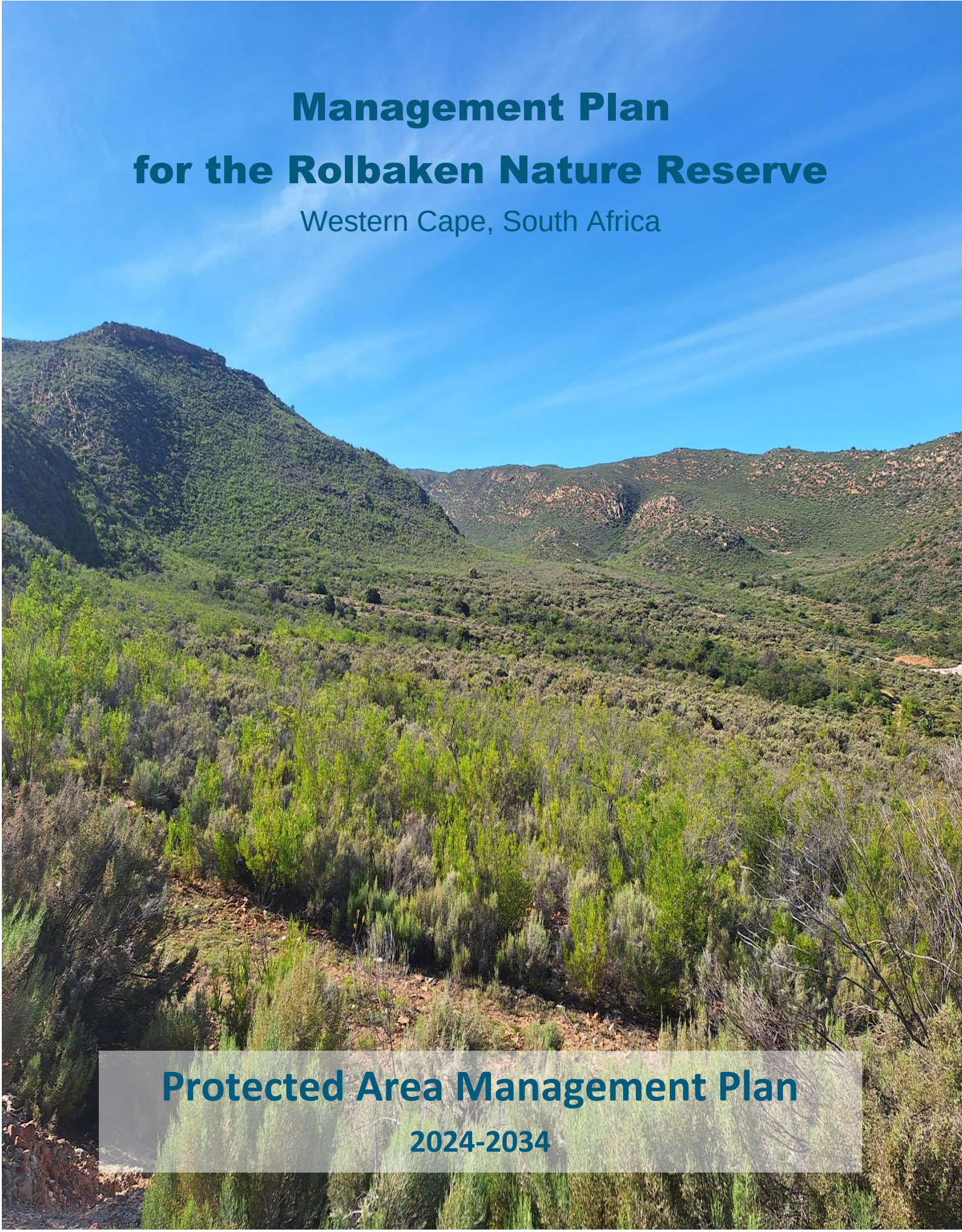
Management Plan
for the Rolbaken Nature Reserve

Western Cape, South Africa



Protected Area Management Plan
2024-2034

Management plan prepared by:
Anita Wheeler 2012. Management Plan 02 of Rolbaken Nature Reserve, CapeNature, Oudtshoorn.
Update: Tom Barry and Carmen Gagiano 2024

Contributors:
Tom Barry, CapeNature

Acknowledgements:
Dick and Mary Carr (Previous owners of Rolbaken Nature Reserve)

Cover image:
Rolbaken Nature Reserve Landscape

Recommended citation:
Rolbaken Nature Reserve Management Plan. Version 1.0, 2024. Dysselsdorp, Western Cape, South Africa

Management plan format:
CapeNature, version August 2019

Protected area management plan format has been developed by CapeNature with input from external partners and industry stakeholders

The development of this revised management plan format has been funded by the Table Mountain Fund.

STATUS

The Rolbaken Nature Reserve has been declared as a Section 23 Nature Reserve.

Declaration Date:	Government Gazette Notice:
2013-08-06	P.N.265/2013 Province of the Western Cape: Provincial Gazette 7160

AUTHORISATION

This Protected Area Management Plan for the Rolbaken Nature Reserve was drafted and recommended by Bennie Terblanche

Supported by:

- CapeNature Conservation Management

Recommended and adopted by:

Name and Title	Signature and Date
Management Authority Bennie Terblanche	
CapeNature Mbulelo Jacobs CapeNature Landscape Manager	

Approved by:

Name and Title	Signature and Date
Anton Bredell Minister of Local Government, Environmental Affairs and Development Planning	

Review Date: 2024-11-06

PART A • Strategic Management Plan

Table of Contents

List of Tables

List of Figures

Abbreviations

APO	Annual Plan of Operation
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CEO	Chief Executive Officer
CFR	Cape Floristic Region
CR	Critically Endangered
DEA&DP	Department of Environmental Affairs and Development Planning
DEA	National Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
EIA	Environmental Impact Assessment
EN	Endangered
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FPA	Fire Protection Association
GRDM	Garden Route District Municipality
IDP	Integrated Development Plan
LC	Least Concern
LT	Least Threatened
MA	Management Authority
MCA	Mountain Catchment Area
MEC	Member of the Executive Council
NEM:BA	National Environmental Management: Biodiversity Act
NEM:PAA	National Environmental Management: Protected Areas Act
NEMA	National Environmental Management Act
NPAES	National Protected Area Expansion Strategy
NR	Nature Reserve
NWA	National Water Act
PA	Protected Area
PAMP	Protected Area Management Plan
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SMP	Strategic Management Plan
SDF	Municipal Spatial Development Framework
SOB	State of Biodiversity
TMF	Table Mountain Fund
VU	Vulnerable
WCBSP	Western Cape Biodiversity Spatial Plan
WCPAES	Western Cape Protected Area Expansion Strategy
WHS	World Heritage Site
WWF-SA	Word Wildlife Fund for Nature South Africa

PART A

STRATEGIC MANAGEMENT PLAN

1 BACKGROUND

1.1 Purpose of the plan

Management plans for biodiversity stewardship sites are strategic documents that provide the framework for the development and operation of biodiversity stewardship sites. They inform management at all levels, from the landowner through to support staff within CapeNature. The purpose of the management plan is to:

- Provide the primary strategic tool for management of Rolbaken Nature Reserve, informing the need for specific programmes and operational procedures.
- Provide for capacity building, future thinking and continuity of management.
- Enable the landowner to develop and manage Rolbaken Nature Reserve in such a way that its values and the purpose for which it has been established are protected.

1.2 Structure of the plan

Section 1:	Background. Provides an overview of the reserve, an introduction to protected area management planning and highlights applicable legislation and the regional and local planning context.
Section 2:	Site Description. Establishes the context of the biodiversity stewardship site, providing the basis for the strategic management framework that follows.
Section 3:	Strategic Management Framework. Lays out the management authority's high-level strategic decisions that guide the operational management of the reserve and includes: Zonation Plan. Which sets out the zonation of the biodiversity stewardship site and outlines the land uses in particular zones. Administrative Structure. Describes the administrative structure that has been established for the reserve.
Section 4:	Operational Management Framework. Sets out the management targets that must be achieved in managing the reserve.
Section 5:	Implementing the Strategic Management Plan. Describes how Part B of the Management Plan, the Annual Plan of Operation (APO), guides the operational implementation of management objectives laid out in this document - Part A, the Strategic Management Plan.

Adaptive management

The preparation of this management plan has been undertaken based on the guiding principles of adaptive management, which is a structured, iterative process in which decisions are made using the best available information, with the aim of obtaining better information through monitoring of performance (Figure 1.1). In this way, decision making is aimed at achieving the best outcome based on current understanding, whilst accruing the information needed to improve future management. Adaptive management can lead to revision of a part or, if necessary, the whole management plan.

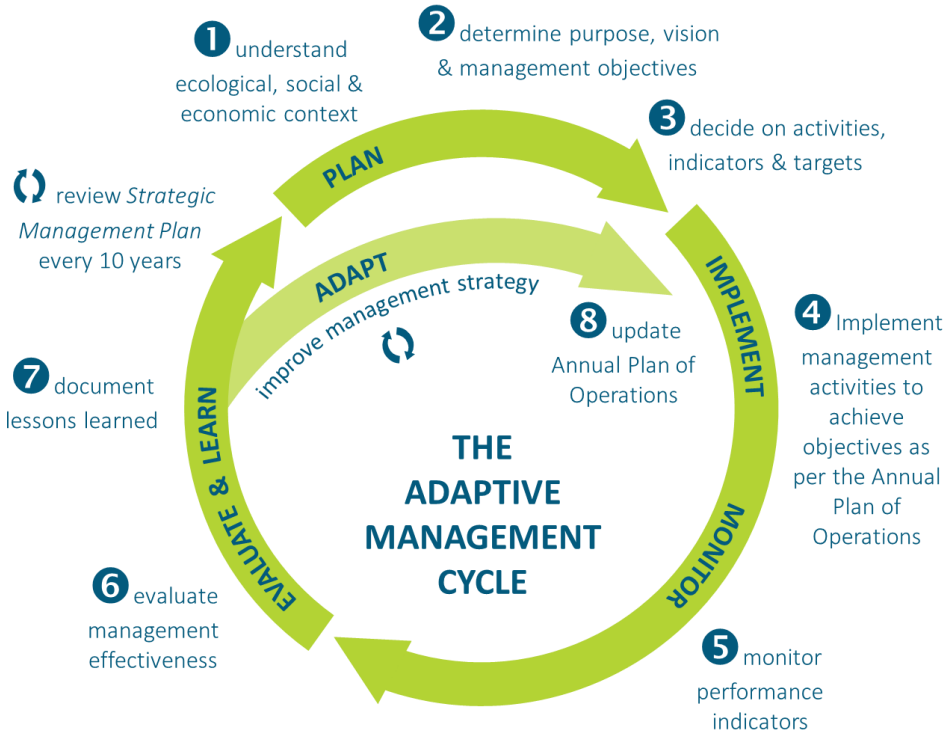


Figure 1.1 The adaptive management cycle

Adaptive management enables landowners and managers to:

- Learn through experience.
- Take account of, and respond to, changing factors that affect the biodiversity stewardship site.
- Develop or refine management processes.
- Adopt best practices and new innovations in biodiversity conservation management.
- Demonstrate that management is appropriate and effective.

1.3 Guiding Legislation

There is a large body of legislation that is relevant to the management of Nature Reserves, but the primary legislation guiding the management of protected areas is the National Environmental Management: Protected Areas Act (No.57 of 2003) (Hereafter referred to as the Act).
The Act establishes the legal basis for the creation and administration of protected areas in South Africa, as its objectives include provisions "for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes". The Act sets out the mechanisms for the declaration of protected areas and the requirements for their management.

In the Western Cape, CapeNature is the Provincial Conservation Authority and its Biodiversity Stewardship Programme facilitates the establishment and management of protected areas on private land.

A detailed list of relevant legislation is provided in Appendix A. Landowners should familiarise themselves with the purpose and contents of the statutes and their subsequent amendments and regulations.

1.3.1 Purpose of declaring protected areas

According to S17 of NEM:PAA, the purpose of declaring an area as a protected area are:

i) to protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas;
ii) to preserve the ecological integrity of those areas;
iii) to conserve biodiversity in those areas;
iv) to protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa;
v) to protect South Africa's threatened or rare species;
vi) to protect an area which is vulnerable or ecologically sensitive;
vii) to assist in ensuring the sustained supply of environmental goods and services;
viii) to provide for the sustainable use of natural and biological resources;
ix) to create or augment destinations for nature-based tourism;
x) to manage the interrelationship between natural environmental biodiversity, human settlement and economic development;
xi) generally, to contribute to human, social, cultural, spiritual and economic development; or
xii) to rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

1.3.2 Declaration status of Rolbaken Nature Reserve

Rolbaken Nature Reserve is declared under Section 23(1) of the National Environmental management: Protected Areas Act (Act 57 of 2003).

See Appendix B – Copy of Rolbaken Nature Reserve Declaration Notice.

2 Site Description

2.1 Introduction

Rolbaken Nature Reserve is situated in the south-western foothills of the Kammanassie Mountains, approximately 40km south-east of Oudtshoorn. It borders the Kammanassie World Heritage Site and Nature Reserve which forms part of the Kammanassie Mountains. The reserve, 506.0316 ha in extent, is situated in the George Municipality, Division of Garden Route District Municipality, Western Cape Province. The closest towns are Uniondale in the east, De Rust in the north-west and Dysselsdorp in the west (Figure 2.1).

The property contains prime habitat for Cape Mountain Zebra which is important for the conservation of the unique gene-pool of this species.

At a national level (SA Veg map), Rolbaken contains Uniondale Shale Renosterveld and South Kammanassie Sandstone Fynbos. At a fine scale level (Vlok et al 2005) it contains three vegetation units i.e. Kammanassie Waboomveld, Leeublad Sandolien Renosterveld and Kammanassie Waboomveld.

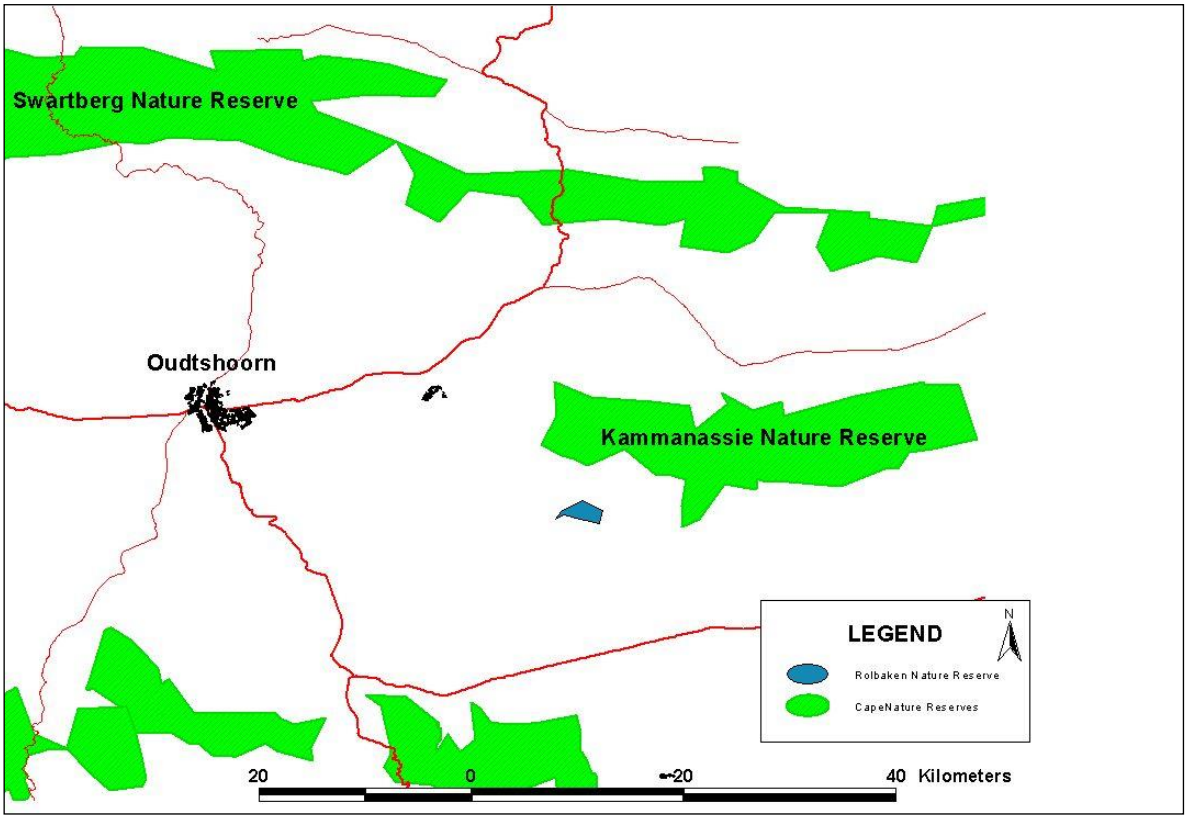


Figure 2.1 Regional location of Rolbaken Nature Reserve

2.2 Landowner details

Owner	Bennie Terblanche
Contact person	Bennie Terblanche
Contact details – Tel.	
Contact details – email	
Management Authority	Bennie Terblanche
Property descriptions	The remaining extent of Farm Rietfontein no. 12 Registration Division of George Province of Western Cape measuring 506.0316 hectares in extent held under Deed of Transfer T95468/2004 in the Garden Route Municipality
Total property area	509.0316 ha

2.3 Key Attributes

The values of a site are those remarkable attributes that led to it being identified as a priority for the conservation. The values are important in planning and management, as they are the aspects of the place that must be protected. The values of Rolbaken Nature Reserve include:

Natural values	The property includes additional Cape mountain zebra habitat for the unique Kammanassie gene pool. Vegetation types include Leeublad Sandolien Renosterveld and Olifants River and Floodplain vegetation types (Vulnerable).
Ecosystem service values	Purification and Detoxification: filtration, purification and detoxification of air, water and soils; Cycling Processes: nutrient cycling, nitrogen fixation, carbon sequestration, soil formation; Regulation and Stabilisation: erosion control, regulation of rainfall and water supply, climate regulation, mitigation of storms and floods; Habitat Provision: refuge for animals and plants, storehouse for genetic material. Pollination Services.
Tourism values	Natural scenic beauty. Peace and tranquillity. Unpolluted skies. Contains wilderness attributes. Existing infrastructure of roads and accommodation facilities. Wildlife viewing.
Cultural and heritage values	Rock art sites on property.
Socio-Economic values	Opportunities to improve environmental awareness and education. Local economic development opportunities. Research opportunities. Contains wilderness attributes.

2.4 Summary of management challenges and opportunities

A summary of the key management challenges and opportunities, addressed in the management plan are highlighted in the table below.

Table 2.1 Management challenges and opportunities

Management Focus Area	Challenges and Opportunities
Fire management	Challenge: Unplanned or out-of-season wildfires. Opportunity: Employment opportunities for fire fighters.
Invasive vegetation management	Challenge: Not applicable Opportunity: Employment opportunities for alien plant control teams.
Wildlife management	Challenge: Not applicable Opportunity: Providing additional suitable habitat for Cape mountain zebra.
Sustainable harvesting	Challenge: Not applicable Opportunity: Employment opportunities for flora pickers.
Erosion prevention and control	Challenge: The mountainous terrain is prone to floods, especially access routes. Opportunity: Employment opportunities for erosion control teams.
Monitoring and Baseline data collection	Challenge: Not applicable Opportunity: Potentially discovering new plant species and archaeological sites.
Biodiversity security	Challenge: Not applicable Opportunity: Contribute to the conservation of Cape mountain zebra and water catchments.
Development of tourism opportunities	Challenge: Mitigation of negative environmental impacts associated with tourism. Opportunity: Natural scenic beauty, peace and tranquillity offer unique eco-tourism opportunity. Generation of income to contribute towards operational costs.
Legal compliance	Challenge: Not applicable Opportunity: Comply with NEMA and relevant environmental legislation.
Management effectiveness	Challenge: Not applicable Opportunity: Implement management actions and partake in annual audits.
Infrastructure	Challenge: Rehabilitation and maintenance of access roads due to floods. Opportunity: Employment opportunities for fence and road repair and general maintenance.

2.5 Land use History

Pre-European- land use

The pre-colonial occupants of the region, the San and Khoi who were present until historical times, occupied mainly the low-lying areas of the Langeberg and consequently had little impact on the upland vegetation. The San were hunter-gatherers and may have deliberately burnt the veld both to encourage game to concentrate on the succulent new growth and to stimulate growth and reproduction of edible Iridaceous and other bulbs (Klein, 1974). The Khoi were pastoralists and were reported to have habitually burnt the veld to provide pasture for their sheep (Brown, 1875; Botha, 1924; Mossop, 1927; Thompson, 1936; Schweitzer & Scott, 1973). Sheep would have had a very different ecological influence on the plant communities compared to the local wild herbivores.

European settlement

By the end of the eighteenth century, the sites around the present-day Riversdale, Barrydale and Heidelberg were already well settled. Farmers occupied the lower-lying foothills and valley lands and used the mountains for grazing. The settlers moved their sheep to low--lying areas during winter and burnt the mountain vegetation in late winter or early spring to provide summer grazing. These unseasonable fires would have been detrimental to the fynbos (Kruger & Bigalke, 1984). Whilst the seminomadic Khoi pastoralists would have moved their herds when the grazing deteriorated, the sedentary settlers moved their flocks back to the same pasture year after year (Wicht & Kruger, 1973). -The practice of burning the veld to provide pasture was continued in one form or another until the introduction of fire protection areas.

Previous landowners

Mr Giliam Stefanus Jacobus Stander (died 11 December 1935) was the first known owner of the property and started farming here in the 1880's. Prior to Mr Stander's occupation, the land was apparently leased to tenants by the State. Giliam Stander was a successful farmer and built the gabled house and a school building. The school provided primary education to children from surrounding farms up until 1963. In October 1935 Giliam's eldest son, Johan Stander, died and Giliam Stander died two months later leaving Johan's widow, Adriana (nee Zaaiman) to run the farm. This soon became too much for her and she was obliged to sell.

In 1936 the property was purchased by a Mr M C Botha, a member of parliament and at one time the district school inspector. His daughter, Mrs M C Schoeman, is the doyen of Afrikaans cultural etiquette. Mr Botha leased the property to tenants because his wife did not want to live there, while they resided in Wilderness. M C Botha however made extensive improvements to the property during his period of ownership.

Sometime in the 1950's the property was initially leased from Mr Botha by Mr Johannes Cornelius Jonker du Preez and then purchased by him sometime later. His eldest son Matthuys Herculaas du Preez, nicknamed Matie, took over the farming in the 1970's and later inherited the property from his father after his death in 1993. Prior to Johannes du Preez's death Matie married and converted the old schoolhouse into a residence while the older gabled house was home to Johannes and after his death provided accommodation to various members of the du Preez family from time to time.

In 2004 the property was purchased by Richard Denzil Carr and Mary Elizabeth Carr and again sold in 2021 to the current owner Bennie Terblanche.

2.6 Ecological context

This section describes the ecological factors that influence biodiversity and ecological processes on Rolbaken Nature Reserve.

2.6.1 Climate and weather

Rolbaken Nature Reserve receives rain throughout the year with an average annual rainfall of approximately 300 mm. The hottest months are December to February with maximum temperatures of 40ºC and the coldest months are June and July with minimum temperatures of 3ºC. Frost occasionally occurs in the lower lying areas from May to September but is limited to less than 20 occurrences annually. Snow falls on the higher lying parts of the Kammanassie mountains approximately five times a year and this form of precipitation contributes significantly to subterranean aquifer recharge.

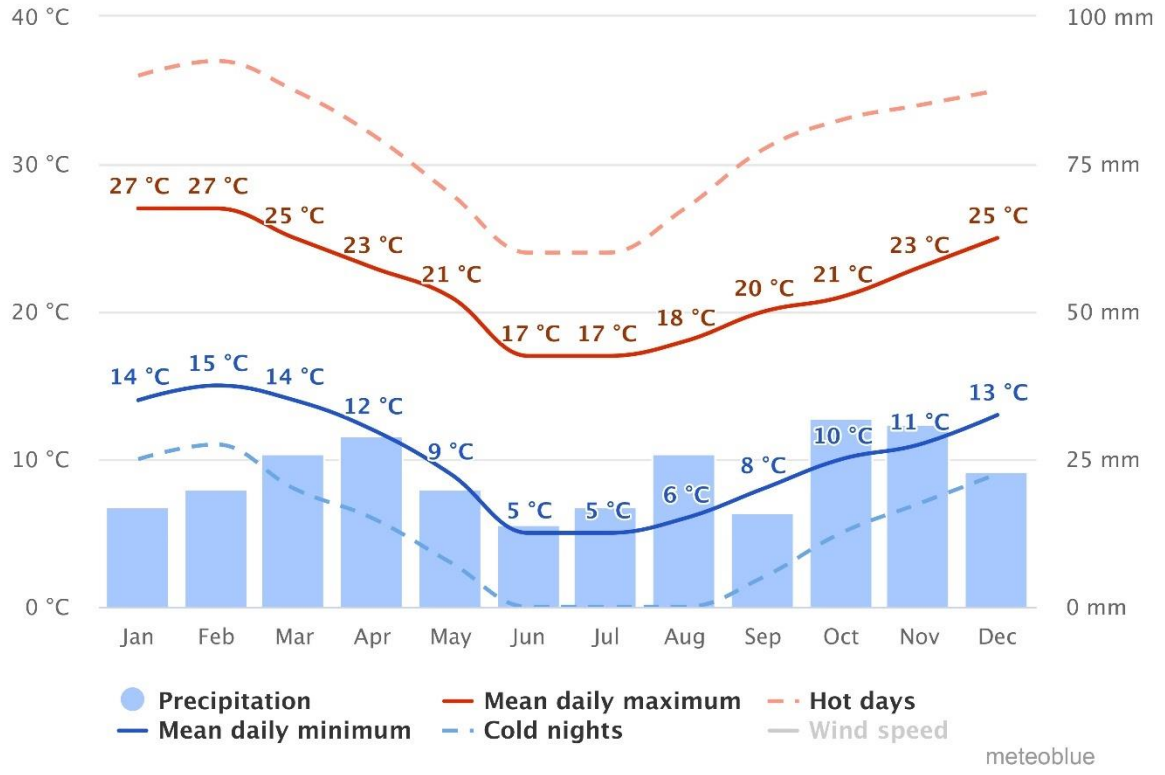


Figure 2.2 Climate and weather for Rolbaken Nature Reserve

2.6.2 Topography, Hydrology and Soils

Rolbaken is predominantly an east-west orientated valley on the southern slope of the Kammanassie Mountain. The mountain section is mainly south facing and steep. The valley section is flatter and has been cultivated. The main drainage line is fed by run-off from the mountain slopes through two large

kloofs and from perched springs. The drainage line has been eroded in some places to a depth of 4 meters but has been stabilized by secondary riparian woodland.

The Kammanassie Mountain Range (KMR) comprises almost exclusively the resistant quartz arenites of the Table Mountain Group (TMG), overlain on the lower slopes by the shale of the Bokkeveld group. A very important shale marker horizon, the Cedarberg formation (varying between 50 and 120 metres thick) occurs within the TMG, separating formations of the Peninsula formation from the lithologies comprising the Nardouw.

The Peninsula formation is a highly competent succession of medium to coarse-grained, thickly bedded, grey sandstone. The Nardouw weathers more brownish, and thin shale intercalations are more common, than in the Peninsula formation. The Nardouw formation is more ductile as a result. Recent deposits occur in the floor of the steep-sided Vermaaks River Valley where talus/scree accumulations up to 20 metres thick are encountered. These deposits comprise large angular quartzite fragments, in some cases metres in diameter, set in an unconsolidated silty matrix. Similar accumulations may occur in the other valleys, which have not been investigated in detail.

Soils generally form a thin (<1 metre) veneer of silty sands/sandy silts as a result of the steep slopes of the Kammanassie mountain and predominantly quartzitic rocks. Locally clayey soils occur in association with weathered shale horizons, and particularly the Cedarberg formation.

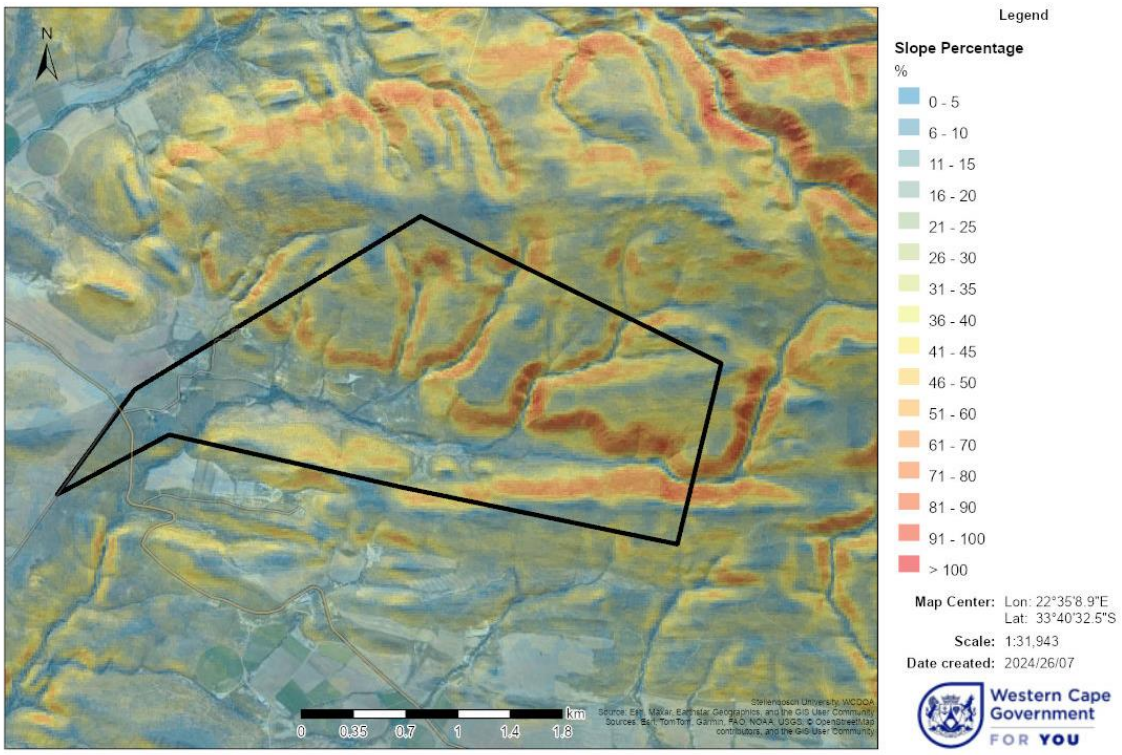


Figure 2.3 Topography of Rolbaken Nature Reserve

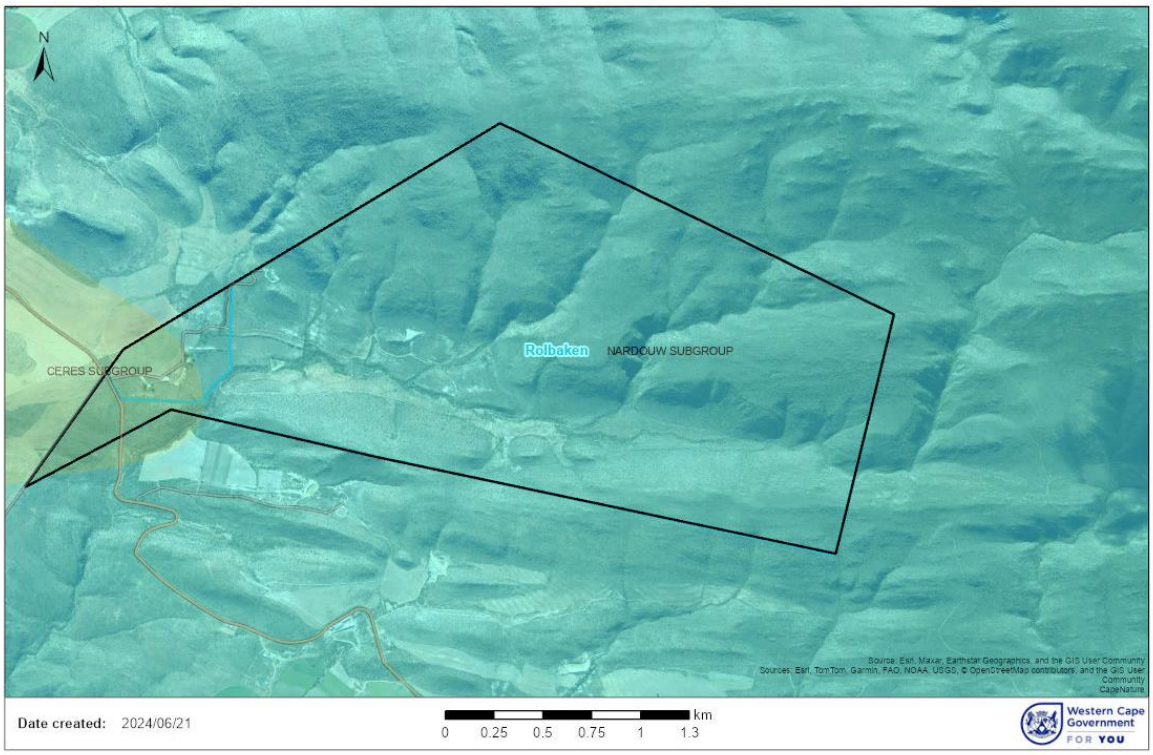


Figure 2.4 Geology of Rolbaken Nature Reserve

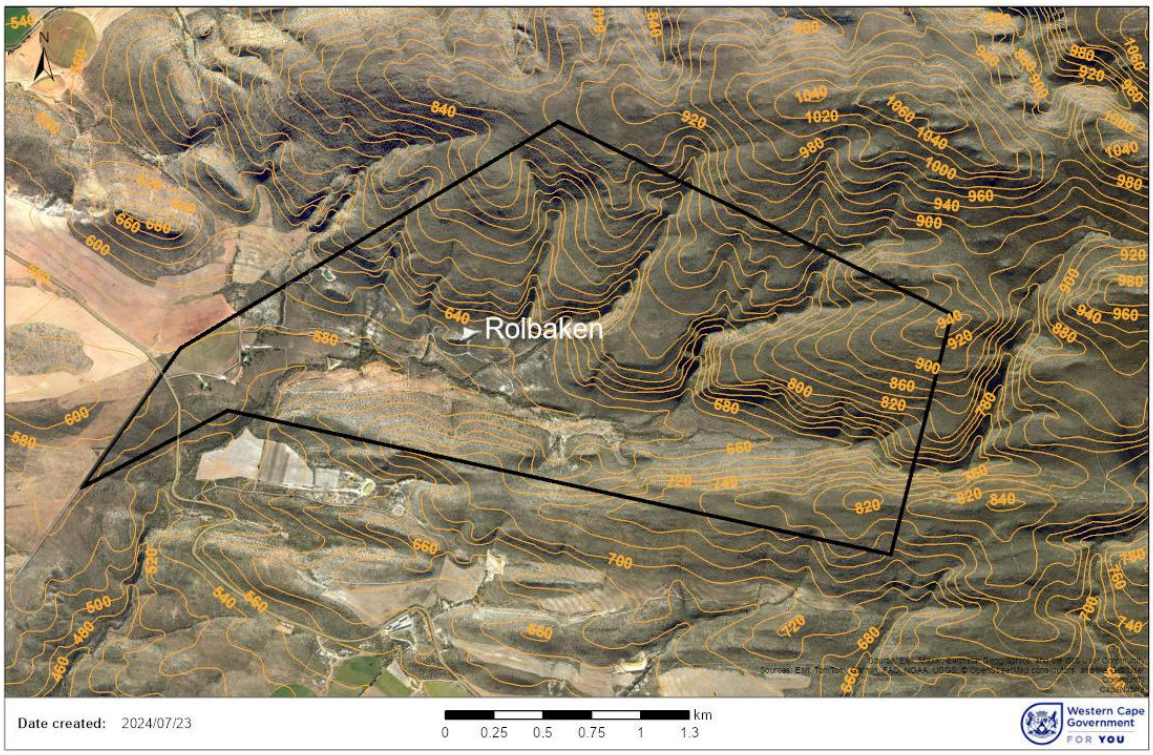


Figure 2.5 Contours (20m) of Rolbaken Nature Reserve

2.6.3 Vegetation

The Cape Floristic Kingdom, one of six world floral kingdoms, is internationally renowned for its special rich flora containing an estimated 9 000 species of vascular plants of which almost 69% are endemic (restricted to the region). This makes it one of the richest regions in the world in terms of botanical diversity. It is characterized by five endemic families and by the conspicuous presence of, amongst others, species belonging to the families Aizoaceae, Ericaceae, Fabaceae, Iridaceae, Orchidaceae, Proteaceae, Restionaceae, Rutaceae and Scrophulariaceae (Goldblatt & Manning, 2000).

The property contains no threatened ecosystems according to the SA Veg map (Table 1 and Figure 2.6). The vegetation types are Uniondale Shale Renosterveld and South Kammanassie Sandstone Fynbos. The property does contain priorities from the Klein Karoo fine-scale map (Vlok *et al.*, 2005). At fine scale level (Figure 2.7) it contains three vegetation types i.e. Kammanassie Waboomveld, Leeublad Sandolien Renostervled and Kammanassie Waboomveld. Leeublad Sandolien Renosterveld and Olifants River & Floodplain, which are both vulnerable whereas Kammanassie Waboomveld which is Least Threatened. Leeublad Sandolien Renosterveld is rich in species, of which several are rare and localised endemics. Kammanassie Waboomveld is a combination of rare and localised endemic species and differs from any other Waboomveld unit. Species list is included in Appendix C.

Table 2.2 Vegetation types description and National targets (SA VegMap).

Description of vegetation types	Conservation status	Current area (ha)	Remaining Extent of total population size	Conservation Target	Contribution to Target
South Kammanassie Sandstone Fynbos	Least Threatened	438.846	96%	27%	1.86%
Uniondale Shale Renosterveld	Least Threatened	55.939	84.9%	29%	8.69%

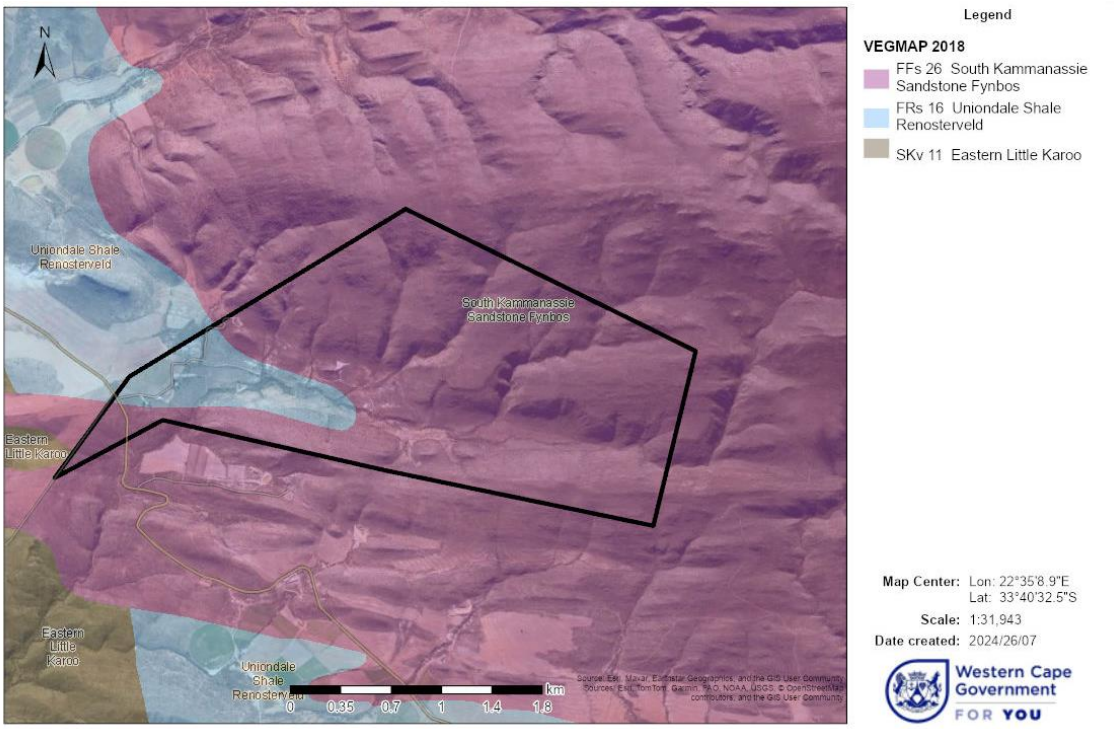


Figure 2.6 Vegetation types found on Rolbaken Nature Reserve as per SA Veg Map.

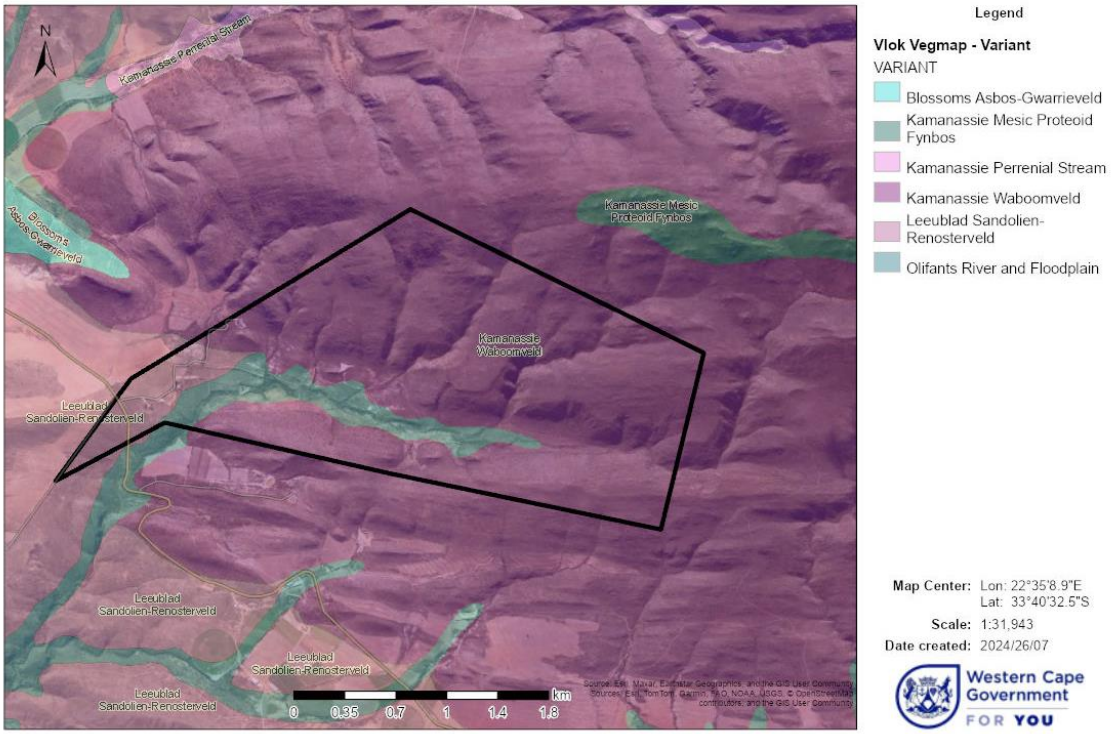


Figure 2.7 Fine-scale vegetation map of Rolbaken Nature Reserve (Vlok *et al*. 2005)

2.6.4 Fire regime

The majority of the vegetation on Rolbaken NR is fire prone. The infrastructure is protected by agricultural lands and existing roads which act as firebreaks. The last fire which occurred on

Rolbaken NR was in 1988 where more than 60% of the property burned. Refer to Figure 2.8 and 2.9.

Fire is an essential ecosystem process in fynbos. It provides the disturbance and stimulus that has contributed to the unprecedented floristic response we experience in our landscape. Fire is an ecosystem process that is essential for the continued functioning of the ecosystem as well as the continued evolution of biota therein. Due to fragmentation of the natural landscape however, fire can no longer operate naturally on a landscape scale. We therefore need to facilitate the process within these smaller compartments to ensure persistence of biodiversity whilst ensuring the safety of persons and property.

Note: Wildfires as well as the use of fire as a management tool pose serious potential risks. Consult the National Veld and Forest Fire Act (101 of 1998) to acquaint yourself with the legal obligations of landowners in fire-prone landscapes.

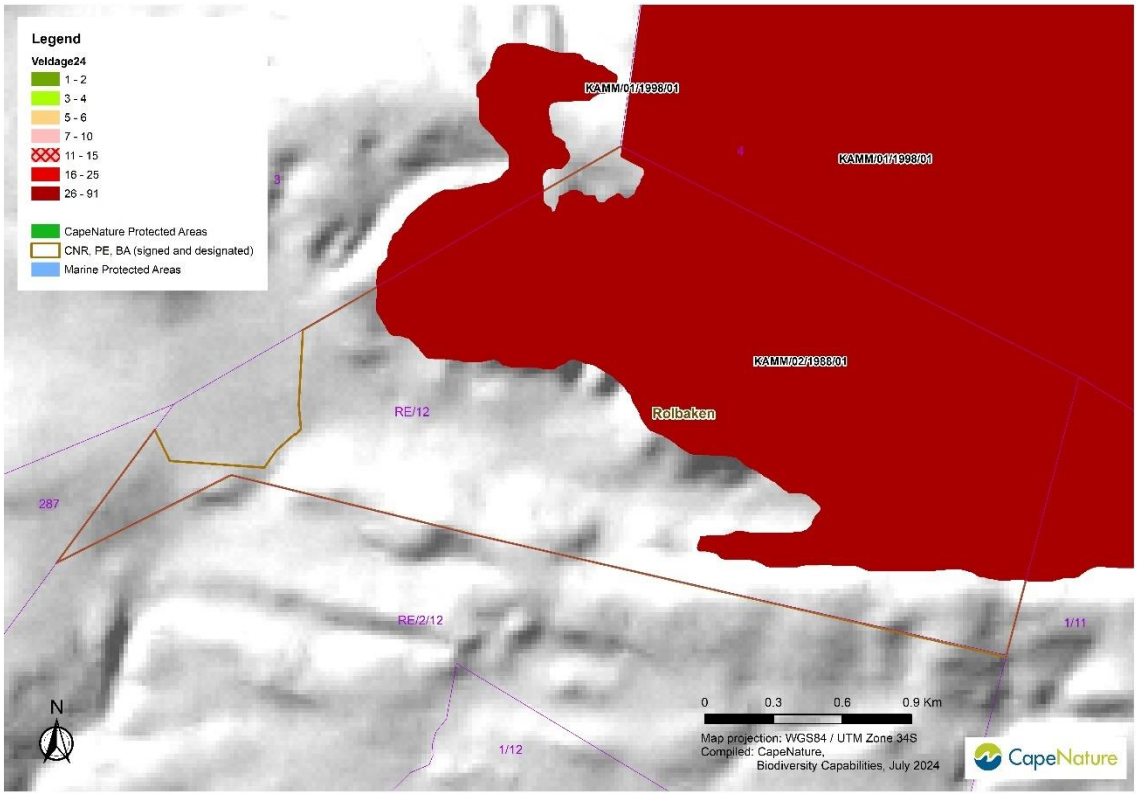


Figure 2.8 The 1988 fire boundary on Rolbaken Nature Reserve.

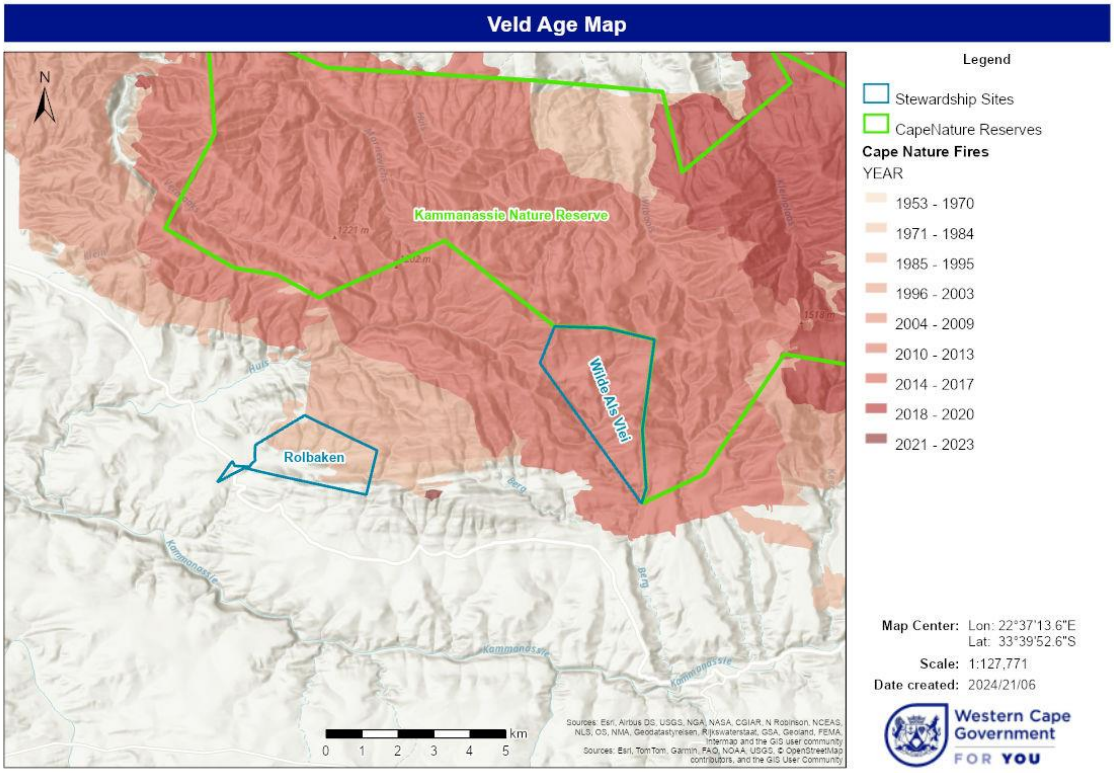


Figure 2.9 Veld Age map of Rolbaken Nature Reserve

2.6.5 Invasive species

Alien vegetation on Rolbaken NR is restricted to 2 to 3 drainage lines and consists of *Opuntia*, Rooikrans and one small patch of Hakea (50 meters from catchment boundary, 60 trees of 2-3 meters high). A first step towards the management of invasive species will be to map the distribution and density of Alien Invasive Plant species on Rolbaken NR (See Management activities in the table section 4.1.1.2 below).

In terms of Section 76 of the National Environmental Management: Biodiversity Act (No.10 of 2004), the management authority of a protected area must incorporate an invasive species control plan in the protected area management plan. This is addressed in section 4.1 below.

2.6.6 Species of conservation concern

A general description of key threatened or red data species present.

- Cape mountain zebra: The unique Kammanassie gene of Cape mountain zebra (CMZ) occur naturally on the property. These animals face numerous risks such as hybridisation with other equids, lack of access to natural drinking water, lack of access to suitable grazing, getting snared in internal fences and limited knowledge of distribution, breeding success and mortality rates. It is recommended that neighbouring landowners of the Kammanassie WHS and NR, who have Kammanassie CMZ on their property sign the Voluntary CMZ Custodianship Agreement with CapeNature which highlights sound CMZ Management Principles.

2.7 Cultural Heritage

The owner has confirmed that there are rock art sites on the property. They have not been mapped or recorded. This will be listed as a management activity in the Operational Management Framework.

2.8 Regional and local planning context

2.8.1 The Protected Area Expansion Strategy and Implementation Plan

The Protected Area Expansion Strategy and Implementation Plan is a response to the National Protected Area Expansion Strategy (NPAES) (SANBI & DEAT, 2010) which calls on Provinces to develop implementation plans in support of the NPAES and in support of provincial conservation efforts and priorities. The NPAES, which provides a broad national framework for Protected Area expansion in South Africa, also identifies areas of importance to be targeted for Protected Area expansion in the country, and mechanisms to achieve this.
The Western Cape Protected Area Expansion Strategy addresses the formal declaration of priority natural habitats as protected areas to secure biodiversity and ecosystem services for future generations. This strategy is aligned with the concepts and goals of the NPAES.

2.8.2 The Strategic Development Framework and Integrated Development Plan

This refers to the Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Land Use Management Systems (LUMS) of the district and local municipalities within which the protected area falls.

Strategic Development Framework (GRDM, 2017) and Integrated Development Plans (GRDM, 2022)

Garden Route District is situated on the southern- eastern coast of the Western Cape Province is currently the third largest district municipality within the Western Cape. With a total earth surface coverage of approximately 23 332 km², the municipality shares its borders with four other district municipalities namely Cacadu District in the Eastern Cape, Overberg and Cape Winelands in the west and to the north the boundary with the Central Karoo District Municipality runs along the Swartberg mountains. In the east, the municipality runs up to the Eastern Cape provincial boundary. Oudtshoorn is the largest inland town, located along the R62 and N12 linking smaller inland towns of Ladismith, Calitzdorp, De Rust and Uniondale.

The inland areas of the Garden Route District are characterised by a strongly rural setting with dispersed farming hamlets and small towns, which in some cases are isolated due to transport and social service delivery costs. Along the coast, the dominant port industrial town of Mossel Bay is functionally linked inland with George, the services centre of the District, as well as along the N2 to the tourism and lifestyle driven settlements of Knysna, Bitou to the East. To the west of Mossel Bay, the towns of Riviersonderend and Riversdale are gateways to the Garden Route and South to the coastal towns of Witsand, Stilbaai and Gouritzmond.

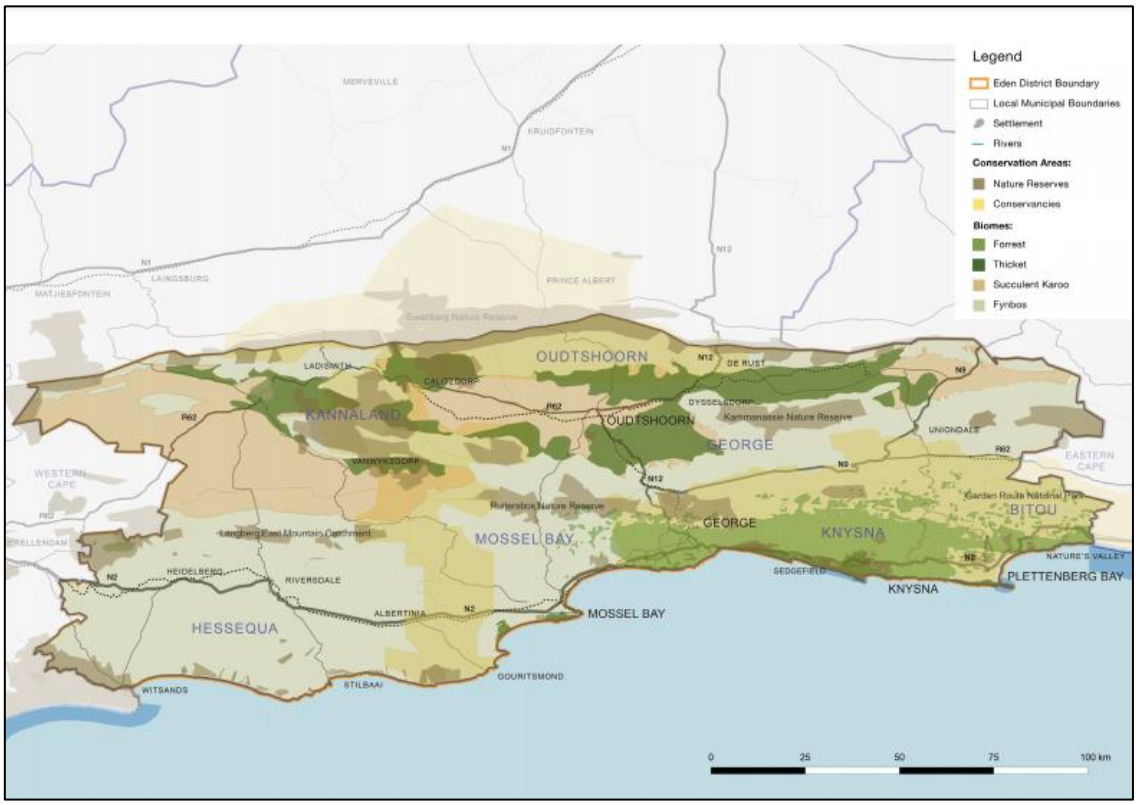


Figure 2.10 Local Spatial Development context for the Garden Route Municipality (GRDM SDF, 2017).

The IDP and SDF of the GRDM recognise the importance of being part of the Cape Floristic Region which is classified to be a global biodiversity hotspot. These documents note that the Garden Route's outstanding natural beauty is made up of diverse wilderness and agricultural landscapes, estuaries and lagoons, mountain backdrops and coastal settings, including the verdant landscapes of the Garden Route. As a result of the natural beauty, the area is well known for its tourism. As it is stated that the Southern Cape coastal belt has been identified as a significant leisure, tourism, lifestyle and retirement economic destination, driven largely by the quality of life and climatic advantages of the region. The district's natural capital and its varied scenic and cultural resources are the attractions that make the Western Cape the country's premier tourism destination (GRDM SDF, 2017). Keeping the natural environment, wetlands, lakes and rivers in a pristine condition is key to future security in the future of the region.

The local and regional planning context is illustrated by the maps shown in Figure 2.11 and Figure 2.12 showing:

- The site overlaying CBA's
- Western Cape Biodiversity Spatial Plan

The Biodiversity Assessment of the Kannaland and Oudtshoorn Local Municipality and Eden District Management Area (Uniondale) (Skowno et al., 2010) points out that this region is unique because of its location in the Succulent Karoo Biome. Twelve habitat types in the region are threatened, and urbanization and agriculture are the main drivers of biodiversity loss.

Stewardship is mentioned as a means for conserving threatened habitats outside formal protected areas (Skowno et al., 2010). According to the 2017 Western Cape Biodiversity Spatial Plan (Pool-Stanvliet et al., 2017) and the bioregional sector plan for the Garden Route (Vromans et al., 2010), Rolbaken NR falls within the Protected Area CBA category (Figure 2.11). Management priorities for Critical Biodiversity Areas are the minimization of loss and further fragmentation, the maintenance of natural ecosystem processes, and prioritization for incorporation into the Protected Areas Network through processes such as stewardship (Vromans et al., 2010).

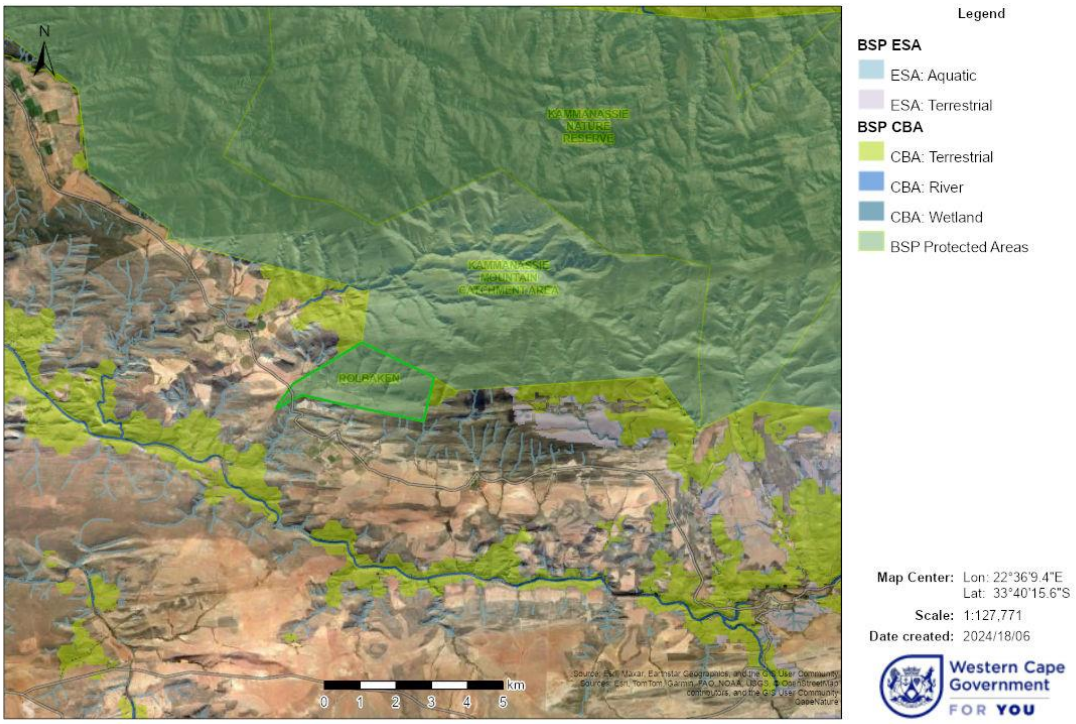


Figure 2.11 Critical Biodiversity Area map of Rolbaken Nature Reserve.

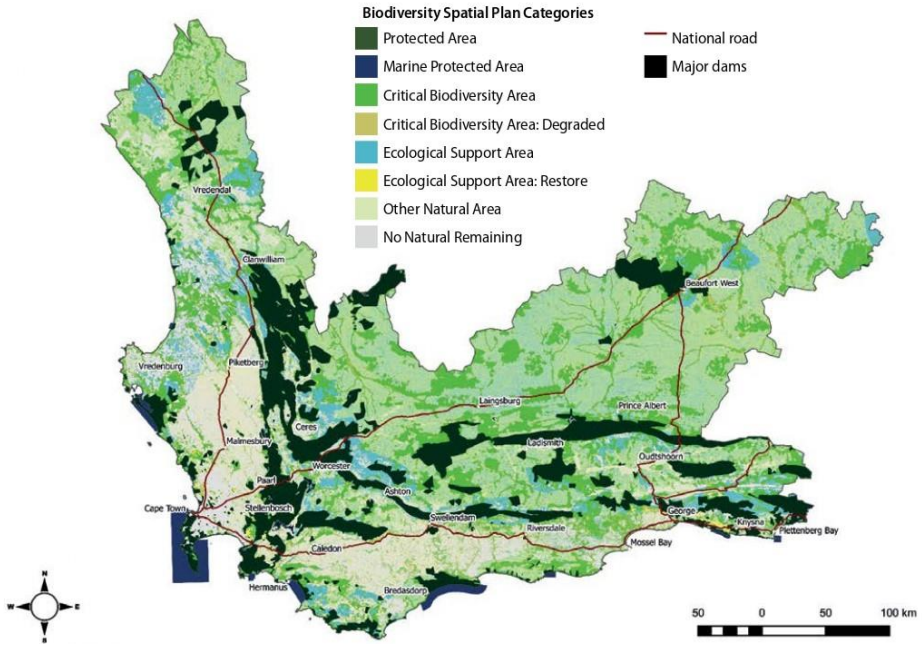


Figure 2.12 The Western Cape Biodiversity Spatial Plan Map (CapeNature, 2017)

2.9 Socio-economic context

Rolbaken Nature Reserve falls within the Garden Route District Municipality and the George Local Municipality. Roughly, 80% of the district's 627917 population lives in urban areas along the coast. The geographic area of the municipality consists of seven municipalities: Bitou, Knysna, George, Mossel Bay, Oudtshoorn, Kannaland and Hessequa. George Municipality, comprising the towns of Uniondale, Haarlem, Blanco and George. Oudtshoorn is the largest inland town, located along the R62 and N12 linking smaller inland towns of Ladismith, Calitzdorp, De Rust and Uniondale. (GRDM IDP, 2022).

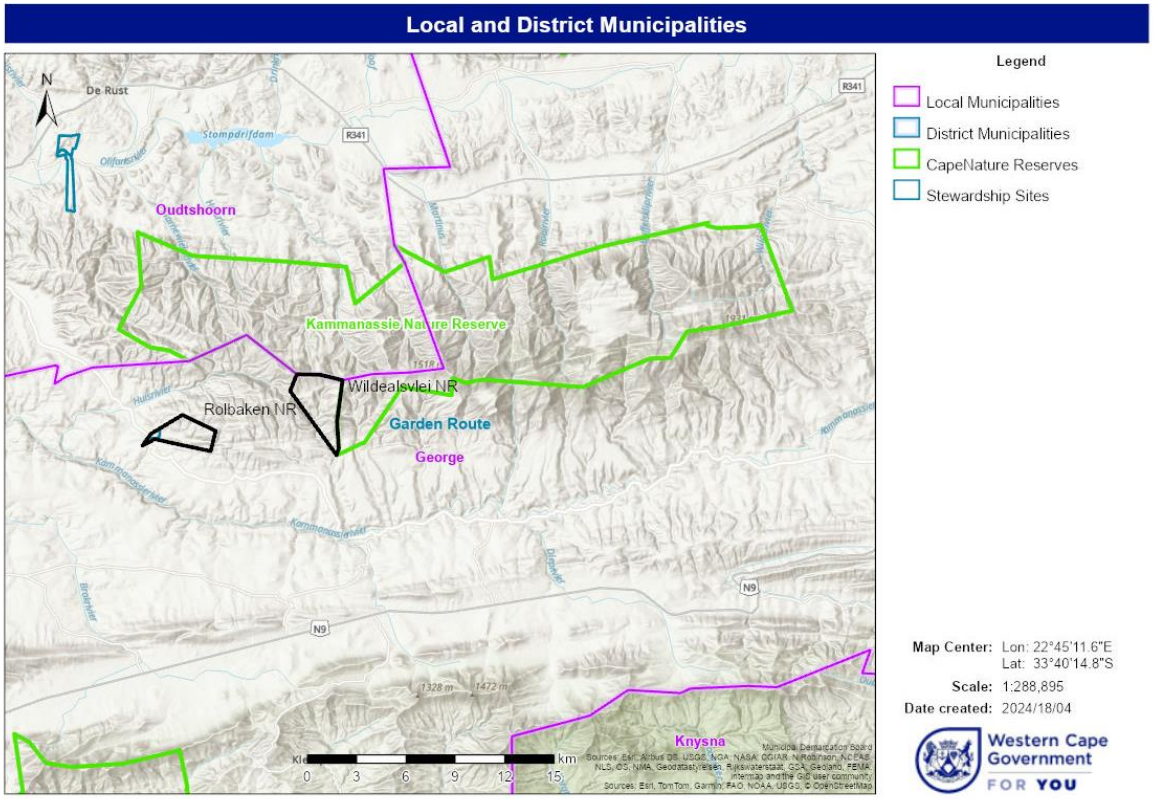


Figure 2.13 Map of location of Rolbaken NR in relation to the local and district municipalities.

The Garden Route District currently has a population of 622 664, meaning it is the third most populous municipal district in the Cape, after the Cape Winelands' and City of Cape Town. The total population is estimated to increase to 643 134 by 2023 which equates to 0.8 per cent average annual growth. In 2017, the Garden Route District economy was dominated by the finance, insurance, real estate and business services (R10.733 billion; 24.9 per cent), wholesale and retail trade, catering and accommodation (R7.811 billion; 18.1 per cent) and manufacturing sectors (R6.312 billion; 14.6 per cent). Combined, these top three sectors contributed R24.856 billion (or 57.6 per cent) to the Garden Route District's economy, estimated to be worth R43.153 billion in 2017.

The wholesale and retail trade, catering and accommodation sector contributed the most jobs to the area in 2017 (55 985; 24.7 per cent), followed by the finance, insurance, real estate and business services sector (39 233; 17.3 per cent) and the community, social and personal services (35 255; 15.5 per cent) sector. Combined, these three sectors contributed 130 473 or 57.5 per cent of the 226 789 jobs in 2017. The unemployment rate in the Garden Route District has been rising steadily since 2015, falling back slightly to 15.2 per cent in 2018. This is slightly lower than the Provincial rate of 17.7 per cent. Unemployment remains a key challenge for the Garden Route District area, with rising population numbers. Income inequality in the Garden Route District has worsened between 2012 and 2018, with the Gini coefficient increasing from 0.585 in 2012 to 0.614 in 2018.

There are 140 informal settlements in the GRDM, together amounting to 15% of all households and the housing waiting list amounts to 65 000 households. Roughly, 80% of the district's population lives in urban areas along the coast.

Agriculture plays an important role in providing employment in the district. In the 2019 Primary Sector figures, 28042 of the 28212 jobs created were in the agriculture, forestry and fisheries industries. The remaining 170 jobs were in the mining and quarrying industry. Agriculture in the Garden Route district varies according to the distribution of homogeneous farming areas from east to west and north to south throughout the Garden Route District Municipality (GRDM) The majority of agri- processing plants appear to cluster around George and surrounds as the service settlement of the region, with Oudtshoorn and surrounds hosting the second highest number of agri-processing facilities. Farming systems in the GRDM are a mixture of irrigated crops and pastures, rainfed crops and pastures / rangelands, extensive livestock and intensive livestock. On a production level, agriculture in the Garden Route District shows fairly high levels of adaptive capacity, with only a few commodities likely to come under direct threat due to moderate warming or other climate change impacts.

The district's profound natural, scenic and landscape beauty contributes to its appeal as a popular tourism destination. Tourism plays a key role in the economy of the district, which is linked to the retail, wholesale, catering and accommodation sector. There is an opportunity to develop unique tourism products that generate revenue for the Nature Reserve.

3 Strategic Management Framework

The strategic management framework is aimed at providing the basis for the protection, development and operation of the protected area over a ten-year period. It consists of the vision, purpose and objectives of Rolbaken Nature Reserve. It has been prepared collaboratively through a process involving the landowner (Management Authority), site manager and CapeNature.

3.1 Purpose

Rolbaken NR serves in the protection of South Africa's threatened and rare species, provides protection to ecosystems and preserves ecological integrity. Benefits of appropriate nature based economic activities may be utilised to promote human, social, cultural and economic development while protecting ecosystems that are vulnerable and ecologically sensitive.

In addition:

- The property contains additional habitat (Kammanassie Waboomveld) for the genetically unique Kammanassie Cape mountain zebra.

- The property abuts private declared mountain catchment areas and adds to the buffer area of the Kammanassie Nature Reserve.
- The property captures lower lying areas and southern slopes.
- Both vegetation types which occur on the property, namely South Kammanassie Sandstone Fynbos and Uniondale Shale Renosterveld, are poorly conserved.

3.2 Vision and Mission

Vision:

To manage and conserve the natural assets that are entrusted to the care of Rolbaken Nature Reserve by proactive partnering with CapeNature to ensure continuous management and to ensure existence of the rich biodiversity value of the property.

Mission:

To restore and maintain the natural environment and its associated ecological processes and services through the implementation of the management objectives of Rolbaken Nature Reserve.

3.3 Management Objectives under Key Performance Areas

The objectives that follow are intended to provide the basis for the achievement of the vision.

The objectives are derived from the vision and purpose and are grouped under Key Performance Areas (KPAs). Tables 3.3.1 - 3.3.4 below set out the key performance areas, the objective for each key performance area and the key deliverables of each objective.

In the Annual Plan of Operations, the objectives below are prioritised in terms of importance and urgency and detailed management activities are described that will deliver the desired outcomes under each objective.

Table 3.3.1 Biodiversity and ecological components objectives and deliverables

KPA: Biodiversity and ecological Components		
OBJECTIVE	**OBJECTIVE STATEMENT**	**KEY DELIVERABLES**
Integrated Wildfire and Invasive Alien Plants	To manage invasive alien plants and the risks associated with uncontrolled wildfire in an integrated way to limit negative impacts on biodiversity and ecosystem function as well as the risks to human safety and infrastructure from wildfire.	Wildfire: • Allow natural fire processes to take place. • Reduced risk of uncontrolled wildfire. • Staff trained and equipped to manage wildfires. • Monitor extent of wildfires and establish thresholds of concern. Invasive Aliens: • Eradicate invasive alien species using mechanical and biological control methods. • Reduce combustible material to reduce intensity and spread of wildfires. • Effective monitoring to prevent further introductions of invasive aliens.
Rehabilitation and restoration	To identify areas of degraded ecosystems and/or habitat in the reserve, understand the causes of degradation and implement restoration/rehabilitation measures.	• Limit the loss of biodiversity and disruption to ecological processes due to degraded habitat. • Extent and cause of degradation determined, and restoration/rehabilitation measures planned. • Soil erosion effectively prevented and eroded sites restored/rehabilitated. • Long-term monitoring of degraded sites and restoration/rehabilitation effectiveness.
Species of special concern	To ensure the optimal long-term population health and ecological function of any plants and animals of special concern.	• Monitoring of populations of species of special concern. • Identify and implement specific management requirements.
Wildlife	To ensure effective conservation of faunal species, populations and inter-relationships in order to enhance biodiversity and maintain and improve ecosystem functioning.	• Manage the introduction and offtakes of wildlife on the Reserve. • Monitor and evaluate the heath of faunal populations. • Monitor and evaluate the impact of fauna on the ecosystem.

Table 3.3.2 Sustainable utilisation of natural resources objectives and deliverables

KPA: Sustainable utilisation of Natural Resources		
OBJECTIVE	**OBJECTIVE STATEMENT**	**KEY DELIVERABLES**
Grazing and browsing of livestock and game	Game and livestock are effectively used as a management tool to ensure the health of natural vegetation.	• Veld condition assessments are used to determine carrying capacity relative to climatic and rainfall cycles. • A Grazing Plan is compiled which takes into consideration veld condition, stock numbers, stock breeds, herd size, camp sizes and grazing frequency per camp. • Game and livestock numbers are managed to ecological carrying capacity.
Recreation and tourism	To generate income from a tourism business that makes a sustainable contribution towards the conservation management costs of the reserve.	• Viable tourism business model to guide tourism development and operations. • A range of appropriate eco-tourism products and services are offered. • Tourism infrastructure and operations do not have a negative impact on any of the conservation objectives of the reserve. • Tourism infrastructure design and construction complies with development planning requirements. • Profits from tourism operations make a meaningful contribution towards conservation management costs.
Sustainable harvesting	To ensure the sustainable use of natural plant resources in a manner that ensures the conservation of biodiversity and minimal ecological disturbance in the areas where harvesting operations occur.	• Harvesting Plan with well managed harvesting activities. • Possession of all necessary harvesting permits. • Accurate and up-to-date records of all harvesting operations maintained. • Monitor and evaluate long-term impacts of harvesting operations.

Table 3.3.3 Socio-economic and heritage objectives and deliverables

KPA: Socio-economic and heritage		
OBJECTIVE	**OBJECTIVE STATEMENT**	**KEY DELIVERABLES**
Environmental Awareness and Education	Stakeholders receive an increased awareness and understanding of the importance and value of functioning ecosystems and an introduction to careers in eco-tourism, hospitality and nature conservation.	• Increase awareness about the value of functioning ecosystems and conservation land use. • Address specific management issues such as security, poaching, etc. • Informal training and/or holiday camps provided to school groups. • Formal career development training provided to potential employees.

Socio-economic development initiatives	To work with relevant stakeholders to make a meaningful contribution towards the socio-economic development needs of local communities.	• Eco-tourism guides, hospitality staff and conservators are sourced from local community • Community receives tangible value from the reserve. • Positive relationships with key community role players and groups.
Heritage features	To locate, document, and conserve archaeological, paleontological and cultural heritage features on the reserve.	• Systematically map and document all archaeological, paleontological and cultural features with input from experts. • To support the study of on-reserve features by experts and to share knowledge and insights gained. • To conserve the integrity of all archaeological and heritage features on the reserve.

Table 3.3.4 Management authority effectiveness, sustainability objectives and deliverables

KPA: Management Authority effectiveness and sustainability		
OBJECTIVE	OBJECTIVE STATEMENT	KEY DELIVERABLES
Legal Compliance	To ensure all reserve declaration documentation is in order and that all activities are compliant with relevant legislation and policies.	• Fully compliant with the Protected Area legislation.
Employee skills development	Managers and staff are supported in the implementation of the management plan by ensuring they have the necessary knowledge and skills to perform their management responsibilities.	• Training needs are identified. • Informal and/or formal training is provided. • Management support and mentorship is provided.
Management of infrastructure and equipment	The reserve has the necessary infrastructure and equipment to enable the cost-effective achievement of the management objectives.	• Infrastructure needed to support personnel in implementing the management plan is in place. • Personnel have the necessary vehicles and equipment to carry out management activities. • Infrastructure is adequately maintained, and equipment serviced and kept in safe working order.
Signage, access control and security	Signage, access control and security measures are put in place that effectively address related threats.	• The perimeter boundary of the reserve is clearly marked with fencing and signage. • Access onto the property in remote areas is restricted with locked gates and controlled through a limited number of managed entry points. • Security measures are put in place to address specific threats.
Research and management knowledge	Knowledge on how to achieve management objectives is gathered, documented and shared with the team to increase management effectiveness.	• Address knowledge gaps through desk-top research, scientific research and getting advice from experts. • Use increased knowledge and research findings to improve management effectiveness.

3.4 Zonation plan

The purpose of the zonation of Rolbaken Nature Reserve is to control the intensity and type of land use within the reserve in efforts to ensure the main goal of biodiversity conservation is met. On this basis, within some zones, the permissible intensity of use will be relatively higher than in others. Refer to the zonation map, Figure 3.1, below which illustrates the following:

- The site's boundaries.
- Infrastructure within the reserve.
- The different zones within the reserve.

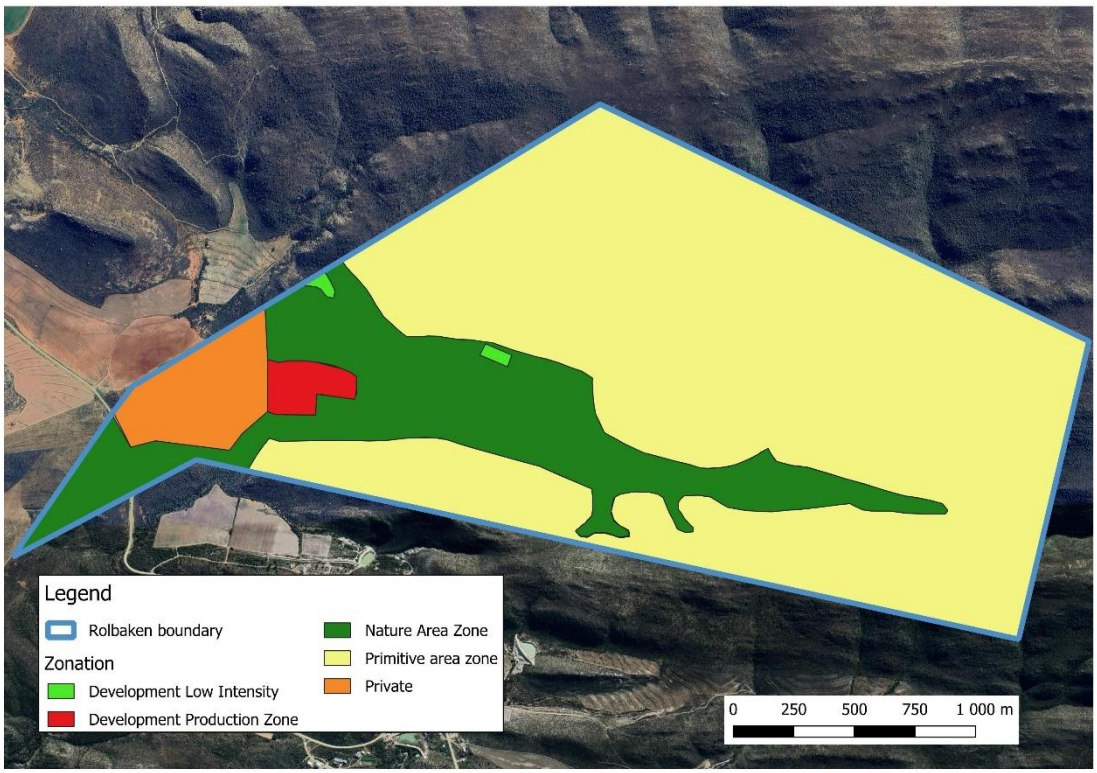


Figure 3.1 Zonation map of Rolbaken Nature Reserve.

Description of zonation on Rolbaken Nature Reserve:

Private Area

An area of 21 hectares has been retained as the Private Area. The area is dominated by a centre pivot irrigation system, the farm residence, outbuildings and the guesthouse. The boundaries of the private area are shown in Figure 3.1. All forms of agriculture according to best practise, will be permissible in the private area.

Development Production Zone

The 4-hectare area will make provision for commercial or subsistence farming in extensive degraded or transformed footprints. Agricultural best practise to support surrounding natural areas, particularly regarding river and wetland buffer areas.

Nature Area Zone

- Restoration of old lands according to best practise principles.
- The irrigation of planted grass pastures as necessary.
- Pasture management through the limited and temporary introduction of domestic stock.
- The cutting and baling of grass pastures for the provision of emergency supplementary fodder for zebra.
- The harvesting of pasture grass seed.
- The extraction of irrigation water from the two existing boreholes at rates equal to or less than those prior to the change in land use.
- The clearance of fence lines through the application of suitable herbicides up to a maximum of 2 m on either side of the fence.

The Development Low Intensity Zone will allow for the development of two self-catering chalets and a Primitive Camp Site.

The Primitive Area Zone will make up the remaining part of the property. Note that this zonation may provide isolated, small, unobtrusive accommodation facilities for up to 16 guests on restricted footprints, particularly for overnight hiking trails. The landowner has not yet identified the exact site for such a development but would like to keep his options open in this regard.

3.4.1 Development Plans

Future development will be limited to the provision of outdoor recreation facilities in keeping with the conservation ethic of management. These might include:

- A basic camp site with rustic ablution facilities.
- Self-catering chalets (2).
- Hiking and mountain bike trails.
- Bird hides.

Future development will only take place in the Development Low Intensity zone areas as per the Zonation map (Figure 3.1).

Management Action - Development	
Action	All development needs to be done according to the NEMA principles and follow the applicable legislation and procedures of all relevant stakeholders.
Responsible Party	The landowner will ensure that all legal requirements are met. CapeNature could assist with the feasibility of development applications.
Time Frame	Throughout the process.
Means	According to guidelines.

3.5 Administrative structure

The landowner is appointed as the Management Authority for the Nature Reserve as agreed to in the Management Agreement concluded between CapeNature and the landowner. In the case of the Rolbaken Nature Reserve, the Management Authority is Bennie Terblanche.

Where applicable, management decisions can be made collaboratively between the Management Authority and CapeNature, however the Management Authority is responsible for the management of the reserve and caries the ultimate decision-making responsibility. The role of the Provincial Conservation Agency, CapeNature, is to provide support, advice and assist with the implementation of the management plan of the Nature Reserve as agreed upon.

Monitoring and Review of the Management Plan
CapeNature shall convene a meeting with the Owner on an annual basis to formally review and audit the annual progress towards achieving the management objectives. CapeNature may also assist the Owner with updating the Management Plan accordingly.

4 Operational Management Guidelines

This section translates the strategic framework described in Section 2 above into Key Deliverables and Management Activities, which will be used to inform annual plans of operation and the resources required to implement them. The management targets will form the basis for monitoring of performance in implementing the plan and are thus measurable.

4.1 Biodiversity and ecological components

4.1.1 Integrated Wildfire and Invasive Alien Plants

Objective statement:

To manage invasive alien plants and the risks associated with uncontrolled wildfire in an integrated way to limit negative impacts on biodiversity and ecosystem function as well as the risks to human safety and infrastructure from wildfire.

4.1.1.1 Wildfire

Deliverables –

- Develop Fire Management plan.
- Allow natural fire processes to take place.
- Reduced risk of uncontrolled wildfire.

- Staff trained and equipped to manage wildfires.
- Monitor extent of wildfires and establish thresholds of concern.

Fire plays an important role in southern African ecology, and has important effects on vegetation composition, regeneration, primary productivity and nutrient cycling. The most important use of fire for conservation management is to maintain viable populations of all existing plant and animal species. The use of fire to achieve other management objectives should always take this into account. These may include: reduction in fuel load to prevent unmanageable wildfires, the control of invasive alien plants, increase in water yield from catchments, promoting desirable plants for the flower picking industry, or improving grazing. In developing a fire management strategy for the site, the following guiding principles should be adhered to:

- Burning should be undertaken in such a way that it maintains spatial and temporal heterogeneity within the landscape.
- A patch mosaic of burnt and un-burnt areas should be maintained. - this follows the precautionary principle, which suggests that a variety of burn practices and veld ages is the best way to maintain species diversity.
- The burning of areas should be undertaken in such a way that promotes patchy burns (i.e. within the block being burnt, some patches will remain un-burnt rather than aiming for a complete burn).
- Season - burn vegetation at the end of autumn, never in winter or spring. Generally, a late summer or early autumn burn is best for fynbos species, however, prescribed burning in the summer months (Nov – Feb) is seldom advised due to the risk of runaway fires. Burning is usually only feasible in March and April. The season for prescribed burns in the Western Cape is the 15 January – 15 May.
- Frequency – Do not burn too frequently. Fynbos should be burnt at intervals between 8 and 20 years, while Renosterveld at 7 to 12-year intervals. No fire should be permitted in fynbos until at least 50% of the population of the slowest-maturing species in an area have flowered for at least three successive seasons. Similarly, a fire is probably not necessary unless a third or more of the plants of these slow-maturing species are senescent (i.e. dying or no longer producing flowers and seeds). Prescribed burns should generally not occur more often than every seven years as this may result in a loss of species that have not matured and produced seeds. Research suggests that, under natural conditions, fynbos should be burnt between eight and 20 years after the last fire. Fire at intervals greater than 25 years may result in the fynbos becoming senescent.
- The intensity of a fire is influenced by the fuel load, fuel moisture, relative humidity and wind speed. The intensity can be manipulated by either reducing the fuel load (i.e. burning more often) or by selecting the conditions that will lead to the desired type of fire. Most fynbos species require high intensity fires for survival; however, low intensity burns are often favoured for safety reasons.
- Burning must be undertaken with consideration of the biodiversity conservation requirements of the site and the need to protect rare and endangered species.

- The fire breaks should be prepared and maintained annually in a manner that is least damaging to the environment and aesthetics of the property. To this end where possible current management roads and tracks should be utilised.
- Burning and fire management must be undertaken in a safe manner that is legally compliant with the National Veld and Forest Fire Act (No. 101 of 1998).

WILDFIRE			
Objectives	To manage invasive alien plants and the risks associated with uncontrolled wildfire in an integrated way to limit negative impacts on biodiversity and ecosystem function as well as the risks to human safety and infrastructure from wildfire.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Allow natural fire processes to take place.	• Develop Fire Management plan (including map). • Ensure Fire Breaks are in place as well as measures to combat fire and protect infrastructure. • If all is in place, then allow natural fires to take place.	MA, CapeNature and FPA	Ongoing
Reduced risk of uncontrolled wildfire.	• Join FPA • Maintain identified firebreaks. • Acquire and maintain the necessary infrastructure and equipment for fire management. • Fire protection measures (boreholes) in place. • Fire awareness campaigns with local community. • Safeguard infrastructure from fire.	MA	Ongoing
Staff trained and equipped to manage wildfires.	• Ensure staff are trained and equipped to combat fires	MA and FPA	As required
Monitor extent of wildfires and establish thresholds of concern.	• Maintain Fire History • Establish a series of fixed-point photography monitoring plots. • Conduct permanent Protea spp. plot monitoring. • Conduct post-fire regeneration monitoring. • Set and monitor thresholds of potential concern.	MA and CapeNature	Ongoing

4.1.1.2 Invasive Alien Plants

Deliverables –

- Eradicate invasive alien species using mechanical and biological control methods.

- Reduce combustible material to reduce intensity and spread of wildfires.
- Effective monitoring to prevent further introductions of invasive aliens.

Landowners are under a legal obligation to control invading alien plants occurring on their properties. Planning this procedure is essential for the long-term success of the programme. A listed invasive species means any species, which is listed in terms of section 70 of the Biodiversity Act, whose establishment and spread occurs outside of its natural distribution range. In undertaking invasive plant control, the following guiding principles should be adhered to:

- Invasive plant control will require an ongoing programme that prioritises key infestations along water courses, drainage lines and upper catchment areas.
- Initial clearing efforts should focus on areas of young, less dense alien plants, as well as those areas containing infestations that are most likely to spread into new areas.
- The ability and resources available for follow up operations should determine the size and location of the initial clearing operation.
- All follow-up requirements must be strictly adhered to otherwise the problem will be exacerbated.
- Strategic partnerships and poverty relief programmes such as the Working for Water programme should be utilised.

INVASIVE ALIEN PLANTS			
Objectives	To manage invasive alien plants and the risks associated with uncontrolled wildfire in an integrated way to limit negative impacts on biodiversity and ecosystem function as well as the risks to human safety and infrastructure from wildfire.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Eradicate invasive alien species using mechanical and biological control methods.	Draw up an invasive species control and eradication plan for mechanical and biological control measures. The plan must include: • A table with species, density and age. • a map of alien species and their distribution • a clearing schedule. • a Budget. • the keeping of accurate records.	MA and CapeNature	As required and updated annually

Reduce combustible material to reduce intensity and spread of wildfires.	Fire Belts are in place and maintained and infrastructure is protected. Staff are equipped and trained.	MA, FPA and CapeNature	Annually
Effective monitoring to prevent further introductions of invasive aliens.	Update Alien Vegetation Map. Prevent Alien Plants from being brought into the Reserve through awareness raising. Remove single invasive plants which show up on the property before they can begin to spread.	MA	Ongoing

4.1.2 Rehabilitation and restoration

Objective Statement:

To identify areas of degraded ecosystems and/or habitat in the reserve, understand the causes of degradation and implement restoration/rehabilitation measures.

Deliverables:

- Limit the loss of biodiversity and disruption to ecological processes due to degraded habitat.
- Extent and cause of degradation determined, and restoration/rehabilitation measures planned.
- Soil erosion effectively prevented and eroded sites restored/rehabilitated.
- Long-term monitoring of degraded sites and restoration/rehabilitation effectiveness.

Areas of the reserve that have been degraded due to past human activities (over-grazing or inappropriately sited roads and tracks) or are left exposed due to alien plant clearing activities, can have a negative impact on the biodiversity value of the protected area. The primary goal of restoration following degradation is to re-establish a structurally representative stand of indigenous vegetation that fulfils the major ecosystem functions and prevents any further soil structure loss. Where soil structure and other ecological components are intact, the management objective is to restore the area back to a natural state. Where these components have been disturbed, the management goal is to rehabilitate the site so that vegetation resembles the structure and species composition of the naturally occurring vegetation type. It is important to note that disturbed areas that can only be rehabilitated to structurally resemble a natural state can still perform an important role in ecological connectivity.

In addressing soil erosion, the following guiding principles should be adhered to:

- Prioritize areas requiring post-alien clearance restoration actions, as resources are usually limited, as well as those continuing to degrade.

- Aim to conserve what remains, i.e. minimise the loss of indigenous seed banks and soil, and in this way restoration costs may be kept to a minimum.
- Areas impacted by soil erosion should be stabilised and re-vegetated with indigenous plant species to prevent the spread of listed invasive plant species.
- Areas susceptible to soil erosion or showing early signs of soil erosion such as loss of vegetation cover, must be managed to prevent soil erosion.
- Keep records of all invaded sites being restored. Records should include alien vegetation clearance methods and dates, restoration actions, and results of alien and indigenous vegetation monitoring.

REHABILITATION AND RESTORATION			
Objectives	To identify areas of degraded ecosystems and/or habitat in the reserve, understand the causes of degradation and implement restoration/rehabilitation measures.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Limit the loss of biodiversity and disruption to ecological processes due to degraded habitat.	• Sow indigenous grass seed and irrigate until established. • Mow (bossiekap) monoculture Renosterbos stands to reduce competition and allow for palatable grasses to establish. • Retard run-off in drainage lines • Limit grazing pressure by domestic stock to sustainable levels	MA	As required
Extent and cause of degradation determined, and restoration/rehabilitation measures planned.	• Limit grazing pressure by domestic stock to sustainable levels • Best practise agricultural activities implemented in the intensive utilisation zone as well as the private area.	MA	Ongoing
Soil erosion effectively prevented and eroded sites restored/ rehabilitated.	• Ensure road network is well maintained by implementing the following: • Fill gullies with conglomerate • Construct effective run-off bumps • Fill potholes with suitable available material. • Encourage *Cynodon dactylon* cover on road verges and central ridge.	MA	Ongoing
Long-term monitoring of degraded sites and restoration/rehabilitation effectiveness.	Ensure that road condition and restoration projects are included in the monitoring plan	MA and CapeNature	Ongoing

4.1.3 Species of special concern

Objective Statement:

To ensure the optimal long-term population health and ecological function of any plants and animals of special concern.

Deliverables:

- Monitoring populations of species of special concern.
- Identify and implement specific management requirements.

The species of special concern on Rolbaken NR include:

- Cape Mountain Zebra (CMZ): The unique Kammanassie gene of Cape mountain zebra (CMZ) occur naturally on the property. These animals face numerous risks such as: hybridisation with other equids, lack of access to natural drinking water, lack of access to suitable grazing, getting snared in internal fences and limited knowledge of distribution, breeding success and mortality rates. It is recommended that neighbouring landowners of the Kammanassie WHS and NR, who have Kammanassie CMZ on their property sign the Voluntary CMZ Custodianship Agreement with CapeNature which highlights sound CMZ Management Principles.

The Deliverables and Management Activities for the Cape Mountain Zebra are covered in the following Objective 4.1.5 Wildlife.

4.1.4 Wildlife

Objective Statement:

To ensure effective conservation of faunal species, populations and inter-relationships in order to enhance biodiversity and maintain and improve ecosystem functioning.

Deliverables:

- Manage the introduction and offtakes of wildlife on the Reserve.
- Monitor and evaluate the health of faunal populations.
- Monitor and evaluate the impact of fauna on the ecosystem.

Many wildlife species are indigenous to the Western Cape region, and the conservation of these species is an important contribution to maintaining ecosystem functioning. Any wildlife management program must integrate the ecological and socio-economic objectives, to maximise the value to biodiversity and the protected area, but also to minimize the human-wildlife conflict.

The careful reintroduction of species can enhance the conservation value of the area and increase the marketability of the Nature Reserve. All reintroductions must be based on sound ecological principles. CapeNature must be consulted on the translocation and reintroduction of all fauna.

The unique Kammanassie gene of Cape mountain zebra (CMZ) occur naturally on the property. These animals face numerous risks such as: hybridisation with other equids, lack of access to natural drinking water, lack of access to suitable grazing, getting snared in internal fences and limited knowledge of distribution, breeding success and mortality rates. It is recommended that neighbouring landowners of the Kammanassie WHS and NR, who have Kammanassie CMZ on their property sign the Voluntary CMZ Custodianship Agreement with CapeNature which highlights sound CMZ Management Principles.

Small antelope (Cape Grysbok, Common (Grey) Duiker, Steenbok and Vaal (Grey) Rhebok) occur naturally in the area and move freely between farms. There is currently no need to manage these populations.

In managing these wildlife species, the following guiding principles should be maintained –

- Maintain only those species indigenous to your region.
- Remove extra-limital species from the property.
- Before reintroduction the following points need to be considered:
    - Was the desired species naturally resident in the area?
    - Why did the animal become extinct in the area?
    - Is that causal factor still a threat?
    - Is the habitat still suitable for the species?
    - What are the potential negative effects of the reintroduction?
    - Where is the nearest existing population?
- Obtain all necessary permits from CapeNature for game management.

WILDLIFE MANAGEMENT			
Objectives	To ensure effective conservation of faunal species (with special reference to the unique Kammanassie Cape mountain zebra), populations and inter-relationships and maintain and improve ecosystem functioning.		
Key Deliverable	**Management Activities**	**Responsibility**	**Timeframe**
Conserve the unique Kammanassie CMZ	• Sign Voluntary CMZ Custodianship Agreement with CapeNature. • Implement risk reduction measures for CMZ.	MA	Ongoing
Prevent the Introduction of alien species or hybridisation risks	• Formulate policy regarding domestic animals in the reserve. • No introduction of alien fish species into river systems. • No introduction of species which can hybridise with CMZ.	MA	Ongoing
Control alien and invasive, and hybridisation risk species	• Identify the occurrence of alien of hybridisation risk fauna on the reserve. • Monitor populations of alien or hybridisation risk fauna on the reserve. • Implement control measures where appropriate. • Measure success of control methods utilised.	MA/CapeNature	Ongoing

Manage the introduction and offtakes of fauna on the reserve	• Only introduce historically occurring species onto Rolbaken NR. • Ensure that the necessary permits are in place for the movement of any fauna.	MA/CapeNature	Ongoing
Monitor and evaluate the health of faunal populations.	• Keep records of CMZ numbers and distribution on Rolbaken NR.	MA/CapeNature	Ongoing
Monitor and evaluate the impact of fauna on the reserve.	• Keep records of herd animal numbers (include domestic stock) and distribution on the property. • Attention should be paid to the Nature Area Zone where restoration of old lands is taking place. Change can be observed by grass composition vs renosterbos. • Set up a photographic plot to monitor change.	MA	Ongoing

4.2 Sustainable utilisation of Natural Resources

4.2.1 Grazing and browsing of livestock and game

Objective Statement:

Game and livestock are effectively used as a management tool to ensure the health of natural vegetation.

Deliverables:

- Veld condition assessments are used to determine carrying capacity relative to climatic and rainfall cycles.
- A Grazing Plan is compiled which takes into consideration veld condition, stock numbers, stock breeds, herd size, camp sizes and grazing frequency per camp.
- Game and livestock numbers are managed to ecological carrying capacity.

Vegetation (natural rangelands) has evolved with indigenous grazers and browsers, and it is best to emulate their foraging habits. Under natural conditions, one would encounter a high concentration of animals of mixed feeding habits (bulk, selective and concentrate feeders) exerting high pressure on the vegetation and when the quantity of forage decreased, they moved off. The veld then had a period in which to recover and because all plants had been utilised equally the composition was not altered.

Where grazers and browsers have been contained, mismanagement of game numbers and game composition can not only alter vegetation species composition, reduce cover and cause erosion, but can also threaten biodiversity and the long-term financial viability of this production. The correct utilisation of vegetation by livestock and game is an essential

tool to maintain vegetation health and composition. Key factors to ensure that grazing and browsing has a beneficial impact include:

- Stocking rates Ha/SU [Hectares per Large Stock Unit (LSU) or Small Stock Unit (SSU)]
- Grazing camp size
- Duration that stock is held in the camp
- Camp rest interval

Long-term veld condition monitoring is essential to ensure that grazing and browsing activities have the desired outcome.

Rolbaken NR Stocking Rate calculations and recommendations:

The area accessible to game and stock for the purpose of this calculation is the Primitive Zone and the Nature Access Zone which makes up 462 hectares (ha).
The Agricultural Stocking Rate for the property taken from Farm Mapper (CFM3, 2024) is 66 ha per large stock unit (LSU) and the Ecological Stocking Rate which is to be implemented is (less 30%) 85.8 ha per LSU. The property can thus be stocked with 5.38 LSU or 32.26 SSU for 12 months of the year (1 LSU is equivalent to 6 SSU).

The above figures can be adapted to a 6-month stocking period or less, for example:

- Stocking 32.28 LSU for a 6-month period or, 48.42 LSU for a 3-month period.
- Stocking 64.56 SSU for a 6-month period or, 96.84 SSU for a 3-month period.

The veld should preferably be rested in spring and summer as far as possible and not be grazed by stock for 18 months after fire has occurred.

In the Nature Access zone where restoration of the old lands is taking place, an increased number of stock can be applied but the area will need to be temporarily fenced if this is to be implemented. Note that the number CMZ visiting the property needs to be taken into consideration as 1 CMZ is equivalent to 0,62 LSU. If the CMZ herds frequent the property on an ongoing basis then the number of stock will need to be reduced accordingly.

GRAZING AND BROWSING OF LIVESTOCK AND GAME			
Objectives	Game and livestock are effectively used as a management tool to ensure the health of natural vegetation.		
Key Deliverable	**Management Activities**	**Responsibility**	**Timeframe**
Veld condition assessments are used to determine carrying capacity relative to climatic and rainfall cycles.	• Reduce number of stock during below average dry periods or when presence of CMZ herds is more regular. • Fence areas where restoration of olds lands is taking place if stocking rates are to be increased.	MA	Ongoing
Compile Grazing plan which takes into	Compile and implement a grazing plan according to the stocking rates described in this section.	MA	Ongoing

consideration veld condition, stock numbers, stock breeds, herd size, camp sizes and grazing frequency per camp.			
Game and livestock numbers are managed to ecological carrying capacity.	Compile and implement a grazing plan according to the stocking rates described in this section.	MA	Ongoing

4.2.2 Recreation and tourism

Objective Statement:

To generate income from tourism businesses that make a sustainable contribution towards the conservation management costs of the reserve.

Deliverables:

- Viable tourism business model to guide tourism development and operations.
- A range of appropriate eco-tourism products and services are offered.
- Tourism infrastructure and operations do not have a negative impact on any of the conservation objectives of the reserve.
- Tourism infrastructure design and construction complies with development planning requirements.
- Profits from tourism operations make a meaningful contribution towards conservation management costs.

Recreation in natural areas is an excellent tool for reconnecting people with the environment. Besides the important educational function, it is also a possible income stream and there are several opportunities that can be developed without compromising the conservation integrity of the area.

In developing tourism within the protected area, the following guiding principles should be adhered to:

- Tourism products must be appropriate to the site's values and must not threaten its biodiversity or ecological function.
- In developing tourism products, requirements for environmental authorisation must be considered and adhered to.
- Tourism products should be designed to capitalise on the unique beauty and biodiversity features of the site.
- Tourism products should be developed in response to tourism market demands and opportunities within the site and should be carefully assessed to determine their viability.

RECREATION AND TOURISM			
Objectives	To generate income from tourism businesses that make a sustainable contribution towards the conservation management costs of the reserve.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Viable tourism business model to guide tourism development and operations.	• Draw up a business model as required. • All development needs to be done according to NEMA principles and applicable legislation and procedures of all relevant stakeholders.	MA	As required
A range of appropriate eco-tourism products and services are offered.	• Include the existing infrastructure which is a guest house and the old farmhouse. • Future development will be limited to the provision of outdoor recreation facilities in keeping with the Zonation plan and conservation ethics of management. These might include: - A basic camps site with rustic ablution facilities. - Self-catering chalets (2) - Hiking and mountain bike trails. - Bird hides.	MA	Ongoing and as required
Tourism infrastructure and operations do not have a negative impact on any of the conservation objectives of the reserve.	All new development needs to be done according to NEMA principles and applicable legislation and procedures of all relevant stakeholders.	MA	As required
Tourism infrastructure design and construction complies with development planning requirements.	All new development needs to be done according to NEMA principles and applicable legislation and procedures of all relevant stakeholders.	MA	As required
Profits from tourism operations make a meaningful contribution towards conservation management costs.	Ensure income generated contributes towards the operational management cost.	MA	Ongoing

4.2.3 Sustainable Harvesting

Objective Statement:

To ensure the sustainable use of natural plant resources in a manner that ensures the conservation of biodiversity and minimal ecological disturbance in the areas where harvesting operations occur.

Deliverables:

- Harvesting Plan with well managed harvesting activities.
- Possession of all necessary harvesting permits.
- Accurate and up-to-date records of all harvesting operations maintained.
- Monitor and evaluate long-term impacts of harvesting operations.

Sustainable harvesting is about satisfying today's demands without threatening the supply for future generations. Wildflower and thatch harvesting are recognised industries in the Western Cape and have the ability to provide sustainable income for the management of a protected area. In order to prevent the degradation of the system on which you rely, in it important to understand the autecology of the species and the ecological requirements of the vegetation type. It is important, therefore, to make certain that species are harvested in a manner that minimizes harvesting impact on individual populations. These standards are as follows:

- Ensure the broader vegetation type is correctly managed.
- Ensure that you harvest at the right time of the year.
- Protect the seed bank of the species, allowing continually regeneration.
- Do not introduce extra-limital species and cultivars or hybrids into natural vegetation. We should not create genetic instability and jeopardise the evolutionary outcome of existing species.
- A cautionary approach must be followed whereby an amount not exceeding 50 % of the flower heads produced on a yearly basis by a plant shall be removed.
- No harvesting may occur one year prior to a burn, or seeding plants between one and five years after a burn.
- Correct harvesting equipment that is in good working condition must be used at all times.
- No breaking or uprooting of plants is allowed.
- Binding twine must be transported in a closed container, and it is the responsibility of pickers to remove binding twine from their harvesting location.
- No litter must be left in the harvesting location.
- Maintain an exclusion block representative of all harvestable species utilized, to ensure population persistence

It is therefore important to ensure that Pickers, Supervisors or Contractors must have completed an accredited sustainable harvesting course. Skills development programs must be in place for all pickers that have not attended the course.
To ensure the sustainable use of natural plant resources in a manner that ensures the conservation of biodiversity and minimal ecological disturbance in the areas where harvesting operations occur.

SUSTAINABLE HARVESTING	
Objectives	To ensure the sustainable use of natural plant resources in a manner that ensures the conservation of biodiversity and minimal ecological disturbance in the areas where harvesting operations occur.

Key Deliverable	Management Activities	Responsibility	Timeframe
Monitoring	Identify and demarcate exclusion zones representative of harvestable species.	CapeNature	Ongoing
Harvesting plan with well-managed harvesting activities.	• Develop and implement a sustainable harvesting plan. • Map the boundaries of the property. • Divide the property into harvesting management zones. • Classify harvestable species according to Vulnerability Index. • Develop list of harvestable species as per floral licence on the property. • Classify harvestable species according to their distribution per management zone.	MA & CapeNature	Annually
Possession of all necessary harvesting permits.	• Adhere to the latest sustainable industry harvesting standards per species. • Where no industry standard exists use must be made of CapeNature guidelines. • Pickers/Contractors must be accredited. • Possession of valid CapeNature flora license. • Understanding of legislation relevant to protected flora.	MA	Annually and as required
Accurate and up-to-date records of all harvesting operations maintained.	• Daily harvesting record maintained. • Monthly harvesting records submitted. • Invoice and delivery note system maintained.	MA	Ongoing
Monitor and evaluate long-term impacts of harvesting operations.	Identify and demarcate exclusion zones representative of harvestable species.	MA and CapeNature	Ongoing

4.3 Socio-economic and heritage

4.3.1 Environmental Awareness and Education

Objective Statement:

Stakeholders receive an increased awareness and understanding of the importance and value of functioning ecosystems and an introduction to careers in eco-tourism, hospitality and nature conservation.

Deliverables:

- Increase awareness about the value of functioning ecosystems and conservation land use.
- Address specific management issues such as security, poaching, etc.
- Informal training and/or holiday camps provided to school groups.
- Formal career development training provided to potential employees

The protected area provides the ideal practical learning space to teach people about the value of nature and conservation. Whilst a degree of awareness and knowledge is likely to flow outwards from the reserve through the engagement of employees with the broader community, a dedicated environmental awareness and education programme is far more effective. Such programmes can achieve specific educational goals and therefore help to address key threats relating to human behaviour.

Management Activity: Develop a plan with Key Deliverables and Management Activities.

4.3.2 Socio-economic development initiatives

Objective Statement:

To work with relevant stakeholders to make a meaningful contribution towards the socio-economic development needs of local communities.

Deliverables:

- Eco-tourism guides, hospitality staff and conservators are sourced from local community.
- Community receives tangible value from the reserve.
- Positive relationships with key community role players and groups.

Poverty and the associated social issues are prevalent in most rural communities in South Africa and the protected area offers a location that can serve as a development node within the rural landscape. It is recommended that the Management Authority partner with other organisations and community groups to identify socio-economic development needs and then decide in which area to play a role. Expanding the reach of the *biodiversity economy* to achieve positive socio-economic impacts in the communities closest to the reserve should be a primary goal.

Management Activity: Develop a plan with Key Deliverables and Management Activities.

4.3.3 Heritage features

Objective Statement:

To locate, document, and conserve archaeological, paleontological and cultural heritage features on the reserve.

Deliverables:

- Systematically map and document all archaeological, paleontological and cultural features with input from experts.
- To support the study of on-reserve features by experts and to share knowledge and insights gained.
- To conserve the integrity of all archaeological and heritage features on the reserve.

The Management Authority is not only a custodian of the reserve in space, but also in time. The landscape in which the reserve is located has a number of paleontological, archaeological and cultural features that need to be discovered, understood and shared. Partnering with specialists in these fields is necessary to identify these features and ensure they are not damaged and that the sites are suitably preserved for further study.

HERITAGE FEATURES			
Objectives	To locate, document, and conserve archaeological, paleontological and cultural heritage features on the reserve.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Systematically map and document all archaeological, paleontological and cultural features with input from experts.	• Search for heritage features such as rock art sites. • Map features with inputs from experts.	MA and CapeNature	Ongoing
To support the study of on-reserve features by experts and to share knowledge and insights gained.	Collaborate with experts regarding any interesting features located on the Rolbaken NR.	MA and CapeNature	Ongoing as required.
To conserve the integrity of all archaeological and heritage features on the reserve.	• Heritage features should be managed according to the best practice guidelines. • Landowners should acquaint themselves and their staff with the necessary background information regarding sites on their properties. • Exercise access control to sites of special significance.	MA and CapeNature	Ongoing

4.4 Management Authority effectiveness and sustainability

The objectives in this key performance area are often overlooked in management plans as it is 'taken for granted' that the Management Authority has already addressed them in

other areas of their business. These objectives are however fundamentally important for the long-term, successful implementation of the protected area management plan.

4.4.1 Legal Compliance

Objective Statement:

To ensure all reserve declaration documentation is in order and that all activities are compliant with relevant legislation and policies.

Deliverables:

- Fully compliant with the Protected Area legislation.

Through the landowners of the protected area, the management authority has been mandated to enforce laws related to the conservation of the site, which prohibit particular activities. In fulfilling this role, the managers of Rolbaken Nature Reserve will adhere to the following guiding principles:

- The management authority will comply with its legal and reporting commitments, according to the NEM:PAA.
- The management authority will adhere to legislative requirements and permitting for all development, water management and biodiversity management activities.

LEGAL COMPLIANCE			
Objectives	To locate, document, and conserve archaeological, paleontological and cultural heritage features on the reserve.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Fully compliant with the Protected Area legislation.	Registration of title deed endorsements by a Notary through a Notarial Deed, and Notary to register it with the Deeds Office. .	MA and CapeNature	As required
	Ensure Conservation Area is rezoned to appropriate conservation zoning, e.g. Open Space III	MA and CapeNature	As required
	Conduct annual audits.	MA and CapeNature	Annually
	Implementation of annual review	MA and CapeNature	Annually
	Update of management plan	MA and CapeNature	When due
	Annual protected area management report to CapeNature	MA	Annually

All development needs to be done according to the NEMA principles and follow the applicable legislation and procedures of all relevant stakeholders.	MA	Ongoing
All water management within the Reserve must comply with the National Water Act (No 36 of 1998).	MA	Ongoing

4.4.2 Employee skills development

Objective Statement:

Managers and staff are supported in the implementation of the management plan by ensuring they have the necessary knowledge and skills to perform their management responsibilities.

Deliverables:

- Training needs are identified.
- Informal and/or formal training is provided.
- Management support and mentorship is provided.

The addition of specialised protected area management activities to the existing operations of the Management Authority often requires the acquisition of new knowledge and skills by the existing employees and management team on the property. It is the responsibility of the MA to assess the knowledge and skills of their human resources relative to the new/additional roles and responsibilities they are assigned and to identify and address knowledge and skills gaps.

In fulfilling this role, the managers of Rolbaken NR will carry out the following activities:

EMPLOYEE SKILLS DEVELOPMENT			
Objectives	To locate, document, and conserve archaeological, paleontological and cultural heritage features on the reserve.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Training needs are identified.	Identify the staff training needs in line with the requirements of their role and the performance management process.	MA	Ongoing
Informal and/or formal training is provided.	Implement formal (accredited / non-accredited) training.	MA/FPA	Ongoing
Management support and mentorship is provided.	• Implement informal on-the-job training and mentorship delivered by line managers. • Line managers' report on training/ mentorship provided.	MA	Ongoing

4.4.3 Infrastructure and equipment

Objective Statement:

The reserve has the necessary infrastructure and equipment to enable the cost-effective achievement of the management objectives.

Deliverables:

- Infrastructure needed to support personnel in implementing the management plan is in place.
- Personnel have the necessary vehicles and equipment to carry out management activities.
- Infrastructure is adequately maintained, and equipment serviced and kept in safe working order

In order for the reserve to operate appropriately, adequate infrastructure needs to be developed and maintained both for management and tourism purposes. In addressing infrastructure needs at the site, the following guiding principles will be adhered to:

- Infrastructure must be provided to ensure the effective management and operation of the nature reserve.
- Infrastructure must be maintained to avoid any damage to the environment and ensure the safety of staff and visitors to the site.

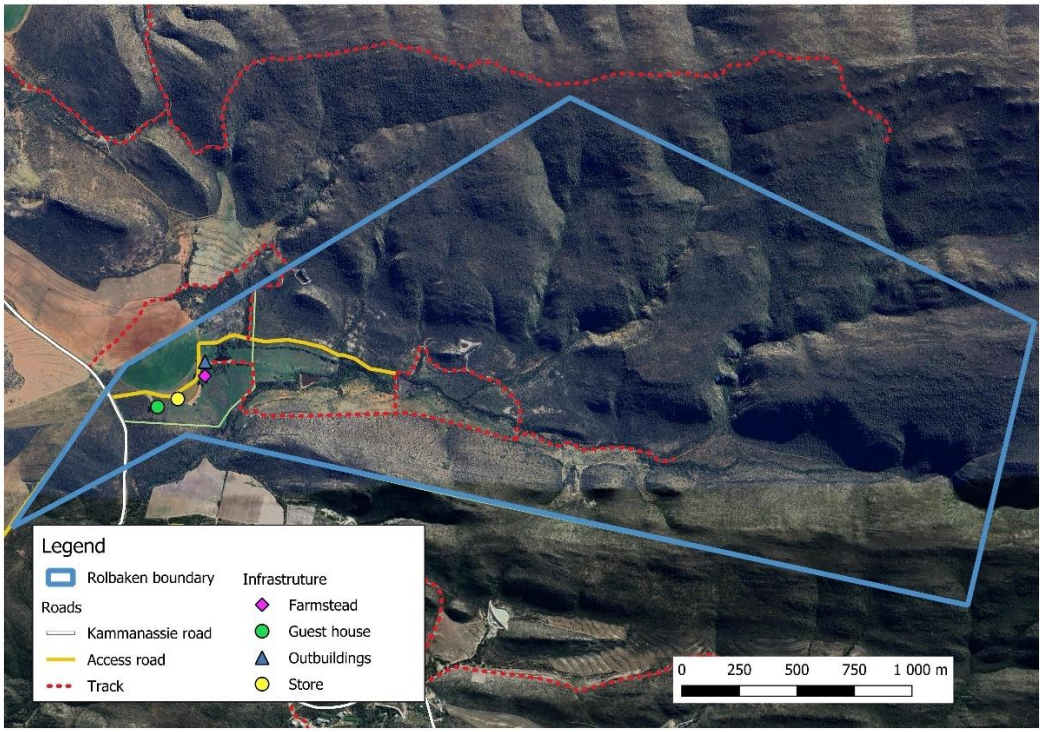


Figure 4.1 Infrastructure on Rolbaken Nature Reserve

INFRASTRUCTURE AND EQUIPMENT			
Objectives	The reserve has the necessary infrastructure and equipment to enable the cost-effective achievement of the management objectives.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Infrastructure needed to support personnel in implementing the management plan is in place.	• Draw up an infrastructure management schedule. • Maintain priority fences, roads and infrastructure according to schedule.	MA	Ongoing
Personnel have the necessary vehicles and equipment to carry out management activities.	• Allocate vehicles from the Leeublad farm Plan. • Ensure vehicles are available to carry out the necessary Management Activities	MA	Ongoing
Infrastructure is adequately maintained, and equipment serviced and kept in safe working order.	• Implement a holistic waste management programme. • Remove unnecessary fences where they can restrict animal movement of pose risks. • Collect and recycle all scrap metal & plastic materials from natural areas. • Compost all domestic organic waste. • Provide recycle bins for guests at the guesthouse and camp site.	MA	Ongoing

4.4.4 Signage, access control and security

Objective Statement:

Signage, access control and security measures are put in place that effectively address related threats.

Deliverables:

- The perimeter boundary of the reserve is clearly marked with fencing and signage.
- Access onto the property in remote areas is restricted with locked gates and controlled through a limited number of managed entry points.
- Security measures are put in place to address specific threats.

Access to the Nature Reserve needs to be controlled and conditions of entry for visitors into the Nature Reserve should be clearly stipulated on signboards at access points. Fencing needs to be effective in terms of demarcating the property boundary, restricting or allowing the movement of wildlife and livestock and performing a security function if required. Law enforcement efforts should be coordinated with the relevant authorities

including CapeNature and the South African Police Service in addressing offences and breaches of the law. Law enforcement at the site will be undertaken through surveillance, monitoring and appropriate reaction in the event of an offence.

SIGNAGE, ACCESS CONTROL AND SECURITY			
Objectives	Signage, access control and security measures are put in place that effectively address related threats.		
Key Deliverable	Management Activities	Responsibility	Timeframe
The perimeter boundary of the reserve is clearly marked with fencing and signage.	• Maintain clearly demarcated protected area boundary (fence if required). • Ensure appropriate signage along fence and at access points	MA & CapeNature	As required
Access onto the property in remote areas is restricted with locked gates and controlled through a limited number of managed entry points.	• Install lockable gates at access points	MA	As required
Security measures are put in place to address specific threats.	• Maintain a schedule of boundary fence patrols • Maintain records of illegal trespassing and poaching incidents. • Maintain membership of local security groups.	MA	As required

4.4.5 Research and management knowledge

Objective Statement:

Knowledge on how to achieve management objectives is gathered, documented and shared with the team to increase management effectiveness.

Deliverables:

- Address knowledge gaps through desk-top research, scientific research and getting advice from experts.
- Use increased knowledge and research findings to improve management effectiveness

In order to effectively achieve the intended outcomes of the management objectives, the Management Authority needs to apply sound knowledge and, at times, the findings of scientific research to determine the most effective management strategy. Much of this knowledge may historically reside with the management authority, however some

specialised insights may need to be gathered from partner organisations and/or subject matter experts.

In some cases, specific research may be required to determine the best course of action to achieve a desired outcome. Establishing partnerships with academic institutions, making the reserve an attractive site for student researchers and compiling a list of management problems that can be addressed by research projects will help to grow the knowledge base through scientific research.

RESEARCH AND MANAGEMENT KNOWLEDGE			
Objectives	Knowledge on how to achieve management objectives is gathered, documented and shared with the team to increase management effectiveness.		
Key Deliverable	Management Activities	Responsibility	Timeframe
Address knowledge gaps through desktop research, scientific research and getting advice from experts.	• Identify and document knowledge gaps. e.g. - Long-term weather records (rainfall) - Compile species lists - Historical records of land use • Establish strategic relationships with academic institutions and NPOs to address knowledge gaps through knowledge acquisition projects.	MA and CapeNature	Ongoing as required
Use increased knowledge and research findings to improve management effectiveness	• Ensure that the findings of all knowledge acquisition projects are translated into practical management best-practice guidelines. • Maintain records of all research projects / findings.	MA & CapeNature	Ongoing as required

5 Monitoring Plan

5.1 Monitoring and Evaluation

Objective Statement:

To gather data that can inform the reserves management strategy by monitoring threats, tracking progress towards the achievement of management objectives and prioritising budget allocation for management activities.

Deliverables:

- M&E requirements documented and responsibilities assigned.
- Monitoring activities implemented and data is captured, stored and collated.
- Monitoring data evaluated and management practices adapted based on insights.
- Improved effectiveness of management through learning and adaption.

Monitoring and evaluation are an essential component of the adaptive management process.

5.1.1 Ecological Monitoring

Long-term ecological monitoring, from a clear baseline, enables the reserve management team to determine if the implemented management activities are achieving the intended outcomes in terms of species conservation and ecological health. Additional ecological indicators may be required to effectively monitor species and ecosystem health.

5.1.2 Monitoring management effectiveness

Every action in the APO has a Key Performance Indicator and target. Monitoring and reporting on these targets enable the assessment of management effectiveness. These KPIs and targets can also be used to measure the performance of personnel responsible for implementing the different aspects of the management plan. During the annual review and planning workshop, performance against KPI targets must be assessed in order to accurately inform the actions in the following year's APO.

Table 5.1 Monitoring guideline for Rolbaken Nature Reserve

Management issue	Parameters to be monitored	Monitoring measures	Monitoring frequency	Responsibility	Reporting requirements
Baseline data	Veld condition, plant community composition and population health of endangered plant species.	Submission of Annual SOB Data	Annually	MA/CapeNature	Updated SOB database
	Establish a series of Fixed-Point Photography (FFP) Monitoring Plots	Photographic and Written Records	Annually	MA/CapeNature	Updated database
Fire management	Burning of firebreaks as part of fire management	Written record/map/photography	Annually	MA/SCFPA	Updated firebreak register
	Burning of blocks as part of controlled burning		Annually		Updated fire register
	Unplanned wildfires	Written record/map/photography	Per event		Updated fire register
	Conduct post-fire vegetation monitoring	Written record/map/photography	Per event		Post fire regeneration register
Invasive plant control	Areas subject to invasive plant control	Photographs/written record	Quarterly	MA	Updated SOB database
	State of areas in which invasive plants have been eradicated				
	Records of labour hours/days	Written record	Annually		APO register
	Herbicide usage	Written record	Annually		Herbicide register
Soil erosion control	Areas subject to erosion control	Photographs/written record	Quarterly	MA	APO register
	State of rehabilitated areas of erosion				APO register
Species of special concern	Numbers, Distribution, Risks	Written Records	Monthly	MA	Updated SOB database
Wildlife	Numbers, Distribution and Condition, Risks	Written Records	Monthly	MA	Updated SOB database
Grazing & browsing	Numbers, Distribution and Condition	Written Records	Monthly	MA	Updated SOB database

Sustainable harvesting	Daily harvesting record maintained. Monthly harvesting records submitted. Invoice and delivery note system maintained.	Written Records	Per event	MA	Register
Law enforcement / security	No of incidents. No of Patrols.	Written Records	Monthly	MA	Compliance Register
Facilities and infrastructure	State of roads, paths, fences and dams	Photographs/written records	Annually	MA	Infrastructure register
	State of facilities and service infrastructure	Maintenance schedule/written records	Monthly	MA	Infrastructure register
	Pollution events	Photographs/written records	Per event		Record of event

6 Implementing the Strategic Management Plan

6.1 Five-year Costing Plan

Below is an estimated breakdown of management costs for each management objective over the ten-year period of this Strategic Management Plan. The figures listed below are considered to be realistic in-terms of the Management Authorities forecasted budget at the time of drafting this plan. The detailed budgets in the successive Annual Plans of Operation will override this costing estimate.

Table 6.1 Estimated annual management cost breakdown.

Management objectives	2024	2025	2026	2027	2028
1. Wildfire	R 2000.00	R 2140.00	R2290.00	R 2450.00	R2622.00
2. Invasive Alien Plants	R 3000.00	R3210.00	R3435.00	R3675.00	R3932.00
3. Rehabilitation and restoration	R 3000.00	R3210.00	R3435.00	R3675.00	R3932.00
4. Aquatic and riparian systems					
5. Species of special concern	R 1000.00	R1070.00	R1145.00	R1225.00	R1311.00
6. Wildlife					
7. Grazing and browsing of livestock and game	R 1000.00	R1070.00	R1145.00	R1225.00	R1311.00
8. Recreation and tourism	R 2000.00	R 2140.00	R2290.00	R 2450.00	R2622.00
9. Sustainable Harvesting					
10. Environmental Awareness and Education	R 2000.00	R 2140.00	R2290.00	R 2450.00	R2622.00
11. Socio-economic development initiatives					
12. Heritage features					
13. Legal Compliance					
14. Employee skills development	R 3000.00	R3210.00	R3435.00	R3675.00	R3932.00
15. Infrastructure and equipment	R 10000.00	R10 700.00	R11449.00	R12250.00	R13108.00
16. Signage, access control and security	R 1000.00	R1070.00	R1145.00	R1225.00	R1311.00
17. Research and management of knowledge	R 1000.00	R1070.00	R1145.00	R1225.00	R1311.00
Estimated Annual Management Cost:	**R29 000.00**	**R31 030.00**	**R33 202.00**	**R35 526.00**	**R38 013.00**

* [1] Estimate. Soil erosion budget is dependent on assessment of priority sites in YR1 and YR6.
* [2] IAP control budget is dependent on individual landowner assessments in YR2 and budgets.
* TBD - 'To be determined'.

6.2 The Annual Review and Planning Workshop

6.2.1 Management Plan Review

The purpose of undertaking an annual review of implementation of the protected area management plan will be to:

- Determine how effectively the management plan has been implemented.
- Assist in determining the focus for the annual plan of operation and the setting of appropriate time frames and budgets.
- Enable effective adaptive management by identifying changes and modifying management interventions.

The annual audit will form the basis of the management plan review. This should include records of recommendations for update/changes to the annual revision of the management schedules as well as the five-year plan. The Annual Plan of Operation (APO) is in a similar format to the Annual Audit See Appendix D below, allowing for a seamless transition of information from Audit to new APO.

6.3 The Annual Plan of Operation

The Annual Plan of Operation (APO) forms an integral part (Part B) of the Protected Area Management Plan. The APO is documented within an associated excel spreadsheet (as shown in Annexure E) for the following reasons:

- to allow for ease of use as a management tool;
- to facilitate updates and changes;
- to simplify the annual audit process;
- to simplify the drafting of subsequent versions of the APO after the annual review and planning workshop.

6.3.1 Drafting the next year's APO

Either as part of the review process or directly after the review, the reserve management team should compile the list of management actions for the following years APO.

The following steps should be taken:

- Review performance of previous year's management actions under each Management Objective. Make note of actual performance relative to the KPI targets set. Discuss challenges experienced and ways to overcome them.

- You can now revise the KPI targets, Person responsible, Budget and Deadlines if necessary. If the KPI used previously was found to be an ineffective indicator, specify a new KPI.
- Systematically work through the APO in this manner one management objective at a time.

6.4 Five-year revision of the Strategic Management Plan

Legislation stipulates a maximum of a five-year management period prior to the revision of the (Part A) Strategic Management Plan (SMP). The SMP can be revised after a shorter management period and this is recommended for a newly establish Nature Reserve where significant management outcomes and infrastructure development is taking place.

7 References

Acocks, J.P.H. (1975) Veld Types of South Africa. Memoir of the Botanical Survey of South Africa No.40. Department of Agricultural Technical Services, Pretoria.

Botha, C.G. (1924). Note on early veld burning in the Cape Colony. South African Journal of Science 21: 351-352.

Brown, J.C. (1875). Hydrology of South Africa. John Crawford, Kirkaldy, UK.

Carbutt, C. and Goodman, P.S. (2010) Assessing the Management Effectiveness of State-owned, Land-based Protected Areas in Western Cape. CapeNature unpublished report, Pietermaritzburg. pp. 1-67.

Camp, K.G.T. (1998) The bioresource units of Western Cape. Cedara report N/A95/32. KZN Department of Agriculture.

CapeNature. (2010) KZN Protected Area Expansion Strategy and Action Plan (2009-2028). CapeNature unpublished report, Pietermaritzburg. pp. 1-63.

Cowan, G.I. (2006) Guidance for the development of management plans in terms of the National Environmental Management: Protected Areas Act (Act 57 of 2003). Department of Environmental Affairs and Tourism, Pretoria.

Department of Environmental Affairs and Tourism (2008) The National Protected Area Expansion Strategy 2008-2012. Pretoria.

Esler, K.J., Pierce, S.M. & de Villiers, C. (2014). Fynbos: Ecology and Management. Briza Publications, Pretoria.

Garden Route District Municipality (formerly Eden District Municipality) (2017). Eden District Spatial Development Framework. https://www.gardenroute.gov.za/document-category/spatial-development-framework/. Accessed 4 June 2024.

Garden Route District Municipality (2022). Integrated Development Plan 2022 -2027. https://www.gardenroute.gov.za/document-category/integrated-development-plans/. Accessed 4 June 2024.

Goldblatt, P. and Manning, J. (2000) Cape Plants. A conspectus of the Cape flora of South Africa. Strelitzia 9.

Goodman P.S. (2011) CapeNature Norms and Standards: Surveillance and Monitoring Plans for Biodiversity. CapeNature unpublished report, Pietermaritzburg.

Hardy, M.B., Barnes, D.L., Moore, A. and Kirkman, K.P. (1999) The management of different types of veld. In Tainton, N.M. (ed) Veld Management in South Africa. University of Natal Press, Pietermaritzburg.

Klein, R.G. (1974). Environment and subsistence of prehistoric man in the southern Cape Province, South Africa. World Archaeology 5 (3): 249-284.

Kruger F.J., Bigalke R.C. (1984) Fire in fynbos. In 'Ecological effects of fire in South African ecosystems.' (Eds P.V. Booysen, N.M. Tainton) Ecological Studies 48, 67–114 (Springer-Verlag: Berlin)

Mossop, E.E. (1927). Old Cape Highways. Cape Town. Maskew Miller Limited.

Mucina, L. and Rutherford, M.C. (eds.) (2006). The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, South African National Biodiversity Institute, Pretoria.

O'Connor, T.G. and Bredenkamp, G.J. (1997) Grassland. In Cowling, R.M., Richardson, D.M. and Pierce, S.M. (eds) Vegetation of Southern Africa. Cambridge University Press, United Kingdom.

O'Connor, T.G. (2005) Influence of land use on plant community composition and diversity in Highland Sourveld grassland in the southern Drakensberg, South Africa. Journal of Applied Ecology, 42, 975-988.

Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. (2017). The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.

South African National Biodiversity Institute and the Department of Environmental Affairs. 2010. National Protected Areas Expansion Strategy for South Africa; Priorities for expanding the protected area network for ecological sustainability and climate change adaptation. Published by the Government of South Africa, Pretoria, 2010. ISBN 978-1-919976-55-6

Schweitzer, F.R. and Scott, K. (1973). Early occurrence of domestic sheep in sub-Saharan Africa. Nature 241, 547.

Scott-Shaw, C.R. (1999) Rare and threatened plants of Western Cape and neighbouring regions. Western Cape Nature Conservation Services, Pietermaritzburg.

Skowno, A.L., Holness, S.D., Desmet, P.G., (2010). Biodiversity Assessment of the Kannaland and Oudtshoorn Local Municipalities, and Eden District Management Area (Uniondale). Unpublished DEADP Report Number: LB07/2008a.

Snyman, H.A. (2004) Short-term influence of fire on seedling establishment in a semi-arid grassland of South Africa. South African Journal of Botany, 70(2), 215-226.

Stolton, S., Hockings, M., Dudley, N., MacKinnon, K., Whitten, T. and Leverington, F. (2007) Management Effectiveness Tracking Tool: reporting progress at protected area sites (2nd edition). World Bank and WWF Forest Alliance.

Thompson, W.R. (1936). Veld Burning: its history and importance in South Africa. Internal Publication, University of Pretoria, Pretoria. 19 pp. Series 1 (31).

Trollope, W.S.W. (1999) Veld Burning. In Tainton, N.M. (ed) Veld Management in South Africa. University of Natal Press, Pietermaritzburg.

Turner, A. A. (ed.) 2012. Western Cape Province State of Biodiversity 2013. CapeNature Scientific Services, Stellenbosch.

Vlok, J.H.J., Cowling, R.M. & Wolf, T. (2005). A vegetation map for the Little Karoo. Unpublished maps and report for a SKEP project supported by CEPF Grant No. 1064410304. 237 pp.

Vromans, D.C., Maree, K.S., Holness, S.D., Job, N. and Brown, A.E. (2010). The Garden Route Biodiversity Sector Plan for the George, Knysna and Bitou Municipalities. Supporting land-use planning and decision-making in Critical Biodiversity Areas and Ecological Support Areas for sustainable development. Garden Route Initiative. South African National Parks. Knysna.

Wicht CL, Kruger FJ (1973) Die ontwikkeling van bergveldbestuur in Suid Afrika. South African Forestry Journal vol. 86, issue 1 pp. 1 - 17. https://doi.org/10.1080/00382167.1973.9629297

8 Appendices

8.1 APPENDIX A - List of statutes to which the Nature Reserve is subject

Biodiversity and Cultural Resource Management and Development:

- Animals Protection Act [No. 71 of 1962]
- Atmospheric Pollution Prevention Act [No. 45 of 1965]
- Conservation of Agricultural Resources Act [No. 43 of 1983]
- Constitution of the Republic of South Africa [No. 108 of 1996]
- Criminal Procedures Act [1977]
- Environment Conservation Act [No. 73 of 1989]
- Forest Act [No. 122 of 1984]
- Hazardous Substances Act [No. 15 of 1973]
- Western Cape Heritage Management Act [No. 10 of 1997]
- Western Cape Nature Conservation Management Act [No. 9 of 1997]
- National Environmental Management Act [No. 107 of 1998]
- National Environmental Management: Biodiversity Act [No. 10 of 2004]
- National Environmental Management: Protected Areas Act [No. 57 of 2003]
- National Forests Act [No. 84 of 1998]
- National Heritage Resources Act [No. 25 of 1999]
- National Water Act [No. 36 of 1998]
- National Water Amendment Act [No. 45 of 1999]
- National Veld and Forest Fire Act [No 101 of 1998]
- Nature Conservation Ordinance [No. 15 of 1974]

General Management:

- Companies Act [No.71 of 2008]
- Promotion of Access to Information Act [No. 2 of 2000]
- Occupational Health and Safety Act [No. 85 of 1993]
- Western Cape Planning and Development Act [No. 5 of 1998]
- Development Facilitation Act [No. 67 of 1995]

- Disaster Management Act [No. 57 of 2002]
- Fire Brigade Services Act [No. 99 of 1987]
- Local Government: Municipal Systems Act [No. 32 of 2000]
- National Road Traffic Act [No. 93 of 1996]
- National Building Standards Act [No. 103 of 1977]
- Water Services Act [No. 108 of 1997]

Human Resource Management:

- Basic Conditions of Employment Act [No. 75 of 1997]
- Broad-Based Black Economic Empowerment Act [No. 53 of 2003]
- Compensation for Occupational Injuries and Diseases Act [No. 130 of 1993]
- Employment Equity Act [No. 55 of 1998]
- Labour Relations Act [No. 66 of 1995]
- Occupational Health and Safety Act [No. 85 of 1993]
- Pension Funds Act [No. 24 of 1956]
- Skills Development Act [No. 97 of 1998]
- Skills Development Levies Act [No. 9 of 1999]
- Unemployment Insurance Act [No. 63 of 2001]

8.2 APPENDIX B - Copy of Rolbaken Nature Reserve declaration

P.N. 265/2013 16 August 2013

WESTERN CAPE NATURE CONSERVATION BOARD

NOTICE

NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT, NO. 57 OF 2003

DECLARATION OF THE ROLBAKEN NATURE RESERVE

I, Anton Bredell, Provincial Minister of Local Government, Environmental Affairs and Development Planning in the Western Cape, under section 23(1) of the National Environmental Management: Protected Areas Act, No. 57 of 2003, declare a nature reserve on:-

Remainder of the Farm Rietfontein No. 12, situated in the Eden District Municipality, Division of George, Western Cape Province, measuring 509, 0316 (Five Hundred and Nine comma Zero Three One Six) hectares in extent and held by Deed of Transfer No. T95468/2004.

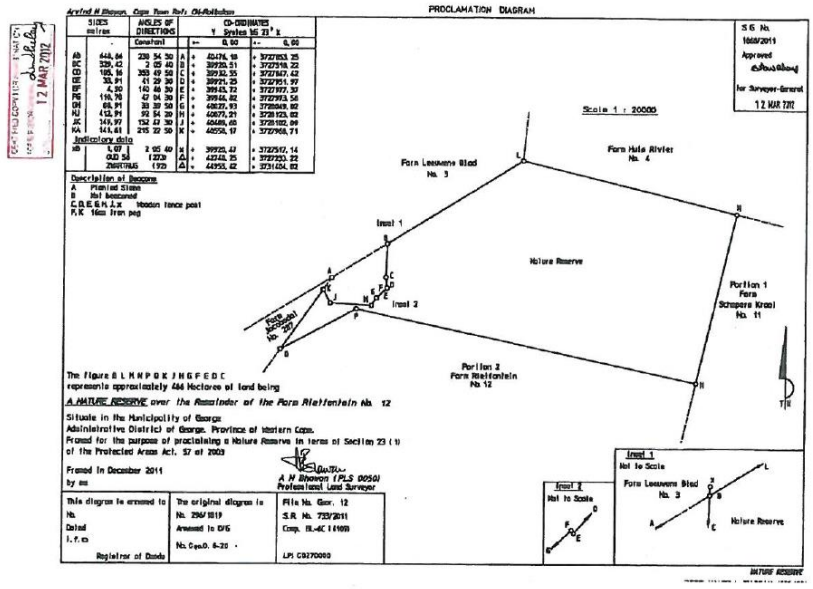
The boundary of the nature reserve is reflected on Diagram No. 1868/2011 as set out in the Schedule, and I assign the name **"Rolbaken Nature Reserve"** to it.

Signed at CAPE TOWN this 6th day of AUGUST 2013.

A BREDELL, MINISTER OF LOCAL GOVERNMENT, ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING

SCHEDULE

DESCRIPTION OF PROPERTY



8.3 APPENDIX C - Species lists

Available species lists for the site should be included in this appendix. These should include:

- Plant species lists.
- General fauna lists (e.g. mammals, herpetofauna, invertebrates).
- Bird lists.
- Specific lists of listed threatened species.

Species recorded from the Kammanassie WHS and NR and adjacent areas.

Plant list

Plant species of special concern recorded from the Kammanassie WHS and NR and adjacent areas. Conservation status as per SANBI Red list http://redlist.sanbi.org/

Scientific Name	Conservation Status SANBI Redlist http://redlist.sanbi.org/ accessed 02/08/24
Acmadenia maculata	NT
Agathosma spinosa	Rare
Alepidea delicatula	Rare
Amphithalea axillaris	NT
Aspalathus congesta	Rare
Aspalathus patens	Rare
Aspalathus sp. nov.	VU
Bobartia paniculata	Rare
Cyclopia alopecuroides	EN
Cyclopia plicata	EN
Disa elegans	LC
Disa lugens	EN
Disa pillansii	LC
Elegia altigena	VU
Erica annalis	Critically Rare
Erica costatisepala	Rare
Erica inordinata	Rare
Erica kammanassieae	Critically Rare
Erica montis-hominis	VU
Erica valida	Rare
Felicia esterhuyseniae	Rare
Geissorhiza elsiae	Rare
Geissorhiza uliginosa	Rare
Gladiolus fourcadei	EN
Gladiolus leptosiphon	VU
Hoodia pilifera subsp. pilifera	VU
Hymenolepis sp. nov.	VU

Lachenalia haarlemensis	VU
Leucadendron rourkei	LC
Leucadendron singulare	VU
Liparia genistoides	EN
Manulea derustiana	VU
Otholobium racemosum	Rare
Oxalis fourcadei	Rare
Oxalis ioeides	DDD
Paranomus esterhuyseniae	NT
Pelargonium denticulatum	Rare
Phylica floccosa	Rare
Protea grandiceps	NT
Protea montana	VU
Protea rupicola	EN
Protea venusta	EN
Relhania decussata syn. Oedera decussata	Rare
Romulea jugicola	VU
Romulea vlokii	VU
Syncarpha montana	Rare
Syringodea derustensis	VU

Mammal list

Scientific name	Common name
Elephantulus edwardii	Cape rock elephant-shrew
Papio hamadryas	Chacma baboon
Lepus capensis	Cape hare
Pronolagus saundersiae	Hewitt's red rock rabbit
Hystrix africaeaustralis	Porcupine
Acomys subspinosus	Cape spiny mouse
Aethomys namaquensis	Namaqua rock mouse
Dendromus melanotis	Grey climbing mouse
Myomyscus verreauxi	Verreaux's mouse
Mystromys albicaudatus	White-tailed mouse
Otomys irroratus	Vlei rat
Rhabdomys pumilio	Striped mouse
Graphiurus ocularis	Spectacled dormouse
Caracal caracal	Caracal
Felis silvestris	African Wild Cat
Panthera pardus	Leopard
Canis mesomelas	Black-backed jackal
Otocyon megalotis	Bat-eared fox
Aonyx capensis	African clawless otter
Mellivora capensis	Honey badger
Galerella pulverulenta	Cape grey mongoose
Orycteropus afer	Aardvark

Procavia capensis	Rock dassie
Equus zebra zebra	Cape Mountain zebra
Oreotragus oreotragus	Klipspringer
Pelea capreolus	Grey rhebuck
Raphicerus campestris	Steenbok
Raphicerus melanotis	Grysbok
Redunca fulvorufula	Mountain reedbuck
Sylvicapra grimmia	Common duiker
Tragelaphus strepsiceros	Kudu
Potamochoerus larvatus	Bushpig
Crocidura flavescens	Greater red musk shrew

Bird list

Scientific name	Common name
Tadorna cana	South African Shelduck
Falco peregrinus	Peregrine Falcon
Falco rupicoloides	Greater Kestrel
Accipiter rufiventris	Rufous-chested Sparrowhawk
Aquila pennatus	Booted Eagle
Aquila verreauxii	Verreaux's Eagle
Buteo rufofuscus	Jackal Buzzard
Buteo vulpinus	Steppe Buzzard
Circus maurus	Black Harrier
Hieraaetus pennatus	Booted Eagle
Melierax canorus	Southern Pale Chanting Goshawk
Francolinus africanus	Greywing Francolin
Streptopelia capicola	Cape Turtle-dove
Streptopelia semitorquata	Red-eyed Dove
Tauraco corythaix	Knysna Turaco
Dendropicos fuscescens	Cardinal Woodpecker
Geocolaptes olivaceus	Ground Woodpecker
Chaetops frenatus	Cape Rock-jumper
Cossypha caffra	Cape Robin-Chat
Monticola explorator	Sentinel Rock-Thrush
Oenanthe monticola	Mountain Wheatear
Saxicola torquata	African Stonechat
Turdus olivaceus	Olive Thrush
Bradypterus victorini	Victorin's Warbler
Cisticola subruficapilla	Grey-backed Cisticola
Prinia maculosa	Karoo Prinia
Sphenoeacus afer	Cape Grassbird
Motacilla capensis	Cape Wagtail
Dryoscopus cubla	Black-backed Puffback
Tchagra tchagra	SouthernTchagra
Telophorus zeylonus	Bokmakierie

Promerops cafer	Cape Sugarbird
Anthobaphes violacea	Orange-breasted Sunbird
Cinnyris afra	Greater Double-collared Sunbird
Nectarinia chalybea	Lesser Doublecollared Sunbird
Nectarinia famosa	Malachite Sunbird
Zosterops pallidus	Cape White-eye
Euplectes capensis	Yellow Bishop
Euplectes orix	Southern Red Bishop
Ploceus velatus	Southern Masked-Weaver
Alario alario	Black-headed Canary
Emberiza capensis	Cape Bunting
Emberiza tahapisi	Cinnamon-breasted Bunting
Pseudochloroptila totta	Cape Siskin
Serinus leucopterus	Protea Seedeater
Lanius collaris	Common Fiscal

Herpetofauna (Amphibian and Reptile) lists

FrogMAP — Frog Atlas of Southern African
4 species found for locus = 3322DA. Date filter: Year collected/observed >= 1980

Scientific name	Common name
Vandijkophrynus gariepensis	Karoo Toad (subsp. gariepensis)
Xenopus laevis	Common Platanna
Amietia fuscigula	Cape River Frog
Strongylopus grayii	Clicking Stream Frog

ReptileMAP — Reptile Atlas of Southern Africa
17 species found for locus = 3322DA. Date filter: Year collected/observed >= 1980

Scientific name	Common name
Agama atra	Southern Rock Agama
Cordylus cordylus	Cape Girdled Lizard
Karusasaurus polyzonus	Karoo Girdled Lizard
Pseudocordylus microlepidotus	Cape Crag Lizard
Pseudocordylus microlepidotus	Cape Crag Lizard (subsp. ?)
Afrogecko porphyreus	Marbled Leaf-toed Gecko
Chondrodactylus bibronii	Bibron's Gecko
Pachydactylus geitje	Ocellated Gecko
Pachydactylus maculatus	Spotted Gecko

Pachydactylus oculatus	Golden Spotted Gecko
Gerrhosaurus typicus	Karoo Plated Lizard
Pedioplanis burchelli	Burchell's Sand Lizard
Pedioplanis namaquensis	Namaqua Sand Lizard
Duberria lutrix	South African Slug-eater
Trachylepis homalocephala	Red-sided Skink
Trachylepis sulcata	Western Rock Skink
Chersina angulata	Angulate Tortoise

Invertebrate list

DungBeetleMAP — Atlas of Dung Beetles in southern Africa.
1 species found for locus = 3322DA. Date filter: Year collected/observed >= 1980

Genus	Species	Common name	Red list category	No. records
Onthophagus	giraffa		Not listed	1

LacewingMAP — Atlas of the Neuroptera and Megaloptera
1 species found for locus = 3322DA. Date filter: Year collected/observed >= 1980

Genus	Species	Common name	Red list category	No. records
Nephoneura	collusor	Owlfly	Not listed	1

LepiMAP — Atlas of African Lepidoptera
26 species found for locus = 3322DA. Date filter: Year collected/observed >= 1980

Genus	Species	Common name	Red list category	No. records	Atlas region endemic
Aloeides	depicta	Depicta copper	Least Concern (SABCA 2013)	2	Yes
Aloeides	juana	Juana copper	Least Concern (SABCA 2013)	2	Yes
Aloeides	pierus	Dull copper	Least Concern (SABCA 2013)	1	Yes
Cacyreus	fracta	Water geranium bronze	Least Concern (SABCA 2013)	1	
Cacyreus	lingeus	Bush bronze	Least Concern (SABCA 2013)	1	

Genus	Species	Common name	Red list category	No. records	Atlas region endemic
Capys	alpheus	Orange banded protea	Least Concern (SABCA 2013)	3	Yes
Chrysoritis	chrysaor	Burnished opal	Least Concern (SABCA 2013)	1	Yes
Chrysoritis	plutus	Plutus' opal	Least Concern (SABCA 2013)	5	Yes
Chrysoritis	zeuxo	Cottrell's daisy copper	Least Concern (SABCA 2013)	2	Yes
Durbaniella	clarki	Clark's rocksitter	Least Concern (SABCA 2013)	1	Yes
Eicochrysops	messapus	Cupreous blue	Least Concern (SABCA 2013)	2	
Lampides	boeticus	Pea blue	Least Concern (SABCA 2013)	1	
Lepidochrysops	asteris	Brilliant blue	Least Concern (SABCA 2013)	1	Yes
Lepidochrysops	balli	Ball's blue	Least Concern (SABCA 2013)	2	Yes
Lepidochrysops	braueri	Brauer's blue	Least Concern (SABCA 2013)	4	Yes
Lepidochrysops	robertsoni	Robertson's blue	Least Concern (SABCA 2013)	1	Yes
Leptomyrina	lara	Cape black-eye	Least Concern (SABCA 2013)	3	
Thestor	murrayi	Murray's skolly	Least Concern (SABCA 2013)	1	Yes
Trimenia	argyroplaga	Large silver-spotted copper	Least Concern (SABCA 2013)	1	
Cassionympha	detecta	Cape brown	Least Concern (SABCA 2013)	3	Yes
Charaxes	pelias	Protea charaxes	Least Concern (SABCA 2013)	1	Yes
Pseudonympha	trimenii	Trimen's brown	Least Concern (SABCA 2013)	2	Yes
Stygionympha	irrorata	Karoo hillside brown	Least Concern (SABCA 2013)	1	
Tarsocera	fulvina	Karoo widow	Least Concern (SABCA 2013)	1	Yes
Vanessa	cardui	Painted lady	Least Concern (SABCA 2013)	2	
Pontia	helice	Common meadow white	Least Concern (SABCA 2013)	3	

ScorpionMAP — Atlas of African Scorpions
1 species found for locus = 3322DA. Date filter: Year collected/observed >= 1980

Genus	Species	Common name	Red list category	No. records
Uroplectes	triangulifer		Not listed	1

8.4 APPENDIX D – Zonation and special management overlay categories

8.4.1 Zonation categories

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Wilderness / Wilderness (declared)	Conservation: To limit visitor numbers and use to minimise impact. Minimal management intervention for visitor or biodiversity management. Include sensitive or threatened habitats & species in this low use zone when contiguous sites meet the criteria for wilderness Users: To provide an experience of solitude in pristine landscapes with minimal evidence of human presence or use.	Completely wild and rugged landscapes (or being restored to this). 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. Area must meet the definition and requirements of the National Environmental Management: Protected Areas Act 57 of 2003. If formally declared in terms of the act, zone = "Wilderness (declared)"; if not = "Wilderness".	"Leave-no-trace" activities: Overnight hiking, without any sleeping facilities, formal campsites, or with only basic, unserviced shelters. "Carry in, Carry out" principle for all food and waste. Guided or unguided nature observation. No fires	No infrastructure of any type if possible. No roads or vehicle tracks. No structures except small existing buildings of cultural, historic or aesthetic value. These can be used as unserviced sleeping shelters for hikers & provided with composting toilets. Narrow permanent walking trails. No signage except small, unobtrusive markers for closed routes, or at trail junctions. NB – in the mountainous, slow-growing fynbos of the Western Cape, the traditional wilderness concept of access without defined trails is unsafe and rapidly results in undesirable user-created trails and erosion.	Unguided visitor access only on foot. Visitors have freedom to use various trails. Use of donkeys, horses or other animals with an official guide only on designated historical routes and trails, or existing roads, and only where this will not cause trampling, erosion or any degradation. Limits on visitor numbers and/or control of routes and access so that zone objectives are met. 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. No fires No vehicle access No access without zone permit	Visitor Management: Manage to conserve natural and cultural resources, ecological processes and wilderness integrity. Leave no trace ethic Restrict numbers of visitors and allow for no-use rest periods if required. Limited management interventions. Management measures may be carried out in extreme conditions, but tread lightly principles must apply. 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. Conservation Management: Habitats with minimal management requirements, typically natural burning zones. Prevent or restore visible trampling or any other impact. Rehabilitate non-essential roads to natural vegetation. Re-zone essential roads out of Wilderness Zoning. Consumptive Use: Not compatible

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Primitive	***Conservation:*** To limit visitor use, numbers and infrastructure to minimise 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 ***Users:*** To provide an experience of solitude in natural landscapes with little nearby evidence of human presence. Can provide access to and buffer Wilderness Zones	Intrinsically wild appearance & character. Areas where users will seldom encounter other human groups or presence. Any visible human impact or infrastructure inside the zone is unobtrusive. Human activities outside zone may be audible or visible in places. Areas remote from management centres, or otherwise difficult or expensive to access for management. Areas that might not meet the criteria for Wilderness but can serve as undeveloped visual buffers for Wilderness. 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.	Guided or unguided nature observation Primarily intended for hiking or walking access. Only allows for 4x4 routes and if specifically considered and noted. Only allows for non-hiking accommodation node if specifically considered and noted.	Deviation from the natural and/or pristine state to be minimised[1] No visible infrastructure in Wilderness viewsheds. May provide isolated, small, unobtrusive accommodation facilities for up to 16 guests on restricted footprints, particularly for overnight hiking trails. May have defined or beaconed hiking routes, management access roads, tracks and firebreaks. Roads for visitor use may only be existing roads or new routes that also allow access for essential management needs. All roads, tracks or trails should be located and constructed to reduce maintenance, visibility and erosion. Where unsurfaced tracks will result in erosion, use double concrete strip or interlocking pavers to stablise. Re-route unstable or erosion-prone road sections if this will lower long-term visual and environmental impact. Avoid full width tarred or surfaced roads or roads and tracks wider than required for a single vehicle.[2]	Visitor access only by permit. Control of visitor numbers, frequency and group sizes to meet zone objectives. Only users of facilities/activities will access to this zone. Defined or non-defined hiking and day trail routes On foot always, or by bicycle, 2x4 or 4x4 vehicle on designated routes. No access without zone permit	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. 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 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. Visible & audible human impacts from adjacent zones should be mitigated Conservation Management: 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. Consumptive Use: Sustainable use can be appropriate under controlled circumstances subject to a formal assessment and application in accordance with CapeNature policies.

[1] CapeNature should embark on a work shopping exercise to determine more explicit thresholds for development, including road infrastructure in this and other zones. Until this time, take a precautionary approach to maintain the zone objective and characteristics.

2 But do consider the safety requirements for access of more than one vehicle at a time for fire-fighting or rescue operations. Where a dedicated escape route might be required for tourism infrastructure, consider whether the additional road impact now or in the future is warranted.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Nature Access	***Conservation:*** To manage and direct visitor use, and plan infrastructure to minimise impact on sensitive environments. To actively manage users and visitor impacts. Allows for minimal or more intensive biodivesrity management intervention. Provide additional protection to sensitive or threatened habitats, species or other features by Special Management Overlays ***Users:*** To provide easy access to natural landscapes with low expectation of solitude at all times. Can buffer wilderness or Primitive Zone.	Areas with extensive lower senstivity habitats: Areas able to accommodate higher numbers of visitors regularly, with no identified sensitive or regionally rare biodiversity. 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.	Guided or unguided nature observation. Day hiking trails and/or short trails. Bird hides, canoeing, mountain biking & rock-climbing where appropriate. Other activities if specifically considered and approved as part of specific reserve zoning scheme. Motorised 2x4 self-drive access on designated routes. No accommodation or camping. Frequent interaction with other users.	Some deviation from natural/pristine state allowed particularly on less sensitive or already disturbed/transformed sites. No accommodation; but ablution facilities may be provided. May have defined or beaconed hiking routes, tourism and management access roads, and management tracks and firebreaks. Infrastructure should be designed to reduce impacts of higher visitor numbers. Roads open to the public should be accessible by 2x4 sedan. Full width tarred or surfaced roads or roads and tracks to accommodate two vehicles are appropriate. Unsurfaced roads may be surfaced if a road planning exercise has confirmed that the location is suitable.	No special access control or permits required for this zone. Will cater for larger number of visitors than primitive zone Vehicle access on dedicated routes, with pedestrian access from parking areas or adjacent Development Zones. On water – only non-motorised crafts allowed	Visitor Management: More frequent monitoring of these areas are 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 Conservation Management: 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. Consumptive Use: Sustainable use may be appropriate subject to a formal assessment and application in accordance with CapeNature policies.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development – Low Intensity	***Conservation:*** To locate the zone and infrastructure to minimise impact on sensitive environments. To actively manage users and visitor impacts on adjacent sensitive areas. Provide additional protection to sensitive or threatened habitats, species or other features by Special Management Overlays ***Users:*** To provide access to adjacent natural landscapes with little expectation of solitude. To provide primarily self-catering accommodation or camping. Can provide for Environmental Education accommodation and access into surrounding landscapes.	Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is essential to minimise infrastructure/use impacts over whole reserve. Areas able to accommodate high numbers of visitors regularly, with no identified sensitive or regionally rare biodiversity. Areas able to accommodate roads, trails and accommodation infrastructure without risk of erosion or degradation. Areas easily accessible from reserve management centre. Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment. Areas not visible from Primitive or Wilderness Zones. Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas with available potable water, and not sensitive to disposal of treated wastewater via soak away.	Picnicking. Walking or bicycle access into adjacent areas. Self-catering accommodation and camping. Meeting, workshops or mini-conference activities for no more than the number of people that can be accommodated overnight in the zone. Can provide for Environmental Education accommodation and access into surrounding landscapes, but this must be carefully planned not to conflict with visitor use.	Reception offices. Self-catering accommodation and camping for up to 100 guests in total at any time[3] No more than 6-8 beds per unit. Single small lodges 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. If possible, roads should be narrow with separate incoming and outgoing routes, otherwise double vehicle width roads are strongly advisable for safety and usability. Roads in this zone should be surfaced wherever possible to reduce management cost and environmental impacts. Development and infrastructure may take up a significant proportion of the zone, but planning should ensure that area still provides relatively natural outdoor experience.	Motorised self-drive 2x4 sedan car access. Tour bus access Parking areas This zone should be used to provide parking and walk-in access for day visitors to adjacent Nature Access zone if possible.	Visitor Management: Use built and infrastructure solutions to such as railings, hard surfacing and boardwalks to manage undesirable visitor impacts. Accept some impact on natural habitats in this zone unless these are specifically addressed in a Special Management Overlay. Frequent footpath and road maintenance must be scheduled for high impact routes. Visible impacts to adjacent Zones should be mitigated Conservation Management: Provide access and generate revenue. Management should aim to mitigate the impacts of the high number of visitors. L largely transformed habitats with lower management requirements. Usually fire exclusion areas. Prevent or restore 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. Consumptive Use: Sustainable use may be appropriate subject to a formal assessment and applicatoin in accordance with CapeNature policies.

[3] Although this sounds high this is still in line with many CapeNature sites that would fall within this zone definition and E.g. configured as 10 x 4-sleeper self-catering units and 15 campsites this seems completely reasonable.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development – High Intensity	***Conservation:*** To locate the zone and infrastructure to minimise impact on sensitive environments. To actively manage users and visitor impacts on adjacent sensitive areas. Provide additional protection to sensitive or threatened habitats, species or other features by Special Management Overlays ***Users:*** To provide access to adjacent natural landscapes with no expectation of solitude. To provide low and/or higher density accommodation.	Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is essential to minimise infrastructure/use impacts over whole reserve. Areas able to accommodate very high numbers of visitors regularly, with no identified sensitive or regionally rare biodiversity. Areas able to accommodate roads, trails and accommodation infrastructure without risk of erosion or degradation. Areas easily accessible from reserve management centre. Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment. Areas not visible from Primitive or Wilderness Zones. Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas with available potable water, and not sensitive to disposal of larger amounts of treated wastewater.	Restaurants and small shops Picnicking. Walking or bicycle access into adjacent areas. Accommodation in small hotels, lodges and higher density self-catering accommodation and/or camping. Meetings, workshop or mini-conference activities for no more than the number of people that can be accommodated overnight in the zone.	High density tourist development nodes Modern amenities incl. restaurants & shops Self-catering accommodation and camping for over 100 guests in total at any time Lodges or small hotels. Roads in this zone should be surfaced wherever possible to reduce management cost and environmental impacts. Development and infrastructure may take up a significant proportion of the zone, but planning should ensure that area still provides relatively natural outdoor experience.	Tour bus access Motorised self-drive sedan car access Parking areas Air access only permitted if considered and approved as part of zoning scheme and no possibility of faunal disturbance.	Visitor Management: Management action will focus mostly on maintenance of facilities & providing high quality experiences. Use built and infrastructure solutions to such as railings, hard surfacing and boardwalks to manage undesirable visitor impacts. Accept substantial impact on natural habitats in this zone unless these are specifically addressed in a Special Management Overlay. Frequent footpath and road maintenance must be scheduled for high impact routes. Visible impacts to adjacent Zones should be mitigated Conservation Management: 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. Usually fire exclusion areas. Prevent or restore 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. Consumptive Use: Sustainable use unlikely to be compatible.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development - Management	Location of infrastructure and facilities for Reserve Administration & Conservation management facilities Not compatible with tourism	Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is essential to minimise infrastructure/use impacts over whole reserve. Areas able to accommodate high disturbance, with no identified sensitive or regionally rare biodiversity. Areas not visible or audible from Development - Low / High Intensity zone, but in close proximity to any other Development Zones. Areas providing easy access to reserve and infrastructure. Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment. Areas not visible from Primitive or Wilderness Zones. Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas with available potable water, and not sensitive to disposal of treated wastewater via soak away.	n/a	Any reserve management infrastructure including offices, sheds, garages, stores, etc. Roads required to access these should be surfaced to reduce long-term maintenance costs and environmental impact.	none	Visitor Management: Accept some impact on natural habitats in this zone unless these are specifically addressed in a Special Management Overlay. Frequent footpath and road maintenance must be scheduled for high impact routes. Visible impacts to adjacent Zones should be mitigated Conservation Management: Management should aim to contain all activities within the smallest possible footprint. L largely transformed habitats with lower management requirements. Usually fire exclusion areas. Prevent or restore trampling or any other management 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. Consumptive Use: Sustainable use unlikely to be possible in small zone.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development - Production	Commercial or subsistence farming (only applicable to privately owned & managed Contract Nature Reserves)	Areas identified for production farming Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is supported by a bioregional plan and specialist site assessment.	May allow agri-tourism	Any agricultural infrastructure.	May allow agri-tourism	Agricultural best practise to support surrounding natural areas, particularly with regard to river and wetland buffer areas.
Development – Private Areas	Private dwelling and surrounds (only applicable to privately owned & managed Contract Nature Reserves)	Private homestead Areas with existing degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is supported by a bioregional plan and specialist site assessment.	n/a	Dwellings and private accommodation areas. Roads to access these.	No access to the public without permission from landowner	Should have no negative impacts on the surrounding conservation area

8.4.2 Special Management Overlays

Additional forms of zonation that can overlap any of the above zones.

Special Management overlays	Objective of zone	Characteristics	Type of Activities	Facilities / Infrastructure	Type of Access	Management Guidelines
Cultural Feature protection	Protection of localised identified important Cultural Feature	Could overlap any other zone, Permanent, temporary or temporal zone to manage important cultural or heritage features	Specific activities dependent on ability to manage activity and feature in question.	Usually none, but specific infrastructure dependent on feature in question.	Specific access dependent on ability to manage access and feature in question.	Feature specific – as required
Species/Habitat protection	Protection of localised identified important Biodiversity Feature	Could overlap any other zone, Permanent, temporary or temporal zone to manage important cultural or heritage features	Specific activities dependent on ability to manage activity and feature in question.	Usually none, but specific infrastructure dependent on feature in question.	Specific access dependent on ability to manage access and feature in question.	Feature specific – as required
Visual protection	Protection of localised sensitive viewsheds and particularly for Wilderness Zone viewsheds	Sensitive viewsheds and particularly for areas within Wilderness Zone viewsheds	Specific activities dependent on ability to manage activity and feature in question.	No roads, firebreaks or buildings. No visible infrastructure Trails may be appropriate	Walking access likely to be appropriate	Feature specific – as required
Natural Resource Access	Access to identified sustainable consumptive use resources as per a resource management plant	Areas with identified natural resources formally assessed as not sensitive to harvesting and provided with a sustainable harvesting plan.	Harvesting of identified resources	None	Specific access dependent on feature in question.	Feature specific – as required
Rehabilitation		This should fall under specific management objectives for any zone				

Research is permissible in all zones, except Species/Habitat protection or Cultural Protection where it may be considered on a case by case basis. Research that requires extensive destructive harvesting, or manipulation of more than a few square meters of habitat should not be considered in any of the Protection overlays, except where research outputs are considered essential for management of that ecosystem research cannot be done at an equivalent site elsewhere, and research results are certain to contribute substantially to management objective.

8.5 APPENDIX E – Annual Plan of Operation