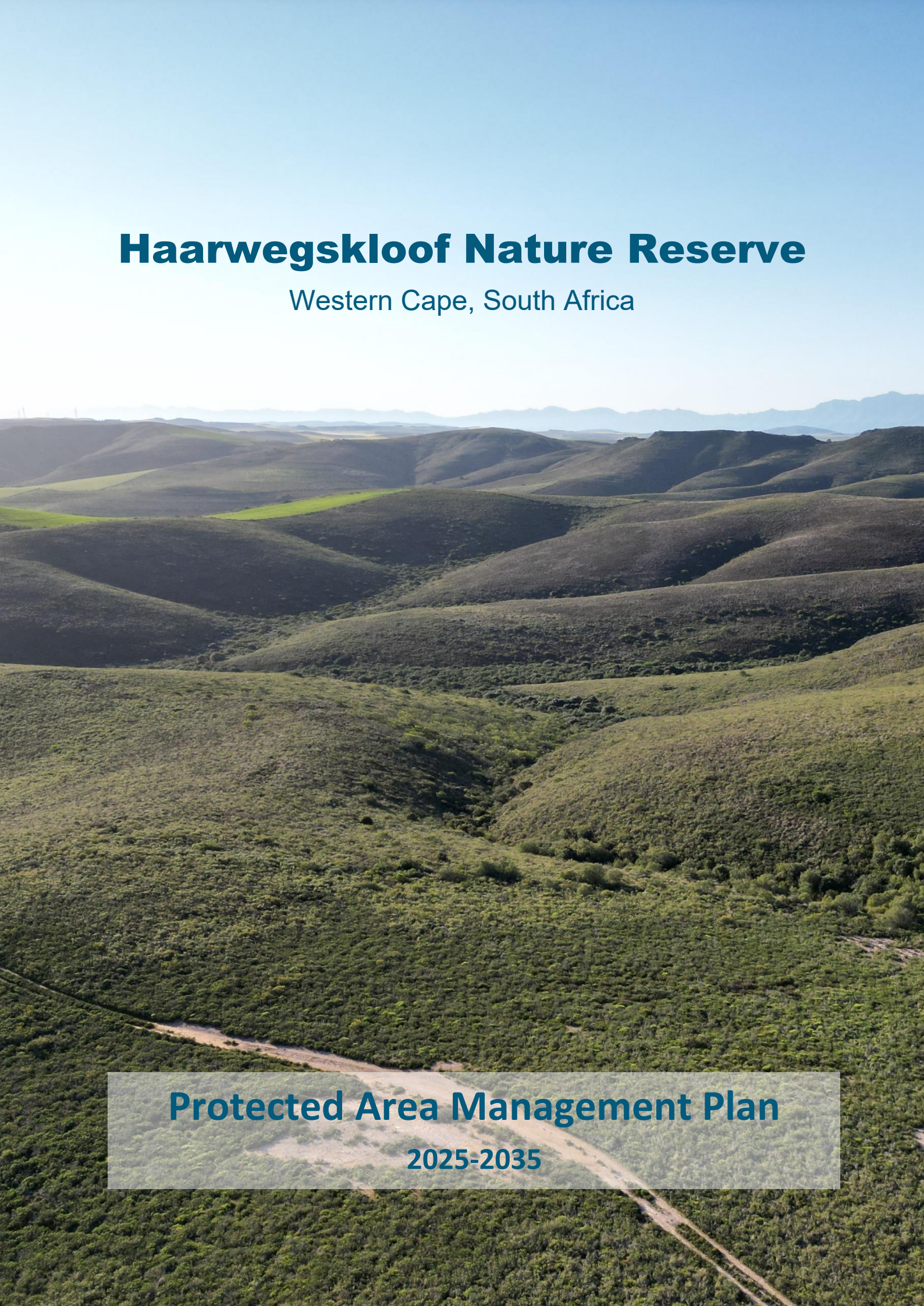
Haarwegskloof Nature Reserve

Western Cape, South Africa



Protected Area Management Plan

2025-2035

Management plan prepared by:
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Grant Forbes

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

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STATUS

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

Declaration Date:	Government Gazette Notice:
2025 - 05 - 16	REF NO. PN 54/2025

AUTHORISATION

This Protected Area Management Plan for the Haarwegskloof Nature Reserve was drafted and recommended by the Overberg Renosterveld Trust as the management authority.

Supported by:

- CapeNature Conservation Operations

Recommended and adopted by:

Name and Title	Signature and Date
Management Authority Odette Curtis-Scott Overberg Renosterveld Trust	
CapeNature Dr Alan Wheeler Landscape South: Landscape Manager	

Approved by:

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

Review Date: 2035

PART A • Strategic Management Plan

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Abbreviations

APO	Annual Plan of Operation
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CEO	Chief Executive Officer
CoAE	Certificate of Adequate Enclosure
CFR	Cape Floristic Region
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMA	Catchment Management Authority
CR	Critically Endangered
DEA&DP	Department of Environmental Affairs and Development Planning
DEA	National Department of Environmental Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DoA	Department of Agriculture Western Cape
DWA	National Department of Water Affairs
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EN	Endangered
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
FPA	Fire Protection Association
GIS	Geographical Information System
IDP	Integrated Development Plan (Municipal)
IUCN	International Union for the Conservation of Nature
LC	Least Concern
LT	Least Threatened
LUPA	Western Cape Land Use Planning Act
MA	Management Authority
MAB	Man and the Biosphere Programme
MCA	Mountain Catchment Area
MCM	National Department of Marine and Coastal Management
MEC	Member of the Executive Council
METT	Management Effectiveness Tracking Tool
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPA	Marine Protected Area
NBA	National Biodiversity Assessment
NEM:BA	National Environmental Management: Biodiversity Act
NEM:PAA	National Environmental Management: Protected Areas Act

NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area
NGO	Non-governmental Organisation
NN	No Natural
NPAES	National Protected Area Expansion Strategy
NR	Nature Reserve
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
ONA	Other Natural Area
PA	Protected Area
PAMP	Protected Area Management Plan
PBSAP	Western Cape Provincial Biodiversity Strategy and Action Plan
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SDF	Spatial Development Framework
SMP	Strategic Management Plan
SOB	State of Biodiversity Report
SPLUMA	Spatial Planning and Land Use Management Act
SDF	Municipal Spatial Development Framework
SEA	Strategic Environmental Assessment
SMME	Small, Micro and Medium Enterprises
SMP	Strategic Management Plan
SWOT	Strengths, weaknesses, opportunities and threats analysis
TMF	Table Mountain Fund
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCC	United Nations Framework Convention on Climate Change
VU	Vulnerable
WCBB	Western Cape Biodiversity Bill
WCBF	Western Cape Biodiversity Framework
WCBSP	Western Cape Biodiversity Spatial Plan
WCPAES	Western Cape Protected Area Expansion Strategy
WWF-SA	Word Wildlife Fund for Nature South Africa

PART A - STRATEGIC MANAGEMENT PLAN

1 PBackground to the Management Plan

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 Haarwegskloof NR, informing the need for specific programmes and operational procedures.
- Inform the need for specific programmes and operational procedures
- Provide for capacity building, future thinking and continuity of management.
- Enable the landowner (WWF-SA) and the management authority (ORT) to develop and manage Haarwegskloof NR 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. Includes the: Purpose. Defines the purpose of the management plan. Vision. Defines the vision held for the protected area. 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.

1.3 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.

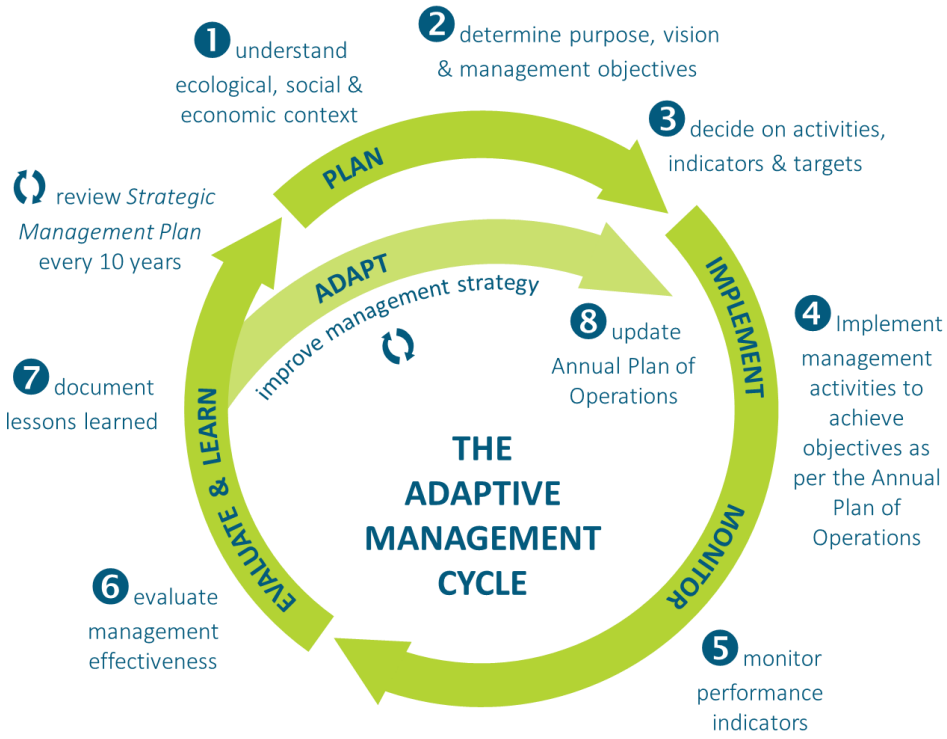

Figure 2.1 The adaptive management cycle

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.

1.4 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.

1.4.1 Purpose of declaring protected areas

The purpose of the nature reserve is the foundation on which all future actions are based and is in line with the key ecological attributes of the reserve, the overall management philosophy of the management authority and the objectives of Section 17 of the National Environmental Management: Protected Areas Act.

The purpose of declaring the Haarwegskloof Nature Reserve is:

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 the areas within the Haarwegskloof Nature Rerserve;
iii) to conserve biodiversity within the Haarwegkloof Nature Reserve;
iv) to protect areas representative of all ecosystems, habitats and species naturally occurring in Haarwegkloof Nature Reserve;
v) to protect threatened or rare species within Haarwegkloof Nature Reserve;
vi) to protect an area which is vulnerable or ecologically sensitive;
vii) to rehabilitate and restore degraded ecosystems and promote the recovery of threatened species;
viii) to contribute to landscape continuity and prevent future habitat fragmentation;
ix) to assist in ensuring the sustained supply of environmental goods and services;
x) to provide opportunities for nature-based tourism and/or environmental education;
xi) to protect the cultural and historic resources of the region; and
xii) generally, to contribute to environmental, human, social, cultural, spiritual and economic development.

1.4.2 Declaration status of Haarwegskloof Nature Reserve

Haarwegskloof Nature Reserve is declared under Section 23(1) of the National Environmental management: Protected Areas Act (Act 57 of 2003) on the 16th of May 2025.

See Appendix B – Copy of Haarwegskloof Nature Reserve Declaration Notice

2 Site Description

2.1 Introduction

The Haarwegskloof Nature Reserve will consist of sections, namely Haarwegskloof, Luiperdskop, Plaatjieskraal and Goereesoe. Currently only Haarwegskloof is in the process of being declared as a nature reserve with Plaatjieskraal's submission for declaration being imminent. The two additional properties, Luiperdskop and Goereesoe, will also be submitted for declaration once the purchase processes have been completed. These sections are an expansion of the Haarwegskloof Nature Reserve and will be added to the Haarwegskloof Nature Reserve declaration. The Reserve is situated within the Overberg Rûens Wheatbelt, between the Sout and Breëde Rivers, close to the boundary of the De Hoop Provincial Nature Reserve. The reserve falls within the Overberg District Municipality, in the Swellendam Local Municipality in the Western Cape, South Africa. It can be accessed from the R319 between Bredasdorp and the N2 on route to Swellendam. The reserve is critical from a landscape conservation perspective in conserving endangered ecosystems. Haarwegskloof Nature Reserve includes Critical Biodiversity Areas and is included in the Rûens Silcrete Hills – De Hoop Vlei Climate Corridor. The reserve is further included in the Western Cape Provincial Protected Area Expansion Strategy (2015-2020) and the protected area expansion within the De Hoop Protected Area Management Plan (CapeNature, 2024 in ed.).

Haarwegskloof Nature Reserve is 547.74 ha in size, with the other properties, if all successfully secured, bringing the total reserve to 1630.16 ha of Endangered Eastern Rûens Shale Renosterveld. The original Haarwegskloof farm was owned by the Lourens family and bought by WWF-SA in 2013 with ORT appointed as the Management Authority since 2014. ORT developed the infrastructure and raised funds to erect a Bontebok fence, with the expectation that Bontebok would be reintroduced to the reserve in future.

Plaatjieskraal, to the north of Haarwegskloof and adjacent to Luiperdskop was owned by the Swart and Lourens families for generations. WWF-SA and ORT have been negotiating for the purchase of both Plaatjieskraal and Luiperdskop for more than 15 years. Plaatjieskraal was purchased in 2023 with funding from the World Land Trust, IUCN-Netherlands Land Acquisition Fund, Wildlandscapes International and WWF-SA and is currently in the process of being declared a nature reserve. Farm portions were realigned so that the veld would be consolidated into a single portion. Approval for the subdivision of the Plaatjieskraal veld from the lands was granted by the National Department of Agriculture, conditional on the title deed being tied, via a notarial tie, to that of the Haarwegskloof. ORT are also in the process of purchasing the above mentioned Luiperdskop and Goereesoe. Goereesoe is in its final stages of transfer with Luiperdskop in the process of subdivision.

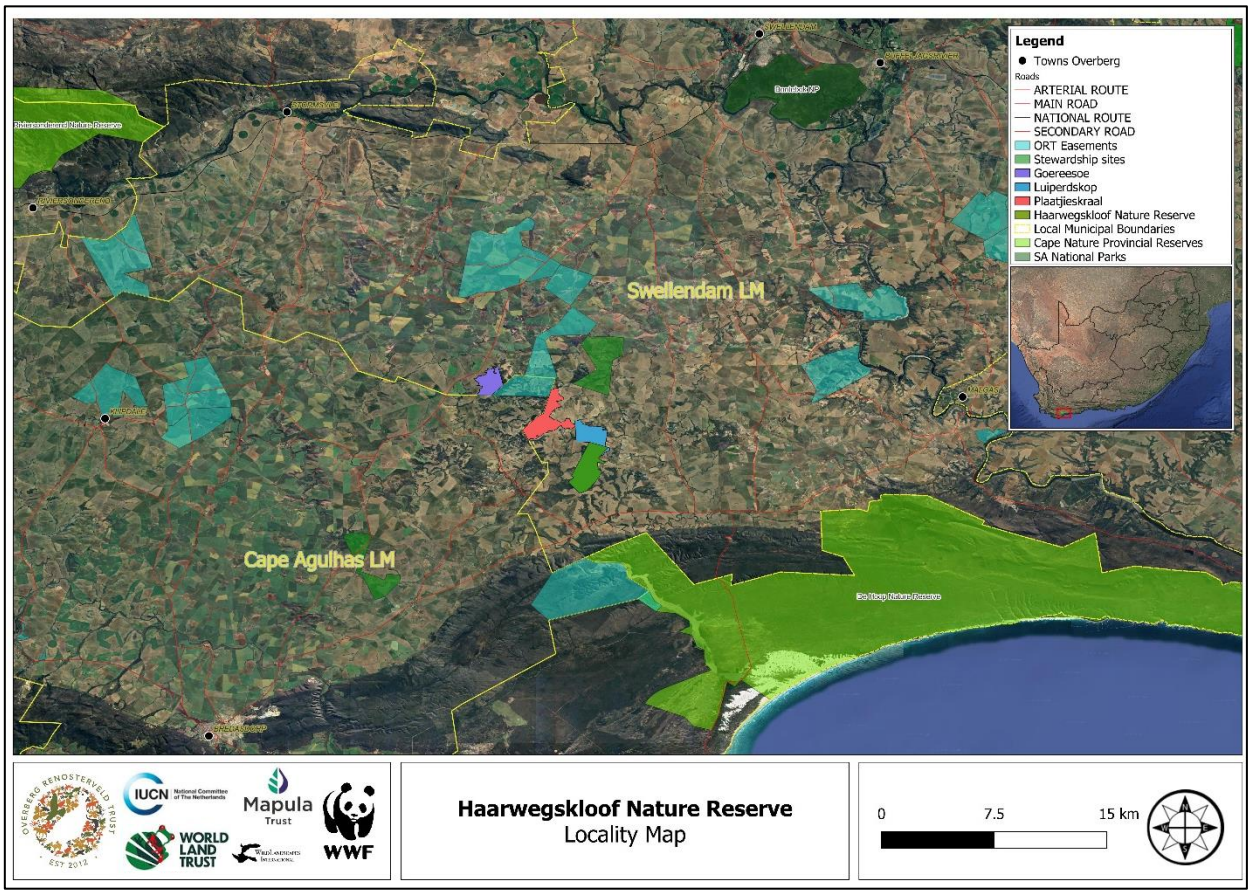

Figure 2.1 Regional location of Haarwegskloof Nature Reserve with the planned expansion to include the farms Plaatjieskraal, Luiperdskop and Goereesoe.

2.2 Landowner details

Landowner Details	
Owner	WWF-SA/ ORT
Contact person	Odette Curtis-Scott
Contact details – Tel.	083 551 3341
Contact details – email	odette@overbergrenosterveld.org.za
Management Authority	Overberg Renosterveld Trust
Property details pertaining to this management plan	
Property descriptions Haarwegskloof Nature Reserve	The Remainder of Farm No. 407, in the Swellendam Municipality, Division of Swellendam, Western Cape Province, measuring 487,1812 ha in extent; Held by Deed of Transfer No. T1281/1929. SG Code: C01100000000040700000.
Property details pertaining to the expansion of Haarwegskloof Nature Reserve: properties intending to be added to the Haarwegskloof Declaration and PAMP	
Property descriptions Plaatjieskraal Section	Farm No. 424, in the Swellendam Municipality, Division of Swellendam, Western Cape Province, measuring 497.61 ha in extent; Held by Deed of Transfer No. T48067/1991. SG Code: C07300000000042400000.

Property descriptions Goereesoe section	Farm Goereesoe, portion 10 of 432, in the Swellendam Municipality, Division of Swellendam, Western Cape Province, measuring 271.81 ha in extent; Held by Deed of Transfer No. TBA. SG Code: 2612/2024.
Property descriptions Luiperdskop section	New property numbers, Title Deeds and SG codes will be allocated to subdivided, consolidated portions post-subdivision approval, from what is currently farm Luiperds Kop No. 35 and farm 408, in the Swellendam Municipality, Division of Swellendam, Western Cape Province, measuring 385.4 ha and 736.2 ha in extent respectively
Total Conservation Area: Haarwegskloof Nature Reserve	547.74 ha
Total Conservation Area: Plaatjieskraal Section	497.61 ha
Total Conservation Area: Luiperdskop Section	TBC 313 ha (GIS 298.72 ha)
Total Conservation Area: Goereesoe Section	271.81 ha

2.3 Key Attributes

The key features of conservation value in the Haarwegskloof Nature Reserve (HNR) 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 the Haarwegskloof Nature Reserve include:

Natural values	The HNR with all the potential expanded sections will contribute a total of 2.18% and 0.15% towards the national conservation target of poorly protected Endangered Eastern Rûens Shale Renosterveld (FRs13) and Ruens Silcrete Renosterveld (FRc2). The expanded reserve also contributes 5.2% and 1.8% of the remaining Eastern Rûens Shale Renosterveld (FRs13) and Ruens Silcrete Renosterveld (FRc2). (SANBI Remnants, 2018) The reserve is listed predominantly as Critical Biodiversity Area. A total of 951.956 ha, or 58.4 % of the HNR is classified as a Critical Biodiversity Area 1 (CBA1), with a further 554.3 ha or 34% is classified as Critical Biodiversity Area 2 (CBA2). The remainder is classified as 'Ecological Support Areas' to be restored and 'No Natural'. Some of the No Natural areas are old (previously ploughed) lands that have are undergoing passive restoration. The Haarwegskloof with the potential expansion forms part of the Rûens Silcrete Hills-De Hoop Vlei Climate Corridor with the associated watercourses and wetlands feeding the De Hoop Vlei, situated on the provincial De Hoop Nature Reserve and an internationally recognised RAMSAR site

	The reserve forms part of the largest contiguous intact Renosterveld vegetation fragments remaining; Haarwegskloof and the potential expanded sections provides a critical breeding refuge for Black Harrier (Endangered) and contains at least 20 – 30 pairs of Black Harriers over their breeding season. Over 600 plant species have been recorded on the reserve to date, with at least 59 of these being threatened. This is largely due to the unique quartz patches found across these properties that comprise distinctive range-restricted plant species and communities, with 8 species discovered and described within the last decade (Curtis et al. 2013, Goldblatt et al. 2013, Duncan 2017).
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 and Pollination Services.
Tourism values	The ORT has established a Renosterveld Research and Visitor Centre, a self-catering guesthouse and a Learning Space on Haarwegskloof, which has opened opportunities for eco-tourism (including specialised botanical and birding tours, hiking, various courses) both on and off the reserve (e.g. guests can stay at HWK and visit De Hoop, the Breede River, etc.), as well as environmental education. Haarwegskloof also features a self-guided walk through one of its quartz patches, with signage at noteworthy plant species describing the plants' key characteristics.
Cultural and heritage values	This reserve provides a unique opportunity for visitors to experience what the Overberg landscape would have looked like prior to major agricultural development.
Socio-Economic values	The establishment of the reserve has led to job creation through: i. management interventions including alien clearing and the erection of Bontebok fencing; ii. development and maintenance of the renosterveld centre, learning space and guesthouses infrastructure and; iii. running of the guesthouse which employs the people from Bredasdorp and Napier. The establishment of the Learning Space ('The Shed') on HWK has also enabled the ORT to partner with funders in order to bring hundreds of children from local farm schools to the reserve annually. Ongoing maintenance of the infrastructure and nature reserve provides local job opportunities.

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 2.4 Management challenges and opportunities

Management Focus Area	Challenges and Opportunities
Fire management	Management Authority should maintain Membership of the Greater Overberg Fire Protection Association; Firebreak Agreements must be negotiated with neighbouring landowners; A prescribed burning policy must be developed for the Nature Reserve.
Invasive vegetation management	The management of invasive alien plant species is a legal requirement of CARA. Most invasive alien plant species on HCNR are restricted to riparian areas, isolated stands of *Pinus halepensis* and *Eucalyptus spp*. around the Research Centre. Although infestations only occur at extremely low densities, a strategic alien clearing plan is required to identify and accordingly manage all alien plants on the property.
Wildlife management	Fencing accepted to the provincial specifications for Bontebok has been erected on the Boundary of Haarwegskloof with a small section to be completed on the boundary of Luiperdskop once Luiperdskop is successfully negotiated and purchased; Habitat assessments must be conducted for potential Bontebok reintroduction, which will no doubt require some management of the old lands present on HWK in order to create artificial grazing lawns. All other wildlife is not managed and is free to roam the entire area.
Rehabilitation and Erosion Control	Erosion must be identified, mapped and incorporated into Erosion Maintenance Plan. The Road network needs to be monitored annually to identify risk areas and address.
Monitoring and Baseline data collection	Historic data for the properties which make up the HCNR is limited. As current capacity for monitoring activities is limited, although regular walk-through surveys are conducted, ad hoc bioblitz's and some post-graduate student studies. Platforms like iNaturalist and Birdlasser are used to capture data from ORT surveys. Camera traps are out on sections of the reserve permanently are moved every 3-6 months. These data are captured on the ORT's internal biodiversity databases. The HCNR also offers collaborative research opportunities to students and academic institutions. The management authority can start with simple data collection, including rainfall records, species caught on camera traps, basic vegetation assessments (using phenocams, fixed point photography and simple plots or transects where possible (particularly for pre- and post-burning or other restoration interventions), and Black Harrier breeding sites.

	A biodiversity resource inventory in place for the HCNR and needs to be kept up to date.
Biodiversity security	Haarwegskloof Nature Reserve has been rezoned to Natural Environment Zone with the Infrastructure node. The additional properties making up the larger reserve needs to the rezoned to Natural Environment Zone.
Development of tourism opportunities	Visitor and Research Centre / Guesthouse business model must be developed.
Legal compliance	Compliance with the full suite of South African Environmental Legislation must be adhered to.
Infrastructure	Although much work has been done to maintain and upgrade the infrastructure on Haarwegskloof, continual maintenance thereof will be required. No infrastructure exists on Plaatjieskraal and Luiperdskop. Overall condition of border fences is currently good, and needs to be kept in this state to prevent access by livestock from neighbouring farms. The Bontebok fence needs to be maintained if the reintroduction of this species is to be considered in future. Roads across the reserve require maintenance work to not only improve usage quality, but also to mitigate and control water run-off, preventing erosion. Implementation of the above offers the opportunity for temporary job creation. Annual maintenance plans for reserve infrastructure need to be developed.
Management effectiveness	An annual review should determine the effectiveness of management interventions and inform the following year's Annual Plan of Operation.

2.5 Landuse History

Hominids have called the Overberg home for more than a million years with evidence of occupation from the Early Stone Age (ESA) through to the Later Stone Age (LSA) and beyond. The San lived as sedentary hunter gatherers and hunted, collected veld plants and caught and collected marine animals. The Khoekhoen or Khoikhoi acquired domesticated animals approximately 2000 years ago and adopted a pastoralist lifestyle utilising sheep and later cattle. Archaeological evidence from Die Kelders Cave in the Walker Bay Nature Reserve proved, for the first time, that the introduction of sheep to southern Africa took place 1900 years ago. Indigenous peoples continued utilising the Overberg after the arrival of European colonists.

The Dutch East India Company (VOC) granted loan places for farming during the 1730's. Free burghers, officials no longer in the employ of the company, staked out land by measuring the distance they could walk or ride in an hour, these points then formed the boundaries of the properties. These farms were leased to the burghers with the lease option being renewable each year on payment of rent. While many farmers trekked northwards into the Bokkeveld, Roggeveld and the Karoo during the first half of the eighteenth century, others crossed the Hottentots Holland Mountains and settled to the east in the districts of Caledon, Bredasdorp and Swellendam.

It is impossible to know what the Overberg looked like prior to settlement as few travellers visited the Bredasdorp district or the Agulhas Plain, preferring to follow the main trek route through Caledon to Swellendam. For this reason, there are a lack of historical records for the region with few accounts or narratives of the vegetation or occurrence of animals for the area. The historical incidence of larger mammals (according to Skead 2011) of the Agulhas area is shown in Table 2.5.

Wild grazing ungulates such as Hippopotamus, Buffalo, Bontebok, Quagga and Red Hartebeest, as well as the now extinct Bloubok, probably maintained extensive grazing lawns in wetland habitats, concentrating their activity in the vicinity of vleis, pans and wetlands. These conditions would have suited short grass grazers such as the Bontebok, Quagga and Red Hartebeest.

The sporadic and patchy occurrence of natural fires within the fynbos and renosterveld of the lowlands and mountain foothills would have provided re-sprouting grazing for the first few years after fires. These habitats, when in a grassy state, would have attracted large numbers of grazers, which would have played an important role in the landscape dynamics of the past.

Table 2.5. Historical Occurrence of Large Mammals in the Overberg Region (Skead 2011).

Elephant *Loxodonta africana*	Common Duiker *Sylvicapra grimmia*
Black Rhinoceros *Diceros bicornis*	Grysbok *Raphicerus melanotis*
Cape Mountain Zebra *Equus zebra zebra*	Steenbok *Raphicerus campestris*
Quagga (extinct) *Equus quagga quagga*	Klipspringer *Oreotragus oreotragus*
Hippopotamus *Hippopotamus amphibious*	Bloubok (extinct) *Hippotragus leucophaeus*
Bontebok *Damaliscus pygarus dorcas*	Brown Hyaena *Hyaena brunnea*
Red Hartebeest *Alecelaphus buselaphus*	Spotted Hyaena *Crocuta crocuta*
Eland *Tragelaphus oryx*	Leopard *Panthera pardus*
Buffalo *Syncerus caffer*	Lion *Panthera leo*
Bushpig *Potamochoerus larvatus*	Caracal *Caracal caracal*
Bushbuck *Tragelaphus scriptus*	Serval *Leptailurus serval*
Grey Rhebok *Pelea capreolus*	African Wild Dog *Lycaon pictus*
Cape Clawless Otter *Aonyx capensis*	Black-backed Jackal *Canis mesomelas*

It is surmised that the nature of habitat and climatic conditions in the Overberg would have stimulated nomadic and migratory behaviour of most of the large mammal species, especially the grazers. Elephant may have occurred periodically within the wetlands while Black Rhinoceros would also have ranged across the landscape in search of browsing opportunities.

The impact of European colonists on the ecological dynamics of the landscape cannot be underestimated as the change from natural free roaming game populations gave way to the controlled movements of domesticated livestock, which tend to be more sedentary. Anders

Sparrman notes the deterioration of veld in the vicinity of Swellendam as early as 1775. He was informed that "beyond a shadow of doubt, that such places as before abounded in grass, and were very fertile in corn…are now fallen off considerably; so that it is feared, that they must in short time be given up."

It is believed that the Khoikhoi mimicked the ranging behaviour of natural game, always keeping their livestock on the move, while the colonists grazed their cattle on the same ground year after year. The colonists also had far more cattle which led to overgrazing and an increase in unpalatable plant species. Sparrman continues "the grasses and herbs which these animals must covet are prevented continually from thriving and taking root, while, on the other hand, the rhinoceros bush, which the cattle…leave untouched, is suffered to take root free and unmolested, and to encroach on the place of others".

Anders Sparrman was ecologically ahead of his time when he noted that "the animals which occur in Africa are, in my opinion, as much designed for the plants peculiar to this climate as the plants are for the animals". Sparrman then warns "…the African colonists ought to take into serious consideration whether by extirpating the game they are not in reality laying waste their country and rendering it a mere desert". Ecological implications with land use practices did not escape him when he noted that farmers who burnt their 'renosterbos' in order to remove it from their fields, found it coming up thicker than ever.

Today the Overberg region comprises a mix of fragmented natural vegetation amidst transformed agricultural landscapes, with most of the larger mammals locally extinct or restricted to artificial grazing lawns on fenced-off reserves or private farms. The need to conserve the remnant vegetation and link the landscape in the form of a corridor network is critical to ensure the persistence of the ecosystems thereby providing habitat for the remaining fauna, flora and their pollinators.

Haarwegskloof was previously owned by various members of the Lourens family and, like all surrounding farms, it was used for grain crops and livestock. Due to the steepness of the slopes, a large portion of the farm was never farmed, or farming was abandoned on several parts of the farm. For this reason, the remaining portion of the farm (i.e. the Nature Reserve) comprises about 80% virgin land and 20% old (previously ploughed) lands.

Haarwegskloof is only approximately 5km away from the boundary of De Hoop Nature Reserve and is physically linked by a watercourse / valley as well as through tributaries of the Sout River. Thus, there are opportunities to link Haarwegskloof with this Provincial Nature Reserve and enable the movement of game between the coastal limestone hills and the inland-lowland renosterveld in future. There are also unique opportunities to expand Haarwegskloof substantially – both to the north and the south. Additionally, there may be opportunities for Conservation Easements (Servitudes) and land purchase beyond this core.

2.6 Ecological context

This section describes the ecological components and drivers that influence biodiversity and ecological processes on Haarwegskloof Nature Reserve.

2.6.1 Climate and weather

The climate is generally hinterland (further from oceanic influences) Mediterranean, with cool, rainy winters and warm, dry summers.

Maximum temperatures are experienced in January (average daily max = 29ºC) and minimum temperatures usually occur in July (average daily min = 6ºC). Rainfall occurs mainly in winter between mid-May and late August. Occasional snowfalls occur on the Langeberg Mountains to the north of Haarwegskloof Nature Reserve during winter.

Weather data provided by the Agricultural Research Centre – Agro Climatology for the Driefontein Railway Siding in the Rûens provides the following information:

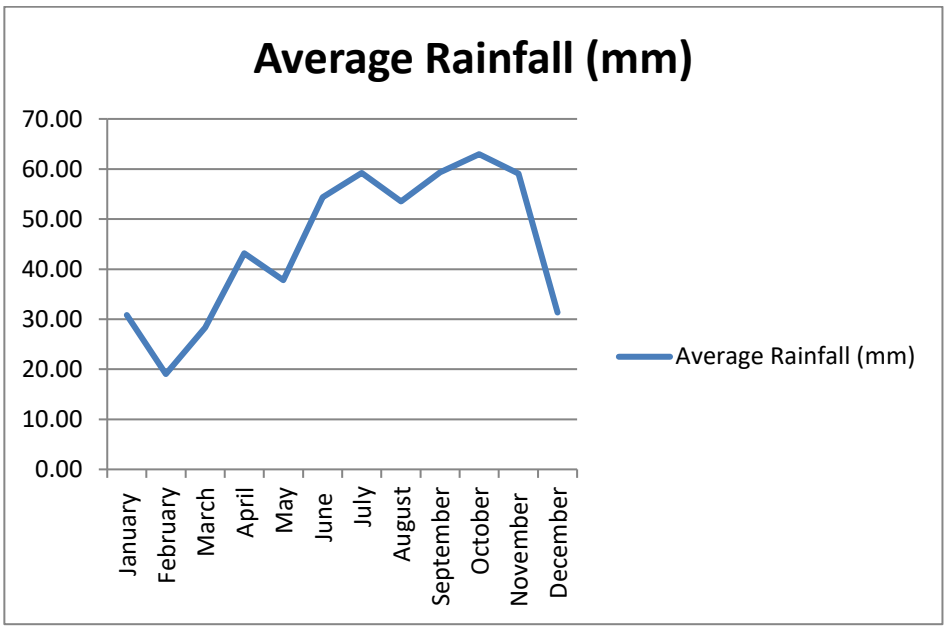

Figure 2.6.1.1: Average Rainfall recorded for the period 2006 – 2014.

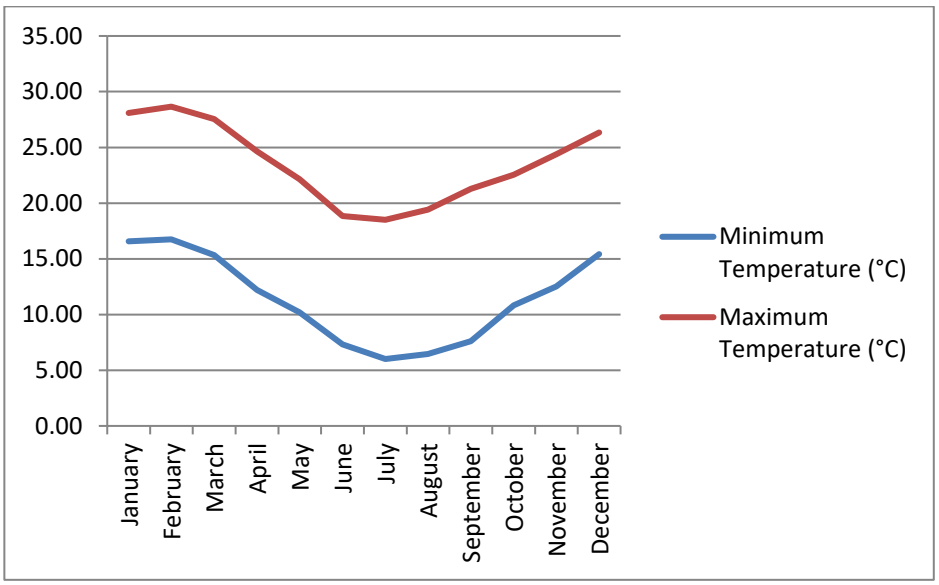

Figure 2.6.1.2 Average minimum and maximum Temperatures recorded for the period 2006 – 2014.

2.6.2 Topography, Geology and Hydrology

The Fynbos Biome is topographically diverse, and this heterogeneity of habitats has been a major driving force in the creation of the most diverse and unique of the temperate floras.

The Rûens, from the Dutch word Ruggens (meaning 'backs' (of animals)), refers to the hilly terrain of the lowlands in the Overberg. Gentle slopes, comprising a variety of aspects, are common throughout the region.

The highest point on Haarwegskloof is 270 metres above sea level in the north-eastern portion of the reserve while the lowest point, 140 metres above sea level, occurs in the southern portion the reserve. Luiperdskop highest point is 310m masl at Rooikop and lowest 145m masl, Plaatjieskraal's highest is at 304m masl at Sonderkoskop and lowest at 120m masl.

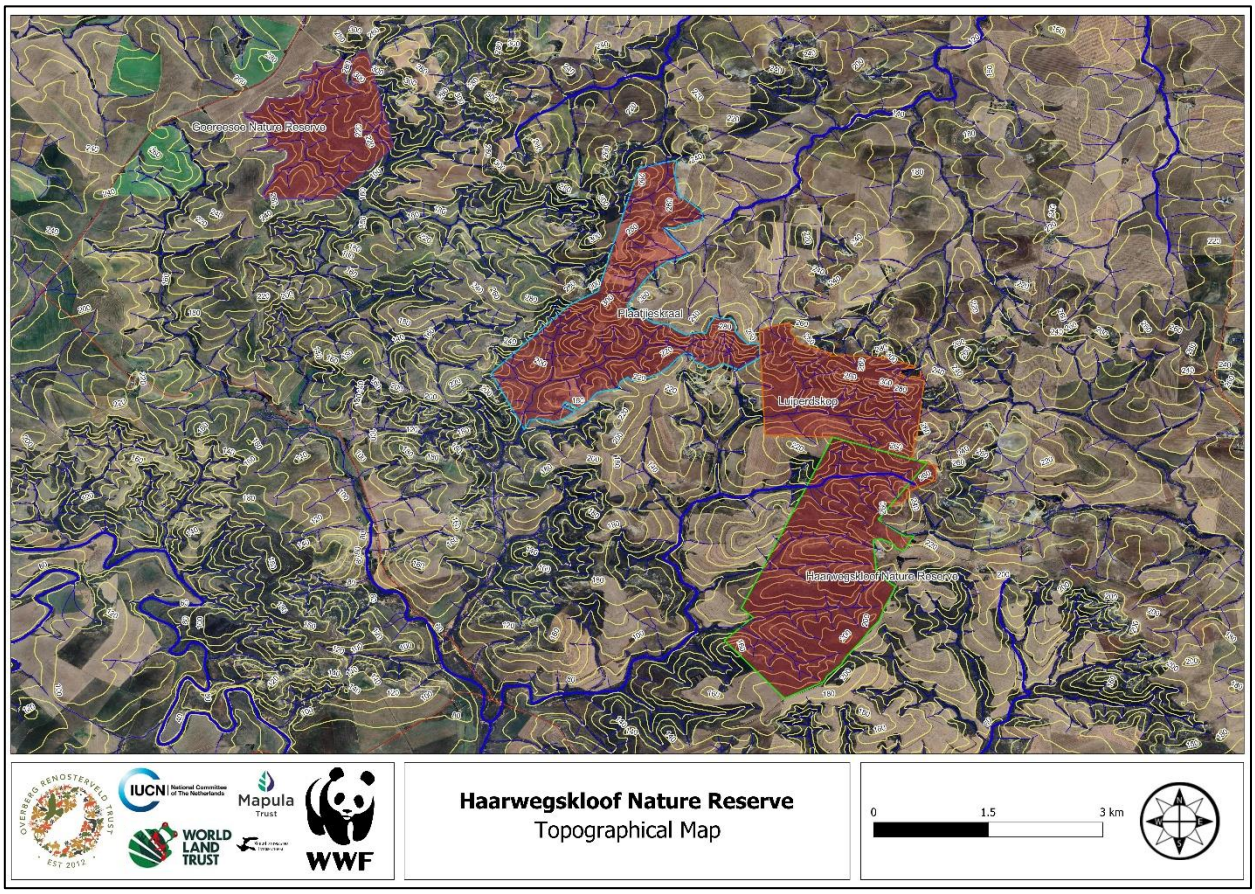

Figure 2.6.2.1 Topography of the Haarwegskloof Nature Reserve

The geology of the Haarwegskloof Nature Reserve is classified as Land Type Fb32 and Fb38 with rare occurrence of lime mostly comprised of shales and subordinate sandstone derived from the Bokkeveld Group specifically from the Ceres and the Bidouw subgroups. Some of the low laying valleys are classified as Fc50 with a higher lime content but still dominated by soils originating from shales. Three fault lines runs through Plaatjieskraal and Luiperdskop separating the Ceres and Bidouw subgroups. Clay soils of the Glenrosa and/or Mispah soil formation typically occur with lime limited to the low-lying soils. The soils have limited pedological development, usually shallow on hard or weathering rock, with the soil depth an average of 450mm. The soils fall within an erodibility category of 0.47.

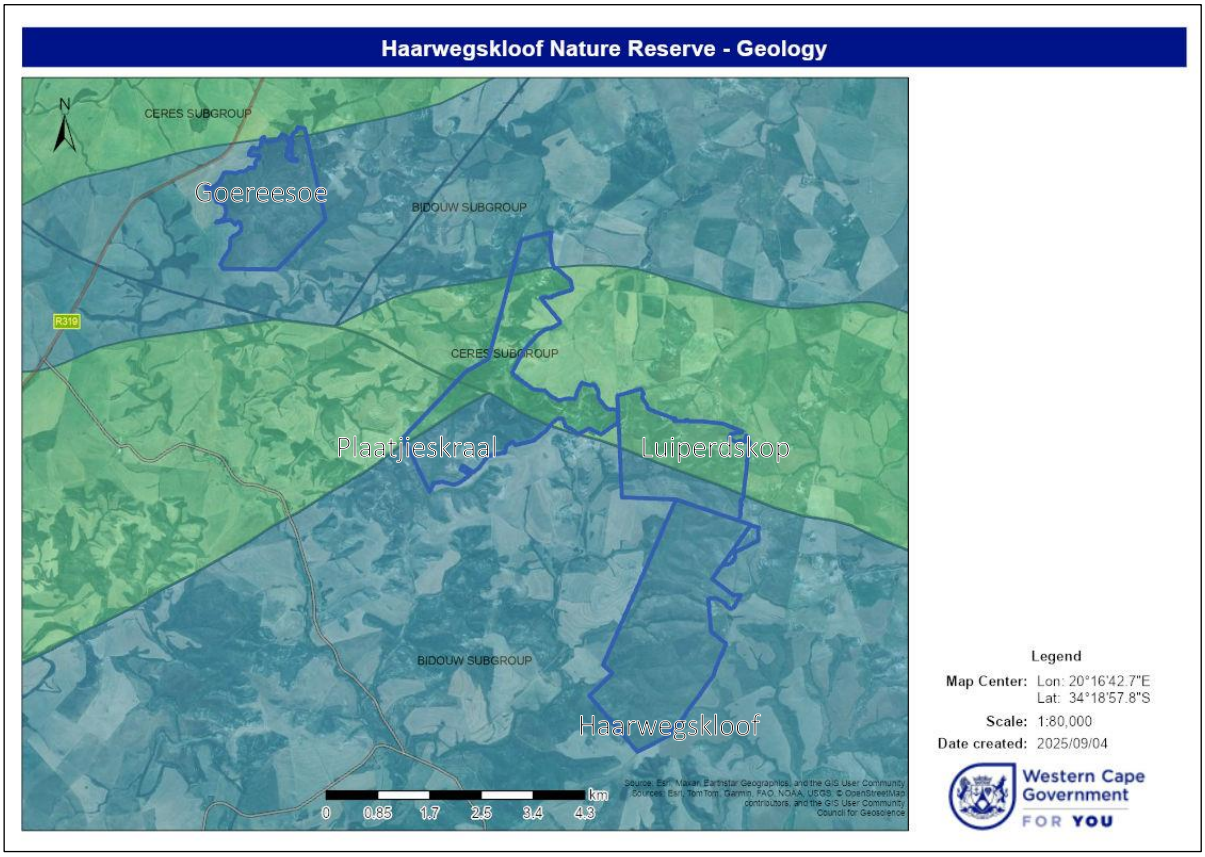

Figure 2.6.2.2 Geology of the Haarwegskloof Nature Reserve

The south facing valleys on Haarwegskloof Nature Reserve drain to the west into Brakkuil se Loop stream, one of the Sout River's tributaries. The Sout River flows in the De Hoop Vlei, a RAMSAR site situated in the De Hoop Provincial Nature Reserve. The north facing slopes of Plaatjieskraal and Luiperdskop falls within the Breëde River Catchment draining into the Brakrivier which later joins the Napkei, a larger local tributary of the Breëde.

Two of the smaller valleys part of the Brakkuil se Loop stream originate in the surrounding agricultural landscape and they may be periodically impacted with pesticides, herbicides as well as increased nutrient loads.

Langkloof from Luiperdskop, Witkleikop se kloof from Plaatjieskraal and Engelsman se Kloof from Goereesoe all feed into the same tributary that eventually feeds the Sout River.

There are two artificial dams (Haarwegskloof -34.344135°; 20.313964° and Goereesoe -34.274064° ,20.249536°) that holds water over the wettest period of the year. There are also some deeper natural pools in the valleys that may retain water for prolonged periods of time.

A spring (-34.340301°; 20.307605°) is located on Haarwegskloof which historically provided water to the surrounding landowners during periods of drought.

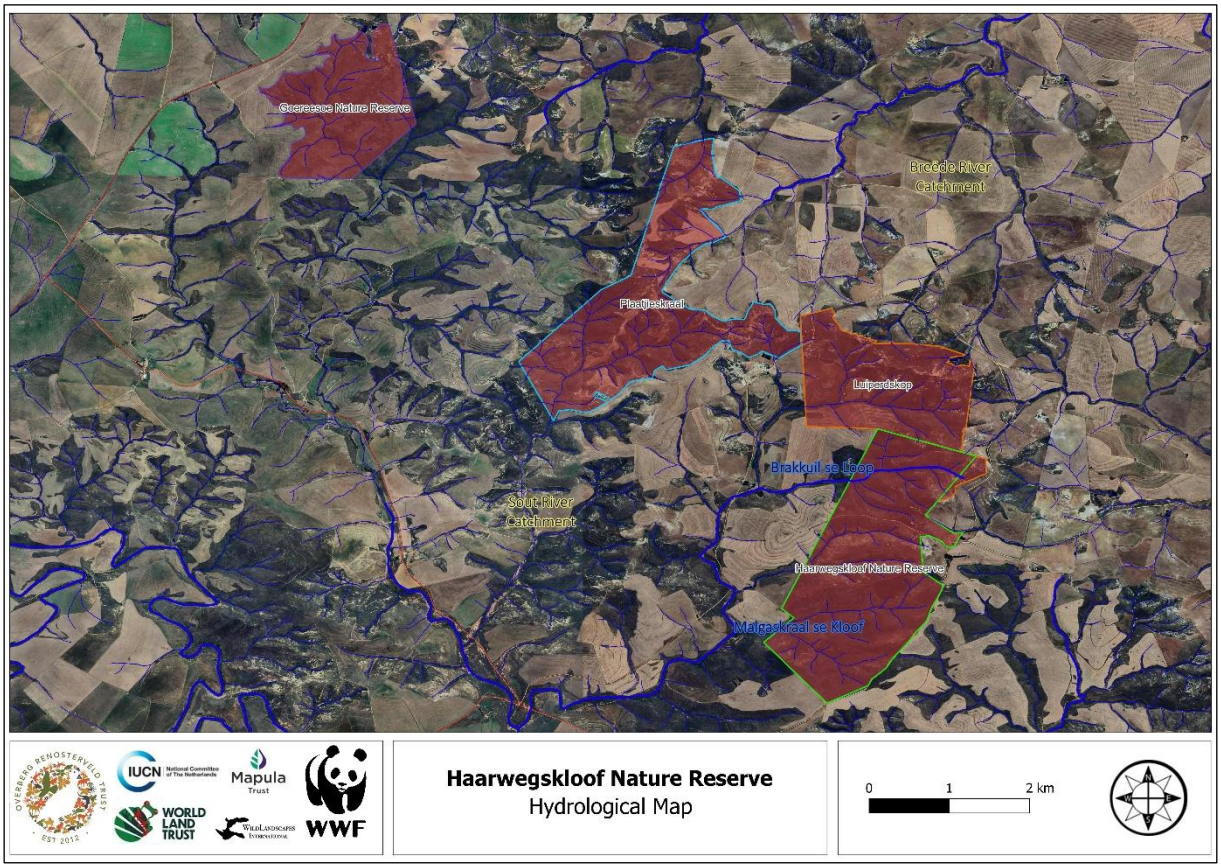

Figure 2.6.2.3 Hydrology of the Haarwegskloof Nature Reserve

2.6.3 Vegetation

The Cape Floristic Kingdom, the smallest of the world's six recognised 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 presence of, amongst others, species belonging to the families Aizoaceae, Ericaceae, Fabaceae, Iridaceae, Orchidaceae, Proteaceae, Restionaceae, Rutaceae and Scrophulariaceae (Goldblatt & Manning, 2000).

Renosterveld, distinctive to Fynbos, grows on relatively nutrient rich soils and is generally devoid of Ericaceae, Proteaceae and Restionaceae, though there are exceptions. The biodiversity wealth of Renosterveld is driven strongly by the large diversity of geophytes, legumes and succulents that occur within the vegetation type. Due to the high nutrient value of Renosterveld, most of the lowlands have been transformed for agriculture resulting in a highly fragmented and threatened system.

Renosterveld of the Overberg is considered part of the East Coast Renosterveld Bioregion with the Fynbos Biome (Mucina and Rutherford, 2006) and this can then be subclassified again as four main

Renosterveld types, namely: Western Rûens Shale Renosterveld, Eastern Rûens Shale Renosterveld, Central Rûens Shale Renosterveld and Rûens Silcrete Renosterveld. Lowland habitats in the Cape Floristic Region (CFR) are under significant threat due to factors such as agriculture, urbanization, groundwater extraction, and the spread of invasive plant species (De Villiers et al., 2016). As a result, numerous range-restricted, rare endemic species are at imminent risk of extinction due to the ongoing loss and fragmentation of their habitats (De Villiers et al., 2016). Renosterveld ecosystems in the Overberg are all Critically Endangered or Endangered, with no possibility of meeting conservation targets, as what remains falls below the recommended targets for all of them.

The vegetation found within the Haarwegskloof Nature Reserve consists of Eastern Rûens Shale Renosterveld (ERSR) and Rûens Silcrete Renosterveld (RSR), both of which are classified as endangered. Eastern Rûens Shale Renosterveld originally covered approximately 276,902 hectares, but due to extensive agricultural transformation, less than 36,422 hectares remain intact. Currently, only about 2% of this remaining vegetation is formally protected. Rûens Silcrete Renosterveld had an original extent of 20,976 hectares, with a mere 2,561 hectares still intact today, of which approximately 3% is protected. The reserve is committed to conserving 5.2% of the remaining ERSR and 1.6% of the remaining RSR, contributing to the preservation of these critically threatened ecosystems.

The Custodians of Rare and Endangered Wildflowers (CREW) and the Overberg Renosterveld Trust (ORT) have conducted numerous botanical surveys on the Haarwegskloof Nature Reserve and recorded a number (>70) of Species of Conservation Concern (SoCC) that included a variety of rare, threatened and endemic botanical species. Continuous surveys build on the comprehensive list of all the plants found within the Reserve. iNaturalist has been a great platform, and the biodiversity records for the respective reserves have been uploaded so that visitors and officials can contribute to this growing database and the Biodiversity Resource Inventory.

A full list of the Botanical SoCC for the Nature Reserve is included in the management plan as Appendix B. A Biodiversity Resource Inventory has been developed for the Haarwegskloof Nature Reserve and is updated regularly.

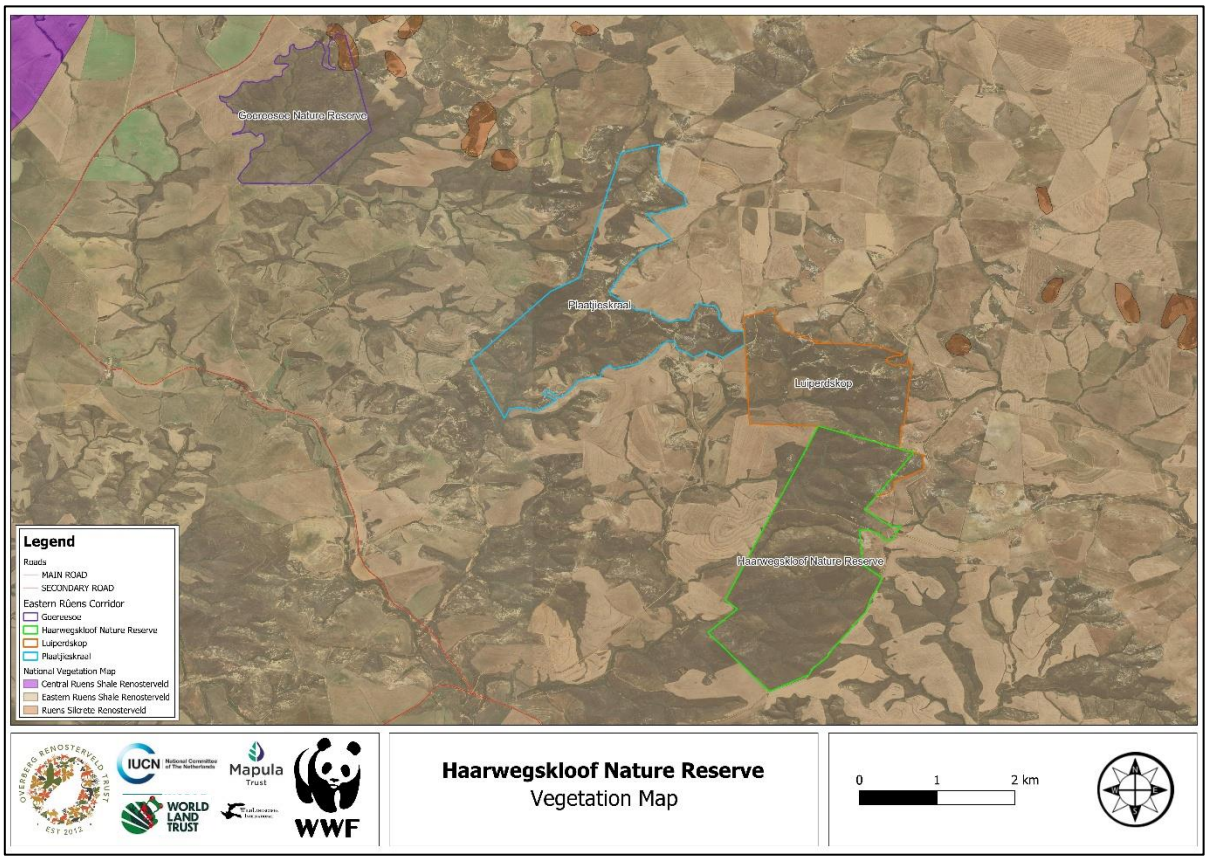

Figure 2.6.3 Vegetation types found on Haarwegskloof Nature Reserve. Species lists are included as Appendix C.

2.6.4 Fire regime

Fire is considered an essential ecological process within the Fynbos Biome and is necessary for the maintenance of ecosystem structure and function as well as for sustaining biological diversity. It provides the disturbance and stimulus that has contributed to the unprecedented floristic responses recorded in many fynbos and renosterveld vegetation types. It is a process that is essential for the continued functioning of the ecosystem as well as the continued evolution of biota within fynbos, and to a lesser degree, renosterveld (Curtis et al., 2024). 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 the extant remnants to ensure persistence of biodiversity whilst ensuring the safety of persons and property.

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

Renosterveld plants appear to be adapted to fire, but evidence that they *depend* on fire to the same degree as fynbos does (e.g. for smoke-stimulated germination), is lacking. Management actions should therefore consider long-term species persistence from a faunal and floral perspective. The Fire Management guidelines that must be taken into consideration are as follows:

- Fire Frequency – this refers to how regularly the natural veld should be burnt. Fire return intervals should not be shorter than 6-10 years for Overberg renosterveld generally, and it is mooted than these should be substantially longer in the drier Eastern Rûens Renosterveld (Curtis et al., 2024; De Villiers et al., 2016).
- Fire Season – this refers to the time of the year during which the natural veld should be burnt. With respect to the specific adaptations of Fynbos animals and plants, indications are that the fire season should be late summer to early autumn (January to early April).
- Fire Intensity – this refers to whether the natural veld will be burnt with a quick, hot, intense fire or a slow, cool, low intensity fire. Fire intensity will favour specific plant species and should be planned to ensure the maximum persistence of biodiversity.
- Fire Size – the size of a fire may vary from small, controlled burn to large fires that burn over thousands of hectares. The suitability of the different fire types will vary across the landscape and the development of a patchwork mosaic of different veld ages may be the best option for safe-guarding species persistence.

Another critical consideration with respect to fire management is the aspect of grazing within renosterveld post burning. Current recommendations are that renosterveld should not be grazed for the first three years after fire to ensure that the bulbous plants, grasses and other key floral components receive adequate time to set seed. Grazing, irrespective of veld age, should also be limited to the summer months (December to March), with winter and spring grazing completely avoided, to ensure that the full species complement has had time to (re)establish and that plants are not grazed / browsed during peak growing and flowering seasons.

Three ecological burns have been implemented on Haarwegskloof to date with some unrecorded fires pre-dating purchase. Plaatjieskraal has been burnt sporadically for grazing purposes and this might have been the case for Luiperdskop and Goereesoe. The latter properties have not seen any fire for the last two to three decades at least. All historic data of ecological controlled burns and wildfires should be captured on a GIS database. Although there are no definitive fire frequencies established for renosterveld, it is likely that several parts of the Conservation Area will require controlled burns, or similar disturbance interventions, in future. Long-term fire plans need to be combined with thorough pre- and post-burn monitoring, allowing for flexibility in an adaptive fire management strategy.

The renosterveld on the Haarwegskloof Nature Reserve is surrounded by transformed agricultural lands that form a natural firebreak and allow for ease of access in the event of an uncontrolled or runaway fire on site. Furthermore, a network of roads can also be used as cut-off points. However, the veld is connected across the broader landscape with intact natural vegetation and the development of firebreak agreements with neighbouring landowners is necessary. It is essential that the Management Authority is a member of the Greater Overberg Fire Protection Association (goFPA), whereby written agreements may be entered into across properties with connected natural vegetation as part of the FPA agreement. Though membership with a FPA is voluntary, in terms of the National Veld and Forest Fires Act (Act No. 101 of 1998) landowners are advised to join the local FPA for insurance purposes and legal responsibilities.

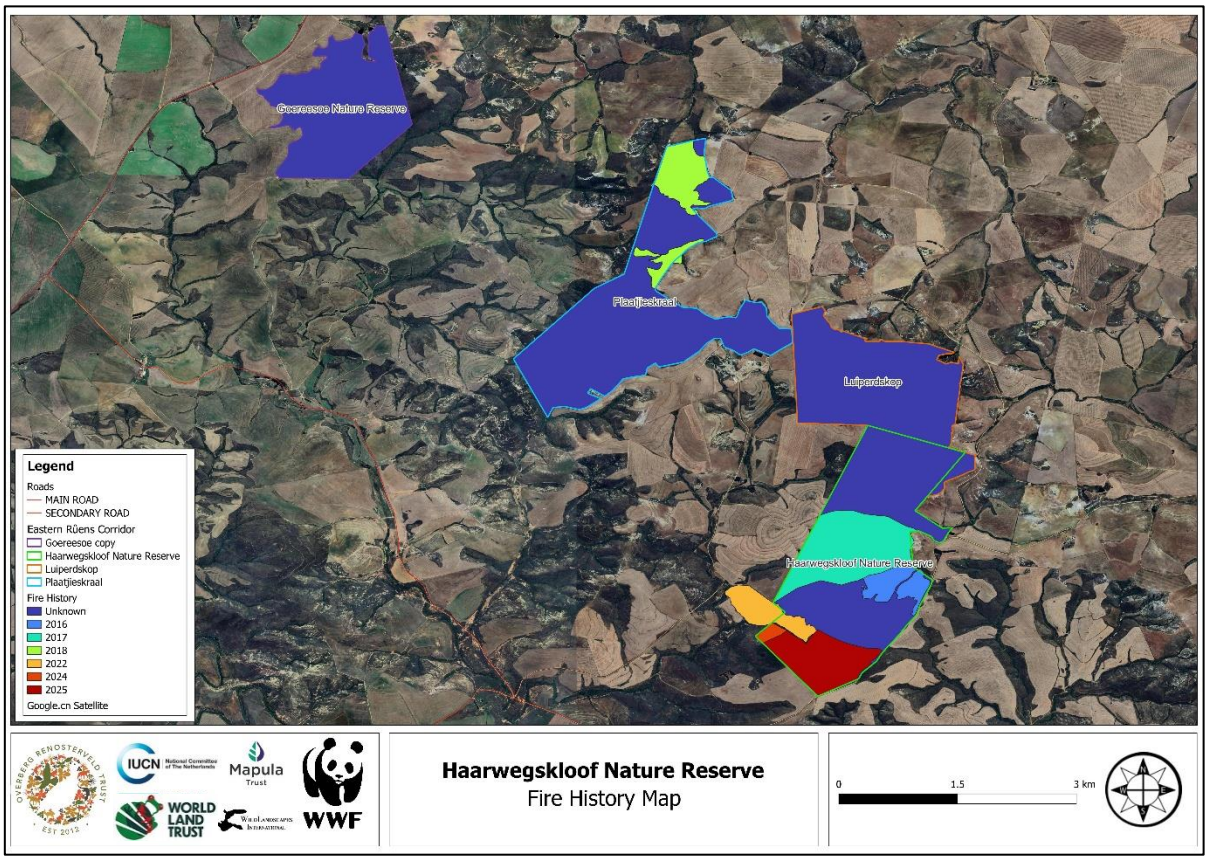

Figure 2.6.4.1 Veld age map for Haarwegskloof Nature Reserve.

2.6.5 Invasive species

Any land management programme in South Africa will inevitably include an alien plant control programme. Alien vegetation control programmes are essential to protect valuable resources such as surface and ground water, biodiversity and to manage fire risk.

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.

An alien control programme, however, requires a high level of commitment, coordination between landowners and authorities, professional planning and thorough implementation. The guidelines provided are compiled from a wide set of resources and will hopefully provide insight to land managers in order for financial and human resources to be effectively used in an integrated control programme.

The Haarwegskloof Nature Reserve is in maintenance phase from an Invasive Alien Plant (IAP) perspective. Woody IAPs have been recorded on site and are limited to *Eucalyptus* spp., *Pinus halepensis*, *Acacia cyclops* and *Opuntia ficus-indica*. Isolated stands of *Acacia cyclops* and *Pinus halepensis* still occur on Plaatjieskraal and Luiperdskop. Large stands have been cleared from

Haarwegskloof and Plaatjieskraal but requires regular follow-up. The potential to manage alien invasive grasses as well as invasive thistles will need investigating.

Invasive fauna has been recorded on site but is limited to Fallow Deer, Domestic cats and Peafowl. Further monitoring to determine the potential occurrence of additional species should be ongoing.

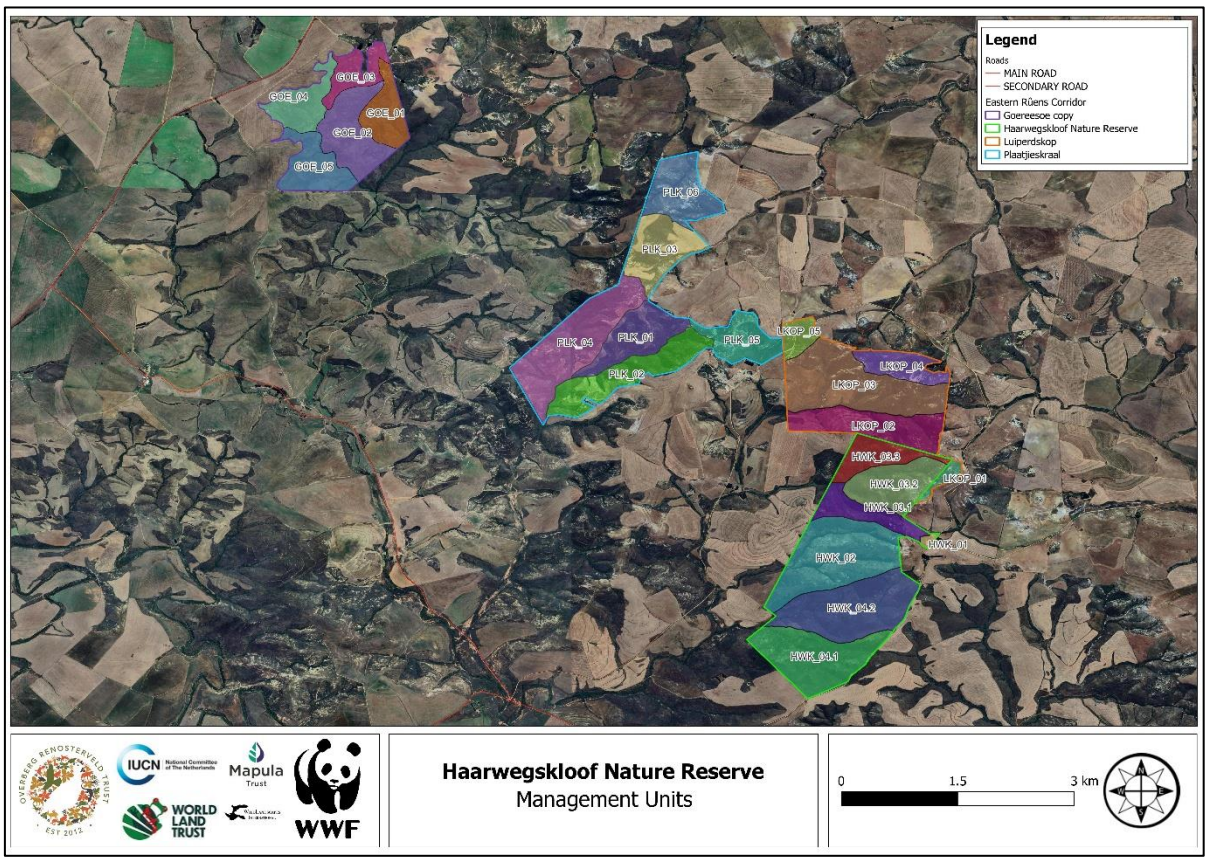

Figure 2.6.5 Invasive alien vegetation map for Haarwegskloof Nature Reserve

2.6.6 Species of conservation concern

The species of conservation concern found in the Haarwegskloof Nature Reserve for plants, birds and mammals are tabled below. A Critically Endangered Dung beetle, *Copris sexdentatus* has also been recorded on the reserve. Additional work must be done to compile lists of the invertebrates to understand the full spectrum of species of conservation concern on the properties.

Table 2.6.6. Plant species of conservation concern on Haarwegskloof Nature Reserve.

Family	*Species*	Red List Status
FABACEAE	*Polhillia curtisiae*	CR
FABACEAE	*Xiphotheca rosmarinifolia*	CR
IRIDACEAE	*Hesperantha kiaratayloriae*	CR
AIZOACEAE	*Drosanthemum quadratum*	EN
AIZOACEAE	*Gibbaeum hartmannianum*	EN
AIZOACEAE	*Mesembryanthemum napierense*	EN
AIZOACEAE	*Ruschia leptocalyx*	EN

AIZOACEAE	*Trichodiadema pygmaeum*	EN
APIACEAE	*Notobubon striatum*	EN
FABACEAE	*Argyrolobium pachyphyllum*	EN
FABACEAE	*Aspalathus smithii*	EN
FABACEAE	*Lotononis viborgioides*	EN
FABACEAE	*Psoralea curtisiae*	EN
FABACEAE	*Xiphotheca guthriei*	EN
IRIDACEAE	*Gladiolus vandermerwei*	EN
PROTEACEAE	*Leucadendron coriaceum*	EN
PROTEACEAE	*Protea decurrens*	EN
RESTIONACEAE	*Elegia squamosa*	EN
SCROPHULARIACEAE	*Selago ramosissima*	EN
AIZOACEAE	*Drosanthemum calycinum*	NT
ASPARAGACEAE	*Asparagus lignosus*	NT
ASPARAGACEAE	*Eriospermum paradoxum*	NT
ASTERACEAE	*Achyranthemum mucronatum*	NT
CYPERACEAE	*Ficinia overbergensis*	NT
EUPHORBIACEAE	*Euphorbia nesemannii*	NT
FABACEAE	*Aspalathus incomta*	NT
GERANIACEAE	*Pelargonium triste*	NT
IRIDACEAE	*Bobartia longicyma longicyma*	NT
IRIDACEAE	*Freesia caryophyllacea*	NT
IRIDACEAE	*Geissorhiza nana*	NT
IRIDACEAE	*Gladiolus teretifolius*	NT
IRIDACEAE	*Ixia micrandra*	NT
IRIDACEAE	*Moraea elsiae*	NT
IRIDACEAE	*Moraea fergusoniae*	NT
IRIDACEAE	*Syringodea longituba violacea*	NT
IRIDACEAE	*Watsonia aletroides*	NT
PROTEACEAE	*Leucadendron meridianum*	NT
PROTEACEAE	*Protea obtusifolia*	NT
RESTIONACEAE	*Elegia recta*	NT
RUTACEAE	*Agathosma foetidissima*	NT
AIZOACEAE	*Acrodon deminutus*	VU
AIZOACEAE	*Trichodiadema occidentale*	VU
ASPHODELACEAE	*Trachyandra chlamydophylla*	VU
ASTERACEAE	*Oedera garnotii*	VU
ERICACEAE	*Erica venustiflora glandulosa*	VU
FABACEAE	*Aspalathus barbigera*	VU
FABACEAE	*Aspalathus campestris*	VU
FABACEAE	*Aspalathus microlithica*	VU
FABACEAE	*Aspalathus millefolia*	VU
FABACEAE	*Aspalathus quartzicola*	VU
FABACEAE	*Aspalathus steudeliana*	VU

FABACEAE	*Aspalathus zeyheri*	VU
HAYCINTHACEAE	*Ornithogalum pilosum*	VU
IRIDACEAE	*Bobartia longicyma microflora*	VU
IRIDACEAE	*Gladiolus vaginatus*	VU
MALVACEAE	*Hermannia lavandulifolia*	VU
ORCHIDACEAE	*Bartholina etheliae*	VU
RUTACEAE	*Acmadenia macropetala*	VU
RUTACEAE	*Diosma passerinoides*	VU

Table 2.6.7. Bird species of conservation concern on Haarwegskloof Nature Reserve.

Species	Common Name	Red List Status
Anhinga rufa	African Darter	NT
Circus ranivorus	African Marsh-Harrier	VU
Certhilauda brevirostris	Agulhas Long-billed Lark	NT
Circus maurus	Black Harrier	EN
Ciconia nigra	Black Stork	EN
Nycticorax nycticorax	Black-crowned Night-Heron	NT
Elanus caeruleus	Black-winged Kite	NT
Anthropoides paradiseus	Blue Crane	VU
Anas smithii	Cape Shoveler	NT
Gyps coprotheres	Cape Vulture	VU
Neotis denhami	Denham's Bustard	VU
Scopus umbretta	Hamerkop	NT
Eupodotis vigorsii	Karoo Korhaan	NT
Charadrius pecuarius	Kittlitz's Plover	NT
Falco biarmicus	Lanner Falcon	NT
Falco naumanni	Lesser Kestrel	VU
Anas erythrorhyncha	Red-billed Teal	NT
Sagittarius serpentarius	Secretarybird	VU
Eupodotis afra	Southern Black Korhaan	VU
Aquila verreauxii	Verreaux's Eagle	VU
Anas undulata	Yellow-billed Duck	NT

Table 2.6.8. Mammal species of conservation concern on Haarwegskloof Nature Reserve.

Species	Common Name	Red List Status
Pelea capreolus	Grey Rhebuck	NT
Panthera pardus	Leopard	VU

2.7 Cultural Heritage

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.

The Haarwegskloof Nature Reserve falls within a very important De Hoop-Eastern Rûens remnants & Rûens silcrete hills - De Hoop Vlei TMF Climate Corridor. The three sites collectively forms the core of this corridor. ORT has secured two sites in the corridor by means of conservation servitudes. Several key properties still need to be secured for conservation in the corridor.

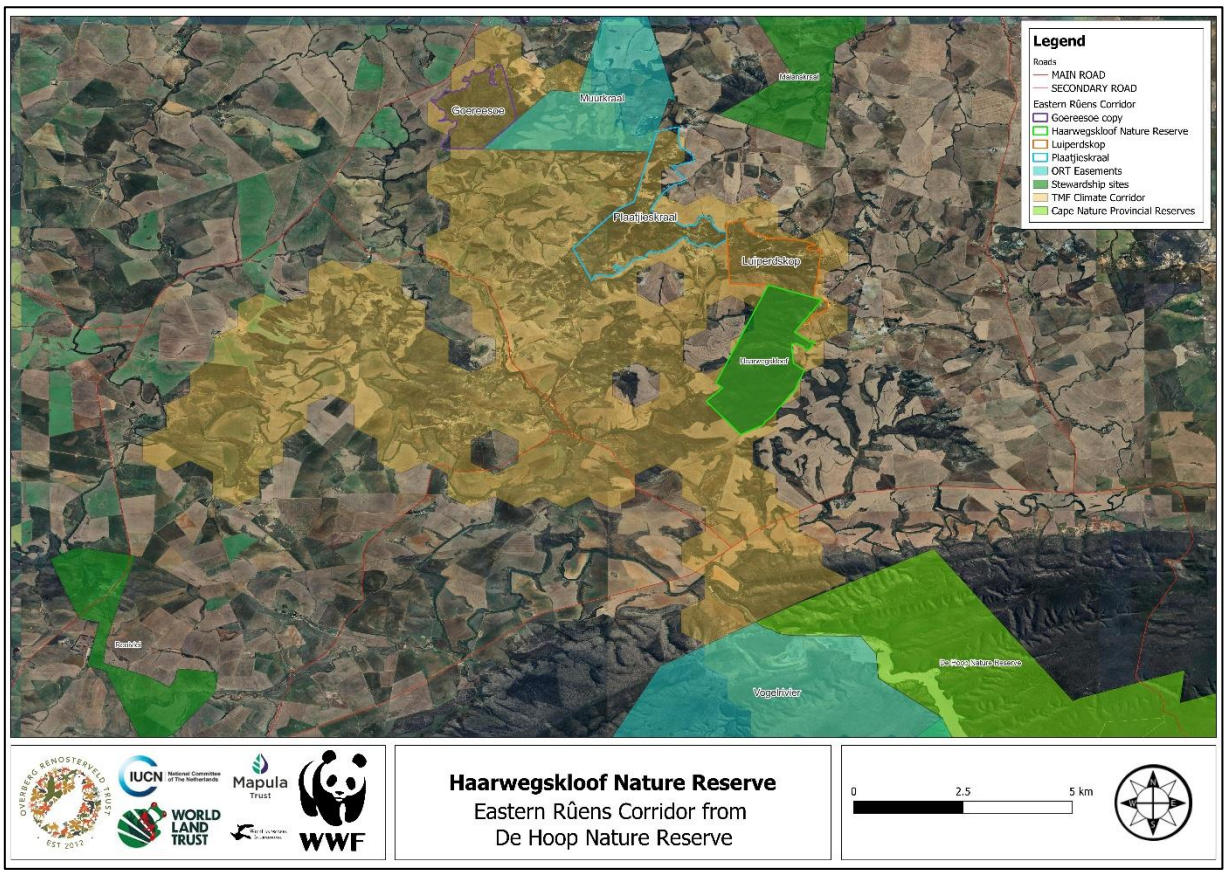

Figure 2.8.1. Map showing the Eastern Rûens Corridor from De Hoop Nature Reserve.

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. Haarwegskloof Nature Reserve is located in the Overberg District Municipality (ODM) which covers an area of approximately 12,241 km^2. The ODM is made up of 4 local municipalities, specifically Theewaterskloof LM, Overstrand LM, Cape Agulhas LM and Swellendam LM. Haarwegskloof is located in Ward 3 of the Swellendam LM. The ODM is mostly rural in nature with an extensive agricultural industry and several small towns, such as Hermanus, Kleinmond, Gansbaai, Villiersdorp, Caledon, Riviersonderend, Swellendam, Bredasdorp, Napier and Struisbaai. The ODM lies at the southernmost region of the African Continent within one of the world's richest biodiversity hotspots, the Cape Floristic Region (CFR).

In terms of the Municipal Systems Act, (Act No. 32 of 2000), local municipalities in South Africa are required to use integrated development planning to map and plan future development in their area. An Integrated Development Plan (IDP) is a 5-year strategic plan in which the municipal strategic and budget priorities are set.

An IDP is intended to be the principal strategic instrument to inform planning and development within a municipality. It should co-ordinate the work of local and other spheres of government and must take into account the existing conditions, constraints and resources available. Among other things, the IDP should address how the environment will be managed and protected. Among the key components of an IDP are disaster management plans and a Spatial Development Framework (SDF). SDFs are essentially the spatial reflection of a municipality's IDP.

An SDF is updated every five years and must indicate the desired patterns of land-use for the municipality and provide strategic guidance regarding the location and form of development, as well as conservation, within the municipality. An SDF must include basic guidelines for a land use management system for the municipality and should be used to guide changes in land-use rights and public investment in infrastructure.

The local municipalities are responsible for producing and co-coordinating IDPs and SDFs, but they must consult other stakeholders in the area who can impact on and/or be impacted on by development and other changes in the area. All government departments working in the area should refer to the IDP to ensure their work is aligned.

In essence SDF's and IDPs are tools for integrating social-, economic- and environmental issues and development within a municipality. As biodiversity is a fundamental component of sustainable development, SDFs and IDPs offer an opportunity to ensure that biodiversity priorities are incorporated into planning processes. In turn, the identification of biodiversity-related projects for the IDP can support local economic development and poverty alleviation.

This should be read in context with the Overberg District Municipal Spatial Development Framework. The Vision for the Overberg District SDF is to "optimise the rich and balanced mix of Overberg's agriculture, tourism, heritage and conservation resources within their scenic setting…". The implications of this vision for conservation is to ensure that private conservation areas must continue to be promoted with careful consideration of appropriate development rights to mobilise the necessary resources for veld rehabilitation and management. This is achieved with the broad Spatial Planning Categories which include:

- Core Areas – no conventional urban development and includes conservation areas, river corridors and ridge line boundaries;
- Buffer Areas – includes undeveloped rural land and extensive agriculture with no development beyond 1 building per 10 hectares with clustered development nodes.

The Spatial Planning Categories further divide the Core Areas into two categories – Core 1: Formally Protected Areas and Core 2: River and Wetland Corridors. The Core 1 category comprises formally protected natural areas including large Core Biodiversity Areas identified by SANBI. The Buffer 1 Critical Biodiversity Areas outside of Core 1 areas is a further category which encompasses important vegetation fragments requiring protection that have been identified by SANBI. Landowners are encourage to protect these area through Stewardship Agreements or in the establishment of conservancies and should only be utilised for conservation purposes.

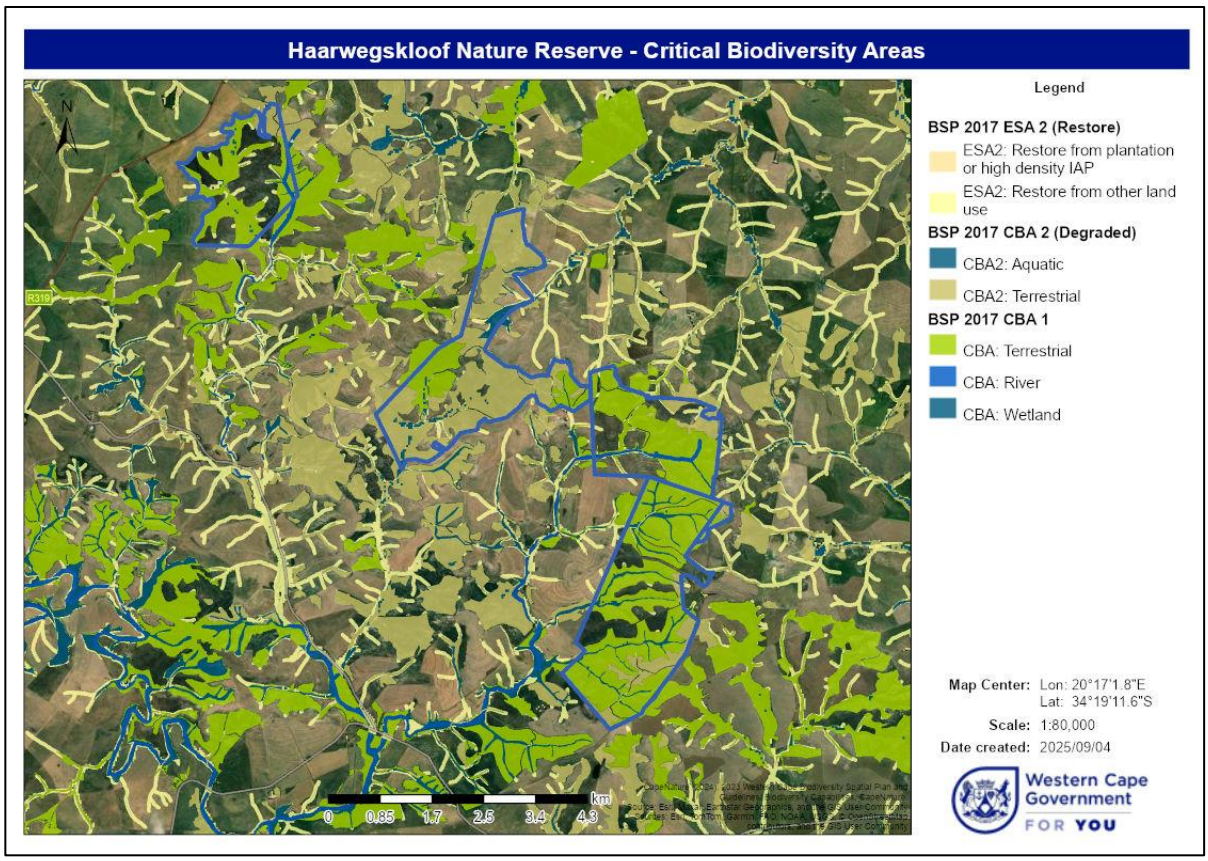

Figure 2.8.2 Critical Biodiversity Area map of Haarwegskloof Complex Nature Reserve (2017)

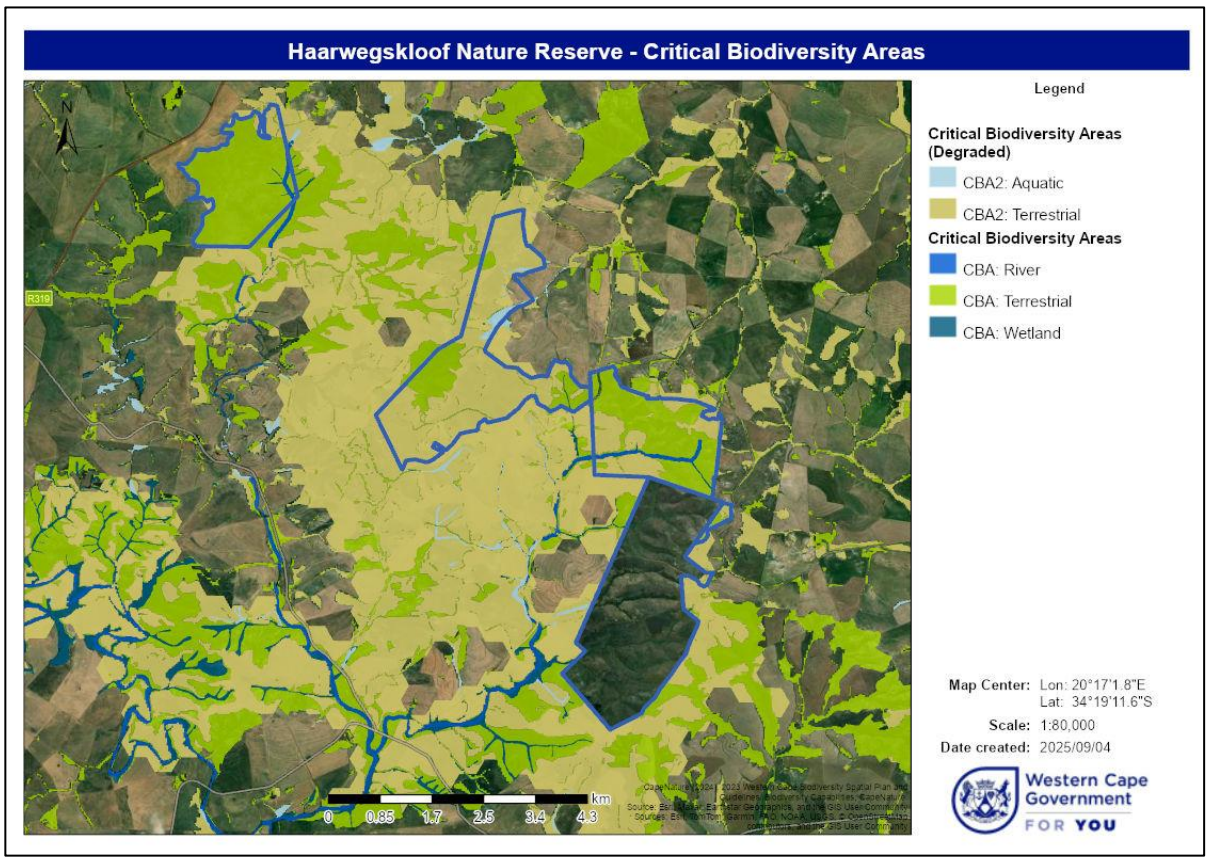

Figure 2.8.2 Critical Biodiversity Area map of Haarwegskloof Complex Nature Reserve (2023)

2.9 Socio-economic context

The reserve is surrounded by intensive agriculture. This can result in an array of challenges for the reserve. Runoff and drift from the cultivated fields can negatively affect biodiversity. Farmers may also target or indirectly kill or poison predatory birds and mammals that use the reserve as a refuge.

Domestic animals may spread diseases to wild animals and vice versa. Domestic animals may also become feral(cats and dogs) and start hunting on the reserve. Feral pigs from nearby farms (not containing the animals) could also compromise veld condition, fences and other infrastructure, should they come on the reserve.

The reserve could attract people from the surrounding communities, who may exploit it for recreational purposes or illegally collect animals and plants for food, traditional medicine, or the illegal plant trade. However, due to Haarwegskloof Nature Reserve's remoteness this is a low risk.

The Management Authority makes use of local Natural Resource Management teams to implement management and restoration interventions. Furthermore, managing and maintaining the infrastructure on the reserve will also result in in the employment of 2-3 people from Bredasdorp on a regular basis. Haarwegskloof has an operational Research Centre, Guesthouse and Learning

Space (the latter known as 'The Shed') which can be rented by individuals or groups generating some income for the reserve, but more importantly bringing people in close contact with renosterveld conservation. The Shed is used amongst other activities, as an outdoor classroom where students from schools in the Overberg (local farm schools facilitated by ORT funding, or public schools that fund their own visits) come to learn about renosterveld. The facilities at Haarwegskloof have recently been renovated and others repurposed to host or cater for larger groups (up to 24 people). The old shed is now used an environmental education facility / lecture room with a kitchen.

2.10 Existing Infrastructure and Disturbed Areas

The Haarwegskloof Nature Reserve, like most farms in the Overberg, is not untouched and contains some infrastructure and areas of historical disturbance. The following infrastructure has been identified:

- A perimeter fence around Haarwegskloof erected to the Bontebok standard; the other sites has some perimeter fencing in place;
- Roads and tracks;
- A main infrastructure node containing five historical buildings that has been repurposed into a Research Centre, the shed which is now used as a meeting venue and education centre, a guest house, a reserve manager cottage and operational/storage buildings;
- Water tanks with its associated pipes that stretches through the reserve and along the boundary fence to the Overberg District Municipality water point:
- A shepherd cottage further away from the main infrastructure which might be upgraded slightly for reserve / temporary staff;
- Previously ploughed fields that have revegetated passively over the last 3 decades.

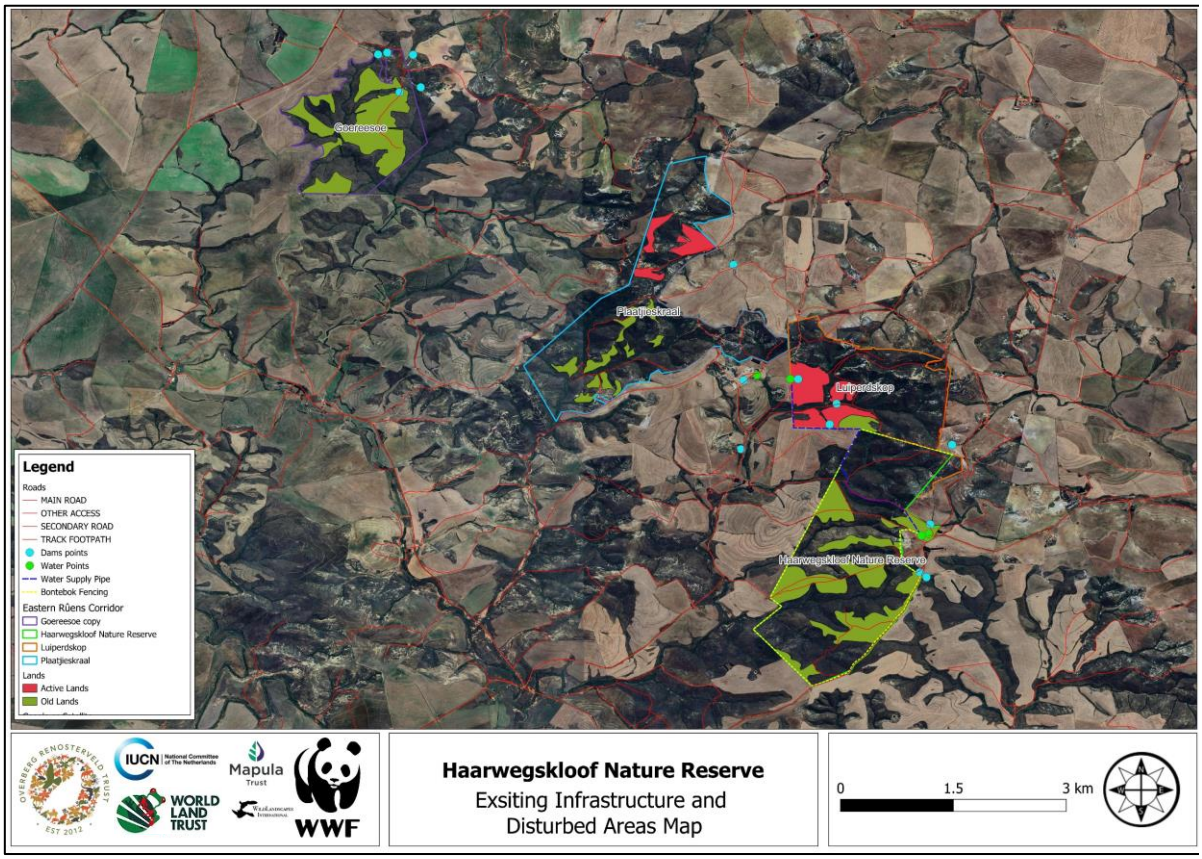

Figure 2.10.1 Locations of infrastructure and previously disturbed areas across Haarwegskloof Complex Nature Reserve

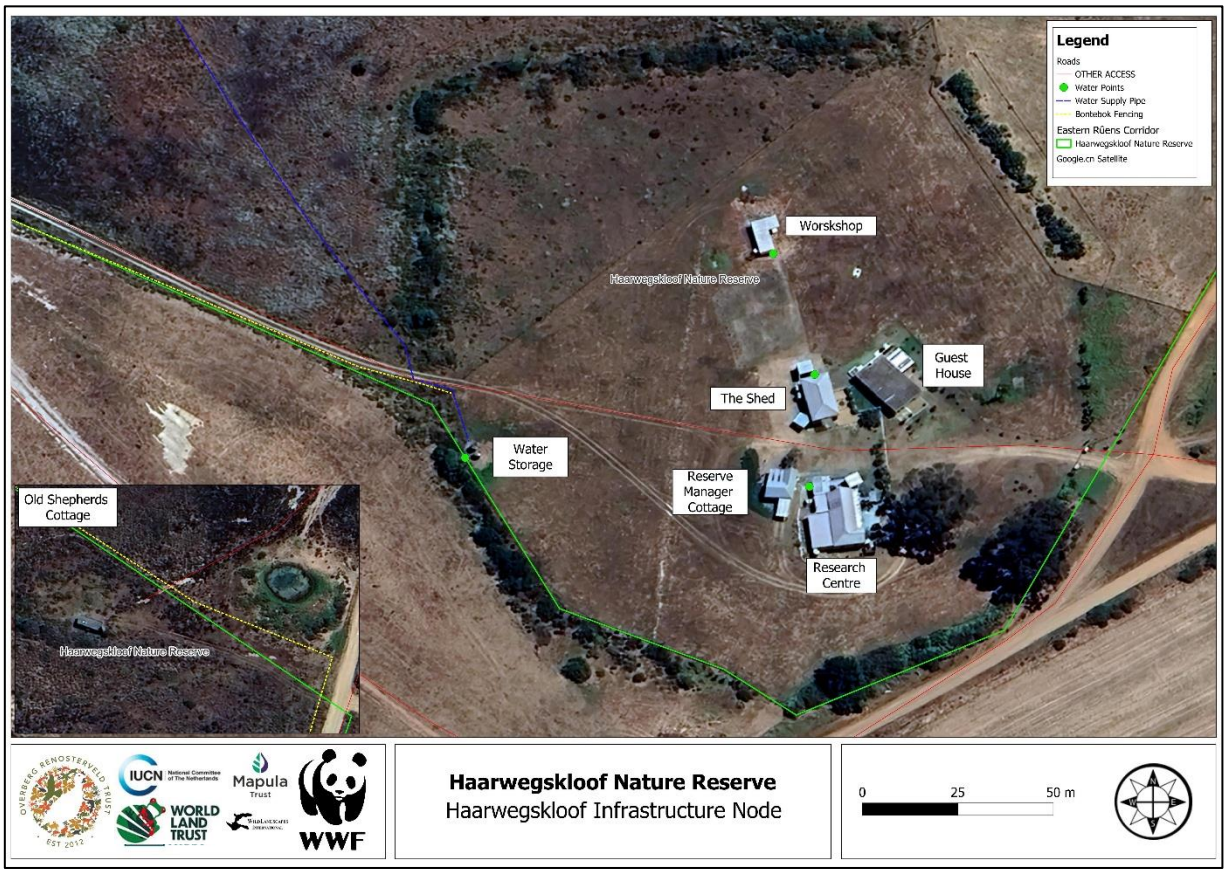

Figure 2.10.2 A closer view of the main infrastructure node at Haarwegskloof Nature Reserve

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 Haarwegskloof Nature Reserve. It has been prepared in a collaboratively process by the site manager and co-owners, being the Overberg Renosterveld Trust (Management Authority) and WWF-SA and CapeNature.

3.1 Purpose

The purpose is the foundation on which all future actions are based and is in line with the key ecological attributes of the reserve and the overall management philosophy of the management authority.

Purpose
Haarwegskloof Nature Reserve serves in the protection of many of South Africa's rare, threatened and endemic species, and protects hundreds of connected hectares of Endangered renosterveld habitats in order to maintain and support ecological integrity. Repurposed infrastructure serves as a base for collaborative research, education and local tourism.

3.2 Vision

The vision statement for the Haarwegskloof Nature Reserve below describes the desired long-term, over-arching outcome that is a result of the effective management of the reserve.

Vision
Haarwegskloof Nature Reserve will be a showcase for optimally functioning Eastern Rûens Shale Renosterveld, where all threats are mitigated and threatened species thrive, while renosterveld habitats are studied, shared and experienced by scientists, visitors and the next generation of renosterveld custodians.

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 3.3.1-4 below set out the key performance areas (KPAs), the objective for each KPA and the key deliverables of each objectives.

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 Plant Management	Wildfire: To implement effective ecological burning regimes to ensure the conservation of habitats and processes by maintaining and improving ecosystem functioning, to allow for natural fire processes to occur without impacting on safety and infrastructure. Invasive Aliens: To eradicate invasive alien species using mechanical and biological control methods, and to reduce combustible material to reduce intensity and spread of wildfires, while undertaking effective monitoring to prevent further introductions of invasive aliens.	Wildfire: • Allow natural fire processes to take place. • Reduce risk of uncontrolled wildfire. • Staff trained and equipped to manage wildfires. • Monitor extent of wildfires and establish thresholds of concern. • Maintain Partnerships to Improve Fire Management Invasive Aliens: • Identify, quantify and map all invasive alien plant species and use data to draft a Strategic Clearing Plan. This plan should include species' densities, control methods and follow-up activities. • Implement Strategic Alien Invasive Plant Clearing Plan through the most effective mechanical, chemical and biocontrol measures. • Monitor to prevent new introductions and inform follow-up operations. • Provide technical advice and guidance for invasive alien plant control programs in the reserve's core buffer zone
Rehabilitation and restoration	To identify areas across the reserve showing signs of degradation, understand the causes of degradation and implement suitable and effective control measures where required, to improve overall ecosystem function.	• Limit the loss of biodiversity and disruption to ecological processes caused by degradation. • Develop a clear management strategy in which degradation across the reserve is identified, quantified and adequate, effective control measures prescribed. • Soil erosion effectively prevented and eroded sites restored/rehabilitated. • Monitoring of degraded sites to measure further degradation, as well as the effectiveness of implemented rehabilitation measures. • Sound relationships with key stakeholders assisting with rehabilitation programmes and activities.
Aquatic and riparian systems	To conserve the biodiversity and ecosystem function of aquatic and riparian systems on the reserve.	• Monitoring programme identifying threats and changes to riparian systems in the • Management actions are identified and implemented to safeguard and improve aquatic health. • Effectively functioning seeps, wetlands, streams, rivers and riparian areas in the reserve.
Species of special concern	To ensure the optimal long-term population viability and ecological function of all life, particularly species of conservation concern	• Identify plant and animal species of special concern present on the reserve by formal survey. • Monitoring of populations of species of special concern (Floral and Faunal). • Identify and implement specific management requirements for each species if required.

Wildlife	To ensure effective conservation of faunal species, populations and inter-relationships in order to enhance biodiversity and maintain and improve ecosystem functioning.	• Compile and maintain a complete fauna species list covering mammals, amphibians, reptiles, birds and invertebrates, using ad-hoc and survey-related records. • Conduct surveys to determine presence of SCC fauna species in a prioritised manner and establish monitoring programmes to determine continued presence. • Wildlife numbers and population health monitored on continual basis. • Impact of wildlife on the ecosystem is monitored. • Introduction of indigenous wildlife to the reserve to ensure optimum population functioning. • Reintroduction of historically occurring wildlife species in line with prescribed protocols and best practises. • Remove honeybee hives to reduce potential competition for wildflower resources with wild honeybees and/or solitary species. • Ensure that other potentially invasive fauna species do not become established in the reserve.

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 small, local tourism business to ultimately cover the infrastructure maintenance and 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.

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 with a specific focus on Renosterveld. Stakeholders are also introduced to careers in eco-tourism, hospitality and nature conservation.	• Increase awareness about the value of functioning ecosystems and conservation of Renosterveld as a tangible experience through hosting schools or providing information to visitors. • Informal training provided to various groups (Universities, Interest groups). • Formal career development training provided to potential employees. • Address specific management issues such as veld management, threat of invasives, erosion, poaching, etc.
Socio-economic development initiatives	To work with relevant stakeholders to make a meaningful contribution towards the socio-economic development needs of local communities.	• Where possible select employees and service providers from local communities. This could include but not limited to eco-tourism guides, hospitality staff, natural resource management teams. • 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 history of the Haarwegskloof Nature reserve and the Overberg district.	• Systematically map and document all archaeological, paleontological and cultural features with input from experts. • Support the study of on-reserve features by experts and to share knowledge and insights gained. • Conserve the integrity of all archaeological and heritage features on the reserve.

Table 3.3.4 Management authority effectiveness and 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.	• Submit this plan to CapeNature for approval. • Fully compliant with the Protected Area legislation. • Manage the reserve in compliance with the approved management plan. • Overall compliance with applicable legislation • All future developments meet the requirements of the National Environmental Management Act (NEMA).

Infrastructure and equipment	To procure and maintain infrastructure and equipment to ensuring productive and effective implementation of management activities on the reserve.	• Infrastructure is adequately maintained, and equipment serviced and kept in compliance with relevant legislation. • 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. • Purchase of equipment essential for the day-to-day management of the reserve. • Annually assessment of infrastructure and draft a list of development and maintenance requirements.
Signage, access control and security	Signage, access control and security measures are put in place that effectively address related threats ensuring that visitors to the reserve conduct themselves in a manner that aligns with the objectives of this management plan, while ensuring their safety during their visit.	• Maintain the Haarwegskloof Nature Reserve existing Bontebok fence and ensure that all other boundary fences within the larger reserve are maintained, but with minimal impacts on the natural movement of wildlife across the landscape. • Conduct regular patrols of boundary fence to record signs of illegal access and the condition of the fence. • Develop and maintain signage at the reserve entrances and alongside public roads notifying visitors that they are entering Haarwegskloof Nature Reserve to raise an increased awareness of the rules of the reserve and encourage visitation. • Install appropriate signage to inform visitors of any rules or restrictions that may apply to particular areas within the reserve. Provide rules and regulations in the form of pictograms where possible, but also as text where necessary. • Install lockable gates at all access points if required. • Security measures are put in place to address specific threats.
Research and management knowledge	To collaborate with research and tertiary education institutes to develop and implement research projects that talk directly to priorities identified in the ORT's Research Strategy. To use the results of these scientific studies to inform renosterveld management decisions and where necessary, adapt management plans and activities accordingly.	• Updated ORT research strategy (many questions in the strategy directly relate to the management of the reserve) to address knowledge gaps through desk-top research, scientific research and engaging with experts. • Maintain and expand partnerships with academic institutions to pursue research objectives • Create and maintain an electronic reference for all research conducted at, or relevant to, Haarwegskloof NR and Overberg renosterveld generally. Ensure that all researchers working on site provide electronic copies of their reports to the reserve to add to the online repository. • Use increased knowledge and research findings to improve management effectiveness ensuring that the management plan is updated in accordance with the latest research during reviews.

3.4 Zonation plan

The purpose of the zonation of Haarwegskloof 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.

CapeNature's protected area zonation categories provides a standardised framework for managing land use across protected areas. It allows for reserves to be divided into various use zones, each with a different purpose, based on a sensitivity analysis. The most sensitive areas may be designated "wilderness" or "primitive" zones which may allow for very little or no development. Previously disturbed areas such as historically ploughed fields may be designated as "Low Intensity" or even "High Intensity" development zones which would allow for a variety of activities. These activities may include development of visitor infrastructure, harvesting of resources or other activities that maximise the human benefit derived from the reserve.

CapeNature's zonation categories (Table 3.4) were developed through an internal workshop process completed in September 2010. Existing protected area zoning categories worldwide were examined to develop a simple and powerful scheme that provides for the required range of visitor experience, access, and conservation. The zonation categories is a core component of any protected area management plan as it provides a spatial context for achieving the vision and objectives set for the protected area.

The purpose of the zonation plan for Haarwegskloof Nature Reserve is to utilise the CapeNature zoning categories to align land-use with the vision for the protected area. The zonation plan therefore needs to cater for:

- Conservation and rehabilitation of terrestrial and riverine/freshwater habitats, with emphasis on the most threatened species and ecosystems;
- Maximising climate change resilience;
- Providing room for rational development of facilities for reserve management and environmental education;
- Providing facilities for nature-based environmental education activities;
- Providing reasonable access to the coast for existing user groups and to the reserve generally for management purposes.

Much of the Plaatjieskraal Section consists of near-pristine Endangered habitat. Endangered Eastern Rûens Shale Renosterveld is the main veld type across the four sections with thicket habitats in the ravines. The corridor stretches from De Hoop Nature Reserve in the south crossing a few private properties towards Haarwegskloof Nature Reserve through Luiperdskop and Plaatjieskraal and on to Goereesoe. This area contains very special and sensitive quartz patches unique to this area with special species assemblages mirroring similar habitats in the Karoo. Luiperdskop and Plaatjieskraal

because of its higher elevation also contain fynbos like species not typical of renosterveld, somewhat transitional habitat.

Existing infrastructure is tightly clustered around the historical buildings on Haarwegskloof. The primary access road to the main infrastructure node is also situated in the east coming from the Ou Plaas (De Hoop) road. An alternative route is through San Souci farm from R319 which could access all three reserves from the centre, also known as the Plaatjieskraal Road. The management tracks present on the reserves currently vary in usage, with some being used only purely for management and others for more regular, general access.

All parts of the reserve should be considered as sensitive given the uniqueness and conservation status of the dominant ecosystem. It is possible, however, to define areas of greater or lesser sensitivity. The virgin areas are of greatest sensitivity, but due to the presence of management tracks and fences, proximity to human activities it would be suitably zoned as primitive. Ploughed areas, with the exception of Haarwegskloof where the ploughed fields are restoring passively, would still be used for a period of 10 years, but after such agreement lapses would be allowed to go fallow. In the long term, old lands will either be left fallow to restore passively, or managed as grazing areas to support reintroduced antelope, such as Bontebok. The main infrastructure node at Haarwegskloof is where the tourism, research and education facilities are located is already zoned for development and therefore would follow this zonation. The zone boundaries were defined along existing roads or tracks as far as possible for the sake of practicality. The zonation map (Figure 3.4.1) and Table 3.4 illustrate the different zones within the reserve and provide descriptions of these zones. More detailed descriptive information is provided in Appendix C. The factors that were considered in assessing the reserve sensitivity and defining the zonation categories are clarified in more detail in the descriptive sections that follow.

Table 3.4: Guide to CapeNature Conservation Management Zones.

Zonation Category	Explanation
Wilderness/ Wilderness Declared	Areas with pristine landscape, sensitive areas or threatened ecosystems. Very limited access.
Primitive	Areas providing natural landscape, solitude and limited access. Normally a buffer area to wilderness zones.
Nature Access	Providing easy access to natural landscape. Includes areas with roads and trails, and access to popular viewing sites and other sites of interest.
Development – Low Intensity	Area with existing degraded footprint. Providing primarily self- catering accommodation and camping, environmental education facilities.
Development – High Intensity	Area extensively degraded. Providing low and/or higher density accommodation, and maybe some conveniences such as shops and restaurants.
Development – Management	Location of infrastructure and facilities for reserve administration and management

Development - Production	Commercial or subsistence farming (applicable to privately owned and managed nature reserves).
Development – Private areas	Private dwellings and surrounds (only applicable to privately owned and managed nature reserve).
Species/Habitat/Cultural Protection	Areas for protection of species or habitats of special conservation concern.
Cultural, Species / Habitat, Visual Natural Resource Access	Special management overlays for areas requiring specific management interventions within the Species / Habitat / Cultural Protection Zone.

Refer to the zonation map, Figure 3.4, below which illustrates the following:

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

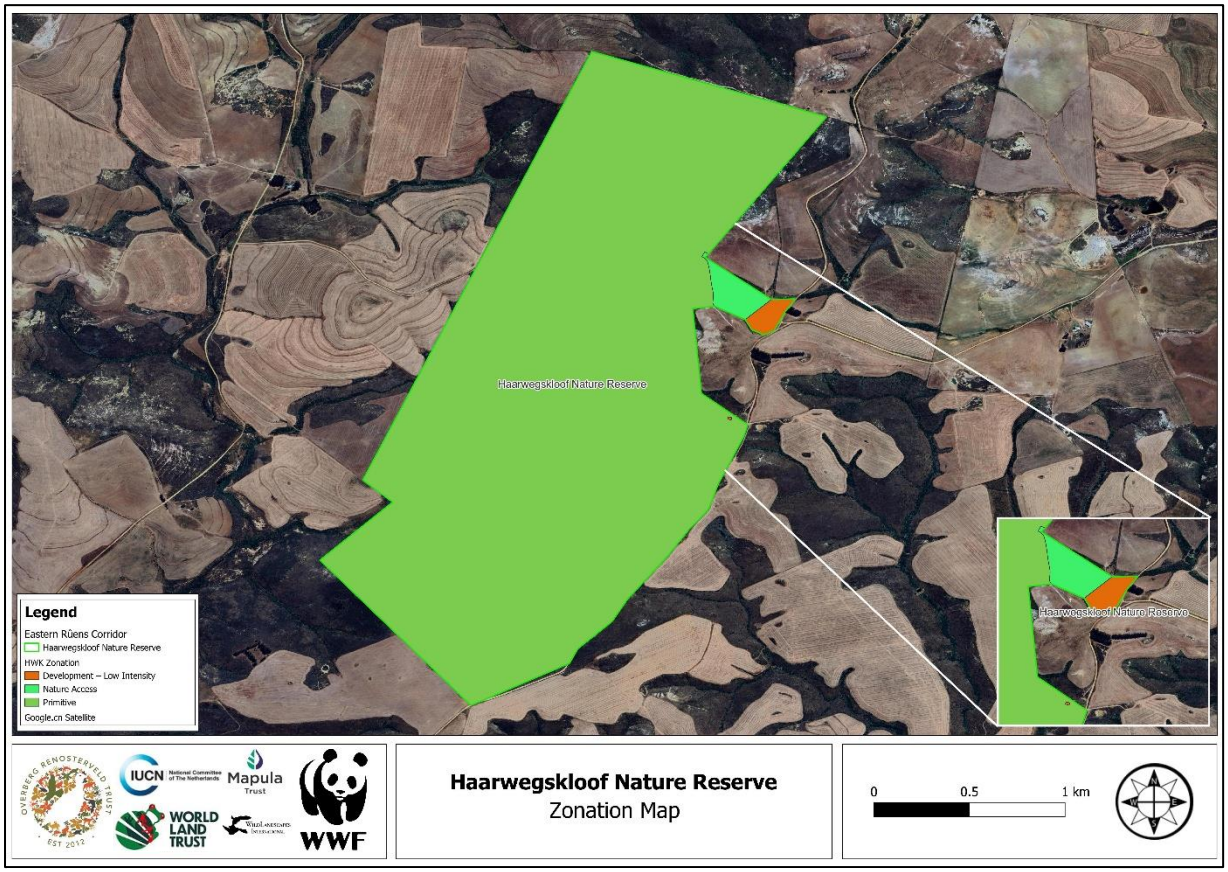

Figure 3.4.1 Zonation map of Haarwegskloof Complex Nature Reserve

3.4.1 Development Plans

No major further development is planned for this reserve other than maintaining the existing infrastructure and possibly the addition of a single, small staff quarters within the footprint of the Haarwegskloof visitor facilities within the Development Zone. The ORT may modify an old labourer's cottage for live-in staff on the reserve in future. ORT will investigate to opportunity to create a circular hiking trail linking Haarwegskloof to Plaatjieskraal.

3.5 Administrative structure

For the reserve to function optimally roles and responsibilities needs to be clearly defined together with the mechanisms by which the various stakeholders may exercise their roles. This brings about consistency and reduces conflict. The following roles and responsibilities have been identified for the Haarwegskloof Nature Reserve:

3.5.1 The Managing Authority

WWF-SA is currently the landowner and has appointed the ORT as the management authority responsible for the implementation of this management plan. The ORT will be the landowner of Goereesoe and Luiperdskop. The ORT raises funds for its various initiatives and along with income generated form the small tourism/education business on the reserve, allocates funds annually for the implementation to the management plan. This may include the appointment of reserve staff or making use of contractors to implement activities listed in this management plan. Furthermore, it would include the acquisition of tools, equipment, and other resources. Reserve staff or contractors will be supervised by the Reserve Manager with support from the Conservation Manager, the CEO and Office Manager.

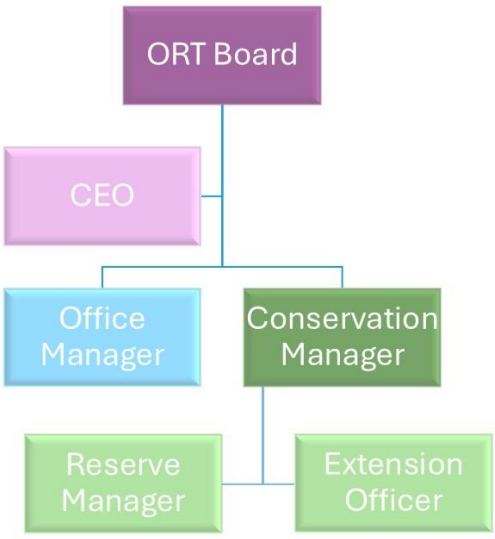

Figure 3.5: Organogram of the ORT staff component. The Reserve Manager indicated here is the responsible employee for the protected areas under the ORT's care and ownership.

Where applicable, management decisions can be made collaboratively between the Management Authority, WWF-SA and CapeNature, however the Management Authority is responsible for the management of the reserve and caries the ultimate decision-making responsibility.

The Overberg Renosterveld Trust will be responsible for submitting an annual progress report to the oversight authority, showing the progress made with regards to the implementation of the PAMP, along with challenges, setbacks or concerns raised.

3.5.2 Oversight Authority

CapeNature as the Provincial Conservation Authority will provide support, advice and assist with the implementation of the management plan of the nature reserve as agreed upon. CapeNature shall convene a meeting with ORT on an annual basis to formally review and audit the annual progress towards achieving the management objectives. CapeNature may also assist ORT with updating the Management Plan accordingly.

4 Operational Management Guidelines

This section translates the strategic framework described in Section 3 above into Key Deliverables and Management Activities, which will be used to inform Annual Plans of Operation (APO) and the resources required to implement them. The APO is attached as Appendix E. The management targets will form the basis for monitoring of performance in implementing the plan and are thus measurable.

4.1 Management Units

Dividing a protected area into management units allows for targeted conservation efforts, efficient resource allocation, and site-specific interventions. Haarwegskloof Nature Reserve existing roads and landmarks has been used as useful boundaries to define management units. 7 management units have been defined ranging from three to 140 ha. Some of the Management units can be defined further into sub-units. The management blocks for the purposes of this plan are defined on the map below and designated by number.

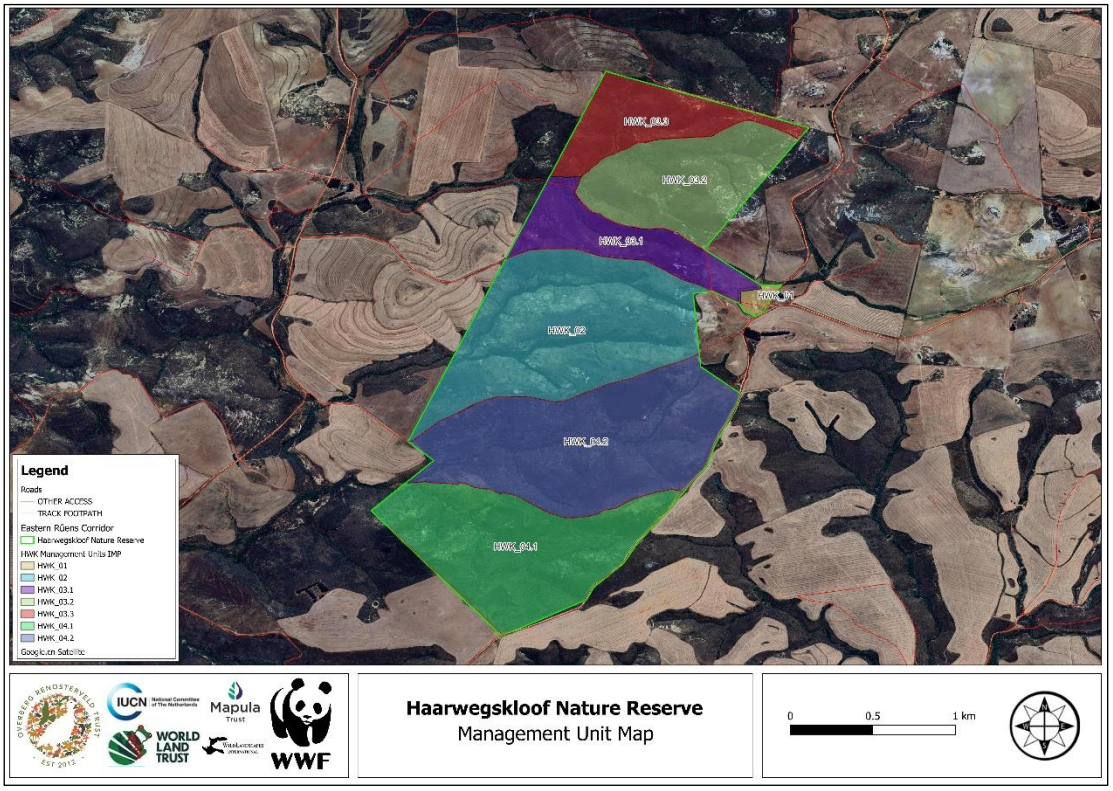

Figure 4.1.1 Management Unit Map for Haarwegskloof Nature Reserve

4.2 Biodiversity and ecological components

4.2.1 Integrated Wildfire and Invasive Alien Plants

4.2.1.1 Wildfire

Objective statement:
To implement effective ecological burning regimes to ensure the conservation of habitats and processes by maintaining and improving ecosystem functioning, to allow for natural fire processes to occur without impacting on safety and infrastructure.

Deliverables –

- Allow natural fire processes to take place.
- Reduced risk of uncontrolled wildfire.
- Staff trained and equipped to manage wildfires.
- Monitor the extent of wildfires and establish thresholds of concern.
- Maintain partnerships to improve fire management.

The role of fire is discussed extensively in 2.6.4 and describes fire in the context of Haarwegskloof Nature Reserve. 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. In developing a fire management strategy for the site giving consideration to the ecological implications in section 2.6.4, 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 aiming for 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, 'clean' burn).
- Season -A late summer or early autumn burn is considered ideal for fynbos and renosterveld habitats, however, prescribed burning in the summer months (Nov – Feb) is seldom supported by the local fire authorities due to the risk of runaway fires and the availability of fire teams during the 'high risk' season. The season for prescribed burns in the Western Cape is the 15 January – 15 May. However, the ORT works hard to maintain a collaborative working relationship with the GOFPA and is generally able to secure burn permits for late summer. Ideally, renosterveld should not be burnt beyond April.
- Frequency – Do not burn too frequently. Fynbos should be burnt at intervals between 8 and 20 years, while recommendations for renosterveld vary from 7 to 12-year intervals – substantially longer in the drier eastern Rûens. Renosterveld does not contain any serotinous species, thus using these as indicators (as is typically done for fynbos) is not possible. Thus, research suggest erring on the side of caution and burning only when the veld appears to have become dominated by a handful of species (either asteraceous shrubs or C3 bunch grasses) (Curtis et al. 2024).

- 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.
- 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 of the property. To this end, existing management roads and tracks should be utilised where possible.
- Burning and fire management must be undertaken in a safe manner that is compliant with the National Veld and Forest Fire Act (No.101 of 1998).

The Fire Management strategy for the Haarwegskloof Nature Reserve needs to be integrated with the Overberg District Municipality (ODM) Fire Management Plan. Input from the Greater Overberg Fire Protection Association (FPA) as to the identification of priority firebreaks as well as potential firebreak agreements with neighbours must be finalised. The burning regime based on veld age must be informed by the ODM Fire Management Plan to maintain a natural mosaic within the broader landscape

The Fire Management component of the Haarwegskloof Nature Reserve must be considered dynamic and updated on a regular basis according to input from all relevant stakeholders.

The necessary Key Deliverables and Management Activities that are required for the Haarwegskloof Nature Reserve's Fire Management Programme are indicated in Table 4.2.1.1.

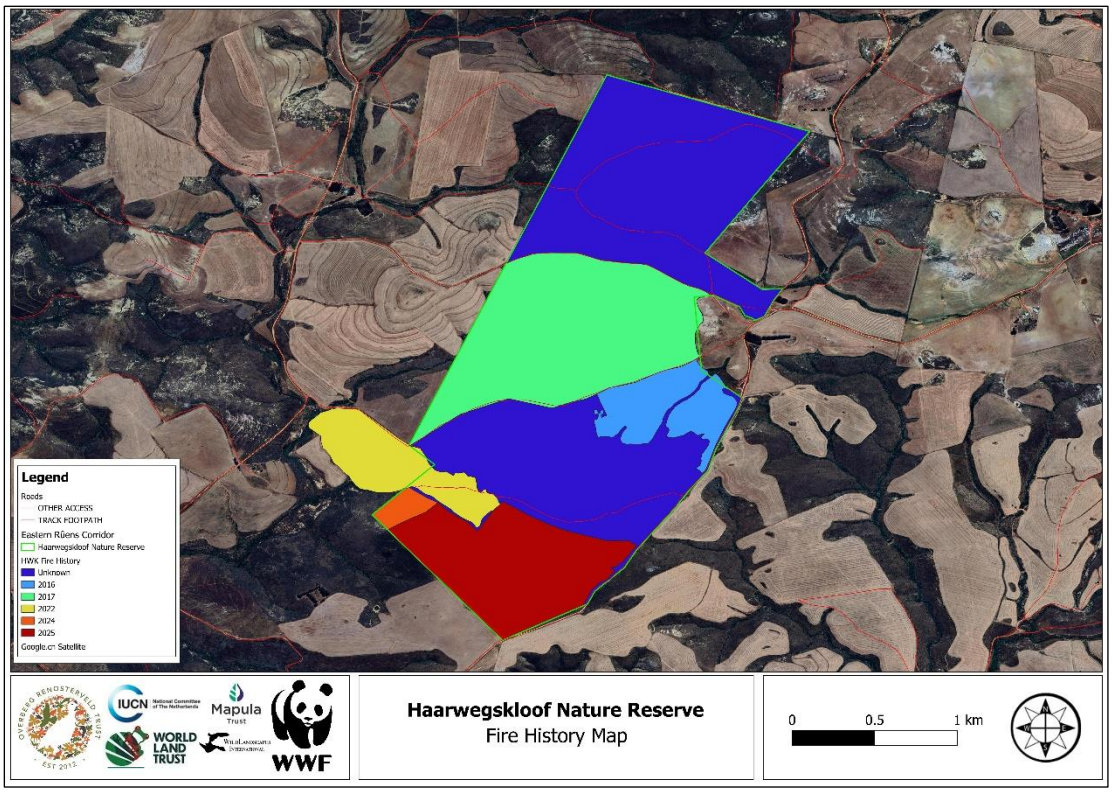

Figure 4.2.1.1 Fire Age Map for Haarwegskloof Nature Reserve

Table 4.2.1.1: Operational Management Framework: Wildfire Table

KPA 1.1 Wildfire		
Objective: *To ensure conservation of species and processes by maintaining and improving ecosystem functioning allow for natural fire processes to occur without impacting on safety and infrastructure.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
The Management Authority to maintain membership with goFPA.	Updated membership invoice.	Annual
Negotiate and maintain the fire management unit for the greater area including neighbours with the approval of the FPA.	Approved Fire Management Unit Agreement.	Year 1 - 2
Identify key firebreaks (Roads) and where necessary around infrastructure. Necessary firebreaks will be made in the event of a planned ecological burn.	Map with approved Fire Management Unit Agreement.	Year 1 - 2
Conduct Pre-Fire Season Fire Audit	Audit Sheets. Inventory of fire-fighting equipment.	Annual
Attend Local FPA Meetings, when possible, at least AGM. Attend Pre-Fire Season meetings with local Fire & Rescue Service.	Minutes of meeting.	Annual
Implement controlled burns that simulate an ecologically appropriate fire regime to maintain the heterogeneity, species diversity, and ecological functioning of habitats in the reserve.	Percentage (25%) of reserve under an ecologically appropriate fire regime.	Year 2 - 10
Maintain strategic partnerships with the ODM Fire and Rescue and goFPA to support the reserve with the implementation of controlled burns and fire management requirements.		

Maintain records of all controlled burns and wildfires that occur in the reserve.	Fire records / fire maps maintained.	Annual

4.2.1.2 Invasive Alien Plants

Objective statement:
To eradicate invasive alien species using mechanical and biological control methods, and to reduce combustible material to reduce intensity and spread of wildfires, while undertaking effective monitoring to prevent further introductions of invasive aliens.

Deliverables –

- Identify, quantify and map all invasive alien plant species and use data to draft a Strategic Clearing Plan. This plan should include specie densities, control methods and follow-up activities.
- Implement Strategic Alien Invasive Plant Clearing Plan through the most effective mechanical, chemical and biocontrol measures.
- Monitor and prevent new introductions and inform follow-up operations.
- Support invasive alien plant control programs in the reserve's core buffer zone

The 's drier climate, particularly relative to the nearby montane and coastal habitats results in lower densities of alien invasive plant species. Most invasives are found in watercourses, on cooler slopes and near homesteads. Old (previously worked) lands and agricultural lands are a source of invasive herbaceous forbs, annuals and grasses, introduced through agricultural practices, and are often more challenging to control. Landowners are under a legal obligation to control invading alien plants occurring on their properties (CARA). Planning this procedure is essential for the long-term success of the programme. A listed invasive species means any species that 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 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.

South Africa's National List of Invasive Species divides invasive species into four categories. The following AIP's have been recorded within Haarwegskloof Nature Reserve:

Table 4.2.1.2.1

Species	Common name	NEMBA Category*

Acacia longifolia	Long-leaved Wattle	1b
Acacia saligna	Port Jackson	1b
Acacia cyclops	Rooikrans	1b
Eucalyptus spp.	Bluegum	1b
Leptospermum laevigatum	Autralian Myrtle	1b
Hakea sericea	Rock Hakea	1b
Hakea gibbosa	Silky Hakea	1b
Opuntia ficus-indica	Sweet prickly pear	1b
Pinus halepensis	Aleppo pine	3

**Any species which occurs in a riparian area must be treated as category 1b*

- Category 1b: Invasive species which must be controlled and wherever possible, removed and destroyed. Any form of trade or planting is strictly prohibited.
- Category 3: Invasive species are undesirable because they have the proven potential of becoming invasive. Category 3 plants will not be allowed to occur anywhere except in biological control reserves and with exemption to 30 m from the 1:50 year flood line of watercourses or wetlands.

Eucalyptus spp. that does not occur within natural vegetation or within drainage systems are not required to be cleared within the relevant environmental legislation. These species that occur within the Development – Production Zone should be mapped, but do not require clearing. Any other IAP species that is included in Catergory Ib or 3 that are recorded within this zone must be cleared immediately to ensure that the maintenance phase is sustained.

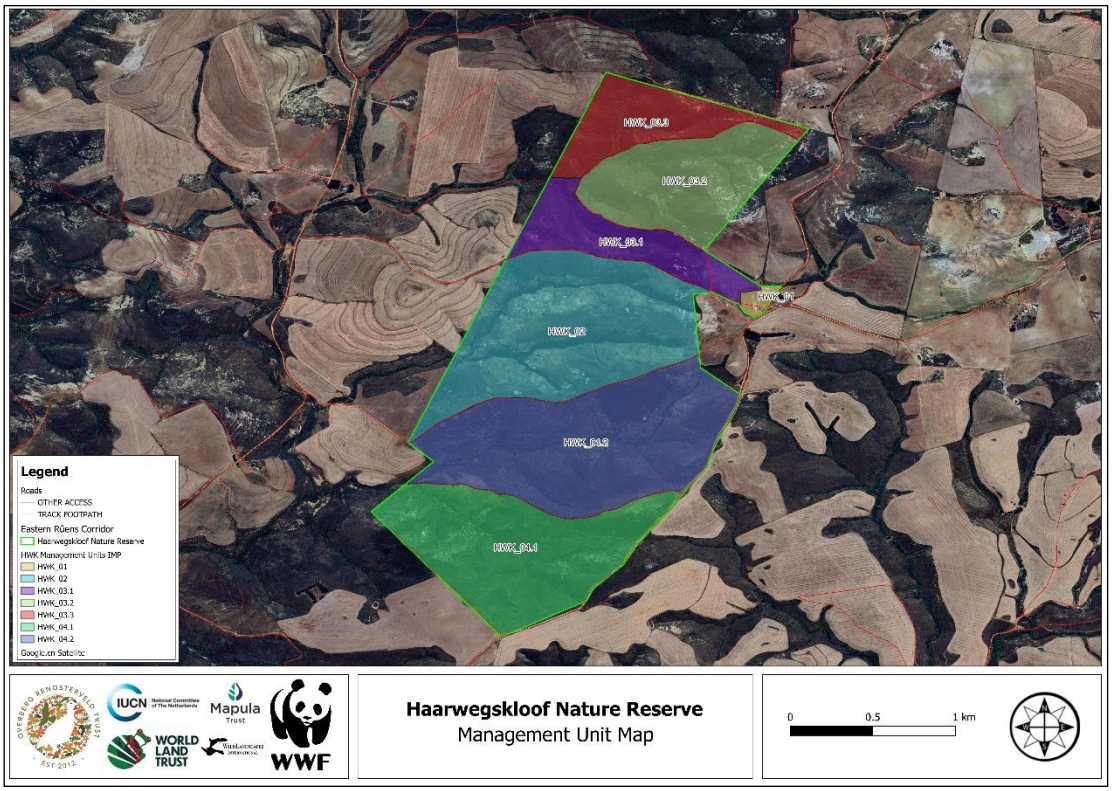

Figure 4.2.1.2 Invasive Vegetation Management Map for Haarwegskloof Nature Reserve

Table 4.2.1.2.2 Alien Species, Density and Age on Haarwegskloof Nature Reserve

Mng. Unit	Ha	Dominant Sp.	Dom. Den.	Dom. Age	Secondary Sp.	Sec. Den.	Sec. Age	Other Sp.	Other Den.	Other Age
HWK_01	3.4	*Opuntia ficus-indica*	5%	A	*Eucalyptus spp.*	1%	A			
HWK_02	144	*Acacia cyclops*	2%	A	*Opuntia ficus-indica*	<1%	A			
HWK_03.1	*44*	*Acacia cyclops*	<1%	y	*Pinus halepensis*	<1%	Y			
HWK_03.2	71	*Pinus halepensis*	1%	y	*Acacia cyclops*	<1%	Y			
HWK_03.3	44	*Acacia cyclops*	<1%	y						
HWK_04.1	110	*Acacia cyclops*	<1%	Y	*Opuntia ficus-indica*	<1%	A	Pinus halepensis	<1%	Y
HWK_04.2	140	*Acacia cyclops*	1%	Y	*Opuntia ficus-indica*	<1%	A			

Table 4.2.1.2.3: Operational Management Framework: Invasive Vegetation Management

KPA 1.2 Invasive Vegetation Management		
Objective: *To eradicate invasive alien species using mechanical and biological control methods, and to reduce combustible material to reduce intensity and spread of wildfires, as well as the effective monitoring to prevent further introductions of invasive aliens.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Identify, quantify and map all invasive alien plant species and use data to draft a Strategic Clearing Plan. This plan should include specie densities, control methods and follow-up activities.	Strategic Clearing Plan	Year 1

Implement Strategic Alien Invasive Plant Clearing Plan through the most effective mechanical, chemical and biocontrol measures.	Hectares cleared. NRM History.	Year 1-2
Monitor prevent new introductions and inform follow-up operations.	Photo record maintained. Follow-up plan.	Year 2-10
Support invasive alien plant control programs in the reserve's buffer zone		Year 2-10

4.2.2 Rehabilitation and restoration

Objective Statement:

To identify areas across the reserve showing signs of degradation, understand the causes of degradation and implement suitable and effective control measures where required, to improve overall ecosystem function.

Deliverables:

- Limit the loss of biodiversity and disruption to ecological processes due to degraded habitat.
- Clear management strategy in which degradation across the reserve is identified, quantified and adequate, effective control measures prescribed.
- Soil erosion effectively prevented and eroded sites restored/rehabilitated.
- Monitoring of degraded sites to measure further degradation, as well as the effectiveness of implemented rehabilitation measures.
- Sound relationships with key stakeholders assisting with rehabilitation programs and activities.

Areas of the reserve that have been degraded due to historic 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 (including previously ploughed lands) that can only be rehabilitated to structurally resemble a natural state can still perform an important role in ecological connectivity (for example, Black Harriers frequently breed in old lands in the eastern Rûens).

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.
- Where possible 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 actively managed to prevent soil erosion.
- All roads, vehicle tracks, trails and other infrastructure in the reserve should be closely monitored and well maintained to prevent them from causing any harm to the natural environment (e.g. erosion).
- Records of all invaded sites being restored should be kept (preferably on a Cloud). Records should include alien vegetation clearance methods and dates, restoration actions, images from fixed point photography and results of alien and indigenous vegetation monitoring.

Haarwegskloof Nature Reserve, shows limited signs of soil degradation across the various areas, although the loss of topsoil in some sections is particularly noticeable. Due to the rugged terrain of the reserve, coupled with shallow fine textured soils, the area is very susceptible to degradation and erosion. Historical human activities which were poorly managed during drought periods, have increased the degradation in some areas. Inappropriate roads and overgrazing by livestock on drier slopes and unique quartz areas that are underlain by kaolin have shown signs of degradation.

Old (previously ploughed, fallow) lands also make up a significant part of the reserve. The old lands on Haarwegskloof have been left to restore passively. Once burnt, the process of succession looks very different to the adjacent veld, but also reaches a climax state dominated by a few local indigenous shrubs and grasses. Old lands play an important role in the breeding of the endangered Black Harrier, *Circus maurus*, particularly within in the *Helichrysum* thickets.

The impact of soil erosion on Haarwegskloof Nature Reserve will be mitigated and controlled through the implementation of a versatile rehabilitation strategy which includes a combination of the following control methods:

- Agronomic: These methods comprise the use of plants and organic material to protect the soil. This includes organic soil covers which retain moisture and create a microclimate for seed germination, as well as the sowing of indigenous plant seed on treated areas. Agronomical methods can also include the use of woven geo-textiles, such as Bio-jute, etc.
- Mechanical: Mechanical methods involve the manipulation of soil topography and the construction of structures which manage water flow and facilitate sediment catchment (e.g. silt fences and gabions). These typically require approval from the local and/or national authorities.
- Land management: Holistic management methods using domestic animals (e.g. Nguni cattle) may prove useful for stimulating plant growth and improving soil

structure. Intensive hoof action can assist with breaking soil crusts and stimulating seed germination, but this requires further research. The ORT plans to pilot such research between 2025 and 2030, subject to capacity and resource availability.

The rehabilitation strategy for Haarwegskloof Nature Reserve will include monitoring actions to evaluate the effectiveness of control measures implemented.

Table 4.2.2: Operational Management Framework: Rehabilitation and restoration

Kpa 1.3 Rehabilitation and Restoration		
Objective: *To identify areas across the reserve showing signs of degradation, and implement suitable and effective control measures where required, to improve overall ecosystem function.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Conduct a Soil Erosion Assessment: Establish the extent of soil erosion across HCNR by identifying and mapping eroded / degraded areas.	Soil Erosion Assessment	Year 1, updated annually.
Conduct a Roads and Footpath Assessment	Roads and Footpath Assessment	Year 1, updated annually.
Draft a Rehabilitation and Restoration Control plan which prioritises eroded sites and old lands for treatment, and includes site specific rehabilitation strategies, time-frames and estimated costs.	Rehabilitation and Restoration Control plan	Year 2
Implement Rehabilitation and Restoration Plan according to priority and funding available.	Number / Percentage (20%) of identified sites stabilised and under rehabilitation.	Year 3 - 10
Monitor effectiveness of implemented treatment activities and use findings to inform management strategy and follow-up treatments.	Annual photographic record.	Year 3 - 10

4.2.3 Aquatic and riparian systems

Objective Statement:

To conserve the biodiversity and ecosystem function of aquatic and riparian systems on the reserve.

Deliverables:

- Monitoring programme identifying threats and changes to riparian systems in the
- Management actions are identified and implemented to safeguard and improve aquatic health.
- Effectively functioning seeps, wetlands, streams, rivers and riparian areas in the reserve.

Rivers and streams shape channels through which they flow, forming continuous systems that connect landscapes. These watercourses support a diversity of habitats, wildlife and ecological processes. Wetlands, although obvious during the rainy season, are somewhat more amorphous. They are more easily recognised by their vegetation, as supported in the National Water Act (36 of 1998) "…land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is

periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil."

As such, these systems are one of the most important natural resources in South Africa and the effective management of catchments, wetlands and river systems secures the availability of the water resource for current and future generations. Wetlands play an important role in improving water quality and are also home to unique biodiversity.

The impact of siltation due to erosion and stream bank degradation, as well as pollution and eutrophication, have significant negative impacts on wetlands and river systems. For this reason, erosion and pollution control measures should always be a priority management objective.

In managing these aquatic systems, the following guiding principles should be maintained -

- Where possible, manage the aquatic system together with landowners both up- and down-stream.
- Prevent excessive water abstraction from rivers, in order to maintain seasonal flow differences.
- Prevent nutrient enrichment of the water / river / wetland system (these systems are naturally acidic and have characteristically low nutrient levels).
- Maintain a buffer area adjacent to the river and wetland habitats, clear of alien plants or impacts.
- Clear all alien plants from riparian areas and rehabilitate where required (mainly bank stabilisation).
- Manage access points into these areas, include roadways and livestock access.
- Establish permanent water monitoring points to highlight potential impacts and management interventions.

Table 4.2.3: Operational Management Framework: Aquatic and riparian systems

KPA 1.4 **Aquatic and riparian systems**		
Objective: *To conserve and improve the biodiversity and ecosystem functioning of riparian systems on the reserve.*		
Management Activity	Key Performance Indicator	Timeframe
Identify existing and potential threats to riparian systems in Haarwegskloof Nature Reserve and monitor impact on ecosystem functioning.	List of threats and monitoring findings.	Year 1 - 2
Removal of invasive species from riparian systems	Photo record maintained. Follow-up plan.	Year 1 - 2

4.2.4 Species of Conservation Concern

Objective Statement:

To ensure the optimal long-term population viability and ecological function of all life, particularly plants and animals of special concern.

Deliverables:

- Identify plant and animal species of conservation concern present on the reserve by formal surveys.
- Monitoring of populations of priority species of conservation concern as capacity allows.
- Identify and implement specific management requirements for each species *if required*.

Monitoring is discussed in Section 5 under 5.1.1 Ecological Monitoring below.

4.2.5 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:

- Compile and maintain a complete fauna species list covering mammals, amphibians, reptiles, birds and invertebrates, using ad-hoc and survey-related records.
- Conduct surveys to determine the presence of SCC fauna species in a prioritized manner and establish monitoring programs to determine continued presence.
- When Species of Conservation Concern are encountered appropriate partners will be informed (e.g. Cape Leopard Trust) for joint monitoring opportunities.
- Reintroduction of historically occurring wildlife species in line with prescribed protocols and best practices, if deemed appropriate and manageable.
- Remove honeybee hives to reduce potential competition for wildflower resources with wild honeybees and/or solitary species.
- Ensure that other potentially invasive fauna species do not become established in the reserve.

While the CFR has lost many of its larger animals, several of the smaller species, particularly antelope and small predators, move freely in the landscape. Several are able to make use of the transformed agricultural lands, but irrespective, most are dependent on natural vegetation to some degree. These animals have an important role to play in maintaining ecosystem functioning. Any wildlife management program must integrate the ecological and socio-economic objectives, so as to maximise the value to biodiversity and the protected area, but also to minimize the human-wildlife conflict.

The aim of the wildlife management on the Haarwegskloof Nature Reserve is to promote the conservation of indigenous fauna as an important component contributing to and maintaining ecosystem functioning. Small to medium sized antelope (Cape Grysbok,

Common (Grey) Duiker, Steenbok, Vaal (Grey) Rhebok and Bushbuck) occur naturally in the area and move freely between properties. 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.

Haarwegskloof Nature Reserve has been earmarked for possible Bontebok relocation from De Hoop Nature Reserve and other private sources. Should the potential for linkage to other existing protected areas become possible then it will be imperative that the respective management authority follow the best practice for game introduction. A reintroduction policy and plan for species that occurred in the area historically, along with calculations of the suitable carrying capacities should be developed. The potential for reintroductions, specifically of small game, which may have previously occurred naturally in the area must be investigated. Herbivores essential for the persistence of biodiversity and ecosystem processes, should be identified and prioritised. The careful reintroduction of species can enhance the conservation value of the area and increase the marketability of the Conservation Area. All reintroductions must be based on sound ecological principles. CapeNature must be consulted on the translocation and reintroduction of all fauna. It must be remembered that most remnant renosterveld has extremely low carrying capacity and that the areas that typically supported historically-occurring, locally extinct species have mostly been converted to agriculture. Thus, the potential for wildlife reintroductions and rewilding is very limited. It is likely that any reintroductions of grazing game species would require the management (e.g. brush cutting or burning) of old (previously ploughed) lands in order to create sufficient grazing opportunities as these are no longer present in the extant renosterveld, even within this well-connected corridor.

Of concern from an alien fauna perspective is the presence of Fallow Deer *Dama dama*. These species require continued monitoring to determine their presence and impacts within the Conservation Area. Any records of this invasive species, or any other invasive species, must be recorded and their populations controlled or eradicated wherever possible.

The key deliverables and management activities required for the Wildlife Management on the Haarwegskloof Nature Reserve is indicated in Table 4.2.5 below.

Table 4.2.5: Operational Management Framework: Wildlife

KPA 1.6 **Wildlife**		
Objective: *To ensure effective conservation of faunal species, populations, and inter-relationships to enhance biodiversity and maintain and improve ecosystem functioning*		
Management Activity	Key Performance Indicator	Timeframe
Ensure that complete, appropriate game fencing (including gates) is present around the Haarwegskloof NR considering the inclusion of Luiperdskop Nature Reserve.	Total kilometres maintained.	Year 1-2
Compile and maintain a complete fauna species	Updated species list.	Annual
Investigate the feasibility of introduction and management of indigenous wildlife to the reserve to ensure optimum population and ecosystem functioning.		Year 2-3
Removal of honeybee hives from the reserve and possible buffer zones around the reserve. (or conduct research RE impacts)	No more beehives.	Year 1-2
Monitoring of invasive fauna on the reserve.	Monitoring data.	Annual

4.3 Sustainable utilisation of natural resources

Haarwegskloof Nature Reserve is about 40km from Swellendam and Bredasdorp, being its closest communities. The reserve does not offer much in terms of harvestable natural resources. It has no known naturally occurring species of economic value, low densities of harvestable game birds and mammals, and a little wood in the form of remaining the *Acacia* and *Eucalyptus* trees, which will be entirely eradicated in the near-future. None of the resources are available at a scale that would render them economically viable.

4.3.1 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. The potential for livestock (through intensive herding programmes) to be used to restore degraded and old renosterveld requires investigating.

Deliverables:

- Veld condition assessments are used to determine carrying capacity relative to climate 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 wherever possible; nonetheless care should be taken to avoid degradation of the vegetation health and composition. Historically, under natural conditions, the renosterveld ecosystem would have included a high concentration of animals of mixed feeding habits (bulk, selective and concentrate feeders) exerting high pressure on the vegetation for short periods, moving off when foraging opportunities declined. The veld then had a period in which to recover and the complexity of grazers and

browsers would have maintained a balance in this very dynamic, non-static system . However, the system has been radically altered with the removal of most large herbivores and the introduction of highly selective feeders in the form of sheep and cattle.

Where herbivores have been limited to smaller areas because of fencing, mismanagement of game numbers and game composition can not only alter vegetation species composition, reduce cover and cause erosion, but can also threaten biodiversity. The correct utilisation of vegetation by 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 (small/large) Stock Unit)
- Grazing camp size
- Duration that stock is held in the camp
- Camp rest interval

When considering game introduction and management, veld condition and carrying capacity per vegetation unit needs to be determined.
The reserve, although mapped as one vegetation unit (Eastern Rûens Shale Renosterveld), consist of various subunits with different carrying capacities. Each of these subunits will differ in species composition, densities and resilience to impacts of grazing. Most of the habitat remaining is often not the areas where game would've frequented. Old lands on the three reserves have the potential to be managed for game and acting as buffer zones for the core areas. Habitat suitability with veld condition assessment will be conducted for each subunit to determine the health, composition and carrying capacity. Taking into consideration the recommended stocking rates and findings of the assessment a precautionary approach will be followed in introducing game to the reserve. Long-term habitat and veld condition monitoring is essential to ensure that grazing and browsing activities have the desired outcome.

Table 4.3.1: Operational Management Framework: Grazing and browsing of livestock and game

KPA 1.6 Grazing and browsing of livestock and game		
Objective: *Game and* livestock are *effectively used as a management tool to ensure the health of natural vegetation.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Habitat suitability and veld condition assessments conducted for subunits on Haarwegskloof.	Habitat suitability and Veld Condition Assessment	Year 1
Discussion with CN and other stakeholders around the outcome of habitat suitability for Bontebok		Year2

4.3.2 Recreation and tourism

Objective Statement:

To generate income from a small, local tourism business to ultimately cover the infrastructure maintenance and 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 comply 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 can provide a steady income stream. There are several opportunities that can be developed without compromising the conservation integrity of the area; infrastructure developments and upgrades are limited to Haarwegskloof alone and are only undertaken on previously disturbed areas and existing infrastructure.

The Reserve provide two options for accommodation on Haarwegskloof: i) a Research and Visitor Centre which offers budget accommodation (bunk beds, bring your own bedding), and ii) a self-catering guesthouse which offers a quality stay (bedding, towels, fully equipped kitchen). For overflow of visitors, particularly groups and students, camping with ablution facilities is also available. These are advertised on the ORT website. Marketing is continuous. Walking trails will be developed organically, as resources become available, and will mostly include existing paths and tracks. Some trails already exist on Haarwegskloof. Signage has been developed for the reserve and include: plant name tags at important sites (e.g. quartz patches), entrance signs and information boards, located at the reserve entrances and inside the Visitor's Centre. Once trails are developed additional signage will be developed and erected. See Table 4.3.2 below.

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.

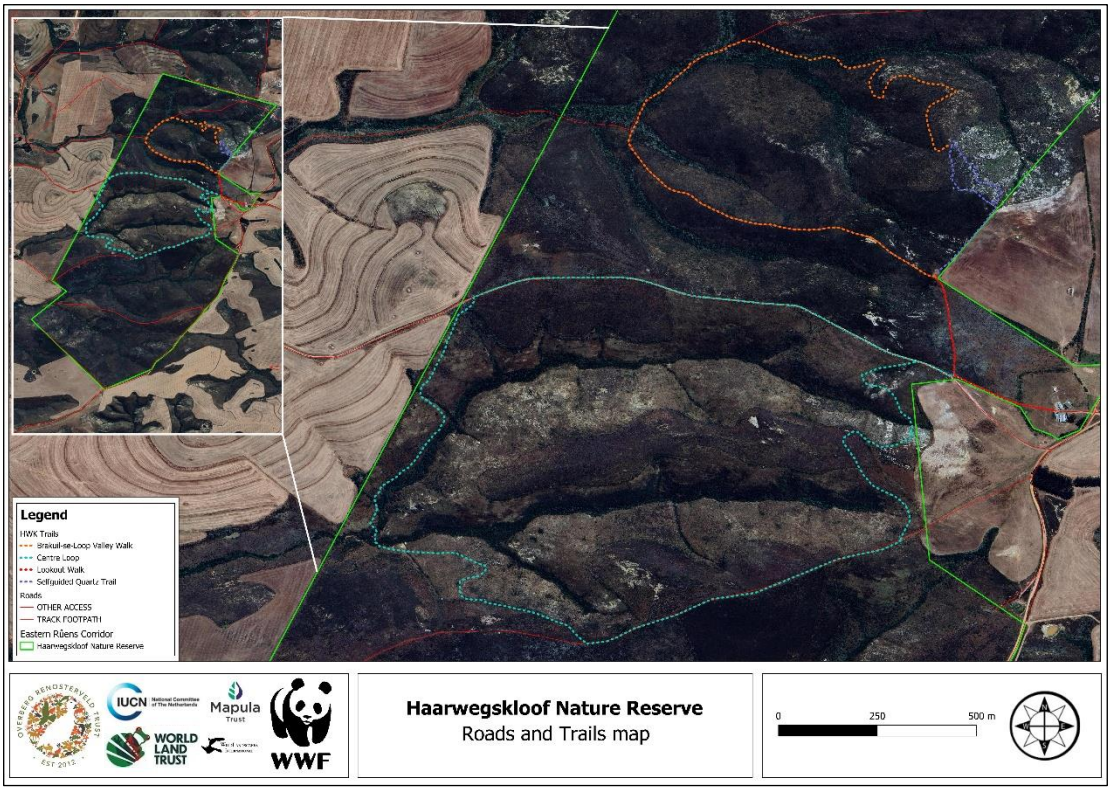

Figure 4.3.2 Roads and trails map for Haarwegskloof Nature Reserve

Table 4.3.2: Operational Management Framework: Recreation and tourism

KPA 1.7 **Recreation and tourism**		
Objective: *To generate income from tourism businesses that make a sustainable contribution towards the conservation management costs of the reserve.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Development of a business plan for Visitor facilities.		
Maintenance of Visitor facilities at Haarwegskloof	Infrastructure maintained.	Annually
Develop and maintain walking trails to guide visitors around sensitive areas.	Trails aid out in appropriate location. Existing trails are maintained.	New trails - Y1&2 Existing trails - Annually
Develop and maintain reception and information signage	Maintain. New signage to be erected at other reserves once declared.	Annually
Sustain and adapt marketing.		

4.4 Socio-economic and heritage

4.4.1 Environmental Awareness and Education

Objective Statement:

Stakeholders receive an increased awareness and understanding of the importance and value of functioning ecosystems with a specific focus on Renosterveld. Stakeholders are also introduced to careers in eco-tourism and nature conservation.

Deliverables:

- Increase awareness about the value of functioning ecosystems and conservation of renosterveld as a real life example through hosting schools or providing information to visitors.

The facilities at Haarwegskloof provides the ideal practical learning space to engage with learners, teachers and other citizens of the Overberg region and beyond about the value of nature and conservation using renosterveld as a practical example. The ORT launched an education project at Haarwegskloof in 2022 with funding from the National Lotteries Commission of South Africa. Since then, the ORT has been partnering with Engie (owner of Excelsior wind energy facility) to reach local, underprivileged farm schools in the Overberg. While 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. It may also help identify and nurture future conservation leaders within these communities by encouraging a career in conservation.

The old shed has been repurposed into an environmental education centre/lecture room with a large kitchen that can host larger groups. By combining the use of all the combined facilities (which are essentially adjacent to one another), weekend or multi day retreats could also be hosted. With all the infrastructure in place, effort should be made to ensure that Environmental Educators, Regional schools, Universities and other interest groups be made aware of the opportunities offered. A brochure has been developed showcasing these amenities. Information signage, artwork and a self-guided trail have been erected at the Renosterveld lookout, providing a gathering/talking point for group activities. Close relationships with various Universities and interest groups have resulted in some long-term monitoring programmes and weekend retreats.

Educational materials and infographics will be provided throughout the to inform people about the uniqueness and threats to renosterveld. These materials should be updated occasionally.

Table 4.4.1: Operational Management Framework: Environmental Awareness and Education

KPA 1.8 Environmental Awareness and Education		
Objective: *Stakeholders receive an increased awareness and understanding of the importance and value of functioning ecosystems with a specific focus on Renosterveld. Stakeholders are also introduced to careers in eco-tourism and nature conservation.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Maintain and further develop the Veld Classroom project to include additional schools and follow-up sessions.	Attendance sheets.	Annual
Host or attract groups from various interest groups to use the facilities	Bookings reflected on the ORT's HWK booking schedule	Ongoing
Update resources veld classroom resources.	Updated lesson plans	As needed

4.4.2 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:

- Where possible select employees and service providers from local communities. This could include but not limited to eco-tourism guides, hospitality staff, natural resource management teams.
- Positive relationships with key community role players and groups.

It should be noted that the is quite remote and does not include any housing facilities to accommodate staff, other than a single reserve manager/extension officer. Any future potential developments, if deemed necessary, will be extremely limited, given the sensitivity of the vegetation and the relatively small size of the reserve.

Table 4.4.2: Operational Management Framework: Socio-economic development initiatives

KPA 1.9 Socio-economic development initiatives		
Objective: *To work with relevant stakeholders to make a meaningful contribution towards the socio-economic development needs of local communities.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Implementation of NRM contracts on the reserve.	NRM History. Socio-economic stats.	Year 1 - 5
Make use of local work force when labour assistance is required implementing management activities.	Number of temporary local workers employed.	Year 1 – 5
Employ local people to assist with hospitality (cleaning, gardening, etc.) wherever feasible	Number of local workers employed	Ongoing

4.4.3 Heritage features

Objective Statement:

To locate, document, and conserve archaeological, paleontological and cultural heritage features history of the Haarwegskloof Nature reserve and the Overberg district.

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

Although not the primary purpose in declaring the reserve, ORT will strive to also conserve the heritage features of the reserve. ORT is not only a custodian of the reserve in space, but also in time. The landscape in which the reserve is located is likely to have a number of paleontological, archaeological and cultural features that have yet to be discovered,

understood and shared. Just south of the reserve lies De Hoop Nature Reserve with its very rich heritage on display for the public. Inevitably the footprint of these earlier inhabitants to the region would've accessed the shale hills around Haarwegskloof. 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.

Table 4.4.3: Operational Management Framework: Heritage features

KPA 1.10 Heritage features		
Objective: *To locate, document, and conserve archaeological, paleontological and cultural heritage features history of the Haarwegskloof Nature reserve and the Overberg district.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Create an inventory by identifying and documenting all heritage features on the reserve.	Inventory of all heritage features. Map indicating location of heritage features.	Year 1 - 5
Engage with academics and local residents to gain more information on the heritage features of the reserve.	Information gathered. Topic specific research papers.	Year 1 - 5
Preservation of heritage assets.	Periodic photographs documenting damage/degradation/restoration. Access restriction and signage.	Year 1 - 5

4.5 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.

4.5.1 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 Haarwegskloof 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 (NEMA), water management (National Water Act (No 36 of 1998) and biodiversity management activities.

Table 4.5.1: Operational Management Framework: Legal Compliance

KPA 1.11 Legal Compliance		
Objective: 1.1.1 *To ensure all reserve declaration documentation is in order and that all activities are compliant with relevant legislation and policies.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Submit this plan to CapeNature for approval.	Approved management plan and APO in place.	Year 1
Manage the reserve in compliance with the approved management plan.	Annual Audits.	Annually
Conduct annual reviews.	Annual management meeting held with relevant stakeholders.	Annually
Implementation of annual review and update of management plan	Annual management meeting held with relevant stakeholders.	Annually
Annual protected area management report to CapeNature	Submission of annual management report to provincial conservation authorities.	Annually
Ensure Notarial Deed with surveyor diagram and title deed restrictions are registered with the Notary and Surveyor General against the property	Registered Notarial Deed with Surveyor Diagram.	

4.5.2 Infrastructure and equipment

Objective Statement:

To procure and maintain infrastructure and equipment to ensuring productive and effective implementation of management activities on the reserve.

Deliverables:

- Infrastructure is adequately maintained, and equipment serviced and kept in compliance with relevant legislation.
- 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.
- Purchase of equipment essential for the day-to-day management of the reserve.
- Annually assessment of infrastructure and draft a list of development and maintenance requirements.

Haarwegskloof NR requires adequate infrastructure and equipment to accomplish the identified management objectives. In order for the reserve to operate appropriately, adequate infrastructure needs to be developed and maintained both for management and tourism purposes. However, the ORT does not intend to develop much more over and above what has already been developed in the last decade, although some additional labourers' cottages may be developed on existing footprints. 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 adequately maintained to avoid any damage to the environment and ensure the safety of staff and visitors to the site.

An Infrastructure map should be included here with a map showing zonation and all infrastructure on the property including roads.

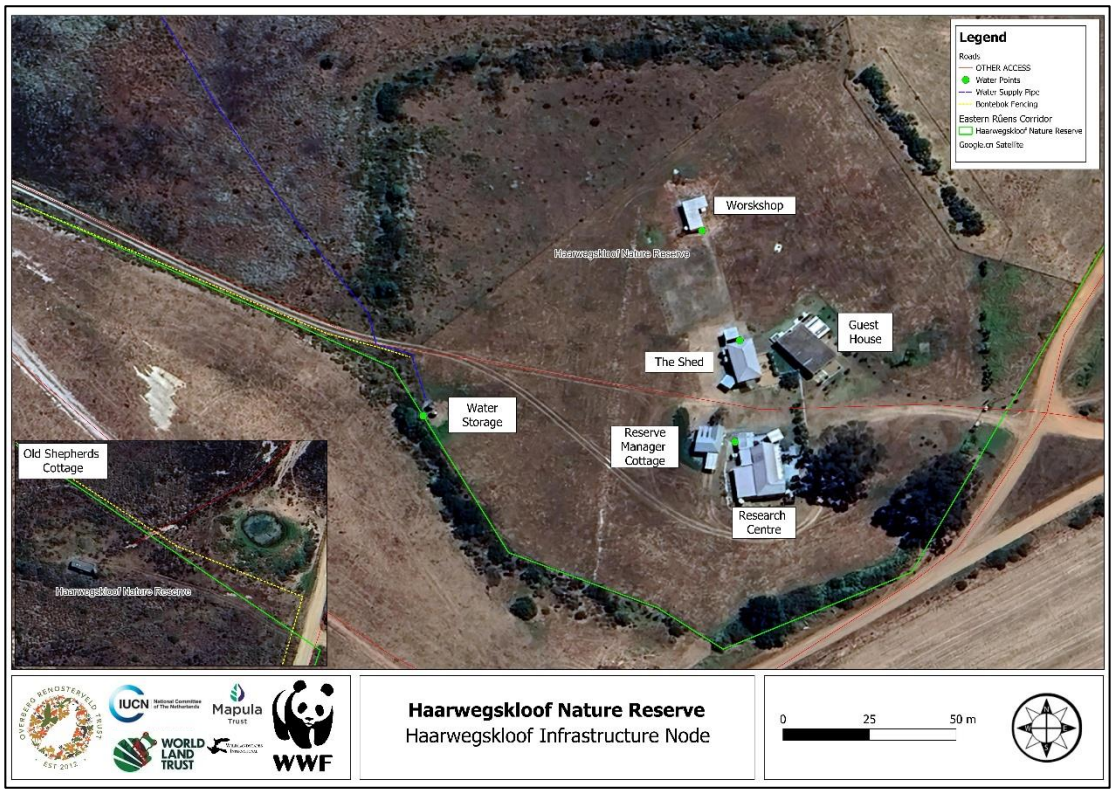

Figure 4.5.2 Infrastructure on Haarwegskloof Nature Reserve (buildings)

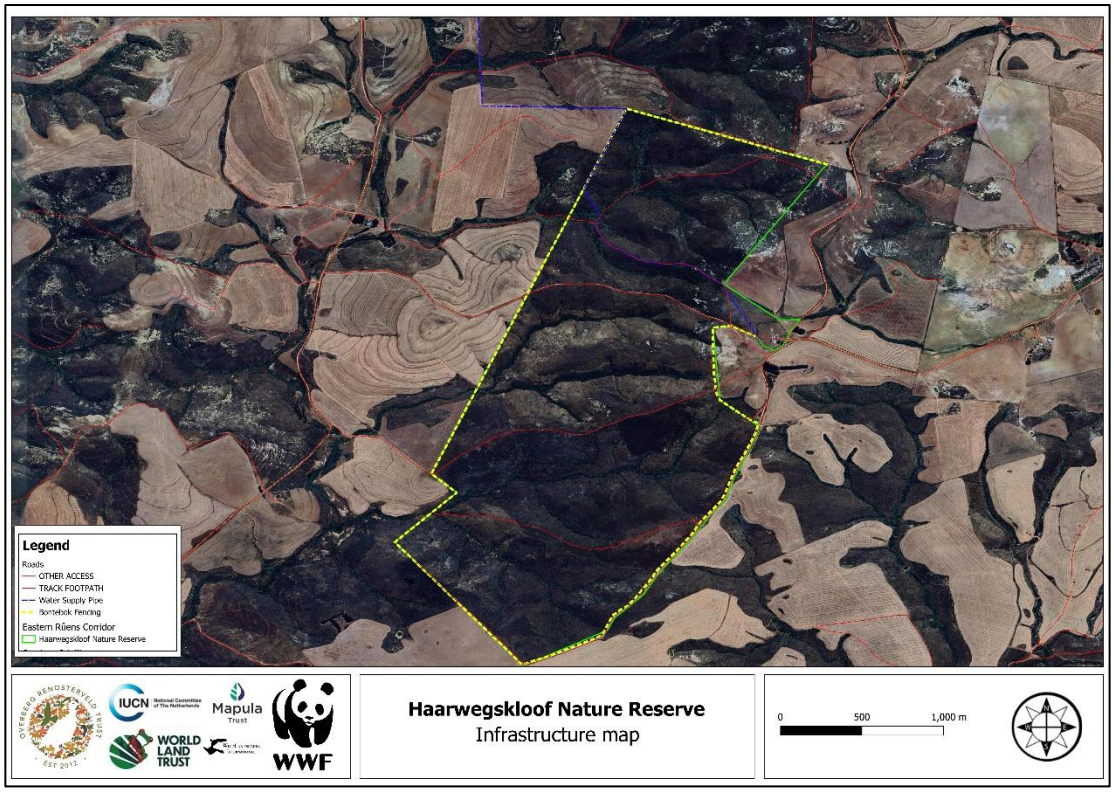

Figure 4.5.3 Infrastructure on Haarwegskloof Nature Reserve (roads, fences)

Table 4.5.2: Operational Management Framework: Infrastructure and equipment

KPA 1.12 Infrastructure and equipment		
Objective: 1.1.1 *To procure and maintain infrastructure and equipment to ensuring productive and effective implementation of management activities on the reserve.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
The Managing Authority must inspect equipment and infrastructure at least once per year to ensure that all infrastructure and equipment is well maintained such that it is functional, safe and aesthetically sound.	• Annual check-list and report	Annually Jan-Feb.
Infrastructure and equipment needed to support personnel in implementing the management plan is in place.	• Create a prioritised list of equipment that needs repair or maintenance work. (Trails, water pipes, roads, fences, buildings) • Purchase of equipment essential for the day-to-day management of the reserve. • Ensure that each maintenance task is delegated to a specific staff member.	Year 1
Draft a list of vehicles and other equipment items that require regular servicing of maintenance procedures and create a schedule.	Maintenance schedule for the reserve.	Year 1
Annually assessment of infrastructure and draft a list of development and maintenance requirements.	Infrastructure Assessment.	Annually Jan-Feb.

4.5.3 Signage, access control and security

Objective Statement:

Signage, access control and security measures are put in place that effectively address related threats ensuring that visitors to the reserve conduct themselves in a manner that aligns with the objectives of this management plan, while ensuring their safety during their visit.

Deliverables:

- Maintain the Haarwegskloof Nature Reserve fence.
- Conduct regular patrols of boundary fences to record signs of illegal access and assess the state of fence in order to identify maintenance requirements.
- Develop and maintain signage at the reserve entrances and alongside public roads notifying visitors that they are entering Haarwegskloof Nature Reserve to raise an increased awareness of the rules of the reserve.
- Install appropriate signage to inform visitors of any rules or restrictions that may apply to particular areas within the reserve.
- Where security for visitors, residents, flora and fauna is a threat, install lockable gates at access points. 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.
- Ensure that all official reserve trails are clearly marked to prevent visitors from wandering and deviating from designated trails.

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 entry points. Signage needs to clearly stipulate the reserve name, emergency contact details and briefly list the rules and regulations for visitors. Thought should be given to the level of detail of the rules and regulations displayed on the signage. Provision is made to evaluate, update and replace the signage when needed. Signage should however always be maintained to a high standard. Educational signage is dealt with in section 4.3.1 but these same principles apply.

Fencing needs to be effective in terms of demarcating the property boundary, performing a security function, restricting livestock access from outside the reserve, while still allowing the movement of wildlife. and. Well maintained fencing deters unwanted visitors and breaches or breaks should be repaired within days of occurring. Adequate fencing and informative signage are essential to maintain the long-term integrity of the reserve and facilitate visitor activity.

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.

Figure 4.5.3 Signage on Haarwegskloof Nature Reserve

Table 4.5.3: Operational Management Framework: Signage, access control and security

KPA 1.13 Signage, access control and security		
Objective: 1.1.1 *Signage, access control and security measures are put in place that effectively address related threats ensuring that visitors to the reserve conduct themselves in a manner that is coherent with the objectives of this management plan and are assured of safety during their visit.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Maintain the Haarwegskloof Nature Reserve fence. Install fencing Plaatjies and Luiperdskop where necessary.		Ongoing Year 2-3, , then ongoing maintenance as required.
Conduct regular (quarterly to biannual) patrols of boundary fence to record signs of illegal access and state of fence.	Patrol sheets completed.	Ongoing
Develop and maintain signage at the reserve entrances and alongside public roads notifying visitors that they are entering Haarwegskloof Nature Reserve to raise an increased awareness of the rules of the reserve.	Adequate signage at reserve entrances and within the reserve.	Year 2 – 3, then ongoing maintenance as required.
Install appropriate signage to inform visitors of any rules or restrictions that may apply to particular areas within the reserve. provide rules and regulations in the form of pictograms where possible, but also as text where necessary.	Adequate signage at reserve entrances and within the reserve.	Year 2 – 3, then ongoing maintenance as required.
Install lockable gates at all access points. Access onto the property in remote areas is restricted with locked gates and controlled through a limited number of managed entry points.	Locks in place.	Y1
Security measures are put in place to address specific threats.		
Ensure that all official reserve trails are clearly marked to prevent visitors from wandering and deviating from official trails.	Trail signage developed and maintained. (Mark no go area, Management only)	Ongoing
Maintain records of illegal trespassing and poaching incidents	Record at the reserve	Ongoing

4.5.4 Research and management knowledge

Objective Statement:

To collaborate with research and tertiary education institutes to develop and implement research projects that talk directly to priorities identified in the ORT's Research Strategy.

To use the results of these scientific studies to inform renosterveld management decisions and where necessary, adapt management plans and activities accordingly.

Deliverables:

- Updated ORT research strategy (many questions in the strategy relate directly to the management of the) to address knowledge gaps through desk-top research, scientific research and collaborating with relevant experts.
- Maintain and expand partnerships with academic institutions to pursue research objectives and where possible, source the resources required to support post-graduate studies that align with the ORT's research strategy.
- Create and maintain an electronic reference database for all research conducted at or relevant to Haarwegskloof NR and renosterveld across the Overberg Rûens generally. Ensure that all researchers working on site provide electronic copies of their reports to the ORT to add to the online repository.
- Use increased knowledge and research findings to improve management effectiveness, ensuring that the management plan is updated in accordance with the latest research during reviews.

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. The ORT has developed an extensive research strategy which is used to engage with and attract academic institutions and other partner organisations to the landscape and make use of its facilities. The Renosterveld Field Guide also contains valuable information with regards to the history and management of Renosterveld. A research hub has been developed and frequently used by researchers at Haarwegskloof Nature Reserve. Research is displayed here in an interactive way to share results from studies on the reserve and other Rûens renosterveld habitats.

Table 4.5.4: Operational Management Framework: Research and management knowledge

KPA 1.14 Research and management knowledge		
Objective: 1.1.1 *To gather, document and share knowledge on how to achieve management objectives is shared with the reserve team, landowners and other stakeholders to increase management effectiveness.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Updated ORT research strategy (many questions in the strategy directly relate to the management of the) to address knowledge gaps through desk-top research, scientific research and getting advice from experts.	ORT research strategy	Ongoing
Maintain and expand partnerships with academic institutions to pursue research objectives and use Haarwegskloof facilities	# of engagements	Ongoing
Create and maintain an electronic reference for all research conducted at or relevant to Haarwegskloof NR. Ensure that all researchers working on site provide electronic copies of their reports to the reserve to add to the online repository.	Developed Database. (Google Drive)	Year 1 - ongoing
Use increased knowledge and research findings to improve management effectiveness ensuring that the management plan is updated in accordance with the latest research during reviews.	Discussed at Annual management meeting held with relevant stakeholders.	

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 integrity. It is therefore an essential component of the implementation of an adaptive management strategy. Additional ecological indicators may be required to effectively monitor species and ecosystem health.

Capacity on the site is limited, impacting the amount of monitoring that could be done. Often monitoring programs requires a lot of effort and resources (including time) when compared to the results. We identify broad monitoring categories here that could be expanded on or initiated on an individual basis. Monitoring should be simple, inexpensive, repeatable, and the most practical methods implemented to answer the question at hand. The methodology followed should also be scientifically sound and statistically defendable, while providing clear outcomes. Therefore, any monitoring programmes should support, and not hamper, the man-power available on site.

Deliverables:

- Establish a protocol for recording ad-hoc sightings of fauna, flora and ecologically relevant events.
- Monitor vegetation condition, SCC presence and populations by appropriate means.
- Ensure that monitoring priorities and protocols are practically implementable by existing field staff.

- Capacitate field staff to undertake monitoring tasks by providing required equipment and training.
- Ensure that all collected biomonitoring data is stored in a useable, accessible format, preferably on the Cloud.
- Establish camera trap monitoring for passive data collection, as well as for vegetation monitoring where the impacts of management interventions require longer monitoring.

5.1.1.1 Vegetation / Habitat monitoring by fixed-point photography

To assess the effectiveness of veld management in a way that can feed back into management decisions and plans, a network of vegetation monitoring plots will be established and surveyed annually to track ecological changes over time. However, given the small management team and the need for expert botanical knowledge—currently limited to senior ORT staff—this approach may require a phased implementation as capacity develops on site with reserve staff.
Additionally fixed-point photography offers a simple yet effective alternative for monitoring vegetation dynamics. This method has been successfully used on other nature reserves, and by scientists, to document long-term vegetation change. Monitoring plots have provided valuable insights into plant community transitions over time. By capturing images at fixed locations, fixed-point photography provides a visual record of habitat condition and general species composition, supplemented by additional observations. It is particularly useful for assessing the impact of management interventions such as alien invasive plant control, post-fire recovery, and passive restoration of old lands. Additional monitoring points can be selected as needed to capture broader vegetation trends. Once monitoring points are established, an annual or biennial fixed-point photography survey can collect key data with minimal equipment or expertise, while specialists can later analyse the imagery to provide further insights and recommendations.

The Overberg region's quartz patches, particularly within the Eastern Rûens Shale Renosterveld, are unique microhabitats characterized by white quartz outcrops. These specialized environments support a distinct assemblage of endemic and often threatened plant species, many of which are not found anywhere else on Earth (Curtis et al. 2013). Despite their ecological significance, these habitats remain understudied, and long-term monitoring is crucial to understanding the dynamics that drive these systems. To address this knowledge gap, a phased vegetation monitoring programme will be implemented at Plaatjieskraal and Haarwegskloof. This will involve establishing transects with monitoring plots across a habitat gradient to document vegetation changes over time across these specialised habitats (this could be useful for testing the theory that, in the absence of fire, the specialised plants on the quartz patches are at risk of being smothered by encroaching C3 grasses from the adjacent shale). This approach aligns with methodologies used in other sensitive ecosystems, where permanent plots track ecological responses to environmental shifts. Similar studies have proven effective in capturing species distribution along

environmental gradients. Fixed-point photography will complement this quantitative monitoring, providing a visual record of habitat condition and vegetation changes. Together, these methods will generate valuable long-term data, guiding conservation efforts and informing adaptive management strategies to protect these rare and fragile habitats. (Curtis et al. 2013).

5.1.1.2 Informal surveys, ad hoc events and Bioblitzes

For opportunistic surveys and bioblitzes, the ORT makes use of iNaturalist to curate photographic and acoustic data. However, because several species (particularly succulents) are threatened by the illegal trade, locations of threatened species or species of conservation concern should be obscured when uploaded to iNat. This will include a combination of the below events per year.

A combination of the following monitoring activities will be undertaken annually, subject to staff capacity and resource availability:

- **Ad-Hoc Sightings:** Opportunistic species sightings will be recorded on iNaturalist (formally by trained reserve staff and informally by visitors).
- **Bioblitz Events:** Periodic Bioblitz events to record species diversity.
- **Faunal Monitoring:** Ongoing monitoring of faunal species using camera traps.
- **Avifaunal Monitoring:** Conduct avifaunal surveys as resources allow (potentially once-off or annually). All sightings will be captured on Birdlasser and will be supplemented by through organized events with birdwatching groups.
- **Black Harrier Monitoring:** Annual monitoring of the Black Harrier population (to count breeding pairs) on the reserve.
- **Small Mammal Surveys:** Expand the small mammal species list through surveys using Sherman traps and advanced camera trap techniques when feasible.
- **Invertebrate Surveys:** Build the invertebrate species list using pitfall traps, sweep netting, and active searches as time and resources permit.
- **Herpetofauna Surveys:** Conduct baseline surveys of reptiles and amphibians through trap arrays and active searches when feasible.
- **Data Management:** All species records will be documented on iNaturalist.

Necessary permits will be obtained in advance from CapeNature. All animals will be photographed and released after capture

5.1.1.3 Species of Conservation Concern

Although Haarwegskloof has been well surveyed, there are still areas that are frequented much less, and vast areas of Plaatjieskraal and Luiperdskop still need to be surveyed. A robust list of plants has been developed with more than 70 Species of Conservation Concern (SoCC). ORT have a close relationship with Custodians of Rare and Endangered Wildflowers programme (CREW) and the staff are familiar with the monitoring protocols and reporting these species using iNaturalist. Most of the threatened animals (excluding

invertebrates) have been identified and ad hoc sightings should be logged with Birdlasser and submitted regularly to BirdMap and to iNaturalist. A combination of the following activities will be conducted to monitor species of conservation concern, subject to resource availability and staff capacity:

- Threatened Plant Species (EN and CR):
    - Locate and map patches/populations of Endangered (EN) and Critically Endangered (CR) plant species.
    - Determine which species are unique to the reserve and monitor these populations biannually where feasible.
    - Conduct opportunistic walk-through surveys to refine species distribution data. External partners, including CREW, may assist with surveys as needed.
- Threatened Animal Species (EN and CR):
    - Document the presence of EN and CR animal species through active searches, opportunistic sightings, and camera trapping.
- Targeted Bioblitz Events:
    - Organize specialized Bioblitzes with expert participation to survey under-explored areas and apply species-specific methods (e.g., invertebrate sampling, small mammal trapping, seasonal avifaunal and herpetofauna surveys).
- Ad-Hoc Reporting:
    - Record observations of all other threatened species during both formal and informal surveys and submit data to relevant platforms (iNaturalist, BirdLasser, BirdMap).
- Black Harrier Monitoring:
    - Conduct annual monitoring of the Black Harrier population, with a focus on counting breeding pairs within the reserve.

All necessary permits will be obtained from CapeNature before surveys are conducted.

Table 5.1.1.: Ecological Monitoring

KPA 5.1.1 Ecological Monitoring		
Objective: *To ensure populations of species of special concern grow to meet natural population limits, whereafter populations are maintained.*		
Management Activity	**Key Performance Indicator**	**Timeframe**
Set-up permanent vegetation monitoring plots and train reserve staff	Plots set-up in field and methodology finalised	Y 1 - 2
Annually survey permanent vegetation monitoring plots	Data sheets captured?	Y 1 onwards
Install fixed point photography bases and take baseline photographs twice annually. Continue 6-monthly photography each year thereafter.	Fixed Point Photography datasheet updated per point	Y 1 - 10
Initiate annual monitoring of EN and CR plant species individuals/clumps after Bioblitzes is conducted. Those species unique to the reserve or area should be prioritized for monitoring.	Map showing location	Y 1 - 2

Monitoring of CR and EN plant species: Those species unique to the reserve or area should be prioritized for monitoring.		Year 2 and onwards
Annual Black Harrier Surveys to determine breeding sites	Map showing breeding sites.	Annually
Determine if special management guidelines are needed and for what species. (CR species, role of fire in maintaining, expanding surveys in to surrounding areas,		Year 3 - 4

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 and is a critical to adaptive management. 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 to accurately inform the actions in the following year's APO. Management Effectiveness also enables the effective assessment of management interventions and, if necessary, can be used to direct modifications of management in an effort to achieve the outcomes required.

5.1.3 Annual monitoring schedule

The annual monitoring schedule should be designed to monitor the implementation of the different aspects of the Protected Area management plan. It should be designed to be simple and easy to implement.

Records should be maintained of key management interventions and of relevant problem events or incidents such as poaching, unauthorised access into the reserve, illegal plant collection, unplanned wildfires, security related incidents, etc. Scientific monitoring programmes may be established to monitor specific management interventions such as measures for the protection of flagship species or particularly sensitive areas in the reserve. Most of the outcomes of the monitoring process will be captured in an annual report, which will be used to inform the following year's annual plan of operation. On this basis, a monitoring schedule for Haarwegskloof Nature Reserve is set out in Table 5.1.3.

Table: 5.1.3 Annual monitoring schedule for the Haarwegskloof Nature Reserve

Key performance areas	Parameters to be monitored	Monitoring measures	Monitoring frequency	Responsibility	Reporting requirements
Fire management	Compliance with the National Veld and Forest Fire Act (No 101 of 1998).	Written record of non-compliance issues.	Annually	Management Authority	Annual report
	Preparation of firebreaks as part of controlled burning	Ha/Written record/map/photography	Annually	Management Authority	Annual report
	Burning of blocks as part of controlled burning	Ha/ Written record/map/photography	Annually		Annual report
	Unplanned wildfires	Written record/map/photography	Per event		Record of event
	Conduct post-fire vegetation monitoring	Establish a Fixed-Point Photography (FFP) Monitoring Plots /Written record/map/photography	Annually	Management Authority	Annual report
Invasive plant control	New areas cleared of alien invasive plants.	Ha	Annually	Management Authority	Annual report
	Maintenance control on previously cleared areas.	Ha	Annually	Management Authority	
	Recovery of areas where invasive plants have been cleared	Establish a Fixed-Point Photography (FFP) Monitoring Plots /Ha / Photographic record if needed.	Annually	Management Authority	Annual report
	Records of labour hours/days	ORT NRM History	Annually	Management Authority	Annual report
Rehabilitation and restoration.	Areas subject to rehabilitation / restoration efforts	Establish a Fixed-Point Photography (FFP) Monitoring Plots /Photographs/written record	Annually	Management Authority	Annual report
	Recovery of rehabilitated areas.	Photographs/written record	Annually	Management Authority	Annual report
Aquatic systems	List threats and monitor findings.	Photographic/written record.	Annually	Management Authority	Annual report

Ecosystem, habitats and species management.	Identify and monitor populations of species of special concern	Written record/map/photography	Annually	Management Authority	Annual report
	Continued updating of species database.	Inat records / updated species list.	Annually	Management Authority	Annual report
	Undesired impacts on sensitive habitats and species of concern	Written record/map/photography	Annually	Management Authority	Annual report
Managing visitor impacts, activities and usage of the reserve.	Contraventions of the reserve's internal rules and/or zonation plan.	Written record/photography	Annually	Management Authority	Annual report
	Visitor numbers /groups to the reserve	Summary of numbers.	Annually	Management Authority	Annual report
Infrastructure management and development.	State of roads, tracks and trails	Photographs/written records	Annually	Management Authority	Annual report
	State of fences	Photographs/written records	Quarterly	Management Authority	Annual report
	State of facilities and service infrastructure	Maintenance schedule/written records	Quarterly	Management Authority	Annual report
	Pollution events	Photographs/written records	Per event	Management Authority	Record of event
Resourcing and capacitating reserve management	Annual environmental budget allocations.	Compare allocated vs. required budget; track budget utilisation trends and funding gaps	Annual	Management Authority	Annual report
Regional management and buffer zone protection.	Reserve captured in SDFs and IDPs.	SDFs and IDPs	Biennially	Management Authority	Five-year Annual report
	Reserve recorded in National Protected Area Register.	Protected Area Register	Once Off	Management Authority	Annual report
	External threats to the reserve's ecological integrity.	Written record.	Per event	Management Authority	Annual report
	Stakeholder recognition and support.	Stakeholder involvement	Annually	Management Authority	Annual report
	Expansion of land between De Hoop NR / Vogelrivier Conservation Easement and Haarwegskloof Nature Reserve towards the Goereesoe.	Ha	Per event	Management Authority	Annual report

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 a five-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.

Key Performance Area	Management objectives	2025	2026	2027	2028	2029
Biodiversity and Ecological Components	Fire Management	R70,000	R0	R80,000	R0	R90,000
	Invasive Alien Plants	R10,000	R10,000	R10,000	R10,000	R10,000
	Rehabilitation and restoration	R0	R15, 000	R10,000	R10,000	R0,000
	Vegetation Management	R0	R10,000	R10,000	R10,000	R0
	Aquatic and riparian systems	R0	R0	R0	R0	R0
	Species of special concern	R0	R0	R0	R0	R0
	Wildlife	R150,000	R50,000	R25,000	R0,000	R0,000
Sustainable Utilisation of Natural Resources	Grazing and browsing of livestock and game	R0	R0	R0	R0	R0
	Recreation and tourism	R0	R0	R0	R0	R0

Socio-economic and Heritage	Environmental Awareness and Education	R10,000	R10,000	R10,000	R10,000	R10,000
	Socio-economic development initiatives	R0	R0	R0	R0	R0
	Heritage features	R0	R0	R0	R0	R0
Management Authority Effectiveness and Sustainability	Legal Compliance	R0	R0	R0	R0	R0
	Infrastructure and equipment	R50,000	R50,000	R50,000	R50,000	R50,000
	Signage, access control and security	R20,000	R0	R0	R0	R0
	Financial Management	R0,000	R0	R0	R0	R0
Monitoring Plan	Research and Field Surveys	R7,500	R7,500	R0	R0	R0
	Biodiversity Knowledge Management	R0	R0	R0	R0	R0
	Ecological Monitoring	R5,000	R0	R0	R0	R0
Estimated Annual Management Cost:		**R3222,500**	**R152,500**	**R195,000**	**R90,000**	**R160,000**

6.2 The Annual Review and Planning Workshop

6.2.1 Annual Report

The management authority will draft a brief annual report at the end of each calendar year showing the progress that was made aligned with the management objectives. The report should highlight successes but should also note any planned management actions that were not undertaken, along with factors that contributed to or prevented success in each planned task. Tasks that are no longer relevant or where alternatives have been noted that may result in a better outcome, these must also be noted. The report will be submitted to CapeNature by the end of January. The first report should be submitted in Month of 2026 after the first full calendar year of implementation of the management plan.

6.2.2 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 management meeting 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 management meeting (See Appendix x below), allowing for a seamless transition of information from annual management meeting to new APO.

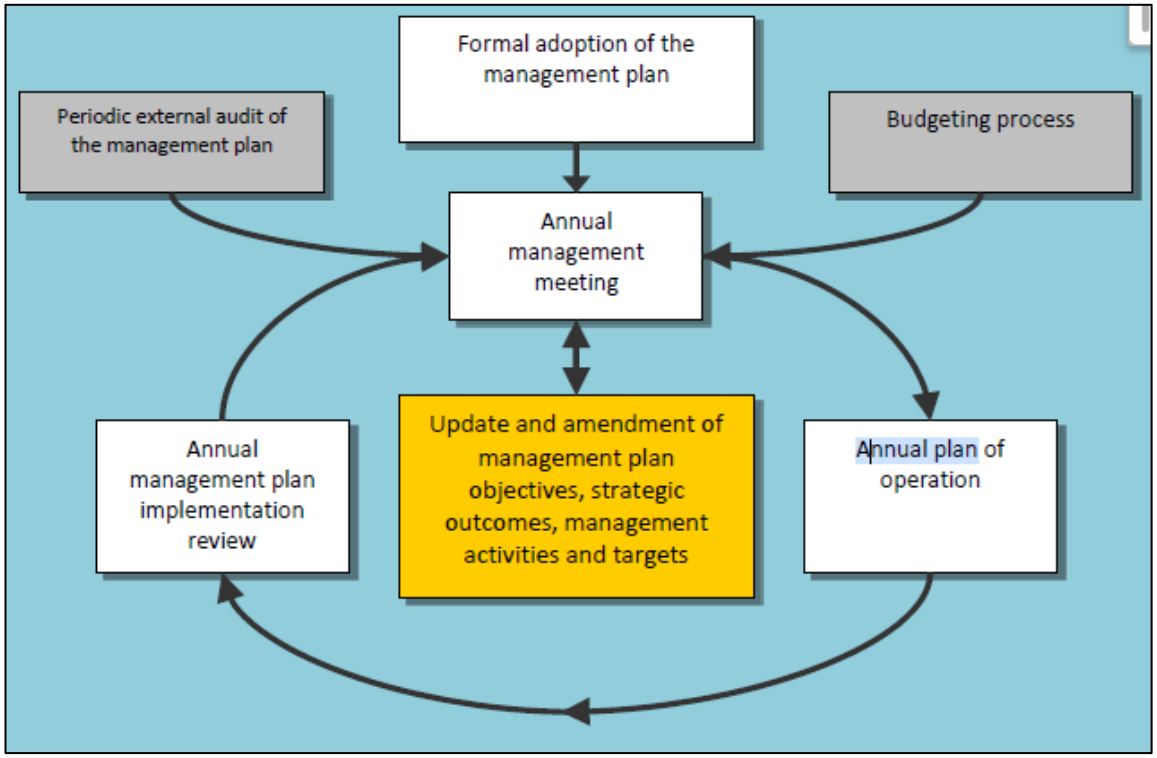

Figure 6.2.2: Process for the implementation of Protected Area Management Plans (Beachwood Mangroves Nature Reserve: Management Plan. Version 1.0 (June 2013), Ezemvelo KZN Wildlife, Pietermaritzburg)

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. Every year an annual plan of operation will be prepared, based on the objectives, strategic outcomes, management activities and targets contained in the management plan and the annual management meeting. 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.

To facilitate effective review, each management action comprises the following components:

- a description of the management actions
- the Key Performance Indicator (KPI)
- the KPI target
- the person responsible for implementation
- the budget assigned to the activity

- the deadline for completion

6.3.1 Drafting the next year's APO

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

The following steps should be taken:

- Finalise the annual report, as part of the annual management plan review described in section 6.2 of the management plan.
- 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.
- As part of the annual performance review, determine the need to modify or change any of the management plan's objectives, strategic outcomes, management activities or targets.
- You can now revise the KPI targets, person responsible, budget and deadlines if necessary.
- Determine KPI targets for the coming year, set specific goals and deadlines, appoint person responsible and determine how budgets will be spent in a manner that will achieve these goals.

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.

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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 Haarwegskloof Nature Reserve declaration

PROVINCIAL NOTICE

P.N. 54/2025 **16 May 2025**

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING

NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT, 2003 (ACT 57 OF 2003)

DECLARATION OF HAARWEGSKLOOF NATURE RESERVE

I, Anton Wilhelm Bredell, Provincial Minister of Local Government, Environmental Affairs and Development Planning in the Western Cape, under section 23(1)*(a)*(i) of the National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (the Act), declare a nature reserve on a portion of—

Remainder of the Farm No. 407, situated in the Swellendam Municipality, Division of Bredasdorp, Western Cape Province; in extent: 547, 7954 (Five Hundred and Forty-Seven comma Seven Nine Five Four) hectares; held by Deed of Transfer No. T1605/2014.

Under section 23(1)*(b)* of the Act, I assign the name "Haarwegskloof Nature Reserve" to the nature reserve, the boundaries of which are reflected on the map set out in the Schedule and on the Surveyor-General diagram which may be viewed at https://www.capenature.co.za/protected-areas-and-stewardship.

Signed at Cape Town on this 16th day of April 2025.

AW BREDELL
PROVINCIAL MINISTER OF LOCAL GOVERNMENT, ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING

PROVINSIALE KENNISGEWING

P.K. 54/2025 **16 Mei 2025**

DEPARTEMENT VAN OMGEWINGSAKE EN ONTWIKKELINGSBEPLANNING

***NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT, 2003* (WET 57 VAN 2003)**

VERKLARING VAN HAARWEGSKLOOF NATUURRESERVAAT

Ek, Anton Wilhelm Bredell, Provinsiale Minister van Plaaslike Regering, Omgewingsake en Ontwikkelingsbeplanning in die Wes-Kaap, kragtens artikel 23(1)*(a)*(i) van die *National Environmental Management: Protected Areas Act, 2003* (Wet 57 van 2003) (die Wet), verklaar 'n natuurreservaat op 'n gedeelte van—

Restant van die Plaas Nr. 407, geleë in die Swellendam-munisipaliteit, Afdeling Bredasdorp, Provinsie Wes-Kaap; groot: 547, 7954 (Vyfhonderd Sewe-en-Veertig komma Sewe Nege Vyf Vier) hektaar; gehou kragtens Transportakte Nr. T1605/2014.

Kragtens artikel 23(1)*(b)* van die Wet, ken ek die naam "Haarwegskloof Natuurreservaat" toe aan die natuurreservaat, waarvan die grense weergegee word op die kaart uiteengesit in die Bylae uiteengesit en op die Landmeter-generaaldiagram wat by https://www.capenature.co.za/protected-areas-and-stewardship gevind kan word.

Geteken te Kaapstad op hierdie 16de dag van April 2025.

AW BREDELL
PROVINSIALE MINISTER VAN PLAASLIKE REGERING, OMGEWINGSAKE EN ONTWIKKELINGSBEPLANNING

ISAZISO SEPHONDO

I.S. 54/2025 **16 kuCanzibe 2025**

ISEBE LEMICIMBI YOKUSINGQONGILEYO NOCWANGCISO LOPHUHLISO

UMTHETHO WOKULONDOLOZWA KWENDALO YESIZWE: UMTHETHO WEENDAWO ZOLONDOLOZO EZIKHUSELWEYO, 2003 (UMTHETHO 57 KA-2003):

ISIBHENGEZO NGENDAWO YOLONDOLOZO NDALO IHAARWEGSKLOOF

Mna, Anton Wilhelm Bredell, uMphathiswa wePhondo wooRhulumente beeNqingqi, iMicimbi yokuSingqongileyo noCwangciso loPhuhliso eNtshona Koloni, ngaphantsi kwecandelo 23(1)*(a)*(i) loMthetho wokuLondolozwa kweNdalo yeSizwe: UMthetho weeNdawo zoLondolozo eziKhuselweyo, 2003 (uMthetho 57 ka-2003) (uMthetho), ndibhengeza ulondolozondalo kwinxalenye—

yeNtsalela yeFama enguNombolo 407, kuMasipala wase Swellendam, iCandelo leBredasdorp, kwiPhondo laseNtshona Koloni; ubungakanani: 547, 7954 (amaKhulu amaHlanu namaShumi amaNe anesiXhenxe khoma isiXhenxe iThoba isiHlanu isiNe) beehektare; eziphantsi kweSiqinisekiso soNikezelo loMhlaba esinguNombolo T1605/2014.

Phantsi kwencandelo 23(1)*(b)* loMthetho, ndinika igama elithi "INdawo yoLondolozo Ndalo iHaarwegskloof" kwindawo yolondolozondalo, leyo imida yayo iboniswe kwimephu njengoko kumisiwe kwiShedyuli nokumzobo kaNocanda-Jikelele unokubonwa kwi-intanethi ku-https://www.capenature.co.za/protected-areas-and-stewardship.

Sityikitywe eKapa ngalo mhla we16 kuTshazimpuzi 2025.

AW BREDELL
UMPHATHISWA WEPHONDO WOORHULUMENTE BEENGINGQI, IMICIMBI YOKUSINGQONGILEYO NOCWANGCISO LOPHUHLISO

8.3 APPENDIX C - Species lists

8.3.1 Plant species list for Haarwegskloof Nature Reserve

BIODIVERSITY DATA COLLECTION AND MONITORING HAARWEGSKLOOF NATURE RESERVE PLANT SPECIES LIST		
Family	Species	Status
ACANTHACEAE	*Barleria pungens*	LC
ACANTHACEAE	*Ruellia pilosa*	VU
ACROBOLBACEAE	*Lethocolea sp.*	LC
AIZOACEAE	*Acrodon deminutus*	VU
AIZOACEAE	*Acrosanthes teretifolia*	LC
AIZOACEAE	*Aizoon africanum*	LC
AIZOACEAE	*Carpobrotus acinaciformis*	LC
AIZOACEAE	*Delosperma sp. (undescribed)*	TBA
AIZOACEAE	*Drosanthemum ambiguum*	LC
AIZOACEAE	*Drosanthemum asperulum*	LC
AIZOACEAE	*Drosanthemum calycinum*	NT
AIZOACEAE	*Drosanthemum hispidum*	LC
AIZOACEAE	*Drosanthemum micans*	EN
AIZOACEAE	*Drosanthemum parvifolium*	LC
AIZOACEAE	*Drosanthemum quadratum*	EN
AIZOACEAE	*Gibbaeum hartmannianum*	EN
AIZOACEAE	*Glottiphyllum depressum*	LC
AIZOACEAE	*Mesembryanthemum longistylum*	LC
AIZOACEAE	*Mesembryanthemum napierense*	EN
AIZOACEAE	*Mesembryanthemum nodiflorum*	LC
AIZOACEAE	*Mesembryanthemum parviflorum*	LC
AIZOACEAE	*Ruschia lineolata*	LC
AIZOACEAE	*Ruschia rigida*	LC
AIZOACEAE	*Ruschia vaginata*	LC
AIZOACEAE	*Trichodiadema gracile*	LC
AIZOACEAE	*Trichodiadema pygmaeum cf.*	EN
ALLIACEAE	*Tulbaghia alliacea*	LC
ALLIACEAE	*Tulbaghia capensis*	LC
AMARANTHACEAE	*Atriplex semibaccata var. appendiculata*	LC
AMARANTHACEAE	*Exomis microphylla var. microphylla*	LC
AMARANTHACEAE	*Salicornia pillansii*	LC
AMARYLLIDACEAE	*Amaryllis belladonna*	LC
AMARYLLIDACEAE	*Boophone disticha*	Declining
AMARYLLIDACEAE	*Crossyne guttata*	LC
AMARYLLIDACEAE	*Gethyllis spiralis*	LC
AMARYLLIDACEAE	*Gethyllis villosa*	LC

AMARYLLIDACEAE	*Haemanthus coccineus*	LC
AMARYLLIDACEAE	*Haemanthus sanguineus*	LC
AMARYLLIDACEAE	*Nerine humilis*	LC
AMARYLLIDACEAE	*Strumaria spiralis*	LC
ANACAMPSEROTACEAE	*Anacampseros lanceolata subsp. nebrownii*	LC
ANACARDIACEAE	*Searsia glauca*	LC
ANACARDIACEAE	*Searsia longispina*	LC
ANACARDIACEAE	*Searsia lucida forma lucida*	Not Evaluated
ANACARDIACEAE	*Searsia pallens*	LC
ANACARDIACEAE	*Searsia rehmanniana var. glabrata*	LC
ANACARDIACEAE	*Searsia rosmarinifolia*	LC
ANACARDIACEAE	*Searsia tomentosa*	LC
ANEMIACEAE	*Anemia caffrorum*	LC
APIACEAE	*Annesorhiza triternata*	LC
APIACEAE	*Arctopus echinatus*	LC
APIACEAE	*Centella affinis cf.*	LC
APIACEAE	*Centella glabrata*	LC
APIACEAE	*Chamarea sp.*	LC
APIACEAE	*Dasispermum tenue*	LC
APIACEAE	*Lichtensteinia interrupta*	LC
APIACEAE	*Lichtensteinia latifolia*	LC
APIACEAE	*Lichtensteinia obscura*	LC
APIACEAE	*Lichtensteinia trifida var. trifida*	LC
APIACEAE	*Notobubon collinum*	NT
APIACEAE	*Notobubon ferulaceum*	LC
APOCYNACEAE	*Carissa bispinosa*	LC
APOCYNACEAE	*Ceropegia africana subsp. africana*	LC
APOCYNACEAE	*Cynanchum viminale*	LC
APOCYNACEAE	*Cynanchum zeyheri*	LC
APOCYNACEAE	*Eustegia minuta*	LC
APOCYNACEAE	*Fockea capensis*	LC
APOCYNACEAE	*Fockea edulis*	LC
APOCYNACEAE	*Gomphocarpus cancellatus*	LC
APOCYNACEAE	*Gomphocarpus physocarpus*	LC
APOCYNACEAE	*Microloma sagittatum*	LC
APOCYNACEAE	*Microloma tenuifolium*	LC
APOCYNACEAE	*Orbea variegata*	LC
APOCYNACEAE	*Schizoglossum aschersonianum var. aschersonianum*	LC
APOCYNACEAE	*Xysmalobium gomphocarpoides var. gomphocarpoides*	LC
APONOGETONACEAE	*Aponogeton distachyos*	LC
ARACEAE	*Zantedeschia aethiopica*	LC
ASPARAGACEAE	*Asparagus aethiopicus*	LC

ASPARAGACEAE	*Asparagus asparagoides*	LC
ASPARAGACEAE	*Asparagus burchellii*	LC
ASPARAGACEAE	*Asparagus capensis var. capensis*	LC
ASPARAGACEAE	*Asparagus declinatus*	LC
ASPARAGACEAE	*Asparagus densiflorus*	LC
ASPARAGACEAE	*Asparagus lignosus*	LC
ASPARAGACEAE	*Asparagus mariae*	LC
ASPARAGACEAE	*Asparagus mucronatus*	LC
ASPARAGACEAE	*Asparagus retrofractus*	LC
ASPARAGACEAE	*Asparagus rubicundus*	LC
ASPARAGACEAE	*Asparagus striatus*	LC
ASPARAGACEAE	*Asparagus suaveolens*	LC
ASPARAGACEAE	*Asparagus volubilis*	LC
ASPHODELACEAE	*Aloe arborescens*	LC
ASPHODELACEAE	*Aloe ferox*	LC
ASPHODELACEAE	*Aloe maculata*	LC
ASPHODELACEAE	*Bulbine abyssinica*	LC
ASPHODELACEAE	*Bulbine favosa*	LC
ASPHODELACEAE	*Bulbine lagopus*	LC
ASPHODELACEAE	*Bulbine mesembryanthoides subsp. mesembryanthoides*	LC
ASPHODELACEAE	*Bulbinella barkeriae*	LC
ASPHODELACEAE	*Bulbinella cauda-felis*	LC
ASPHODELACEAE	*Gasteria carinata var. carinata*	LC
ASPHODELACEAE	*Haworthia maraisii*	DDT
ASPHODELACEAE	*Haworthia minima var. minima*	LC
ASPHODELACEAE	*Haworthia mutica*	DDT
ASPHODELACEAE	*Haworthia turgida*	DDT
ASPHODELACEAE	*Trachyandra chlamydophylla*	VU
ASPHODELACEAE	*Trachyandra revoluta*	LC
ASTERACEAE	*Achyranthemum paniculatum*	LC
ASTERACEAE	*Arctotheca calendula*	LC
ASTERACEAE	*Arctotheca prostrata*	LC
ASTERACEAE	*Arctotis acaulis*	LC
ASTERACEAE	*Arctotis hirsuta*	LC
ASTERACEAE	*Athanasia dentata*	LC
ASTERACEAE	*Athanasia filiformis*	LC
ASTERACEAE	*Athanasia juncea*	LC
ASTERACEAE	*Athanasia trifurcata*	LC
ASTERACEAE	*Athrixia capensis*	LC
ASTERACEAE	*Berkheya armata*	LC
ASTERACEAE	*Berkheya heterophylla*	LC
ASTERACEAE	*Berkheya rigida*	LC
ASTERACEAE	*Chrysocoma ciliata*	LC
ASTERACEAE	*Corymbium africanum subsp. africanum*	LC

ASTERACEAE	*Cotula coronopifolia*	LC
ASTERACEAE	*Curio archeri*	DDT
ASTERACEAE	*Curio citriformis*	DDT
ASTERACEAE	*Curio crassulifolius*	DDT
ASTERACEAE	*Curio radicans*	LC
ASTERACEAE	*Cymbopappus adenosolen*	LC
ASTERACEAE	*Dicerothamnus rhinocerotis*	LC
ASTERACEAE	*Dimorphotheca nudicaulis var. nudicaulis*	LC
ASTERACEAE	*Disparago ericoides*	LC
ASTERACEAE	*Eriocephalus africanus var. africanus*	LC
ASTERACEAE	*Felicia amoena*	LC
ASTERACEAE	*Felicia muricata subsp. muricata*	LC
ASTERACEAE	*Gazania krebsiana subsp. krebsiana*	LC
ASTERACEAE	*Gerbera piloselloides*	LC
ASTERACEAE	*Gerbera serrata*	LC
ASTERACEAE	*Helichrysum asperum ~~var. albidulum~~*	LC
ASTERACEAE	*Helichrysum cymosum subsp. cymosum*	LC
ASTERACEAE	*Helichrysum dasyanthum*	LC
ASTERACEAE	*Helichrysum excisum*	LC
ASTERACEAE	*Helichrysum odoratissimum*	LC
ASTERACEAE	*Helichrysum pandurifolium*	LC
ASTERACEAE	*Helichrysum patulum*	LC
ASTERACEAE	*Helichrysum rosum var. rosum*	LC
ASTERACEAE	*Helichrysum rutilans*	LC
ASTERACEAE	*Helichrysum teretifolium*	LC
ASTERACEAE	*Helichrysum tinctum*	LC
ASTERACEAE	*Lactuca inermis*	LC
ASTERACEAE	*Lasiospermum bipinnatum*	LC
ASTERACEAE	*Leysera gnaphalodes*	LC
ASTERACEAE	*Macledium spinosum*	LC
ASTERACEAE	*Metalasia acuta*	LC
ASTERACEAE	*Metalasia densa*	LC
ASTERACEAE	*Nidorella ivifolia*	LC
ASTERACEAE	*Oedera garnotii*	VU
ASTERACEAE	*Oedera genistifolia*	LC
ASTERACEAE	*Oedera squarrosa*	LC
ASTERACEAE	*Oedera uniflora*	LC
ASTERACEAE	*Oncosiphon piluliferum*	LC
ASTERACEAE	*Oncosiphon suffruticosus*	LC
ASTERACEAE	*Osteospermum monilifera subsp. monilifera*	LC
ASTERACEAE	*Osteospermum monstrosum*	LC
ASTERACEAE	*Osteospermum polygaloides var. polygaloides*	LC
ASTERACEAE	*Osteospermum tomentosum*	LC
ASTERACEAE	*Pentzia incana*	LC
ASTERACEAE	*Printzia polifolia*	LC

ASTERACEAE	*Pseudognaphalium sp.*	
ASTERACEAE	*Pteronia hirsuta*	LC
ASTERACEAE	*Pteronia incana*	LC
ASTERACEAE	*Rhynchopsidium sessiliflorum*	LC
ASTERACEAE	*Senecio bipinnatus*	LC
ASTERACEAE	*Senecio burchellii*	LC
ASTERACEAE	*Senecio erubescens var. erubescens*	LC
ASTERACEAE	*Senecio lycopodioides*	VU
ASTERACEAE	*Senecio pinifolius*	LC
ASTERACEAE	*Senecio pterophorus*	LC
ASTERACEAE	*Senecio purpureus*	LC
ASTERACEAE	*Senecio rosmarinifolius*	LC
ASTERACEAE	*Seriphium plumosum*	LC
ASTERACEAE	*Stoebe capitata*	LC
ASTERACEAE	*Stoebe rugulosa*	EN
ASTERACEAE	*Ursinia anthemoides subsp. anthemoides*	LC
ASTERACEAE	*Ursinia discolor*	LC
ASTERACEAE	*Ursinia nana subsp. nana*	LC
BORAGINACEAE	*Lobostemon capitatus*	VU
BORAGINACEAE	*Lobostemon echioides*	LC
BRASSICACEAE	*Heliophila cornuta var. squamata*	LC
BRASSICACEAE	*Heliophila pendula*	LC
BRASSICACEAE	*Sisymbrium capense*	LC
BRUNIACEAE	*Brunia noduliflora*	LC
BRYACEAE	*Bryum sp.*	
CAMPANULACEAE	*Cyphia digitata subsp. digitata*	LC
CAMPANULACEAE	*Cyphia volubilis var. volubilis*	LC
CAMPANULACEAE	*Wahlenbergia tenella var. tenella*	LC
CAMPANULACEAE	*Wahlenbergia tenerrima*	LC
CARYOPHYLLACEAE	*Dianthus albens*	LC
CARYOPHYLLACEAE	*Dianthus thunbergii*	LC
CARYOPHYLLACEAE	*Silene burchellii ssp. pilosellifolia*	LC
CARYOPHYLLACEAE	*Silene undulata*	LC
CARYOPHYLLACEAE	*Spergularia media*	LC
CELASTRACEAE	*Cassine peragua subsp. peragua*	LC
CELASTRACEAE	*Gymnosporia buxifolia*	LC
CELASTRACEAE	*Maytenus oleoides*	LC
CELASTRACEAE	*Pterocelastrus tricuspidatus*	LC
COLCHICACEAE	*Colchicum eucomoides*	LC
COLCHICACEAE	*Wurmbea glassii*	LC
COLCHICACEAE	*Wurmbea punctata*	LC
COLCHICACEAE	*Wurmbea variabilis*	LC
COMMELINACEAE	*Commelina africana var. africana*	LC
CONVOLVULACEAE	*Convolvulus capensis*	LC
CONVOLVULACEAE	*Falkia repens*	LC

CRASSULACEAE	*Adromischus caryophyllaceus*	LC
CRASSULACEAE	*Adromischus filicaulis subsp. marlothii*	LC
CRASSULACEAE	*Adromischus maculatus*	NT
CRASSULACEAE	*Cotyledon orbiculata var. orbiculata*	LC
CRASSULACEAE	*Crassula atropurpurea var. atropurpurea*	LC
CRASSULACEAE	*Crassula capensis var. albertinae*	LC
CRASSULACEAE	*Crassula capensis var. capensis*	LC
CRASSULACEAE	*Crassula cotyledonis*	LC
CRASSULACEAE	*Crassula expansa subsp. expansa*	LC
CRASSULACEAE	*Crassula muscosa var. muscosa*	LC
CRASSULACEAE	*Crassula nudicaulis var. nudicaulis*	LC
CRASSULACEAE	*Crassula nudicaulis var. platyphylla*	LC
CRASSULACEAE	*Crassula perforata subsp. perforata*	LC
CRASSULACEAE	*Crassula pubescens subsp. pubescens*	LC
CRASSULACEAE	*Crassula sebaeoides*	LC
CRASSULACEAE	*Crassula subulata var. subulata*	LC
CRASSULACEAE	*Crassula tetragona*	LC
CRASSULACEAE	*Crassula tetragona subsp. tetragona*	LC
CUCURBITACEAE	*Cucumis zeyheri*	LC
CUCURBITACEAE	*Kedrostis capensis (or nana)*	LC
CYPERACEAE	*Carex capensis ~~Schoenoxiphium ecklonii~~*	NT
CYPERACEAE	*Cyperus textilis*	LC
CYPERACEAE	*Ficinia albicans*	LC
CYPERACEAE	*Ficinia indica*	LC
CYPERACEAE	*Ficinia nigrescens*	LC
CYPERACEAE	*Ficinia nodosa*	LC
CYPERACEAE	*Ficinia oligantha*	LC
CYPERACEAE	*Ficinia overbergensis*	NT
CYPERACEAE	*Ficinia ramosissima*	LC
CYPERACEAE	*Ficinia repens*	LC
CYPERACEAE	*Isolepis marginata*	LC
CYPERACEAE	*Schoenus cuspidatus*	LC
CYPERACEAE	*Schoenus quartziticus*	STBA
CYTINACEAE	*Cytinus sanguineus*	LC
DIPSACACEAE	*Scabiosa columbaria*	LC
DROSERACEAE	*Drosera cistiflora*	LC
DROSERACEAE	*Drosera zeyheri*	LC
EBENACEAE	*Diospyros austro-africana*	LC
EBENACEAE	*Diospyros dichrophylla*	LC
EBENACEAE	*Euclea crispa subsp. crispa*	LC
EBENACEAE	*Euclea undulata*	LC
ERICACEAE	*Erica cerinthoides var. cerinthoides*	LC
ERICACEAE	*Erica coccinea subsp. coccinea*	LC
ERICACEAE	*Erica copiosa var. copiosa*	LC
ERICACEAE	*Erica karooica*	LC

ERICACEAE	*Erica plukenetii subsp. plukenetii*	LC
ERICACEAE	*Erica setacea*	LC
ERICACEAE	*Erica venustiflora subsp. glandulosa*	VU
EUPHORBIACEAE	*Clutia alaternoides*	LC
EUPHORBIACEAE	*Clutia cf. govaertsii*	LC
EUPHORBIACEAE	*Clutia polygonoides*	LC
EUPHORBIACEAE	*Clutia tomentosa*	LC
EUPHORBIACEAE	*Euphorbia burmannii*	LC
EUPHORBIACEAE	*Euphorbia clandestina*	LC
EUPHORBIACEAE	*Euphorbia erythrina var. erythrina*	LC
EUPHORBIACEAE	*Euphorbia genistoides*	LC
EUPHORBIACEAE	*Euphorbia mauritanica*	LC
EUPHORBIACEAE	*Euphorbia nesemannii*	NT
EUPHORBIACEAE	*Euphorbia rhombifolia*	LC
EUPHORBIACEAE	*Euphorbia silenifolia*	LC
EUPHORBIACEAE	*Euphorbia tuberosa*	LC
FABACEAE	*Amphithalea violacea*	LC
FABACEAE	*Argyrolobium molle*	LC
FABACEAE	*Argyrolobium pachyphyllum*	EN
FABACEAE	*Aspalathus acuminata subsp. acuminata*	LC
FABACEAE	*Aspalathus alpestris*	LC
FABACEAE	*Aspalathus aspalathoides*	LC
FABACEAE	*Aspalathus asparagoides subsp. asparagoides*	LC
FABACEAE	*Aspalathus barbigera*	VU
FABACEAE	*Aspalathus campestris*	VU
FABACEAE	*Aspalathus candidula*	VU
FABACEAE	*Aspalathus ciliaris*	LC
FABACEAE	*Aspalathus eustonbrownii*	VU
FABACEAE	*Aspalathus grobleri*	EN
FABACEAE	*Aspalathus hispida subsp. albiflora*	LC
FABACEAE	*Aspalathus incompta*	NT
FABACEAE	*Aspalathus incurvifolia*	LC
FABACEAE	*Aspalathus laricifolia*	LC
FABACEAE	*Aspalathus microlithica*	VU
FABACEAE	*Aspalathus microphylla*	LC
FABACEAE	*Aspalathus millefolia*	VU
FABACEAE	*Aspalathus mundiana*	LC
FABACEAE	*Aspalathus nigra*	LC
FABACEAE	*Aspalathus pinguis subsp. pinguis*	LC
FABACEAE	*Aspalathus quartzicola*	VU
FABACEAE	*Aspalathus smithii*	EN
FABACEAE	*Aspalathus spinosa subsp. spinosa*	LC
FABACEAE	*Aspalathus steudeliana*	VU
FABACEAE	*Aspalathus submissa*	LC
FABACEAE	*Aspalathus zeyheri*	VU

FABACEAE	*Indigofera heterophylla*	LC
FABACEAE	*Indigofera incana*	LC
FABACEAE	*Indigofera nigromontana*	LC
FABACEAE	*Indigofera priorii*	LC
FABACEAE	*Lessertia annularis*	LC
FABACEAE	*Lessertia frutescens subsp. microphylla*	LC
FABACEAE	*Lessertia pauciflora*	LC
FABACEAE	*Lessertia spinescens*	LC
FABACEAE	*Lessertia spinescens*	LC
FABACEAE	*Lessertia stenoloba*	LC
FABACEAE	*Liparia striata*	EN
FABACEAE	*Lotononis pungens*	LC
FABACEAE	*Lotononis umbellata*	LC
FABACEAE	*Melolobium humile*	LC
FABACEAE	*Podalyria myrtillifolia*	LC
FABACEAE	*Polhillia curtisiae*	CR
FABACEAE	*Polhillia pallens*	VU
FABACEAE	*Polhillia stirtoniana*	LC
FABACEAE	*Psoralae ~~Otholobium~~ candicans*	LC
FABACEAE	*Psoralae ~~Otholobium~~ curtisiae*	EN
FABACEAE	*Psoralae ~~Otholobium~~ pungens*	EN
FABACEAE	*Tephrosia capensis var. capensis*	LC
FABACEAE	*Trifolium burchellianum subsp. burchellianum*	LC
FABACEAE	*Vachellia karroo*	LC
FABACEAE	*Xiphotheca guthriei*	EN
FABACEAE	*Xiphotheca rosmarinifolia*	CR
Fissidentaceae	*Fissidens megalotis*	LC
GENTIANACEAE	*Chironia baccifera*	LC
GENTIANACEAE	*Chironia jasminoides*	LC
GENTIANACEAE	*Chironia tetragona*	LC
GENTIANACEAE	*Sebaea albens*	LC
GENTIANACEAE	*Sebaea aurea*	LC
GENTIANACEAE	*Sebaea exacoides*	LC
GENTIANACEAE	*Sebaea scabra*	NT
GERANIACEAE	*Pelargonium alchemilloides*	LC
GERANIACEAE	*Pelargonium candicans*	LC
GERANIACEAE	*Pelargonium capitatum*	LC
GERANIACEAE	*Pelargonium carneum*	LC
GERANIACEAE	*Pelargonium caucalifolium subsp. caucalifolium*	LC
GERANIACEAE	*Pelargonium dipetalum subsp. stenosiphon*	LC
GERANIACEAE	*Pelargonium grossularioides*	LC
GERANIACEAE	*Pelargonium lobatum*	LC
GERANIACEAE	*Pelargonium longifolium*	LC
GERANIACEAE	*Pelargonium myrrhifolium var. myrrhifolium*	LC
GERANIACEAE	*Pelargonium odoratissimum*	LC

GERANIACEAE	*Pelargonium pinnatum*	LC
GERANIACEAE	*Pelargonium rapaceum*	LC
GERANIACEAE	*Pelargonium triste*	LC
HAEMODORACEAE	*Dilatris pillansii*	LC
HAEMODORACEAE	*Wachendorfia paniculata*	LC
HYACINTHACEAE	*Albuca canadensis*	LC
HYACINTHACEAE	*Albuca cooperi*	LC
HYACINTHACEAE	*Albuca kirstenii*	Rare
HYACINTHACEAE	*Albuca suaveolens*	LC
HYACINTHACEAE	*Drimia altissima*	Declining
HYACINTHACEAE	*Drimia capensis*	LC
HYACINTHACEAE	*Drimia elata*	DDT
HYACINTHACEAE	*Eucomis regia*	LC
HYACINTHACEAE	*Lachenalia barbarae*	CR
HYACINTHACEAE	*Lachenalia orchioides var. orchioides*	LC
HYACINTHACEAE	*Lachenalia perryae*	LC
HYACINTHACEAE	*Lachenalia rosea*	LC
HYACINTHACEAE	*Lachenalia sp.*	STBA
HYACINTHACEAE	*Ledebouria revoluta*	LC
HYACINTHACEAE	*Massonia depressa*	LC
HYACINTHACEAE	*Massonia longipes*	LC
HYACINTHACEAE	*Massonia pustulata*	LC
HYACINTHACEAE	*Ornithogalum dubium*	LC
HYACINTHACEAE	*Ornithogalum graminifolium*	LC
HYACINTHACEAE	*Ornithogalum graminifolium cf.*	LC
HYACINTHACEAE	*Ornithogalum juncifolium var. juncifolium*	LC
HYACINTHACEAE	*Ornithogalum neopatersonia*	LC
HYACINTHACEAE	*Ornithogalum pilosum*	VU
HYACINTHACEAE	*Ornithogalum thyrsoides*	LC
HYPOXIDACEAE	*Empodium plicatum*	LC
HYPOXIDACEAE	*Hypoxis floccosa*	LC
HYPOXIDACEAE	*Pauridia capensis*	LC
HYPOXIDACEAE	*Pauridia flaccida*	LC
HYPOXIDACEAE	*Pauridia minuta*	LC
HYPOXIDACEAE	*Pauridia ovata*	LC
IRIDACEAE	*Aristea pusilla*	LC
IRIDACEAE	*Babiana patersoniae*	LC
IRIDACEAE	*Babiana patula*	Declining
IRIDACEAE	*Bobartia longicyma subsp. microflora*	VU
IRIDACEAE	*Chasmanthe aethiopica*	LC
IRIDACEAE	*Chasmanthe bicolor*	VU
IRIDACEAE	*Ferraria crispa subsp. crispa*	LC
IRIDACEAE	*Freesia caryophyllacea*	NT
IRIDACEAE	*Freesia refracta*	LC
IRIDACEAE	*Geissorhiza inconspicua cf.*	LC

IRIDACEAE	*Geissorhiza nana*	LC
IRIDACEAE	*Geissorhiza parva*	LC
IRIDACEAE	*Gladiolus carinatus*	LC
IRIDACEAE	*Gladiolus floribundus*	LC
IRIDACEAE	*Gladiolus gracilis*	LC
IRIDACEAE	*Gladiolus maculatus*	LC
IRIDACEAE	*Gladiolus patersoniae*	LC
IRIDACEAE	*Gladiolus permeabilis subsp. permeabilis*	LC
IRIDACEAE	*Gladiolus teretifolius*	NT
IRIDACEAE	*Gladiolus tristis*	LC
IRIDACEAE	*Gladiolus vaginatus*	LC
IRIDACEAE	*Gladiolus vandermerwei*	EN
IRIDACEAE	*Hesperantha falcata*	LC
IRIDACEAE	*Hesperantha kiarataylorae*	CR
IRIDACEAE	*Hesperantha muirii*	EN
IRIDACEAE	*Ixia flexuosa*	LC
IRIDACEAE	*Ixia micrandra var. micrandra*	NT
IRIDACEAE	*Ixia orientalis*	NT
IRIDACEAE	*Lapeirousia pyramidalis subsp. pyramidalis*	LC
IRIDACEAE	*Micranthus alopecuroides*	LC
IRIDACEAE	*Micranthus tubulosus*	LC
IRIDACEAE	*Moraea ciliata*	LC
IRIDACEAE	*Moraea debilis*	EN
IRIDACEAE	*Moraea elsiae*	NT
IRIDACEAE	*Moraea fergusoniae*	NT
IRIDACEAE	*Moraea gawleri*	LC
IRIDACEAE	*Moraea inconspicua Goldblatt*	LC
IRIDACEAE	*Moraea lewisiae subsp. lewisiae*	LC
IRIDACEAE	*Moraea setifolia*	LC
IRIDACEAE	*Moraea tricuspidata*	LC
IRIDACEAE	*Moraea tripetala subsp. tripetala*	LC
IRIDACEAE	*Moraea unguiculata*	LC
IRIDACEAE	*Romulea flava var. flava*	LC
IRIDACEAE	*Romulea rosea var. rosea*	LC
IRIDACEAE	*Syringodea longituba var. violacea ~~longituba~~*	NT
IRIDACEAE	*Tritonia flabellifolia var. flabellifolia*	LC
IRIDACEAE	*Tritoniopsis antholyza*	LC
IRIDACEAE	*Tritoniopsis revoluta*	LC
IRIDACEAE	*Watsonia aletroides*	NT
IRIDACEAE	*Watsonia laccata*	LC
JUNCACEAE	*Juncus acutus ~~subsp. leopoldii~~*	LC
LAMIACEAE	*Ballota africana*	LC
LAMIACEAE	*Leonotis ocymifolia*	LC
LAMIACEAE	*Pseudodictamnus africanus*	LC
LAMIACEAE	*Salvia aurea*	LC

LAMIACEAE	*Salvia runcinata*	LC
LAMIACEAE	*Stachys aethiopica*	LC
LEUCOBRYACEAE	*Campylopus introflexus*	LC
LINACEAE	*Linum africanum*	LC
LINACEAE	*Linum thunbergii*	LC
LOBELIACAEA	*Lobelia anceps*	LC
LOBELIACAEA	*Lobelia erinus*	LC
LOBELIACAEA	*Lobelia tomentosa*	LC
MALVACEAE	*Abutilon sonneratianum*	LC
MALVACEAE	*Anisodontea fruticosa*	LC
MALVACEAE	*Anisodontea scabrosa*	LC
MALVACEAE	*Grewia occidentalis var. occidentalis*	LC
MALVACEAE	*Hermannia alnifolia*	LC
MALVACEAE	*Hermannia althaeifolia*	LC
MALVACEAE	*Hermannia cuneifolia*	LC
MALVACEAE	*Hermannia diversistipula*	LC
MALVACEAE	*Hermannia flammea*	LC
MALVACEAE	*Hermannia flammula*	LC
MALVACEAE	*Hermannia holosericea*	LC
MALVACEAE	*Hermannia hyssopifolia*	LC
MALVACEAE	*Hermannia imbricata ~~trifoliata~~*	LC
MALVACEAE	*Hermannia lavandulifolia*	VU
MALVACEAE	*Hermannia saccifera*	LC
MALVACEAE	*Hermannia sp. nov. microtesticulare (ms)*	LC
MALVACEAE	*Hermannia sp. nov. shivae (ms)*	LC
MALVACEAE	*Hermannia ternifolia*	LC
MALVACEAE	*Hibiscus aethiopicus var. aethiopicus*	LC
MALVACEAE	*Hibiscus pusillus*	LC
MALVACEAE	*Sida cordifolia subsp. cordifolia*	LC
MELIANTHACEAE	*Melianthus major*	LC
MENISPERMACEAE	*Cissampelos capensis*	LC
MONTINIACEAE	*Montinia caryophyllacea*	LC
MYRSINACEAE	*Myrsine africana*	LC
OLEACEAE	*Olea europaea subsp. cuspidata*	LC
ORCHIDACEAE	*Bartholina burmanniana*	LC
ORCHIDACEAE	*Bartholina etheliae*	VU
ORCHIDACEAE	*Disa bracteata*	LC
ORCHIDACEAE	*Disperis bolusiana subsp. bolusiana*	LC
ORCHIDACEAE	*Holothrix burchellii*	LC
ORCHIDACEAE	*Holothrix mundii*	LC
ORCHIDACEAE	*Holothrix secunda*	LC
ORCHIDACEAE	*Holothrix villosa ssp. villosa*	LC
ORCHIDACEAE	*Pterygodium alatum*	LC
ORCHIDACEAE	*Pterygodium catholicum*	LC
ORCHIDACEAE	*Pterygodium volucris*	LC

ORCHIDACEAE	*Satyrium erectum*	LC
OROBANCHACEAE	*Hyobanche glabrata*	LC
OROBANCHACEAE	*Hyobanche rubra*	LC
OROBANCHACEAE	*Hyobanche sanguinea*	LC
OXALIDACEAE	*Oxalis bifida*	LC
OXALIDACEAE	*Oxalis ciliaris var. ciliaris*	LC
OXALIDACEAE	*Oxalis confertifolia var. confertifolia*	DDT
OXALIDACEAE	*Oxalis depressa*	LC
OXALIDACEAE	*Oxalis eckloniana var. sonderi*	LC
OXALIDACEAE	*Oxalis engleriana*	LC
OXALIDACEAE	*Oxalis fergusonae*	LC
OXALIDACEAE	*Oxalis heterophylla*	LC
OXALIDACEAE	*Oxalis obtusa*	LC
OXALIDACEAE	*Oxalis orthopoda*	LC
OXALIDACEAE	*Oxalis pes-caprae var. pes-caprae*	LC
OXALIDACEAE	*Oxalis polyphylla var. polyphylla*	LC
OXALIDACEAE	*Oxalis punctata*	LC
OXALIDACEAE	*Oxalis purpurea*	LC
OXALIDACEAE	*Oxalis robinsonii*	DDT
OXALIDACEAE	*Oxalis stellata var. glandulosa*	LC
OXALIDACEAE	*Oxalis truncatula*	LC
OXALIDACEAE	*Oxalis zeekoevleyensis*	LC
PHYLLANTHACEAE	*Lachnostylis hirta*	LC
PLUMBAGINACEAE	*Limonium kraussianum*	LC
PLUMBAGINACEAE	*Limonium scabrum var. scabrum*	LC
POACEAE	*Aristida diffusa subsp. diffusa*	LC
POACEAE	*Capeochloa arundinacea*	LC
POACEAE	*Cymbopogon marginatus*	LC
POACEAE	*Cymbopogon pospischilii*	LC
POACEAE	*Cynodon dactylon*	LC
POACEAE	*Digitaria eriantha*	LC
POACEAE	*Ehrharta calycina var. calycina*	LC
POACEAE	*Ehrharta capensis*	LC
POACEAE	*Ehrharta longiflora*	LC
POACEAE	*Eragrostis curvula*	LC
POACEAE	*Hyparrhenia hirta*	LC
POACEAE	*Melinis repens subsp. repens*	LC
POACEAE	*Pentameris eriostoma*	LC
POACEAE	*Pentameris pallida*	LC
POACEAE	*Phragmites australis*	LC
POACEAE	*Sporobolus virginicus*	LC
POACEAE	*Tenaxia stricta*	LC
POACEAE	*Themeda triandra*	LC
POACEAE	*Tribolium hispidum*	LC
POACEAE	*Tribolium purpureum*	LC

POACEAE	*Tribolium uniolae*	LC
POACEAE	*Trisetopsis hirtula*	LC
POLYGALACEAE	*Muraltia dispersa*	LC
POLYGALACEAE	*Muraltia rhamnoides*	LC
POLYGALACEAE	*Muraltia spinosa*	LC
POLYGALACEAE	*Polygala affinis*	LC
POLYGALACEAE	*Polygala garcinii*	LC
POLYGALACEAE	*Polygala umbellata*	LC
POLYGONACEAE	*Polygonum undulatum*	LC
POTTIACEAE	*Pseudocrossidium crinitum*	LC
POTTIACEAE	*Triquetrella mxinwana cf.*	LC
POTTIACEAE	*Triquetrella sp.*	LC
PRIMULACEAE	*Samolus porosus*	LC
PROTEACEAE	*Leucadendron coriaceum*	EN
PROTEACEAE	*Leucadendron salignum*	LC
PROTEACEAE	*Leucadendron teretifolium*	LC
PROTEACEAE	*Protea decurrens*	EN
PROTEACEAE	*Protea obtusifolia*	NT
PTERIDACEAE	*Cheilanthes capensis*	LC
RANUNCULACEAE	*Anemone anemonoides subsp. anemonoides*	LC
RANUNCULACEAE	*Anemone vesicatoria subsp. vesicatoria*	LC
RESTIONACEAE	*Elegia recta*	NT
RESTIONACEAE	*Elegia recta*	NT
RESTIONACEAE	*Elegia squamosa*	EN
RESTIONACEAE	*Elegia squamosa*	EN
RESTIONACEAE	*Restio capensis*	LC
RESTIONACEAE	*Thamnochortus sp.*	-
RHAMNACEAE	*Phylica selaginoides*	LC
ROSACEAE	*Cliffortia ramosissima*	LC
ROSACEAE	*Cliffortia ruscifolia var. ruscifolia*	LC
RUBIACEAE	*Anthospermum aethiopicum*	LC
RUBIACEAE	*Anthospermum galioides subsp. galioides*	LC
RUBIACEAE	*Anthospermum spathulatum subsp. spathulatum*	LC
RUBIACEAE	*Galium capense*	LC
RUSCACEAE	*Eriospermum capense subsp. capense*	LC
RUSCACEAE	*Eriospermum lanceifolium*	LC
RUSCACEAE	*Eriospermum paradoxum*	LC
RUTACEAE	*Acmadenia macropetala*	VU
RUTACEAE	*Agathosma capensis*	LC
RUTACEAE	*Agathosma foetidissima*	NT
RUTACEAE	*Diosma passerinoides*	VU
SANTALACEAE	*Thesium funale*	LC
SANTALACEAE	*Thesium stirtonii*	LC
SANTALACEAE	*Thesium strictum*	LC
SANTALACEAE	*Viscum capense*	LC

SANTALACEAE	*Viscum hoolei*	LC
SAPINDACEAE	*Dodonaea viscosa var. angustifolia*	LC
SAPOTACEAE	*Sideroxylon inerme L. subsp. inerme*	LC
SCHIZAEACEAE	*Schizaea pectinata*	LC
SCROPHULARIACEAE	*Buddleja saligna*	LC
SCROPHULARIACEAE	*Chaenostoma aethiopicum*	LC
SCROPHULARIACEAE	*Chaenostoma caeruleum*	LC
SCROPHULARIACEAE	*Chaenostoma revolutum*	LC
SCROPHULARIACEAE	*Diascia decipiens cf.*	LC
SCROPHULARIACEAE	*Diascia elongata cf.*	LC
SCROPHULARIACEAE	*Diascia parviflora*	LC
SCROPHULARIACEAE	*Dischisma ciliatum subsp. ciliatum*	LC
SCROPHULARIACEAE	*Freylinia undulata*	LC
SCROPHULARIACEAE	*Hemimeris racemosa*	LC
SCROPHULARIACEAE	*Jamesbrittenia atropurpurea subsp. atropurpurea*	LC
SCROPHULARIACEAE	*Jamesbrittenia calciphila*	NT
SCROPHULARIACEAE	*Selago corymbosa*	LC
SCROPHULARIACEAE	*Selago dolosa*	LC
SCROPHULARIACEAE	*Selago fruticosa cf.*	LC
SCROPHULARIACEAE	*Selago ramosissima*	EN
SCROPHULARIACEAE	*Selago scabrida*	LC
SCROPHULARIACEAE	*Teedia lucida*	LC
SCROPHULARIACEAE	*Zaluzianskya capensis*	LC
SCROPHULARIACEAE	*Zaluzianskya divaricata*	LC
SOLANACEAE	*Lycium cinereum*	LC
SOLANACEAE	*Solanum capense*	LC
SOLANACEAE	*Solanum linnaeanum*	LC
SOLANACEAE	*Solanum tomentosum var. tomentosum*	LC
SOLANACEAE	*Withania somnifera*	LC
TECOPHILAEACEAE	*Cyanella hyacinthoides*	LC
TECOPHILAEACEAE	*Cyanella lutea*	LC
THYMELAEACEAE	*Gnidia caniflora*	LC
THYMELAEACEAE	*Gnidia fourcadei*	LC
THYMELAEACEAE	*Gnidia juniperifolia*	LC
THYMELAEACEAE	*Gnidia laxa*	LC
THYMELAEACEAE	*Passerina ericoides*	VU
THYMELAEACEAE	*Struthiola ciliata*	LC
TYPHACEAE	*Typha capensis*	LC
VERBENACEAE	*Chascanum cernuum/cuneifolium*	LC
ZYGOPHYLLACEAE	*Roepera fulva*	LC
ZYGOPHYLLACEAE	*Roepera morgsana*	LC
ZYGOPHYLLACEAE	*Roepera sessilifolium cf.*	LC

8.3.2 Bird species list for Haarwegskloof Nature Reserve

BIODIVERSITY DATA COLLECTION AND MONITORING			
HAARWEGSKLOOF NATURE RESERVE BIRD SPECIES LIST			
Scientific Name	Common names		SA Red List
	English	Afrikaans	
Tricholaema leucomelas	Acacia Pied Barbet	Bonthoutkapper	LC
Anas sparsa	African Black Duck	Swarteend	LC
Apus barbatus	African Black Swift	Swartwindswael	LC
Anhinga rufa	African Darter	Slanghalsvoel	NT
Muscicapa adusta	African Dusky Flycatcher	Donkervlieevanger	LC
Haliaeetus vocifer	African Fish-Eagle	Visarend	LC
Accipiter tachiro	African Goshawk	Afrikaanse Sperwer	LC
Polyboroides typus	African Harrier-Hawk	Kaalwangvalk	LC
Upupa africana	African Hoopoe	Hoephoep	LC
Circus ranivorus	African Marsh-Harrier	Afrikaanse Vleivalk	VU
Columba arquatrix	African Olive-Pigeon	Geelbekbosduif	LC
Terpsiphone viridis	African Paradise-Flycatcher	Paradysvlieevanger	LC
Anthus cinnamomeus	African Pipit	Gewone Koester	LC
Porphyrio madagascariensis	African Purple Swamphen	Grootkoningriethaan	LC
Ortygospiza atricollis	African Quailfinch	Gewone Kwartelvinkie	LC
Rallus caerulescens	African Rail	Grootriethaan	LC
Acrocephalus baeticatus	African Reed-Warbler	Kleinrietsanger	LC
Threskiornis aethiopicus	African Sacred Ibis	Skoorsteenveer	LC
Gallinago nigripennis	African Snipe	Afrikaanse Snip	LC
Platalea alba	African Spoonbill	Lepelaar	LC
Saxicola torquatus	African Stonechat	Gewone Bontrokkie	LC
Strix woodfordii	African Wood-Owl	Bosuil	LC
Certhilauda brevirostris	Agulhas Long-billed Lark	Overberglangbeklewerik	NT
Tachymarptis melba	Alpine Swift	Witpenswindswael	LC
Chalcomitra amethystina	Amethyst Sunbird	Swartsuikerbekkie	LC
Tyto alba	Barn Owl	Nonnetjie-uil	LC
Hirundo rustica	Barn Swallow	Europese Swael	LC
Apalis thoracica	Bar-throated Apalis	Bandkeelkleinjantjie	LC
Amaurornis flavirostris	Black Crake	Swartriethaan	LC
Cuculus clamosus	Black Cuckoo	Swartkoekoek	LC
Circus maurus	Black Harrier	Witkruisvleivalk	EN
Psalidoprocne holomelaena	Black Saw-wing	Swartsaagvlerkswael	LC
Accipiter melanoleucus	Black Sparrowhawk	Swartsperwer	LC
Ciconia nigra	Black Stork	Grootswartooievaar	EN
Nycticorax nycticorax	Black-crowned Night-Heron	Gewone Nagreier	NT
Ardea melanocephala	Black-headed Heron	Swartkopreier	LC
Elanus caeruleus	Black-winged Kite	Blouvalk	NT
Vanellus armatus	Blacksmith Lapwing	Bontkiewiet	LC

Himantopus himantopus	Black-winged Stilt	Rooipootelsie	LC
Anthropoides paradiseus	Blue Crane	Bloukraanvoel	VU
Telophorus zeylonus	Bokmakierie Bokmakierie	Bokmakierie	LC
Aquila pennatus	Booted Eagle	Dwergarend	LC
Crithagra sulphuratus	Brimstone Canary	Dikbekkanarie	LC
Halcyon albiventris	Brown-hooded Kingfisher	Bruinkopvisvanger	LC
Riparia paludicola	Brown-throated Martin	Afrikaanse Oewerswael	LC
Centropus burchellii	Burchell's Coucal	Gewone Vleiloerie	LC
Batis capensis	Cape Batis	Kaapse Bosbontrokkie	LC
Pycnonotus capensis	Cape Bulbul	Kaapse Tiptol	LC
Emberiza capensis	Cape Bunting	Rooivlerkstreepkoppie	LC
Serinus canicollis	Cape Canary	Kaapse Kanarie	LC
Mirafra apiata	Cape Clapper Lark	Kaapse Klappertjie	LC
Corvus capensis	Cape Crow	Swartkraai	LC
Sphenoeacus afer	Cape Grassbird	Grasvoel	LC
Certhilauda curvirostris	Cape Long-billed Lark	Weskuslangbeklewerik	LC
Macronyx capensis	Cape Longclaw	Oranjekeelkalkoentjie	LC
Cossypha caffra	Cape Robin-Chat	Gewone Janfrederik	LC
Anas smithii	Cape Shoveler	Kaapse Slopeend	NT
Passer melanurus	Cape Sparrow	Gewone Mossie	LC
Pternistis capensis	Cape Spurfowl	Kaapse Fisant	LC
Promerops cafer	Cape Sugarbird	Kaapse Suikervoel	LC
Streptopelia capicola	Cape Turtle-Dove	Gewone Tortelduif	LC
Gyps coprotheres	Cape Vulture	Kraansaasvoël	VU
Motacilla capensis	Cape Wagtail	Gewone Kwikkie	LC
Ploceus capensis	Cape Weaver	Kaapse Wewer	LC
Zosterops virens	Cape White-eye	Kaapse Glasogie	LC
Oenanthe pileata	Capped Wheatear	Hoeveldskaapwagter	LC
Dendropicos fuscescens	Cardinal Woodpecker	Kardinaalspeg	LC
Bubulcus ibis	Cattle Egret	Veereier	LC
Parisoma subcaeruleum	Chestnut-vented Warbler	Bosveldtjeriktik	LC
Cisticola textrix	Cloud Cisticola	Gevlekte Klopkloppie	LC
Lanius collaris	Common Fiscal	Fiskaallaksman	LC
Delichon urbicum	Common House-Martin	Huisswael	LC
Gallinula chloropus	Common Moorhen	Grootwaterhoender	LC
Struthio camelus	Common Ostrich	Volstruis	LC
Coturnix coturnix	Common Quail	Afrikaanse Kwartel	LC
Actitis hypoleucos	Common Sandpiper	Gewone Ruiter	LC
Sturnus vulgaris	Common Starling	Europese Spreeu	LC
Estrilda astrild	Common Waxbill	Rooibeksysie	LC
Vanellus coronatus	Crowned Lapwing	Kroonkiewiet	LC
Neotis denhami	Denham's Bustard	Veldpou	VU
Chrysococcyx caprius	Diderick Cuckoo	Diederikkie	LC
Alopochen aegyptiacus	Egyptian Goose	Kolgans	LC
Merops apiaster	European Bee-eater	Europese Byvreter	LC

Stenostira scita	Fairy Flycatcher	Feevlieievanger	LC
Cercomela familiaris	Familiar Chat	Gewone Spekvreter	LC
Caprimulgus pectoralis	Fiery-necked Nightjar	Afrikaanse Naguil	LC
Sigelus silens	Fiscal Flycatcher	Fiskaalvlieivanger	LC
Crithagra scotops	Forest Canary	Gestreepte Kanarie	LC
Dicrurus adsimilis	Fork-tailed Drongo	Mikstertbyvanger	LC
Megaceryle maximus	Giant Kingfisher	Reusevisvanger	LC
Plegadis falcinellus	Glossy Ibis	Glansibis	LC
Indicator indicator	Greater Honeyguide	Grootheuningwyser	LC
Hirundo cucullata	Greater Striped Swallow	Grootstreepswael	LC
Ardea cinerea	Grey Heron	Bloureier	LC
Parus afer	Grey Tit	Piet-tjou-tjou-grysmees	LC
Cisticola subruficapilla	Grey-backed Cisticola	Grysrugtinktinkie	LC
Eremopterix verticalis	Grey-backed Sparrowlark	Grysruglewerik	LC
Scleroptila africanus	Grey-winged Francolin	Bergpatrys	LC
Bostrychia hagedash	Hadeda Ibis	Hadeda	LC
Scopus umbretta	Hamerkop	Hamerkop	NT
Numida meleagris	Helmeted Guineafowl	Gewone Tarentaal	LC
Anas hottentota	Hottentot Teal	Gevlekte Eend	LC
Passer domesticus	House Sparrow	Huismossie	LC
Buteo rufofuscus	Jackal Buzzard	Rooiborsjakkalsvoel	LC
Eupodotis vigorsii	Karoo Korhaan	Vaalkorhaan	NT
Prinia maculosa	Karoo Prinia	Karoolangstertjie	LC
Cercotrichas coryphoeus	Karoo Scrub-Robin	Slangverklikker	LC
Larus dominicanus	Kelp Gull	Swartugmeeu	LC
Charadrius pecuarius	Kittlitz's Plover	Geelborsstrandkiewiet	NT
Chrysococcyx klaas	Klaas's Cuckoo	Meitjie	LC
Campethera notata	Knysna Woodpecker	Knysnaspeg	LC
Falco biarmicus	Lanner Falcon	Edelvalk	NT
Galerida magnirostris	Large-billed Lark	Dikbeklewerik	LC
Streptopelia senegalensis	Laughing Dove	Rooiborsduifie	LC
Indicator minor	Lesser Honeyguide	Kleinheuningwyser	LC
Falco naumanni	Lesser Kestrel	Kleinrooivalk	VU
Acrocephalus gracilirostris	Lesser Swamp-Warbler	Kaapse Rietsanger	LC
Cisticola tinniens	Levaillant's Cisticola	Vleitinktinkie	LC
Egretta garzetta	Little Egret	Kleinwitreier	LC
Tachybaptus ruficollis	Little Grebe	Kleindobbertjie	LC
Bradypterus baboecala	Little Rush-Warbler	Kaapse Vleisanger	LC
Apus affinis	Little Swift	Kleinwindswael	LC
Sylvietta rufescens	Long-billed Crombec	Bosveldstompstert	LC
Alcedo cristata	Malachite Kingfisher	Kuifkopvisvanger	LC
Nectarinia famosa	Malachite Sunbird	Jangroentjie	LC
Oenanthe monticola	Mountain Wheatear	Bergwagter	LC
Oena capensis	Namaqua Dove	Namakwaduifie	LC
Cisticola fulvicapilla	Neddicky Neddicky	Neddikkie	LC

Anthus nicholsoni nicholsoni	Nicholson's Pipit	Nicholsonse Koester	LC
Telophorus olivaceus	Olive Bush-Shrike	Olyfboslaksman	LC
Turdus olivaceus	Olive Thrush	Olyflyster	LC
Dendropicos griseocephalus	Olive Woodpecker	Gryskopspeg	LC
Pavo cristatus	Peafowl	Pou	LC
Hirundo dimidiata	Pearl-breasted Swallow	Perelborsswael	LC
Recurvirostra avosetta	Pied Avocet	Bontelsie	LC
Corvus albus	Pied Crow	Witborskraai	LC
Ceryle rudis	Pied Kingfisher	Bontvisvanger	LC
Spreo bicolor	Pied Starling	Witgatspreeu	LC
Vidua macroura	Pin-tailed Whydah	Koningrooibekkie	LC
Anthus leucophrys	Plain-backed Pipit	Donkerkoester	LC
Ardea purpurea	Purple Heron	Rooireier	LC
Anas erythrorhyncha	Red-billed Teal	Rooibekeend	NT
Calandrella cinerea	Red-capped Lark	Rooikoplewerik	LC
Cuculus solitarius	Red-chested Cuckoo	Piet-my-vrou	LC
Streptopelia semitorquata	Red-eyed Dove	Grootringduif	LC
Urocolius indicus	Red-faced Mousebird	Rooiwangmuisvoel	LC
Fulica cristata	Red-knobbed Coot	Bleshoender	LC
Onychognathus morio	Red-winged Starling	Rooivlerkspreeu	LC
Phalacrocorax africanus	Reed Cormorant	Rietduiker	LC
Columba livia	Rock Dove	Tuinduif	LC
Falco rupicolus	Rock Kestrel	Kransvalk	LC
Hirundo fuligula	Rock Martin	Kransswael	LC
Sagittarius serpentarius	Secretarybird	Sekretarisvoël	VU
Andropadus importunus	Sombre Greenbul	Gewone Willie	LC
Tadorna cana	South African Shelduck	Kopereend	LC
Eupodotis afra	Southern Black Korhaan	Swartvlerkkorhaan	VU
Laniarius ferrugineus	Southern Boubou	Suidelike Waterfiskaal	LC
Cinnyris afer	Southern Double-collared Sunbird	Groot-rooibandsuikerbekkie	LC
Cinnyris chalybeus	Southern Double-collared Sunbird	Klein-rooibandsuikerbekkie	LC
Passer diffusus	Southern Grey-headed Sparrow	Gryskopmossie	LC
Ploceus velatus	Southern Masked-Weaver	Swartkeelgeelvink	LC
Melierax canorus	Southern Pale Chanting Goshawk	Bleeksingvalk	LC
Euplectes orix	Southern Red Bishop	Rooivink	LC
Tchagra tchagra	Southern Tchagra	Grysborstjagra	LC
Colius striatus	Speckled Mousebird	Gevlekte Muisvoel	LC
Columba guinea	Speckled Pigeon	Kransduif	LC
Bubo africanus	Spotted Eagle-Owl	Gevlekte Ooruil	LC
Burhinus capensis	Spotted Thick-knee	Gewone Dikkop	LC
Plectropterus gambensis	Spur-winged Goose	Wildemakou	LC
Buteo vulpinus	Steppe Buzzard	Bruinjakkalsvoel	LC
Crithagra gularis	Streaky-headed Seedeater	Streepkopkanarie	LC
Coccopygia melanotis	Swee Waxbill	Suidelike Swie	LC
Turtur tympanistria	Tambourine Dove	Witborsduifie	LC

Phyllastrephus terrestris	Terrestrial Brownbul	Boskrapper	LC
Charadrius tricollaris	Three-banded Plover	Driebandstrandkiewiet	LC
Aquila verreauxii	Verreaux's Eagle	Witkruisarend	VU
Burhinus vermiculatus	Water Thick-knee	Waterdikkop	LC
Ciconia ciconia	White Stork	Witooievaar	LC
Phalacrocorax carbo	White-breasted Cormorant	Witborsduiker	LC
Dendrocygna viduata	White-faced Duck	Nonnetjie-eend	LC
Corvus albicollis	White-necked Raven	Withalskraai	LC
Apus caffer	White-rumped Swift	Witkruiswindswael	LC
Crithagra albogularis	White-throated Canary	Witkeelkanarie	LC
Hirundo albigularis	White-throated Swallow	Witkeelswael	LC
Phylloscopus trochilus	Willow Warbler	Hofsanger	LC
Euplectes capensis	Yellow Bishop	Kaapse Flap	LC
Crithagra flaviventris	Yellow Canary	Geelkanarie	LC
Anas undulata	Yellow-billed Duck	Geelbekeend	NT
Egretta intermedia	Yellow-billed Egret	Geelbekwitreier	LC
Milvus aegyptius	Yellow-billed Kite	Geelbekwou	LC
Cisticola juncidis	Zitting Cisticola	Landeryklopkloppie	LC

8.3.3 Mammal list for Haarwegskloof Nature Reserve

BIODIVERSITY DATA COLLECTION AND MONITORING			
HAARWEGSKLOOF NATURE RESERVE MAMMAL SPECIES LIST			
Latin name	Common Name		Red list Status
	English Common Name	Afrikaans Common Name	
Aardvark (ORYCTEROPODIDAE)			
Orycteropus afer afer	Aardvark	Erdvark	LC
Aardwolf (HYAENIDAE)			
Proteles cristatus	Aardwolf	Maanhaarjakkals	LC
Antelope (BOVIDAE)			
Antidorcas marsupialis subsp. marsupialis	Springbok	Springbok	LC
Dama dama	Takbok	Fallow Deer	Alien
Pelea capreolus	Grey Rhebuck	Vaalribbok	LC
Raphicerus campestris	Steenbuck	Steenbok	LC
Raphicerus melanotis	Cape Grysbuck	Kaapse Grysbok	LC
Sylvicapra grimmia grimmia	Common Duiker	Duiker	LC
Tragelaphus strepsiceros subsp. strepsiceros	Kudu	Koedoe	Extra-limital
Tragelaphus sylvaticus ssp. sylvaticus	Southern Bushbuck	Suidelike Bosbok	LC
Bats (RHINOLOPHIDAE)			
Miniopterus natalensis	Natal Long-fingered Bat	Natal grotvlermuis	LC
Neoromicia capensis	Cape Sertine Bat	Kaapse dakvlermuis	LC
Nycteris thebaica	Egyptian Slit-faced Bat	Egiptiese spleetneusvlermuis	LC
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	Geoffroy se saalneusvlermuis	LC
Cats (FELIDAE)			
Caracal caracal caracal	Caracal	Rooikat	LC
Felis catus	Domestic Cat	Huiskat	Alien
Felis silvestris cafra	African Wild Cat	Vaalboskat / Groukat	LC
Panthera pardus	Leopard	Luiperd	VU
Genets (VIVERRIDAE)			
Genetta genetta	Small-spotted Genet	Kleinkolmuskeljaatkat	LC
Genetta tigrina	Large-spotted Genet	Grootkolmuskejaatkat	LC
Hares (LEPORIDAE)			
Lepus saxatilis saxatilis	Scrub Hare	Kolhaas	LC
Hyrax (PROCAVIIDAE)			
Procavia capensis	Rock Hyrax	Klipdassie	LC
Jackal & Foxes (CANIDAE)			
Lupulella mesomelas	Black-backed Jackal	Rooijakkals	LC
Otocyon megalotis	Bat-eared Fox	Bakoorjakkals	LC

Vulpes chama	Cape Fox	Draaijakkals / Silwerjakkals	LC
Molerats (BATHYERGIDAE)			
Cryptomys hottentotus	Common Molerat	Vaalmol	LC
Mongooses (HERPESTIDAE)			
Atilax paludinosus paludinosus	Water Mongoose	Watermuishond / kommetjiegatmuishond	LC
Cynictis penicillata	Yellow Mongoose	Rooimeerkat	LC
Galerella pulverulenta subsp. pulverulenta	Cape / Small Grey Mongoose	Kleingrysmuishond	
Herpestes ichneumon cafer	Egyptian / Large Grey Mongoose	Grootgrysmuishond	LC
Pigs (SUIDAE)			
Potamochoerus larvatus ssp. koiropotamus	Southern Bushpig	Suidelike Bosvark	LC
Polecats & Badgers (MUSTELIDAE)			
Ictonyx striatus	Striped Polecat / Zorilla	Stinkmuishond	LC
Mellivora capensis capensis	Honey Badger	Ratel	LC
Porcupines (HYSTRICIDAE)			
Hystrix africaeaustralis africaeaustralis	Cape Porcupine	Ystervark	LC
Rats & Mice (MURIDAE)			
Gerbilliscus afra	Cape Gerbil	Nagmuis	LC
Micaelamys namaquensis	Namaqua Rock Mouse	Namakwalandse Klipmuis	LC
Mus minutoides	Pygmy Mouse	Dwergmuis	LC
Otomys irroratus	Southern Vlei Rat	Suidlike Vleirot	LC
Rattus rattus	House Rat	Rot	Alien
Rhabdomys pumilio	Four-striped Mouse	Streepmuis	LC
Sengis (MACROSCELIDIDAE)			
Elephantulus edwardii	Cape Rock Elephant Shrew / Cape Rock Sengi	Klaasneus	LC
Shrews (SORICIDAE)			
Suncus varilla	Reddish-Grey Musk Shrew	Rooigrysskeerbek	LC

8.3.4 Reptile list for Haarwegskloof Nature Reserve

BIODIVERSITY DATA COLLECTION AND MONITORING			
HAARWEGSKLOOF NATURE RESERVE REPTILE SPECIES LIST			
Family	Latin name	Common names	
		Afrikaans	Engels
Snakes			
VIPERIDAE	*Bites arietans*	Puff Adder	Pofadder
LAMPROPHIIDAE	*Boaedon capensis*	Brown House Snake	Bruinhuisslang
COLUBRIDAE	*Crotaphopeltis hotamboeia*	Red-lipped / Herald Snake	Rooilipslang
COLUBRIDAE	*Dasypeltis scabra scabra*	Egg-Eater	Eiervreter
COLUBRIDAE	*Dispholidus typus*	Boomslang	Boomslang
PSEUDOXYRHOPHIIDAE	*Duberria lutrix*	Slug-eater	Tabakrolletjie
ELAPIDAE	*Hemachatus haemachatus*	Rinkhals	Rinkhals
ATRACTASPIDIDAE	*Homoroselaps lacteus*	Spotted Harlequin Snake	Gevlekte skaapsteker
LEPTOTYPHLOPIDAE	*Leptotyphlops nigricans*	Black Thread Snake	Kaapse Erdslangetjie
ELAPIDAE	*Naja nivea*	Cape Cobra	Geelslang / Koperkapel
PSAMMOPHIIDAE	*Psammophis crucifer*	Cross-marked Sand Snake	Kruismerkslang
PSAMMOPHIIDAE	*Psammophylax rhombeatus*	Rhombic Skaapsteker	Skaapsteker
Tortoises			
TESTUDINIDAE	*Chersina angulata*	Angulate Tortoise	Rooipensskilpad / Duineskilpad
TESTUDINIDAE	*Geochelone pardalis*	Leopard Tortoise	Bergskilpad
TESTUDINIDAE	*Homopus areolatus*	Parrot-beaked Tortoise	Papegaaibek-padloper
Lizards / Geckos / Chameleons			
SCINCIDAE	*Acontias meleagris*	Cape Legless Skink	Kaapse pootlose skink
AGAMIDAE	*Agama atra*	Southern Rock Agama	Suidelike Rotskoggelmander
CHAMAELEONIDAE	*Bradypodion gutturale*	Robertson Dwarf Chameleon	Klein Karoo Dwergverkleurmannetjie
CORDYLIDAE	*Chamaesaura anguina subsp. anguina*	Cape Grass Lizard	Kaapse grasakkedis
CORDYLIDAE	*Cordylus cordylus*	Cape Girdled Lizard	Kaapse Gordelakkedis
GERRHOSAURIDAE	*Gerrhosaurus typicus*	Namaqua Plated Lizard	Namaqua Panserakkedis
GEKKONIDAE	*Pachydactylus geitje*	Ocellated Thick-toed Gecko	Koldiktoongeitjie

GERRHOSAURIDAE	*Tetradactylus tetradactylus*	Long-tail Whip Lizzard / Seps	Langstertseps
SCINCIDAE	*Trachylepis capensis*	Cape Skink	Kaapse skink

8.3.5 Amphibian list for Haarwegskloof Nature Reserve

BIODIVERSITY DATA COLLECTION AND MONITORING			
HAARWEGSKLOOF NATURE RESERVE AMPHIBIAN SPECIES LIST			
Family	**Latin name**	**Common names**	
		Afrikaans	**Engels**
Frogs			
Brevicipitidae	*Breviceps montanus*	Cape Mountain Rain Frog	Bergreënpadda / Janblom / Blaasoppadda
Bufonidae	*Vandijkophrynus angusticeps*	Cape Sand Toad	Sandskurwepadda
Pyxicephalidae	*Amietia fuscigula*	Cape River Frog	Kaapse rivierpadda
Pyxicephalidae	*Cacosternum australis*	Southern Caco	Suidelike Blikslaertjie
Pyxicephalidae	**Strongylopus grayii**	**Clicking Stream Frog**	**Graspadda**
Platannas			
Pipidae	*Xenopus laevis*	African Clawed Frog	Platanna
Toads			
Bufonidae	*Sclerophrys capensis*	Raucus Toad	Hees Skurwepadda, Lawaaierige Skurwepadda

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 stabilise. 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 application 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

This plan provides detailed, budget-aligned management actions for period January to December 2025. Additional management actions for future years and that may be ongoing across a number of years are also included for future reference, but those not applicable to 2025 are in grey.

Annual Plan of Operation

Haarwegskloof Nature Reserve

2025/26

REPORT

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KPA	Objective	Objective Statement	This Years Plan	Budget	Management Activities	Evidence	Resp. Person	Annual Status
	Integrated Wildfire Control	To manage 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.	Maintain membership with goFPA and manage the fire management unit for the greater area, including neighboring reserves, with firebreaks identified along key roads. Conduct pre-fire season audits, attend local FPA and Fire & Rescue Service meetings, and maintain records of all controlled burns and wildfires. Ensure the upkeep of essential firebreaks around infrastructure.	RO	The Management Authority to maintain membership with goFPA.	Updated membership invoice.	Reserve Manager & Office Manager	*Completed*
					Negotiate and maintain the fire management unit for the greater area including neighbours with the approval of the FPA identifying key roads that could be used as firebreaks.	Map with approved Fire Management Unit Agreement.	Conservation Manager & Reserve Manager	*On Track*
					Conduct Pre-Fire Season Fire Audit	Audit Sheets. Inventory of fire-fighting equipment	Conservation Manager & Reserve Manager	*On Track*
					Attend Local FPA Meetings, when possible, at least AGM. Attend Pre-Fire Season meetings with local Fire & Rescue Service.	Minutes of meeting	Conservation Manager & Reserve Manager	*On Track*
					Maintain records of all controlled burns and wildfires that occur in the reserve.	Fire records / fire maps maintained.	Reserve Manager	*On Track*
					Maintain key firebreaks where necessary around infrastructure.	Firebreaks maintained.	Reserve Manager	*On Track*
	grated Invasive Alien Species Control	To control (or eradicate where possible) invasive alien species using appropriate methods, and to reduce combustible material to reduce intensity and spread of wildfires, as well as the effective monitoring to prevent further introductions	Develop a five-year Strategic Clearing Plan (SCP) for the greater Haarwegskloof Reserve. Implement clearing activities in designated annual units and survey Goereesoe and Luiperdskop to gather necessary data on invasive species for	RO	Draft a Strategic Clearing Plan (SCP) for the greater HWK reserve (5 year plan). This plan should include species densities, control methods and follow-up activities.	Strategic Clearing Plan	Conservation Manager & Reserve Manager	*On Track*
					Implement clearing activities in the predetermined annual units listed in the Strategic Clearing Plan through the most effective mechanical, chemical and biocontrol measures.	Hectares cleared. NRM History.	Reserve Manager	*On Track*
					Survey Goereesoe and Luiperdskop to gather neccesary species and densities of invasive species to complete the SCP.	Database established.	Reserve Manager	*On Track*

8.6 APPENDIX F – Fixed Point Photography methodology

Method and Materials

Purchase the following materials:

- Concrete (approximately 0.064 m2/site)
- Galvanised, stainless steel or aluminium square tubing – approximately 50 x 50 x 600 mm – one per site
- Two wooden batons (approx. 44 x 44 mm) at 1.6 and 2 m long
- Black and fluorescent orange spray paint
- A roll of masking tape
- A stencil with large numbers plus a stencil with a 20 mm long arrow or triangle shape (either purchased or made from plastic/cardboard sheeting)
- 'Hammerite' or similar anti-rust paint (if galvanised steel is used) – colour of choice
- A basic digital camera with a 35 mm lens or equivalent
- A compass

Material preparation and methodology

- Cut the square tubing into 600 mm sections. If galvanised steel tubing is used, coat the tube liberally in anti-rust paint.
- Cut the two batons to length as indicated. Tape off 10 cm sections from one end of the baton. Paint the 2.5 m long baton black spray paint. Allow paint to dry fully. Remove the tape from previously taped sections and cover the painted sections with tape. Paint the pole with fluorescent orange spray paint. Allow to dry fully. Remove the tape. Stencil a '0.5' onto the middle of the orange section nearest to 0.5 m from the ground. Stencil an arrow/triangle shape above or below the numbering, with the point indicating where the 0.5 m mark lies. Do the same for 1 m and 1.5 m. Allow to dry fully before use.
- At each site, dig a hole by hand of approximately 400 mm square. Insert the 600 mm long tube into the concrete such that only 200 mm protrudes directly upwards. Mix and pour concrete into the hole such that the concrete base lies just 10 cm below the surface. Cover the concrete base with sand while wet for aesthetic purposes.
- Once the concrete is dry, chose a sunny day that is not overly windy and visit the fixed-point photography sites. Two people are required for the task. Take photos in accordance with the following procedure:

    - Person 1: Take the long, spray-painted pole. Pace out 10 m on a direct northerly compass bearing (magnetic north) from the concrete base. Hold the pole vertically at the point paced out. Be sure that the numbering faces the camera.
    - Person 2: Place the pole in the square tube that protrudes vertically from the concrete base. Place the camera on top of the pole and take the photograph.
- Repeat such that photographs are taken facing north, south, east and west at each site.