoei River and aquatic eastern boundary of the reserve;*						R 41 536,70	R 29 645,64	R 84 589,57	R 129 709,51	R 131 422,86
b	*Motivate adjacent landowners and those along the banks of the Seekoei and Orange River to implement their own invasive species control programs.*										
5	Rehabilitation or mitigation of degradation in PA		There is a plan for addressing degraded areas within the PA								
a	*Close and rehabilitate all unused, extraneous and/or highly erodible trails/tracks and roads in the reserve.*										
b	Map and monitor all roads and tracks and maintain road closures										
c	*Close and rehabilitate solid waste dump sites in the reserve, and remove all solid waste to the nearest municipal dump sites.*						R 53 732,03	R 119 581,78	R 190 392,16	R 161 105,86	R 171 519,71
d	*Consevancy tanks at tourist facilities are emptied every forte night or as the need arise and taken to package plant*										
e	*Close/remove/demolish and rehabilitate all extraneous and unused buildings and foundations, dumped materials, old equipment, gravel pits, roads and old fencing from the reserve.*										

Management actions and target relating to Biodiversity and Heritage Conservation KPA 1 cont.

Objective 1.3: Maintenance of ecological processes of the DKNR							R 328 162,02	R 400 532,22	R 1 651 482,10	R 413 909,94	R 1 269 304,82
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Re-establish, manage and maintain viable populations of locally indigenous fauna and flora:		The reserve is scientifically managed to promote biodiversity conservation through qualitative quantative descision support and evaluation	6.3 Ecological processes	Management Authority (Biodiversity Unit) Ecological Manager	■ ■ ■ ■ ■					
a	*Compilation of a genetic management policy for the managgement of the game population of the reserve;*					■ ■ ■	R 104 065,12	R 110 321,68	R 1 394 780,26	R 163 501,77	R 955 189,36
b	*Introduce new genetic material for buffalo, gemsbok,red hartbeest and eland.*					■ ■					
c	*Introduce desert black rhino and cape mountain zebra to the reserve;*					■ ■					
d	*Removal of alien game species (i.e. waterbuck, impala and nyala)*					■ ■ ■					
2	Develop and maintain a game monitoring and reporting model for the Reserve:					■ ■ ■					
a	*Investigate aerial drone technology as alternatie to current game census techniques.*					■ ■	R 140 827,02	R 163 797,52	R 155 187,39	R 163 644,17	R 223 691,09
b	*Monitor species demography and distributions within the estate*					■ ■ ■ ■ ■					
3	Maintain a bi-annual rangeland monitoring programme to assess the effectivenes of reserve management actions.					■ ■ ■ ■ ■	R 38 188,26	R 47 825,49	R 52 910,01	R 38 755,51	R 29 909,62
4	Assess, and implement, environmentally friendly measures to reduce the impacts of any damage-causing and problem animals		A scientifically based assessment has shown that ecological processes are being effectively maintained /augmented with the result that ecological integrity and biodiversity are not being compromised.			■ ■ ■ ■ ■	R 17 343,24	R 24 243,20	R 25 455,36	R 26 728,13	R 29 605,06
a	*Reserve infrastructure have deterants to limit the effect of baboons*										
5	Compile and manitain functional Fire Management (Disaster Management) Programme for the DKNR		Fires in the reserve do not have undesirable ecological effects, threaten reserve infrastructure or threaten neighbouring properties.	6.3 Ecological processes - Cost of damage resulting from fires spreading to neighbouring properties (based on insurance claim). Cost of damage to reserve infrastructure from fires (based on insurance claim).	Management Authority (Biodiversity Unit) Reserve Manager	■ ■ ■ ■ ■					
a	*Install and maintain basic fire protection measures in all affected tourism, administrative and staff accommodation buildings.*					■ ■ ■ ■ ■					
b	*Maintain, in accordance with the requirements of the Fire Management Programme, record and map all fires occurring in the reserve.*					■ ■ ■ ■ ■	R 27 738,37	R 54 344,34	R 23 149,08	R 21 280,35	R 30 909,68
c	*Ensure that all reserve management staff are adequately trained and equipped to implement the Fire Management Programme.*					■ ■					
d	*Establish and maintain formal and informal partnerships with neighbours, and fire management agencies (e.g. Colesberg Local Municipality, Working on Fire) to improve the capacity of the reserve to implement the Fire Management Programme.*					■ ■ ■ ■ ■					
Objective 1.4: Maintenance of critical ecosystem services							R 0,00	R 12 585,84	R 41 196,39	R 22 201,42	R 23 311,49
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	ID critical ecological sevices that deliver services to surrounding communities.		A structured and scientific measurement and monitoring system has shown that ecosystem services are being effectively maintained with the result that the PA and neighbouring land users are deriving benefit from these services.	6.4 Ecosystem services	Management Authority (Biodiversity Unit) Reserve Manager	■ ■ ■	R 0,00	R 0,00	R 6 837,05	R 0,00	R 0,00
a	*Description and monitoring change wrt biodiversity importance of PA*					■ ■ ■ ■ ■					
b	*Do habitat description for interface and determine the contribution to National and Provincial biodiversity targets and maps. Determine size and shape of the site to fully achieve the conservation objectives and include in PAES*					■ ■ ■	R 0,00	R 12 585,84	R 7 929,08	R 8 325,53	R 8 741,81
2	Develop a structured and scientific measurement system for effective maintenance of ecological services					■ ■	R 0,00	R 0,00	R 26 430,26	R 0,00	R 0,00
3	Monitoring benefit of ecological services to PA and neighboring land users					■ ■ ■	R 0,00	R 0,00	R 0,00	R 13 875,89	R 14 569,68

Management actions and target relating to Biodiversity and Heritage Conservation KPA 1 cont.

Objective 1.5: Land use planning and management outside of the protected area							22 751,37	R 8 882,26	R 22 844,66	R 19 329,27	R 32 888,85
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Collect and update key baseline information concerning landuse practices of the reserve domain, PA interface and viewshed interface.		There is a bilateral relationship between any relevant Biodiversity Plan and/or the applicable aspects of the IDP of the local municipality and the planning and management of the PA. There is formal agreement with industries within the zone of influence.	6.5 Land use planning and management outside of the protected area	Reserve Managare, Ecological Manager		R 22 751,37	R 1 330,76	R 19 351,41	R 15 661,36	R 29 037,54
a	*02 BMP 2 SSC*										
b	*03 BMP 3 Freshwater and Wetlands*										
c	*04 BMP 4 IAS*										
d	*05 BMP 5 Resource Use Tourism*										
e	*07 BMP 7 Degradation Rehabilitation*										
f	*08 BMP 8 Cultural Heritage*										
2	Provide and define a zone of influence and applicable buffering mechanisms (interphases) with guidelines for suitable land uses.				Management Authority (Biodiversity Unit) Reserve Manager		R 0,00	R 7 551,50	R 3 493,25	R 3 667,91	R 3 851,31
Objective 1.6: Water use planning and management operations influencing the protected area control illegal harvesting of natural resources							R 100 335,22	R 123 512,42	R 62 974,09	R 69 959,01	R 88 611,14
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Collect and update key baseline information concerning landuse practices of the reserve catcment interface (Orange towards the Gariep Dam and Seekoei River up until its origin)		Catchment and river plans and water management fully take the water needs of the PA into account and the water quality meets required standards as set out by the relevant authority.	6.6 Water use planning and management operations influencing the protected area	Ecological Manager & Field Rangers		R 16 484,57	R 11 265,06	R 13 964,36	R 12 780,14	R 27 298,32
a	*01 BMP 1 Biodiversity mechanisms*										
b	*02 BMP 2 SSC*										
c	*03 BMP 3 Freshwater and Wetlands*										
d	*04 BMP 4 IAS*										
e	*05 BMP 5 Resource Use Tourism*										
f	*07 BMP 7 Degradation Rehabilitation*										
g	*08 BMP 8 Cultural Heritage*										
2	Execute monthly aquatic boat patrols of the Vanderkloof Dam and Orange River										
a	*Certification of RIB by SAMSA*						R 79 075,30	R 107 213,03	R 43 723,68	R 51 628,52	R 55 484,95
b	*Acquisition of inland water skippers licence (ecological manager and field rangers)*										
3	Participation in Catchment Management and other forums to ensure that the quality and quantity of water meets the needs for maintaining habitats, species and ecosystems						R 4 775,35	R 5 034,34	R 5 286,05	R 5 550,35	R 5 827,87
Objective 1.7: Audit achievement of biodiversity targets							R 0,00	R 0,00	R 0,00	R 0,00	R 14 569,68
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Monitoring results of management actions against set objectives. State of biodiversity Report.		A structured and scientific biodiversity condition assessment has shown that the management of biodiversity is meeting the set targets. Management techniques are constantly being adapted to changing environments and new knowledge.	6.2 Achievement of biodiversity targets	Management Authority (Biodiversity Unit) Reserve Manager		R 0,00	R 0,00	R 0,00	R 0,00	R 14 569,68

Management actions and target relating to Biodiversity and Heritage Conservation KPA 1 cont.

Objective 1.8: Manage and mitigate the environmental impacts of conservation management, tourism, recreation and natural resource use											R 29 924,51	R 999 770,14	R 22 498,12	R 71 852,26	R 34 047,32
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Develop and Implement management guidelines for the sustainable extractive use of biotic and abiotic resources .		Management guidelines for the sustainable extractive use of biotic and abiotic resources that apply to both the organisation and outside parties are in place.	4.12 Sustainable Extractive Use	Management Authority (Biodiversity Unit) Reserve Manager						R 0,00	R 25 171,68	R 0,00	R 27 751,77	R 0,00
2	Monitor visitor impacts and determine carrying capacity for current and anticipated levels of visitation		Visitor impacts which could result from current and anticipated levels of visitation are fully mitigated by the design of the tourism infrastructur	5.1 Tourism Infrastructure (mitigating impacts) 2.6 Restoration of degraded areas							R 29 924,51	R 49 426,79	R 22 498,12	R 44 100,49	R 34 047,32
3	Develop a formal legally compliant programme with functional infrastructure for the management of hazardous substances (flammable and non-flammable).		A formal legally compliant programme with functional infrastructure for the management of hazardous substances (flammable and non-flammable) is in place.	4.13 Management of Hazardous Substances							R 0,00	R 925 171,68	R 0,00	R 0,00	R 0,00
Objective 1.9: Obtain Cultural Heritage knowledge about the PA											R 0,00	R 0,00	R 85 426,49	R 101 950,67	R 25 084,41
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Document and inventorize the cultural heritage resources of the reserve an determine significance BMP 8		A formal cultural heritage survey by an accredited heritage practitioner has identified heritage resources and values and has been verified by SAHRA and is included in the IMP	1.5 Cultural Heritage knowledge	Management Authority (Biodiversity Unit) Reserve Manager						R 0,00	R 0,00	R 49 215,13	R 0,00	R 0,00
2	Develop informational and interpretive materials about the heritage resources of the reserve.										R 0,00	R 0,00	R 0,00	R 95 348,43	R 0,00
3	In collaboration with academic institutions develop biodiversity management plans for significant cultural heritage assets and sites with biodiversity values		There is a comprehensive Biodiversity Management Plan	2.5 Biodiversity management plans for cultural heritage sites with biodiversity values							R 0,00	R 0,00	R 18 652,76	R 2 934,33	R 7 702,62
4	Implement management plans for maintenance of the significant cultural heritage resources including collections management/curatorship of heritage artifacts.		The Collections Management Plan has been developed and is fully implemented.	2.7 Collections management/curatorship of heritage artifacts							R 0,00	R 0,00	R 8 779,30	R 3 667,91	R 3 851,31
5	Monitor and regular condition assessment of Cultural Heritage Resources		A structured assessment conducted by an accredited heritage practitioner, has shown that the management of cultural heritage assets and values are meeting the set management objectives.	6.7 Cultural Heritage condition assessment							R 0,00	R 0,00	R 8 779,30	R 0,00	R 13 530,49

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

4.2 KPA 2: Recreation, Marketing, Education, Awareness & Interpretation

4.2.1 *Objective 2.1: Develop, deliver and maintain a diverse range of tourism and recreational services for visitors to the PA in accordance with CDF*

4.2.1.1 *Norms and standards*

- ❖ Ensure the approved management plan is implemented accordingly to meet the objectives set in the management plan.
  - ➢ Commercial tourism, where applicable, contributes to the protected area objectives:
    - The commercial tour operators interact with protected area management;
    - There is an excellent co-operation between protected area management and tourism operators to enhance visitor experiences maintain protected area conservation values and resolve conflicts;
    - The commercial tour operators contribute to protected area management;
    - Permits, licenses and concessions are granted in terms of management plan objectives;
    - Tourism standards are developed for nature based tourism;
    - Protected areas serving as triggers for tourism, economic development (where applicable/ subject to management plan).

4.2.1.2 *Principles:*

- In developing and maintaining tourism and recreational infrastructure, the Reserve shall obtain the necessary in terms of all relevant legislation;
- Tourism and recreational infrastructure developed within the Reserve must be appropriate to the purpose for which the Reserve has been proclaimed, and must not threaten its biodiversity or ecological function;
- Environmental resources, together with the maintenance of essential ecological processes and conservation of natural heritage and biodiversity, constitute a key element in tourism planning and development;
- Ensure that tourism development is appropriate in scale, requiring the lowest possible consumption of non-renewable resources; and
- Ensure that additional funds for conservation are generated from the tourism business;
- Tourism activities and experiences must the PAs' unique attributes and special features as the preferred focus to ensure sustainability and a unique product compatible with the overall desired state whilst applying the principles of Responsible Tourism.

4.2.2 *Objective 2.2: Develop and implement a focused and cost-effective marketing programme for the PA*

4.2.2.1 *Norms and standards*

- ❖ Ensure the approved management plan is implemented accordingly to meet the objectives set in the management plan.
  - ➢ Commercial tourism, where applicable, contributes to the protected area objectives:

- The commercial tour operators interact with protected area management;
- There is an excellent co-operation between protected area management and tourism operators to enhance visitor experiences maintain protected area conservation values and resolve conflicts;
- The commercial tour operators contribute to protected area management;
- Permits, licenses and concessions are granted in terms of management plan objectives;
- Tourism standards are developed for nature based tourism;
- Protected areas serving as triggers for tourism, economic development (where applicable/ subject to management plan).

4.2.2.2 *Principles:*

- Tourism and recreational infrastructure shall be developed in response to tourism market demands and opportunities within the Reserve, and should be carefully assessed to determine its viability;
- Using tourism as a conservation strategy by optimally deploying and appropriately utilizing environmental resources;
- Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities and contributing to poverty alleviation;
- The Reserve shall collaborate and cooperate with key local, regional and institutional partners to strengthen the marketing of the reserve's tourism and recreational infrastructure and services; improve the awareness of the Reserve, and its prospective uses, in local communities; and promote the use of the reserve as a local educational resource;
- Visitor management must take heed of a recent demand analysis and develop creative alternatives e.g. “park and drive" vs. “self-drive", converting day visitors to overnight visitors, interpretive centres at gates for when gate quotas are reached;
- Infrastructure upgrading must be aimed at the state of grading of 70% (by the Grading Council of SA);
- Revenue sharing with applicable communities according to relevant clauses in the Co-Management Agreement;
- Pricing strategy must ensure that pricing is competitive, affords access to all South Africans and that it correlates with star grading and tourism will need to focus on the flexibility of packages, in line with the rest of the ecotourism industry.

4.2.3 *Objective 2.3: Develop and implement a focused and cost-effective awareness-raising and educational programme for the PA*

4.2.3.1 *Norms and standards*

- ❖ Ensure that the protected area has an education and awareness programme in place.
  - ➢ Education and awareness programme developed:
    - There is a planned education and awareness programme;

- There is an education and awareness plan linked to the objectives of the protected area;
- There is a fully implemented and highly effective education and awareness the objectives of the protected area.

4.2.3.2 *Principles:*

- The popularity of wilderness related activities and the fact that income is generated with very little impact on the environment, emphasized the importance to zone land for this purpose and to develop activities in this regard;
- Day programs can be developed to afford schools the opportunity to experience the PA for a day and to enjoy a carefully planned environmental education program run by qualified education and interpretative staff;
- Bush Camps can be provided to offer a unique opportunity for learners to experience their natural environment in the rustic comfort of a secluded campsite;
- Learners to enjoy the PA on foot or by open vehicle under the guidance of a qualified officer who gives insights into all aspects of the environment;
- Teacher development by contributing to Outcomes Based Education enhancement programme, linking curriculum with environmental conservation and resources are developed in the process;
- Programs on rediscovering and using traditional knowledge and methodologies of learning used in the past to relate to their environment. Experiential learning through inter-generational communication is the key to this project. In their home language, “wise men” and women facilitate the interaction of small groups of young people with nature through interpretive trails and cultural activities in the camp;
- Outreach programmes to promote the use of the PA as an “outdoor laboratory" and Centre for social science research and projects through the development of specialized educational programmes aimed at tertiary institutions and researchers at the local and national levels, and active participation in the bioregional plan for the PA;
- The use of interpretive materials such as information boards, signs and plaques pertaining to special features of the PA. Reliance on donor funding is seen as an important risk.

4.2.4 *Management actions and targets relating to Recreation, Marketing, Education, Awareness & Interpretation KPA 2*

KPA 2: Recreation, Marketing, Education, Awareness and Interpretation							**R 331 238,59**	**R 447 437,08**	**R 383 176,57**	**R 326 910,47**	**R 366 602,82**
Objective 2.1: Develop, deliver and maintain a diverse range of tourism and recreational services for visitors taking into account the criteria for use zones							R 216 517,57	R 312 954,70	R 227 352,84	R 222 956,29	R 245 542,08
#	Management action	Priority	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame Years 1 – 5		Cost estimates (Years 1-5)				
					1	2 3 4 5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Facilitate controlled access to the reserve for other complementary recreational activities, including mountain biking,trail running, kayacking, hiking and angling:		3.8 Adequacy of Tourism infrastructure	Reserve Manager; Facilities Manager			R 11 759,94	R 29 453,55	R 33 119,66	R 16 236,27	R 31 400,00
a	*Link up with adventure events;*										
b	*Develop and market kayack trail from Doornkloof bay to Roodewal recreational area and a two to three day trail to Rolfontein;*										
c	*Develop and market mountain bike and running trail through quiet and wilderness zone in the eastern part of reserve;*										
d	*Develop and market mountain bike trail to British fort in northern part of the reserve;*										
e	*Establishment and marketing of annual endurance marathon in collaboration with local and provincial running clubs;*										
f	*Establishment and marketing of annual angling competitions in collaboration with local angling clubs;*										
g	*Implementation of Universal Accessibility Standards for reserve facilities*										
2	Design, market and institute, a guided interpretive heritage and other sensitive areas route for reserve visitors.						R 13 969,17	R 14 726,78	R 15 463,12	R 16 236,27	R 17 048,09
3	Support entrepreneurial opportunities for local communities to participate in the provision and management of tourist and recreational products.						R 6 984,59	R 7 363,39	R 7 731,56	R 8 118,14	R 8 524,04
4	Manage visitor functions						R 183 803,87	R 261 410,98	R 171 038,51	R 182 365,61	R 188 569,95
a	*Keep accurate record of visitor bookings.*										
b	*Maintain information about local anglers*										
c	*Attend to visitors queries;*										

Management actions and targets relating to Recreation, Marketing, Education, Awareness & Interpretation KPA 2 cont.

Objective 2.2: Develop and implement a focused and cost-effective marketing programme										R 80 838,13	R 63 796,22	R 90 167,19	R 62 217,20	R 65 823,74
#	Management action	Priority	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame Years 1 – 5					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Develop a tourism marketing/management plan for the reserve		2.3 Education, awareness and interpretation programme	Reserve Manager; Facilities Manager						R 2 793,83	R 7 363,39	R 3 092,62	R 0,00	R 3 409,62
2	Continually provide updated information in the ongoing development of corporate, regional and provincial tourism marketing products and materials.		4.9 Implementation of Education, awareness and interpretation programme.							R 2 793,83	R 2 945,36	R 3 092,62	R 3 247,25	R 3 409,62
3	Maintain daily information about the reserve visitors and users (e.g. numbers/group, age category, gender, time of visit, length of stay, nationality, etc.) in a standardised corporate format:									R 75 250,46	R 53 487,48	R 53 518,82	R 58 969,94	R 59 004,50
a	*Maintain information about visitors (permit database);*													
b	*Set and monitor occupation rates;*													
c	*Maintain information about organised events*													
4	Accreditation of activities and facilities with a recognised tourism grading standard.		3.8.1 Tourism grading							R 0,00	R 0,00	R 30 463,12	R 0,00	R 0,00
a	*Implementation of Universal Accessibility Standards for reserve facilities*													

Management actions and targets relating to Recreation, Marketing, Education, Awareness & Interpretation KPA 2 cont.

Objective 2.3: Develop and implement a focused and cost-effective awareness-raising and educational programme										R 33 882,89	R 70 686,16	R 65 656,54	R 41 736,98	R 55 237,00
#	Management action	Priority	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame Years 1 – 5					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Update, publish and distribute reserve-specific brochures and pamphlets to tourism information offices (local, regional and provincial), remote visitor contact points and visitors.		4.9 Implementation of Education, awareness and interpretation programme.	Reserve Manager; Facilities Manager						R 8 966,10	R 49 452,37	R 55 281,96	R 24 821,24	R 24 828,36
a	*Compilation of promotional DVD.*													
b	*Develop and maintain reserve website.*													
2	Setting up exibitions at peak season shows and special events.									R 8 966,10	R 4 418,03	R 4 638,93	R 0,00	R 10 942,30
3	Develop and implement presentations and reserve intrepetation in conjuction with EE.									R 7 975,34	R 8 407,88	R 0,00	R 9 269,69	R 9 733,17
4	Establish links with local educational institutions and networks in order to promote subsidised access to, and use of, the reserve as an educational resource									R 7 975,34	R 8 407,88	R 5 735,65	R 7 646,06	R 9 733,17
a	*Determine research opportunities*													
b	*Develop and implement curriculum orientated educational program*													
c	*Partnership with Eco Schools*													

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

4.3 KPA 3: Enforcement, Security & Access Control

4.3.1 *Objective 3.1: Secure the legal tenure of, and management authority for, the DKNR*

4.3.1.1 *Norms and standards*

- ❖ Ensure that correct legal processes have been followed in securing the protected area.
  - ➢ A protected area is declared in terms of the Protected Areas Act 57 of 2003:
    - The protected area is declared in the Government Gazette;
    - The Registrar of Deeds has been informed in writing of the declaration and has recorded such declaration in the relevant registers and documents;
    - The protected area is listed in the Register of Protected Areas as required by section 10 of the Act;
    - The protected area has an assigned management authority.
  - ➢ There are applicable legal mechanisms in place to control inappropriate activities:
    - There are appropriate regulations;
    - The protected area has a formal set of approved internal rules and regulations.
  - ➢ There are adequate legal controls to ensure the integrity of the protected area.
    - The Act is applied / enforced;
    - The National Environmental Management Act, 1998, the NEM: Biodiversity Act, 2004 are applied and or enforced;
    - The relevant regulations are applied and or enforced;
    - Internal rules are in effect.
- ❖ Ensure that the boundaries of the protected area are well demarcated, secured and publically known.
  - ➢ Boundaries of the protected area are demarcated, secured and publically known.
    - The extent of the protected area is included in a description and Surveyor General diagramme;
    - The boundaries are appropriately demarcated;
    - The boundaries are known by both the management authority of a protected area and the neighbouring community;
    - Any deviations from the declared area are agreed upon and documented in the management plan and include a signed, legally binding MoU;
    - Conflicts with the local community are resolved fairly and effectively.

4.3.1.2 *Principles:*

- The Reserve shall conform to the legal requirements of the NEMPAA.

4.3.2 *Objective 3.2: Secure the boundaries of, and maintain controlled access to, the DKNR*

4.3.2.1 *Norms and standards*

- ❖ Ensure that the relevant legislation is effectively enforced in a protected area.
  - ➢ Protection systems are in place:

- Management mechanisms effectively control and manage access;
- The available management mechanisms are working to control both illegal and legitimate access;
- Effective control measures are in place to control the use of the protected area; Standard operating procedures for controlling activities have been developed and are being effectively implemented/ contingency plans;
- Annual risk assessments completed and mitigating interventions applied where appropriate;
- Critical cultural heritage assets have been identified and secured in terms of a heritage management plan.

4.3.2.2 *Principles:*

- Fencing specifications shall conform to the legal requirements of the NCNCA;
- The boundaries of the Reserve shall, at all times, be clearly demarcated and be regularly maintained;
- All entry and exit points shall be properly managed to ensure that access to, and through, the Reserve is effectively controlled at all times.

4.3.3 *Objective 3.3: Sustain an effective law enforcement and compliance capacity in the DKNR*

4.3.3.1 *Norms and standards*

- ❖ Ensure that the relevant legislation is effectively enforced in a protected area.
  - ➢ The NEMPAA, 2003 (Act No. 57 of 2003), the NEMA Act,1998 (Act No. 107 of 1998), the NEMBA Act,2004 (Act No. 10 of 2004 their Regulations and internal rules are in effect:
    - The protected area has sufficient capacity to enforce the Acts, regulations and internal rules;
    - The protected area's staff is adequately capacitated to enforce legislation within the organization's mandate and does so effectively;
    - Staff resources are adequate to conduct critical law enforcement activities;
    - The staff has been formally designated to enforce the relevant legislation;
    - Appropriate staff have been designated environmental management inspectors;
    - The staff has the necessary equipment to enable them to do law enforcement effectively;
    - The protected area has allocated sufficient funds for effective law enforcement;
    - The protected area receives adequate support from other sections of the organization to effectively manage ensure effective management;
    - The protected area management has a database to register illegal activities.

4.3.3.2 *Principles:*

- The Reserve shall conform to the legal requirements of all relevant legislation.

4.3.4 *Management actions and targets relating to Enforcement, Security & Access Control KPA 3*

KPA 3: Enforcement, Security and Access Control										R 1 254 510,33	R 1 374 107,48	R 1 583 778,54	R 1 200 716,20	R 1 101 751,70
Objective 3.1: Secure the legal tenure of, and management authority for the DKNR										**R 9 550,70**	**R 25 171,68**	**R 0,00**	**R 0,00**	**R 90 397,55**
#	Management action	Priority & Mett Ref	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure declaration of all properties within the domain to obtain legal status in terms of NEMPAA and registered on the national PA register		All properties managed as part of the PA have been declared and listed in the NPA Register and the registrar of Deeds has recorded the declaration against the relevant register and documents.	1.1 Legal Status	Regional Manager						R 0,00	R 12 585,84	R 0,00	R 0,00	R 78 741,81
2	Develop and Review Protected Area internal rules ito section 52 of NEM:PAA that are PA specific.		Internal rules for controlling use & activities in the PA have been gazetted.	1.2 Protected Area internal rules							R 4 775,35	R 0,00	R 0,00	R 0,00	R 5 827,87
3	Protected Area boundary demarcation with deviations and servitute register Demarcation may be by fencing, bollards, beacons, sign posts (with maps):		The boundary of the PA is known by the management authority, fully demarcated and is thus known and respected by the local residents/neighbouring land users and the public.	1.3 Protected Area boundary demarcation	Reserve Manager						R 4 775,35	R 12 585,84	R 0,00	R 0,00	R 5 827,87
a	*Record all boundary deviations in a legally binding document*			1.3.1 Boundary deviations											
b	*Compile a register of all servitudes and the conditions relating thereto.*			1.3.2 Servitude register											

Management actions and targets relating to Enforcement, Security & Access Control KPA 3 cont.

Objective 3.2: Secure the boundaries of, and maintain controlled access to the DKNR							R 1 142 315,21	R 1 187 809,38	R 1 364 716,36	R 1 072 464,29	R 534 853,01
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates (Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Draw up protection systems or mechanisms for controlling current and anticipated levels of legitimate and illegitimate access or activities in the PA and verified success by a relevant PA integrity audit (eg. SOAM or PAME)										
a	*Ensure that all reserve visitor gates and management entry points are adequately staffed and administered*										
b	*Maintain, a 'gate entry pass/visitor permit book' system for all visitors to, and users of, the reserve.*			5.2 Functioning of Law Enforcement and Compliance systems			R 348 717,85	R 362 018,41	R 473 149,76	R 408 246,59	R 433 447,61
c	*Patrol of surface area of the Vanderkloof Dam as this is under the control of DAELR*										
d	*Installation of live image and voice streaming and recording between shared access gate and adminatrative building. This through WiFi Network.*		Profile of reserve visitors and users. Incident record of illegal access.								
e	*Investigate the collaboration of lanowners immediatley adjacent to the Vanderkloof Dam in the estbalishment of a radio network to a facilitate communication relative conservation and security management of the dam*				Security manager Reserve Manager, Field Rangers & Gate Guards						
f	*Mouthly boundary patrols (i.e. foot and aquatic)*										
2	Complete the construction of the perimeter signage/fencing to meet all requirements of the DAEARDLR Technical Guidelines and Principles (TGP) for fencing.										
a	*Complete Twyfelberg fence upgrade*										
b	*Upgrade to western boundary fenceline (Soutplaat to Diepkloof*		The reserve assets are secure. The reserve visitors and users have equitable access to the reserve, and are safe from harm.	1.3 Protected Area boundary demarcation			R 793 597,36	R 825 790,96	R 891 566,60	R 664 217,69	R 101 405,41
c	*Upgrade to Western boundary fenceline*										
d	*Upgrade to Rievalley fence-line*										
d	*Erect signage along eastern aquatic*										
e	*Ensure regular maintenance of the perimeter fencing in the reserve.*										

Management actions and targets relating to Enforcement, Security & Access Control KPA 3 cont.

Objective 3.3: Sustain an effective law enforcement and compliance capacity in the reserve							R 102 644,42	R 161 126,43	R 219 062,19	R 128 251,91	R 476 501,14
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates (Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure capacity/resources/support to enforce (arrest and prosecute) PA internal rules/regulations.		PA has excellent capacity, resources, support to enforce (arrest and prosecute) rules/regulations. Incremental decrease in incidence of illegal activities occurring in the reserve.	3.6 Law enforcement capacity and capability	Security manager Reserve Manager, Senior Field Ranger Field Rangers & Gate guards		R 102 644,42	R 161 126,43	R 205 847,06	R 128 251,91	R 476 501,14
a	*Maintain and collate information on all enforcement incidents;*										
b	*Ensure the provision of enforcement and compliance training for all reserve field rangers;*										
c	*Ensure that the field ranger staff complement is adequately resourced and equipped to fulfil an effective enforcement and compliance function;*										
d	*Conduct regular inservice traning and practice sessions.*										
e	*Ensure each staff member is regularly issued with uniform, protective clothing (as may be required) and the necessary equipment to fulfil their job function.*										
2	Draw up an Integrated Compliance Plan addressing all aspects of law enforcement that incorporates *inter alia* raising awareness, improving community relationships, training and cooperation with legal agencies.		Protection systems or mechanisms for controlling current and anticipated levels of legitimate and illegitimate access or activities in the PA are fully implemented. The success has been verified by a relevant PA integrity audit (eg. SOAM or PAME)	5.2.1 Integrated Compliance Plan	Security manager Reserve Manager		R 0,00	R 0,00	R 13 215,13	R 0,00	R 0,00
a	*Undertake a Threat Analysis to determine all potential threats to the safety and security of the reserve.*										
b	*Develop, and implement, mechanisms for subsidised entry for local community user and interest groups.*										
c	*Provide, on request, controlled access to recognised cultural/religious sites and non-destructive or consumptive cultural/religious practices.*										

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

4.4 KPA 4: Infrastructure and Equipment

4.4.1 *Objective 4.1: Acquire and maintain operational equipment and vehicles for the DKNR*

4.4.1.1 *Norms and standards*

- ❖ Ensure that each protected area has the necessary operational equipment and infrastructure in place, with an effective maintenance programme.
  - ➢ Necessary operational equipment and infrastructure are in place:
    - The infrastructure necessary to manage the protected area effectively is in place;
    - Staff facilities are adequate to perform critical management activities;
    - There is adequate operational equipment as required for operational management purposes.
  - ➢ Equipment and infrastructure are effectively maintained:
    - A regular programme of infrastructure maintenance is adhered to;
    - Equipment is maintained in good working condition.

4.4.1.2 *Principles:*

- The Reserve shall acquire and/or replace the equipment and vehicles necessary to implement the activities identified in this IMP.
- Reserve equipment and vehicles shall be regularly maintained in accordance with the manufacturers' specifications.

4.4.2 *Objective 4.2: Construct, maintain and upgrade the administration infrastructure and bulk services infrastructure in the DKNR*

4.4.2.1 *Norms and standards*

- ❖ Follow Technical management guideline and procedures for the development, maintenance and upgrading of roads in provincial nature reserves.
- ❖ Promote and or ensure the positive involvement of the protected area management in Water use planning and management operations influencing the PA.
  - ➢ Water-use planning outside takes into account the objectives of the protected area.
    - Management authorities play an active role in water use planning affecting the protected area;
    - The water-use planning takes cognizance of the protected area and the achievement of protected area management objectives.

4.4.2.2 *Principles:*

- Administrative and operations infrastructure and services must be limited, and appropriately scaled, to the necessary administrative and operational requirements of the reserve, and must not threaten its biodiversity or ecological function;
- In developing and maintaining administrative and operations infrastructure, the Reserve shall obtain the necessary authorization in terms of the relevant legislation;
- The Reserve shall strive to phase out bulk services that have a detrimental impact on the environment. It will, in turn, seek to introduce more sustainable technologies, wherever practicable and cost-effective;

- The Reserve shall rationalize the network of roads, tracks and footpaths to reduce the maintenance costs and limit the environmental impacts, while ensuring adequate access for tourism and operational management requirements.

4.4.3 *Objective 4.3: Construct, upgrade and maintain day and overnight visitor buildings and infrastructure in the DKNR*

4.4.3.1 *Norms and standards*

- ❖ Ensure that the protected area has visitor facilities that contribute to their visitor's experience.
  - ➢ Visitor facilities, where appropriate (are established in line) with the protected area objectives are established in response to tourism market demands and contribute positively to the visitor experience.
    - The visitor/tourism facilities are adequate and sufficient to prevent damage to protected areas;
    - Tourism infrastructure is effectively servicing the current volume of visitors to the protected area according to the protected areas carrying capacity;
    - The visitor facilities are appropriate to the level of visitor use.

4.4.3.2 *Principles:*

- Continuously minimize the potential negative impacts caused by existing tourism use, particularly to sensitive sites.
- Direct new tourism developments (if possible) to less sensitive areas.

4.4.4 *Management actions and targets relating to Infrastructure & Equipment KPA 4*

KPA 4: Infrastructure and Equipment						**R 1 023 978,77**	**R 3 042 386,31**	**R 1 594 464,82**	**R 1 878 002,97**	**R 2 061 841,32**
Objective 4.1: Acquire and maintain operational equipment and vehicles						R 477 901,28	R 1 037 474,34	R 627 305,00	R 657 630,55	R 815 966,74
#	Management action	Priority	Management targets	Responsibility	Time frame (Years 1 – 5)	Cost estimates (Years 1-5)				
					1 2 3 4 5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Acquire and maintain operational equipment and constantly update an operational equipment register.		Operational equipment is adequate and suitable for current and future anticipated operational needs.There is a maintenance schedule and all operational equipment is being correctly maintained and meeting the set standards.	Management Authority: Reserve Manager		R 283 874,24	R 231 203,77	R 302 854,29	R 333 878,91	R 554 877,52
a	*Procure, maintain and safely store operational stores and equipment*									
b	*Installation of telephone communications and internet connectiviety at new adminstrative building*									
c	*Maintain current radio network hardware and install base radios in all reserve vehicles and at the PV gate rangers outpost*									
d	*Maintain and safely store all firearms.*									
2	Maintain and/or replace all reserve vehicles and equipment according to the manufacturers' specifications and/or corporate replacement cycles.		The transport fleet is totally appropriate and sufficient for all management needs with adequate numbers and range of vehicles (including boats, aircraft etc.) to meet management needs? There is a maintenance schedule and the entire transport fleet is being maintained and meeting the set standards.	Management Authority: Reserve Manager		R 194 027,05	R 806 270,57	R 324 450,71	R 323 751,64	R 261 089,22
a	Maintain and update all assets and stock inventory registers and reports for the reserve									
b	*Determine the economic valuation of the reserve.*									

Management actions and targets relating to Infrastructure & Equipment KPA 4 cont.

Objective 4.2: Construct, maintain and upgrade the administration infrastructure and bulk services infrastructure of the DNR										R 428 237,15	R 910 211,48	R 780 473,62	R 983 673,84	R 949 429,67
#	Management action	Priority	Management targets	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure the regular maintenance of all reserve administrative, staff accommodation,operational buildings and infrastructure.		Infrastructure required for operational management purposes buildings, roads, bulk services including jetties, storage facilities and staff housing is optimal for current and future anticipated management needs.. State (using a grading system) of reserve buildings and infrastructure. Records of instances of overloading of the bulk service supplies.	Department of Public Works; Regional Manager Reserve Manager; Infrastructure Manager						R 305 411,88	R 641 853,98	R 553 963,44	R 580 160,25	R 581 702,37
a	*Construction of undercover parking at adminstrative building*													
b	*Domestic cleaning of admsitrative building and visitor facilitities (i.e. chalets, guesthouse and ablution facilities)*													
c	*Maintenance to reserve facility air conditioners*													
d	*Installation of surveillence equipment at admin building and shared access gate*													
e	*Maintenance to Coolroom*													
f	*Maintenance to old reserve workshop complex*													
g	*Maintenance to staff village*													
h	*Installation of solar geyser at the PV gate ranger outpost, managers house and inspection quarters*													
i	*Installation of solar submersible pump for PV gate field rangers outpost*													
j	*Maintenance reserve manager's house and the sinking of a sewage conservancy tank;*													
k	*Maintenance to package plant*													
2	Implement the maintenance of the network of roads in the reserve, with a strong focus on maintaining and mitigating highly erodible areas:		Rationalised network of well-maintained management tracks traversing the reserve	Department of Public Works; Regional Manager Reserve Manager; Infrastructure Manager						R 122 825,27	R 268 357,50	R 226 510,18	R 403 513,59	R 367 727,31
a	*Upgrade (ease of access by sedan vehicles) of main tourist road from main entrance gate to and including road at the Rooedwaal recreational area up until PV Gate;*													
b	*Maintenance to Doornhoek and Doornkloof circular road;*													
c	*Maintenance to Pen se Berg pass;*													
d	*Maintenance to repeater access road;*													
e	*Communicate the urgent need for the upgrade of the main access road to DKNR and the reserve main tourist road in the Reserve with the Dept. Roads and Public Works*													
f	*Maintenance to Broederstroom access road.*													
g	*Maintenenance of secondary management roads*													
h	*Maintenance to main access road to DKNR traversing through Hunters Moon*													

Management actions and targets relating to Infrastructure & Equipment KPA 4 cont.

Objective 4.3: Construct, upgrade and maintain day and overnight visitor buildings and infrastructure										R 117 840,34	R 1 094 700,48	R 186 686,20	R 236 698,58	R 296 444,91
#	Management action	Priority	Management targets	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Assess the cost-effectiveness of different management options (e.g. concessioning, leasing, service agreement, community-managed, etc.) for the operating of lodges, camps and select the preferred/optimal management option/s.		Tourism infrastructure is optimal to manage the current and anticipated future volume of visitors. Rationalised network of well-maintained visitor roads and network of self-guided and/or guided hiking trails traversing the reserve.	Department of Public Works; Regional Manager Reserve Manager; Infrastructure Manager						R 0,00	R 0,00	R 5 286,05	R 0,00	R 0,00
a	*Implement, and formalise (as required), the selected management option for the lodges, camps.*													
2	Upgrade, renovate and maintain the overnight visitor buildings, facilities, equipment and linked reserve infrastructure to meet DAERL standards for the provision of nature-based tourism products:									R 117 840,34	R 1 094 700,48	R 181 400,15	R 236 698,58	R 296 444,91
a	*Maintenance to group camp facility;*													
b	*Exterior maitenance to guesthouse*													
c	*Upgrade the solar house for more electrical storage and output capacity for the Roodewal Recreational Area:*													
d	*Refurbishment of the Vorster's Hoogte bushut*													
e	*Contruction of undercover parking at chalets at the Roodewal Recreational area*													
f	*Maintenance to Roodewal chalets and visitor facilities*													

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

4.5 KPA 5: Stakeholder Involvement

4.5.1 *Objective 5.1: Interaction with stakeholders and communities in the planning, development and management of the DKNR*

4.5.1.1 *Norms and standards*

- ❖ Good relationship between the protected area staff and neighboring communities.
  - ➢ Neighbor relations contribute positively to the success of the protected:
    - The neighboring communities have relevant input, where relevant, into decisions relating to protected area management;
    - An advisory committee or park forum has been established.
- ❖ Ensure that the protected area plays an important role in socio-economic activities within their sphere of influence.
  - ➢ A process to evaluate the stakeholder's feedback is in place for all protected areas:
    - The protected area receives high level support as a result of co-management consultation and high-quality visitor experiences emanating from effective protected area management;
    - The protected area has a large degree of support from neighbours, district and public stakeholders;
    - The protected area has a functional protected area advisory committee;
    - The protected area advisory committee is representative of all stakeholders of the protected area.

4.5.1.2 *Principles:*

- The Reserve shall establish and maintain an effective Reserve Advisory Committee based on the Regulations for the Proper Administration of Nature Reserves, promulgated in terms of Section 86 (1) of NEMPAA.

4.5.2 *Objective 5.2: Actively participate in local and regional conservation and socio-economic development initiatives that may affect or benefit the PA*

4.5.2.1 *Norms and standards*

- ❖ Ensure that the protected area plays an important role in socio-economic activities within their sphere of influence.
  - ➢ A protected area provides substantive socio-economic benefits to the local area, where appropriate (refer to section 41 of the Act):
    - The protected area provides socio-economic benefits to local communities;
    - Programmes to enhance local community welfare whilst conserving protected area resources are being implemented;
    - There is effective communication with local communities;
    - The protected area is a source of employment for local communities;
    - The protected area provides community development opportunities through sustainable resource use;
    - The protected area provides access to spiritual or religious sites;
    - An active education and interpretation programme is implemented, focusing primarily on local children in the region around the protected area;
    - The protected area receives inside and outside contributions;

- The protected area has co-management framework for benefit flows.

❖ Good relationship between the protected area staff and neighboring communities.
  ➢ Neighbor relations contribute positively to the success of the protected:
    - The protected area has trans frontier and bilateral agreements - where applicable;

4.5.2.2 *Principles:*

- Reserve management shall actively collaborate with national, provincial and local tourism and conservation initiatives that could contribute to meeting the objectives of this IMP;
- The Reserve shall strive to work with the relevant government institutions in order to integrate all local and regional planning and socio-economic development activities affecting the Reserve;
- The Reserve shall participate in, and support, any Co-Management Committee as an important governance mechanism to achieve the aims and objectives of the Co-Management Agreement;
- The Reserve shall strive to meet to the socio-economic development commitments made in any Co-Management Agreement.

4.5.3 *Objective 5.3: Develop, implement and maintain effective mechanisms for ongoing communications with co-management partners*

4.5.3.1 *Norms and standards*

❖ Good relationship between the protected area staff and neighbouring communities.
  ➢ Neighbour relations contribute positively to the success of the protected:
    - The neighbouring communities have relevant input, where relevant, into decisions relating to protected area management;
    - The protected area has entered into a co-management agreement with neighboring communities and partners - where relevant;
    - The protected area has transfrontier and bilateral agreements - where applicable;
    - An advisory committee or park forum has been established.

❖ Ensure that the protected area plays an important role in socio-economic activities within their sphere of influence.
  ➢ A protected area provides measurable economic benefits to the direct beneficiaries:
    - The protected area develops and implements a programme that provides economic benefits to local communities / beneficiaries where appropriate;
    - The protected area delivers considerable quantifiable long-term economic benefits that make a real difference to the livelihoods of local communities.

4.5.3.2 *Principles:*

- Stakeholder communications shall be focused on strengthening a sense of ownership and empowerment in local community, through an improved understanding of the contribution of the reserve to socio-economic development and heritage/biodiversity conservation;

- Stakeholder communications shall seek to develop a common understanding in surrounding communities of the issues affecting the integrity of the reserve, and collaborative approaches to resolve these.

4.5.4 *Management actions and targets relating to Stakeholder Involvement KPA 5*

#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Objective 5.1: Interaction with stakeholders and communities in the planning, development and management of the DKNR											R 23 113,71	R 24 367,26	R 18 303,66	R 18 746,77	R 42 777,83
1	Under the guidance of the Regulations for the proper administration of Nature Reserves, as promulgated in terms of Section 86 (1) of NEMPAA, establish a Reserve Advisory Committee and meet on a regular, agreed to basis.		A well represented functioning and formalised Community Liaison Structure contributes significantly to the management/development of the PA.	4.11 Community Liaison Structure	Reserve Manager & Accomodation officer						R 0,00	R 12 585,84	R 0,00	R 0,00	R 14 569,68
2	Develop and impliment an active Public Relations (PR) and Communication Programme.		There is a wide ranging multi media public relations and communication programme keeping the general public and internal role players informed of important aspects of the PA.	4.10 Public Relations (PR) and Communication Programme							R 10 363,02	R 5 890,71	R 9 924,99	R 10 421,24	R 12 647,11
a	*Ensure positive press coverage is obtained and timeously and effectively respond to items in public media which may negatively impact on the reserve and organisation.*														
b	*Initiate and sustain ongoing communications with the communal and/or private landowners to discuss opportunities for ongoing cooperation and collaboration.*														
3	Ensure members of the community are involved in supporting the PA through volunteering, projects and fundraising by establishing formal groups such as Friends groups, Volunteers or Honorary rangers.		There are a wide range of projects supported by volunteers including fund raising and assistance with management that contribute significantly to increased PA management effectiveness.	5.5 Community Support							R 12 750,69	R 5 890,71	R 8 378,68	R 8 325,53	R 15 561,04
Objective 5.2: Actively participate in local and regional conservation and socio-economic development initiatives that may affect or benefit the DKNR											R 12 750,69	R 20 993,72	R 20 497,09	R 38 173,01	R 35 958,59
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Participate in local municipal IDP planning processes, with a specific focus on the provision of municipal infrastructure and services to the reserve and supporting local economic development initiatives in the community.		A formal published review/audit has shown that the PA delivers quantifiable long term stimuli to the regional (and possibly the national) economy and delivers a broad range of long term quantifiable community benefits that improve the livelihood strategies and resilience in the lives of communities.	6.1 Economic and Social benefit assessment Direct and measurable benefitsaccrue to local community from the reserve.	Co-Management Committee Reserve Manager						R 4 775,35	R 7 551,50	R 7 929,08	R 8 325,53	R 5 827,87
a	*Identify, and make application for, EPWP-related funding for relevant tourism and conservation initiatives in the reserve.*														
b	*Support local/regional initiatives to establish a FPA, with a specific focus on rationalising the reserve firebreaks and improving access to fire-fighting resources and support.*														
2	Participate in the planning and development of other conservation initiatives with a specific focus on strengthening linkages		The PA is influencing the local or regional economy and providing measurable social benefits to communities. Social benefits to direct benefits such as jobs, training and health care. Stimulus of the economy through businesses benefiting from tourism and meeting the needs of the protected area.	6.1 Economic and Social benefit assessment Direct and measurable benefitsaccrue to local community from the reserve.	Reserve Manager; Regional Manager & accommodation officer						R 2 387,67	R 7 551,50	R 7 929,08	R 8 325,53	R 5 827,87
3	Investigate and select mechanisms for optimising employment, empowerment and capacity building opportunities for the local community.		Direct and measurable benefits accrue to local community from the reserve. Extent (number of beneficiaries) and nature (employment – permanent/ temporary; business opportunity; training; capacity-building) of community benefits.	4.15 Commercial Tourism							R 5 587,67	R 5 890,71	R 4 638,93	R 21 521,94	R 24 302,85
a	*Develop opportunities for selected individuals from the local community to be trained and directly employed in appropriate conservation and tourism related work.*														
b	*Develop opportunities to facilitate an empowerment component for selected individuals from the local community in any outsourcing/concessioning of the tourism and recreational products.*														
c	*Identify, and if feasible develop, opportunities for the establishment of community-based entrepreneurial opportunities within, or linked to, the reserve, including: game drives; sale of curios and crafts; guided heritage trails; village tourism; conservation enterprise; horse trails; event management and commercial hunting packages.*														

Management actions and targets relating to Stakeholder Involvement KPA 5 cont.

Objective 5.3: Develop, implement and maintain effective mechanisms for ongoing communications with co-management partners											R 14 326,05	R 17 620,17	R 21 144,21	R 19 426,24	R 17 483,62
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Continually review, and amend (as required), the structure, representation and TOR of the Co-Management Committee to ensure that it contributes to realising the intent of the Co-Management Agreement.		There is a formal representative structure for community partners to participate in decision making according to a legally binding co-management agreement.	4.14 Community partners	Co-Management Committee Reserve Manager						R 4 775,35	R 5 034,34	R 7 929,08	R 8 325,53	R 5 827,87
2	Provide ongoing support (*e.g.* logistical, administrative, technical, professional and leadership) to, and actively participate in, an effectively functioning Co-Management Committee.										R 9 550,70	R 12 585,84	R 13 215,13	R 11 100,71	R 11 655,74
a	*Hold quarterly (more regular if required) meetings with the Co-Management Committee to ensure that co-management decisions are made timeously and effectively.*														
b	*Support the ongoing capacity building of the local community representatives on the Co-Management Committee.*														
c	*Host quaterly meeting, each in a different neighbouring village, to present and discuss issues of mutual concern.*														

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

4.6 KPA 6: Administration & Planning

4.6.1 *Objective 6.1: Institute and maintain an effective management planning capability in the DKNR*

4.6.1.1 *Norms and standards*

- Ensure proper planning in the establishment or expansion of the protected area.
  - A protected area is designed and planned to meet its objectives:
    - The size of the protected area is sufficient to achieve its conservation objectives;
    - The protected area forms a critical part of a greater, integrated system forming a trans frontier protected area;
    - The shape of the protected area is adequate sufficient to achieve its conservation objectives;
    - The design of the protected area is adequately to allow large-scale ecological processes to take place;
    - The objectives are consistent with the protected area location;
    - The layout and configuration of the protected area optimizes the conservation of biodiversity.
- Ensure the approved management plan is implemented accordingly to meet the objectives set in the management plan.
  - A management plan has been developed for the protected area in accordance with section 39 of the Act, and the Guidelines for the development of a management plan for a protected area in terms of the Act.
    - The purpose of the protected area is reflected in the management plan;
    - The management plan contains explicit biodiversity targets for all priority biodiversity elements;
    - The management plan addresses the management of specific priority species and habitats;
    - There is an analysis and strategy for addressing protected area threats and pressures;
    - The results of monitoring, research and evaluation are routinely incorporated into planning and decision making;
    - An expansion plan to meet the conservation objectives has been developed - where relevant;
    - A zoning plan indicating what activities may take place in different sections of the area, and the conservation objectives of these sections is included in the management plan;
    - An infrastructure development plan (concept development plan), subject to the zoning plan, is included in the management plan - where development is to be considered;
    - There is a programme for the implementation of the management plan linked to annual work plans and staff performance agreements;
    - The management plan is being fully implemented;
    - Relevant components of the municipal IDP have been considered in the management plan; Municipal IDPs have (taken the relevant aspects of the management plan into account) considered the ecological sensitivity of the protected area, its buffer zones and any priorities areas for protected area expansion;

- The planning process allows adequate consultation with key stakeholders in the compilation of the management plan;
- There is an established schedule and process for periodic review and updating of the management plan;
- There is a programme for the implementation of the management plan and its costing; Where appropriate, the implementation of community-based natural resource management is planned for;
- The terms and conditions of any relevant Biodiversity plan and/or the applicable aspects of the IDP of the local municipality have been taken into account as required by the Act;

➢ The management plan for the protected area has been approved:
- An up to date management plan has been adopted by the Board and or the HOD and approved by the Minister or the MEC.

➢ The management plan as approved is implemented successfully.
- Annual work plan of operations, implementing the management plan is in place.
- There is a detailed work plan identifying specific targets for achieving management objectives linked to the management plan.

4.6.1.2 *Principles:*
- The Reserve shall conform to the legal requirements of the NEMPAA.

4.6.2 *Objective 6.2: Maintain an adequately equipped, resourced and trained staff complement for the DKNR*

4.6.2.1 *Norms and standards*

❖ Ensure that all protected areas have effective systems in place to manage human resources.

➢ Human resource capacity is adequate to manage the protected area effectively:
- The skills development audit is completed and results are implemented;
- The protected area staff execute their duties to a high standard and require minimal supervision;
- The protected area employment conditions are adequate sufficient to retain high- quality staff;
- The protected area has a staff performance evaluation system in place;
- The protected area has a succession programme in place.

➢ Human resource management contributes to effective management of the protected:
- There is an effective staff management programme in place;
- The protected areas fully implements the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);
- The protected area has a staff health and safety programme in place;
- The protected area staff have good living conditions;
- The protected area has disaster management plans in place.

4.6.2.2 *Principles:*
- The Reserve shall identify opportunities for the training and capacity building of reserve staff.

4.6.3 *Objective 6.3: Institute and maintain an effective financial and administration capability in the PA*

- ❖ Ensure that each protected area has an effective performance evaluation system in place.
  - ➢ A performance evaluation system for the management of the protected area is in place:
    - There is a functioning evaluation system in place to measure performance against set objectives for the protected area.
- ❖ Ensure that each protected area has its own administrative system in place for its management.
  - ➢ The protected area has a supportive administration system for effective management:
    - Ensuring that Public Finance Management Act is implemented;
    - Ensure that assets are well managed;
    - The reporting system is well managed;
    - The system for information management is managed properly.
- ❖ Ensure that the protected area's finances are well managed and there is a system for their management.
  - ➢ Financial management effectively contributes to the management of the protected:
    - An operational budget is allocated to fund the critical management need of the protected area;
    - The long-term financial outlook for the protected areas is stable;
    - The allocation of expenditures is appropriate according to the protected areas priorities and objectives;
    - Financial management practice enables efficient and effective protected area management;
    - Funding to conduct critical management activities is adequate for the next 5 years to conduct critical management activities;
    - The costing of management plans and shortfalls are addressed;
    - There is a procurement plan supporting local communities (socio-economic).
  - ➢ Alternative resources used for the management of a protected area are well managed:
    - The management authority encouraged to solicit external funding or services for the management of a protected area;
    - Environmental programmes to assist management of the protected area.
  - ➢ Mechanisms to enable volunteers to work in protected areas and managed where relevant are in place:
    - There is a system for the appointment and management of volunteers in place;
    - There is a system for the application of external sources to be used to contribute to management of protected area.

4.6.3.1 *Principles:*

- All information that is used to support the operational planning and decision-making in the reserve shall be collected, collated, updated, maintained and presented in a cost-effective format that is readily accessible for use by management.

4.6.4 *Management actions and targets relating to Administration & Planning KPA 6*

Objective 6.1: Institute and maintain an effective management planning capability in the DKNR											R 85 221,92	R 56 586,88	R 70 817,89	R 72 714,75	R 78 076,72
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Compile and regular revision of IMP for the PA:		The IMP is fully integrated covering all aspects of PA management with measureable objectives and is approved by the MEC that include a PA Expansion Plan in line with expansion strategy for the organisation, a zone of influence (linterphases) with guidelines for suitable land uses for input into the municipal IDP: catchment and river plans. An approved CDF based on a sensitivity analysis exists as part of the IMP. All relevant standard operating procedures pertaining to all management activities are in place and are regularly updated to ensure best practice.	2.1 PA design 2.1.1 PA expansion plan 2.1.2 Delineation of a zone of influence 2.1.3 Corridor management 2.2 Management Plan 2.2.1 Conservation Development Framework (CDF)	Reserve Manager PA Man Comm						R 50 615,00	R 35 465,26	R 37 937,17	R 39 834,03	R 41 825,73
a	*Revise PA Expansion Plan in line with expansion strategy for the organisation.*														
b	*Ensure the size and shape of the PA is adequate to achieve the conservation mandate;*														
c	*Revise zone of influence and applicable buffering mechanisms (interphases) with guidelines for suitable land uses;*														
d	*Revise impliment a CDF (zoning system) based on a sensitivity analysis indicating visitor use zones, and positioning and nature of operational & visitor infrastructure;*														
e	*Update State of Knowledge Data Repository;*														
f	*Develop and update standard operating procedures pertaining to all management activities*														
2	Develop an APO or annual work plan identifying all the activities, tasks and outcomes (operational & management) in accordance with predetermined time frames and approved management plans to be completed in a financial year:		An approved APO exists and actions are linked to the PA's management plan targets and to the Key Performance Areas of the PA manager	4.1 Annual Plan of Operation (APO) 5.4 Linking of management Plan to Key Performance Areas							R 34 606,92	R 21 121,63	R 32 880,72	R 32 880,72	R 36 250,99
a	*Regular updates of APO;*														
b	*Link SMP and APO to the Key Performance Areas of the PA manager and key personell;*														

Objective 6.2: Maintain an adequately equipped, resourced and trained staff complement for the DKNR											R 2 126 280,06	R 2 970 571,00	R 3 188 787,31	R 3 762 522,13	R 4 146 760,13
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure that all vacant posts in the reserve's approved organogram are filled and determine actual needs for achieving management objectives.		The approved organogram reflects the actual needs for effectively achieving all management objectives and the HR capacity meets the approved levels.	3.2 Human Resource capacity	Management Authority: HR & HRD						R 1 661 077,03	R 2 381 907,63	R 2 662 016,44	R 3 162 401,11	R 3 509 866,99
2	Identify training needs, and facilitate access to training programs for reserve staff, with a priority focus on field ranger, first aid, hospitality and IT skills training.		Staff are well skilled for their duties and staff productivity targets are often exceeded as indicated in staff performance reviews. An individual career path has been determined for each staff member.	5.3 Staff Development and productivity							R 164 731,86	R 228 421,97	R 190 372,74	R 222 058,79	R 223 117,79
3	Implement the institutional staff performance appraisal system.		HR management and staff development systems are excellent and fully support management effectiveness. There is an effective staff handover system and new staff are promptly made aware of relevant aspects of the PA management. Staff receive incentives to remain in the organisation to prevent loss of skills and experience.	4.3 HR Management systems							R 271 772,84	R 264 203,59	R 304 558,42	R 339 355,55	R 365 289,06
a	*Have clear job descriptions and Performance Agreements on record. Link KPA's to APO and Mett*														
b	*Maintain all staff information for the reserve (leave records, attendance registers, overtime, etc.).*														
4	Implement the institutional Occupational Health and Safety policies and procedures in the reserve.		An external audit has certified that PA management complies with and implements the Occupational Health and Safety Act.	3.10 Health and safety							R 28 698,33	R 96 037,81	R 31 839,70	R 38 706,69	R 48 486,28

Management actions and targets relating to Administration & Planning KPA 6 cont.

Objective 6.3:Institute and maintain an effective financial and admin. planning capability in the Reserve												
								R 760 303,08	R 731 640,58	R 745 481,78	R 795 035,08	R 933 110,29
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)		Cost estimates (Years 1-5)				
						1	2 3 4 5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Administer the administrative systems supportive of effective management and proper functioning of the PA:		Administrative support systems are excellent and fully support management effectiveness.	4.4 Administrative support systems	Reserve Manager			R 521 584,04	R 536 917,64	R 570 874,83	R 600 597,07	R 660 606,13
a	*Do annual Mett assesment;*											
b	*Institute and maintain an electronic and/or hard copy filing system for all reserve-specific information;*											
c	*Maintain and update all assets and stock inventory registers and reports for the reserve;*											
d	*Maintain a reserve-based record of all purchases made, accounts paid and services procured in support of reserve operations over each financial year;*											
2	Ensure electronic data are backed up on a routine basis, stored according to organisational standards and are easy to access.		Information Technology systems are excellent and fully support management effectiveness.	4.5 Information Technology systems	Reserve Manager IT section			R 76 650,68	R 123 187,10	R 60 046,46	R 63 048,78	R 146 201,22
a	*Ensure electronic data are backed up on a routine basis and stored according to organisational standards and are easy to access*											
b	*Institute and maintain an electronic and/or hard copy filing system for all reserve-specific information*											
c	*Inventory of all literature*											
3	Ensure financial management is excellent and all management goals are met		The available budget is sufficient and meets the full management needs of the PA. There are skills and capacity in the organisation to raise external sources of funding for specific projects. An operational budget, specific to the PA, is secure and is guaranteed on a 3-5 year cycle. Updated guidelines, policies and procedures available at the reserve.	3.3 Adequacy of Operational budget 3.4 Security of Operational budget 3.4.1 Capital budget 3.4.2 Budget Management 4.8 Insurance	Reserve Manager			R 162 068,36	R 71 535,84	R 114 560,50	R 131 389,23	R 126 302,95
a	*All operational equipment, infrastructure and vehicles are covered by adequate insurance;*											
b	*Prepare annual budget according to the APO and identify needs for external funding;*											
c	*PA Manager to be responsible and accountable for budget management;*											
d	*Read and apply all updated Management Authority guidelines, policies and procedures to the daily functioning of the reserve;*											
e	*Determine the economic valuation of the reserve;*											
f	*Keep record and manage own revenue according to PFMA and supply inputs when required;*											

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

5. RESOURCING AND GOVERNANCE FRAMEWORK

This section provides brief recommendations on the minimum staffing complement and funding that would be required to implement the RMP (*i.e.* the IMP and APO). This section also briefly describes the key responsibilities of the reserve management team in the development, implementation, monitoring and review of the RMP.

5.1 Staffing Requirements

It is proposed that the following minimum staffing complement[17] would be required to implement this IMP[18]:

POST DESIGNATION	NUMBER
RESERVE MANAGER	1
ASST. RESERVE MANAGER	1
SENIOR FIELD RANGER	1
FIELD RANGER	6
GENERAL FOREMAN	1
GENERAL ASSISTANT	5
ADMINISTRATION CLERK	1
ADMIN CLEANER	1
FACILITY MANAGER	1
HANDYMAN/DRIVER	1
GATE GUARD	3
FACILITY CLEANER	2

5.2 Funding Requirements

It is proposed that the following operational[19] and capital[20] budget would be required to implement this IMP:

KPA 1: Biodiversity and Heritage Conservation

ECONOMIC CLASSIFICATION - SCOA	*2019/2020 Budget*	*2020/2021 Budget*	*2021/2022 Budget*	*2022/2023 Budget*	*2023/2024 Budget*
PERSONNEL	*R433 771,08*	*R562 190,29*	*R759 238,70*	*R776 869,72*	*R848 760,70*
GOODS AND SERVICES	*R182 750,00*	*R341 260,00*	*R158 370,00*	*R253 480,00*	*R152 490,00*
CAPITAL ASSETS >R5000	*R36 000,00*	*R1 015 000,00*	*R1 400 000,00*	*R125 000,00*	*R910 000,00*
TOTAL:	*R652 521,08*	*R1 918 450,29*	*R2 317 608,70*	*R1 155 349,72*	*R1 911 250,70*

[17] This minimum staff complement assumes that the overnight tourism facilities and services are not outsourced to an operator or concessionaire and that the reserve management is directly responsible for the management of these facilities and services.

[18] The staffing requirements reflected in the IMP are premised on two elements: (i) a critical assessment of the efficacy of the current approved (not actual) organogram for the reserve in respect of current reserve management responsibilities; and (ii) a facilitated discussion with the RPT on any (mostly minor) adjustments/changes that may be required to this approved organogram in order to more effectively implement the IMP for the next five years.

[19] Operational costs are roughly based on an area-complexity factor (i.e. different cost ranges per ha, based on the level (high, medium or low) of management complexity). This was then moderated against documented expenditure for operational costs in Northern Cape's provincial reserves, wherever available. This was then again moderated against equivalent reserves in Kwa-Zulu Natal and the Western Cape, as well as reserves of SANParks and ECParks, where operating costs have stabilized and are well documented over a period of three to five years.

[20] Capital budget requirements are roughly based on known costs for similar capital investments, either in terms of replacement costs (e.g. vehicles), infrastructure development costs (e.g. cost/ha or cost/km for fencing or roads), bulk services (e.g. costs/m for pipelines, etc.), or building costs (e.g. cost/m2 for staff accommodation or chalets), etc.

KPA 2: Recreation, Marketing, Education, Awareness and Interpretation

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONNEL	R 331 238,59	R 311 437,08	R 320 176,57	R 312 510,47	R 349 802,82
GOODS AND SERVICES	R 0,00	R 68 000,00	R 24 000,00	R 7 200,00	R 8 400,00
CAPITAL ASSETS >R5000	R 0,00	R 0,00	R 15 000,00	R 0,00	R 0,00
TOTAL	R 331 238,59	R 379 437,08	R 359 176,57	R 319 710,47	R 358 202,82

KPA 3: Enforcement, security and access control

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONNEL	R 610 394,57	R 667 903,85	R 764 240,36	R 787 316,20	R 776 751,70
GOODS AND SERVICES	R 772 115,76	R 824 203,64	R 884 538,18	R 539 400,00	R 325 000,00
CAPITAL ASSETS >R5000	R 12 000,00	R 22 000,00	R 80 000,00	R 24 000,00	R 0,00
TOTAL	R 1 394 510,33	R 1 514 107,48	R 1 728 778,54	R 1 350 716,20	R 1 101 751,70

KPA 4: Infrastructure and equipment

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONNEL	R 598 248,77	R 806 846,31	R 898 008,77	R 1 202 802,97	R 1 251 951,32
GOODS AND SERVICES	R 452 330,00	R 1 586 040,00	R 546 570,00	R 510 000,00	R 785 590,00
CAPITAL ASSETS >R5000	R 26 000,00	R 1 285 000,00	R 338 000,00	R 276 000,00	R 222 000,00
TOTAL:	R 1 076 578,77	R 3 677 886,31	R 1 782 578,77	R 1 988 802,97	R 2 259 541,32

KPA 5: Stakeholder involvement

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONEEL	R 50 190,46	R 62 981,15	R 59 944,96	R 76 346,02	R 96 220,04
GOODS AND SERVICES	R 0,00	R 0,00	R 0,00	R 0,00	R 0,00
CAPITAL ASSETS >R5000	R 0,00	R 0,00	R 0,00	R 0,00	R 0,00
TOTAL	R 50 190,46	R 62 981,15	R 59 944,96	R 76 346,02	R 96 220,04

KPA 6: Administration and planning

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONEEL	R 2 611 735,75	R 2 959 982,58	R 3 366 171,10	R 3 926 900,11	R 4 306 987,00
GOODS AND SERVICES	R 529 615,88	R 694 815,88	R 578 915,88	R 635 015,88	R 740 615,88
CAPITAL ASSETS >R5000	R 0,00	R 40 000,00	R 0,00	R 0,00	R 40 000,00
TOTAL	R 3 141 351,63	R 3 694 798,46	R 3 945 086,98	R 4 561 915,99	R 5 087 602,88

Total Budget Requirements

ECONOMIC CLASSIFICATION - SCOA	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
	Budget	Budget	Budget	Budget	Budget
PERSONNEL	R4 635 579,22	R5 371 341,25	R6 167 780,46	R7 082 745,49	R7 630 473,59
GOODS AND SERVICES	R1 936 811,64	R3 514 319,52	R2 192 394,06	R1 945 095,88	R2 012 095,88
CAPITAL ASSETS >R5000	R74 000,00	R2 362 000,00	R1 833 000,00	R425 000,00	R1 172 000,00
TOTAL:	R6 646 390,86	R11 247 660,77	R10 193 174,52	R9 452 841,37	R10 814 569,47

5.3 Roles and Responsibilities

5.3.1 *Reserve Management*

The key responsibilities of reserve management in the development, implementation, monitoring and review of the IMP are summarized as follows:

Biodiversity Management (Management Authority HO)	The conservation agencies and services sub-program of the Management Authority will have direct responsibility for: • Implementation of the designated priority activities in the IMP, and linked APO; and • Providing professional and technical support to the Regional Manager, Reserve Manager in the implementation of the IMP and APO.
Regional Manager	The Regional Manager will have overall responsibility for: • Ensuring the alignment of the IMP with Provincial and DAERL policies and guidelines; • Ensuring the coordination and alignment of the IMP with other departmental activities and initiatives; • Providing oversight of the implementation of the IMP and APO; • Reporting on the performance of the DKNR in the implementation of the IMP and APO to Program Manager; • Instituting corrective actions to ensure that the IMP and linked APO is implemented, reviewed and updated; and • Approval of the APO.
Reserve Manager	The Reserve Manager will have direct responsibility for: • Annually drafting an APO to operationalize the priority activities identified in the IMP; • Implementation of the APO; • Monitoring of performance against the APO (and the IMP); • Reporting of performance against the APO (and the IMP) to the Regional Manager; • Management of reserve staff, resources and finances in the implementation of the APO; and • Communicating with the Regional Manager about obstacles in the implementation of the APO.

5.3.2 *Reserve Planning Team*

The RPT may include any of the following persons:

- Regional Manager;
- Northern Cape PA Managers;
- The Reserve Manager;
- Key reserve management staff;
- Biodiversity planner;
- Regional scientist/s;
- Landowner/s (in the case of stewardship agreements);
- Representative/s of any reserve co-management committee (in cases where one has been established); and
- Co-opted technical experts/consultants.

The RPT is specifically responsible for the following:

- Overseeing all planning initiatives and activities in the Reserve;
- Providing strategic direction to the RMP;
- Providing technical and scientific inputs into the RMP;
- Approving the first draft of the reserve's IMP for public consultation;

- Identifying the need for subsidiary plans in the reserve, and guiding its formulation;
- Providing technical inputs into the preparation of the APOs for the Reserve;
- Approving the first draft of the reserve's APOs for formal submission to the Management Authority;
- Reviewing the reserve's performance against the objectives and goals established in the IMP and APOs;
- Guiding the updating of the IMP and APOs, based on the outcomes of the annual performance review; and
- Assisting in identifying the ongoing human resource and budgetary requirements of the reserve.

5.3.3 *Protected Area Advisory Committee*

Regulation 9 of the Regulations for the Proper Administration of Nature Reserves made in terms of Section 86 (1) of NEMPAA states that the Management Authority may establish one or more advisory committees in respect of a nature reserve according to the procedure stipulated in Regulation 10 of the aforementioned Regulations. Upon following this procedure, the Management Authority may appoint an advisory committee, provided that at least one employee of the Management Authority, nominated by the Management Authority itself, serve as an ex officio member of the committee. Each member of the advisory committee is appointed by the Management Authority for a period determined by the Management Authority, which may not exceed three years. The mandate of any advisory committee must be defined by the Management Authority itself in specific terms in writing. These specific terms must include the terms of reference; the method of communicating advice; the acceptance and rejection of advice offered; the appointment and removal of committee members; and the support to be provided, together with any remuneration payable and its terms.

5.3.4 *Reserve Co-Management Committee*

As all properties are currently State-owned no co-management agreement is applicable. If properties of the Northern Cape or private land are incorporated at a later stage as part of the expansion strategy the key responsibilities of DKNRCMC in the development, implementation, monitoring and review of the RMP are summarized as follows:

Doornkloof Co-Management Committee
The DKNRCMC shall have overall responsibility for: • Representing the interests of the different reserve stakeholder groups and institutions during the preparation of the IMP and APOs; • Overseeing the drafting of the IMP and APOs; • Providing strategic inputs into the drafting of the IMP, and technical inputs into the annual drafting of the APOs; • Making recommendations to the Regional Manager on the adoption of the IMP and annual APOs; • Reviewing the quarterly and annual performance of the DKNNR against the APO and IMP; and • Providing inputs into ad hoc and emergency reserve decision-making not adequately addressed in the IMP/APO.

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Annexure 1: Departmental programmes and Sub-programmes

PROGRAMME	DESCRIPTION
Programme 1	**Administration**
Sub-programme 1.1	Office of the MEC
Sub-programme 1.2	Senior Management
Sub-programme 1.3	Corporate Services
Sub-programme 1.4	Financial Management
Sub-programme 1.5	Communication Services
Programme 2	**Sustainable Resource Use Management**
Sub-programme 2.1	Agricultural Engineering Services and Land Care
Sub-programme 2.2	Land-use Management and Disaster Risk Reduction
Sub-programme 2.3	Agricultural Producer and Development Producer Support Services
Sub-Programme 2.4	Extension and Advisory Services
Programme 3	**Agricultural Producer Support and Development**
Sub -Programme 3.1	Producer Support Services
Sub-Programme 3.2	Extension and Advisory Services
Sub-Programme 3.3	Food Security
Programme 4	**Veterinary Services**
Sub-Programme 4.1	Animal Health
Sub-programme 4.2	Veterinary International Trade Facilitation
Sub-programme 4.3	Veterinary Public Health
Sub-programme 4.4	Veterinary Diagnostic Services
Sub-programme 4.5	Veterinary Technical Support Services
Programme 5	**Research and Technology Development Services**
Sub-programme 5.1	Research
Sub-programme 5.2	Technology Transfer Services
Sub-programme 5.3	Infrastructure Support Services
Programme 6	**Agricultural Economics Services**
Sub-programme 6.1	Production Economics and Marketing Support
Sub-programme 6.2	Macroeconomics Support
Sub-programme 6.3	Agro-processing Support
Programme 7	**Rural Development**
Sub-programme 7.1	Rural Development Coordination
Sub-programme 7.2	Social Facilitation
Programme 8	**Environment and Nature Conservation**
Sub-programme 8.1	Compliance and Enforcement

Sub-subprogramme 8.1.1	Environmental Quality Management Authorisation
Sub-subprogramme 8.1.2	Biodiversity Management Authorization and Compliance
Sub-programme 8.2	Environmental Quality Management
Sub-subprogramme 8.2.1	Impact Management
Sub-subprogramme 8.2.2	Air Quality Management
Sub-subprogramme 8.2.3	Pollution and Waste Management
Sub-subprogramme 8.2.4	Environmental Communication and Awareness Raising
Sub-subprogramme 8.2.5	Expanded Public Works Programme
Sub-programme 8.3	**Biodiversity Management**
Sub-subprogramme 8.3.1	Biodiversity Protected Area Planning and Management
Sub-subprogramme 8.3.2	**Conservation agency and Services**
Sub-subprogramme 8.3.3	Coastal Management
Sub-subprogramme 8.3.4	Environmental Capacity Development and Support

Annexure 2: Conservation Development Framework

Conservation Development Framework (CDF) and Use Zone Map

1) Introduction

The CDF is a strategic spatial plan for the Reserve and its surrounds that indicates a range of visitor use zones, areas requiring special management intervention, the placement of visitor facilities, the nature and size of these facilities, entry points and movement routes through the Reserve. It also provides guidelines for potential future development, rehabilitation and the management of land-use along the reserve borders. The CDF is underpinned by a thorough analysis of the biodiversity, cultural-heritage and landscape limits to development, as well as the tourism opportunities. Sensitivity-value analysis is a decision support tool for spatial planning that is designed to integrate best available biodiversity information into a format that allows for defensible and transparent decisions to be made.

2) Basic planning principles applied

The basic planning principles applied in the compilation of the CDF and facilities in reserves are as follow:

a) Reserve Interface Zone

- Recognize that Reserve boundaries are not static and that there are factors beyond the current or future boundaries that can influence the Reserve;
- Interface Zones, shows the areas within which surrounding land-use changes could affect the Reserve;
- The zones serve as a basis for identifying focus areas in which Reserve management should respond to development proposals and EIAs, identifying impacts that would be important at a particular site, and most importantly, serving as the basis for integrating long-term protection of a reserve into the spatial development plans of municipalities and other local authorities.

b) Regional Influences

- Recognize that the Reserve cannot exist in isolation and that planning needs to ensure that the Reserve is integrated with the surrounding landscapes and economic and social structures;
- Ensure that the plans take account of the IDP/SDF of the local municipality;
- Conduct market research to ensure that the proposed facilities are sustainable in the local regional and national market:
  - Provide unique integrated ranges of products;
  - Provide facilities that serve the local community.
- Determine the extent to which Reserve management will be involved in planning issues outside of the future boundary (Reserve interface Zone) and produce guidelines for this area.

c) Biodiversity conservation

- Recognize that the prime mandate of the Reserve is to conserve biodiversity:
  - All planning will be underpinned by a thorough sensitivity analysis of all biophysical aspects using the best available data;
  - Apply the principles of Strategic Environmental Assessment (SEA) that is similar to that of EIA for projects;
  - Apply the principles of Limits of Acceptable Change to determine the carrying capacity of the Reserve;

- Follow the IEM system for all developments that promotes the principles of transparency, accountability and informed decision-making at all stages of the project life cycle.
- Apply the "precautionary" principle whenever insufficient information is available to make an informed decision;
- Reduce the current impacts of structures and roads;
- Rationalize and consolidate the roads system;
- Mitigate current impacts;
- Rehabilitate impacted areas.

d) Scenic resources

- Recognize that conservation and management of scenic quality is a vital part of Reserve's mandate;
- Mitigate the visual impact of current structures and where necessary remove structures from highly visually sensitive areas:
- Ensure that new developments and roads do not impact on the scenic quality;
- Visual sensitivity must inform the acquisition of land outside of the Reserve;
- Improve the sense of place at existing facilities in the Reserve.

e) Heritage/Cultural assets

- Recognize that the Reserve has a mandate not only in terms of the PAA but also the National Heritage Resources Act to manage cultural assets;
- Ensure that cultural sites are not disturbed by developments;
- Celebrate cultural assets in the provision of facilities, information and interpretation.

f) Visitor facilities and infrastructure

- Recognize that Reserve offers a wide range of unique opportunities for experiences of solitude and nature-based recreation;
- All facilities to comply with "Touching the Earth Lightly" principles;
- Determine the optimum number of visitors to ensure quality experiences;
- Provide a range of unique experiences without significant impacts on biodiversity and scenery;
- Zone the Reserve to allow for different levels of intensity of use;
- Consolidate and minimize entry points;
- Where possible place new management and visitor facilities on the periphery of the Reserve;
- Provide opportunities to experience the Reserve on foot, bicycles or kayaks.

3) Sensitivity analysis

As a first step in compiling the CDF a sensitivity analysis was done for the Reserve. Biodiversity conservation, wilderness attributes, unique landscape features, and the legacy of development that includes obsolete structures, infrastructure considered as heritage in terms of the National Heritage Resources Act, all act as the primary informants to land-use planning. The process analyzed the overall Reserve environment and assessed the range and scale of activities that the Reserve can support. Where available the data extends beyond the Reserve estate and covers the complete domain. Ideally data should include the complete interface;

The following data used in the Sensitivity analysis is only the basic requirements and all available data should be sourced.

a) Reserve interface

- This layer should be divided into historic, current situation with regard to conservation and protected areas as well as the vision for the future (yesterday, today and tomorrow);
- A rudimentary Reserve interface delineation exercise for the Reserve has been conducted and identified three Interface Zone categories

➢ Priority Natural Areas:
  - These are key areas for both pattern and process that are required for the long-term persistence of biodiversity in and around the Reserve and includes other protected- and conservation areas;
  - The zone also includes areas identified for future Reserve expansion. Inappropriate development and negative land-use changes should be opposed in this area;
  - Developments and activities should be restricted to sites that are already transformed. Only developments that contribute to ensuring conservation friendly land-use should be viewed favorably;
  - This layer was derived from identification of intact natural areas around Reserve as highlighted through the CBA assessment combined with an evaluation of areas for their corridor value.

➢ Catchment Protection Areas:
  - These are areas important for maintaining key hydrological processes within the Reserve;
  - Inappropriate development (dam construction, loss of riparian vegetation etc.) should be opposed;
  - Control of alien vegetation and soil erosion as well as appropriate land care should be promoted;
  - The delineation of these areas is based on river health program;
  - This assessment is not very well geared at showing areas of Reserve vulnerability to specific hydrological impacts, and the Aquatic Ecosystems of the Reserve must be formally classified according to the six-tiered structure of the Classification System for Wetlands and other Aquatic Ecosystems in South Africa.

➢ Viewshed Protection Areas:
  - These are areas where development is likely to impact on the aesthetic quality of the visitor's experience in a Reserve;
  - Within these areas any development proposals should be carefully screened to ensure that they do not impact excessively on the aesthetics of the Reserve;
  - The areas identified are only broadly indicative of sensitive areas, as at a fine scale many areas within this zone would be perfectly suited for development;
  - In addition, major projects with large scale regional impacts may need to be re-considered even if they are outside the Viewshed Protection Zone;
  - This layer was derived from a visual analysis conducted for the Reserve.

b) Reserve domain (Planning domain)

- Planning domain include current Reserve boundaries (estate) with planned expansion for next 5-year planning period.

c) Reserve estate (Boundaries & Beacons)

- Layout plan of the Reserve showing current boundary;

- All corners (beacons) should be listed with their co-ordinates in the legend[21].

d) Climate regions

- CSIR Köppen-Geiger map based on 1985 to 2005 South African Weather Services data on a very fine 1 km x 1 km grid;
- This layer was completed on a large scale for the complete Northern Cape Province;

e) Digital Terrain Model (topography)

- This was done on a 30m resolution and indicate areas with special natural features (waterfalls, canyons, plateau's, escarpments, caves and rock formations);
- This layer also indicates all high points with names and or trig beacons;
- Areas that have particular aesthetic value were also mapped as polygons.

f) Geology map

- Fine scale units according to the maps provided by the council of geoscience were used and were geo-reference to produce the layer for the Reserve domain.

g) Land types & Soil map:

- The Land Type Map covering the Reserve domain together with the Land Type Memoir with explanatory information on land types, modal profiles and climate zones were used to compile this layer.

h) Aquatic Ecosystems

- Classification and mapping according to SANBI System for Wetlands and other Aquatic Ecosystems in South Africa were used to map the aquatic ecosystems;
- Distinction is made between Floodplain wetlands, Un-channeled valley-bottom wetlands, Wetland flats, Channeled valley-bottom wetlands, Depressions, Seeps and Rivers.

i) Biomes and Bioregions

- The biomes and bioregions according to the Reserve domain were mapped.

j) Vegetation Map

- This layer needs to broadly fit in with the new national classification;
- Sub-categories including management units and disturbed areas that will include degraded areas for the previous 5 years and all transformed areas were also included.

k) Special habitats:

- Known concentrations of species of conservation concern (breeding colonies, etc.) need to be mapped;
- This will only be broadly mapped (complete habitat) and can be based on expert assessment.

l) Archaeological and Cultural resources:

- Brief survey with cultural/heritage sites point data;
- Specialist studies needed to classify the value of each site (national-local etc.) (Research proposals submitted).

m) Existing infrastructure, services and facilities:

- All visitor facilities provided in the Reserve estate were mapped;

[21] Only estimated position but needs to be replaced with surveyed co-ordinate according to deeds diagrams

- All tourism facilities in Reserve domain were mapped;
- All infrastructure within the Reserve domain were mapped.
- All existing and potential access points were mapped;
- All services (potable water, Eskom power supply) within the Reserve domain were mapped.

n) Visual Analysis:

- The view shed from the Reserve domain was determined to establish the footprint of the Reserve interphase;
- Visual analysis was also done to determine the view shed from existing visitor facilities and other infrastructure;
- The analysis was used to determine the aesthetic value.

4) Reserve Policies & Context

a) Reserve policies in respect of biodiversity conservation and the provision of facilities

- The second step in the CDF process was to determine the policies in respect of biodiversity conservation and the provision of facilities;
- These policies are provided for as Appendix 1 to this CDF as it also needs to be approved as part of the IMP.

b) Determine what the short- and long- term visitor requirements are

- This should be underpinned by a visitor survey which sets out the visitor profile, site patronage & visitor's concerns and requirements;
- This should be accompanied by a market survey of the demand for services and products;
- In order to be strategic, the planning process should look beyond the current boundaries and plan accordingly;
- It is also essential to determine the extent to which local (adjacent to Reserve domain) and regional (Reserve interface) influences will influence visitor requirements in the Reserve.

5) Sensitivity-values mapping

a) Determine significant informants

- All the data layers collected during the first step of the CDF process (sensitivity analysis) were examined in terms of significance and sensitivity to development;
- The result has informed the use zone mapping and the placing, extent and the nature of visitor facilities;
- To determine and map sensitivity-values it must be emphasized that the data required to make this exercise defensible, is often inadequate or not available at all. Thus, the first step in the CDF process, the collecting and recording of the best available data should be seen as an extremely high priority.

6) Use Zone map and development sites

a) Determine use zones

- This step of the CDF process is a requirement for the Reserve in terms of the PAA. A draft was exposed to all stakeholders and amended as required by the PAA that is now submitted to the Executive Management for ratification and approval by the MEC as part of the Reserve's IMP;

- This process was informed largely by the sensitivity map and Reserve policies and planning principles;
- The generic set of visitor use zones for all reserves was used as a guideline.

b) Determine locations for future development of specific facilities

- Informed by the use zones, regional influences, visitor requirements, market needs and other informants, sites for potential visitor facilities and alternates were identified;
- At the same time potential transport routes and alternates are identified and the standards for all roads, footpaths and cycle routes will be set;
- Using the principle of SEA the alternate sites will be critically examined and the most suitable location decided on;
- The scale of development and the numbers of visitors need to be informed by an assessment of cumulative impacts for the whole Reserve;

Based on available information, and in consultation with the RPT, the Conservation Development Framework (CDF) is presented as a strategic spatial planning framework for the DKNR and its surrounds. Annexure 1 describes the objectives, characteristics, uses, management guidelines and broad conservation and tourism infrastructural requirements designated for each of the use zones. Each of these zones has criteria for the type of activities, interaction with other users the type and size of facilities, the sophistication of facilities and the standard of roads.

7) Site plans

- As a final step in the planning process detailed planning will be undertaken for each site to produce a site plan for each visitor site which will inform the development of the specific facilities;
- The percent plans will determine the nature and scale of the facilities and will guide future phased expansion;
- In the long term it is proposed to produce a design manual for the Reserve which will guide the style of all facilities and accompanying signage.

8) CDF Guide to Use Zones - General characteristics and objectives

a) Wilderness Zone

i. General Characteristics

- It complies fully with the criteria for the designation in terms of the Protected Areas Act 57 of 2003.
- This is an area retaining an intrinsically wild and rugged appearance and character, or capable of being restored to such and which is undeveloped and without roads.
- Different wilderness blocks are usually separated from each other by management tracks, a necessity in areas with increased poaching pressure and the need to access remote areas by rangers.
- The area provides outstanding opportunities for solitude and has awe-inspiring natural characteristics.
- Areas where users have little chance of encountering any other human presence or group.
- Sight or sound of human activities outside zone barely discernible and at far distance; preferably no human impact or infrastructure inside the zone other than trails.
- Natural burning regimes, with no active fire management and road/firebreak infrastructure.
- Areas with minimal Invasive Alien Plant infestations, where IAP control can be done without vehicle access.
- Include sensitive or threatened habitats & species, important heritage sites and features in this low use zone when contiguous sites meet the criteria for wilderness.

ii. Conservation Objective:

- Wilderness zones are managed to protect and maintain natural and cultural biodiversity and the provision of environmental goods and services.
- Management interventions use a “minimum tool approach” and “no-trace-left” activities may be conducted.
- Maintain the zone in as near to a natural state as possible with no impact on biodiversity pattern or processes.
- Existing impacts on biodiversity either from historical usage or originating from outside the zone should be minimized.

iii. Aesthetic / recreational objectives

- To provide an experience of solitude in pristine landscapes with minimal evidence of human presence or use.
- 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.) will not be tolerated.

iv. Conservation and Special Management (Resource Utilization)

- M minimal management requirements, typically natural burning regime.
- Prevent or restore visible trampling or any other impact.
- Rehabilitate non-essential roads to natural vegetation. Re-zone essential roads out of Wilderness Zoning.
- Resource Utilization not compatible

v. Visitor Management

- Manage to conserve natural and cultural resources, ecological processes and wilderness integrity.

- Limited management interventions. Management measures may be carried out in extreme conditions, but tread lightly principles must apply.
- Intensive maintenance of visitor activities. Leave no trace ethic. Restrict numbers of visitors and allow for no-use rest periods if required.
- Active enforcement of reserve regulations.
- Since visitor use cannot be intensively managed, re-route trails away from any areas with sensitive local habitats or plant and animal species.
- Trail layout, design and construction must reduce maintenance requirements.

b) Remote Zone

i. General Characteristics

- These areas provide a "wilderness experience", but do not necessarily comply with the criteria for legal designation as wilderness.
- The same criteria as for wilderness although limited unimproved management tracks (mostly extreme 4x4) are allowed. There are no permanent improvements or any form of human habitation. Moderate levels of visibility obtrusiveness allowed.
- Popular view sites or natural and cultural attractions only accessible by extreme 4 X4 self-drive or access by boat.
- Areas that may have natural burning regimes, with no active fire management and road/firebreak infrastructure or areas that require active fire management to stay within thresholds of concern.

ii. Conservation Objective:

- The conservation objective is to maintain the zone in a natural state with no impact on biodiversity pattern or processes. Existing impacts on biodiversity either from historical usage or originating from outside the zone should be minimized.
- Habitats with minimal management requirements, typically natural burning zones.
- To minimize and mitigate the effects of visitor use on the reserve's natural habitats and species and its cultural sites.

iii. Aesthetic / recreational objectives

- To provide an experience of relative solitude and wildness. Signs and sounds of the urban area are more obvious and encounters with other visitors are more frequent than in Wilderness. There may be some signs of infrastructure mainly of a heritage nature.
- Although less physical exertion is required, a reasonable level of fitness, self-reliance and experience is necessary.
- The nature of the experience is dependent on the quality of the natural environment.

iv. Conservation and Special Management (Resource Utilization)

- May require active conservation management interventions erosion control, fire breaks and block burning.
- Intensive maintenance of visitor activities
- Intensive conservation management activities undertaken (rehabilitation).
- Resource Utilization not compatible

v. Visitor Management

- Manage to conserve natural and cultural resources, ecological processes and wilderness integrity.

- Limited management interventions. Management measures may be carried out in extreme conditions, but tread lightly principles must apply.
- Intensive maintenance of visitor activities. Leave no trace ethic. Restrict numbers of visitors and allow for no-use rest periods if required.
- Active enforcement of reserve regulations.
- Trail layout, design and construction must reduce maintenance requirements.

c) Primitive Zone

i. General Characteristics

- Intrinsically wild appearance & character
- Areas where users will seldom encounter other human groups or presence with access controlled in terms of numbers, frequency and size of groups.
- Any visible human impact or infrastructure inside the zone is unobtrusive. Views of human activities and development outside of the reserve or zone may be audible or visible in places.
- The zone has limited access roads and the potential for basic small-scale self-catering accommodation facilities or small concession Rest Camps (which would generally have more sophisticated facilities).
- Areas remote from management centres, or otherwise difficult or expensive to access for management.
- Primitive areas are designated to buffer remote or wilderness areas from higher use areas and activities outside the reserve, as well as to protect most of the remaining sensitive areas from high levels of tourist activity.
- Almost all highly and moderately sensitive environments that were not included within the Wilderness or Remote zone are included in this zone.
- Primitive areas are also designated in valleys with relatively low environmental sensitivity to allow access to remote areas as well as to contain the infrastructure required for management and tourist activity in these areas (e.g. trail huts and access roads).
- Areas that might not meet the criteria for Wilderness or Remote but can serve as undeveloped visual buffers for these zones.
- Areas that may have natural burning regimes, with no active fire management and road/firebreak infrastructure OR areas that require active fire management to stay within thresholds of concern.

ii. Conservation Objective:

- The conservation objective is to maintain the zone in an almost completely natural state with little or no impact on biodiversity processes, and very limited and site-specific impacts on biodiversity pattern.
- Existing impacts on biodiversity either from historical usage or originating from outside the zone should be minimized.
- To limit visitor use, numbers and infrastructure to minimize impact in sensitive environments. To reduce need for management of users and visitor impacts.
- Allows for minimal or more intensive biodiversity management intervention.
- Include extensive areas of sensitive or threatened habitats & species in this low use zone when sites do not meet the criteria for wilderness.

iii. Aesthetic / recreational objectives

- The aesthetic/recreational objectives for the zone specify that activities which impact on the intrinsically wild appearance and character of the

infrastructure/facility should be designed to fit in with the environment within which it is located in order to avoid aesthetic impacts.

- To provide an experience of solitude in natural landscapes with little nearby evidence of human presence.
- Can provide access to and buffer Wilderness and Remote Zones.
- To provide easy access to experience the reserve's natural landscapes, habitats, species and heritage resources.
- Limited range of activities and relaxation in a natural environment.

iv. Conservation and Special Management (Resource Utilization)

- Habitats with lower or higher management requirements.
- Usually remote areas so roads and trails should be planned and constructed assuming infrequent maintenance.
- Intensive maintenance of visitor activities and facilities
- Prevent or restore visible trampling or any other visitor impact.
- Rehabilitate non-useful roads to natural vegetation
- Sustainable use can be appropriate under controlled circumstances subject to a formal assessment and application in accordance with DENC policies.

v. Visitor Management

- Manage to conserve natural and cultural resources, ecological processes and wild appearance & character.
- Restrict numbers of visitors and allow for no-use rest periods if required.
- Active enforcement of reserve regulations.
- All facilities will be small, very basic, self-catering and distributed to avoid contact between users.
- There should be limited if any interaction between groups. Visible & audible human impacts from adjacent zones should be mitigated.
- Since visitor use usually cannot be intensively managed, re-route trails away from any areas with sensitive local habitats or plant and animal species. Trail layout, design and construction must reduce maintenance requirements.

d) Quiet Zone

i. General Characteristics

- The same as for primitive with the exception that this zone is characterized by unaccompanied (or accompanied under some circumstances) non-motorized access, where visitors can walk or cycle and experience nature without the intrusion of any form of motorized transport;
- Visitor numbers and density are higher than in the primitive zone and contact between visitors is frequent;
- This zone provides experiences of a relative sense of solitude and relaxation in an environment that is openly exposed to the sights of the surrounds;
- There is less of a challenge and the zone is easier to access and less physical exertion is required.
- The quality of the experience is less dependent on the quality of the natural environment than primitive with the provision of basic facilities as for the leisure low intensity zone.
- It also serves as a buffer to the adjoining primitive or farm/urban area.

ii. Conservation Objective:

- The same as for primitive.

iii. Aesthetic / recreational objectives

- The same as for leisure low intensity

iv. Conservation and Special Management (Resource Utilization)

- The same as for primitive.

v. Visitor Management

- The same as for leisure low intensity with the exception of no motorized transport

e) Leisure Zone Low Intensity

i. General Characteristics

- Areas with extensive lower sensitivity habitats:
- Areas able to accommodate higher numbers of visitors regularly, with no identified sensitive or regionally rare biodiversity.
- Popular view or access sites.
- Extensive areas able to accommodate roads, trails and tracks without high risk of erosion and degradation.
- Areas accessible for regular management of roads and trails.
- Areas where roads and trail infrastructure can be located with low visibility from the surrounding landscape, particularly from adjacent Primitive or Wilderness Zones.
- Usually areas that require active fire management with firebreaks to stay within thresholds of concern, but may also include natural burning regimes.
- Facilities along roads are limited to basic self-catering picnic sites with toilet facilities.
- Low intensity leisure areas are designated in current game viewing loops, around current accommodation and other associated infrastructure outside of the main camps, and along existing public access roads where they form part of the reserve road network.
- Areas with a contained, low-density development footprint.
- The underlying characteristic of this zone is motorized self-drive access with the potential for roads, trails and small to medium scale recreational facilities and self-catering accommodation units in small basic camps without modern facilities such as shops and restaurants.

ii. Conservation Objective:

- The conservation objective is to mitigate the biodiversity impacts of the relatively high levels of tourism activity and infrastructure that are accommodated within this zone through careful planning and active management, and to ensure that both the negative effects of the activities and infrastructure are restricted to the zone, and that the zone is maintained in a generally natural state that is in keeping with the character of a protected area.
- To manage and direct visitor use, and plan infrastructure to minimize impact on sensitive environments.
- To actively manage users and visitor impacts. Allows for minimal or more intensive biodiversity management intervention.
- Provide additional protection to localized sensitive or threatened habitats, species or other features by Special Management Overlays
- Deviation from the natural / pristine state should be minimized 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.

iii. Aesthetic / recreational objectives

- The aesthetic / recreational objectives for the zone specify that although activities and facilities will impact on the wild appearance and reduction of the wilderness characteristics of the area (solitude, remoteness, wildness etc.) is inevitable, these should be managed and limited to ensure that the area still provides a relatively natural outdoor experience.
- To provide easy access to natural landscapes with low expectation of solitude at all times. Can buffer between development and wilderness or Primitive Zones.
- To provide a wide range of medium sized accommodation, facilities, activities and services with relaxation in a relatively natural environment.
- 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 and relatively natural outdoor experience.

iv. Conservation and Special Management (Resource Utilization)

- Habitats with lower or higher management requirements.
- May be natural burning zones. Prevent or restore visible trampling or any other visitor impact.
- Rehabilitate non-useful roads to natural vegetation.
- Limited conservation management activities undertaken.
- Sustainable use of natural resources may, where feasible, be considered on application, and subject to a formal permitting arrangement.

v. Visitor Management

- More frequent monitoring of these areas is necessary to prevent damage or degradation.
- More frequent footpath maintenance must be scheduled for busy routes, with particular attention paid to use of railings or other access control to prevent damage to sensitive areas.
- Unless visitor access can definitely be intensively guided and managed, re-route trails away from any sensitive local habitats or plant and animal species.
- Trail layout, design and construction must be specified to reduce maintenance requirements under higher use.
- Visible & audible human impacts to adjacent Primitive or Wilderness Zones should be mitigated.
- Active enforcement of reserve regulations.
- Active visitor control.
- Risk management (e.g. fire safety) measures implemented.
- Development footprint actively contained.

f) Leisure Zone High Intensity & Reserve administration

i. General Characteristics

- The main characteristic is that of a high-density tourist development node with amenities such as shops, restaurants and interpretive centres.
- Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas not visible from Primitive or Wilderness Zones.

- Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment.
- This is the zone where more concentrated human activities are allowed and is accessible by motorized transport on high volume transport routes.
- Major provincial roads cutting through the reserve should be in the high intensity leisure zone.
- Areas with extensive degraded or transformed footprints.
- Areas with an extensive high-density development footprint.
- Areas with limited biodiversity significance.
- Areas where risk of fire damage to infrastructure is low, or can be mitigated.
- Areas that have access to potable water and Eskom power, and not sensitive to disposal of treated wastewater.
- Areas that is easily accessible from the reserve entry points.
- Areas with low visibility from the surrounding landscape.

ii. Conservation Objective:

- The main focus is to ensure a high quality visitor experience, however the conservation objectives still require that the high levels of tourism activity and infrastructure that are accommodated within this zone are planned and managed to minimize the effect on the surrounding natural environment, and that the zone must still retain a level of ecological integrity consistent with a protected area.
- To actively manage users and visitor impacts on adjacent sensitive areas.
- To contain the impacts and footprint of reserve visitor facilities, services and infrastructure.
- Deviation from the natural / pristine state should be minimized 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.
- To define the location of the infrastructure and facilities for reserve administration.

iii. Aesthetic / recreational objectives

- To provide access to adjacent natural landscapes with no expectation of solitude.
- The aesthetic/ recreational objectives for the zone specify although the high visitor numbers, activities and facilities will impact on the wild appearance and reduction of the wilderness characteristics of the area (solitude, remoteness, wildness etc.) is inevitable, these should be managed and limited to ensure that the area generally still provides a relatively natural outdoor experience.
- To provide a wide range of medium sized to large scale accommodation, facilities and associated attractions and conveniences.
- Comfortable and sophisticated facilities while retaining a natural ambiance.

iv. Conservation and Special Management (Resource Utilization)

- Provide access and generate maximum revenue.
- Management should aim to mitigate the biodiversity impacts of the high number of visitors only in sensitive areas (if any) identified by Special Management Overlay.
- These are highly transformed habitats with lower management requirements.
- Natural fire exclusion areas.
- Prevent or rehabilitate visible trampling or any other visitor impact.

- Plan for a compact overall development footprint, avoiding dispersed infrastructure that will increase fire risk and/or environmental footprint. This is most critical in fire-prone environments.
- Sustainable use unlikely to be compatible.

v. Visitor Management

- Management action will focus mostly on maintenance of facilities & providing high quality experiences.
- Use infrastructure solutions such as railings, hard surfacing and boardwalks to manage undesirable visitor impacts.
- Frequent landscape, footpath and road maintenance must be scheduled for high impact areas.
- Active enforcement of reserve regulations.
- Risk management (e.g. fire safety) measures implemented.
- Active visitor control.
- Visible impacts to adjacent Zones should be mitigated.

g) Azonal - Special Protection Zones (Species, Habitats, Heritage)

i. General Characteristics

- Sites or areas where uncontrolled public access is undesirable due to the presence of threatened species and habitats or sensitive heritage features.
- Sensitive habitat types identified for special protection in order to reduce any potential loss and to priorities rehabilitation work in these areas.

ii. Conservation Objective:

- Protection of species, habitats or heritage sites of special conservation concern.
- No deviation from natural / pristine state is allowed, Infrastructure, especially paths and viewpoints should be designed to limit the impact of large numbers of visitors on the biophysical environment.

iii. Aesthetic / recreational objectives

- Na

iv. Conservation and Special Management (Resource Utilization)

- Restrictions on access and numbers of visitors may be enforced.
- Active conservation and heritage management activities undertaken, as required.

v. Visitor Management

- Where visitor access is permitted, strict access control is required to delimit access routes, and, if necessary, screen visitors; i.e. hides, boardwalks, screened routes, and paths with railings may be appropriate.

h) Azonal - Special Management Zones (Resource Utilization)

i. General Characteristics

- Demarcated sites or areas where seasonal utilization of natural resources (e.g. harvesting of grass for thatching, collection of reeds for building material, hunting of wildlife for trophies or meat, angling etc.) takes place.
- Demarcated sites or areas where bait collection will be allowed
- Regulation and control of resource utilization (commercial and/or community based), including hunting.
- Seasonal restrictions on access may be enforced.
- Active management of resource utilization permits.

i) Azonal - Special Management Zones (Private Land)

i. General Characteristics

- These are areas of land which are fenced into the reserve through stewardship programs or agreements with the Department, but which are owned by private individuals, companies, trusts, communities, etc.
- A co-management agreement should be drawn up and management should be implemented through negotiation with the Co Management Committee.
- While owners are not restricted to this zone, they do have exclusive use in it.
- Reserve Management, however, retains access and all management rights in these zones at all times.
- No access is allowed to these areas unless by prior arrangement with the landowners. Reserve Management, or their nominated agent, will obviously have access for control purposes.
- The owner retains any agreed development rights subject to an Environmental Impact Assessment (EIA) and possible re-negotiation of fees and carries any costs associated therewith.

9) CDF Use Zones - Desired State Limits of acceptable change (LAC)

Zone	Limits of acceptable change: Biophysical	Limits of acceptable change: Aesthetics and recreational
Wilderness Zone Remote Zone	The zone should be kept in a natural state with no impact on biodiversity pattern or processes.	The area should be kept in a natural state, and 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.) should not be allowed. Controlled access, only on foot for visitors. Established footpaths where erosion maybe a problem. Essentially undeveloped and road less
Primitive Zone	Deviation from a natural/pristine state should be small and limited to restricted impact footprints and existing impacts should 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 should be designed to limit impacts. Infrastructure, especially paths and viewpoints should be designed to limit the impact of large numbers of visitors on the biophysical environment.
Quiet Zone	The zone should be maintained in a generally natural state, but some deviation from a natural/pristine state is allowed. Infrastructure should only be allowed within a restricted development footprint, and infrastructure, especially paths and viewpoints should be designed to limit the impacts of large numbers of visitors on the biophysical environment.	The zone should retain a generally natural appearance and character, and activities which impact on this should be restricted. In particular visitors are not allowed motorised access to this zone. It is however recognized that the presence of larger numbers of visitors and the facilities they require, may impact on the feeling of wildness found in this zone.
Leisure Low Intensity	Although it is inevitable that activities and facilities will impact on the wild appearance and reduce the wilderness characteristics of the area (solitude, remoteness, wildness etc), these should be managed and limited to ensure that the area still provides a relatively natural outdoor experience.	The area should be managed to provide a relatively natural outdoor experience. Although, it is inevitable that the high visitor numbers, activities and facilities will impact on the wild appearance, the aesthetics of the zone still need to be maintained in a sufficiently natural state to ensure that the overall objectives and purpose for proclamation of the reserve are not compromised.
Leisure High Intensity	The zone must retain a level of ecological integrity consistent with a protected area. 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 no activities or infrastructure should be allowed which compromise the overall objectives and purpose for proclamation of the reserve.	

10)CDF Use Zones - Guidelines for Managing Recreational Activities

Recreational Activities	Interaction between users groups	Off-road self-drive	Mountain Biking	Horse Riding	Hiking	Walking (Day trails)	Running	Bouldering Kloofing	Traditional & Free Climbing	Sport Climbing	Guided nature / heritage tours	Hang & Paragliding	Overnight	Caravanning / camping	Picnic and braaing	Row boats	Canoes and kayaks	Sailing (large yachts)	Dinghies and Sail board (wind surfing)	Power boating (fuel driven)	Swimming & Water sports	Angling	On –road self-drive	Tourist route Busses	Workshop or conference
Wilderness Zone	None				1				1				2				3								
Remote Zone	None to low	4			1	1	1	1	1		1		2				3			8					
Primitive Zone	Low to medium	4	4	4	5	4	4	4	5	4	5	7	6		4	7	7		7	8	8	8	4		
Quiet Zone	Medium		4	4	9	4	4	4	9			7	6	6		7	7		7		8	8			
Leisure Low Intensity	Frequent	4	4	4						10		7				7	7		7	10	10	8	4		
Leisure High Intensity	Frequent		4							10		10								10	10	8			

	Restricted activities - If an activity is not listed in the table, then it is not permitted
	Controlled activities - Suitable under management conditions
	Unrestricted activities - Very suitable
1	Only groups >3 and <10 people per group on designated trails “Leave-no-trace” activities: "Carry in, Carry out" principle for all food and waste.
2	Overnight hiking, without any sleeping facilities, formal campsites, or with only basic, un-serviced shelters. No fires.
3	Entry is by foot or by river from outside the zone provided all equipment is carried in and out.
4	Only on designated routes or sites, seasonal restrictions if needed for safety
5	Only small groups <16 people per group
6	Basic, un-serviced, accommodation (cabin, huts) or formal campsites (tent camps). Isolated, small, unobtrusive facilities for up to 16 guests on restricted footprints. Designated fire places
7	From launch sites provided or by river from outside the zone or provided all equipment is carried in and out.
8	Only on designated sites. No skiing and restrictions on size of outboard motors. No beaching on islands or bank. Angling regulations applicable.
9	Only small groups <8 people per group
10	Skiing can be allowed and restrictions on size of outboard motors. .

11) CDF Use Zones - Guidelines for the Provision of Visitor Facilities & Other Infrastructure

infrastructure and Facilities	Signage	Trails	Water ways, jetty' s	Horse, donkey cart, pack animals	Shelters Natural	Tracks	Internal fences & firebreaks	Interpretive & Educational Centres	Launching sites	Refuse bins	Picnic site	Accommodation and Houseboats	Camping & Caravan sites	Bird/Game hides or view points	Rustic Campsites	Interpretive signage	Toilets	Roads	Access Points Reception offices, gate huts	Lodges and Rest Camps	Conference	Bulk infrastructure	Services (power, waste management, water, etc.)	Food & Beverages Outlet, Equipment Rental	Curios & Craft Sales	Air strip	Swimming pools and water parks	Fuel supply pump
Wilderness Zone	6	7	2	3	1																							
Remote Zone	6	7	2	3	1	5	5																					
Primitive Zone	6	7	2	3	1	8	10	10	10	13	10	11		10	10	10	10	9				19	19					
Quiet Zone											10	11		12	12	12	13					19	19					
Leisure Low Intensity											14	14	14				13	16	17	15		19	19					
Leisure High Intensity																		17		4	18					20		

	Restricted activities - If an activity is not listed in the table, then it is not permitted except for temporary structures
	Controlled activities - Suitable under management conditions
	Unrestricted activities - Very suitable
1	No structures except small existing buildings of cultural, historic or aesthetic value. Can be used as un-serviced sleeping shelters for hikers & provided with composting toilets.
2	Use of non-motorised canoe or flotation device on rivers can be acceptable where entry is by foot or by river from outside the zone.
3	Use of donkeys, horses or other pack animals with an official guide only on designated historical routes and trails, or existing tracks, and only where this will not cause trampling, erosion or any degradation.
4	High density tourist resorts with modern amenities including restaurants, curio and refreshment stalls, shops, education centres and high volume roads. Infrastructure should be designed to reduce impacts of higher visitor numbers and planning should ensure that area still provides relatively natural outdoor experience.
5	No roads but limited vehicle tracks mainly on fire breaks. Unguided visitor access only on foot. Only allows for 4x4 routes or vehicle access if specifically considered and noted.
6	No signage except small, unobtrusive markers for closed routes, or at trail junctions.
7	Narrow permanent walking trails. Visitors have freedom to use various trails. The traditional wilderness concept of access without defined trails is unsafe and rapidly results in undesirable user-created trails and erosion.

8	All roads, tracks or trails to be located and constructed to reduce maintenance, visibility and erosion. Where un-surfaced tracks will result in erosion, use concrete strip or interlocking pavers to stabilise. Re-route unstable or erosion-prone road sections if this will lower long-term visual and environmental impact.
9	New roads for visitor access only justified if also required for management access or firebreaks. Avoid wide surfaced roads or roads and tracks wider than required for a single vehicle.
10	Deviation from natural state to be minimised. Infrastructure should not be visible from Wilderness Zones. Designated fire places with services.
11	May provide isolated, small, unobtrusive accommodation facilities for up to 16 guests on restricted footprints,
12	Unaccompanied non-motorised access to specific facilities. Vehicle access on dedicated routes, with pedestrian access from parking areas or adjacent Development Zones.
13	Facilities maybe provided in high use areas.
14	Self-catering accommodation and camping for up to 100 guests in total at any time
15	Single small Rest Camps for up to 30 guests are permissible if all facilities are contained in a compact footprint, this represents the total accommodation for the zone, and any restaurant or catering facilities are for overnight guests only.
16	Roads open to the public should be accessible by 2x4 sedan. Roads in this zone should be surfaced to reduce management cost and environmental impacts.
17	Accessible by motorised transport (car/bus) on high volume transport routes, including delivery vehicles. If possible roads should be narrow with separate incoming and outgoing routes; otherwise double vehicle width roads are strongly advisable for safety and usability.
18	Meetings, workshop or -conference activities for no more than the number of people that can be accommodated overnight in the zone.
19	Location of infrastructure and facilities for Reserve Administration & especially conservation management facilities (storage facilities, workshops, game capture and holding facilities). Not compatible with tourism and tourism access.
20	The Reserve Airspace is regulated by Section 47 of the Protected Areas Act as 2500 ft. (762 meters) above the highest point.

12) CDF Use Zones - Guidelines for Managing External Commercial Activities ~~&~~ Organised Events

Recreational Activities	**Film shoots**	**Group Events**	**Helicopter tours**	**Cultural events**	**Specialised adventure events**	**Environ Education**	**Commercial passenger boats (ferries)**	**Houseboats (private and commercial)**	**Research**
Wilderness Zone									
Remote Zone	2			1	1	1			1
Primitive Zone	3			1	1	1			1
Quiet Zone				1	3	1			1
Leisure Low Intensity	3			3	3	3			1
Leisure High Intensity	3	3	4	3	**3**		3	3	1
	Restricted activities - If an activity is not listed in the table, then it is not usually permitted								
	Controlled activities - Suitable under management conditions. The type of activities may be considered but								

	not necessarily approved.
	Unrestricted activities - Very suitable
1	The number of events, the number of participants and frequency of events to be strictly controlled
2	Restricted to nature and scientific films. All equipment to be carried in and out.
3	Activities should not interfere with designated use of the zone
4	The Reserve Airspace is regulated by Section 47 of the Protected Areas Act as 2500 ft (762 meters) above the highest point (900 meters).

13) CDF Visitor Site Categories – Role, Facilities and Management Guidelines

Site	Role	Facilities	Applicable zones	Guidelines
Tourist Destination	Main tourist destinations. Seeing and experiencing specific attractions. Short duration visit.	Appropriate facilities to deal with large numbers of tourists e.g. parking, ablutions, interpretation, footpaths, transport systems, refreshments.	High Intensity Leisure	Due to high pressure of tourist volumes and the sensitive nature of the surrounds, these sites are maintained as destinations of high volumes and short duration. Facilities should not detract from the intrinsic qualities of the area.
Mixed Use	Serves a variety of purposes - recreation, leisure, transit, education, refreshments. Varies in scale and purpose according to context	Ablutions, parking, food outlets, interpretative centres, education facilities, recreation facilities (picnic & braai). Administration facilities.	High Intensity leisure, Low Intensity leisure, Primitive	Length of stay is longer than for Tourist Destinations and provides for a range of activities.
Picnic / braai, Camping	Provides braai and/or picnic facilities. Rustic camping sites	Only picnic and braai facilities, tables with seating and ablutions. No other facilities.	Low Intensity leisure, Primitive	Provides for safe and secure family orientated facilities for low intensity leisure activities
Entry Point	Points of entry which can be categorised as: -Pay Points, -Gateways, -Minor Access Points and -Local Access Points	Parking with signage & information. Ablutions and trading at selected sites.	Low Intensity Leisure	Maintained as entry points Not suitable to diversify into Mixed Use sites. Management of security is required
Accommodation	Provides accommodation from which adjoining zones can be accessed.	Small (max. 16 beds) accommodation units, preferably self-catering for visitors	Low Intensity leisure, Primitive Quiet	The accommodation should be appropriate to the surrounding environment.

14)CDF: Management Guidelines for the Reserve Movement Network

Category	Characteristics	Applicable zones	Guidelines
Transit route	A high volume road used to gain access to high intensity visitor sites. Used by delivery, service and management vehicles to tourist and admin facilities. Commercialised coach tours are allowed.	High Intensity leisure	Managed to allow tourism and management access to destinations. Minimal facilities such as view sites along road. The view shed is included in zone for all new roads and where possible for existing roads.
Tourist Roads	These may be surfaced or un-surfaced roads used for game viewing and sight-seeing in sedan vehicles and microbuses. Self-drive and tours. Busses are allowed, but no commercial coach tours.	Low intensity leisure	View sites and interpretative boards at suitable sites. Parking to access footpaths and facilities. The view shed is included in zone for all new roads and where possible for existing roads.
Limited access roads	These may be surfaced or un-surfaced roads used only for accessing campsites and accommodation	Primitive Quiet	Minimal facilities such as view sites along road. Directional and regulatory signage provided.
Tracks	These may be two wheel or 4x4 tracks. Used as footpaths and for activities such as Mountain Biking, horse riding and approved scenic/game drives on extreme 4X4 roads requiring specialised driving skills under controlled conditions.	Remote Primitive Quiet	These tracks are used primarily for recreational access. There must be strict management guidelines for the use of vehicles. Generally, maintenance is low key to allow the road to be as unobtrusive as is possible. Directional and regulatory signage provided.
Reserve Roads	These may be two wheel or 4x4 tracks or roads used only for management purposes.	Remote Primitive Quiet	These roads are used only for management access. Generally, maintenance is low key to allow the road to be as unobtrusive as is possible. No directional and regulatory signage provided.
Paths	Used as footpaths and for activities such as Mountain Biking, horse riding .	Remote Primitive Quiet	These paths are used primarily for recreational access. Generally, maintenance is low key to allow the paths to be as unobtrusive as is possible. Directional and regulatory signage provided.
Notes: 1. The movement network provides for linking visitor sites across different use zones as determined through local planning processes and statutory			

approvals (e.g. EIA and HIA)
2. If the Reserve's use zones are traversed by public roads. Joint management arrangements will be sought between the Reserve and the relevant authorities to uphold the experiential qualities of the zone that the road traverses.

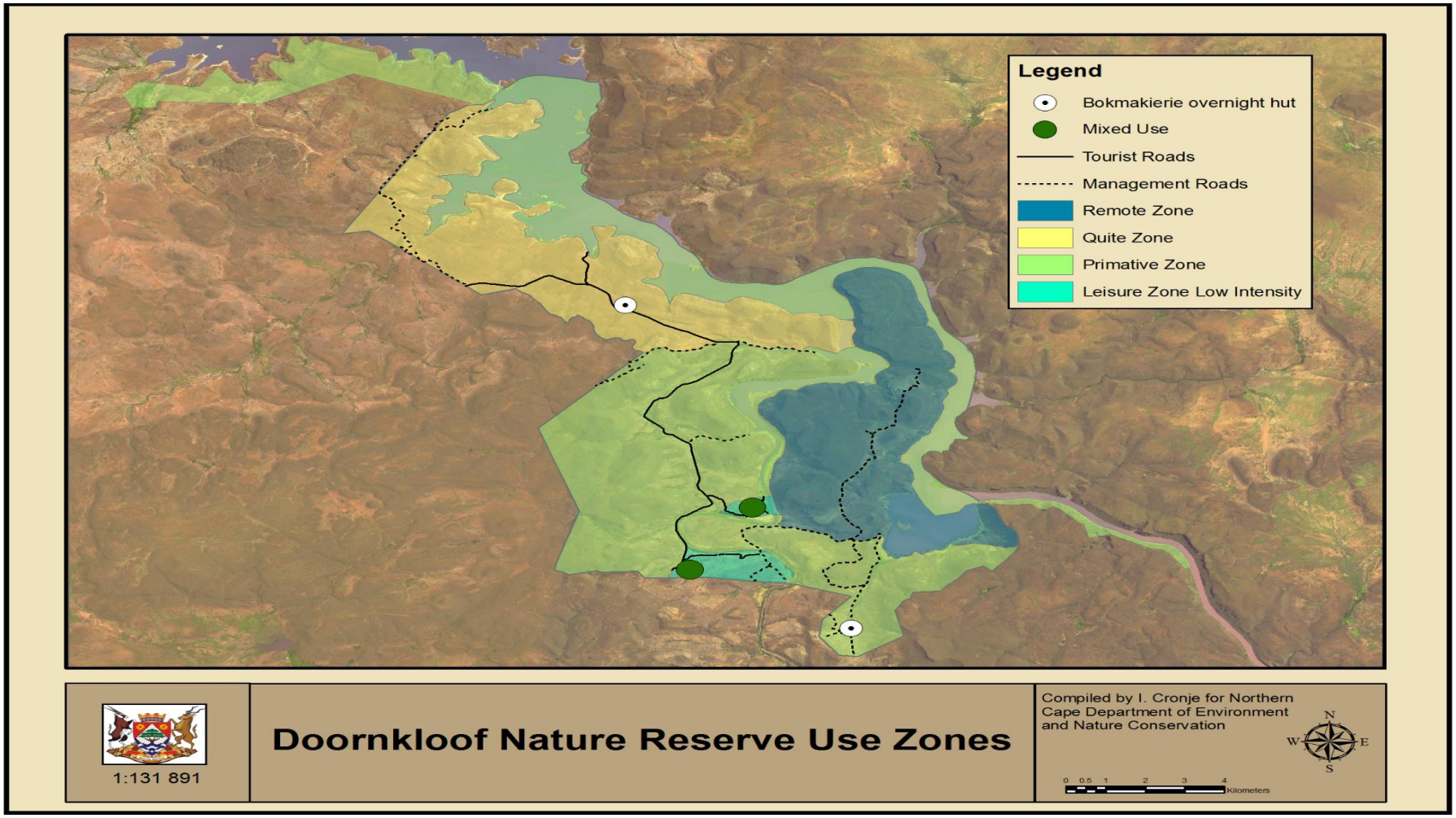

Figure 1: Use Zone Map for the DKNR.

Annexure 3
Annual Plan of Operations (APO) 2019 to 2024

#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
KPA 1: Biodiversity and Heritage Conservation											**R 5 168 090,12**	**R 1 942 450,29**	**R 2 340 445,76**	**R 1 130 349,72**	**R 1 930 250,70**
Objective 1.1 Obtain Biodiversity Knowledge											R 73 753,95	R 226 327,54	R 164 278,17	R 130 379,93	R 114 471,29
1	Identify and analyse internal and external risks/influences wrt. Biodiversity & Heritage Conservation with potential actions to be taken to manage these.		A full risk assessment, covering *inter alia* biodiversity, financial management, human resources, tourism, pressures & threats has been undertaken for the PA that informs management planning.	1.6 Risk assessment	Management Authority (Biodiversity Unit); Reserve Manager						R 0,00	R 10 068,67	R 0,00	R 11 100,71	R 0,00
2	Identify, and prioritise the biodiversity management requirements of the PA for baseline information, research and monitoring.		Research needs have been identified and projects relevant to all management needs are being undertaken, enabling the monitoring of results of management actions against set objectives.	3.1 Management Research Programme							R 0,00	R 12 585,84	R 0,00	R 0,00	R 0,00
a	*Inclusion of Doornkloof into the Platberg-Karoo IBA*														
3	Develop and maintain a targeted research and monitoring program relevant to management needs to guide biodiversity management		There is an established Monitoring & Evaluation program which is fully implemented with PA management participation and is used to guide adaptive management.	3.1.1 Monitoring and Evaluation Programme							R 34 318,78	R 28 878,41	R 11 422,33	R 29 993,44	R 12 593,12
4	Facilitate access for external research institutions to implement the priority research and monitoring requirements of the reserve.		There is an established working relationship with researchers and regular liaison leads to research results feeding into management decisions.	3.1.2 Relationship with researchers							R 0,00	R 23 878,41	R 32 915,58	R 15 000,00	R 7 702,62
a	*In collaboration with academic institutions implement a a genetic intregity study of game species in the reserve to guide best management practices.This includes the provision of a genetic database of all species with documented introductions;*														
b	*Initiate in collaboration with academic institutions a small predator (i.e. black-backed jackal and carcal) prey research study to investigate the decline of mountain reedbuck in the reserve.*														
5	Collect and update key baseline information concerning key species, habitats, ecosystems and invasive species in the reserve:		Information and the understanding thereof concerning key species, habitats, ecosystems and invasive species of the PA as compiled by scientific services supports the achievement of all biodiversity objectives.	1.4. Biodiversity knowledge and understanding	Ecological Manager & Field Rangers						R 28 485,23	R 66 703,19	R 103 627,38	R 61 558,75	R 76 190,61
a	*01 BMP 1 Biodiversity mechanisms*														
b	*02 BMP 2 SSC*														
c	*03 BMP 3 Freshwater and Wetlands (Ground water - Boreholes)*														
d	*04 BMP 4 IAS*														
e	*05 BMP 5 Resource Use Tourism*														
f	*07 BMP 7 Degradation Rehabilitation*														
g	*08 BMP 8 Cultural Heritage*														
h	*09 BMP 9 Climate and Climate Change*														
6	Maintain the baseline biodiversity data sourced from field ranger cybertracker reports and export to GIS for data interpreation,presentation and preservation.		Reserve database of management-oriented biodiversity information readily accessible and in an understandable format to facilitate decision making.	1.5.1 Format of data							R 10 949,93	R 84 213,03	R 16 312,88	R 12 727,03	R 17 984,95

Objective 1.2: Restoration and mitigation of degradation							R 4 613 163,05	R 170 839,88	R 289 745,74	R 300 767,21	R 327 961,69
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)	Cost estimates Years 1-5)				
						1 2 3 4 5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Collect and update key baseline information concerning degradation:		There is a plan for addressing degraded areas within the PA. Visitor impacts which could result from current and anticipated levels of visitation are fully mitigated by the design of the tourism infrastructure	5.1 Tourism Infrastructure (mitigating impacts) 2.6 Restoration of degraded areas	Reserve Manager; Ecological Manager						
a	*Map and monitor visitor impact (trampling, waste, graffiti, fire rings and other negative impacts) per hotspot wrt. special natural features (caves, waterfalls etc.)*						R 10 949,93	R 9 026,62	R 9 477,95	R 9 951,85	R 10 449,44
2	Compile an invasive species control and eradication plan in terms sec. 76 of the NEM: Biodiversity Act, 2004:		There is a plan for addressing control and eradication of invasive species within the PA.								
a	*Locate, document and map invasive species within the reserve estate, domain and interface with particular reference to aquatic invasive speces that enter the reserve via the Seekoei and Orange Rivers.*						R 0,00	R 12 585,84	R 0,00	R 0,00	R 8 741,81
3	Develop partnerships with funding and implementing agencies (e.g. WfW) to improve the capacity of the reserve to sustain its invasive alien plant control program.						R 4 775,35	R 0,00	R 5 286,05	R 0,00	R 5 827,87
4	Implement an invasive species control and eradication plan		No spread or densification of excotic encroachment. Extent, by density, of invasive alien plants known.	2.6 Restoration of degraded areas	Reserve Manager, Field Ranger,Maintenance Team						
a	*Routine follow up and clearing along Seekoei River and aquatic eastern boundary of the reserve;*						R 41 536,70	R 29 645,64	R 84 589,57	R 129 709,51	R 131 422,86
b	*Motivate adjacent landowners and those along the banks of the Seekoei and Orange River to implement their own invasive species control programs.*										
5	Rehabilitation or mitigation of degradation in PA		There is a plan for addressing degraded areas within the PA								
a	*Close and rehabilitate all unused, extraneous and/or highly erodible trails/tracks and roads in the reserve.*										
b	Map and monitor all roads and tracks and maintain road closures										
c	*Close and rehabilitate solid waste dump sites in the reserve, and remove all solid waste to the nearest municipal dump sites.*						R 53 732,03	R 119 581,78	R 190 392,16	R 161 105,86	R 171 519,71
d	*Consevancy tanks at tourist facilities are emptied every forte night or as the need arise and taken to package plant*										
e	*Close/remove/demolish and rehabilitate all extraneous and unused buildings and foundations, dumped materials, old equipment, gravel pits, roads and old fencing from the reserve.*										

Objective 1.3: Maintenance of ecological processes of the DKNR							R 328 162,02	R 400 532,22	R 1 651 482,10	R 413 909,94	R 1 269 304,82
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Re-establish, manage and maintain viable populations of locally indigenous fauna and flora:		The reserve is scientifically managed to promote biodiversity conservation through qualitative quantative descision support and evaluation	6.3 Ecological processes	Management Authority (Biodiversity Unit) Ecological Manager						
a	*Compilation of a genetic management policy for the manamgement of the game population of the reserve;*										
b	*Introduce new genetic material for buffalo, gemsbok,red hartbeest and eland.*						R 104 065,12	R 110 321,68	R 1 394 780,26	R 163 501,77	R 955 189,36
c	*Introduce desert black rhino and cape mountain zebra to the reserve;*										
d	*Removal of alien game species (i.e. waterbuck, impala and nyala)*										
2	Develop and maintain a game monitoring and reporting model for the Reserve:										
a	*Investigate aerial drone technology as alternatie to current game census techniques.*						R 140 827,02	R 163 797,52	R 155 187,39	R 163 644,17	R 223 691,09
b	*Monitor species demography and distributions within the estate*										
3	Maintain a bi-annual rangeland monitoring programme to assess the effectivenes of reserve management actions.						R 38 188,26	R 47 825,49	R 52 910,01	R 38 755,51	R 29 909,62
4	Assess, and implement, environmentally friendly measures to reduce the impacts of any damage-causing and problem animals		A scientifically based assessment has shown that ecological processes are being effectively maintained /augmented with the result that ecological integrity and biodiversity are not being compromised.				R 17 343,24	R 24 243,20	R 25 455,36	R 26 728,13	R 29 605,06
a	*Reserve infrastructure have deterants to limit the effect of baboons*										
5	Compile and manitain functional Fire Management (Disaster Management) Programme for the DKNR		Fires in the reserve do not have undesirable ecological effects, threaten reserve infrastructure or threaten neighbouring properties.	6.3 Ecological processes - Cost of damage resulting from fires spreading to neighbouring properties (based on insurance claim). Cost of damage to reserve infrastructure from fires (based on insurance claim).	Management Authority (Biodiversity Unit) Reserve Manager						
a	*Install and maintain basic fire protection measures in all affected tourism, administrative and staff accommodation buildings.*										
b	*Maintain, in accordance with the requirements of the Fire Management Programme, record and map all fires occurring in the reserve.*						R 27 738,37	R 54 344,34	R 23 149,08	R 21 280,35	R 30 909,68
c	*Ensure that all reserve management staff are adequately trained and equipped to implement the Fire Management Programme.*										
d	*Establish and maintain formal and informal partnerships with neighbours, and fire management agencies (e.g. Colesberg Local Municipality, Working on Fire) to improve the capacity of the reserve to implement the Fire Management Programme.*										
Objective 1.4: Maintenance of critical ecosystem services							R 0,00	R 12 585,84	R 41 196,39	R 22 201,42	R 23 311,49
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	ID critical ecological sevices that deliver services to surrounding communities.		A structured and scientific measurement and monitoring system has shown that ecosystem services are being effectively maintained with the result that the PA and neighbouring land users are deriving benefit from these services.	6.4 Ecosystem services	Management Authority (Biodiversity Unit) Reserve Manager		R 0,00	R 0,00	R 6 837,05	R 0,00	R 0,00
a	*Description and monitoring change wrt biodiversity importance of PA*										
b	*Do habitat description for interface and determine the contribution to National and Provincial biodiversity targets and maps. Determine size and shape of the site to fully achieve the conservation objectives and include in PAES*						R 0,00	R 12 585,84	R 7 929,08	R 8 325,53	R 8 741,81
2	Develop a structured and scientific measurement system for effective maintenance of ecological services						R 0,00	R 0,00	R 26 430,26	R 0,00	R 0,00
3	Monitoring benefit of ecological services to PA and neighboring land users						R 0,00	R 0,00	R 0,00	R 13 875,89	R 14 569,68

Objective 1.5: Land use planning and management outside of the protected area										22 751,37	R 8 882,26	R 22 844,66	R 19 329,27	R 32 888,85
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Collect and update key baseline information concerning landuse practices of the reserve domain, PA interface and viewshed interface.		There is a bilateral relationship between any relevant Biodiversity Plan and/or the applicable aspects of the IDP of the local municipality and the planning and management of the PA. There is formal agreement with industries within the zone of influence.	6.5 Land use planning and management outside of the protected area	Reserve Managare, Ecological Manager						R 22 751,37	R 1 330,76	R 19 351,41	R 15 661,36	R 29 037,54
a	*02 BMP 2 SSC*														
b	*03 BMP 3 Freshwater and Wetlands*														
c	*04 BMP 4 IAS*														
d	*05 BMP 5 Resource Use Tourism*														
e	*07 BMP 7 Degradation Rehabilitation*														
f	*08 BMP 8 Cultural Heritage*														
2	Provide and define a zone of influence and applicable buffering mechanisms (interphases) with guidelines for suitable land uses.				Management Authority (Biodiversity Unit) Reserve Manager						R 0,00	R 7 551,50	R 3 493,25	R 3 667,91	R 3 851,31
Objective 1.6: Water use planning and management operations influencing the protected area control illegal harvesting of natural resources											R 100 335,22	R 123 512,42	R 62 974,09	R 69 959,01	R 88 611,14
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Collect and update key baseline information concerning landuse practices of the reserve catcment interface (Orange towards the Gariep Dam and Seekoei River up until its origin)		Catchment and river plans and water management fully take the water needs of the PA into account and the water quality meets required standards as set out by the relevant authority.	6.6 Water use planning and management operations influencing the protected area	Ecological Manager & Field Rangers						R 16 484,57	R 11 265,06	R 13 964,36	R 12 780,14	R 27 298,32
a	*01 BMP 1 Biodiversity mechanisms*														
b	*02 BMP 2 SSC*														
c	*03 BMP 3 Freshwater and Wetlands*														
d	*04 BMP 4 IAS*														
e	*05 BMP 5 Resource Use Tourism*														
f	*07 BMP 7 Degradation Rehabilitation*														
g	*08 BMP 8 Cultural Heritage*														
2	Execute monthly aquatic boat patrols of the Vanderkloof Dam and Orange River														
a	*Certification of RIB by SAMSA*										R 79 075,30	R 107 213,03	R 43 723,68	R 51 628,52	R 55 484,95
b	*Acquisition of inland water skippers licence (ecological manager and field rangers)*														
3	Participation in Catchment Management and other forums to ensure that the quality and quantity of water meets the needs for maintaining habitats, species and ecosystems										R 4 775,35	R 5 034,34	R 5 286,05	R 5 550,35	R 5 827,87
Objective 1.7: Audit achievement of biodiversity targets											R 0,00	R 0,00	R 0,00	R 0,00	R 14 569,68
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Monitoring results of management actions against set objectives. State of biodiversity Report.		A structured and scientific biodiversity condition assessment has shown that the management of biodiversity is meeting the set targets. Management techniques are constantly being adapted to changing environments and new knowledge.	6.2 Achievement of biodiversity targets	Management Authority (Biodiversity Unit) Reserve Manager						R 0,00	R 0,00	R 0,00	R 0,00	R 14 569,68

Objective 1.8: Manage and mitigate the environmental impacts of conservation management, tourism, recreation and natural resource use											R 29 924,51	R 999 770,14	R 22 498,12	R 71 852,26	R 34 047,32
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Develop and Implement management guidelines for the sustainable extractive use of biotic and abiotic resources .		Management guidelines for the sustainable extractive use of biotic and abiotic resources that apply to both the organisation and outside parties are in place.	4.12 Sustainable Extractive Use	Management Authority (Biodiversity Unit) Reserve Manager						R 0,00	R 25 171,68	R 0,00	R 27 751,77	R 0,00
2	Monitor visitor impacts and determine carrying capacity for current and anticipated levels of visitation		Visitor impacts which could result from current and anticipated levels of visitation are fully mitigated by the design of the tourism infrastructur	5.1 Tourism Infrastructure (mitigating impacts) 2.6 Restoration of degraded areas							R 29 924,51	R 49 426,79	R 22 498,12	R 44 100,49	R 34 047,32
3	Develop a formal legally compliant programme with functional infrastructure for the management of hazardous substances (flammable and non-flammable).		A formal legally compliant programme with functional infrastructure for the management of hazardous substances (flammable and non-flammable) is in place.	4.13 Management of Hazardous Substances							R 0,00	R 925 171,68	R 0,00	R 0,00	R 0,00
Objective 1.9: Obtain Cultural Heritage knowledge about the PA											R 0,00	R 0,00	R 85 426,49	R 101 950,67	R 25 084,41
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Document and inventorize the cultural heritage resources of the reserve an determine significance BMP 8		A formal cultural heritage survey by an accredited heritage practitioner has identified heritage resources and values and has been verified by SAHRA and is included in the IMP	1.5 Cultural Heritage knowledge	Management Authority (Biodiversity Unit) Reserve Manager						R 0,00	R 0,00	R 49 215,13	R 0,00	R 0,00
2	Develop informational and interpretive materials about the heritage resources of the reserve.										R 0,00	R 0,00	R 0,00	R 95 348,43	R 0,00
3	In collaboration with academic institutions develop biodiversity management plans for significant cultural heritage assets and sites with biodiversity values		There is a comprehensive Biodiversity Management Plan	2.5 Biodiversity management plans for cultural heritage sites with biodiversity values							R 0,00	R 0,00	R 18 652,76	R 2 934,33	R 7 702,62
4	Implement management plans for maintenance of the significant cultural heritage resources including collections management/curatorship of heritage artifacts.		The Collections Management Plan has been developed and is fully implemented.	2.7 Collections management/curatorship of heritage artifacts							R 0,00	R 0,00	R 8 779,30	R 3 667,91	R 3 851,31
5	Monitor and regular condition assessment of Cultural Heritage Resources		A structured assessment conducted by an accredited heritage practitioner, has shown that the management of cultural heritage assets and values are meeting the set management objectives.	6.7 Cultural Heritage condition assessment							R 0,00	R 0,00	R 8 779,30	R 0,00	R 13 530,49

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

KPA 2: Recreation, Marketing, Education, Awareness and Interpretation										R 331 238,59	R 447 437,08	R 383 176,57	R 326 910,47	R 366 602,82
Objective 2.1: Develop, deliver and maintain a diverse range of tourism and recreational services for visitors taking into account the criteria for use zones										R 216 517,57	R 312 954,70	R 227 352,84	R 222 956,29	R 245 542,08
#	Management action	Priority	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame Years 1 – 5					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Facilitate controlled access to the reserve for other complementary recreational activities, including mountain biking,trail running, kayacking, hiking and angling:		3.8 Adequacy of Tourism infrastructure	Reserve Manager; Facilities Manager						R 11 759,94	R 29 453,55	R 33 119,66	R 16 236,27	R 31 400,00
a	*Link up with adventure events;*													
b	*Develop and market kayack trail from Doornkloof bay to Roodewal recreational area and a two to three day trail to Rolfontein;*													
c	*Develop and market mountain bike and running trail through quiet and wilderness zone in the eastern part of reserve;*													
d	*Develop and market mountain bike trail to British fort in northern part of the reserve;*													
e	*Establishment and marketing of annual endurance marathon in collaboration with local and provincial running clubs;*													
f	*Establishment and marketing of annual angling competitions in collaboration with local angling clubs;*													
g	*Implementation of Universal Accessibility Standards for reserve facilities*													
2	Design, market and institute, a guided interpretive heritage and other sensitive areas route for reserve visitors.									R 13 969,17	R 14 726,78	R 15 463,12	R 16 236,27	R 17 048,09
3	Support entrepreneurial opportunities for local communities to participate in the provision and management of tourist and recreational products.									R 6 984,59	R 7 363,39	R 7 731,56	R 8 118,14	R 8 524,04
4	Manage visitor functions									R 183 803,87	R 261 410,98	R 171 038,51	R 182 365,61	R 188 569,95
a	*Keep accurate record of visitor bookings.*													
b	*Maintain information about local anglers*													
c	*Attend to visitors queries;*													

Objective 2.2: Develop and implement a focused and cost-effective marketing programme										R 80 838,13	R 63 796,22	R 90 167,19	R 62 217,20	R 65 823,74
#	Management action	Priority	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame Years 1 – 5					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Develop a tourism marketing/management plan for the reserve		2.3 Education, awareness and interpretation programme	Reserve Manager; Facilities Manager						R 2 793,83	R 7 363,39	R 3 092,62	R 0,00	R 3 409,62
2	Continually provide updated information in the ongoing development of corporate, regional and provincial tourism marketing products and materials.		4.9 Implementation of Education, awareness and interpretation programme.							R 2 793,83	R 2 945,36	R 3 092,62	R 3 247,25	R 3 409,62
3	Maintain daily information about the reserve visitors and users (e.g. numbers/group, age category, gender, time of visit, length of stay, nationality, etc.) in a standardised corporate format:									R 75 250,46	R 53 487,48	R 53 518,82	R 58 969,94	R 59 004,50
a	*Maintain information about visitors (permit database);*													
b	*Set and monitor occupation rates;*													
c	*Maintain information about organised events*													
4	Accreditation of activities and facilities with a recognised tourism grading standard.		3.8.1 Tourism grading							R 0,00	R 0,00	R 30 463,12	R 0,00	R 0,00
a	*Implementation of Universal Accessibility Standards for reserve facilities*													

Objective 2.3: Develop and implement a focused and cost-effective awareness-raising and educational programme										R 33 882,89	R 70 686,16	R 65 656,54	R 41 736,98	R 55 237,00
#	Management action	Priority	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame Years 1 – 5					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Update, publish and distribute reserve-specific brochures and pamphlets to tourism information offices (local, regional and provincial), remote visitor contact points and visitors.		4.9 Implementation of Education, awareness and interpretation programme.	Reserve Manager; Facilities Manager						R 8 966,10	R 49 452,37	R 55 281,96	R 24 821,24	R 24 828,36
a	*Compilation of promotional DVD.*													
b	*Develop and maintain reserve website.*													
2	Setting up exibitions at peak season shows and special events.									R 8 966,10	R 4 418,03	R 4 638,93	R 0,00	R 10 942,30
3	Develop and implement presentations and reserve intrepetation in conjuction with EE.									R 7 975,34	R 8 407,88	R 0,00	R 9 269,69	R 9 733,17
4	Establish links with local educational institutions and networks in order to promote subsidised access to, and use of, the reserve as an educational resource									R 7 975,34	R 8 407,88	R 5 735,65	R 7 646,06	R 9 733,17
a	*Determine research opportunities*													
b	*Develop and implement curriculum orientated educational program*													
c	*Partnership with Eco Schools*													

CATEGORY	PRIORITIES
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	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

KPA 3: Enforcement, Security and Access Control										R 1 254 510,33	R 1 374 107,48	R 1 583 778,54	R 1 200 716,20	R 1 101 751,70
Objective 3.1: Secure the legal tenure of, and management authority for the DKNR										**R 9 550,70**	**R 25 171,68**	**R 0,00**	**R 0,00**	**R 90 397,55**
#	Management action	Priority & Mett Ref	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure declaration of all properties within the domain to obtain legal status in terms of NEMPAA and registered on the national PA register		All properties managed as part of the PA have been declared and listed in the NPA Register and the registrar of Deeds has recorded the declaration against the relevant register and documents.	1.1 Legal Status	Regional Manager						R 0,00	R 12 585,84	R 0,00	R 0,00	R 78 741,81
2	Develop and Review Protected Area internal rules ito section 52 of NEM:PAA that are PA specific.		Internal rules for controlling use & activities in the PA have been gazetted.	1.2 Protected Area internal rules							R 4 775,35	R 0,00	R 0,00	R 0,00	R 5 827,87
3	Protected Area boundary demarcation with deviations and servitute register Demarcation may be by fencing, bollards, beacons, sign posts (with maps):		The boundary of the PA is known by the management authority, fully demarcated and is thus known and respected by the local residents/neighbouring land users and the public.	1.3 Protected Area boundary demarcation	Reserve Manager						R 4 775,35	R 12 585,84	R 0,00	R 0,00	R 5 827,87
a	*Record all boundary deviations in a legally binding document.*			1.3.1 Boundary deviations											
b	*Compile a register of all servitudes and the conditions relating thereto.*			1.3.2 Servitude register											
Objective 3.2: Secure the boundaries of, and maintain controlled access to the DKNR										R 1 142 315,21	R 1 187 809,38	R 1 364 716,36	R 1 072 464,29	R 534 853,01
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Draw up protection systems or mechanisms for controlling current and anticipated levels of legitimate and illegitimate access or activities in the PA and verified success by a relevant PA integrity audit (eg. SOAM or PAME)														
a	*Ensure that all reserve visitor gates and management entry points are adequately staffed and administered*														
b	*Maintain, a 'gate entry pass/visitor permit book' system for all visitors to, and users of, the reserve.*														
c	*Patrol of surface area of the Vanderkloof Dam as this is under the control of DAELR*			5.2 Functioning of Law Enforcement and Compliance systems							R 348 717,85	R 362 018,41	R 473 149,76	R 408 246,59	R 433 447,61
d	*Installation of live image and voice streaming and recording between shared access gate and adminatrative building. This through WiFi Network.*		Profile of reserve visitors and users. Incident record of illegal access.												
e	*Investigate the collaboration of lanowners immediatley adjacent to the Vanderkloof Dam in the estbalishment of a radio network to a facilitate communication relative conservation and security management of the dam*				Security manager Reserve Manager, Field Rangers & Gate Guards										
f	*Mouthly boundary patrols (i.e. foot and aquatic)*														
2	Complete the construction of the perimeter signage/fencing to meet all requirements of the DAEARDLR Technical Guidelines and Principles (TGP) for fencing.														
a	*Complete Twyfelberg fence upgrade*														
b	*Upgrade to western boundary fenceline (Soutplaat to Diepkloof*		The reserve assets are secure. The reserve visitors and users have equitable access to the reserve, and are safe from harm.	1.3 Protected Area boundary demarcation							R 793 597,36	R 825 790,96	R 891 566,60	R 664 217,69	R 101 405,41
c	*Upgrade to Western boundary fenceline*														
d	*Upgrade to Rievalley fence-line*														
d	*Errect signage along eastern aquatic*														
e	*Ensure regular maintenance of the perimeter fencing in the reserve.*														

Objective 3.3: Sustain an effective law enforcement and compliance capacity in the reserve											R 102 644,42	R 161 126,43	R 219 062,19	R 128 251,91	R 476 501,14
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure capacity/resources/support to enforce (arrest and prosecute) PA internal rules/regulations.		PA has excellent capacity, resources, support to enforce (arrest and prosecute) rules/regulations. Incremental decrease in incidence of illegal activities occurring in the reserve.	3.6 Law enforcement capacity and capability	Security manager Reserve Manager, Senior Field Ranger Field Rangers & Gate guards						R 102 644,42	R 161 126,43	R 205 847,06	R 128 251,91	R 476 501,14
a	*Maintain and collate information on all enforcement incidents;*														
b	*Ensure the provision of enforcement and compliance training for all reserve field rangers;*														
c	*Ensure that the field ranger staff complement is adequately resourced and equipped to fulfil an effective enforcement and compliance function;*														
d	*Conduct regular inservice traning and practice sessions.*														
e	*Ensure each staff member is regularly issued with uniform, protective clothing (as may be required) and the necessary equipment to fulfil their job function.*														
2	Draw up an Integrated Compliance Plan addressing all aspects of law enforcement that incorporates *inter alia* raising awareness, improving community relationships, training and cooperation with legal agencies.		Protection systems or mechanisms for controlling current and anticipated levels of legitimate and illegitimate access or activities in the PA are fully implemented. The success has been verified by a relevant PA integrity audit (eg. SOAM or PAME)	5.2.1 Integrated Compliance Plan	Security manager Reserve Manager						R 0,00	R 0,00	R 13 215,13	R 0,00	R 0,00
a	*Undertake a Threat Analysis to determine all potential threats to the safety and security of the reserve.*														
b	*Develop, and implement, mechanisms for subsidised entry for local community user and interest groups*														
c	*Provide, on request, controlled access to recognised cultural/religious sites and non-destructive or consumptive cultural/religious practices.*														

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KPA 4: Infrastructure and Equipment										**R 1 023 978,77**	**R 3 042 386,31**	**R 1 594 464,82**	**R 1 878 002,97**	**R 2 061 841,32**
Objective 4.1: Acquire and maintain operational equipment and vehicles										R 477 901,28	R 1 037 474,34	R 627 305,00	R 657 630,55	R 815 966,74
#	Management action	Priority	Management targets	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
					1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Acquire and maintain operational equipment and constantly update an operational equipment register.		Operational equipment is adequate and suitable for current and future anticipated operational needs.There is a maintenance schedule and all operational equipment is being correctly maintained and meeting the set standards.	Management Authority: Reserve Manager						R 283 874,24	R 231 203,77	R 302 854,29	R 333 878,91	R 554 877,52
a	*Procure, maintain and safely store operational stores and equipment*													
b	*Installation of telephone communications and internet connectiviety at new adminstrative building*													
c	*Maintain current radio network hardware and install base radios in all reserve vehicles and at the PV gate rangers outpost*													
d	*Maintain and safely store all firearms.*													
2	Maintain and/or replace all reserve vehicles and equipment according to the manufacturers' specifications and/or corporate replacement cycles.		The transport fleet is totally appropriate and sufficient for all management needs with adequate numbers and range of vehicles (including boats, aircraft etc.) to meet management needs? There is a maintenance schedule and the entire transport fleet is being maintained and meeting the set standards.	Management Authority: Reserve Manager						R 194 027,05	R 806 270,57	R 324 450,71	R 323 751,64	R 261 089,22
a	Maintain and update all assets and stock inventory registers and reports for the reserve													
b	*Determine the economic valuation of the reserve.*													

Objective 4.2: Construct, maintain and upgrade the administration infrastructure and bulk services infrastructure of the DNR											
						R 428 237,15	R 910 211,48	R 780 473,62	R 983 673,84	R 949 429,67	
#	Management action	Priority	Management targets	Responsibility	Time frame (Years 1 – 5)	Cost estimates (Years 1-5)					
					1 2 3 4 5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	
1	Ensure the regular maintenance of all reserve administrative, staff accommodation,operational buildings and infrastructure.		Infrastructure required for operational management purposes buildings, roads, bulk services including jetties, storage facilities and staff housing is optimal for current and future anticipated management needs.. State (using a grading system) of reserve buildings and infrastructure. Records of instances of overloading of the bulk service supplies.	Department of Public Works; Regional Manager Reserve Manager; Infrastructure Manager		R 305 411,88	R 641 853,98	R 553 963,44	R 580 160,25	R 581 702,37	
a	*Construction of undercover parking at adminstrative building*										
b	*Domestic cleaning of admsitrative building and visitor facilitities (i.e. chalets, guesthouse and ablution facilities)*										
c	*Maintenance to reserve facility air conditioners*										
d	*Installation of surveillence equipment at admin building and shared access gate*										
e	*Maintenance to Coolroom*										
f	*Maintenance to old reserve workshop complex*										
g	*Maintenance to staff village*										
h	*Installation of solar geyser at the PV gate ranger outpost, managers house and inspection quarters*										
i	*Installation of solar submersible pump for PV gate field rangers outpost*										
j	*Maintenance reserve manager's house and the sinking of a sewage conservancy tank;*										
k	*Maintenance to package plant*										
2	Implement the maintenance of the network of roads in the reserve, with a strong focus on maintaining and mitigating highly erodible areas:		Rationalised network of well-maintained management tracks traversing the reserve	Department of Public Works; Regional Manager Reserve Manager; Infrastructure Manager		R 122 825,27	R 268 357,50	R 226 510,18	R 403 513,59	R 367 727,31	
a	*Upgrade (ease of access by sedan vehicles) of main tourist road from main entrance gate to and including road at the Rooedwaal recreational area up until PV Gate;*										
b	*Maintenance to Doornhoek and Doornkloof circular road;*										
c	*Maintenance to Pen se Berg pass;*										
d	*Maintenance to repeater access road;*										
e	*Communicate the urgent need for the upgrade of the main access road to DKNR and the reserve main tourist road in the Reserve with the Dept. Roads and Public Works*										
f	*Maintenance to Broederstroom access road.*										
g	*Maintenenance of secondary management roads*										
h	*Maintenance to main access road to DKNR traversing through Hunters Moon*										

Objective 4.3: Construct, upgrade and maintain day and overnight visitor buildings and infrastructure											R 117 840,34	R 1 094 700,48	R 186 686,20	R 236 698,58	R 296 444,91
#	Management action	Priority	Management targets	Responsibility	Time frame (Years 1 – 5)						Cost estimates (Years 1-5)				
					1	2	3	4	5		2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Assess the cost-effectiveness of different management options (e.g. concessioning, leasing, service agreement, community-managed, etc.) for the operating of lodges, camps and select the preferred/optimal management option/s.		Tourism infrastructure is optimal to manage the current and anticipated future volume of visitors. Rationalised network of well-maintained visitor roads and network of self-guided and/or guided hiking trails traversing the reserve.	Department of Public Works; Regional Manager Reserve Manager; Infrastructure Manager							R 0,00	R 0,00	R 5 286,05	R 0,00	R 0,00
a	*Implement, and formalise (as required), the selected management option for the lodges, camps.*														
2	Upgrade, renovate and maintain the overnight visitor buildings, facilities, equipment and linked reserve infrastructure to meet DAERL standards for the provision of nature-based tourism products:										R 117 840,34	R 1 094 700,48	R 181 400,15	R 236 698,58	R 296 444,91
a	*Maintenance to group camp facility;*														
b	*Exterior maitenance to guesthouse*														
c	*Upgrade the solar house for more electrical storage and output capacity for the Roodewal Recreational Area;*														
d	*Refurbishment of the Vorster's Hoogte bushut*														
e	*Contruction of undercover parking at chalets at the Roodewal Recreational area*														
f	*Maintenance to Roodewal chalets and visitor facilities*														

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KPA 5: Stakeholder Involvement											**R 50 190,46**	**R 62 981,15**	**R 59 944,96**	**R 76 346,02**	**R 96 220,04**
Objective 5.1: Interaction with stakeholders and communities in the planning, development and management of the DKNR											R 23 113,71	R 24 367,26	R 18 303,66	R 18 746,77	R 42 777,83
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Under the guidance of the Regulations for the proper administration of Nature Reserves, as promulgated in terms of Section 86 (1) of NEMPAA, establish a Reserve Advisory Committee and meet on a regular, agreed to basis.		A well represented functioning and formalised Community Liaison Structure contributes significantly to the management/development of the PA.	4.11 Community Liaison Structure	Reserve Manager & Accomodation officer						R 0,00	R 12 585,84	R 0,00	R 0,00	R 14 569,68
2	Develop and impliment an active Public Relations (PR) and Communication Programme.		There is a wide ranging multi media public relations and communication programme keeping the general public and internal role players informed of important aspects of the PA.	4.10 Public Relations (PR) and Communication Programme							R 10 363,02	R 5 890,71	R 9 924,99	R 10 421,24	R 12 647,11
a	*Ensure positive press coverage is obtained and timeously and effectively respond to items in public media which may negatively impact on the reserve and organisation;*														
b	*Initiate and sustain ongoing communications with the communal and/or private landowners to discuss opportunities for ongoing cooperation and collaboration.*														
3	Ensure members of the community are involved in supporting the PA through volunteering, projects and fundraising by establishing formal groups such as Friends groups, Volunteers or Honorary rangers.		There are a wide range of projects supported by volunteers including fund raising and assistance with management that contribute significantly to increased PA management effectiveness.	5.5 Community Support							R 12 750,69	R 5 890,71	R 8 378,68	R 8 325,53	R 15 561,04
Objective 5.2: Actively participate in local and regional conservation and socio-economic development initiatives that may affect or benefit the DKNR											R 12 750,69	R 20 993,72	R 20 497,09	R 38 173,01	R 35 958,59
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Participate in local municipal IDP planning processes, with a specific focus on the provision of municipal infrastructure and services to the reserve and supporting local economic development initiatives in the community.		A formal published review/audit has shown that the PA delivers quantifiable long term stimuli to the regional (and possibly the national) economy and delivers a broad range of long term quantifiable community benefits that improve the livelihood strategies and resilience in the lives of communities.	6.1 Economic and Social benefit assessment Direct and measurable benefitsaccrue to local community from the reserve.	Co-Management Committee Reserve Manager						R 4 775,35	R 7 551,50	R 7 929,08	R 8 325,53	R 5 827,87
a	*Identify, and make application for, EPWP-related funding for relevant tourism and conservation initiatives in the reserve.*														
b	*Support local/regional initiatives to establish a FPA, with a specific focus on rationalising the reserve firebreaks and improving access to fire-fighting resources and support.*														
2	Participate in the planning and development of other conservation initiatives with a specific focus on strengthening linkages		The PA is influencing the local or regional economy and providing measurable social benefits to communities. Social benefits to direct benefits such as jobs, training and health care. Stimulus of the economy through businesses benefiting from tourism and meeting the needs of the protected area.	6.1 Economic and Social benefit assessment Direct and measurable benefitsaccrue to local community from the reserve.							R 2 387,67	R 7 551,50	R 7 929,08	R 8 325,53	R 5 827,87
3	Investigate and select mechanisms for optimising employment, empowerment and capacity building opportunities for the local community.		Direct and measurable benefits accrue to local community from the reserve. Extent (number of beneficiaries) and nature (employment – permanent/ temporary; business opportunity; training; capacity-building) of community benefits.	4.15 Commercial Tourism	Reserve Manager; Regional Manager & accommodation officer						R 5 587,67	R 5 890,71	R 4 638,93	R 21 521,94	R 24 302,85
a	*Develop opportunities for selected individuals from the local community to be trained and directly employed in appropriate conservation and tourism related work.*														
b	*Develop opportunities to facilitate an empowerment component for selected individuals from the local community in any outsourcing/concessioning of the tourism and recreational products.*														
c	*Identify, and if feasible develop, opportunities for the establishment of community-based entrepreneurial opportunities within, or linked to, the reserve, including: game drives; sale of curios and crafts; guided heritage trails; village tourism; conservation enterprise; horse trails; event management and commercial hunting packages.*														

Objective 5.3: Develop, implement and maintain effective mechanisms for ongoing communications with co-management partners											R 14 326,05	R 17 620,17	R 21 144,21	R 19 426,24	R 17 483,62
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Continually review, and amend (as required), the structure, representation and TOR of the Co-Management Committee to ensure that it contributes to realising the intent of the Co-Management Agreement.		There is a formal representative structure for community partners to participate in decision making according to a legally binding co-management agreement.	4.14 Community partners	Co-Management Committee Reserve Manager						R 4 775,35	R 5 034,34	R 7 929,08	R 8 325,53	R 5 827,87
2	Provide ongoing support (*e.g*. logistical, administrative, technical, professional and leadership) to, and actively participate in, an effectively functioning Co-Management Committee.										R 9 550,70	R 12 585,84	R 13 215,13	R 11 100,71	R 11 655,74
a	*Hold quarterly (more regular if required) meetings with the Co-Management Committee to ensure that co-management decisions are made timeously and effectively.*														
b	*Support the ongoing capacity building of the local community representatives on the Co-Management Committee.*														
c	*Host quaterly meeting, each in a different neighbouring village, to present and discuss issues of mutual concern.*														

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	Activities completed for the 5 year cycle to be assessed during the following planning cycle.

KPA 6: Administration and Planning												
							R 2 971 805,07	R 3 758 798,46	R 4 005 086,98	R 4 630 271,96	R 5 157 947,14
Objective 6.1: Institute and maintain an effective management planning capability in the DKNR							R 85 221,92	R 56 586,88	R 70 817,89	R 72 714,75	R 78 076,72
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates (Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Compile and regular revision of IMP for the PA:		The IMP is fully integrated covering all aspects of PA management with measureable objectives and is approved by the MEC that include a PA Expansion Plan in line with expansion strategy for the organisation, a zone of influence (linterphases) with guidelines for suitable land uses for input into the municipal IDP: catchment and river plans. An approved CDF based on a sensitivity analysis exists as part of the IMP. All relevant standard operating procedures pertaining to all management activities are in place and are regularly updated to ensure best practice.	2.1 PA design 2.1.1 PA expansion plan 2.1.2 Delineation of a zone of influence 2.1.3 Corridor management 2.2 Management Plan 2.2.1 Conservation Development Framework (CDF)	Reserve Manager PA Man Comm		R 50 615,00	R 35 465,26	R 37 937,17	R 39 834,03	R 41 825,73
a	*Revise PA Expansion Plan in line with expansion strategy for the organisation;*										
b	*Ensure the size and shape of the PA is adequate to achieve the conservation mandate;*										
c	*Revise zone of influence and applicable buffering mechanisms (interphases) with guidelines for suitable land uses;*										
d	*Revise impliment a CDF (zoning system) based on a sensitivity analysis indicating visitor use zones, and positioning and nature of operational & visitor infrastructure;*										
e	*Update State of Knowledge Data Repository;*										
f	*Develop and update standard operating procedures pertaining to all management activities*										
2	Develop an APO or annual work plan identifying all the activities, tasks and outcomes (operational & nanagement) in accordance with predetermined time frames and approved management plans to be completed in a financial year:		An approved APO exists and actions are linked to the PA's management plan targets and to the Key Performance Areas of the PA manager	4.1 Annual Plan of Operation (APO) 5.4 Linking of management Plan to Key Performance Areas			R 34 606,92	R 21 121,63	R 32 880,72	R 32 880,72	R 36 250,99
a	*Regular updates of APO;*										
b	*Link SMP and APO to the Key Performance Areas of the PA manager and key personell;*										

Objective 6.2: Maintain an adequately equipped, resourced and trained staff complement for the DKNR							R 2 126 280,06	R 2 970 571,00	R 3 188 787,31	R 3 762 522,13	R 4 146 760,13
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5) 1 2 3 4 5	Cost estimates (Years 1-5) 2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Ensure that all vacant posts in the reserve's approved organogram are filled and determine actual needs for achieving management objectives.		The approved organogram reflects the actual needs for effectively achieving all management objectives and the HR capacity meets the approved levels.	3.2 Human Resource capacity	Management Authority: HR & HRD		R 1 661 077,03	R 2 381 907,63	R 2 662 016,44	R 3 162 401,11	R 3 509 866,99
2	Identify training needs, and facilitate access to training programs for reserve staff, with a priority focus on field ranger, first aid, hospitality and IT skills training.		Staff are well skilled for their duties and staff productivity targets are often exceeded as indicated in staff performance reviews. An individual career path has been determined for each staff member.	5.3 Staff Development and productivity			R 164 731,86	R 228 421,97	R 190 372,74	R 222 058,79	R 223 117,79
3	Implement the institutional staff performance appraisal system.		HR management and staff development systems are excellent and fully support management effectiveness. There is an effective staff handover system and new staff are promptly made aware of relevant aspects of the PA management. Staff receive incentives to remain in the organisation to prevent loss of skills and experience.	4.3 HR Management systems			R 271 772,84	R 264 203,59	R 304 558,42	R 339 355,55	R 365 289,06
a	*Have clear job descriptions and Performance Agreements on record. Link KPA's to APO and Mett*										
b	*Maintain all staff information for the reserve (leave records, attendance registers, overtime, etc.).*										
4	Implement the institutional Occupational Health and Safety policies and procedures in the reserve.		An external audit has certified that PA management complies with and implements the Occupational Health and Safety Act.	3.10 Health and safety			R 28 698,33	R 96 037,81	R 31 839,70	R 38 706,69	R 48 486,28

Objective 6.3:Institute and maintain an effective financial and admin. planning capability in the Reserve											R 760 303,08	R 731 640,58	R 745 481,78	R 795 035,08	R 933 110,29
#	Management action	Priority	Management targets	Key performance indicators Mett-Sa Vers 3	Responsibility	Time frame (Years 1 – 5)					Cost estimates (Years 1-5)				
						1	2	3	4	5	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
1	Administer the administrative systems supportive of effective management and proper functioning of the PA:		Administrative support systems are excellent and fully support management effectiveness.	4.4 Administrative support systems	Reserve Manager						R 521 584,04	R 536 917,64	R 570 874,83	R 600 597,07	R 660 606,13
a	*Do annual Mett assesment;*														
b	*Institute and maintain an electronic and/or hard copy filing system for all reserve-specific information;*														
c	*Maintain and update all assets and stock inventory registers and reports for the reserve;*														
d	*Maintain a reserve-based record of all purchases made, accounts paid and services procured in support of reserve operations over each financial year;*														
2	Ensure electronic data are backed up on a routine basis, stored according to organisational standards and are easy to access.		Information Technology systems are excellent and fully support management effectiveness.	4.5 Information Technology systems	Reserve Manager IT section						R 76 650,68	R 123 187,10	R 60 046,46	R 63 048,78	R 146 201,22
a	*Ensure electronic data are backed up on a routine basis and stored according to organisational standards and are easy to access*														
b	*Institute and maintain an electronic and/or hard copy filing system for all reserve-specific information*														
c	*Inventory of all literature*														
3	Ensure financial management is excellent and all management goals are met		The available budget is sufficient and meets the full management needs of the PA. There are skills and capacity in the organisation to raise external sources of funding for specific projects. An operational budget, specific to the PA, is secure and is guaranteed on a 3-5 year cycle. Updated guidelines, policies and procedures available at the reserve.	3.3 Adequacy of Operational budget 3.4 Security of Operational budget 3.4.1 Capital budget 3.4.2 Budget Management 4.8 Insurance	Reserve Manager						R 162 068,36	R 71 535,84	R 114 560,50	R 131 389,23	R 126 302,95
a	*All operational equipment, infrastructure and vehicles are covered by adequate insurance;*														
b	*Prepare annual budget according to the APO and identify needs for external funding;*														
c	*PA Manager to be responsible and accountable for budget management;*														
d	*Read and apply all updated Management Authority guidelines, policies and procedures to the daily functioning of the reserve;*														
e	*Determine the economic valuation of the reserve;*														
f	*Keep record and manage own revenue according to PFMA and supply inputs when required;*														

CATEGORY	PRIORITIES
	Critical to the effective management of the Reserve. Funding and Resources should be secured to implement these actions as reflected in the Management Effectiveness Tracking Tool (METT).
	Important to the effective management of the Reserve but may be delayed because of limited funds or resources.
	Constitues good management but not necessarily critical or important to the Reserve's management effectiveness. Implementation may be dependant on the availability of external funding or support.
	Activities completed for the 5 year cycle to be assessed during the following planning cycle.